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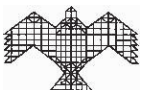
Workshop Report

National Workshop on
Indo-US Relations

Changing Contours of Indo-US Relations

Editors

K.P. Vijayalakshmi
Arvind Kumar
Sonika Gupta
S. Chandrashekar



International Strategic and Security Studies Programme

NATIONAL INSTITUTE OF ADVANCED STUDIES

Bangalore, India

Report on the National Workshop on Changing Contours of Indo-US Relations

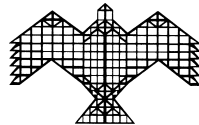
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Foreword

When Dr. Vijayalakshmi mooted the idea of an Indo-US Workshop that looked at all dimensions of Indo-US Relations in March 2005 none of us even remotely imagined that momentous events were going to transform the basic structure of the relationship. As I and my colleagues at NIAS (Prof. S. Chandrashekar, Arvind Kumar and Dr. Sonika Gupta) along with Prof. Vijayalakshmi struggled to put together a workshop package that would capture the gamut of the relationship, major events slowly started unfolding. The Joint Statement of 18th July 2005 issued by Prime Minister Dr. Manmohan Singh and President George W. Bush was the first sign that there was indeed going to be a paradigm shift in Indo-US relations.

As the debate within India on Indo-US relations and on the civilian nuclear deal was hotting up, our desire to try and ensure that we get the best people in India to come to the Workshop and share their insights with us became more and more important. The motive for this was of course the desire that the inputs from the Workshop would influence policy and decision making on this matter of great importance to the future of the country. We were lucky in both respects. We did get the best brains in India from both academia and members of the strategic community to come to Bangalore and take part in the Workshop. We were also fortunate that the dates of the Workshop February 9th and 10th 2006 just preceded the visit of President George W Bush to India that took place on March 1st, 2006. One of the issues that was engaging the attention of the whole country was related to the Indo-US nuclear deal. The International Strategic and Security Studies Programme at NIAS put together a short briefing paper that looked at all dimensions of Indo-US Relations with a specific focus on the “nuclear deal”. This briefing paper did reach the highest policy and decision making levels in the country. We believe that it helped in improving our understanding of the drivers of the relationship between India and the US. We also believe that it did contribute in a small way in getting the deal through.

The initial two page brief was followed by a more elaborate twenty page “Workshop Brief” addressed to the larger strategic and academic community in India and abroad. This has been widely distributed and is also available on the NIAS website.

There was also a great deal of interest that the proceedings of the Workshop be brought out as quickly as possible. This edited volume of the Workshop Proceedings has been brought out to cater to this need of the strategic community in India and abroad.

Before I conclude, I would like to thank all the participants at the Workshop who took time off from their busy schedules to come to Bangalore and participate in this important event. I think their contribution did make a difference to our understanding of a complex issue. I would also like to specially thank my former colleague Dr. G. Madhavan Nair, Chairman, Space Commission for his support of this Workshop.

Happy Reading.

K. KASTURIRANGAN
Director, NIAS

Introduction

The International Strategic and Security Studies Programme of the National Institute of Advanced Studies (NIAS), Bangalore organised a two day National Workshop on “Changing Contours of Indo-US Relations” during 9-10 February 2006. The objectives of the Workshop were to exchange views and generate opinion on a wide spectrum of issues relating to Indo-US relations. The themes for the debate included:

- Perceptions and misperceptions in Indo-US relations
- Indo-US economic relations: emerging dynamics
- Changing security environment and implications for Indo-US cooperation in defence
- Prospects for Indo-US cooperation in high technology
- US and Indian legal systems and their implications for Indo-US relations

The participants for the Workshop were drawn from academia, the strategic community, scientists, technologists, diplomats, practitioners and the defence services.

The major focus of the Workshop was to critically assess the paradigm shift in perceptions reshaping Indo-US relations. The purpose was to get different perspectives on the commonalities and differences that would govern Indo-US relations in the near and distant future. The visit of the US President George W. Bush to India and the possibility of an accord between the US and India on civilian nuclear cooperation provided the backdrop to the organization of the workshop. The output from the workshop was meant to feed into the policy making and decision-making processes. This in fact did happen.

Workshop Highlights

- His Excellency Shri T.N. Chaturvedi, Governor of Karnataka, inaugurated the Workshop on the 9th of February 2006. His Excellency also delivered the Inaugural Address.
- Shri K. Subrahmanyam, Chairman Task Force on Global Strategic Developments, Government of India, gave a special Public Lecture on “Challenges and Prospects for Indo-US Relations” on the evening of the 9th of February 2006.
- In a special session, Dr. Anil Kakodkar, Chairman of the Atomic Energy Commission and Secretary, Department of Atomic Energy addressed the Workshop participants and shared with them his views on the status and prospects of cooperation between India and the US in the civilian nuclear field.

Following is a detailed report of the workshop. At the end of each session a summary of the main highlights of the session is provided. This is followed by a discussion on how the different strands of thinking addressed in each of the sessions intertwine to provide an overall understanding of the critical drivers of the relationship between the US and India. We conclude with a brief section on the implications of this understanding for policy making.

Inaugural Session



His Excellency Shri T.N. Chaturvedi, the Governor of Karnataka
delivering the Inaugural Address

Inaugural Session

Prof. Vijayalakshmi: Friends, His Excellency Shri Chaturvediji, Governor of Karnataka, Dr. Kasturirangan Director National Institute of Advanced Studies (NIAS), Professor Chandra, and all of us at NIAS welcome you to this two-day workshop on Indo-US Relations. I am sure you will all agree that this workshop is both timely and appropriate - a major initiative that needed to be done. This morning we have with us His Excellency, Shri Chaturvedi, Governor of Karnataka to inaugurate this Workshop. I now invite Dr. Kasturirangan of NIAS to give us his welcome remarks.

Welcome Remarks - Dr. K. Kasturirangan: Good morning. Your Excellency Shri Chaturvediji, Governor of Karnataka, Shri K. Subrahmanyam, Chairperson of the Task Force on Global Strategic Developments, Shri Vijay Nambiar, Shri Venkateswaran, Admiral Jacob, Professor Arunachalam, Mr. Lalit Mansingh, Srimathi Arundhathi Ghose, distinguished ambassadors and diplomats, members of the Task Force on Global Strategic Developments, respected professors from various academic institutions, participants of this workshop, my colleagues from the National Institute of Advanced Studies (NIAS), members of the media, ladies and gentlemen.

It gives me great pleasure to welcome all of you to Bangalore and to the National Institute of Advanced Studies. As many of you are aware, NIAS was born out of the vision of the late J.R.D. Tata. He saw NIAS as a place where talented men and women from different disciplines and different walks of life could get together and work together on problems that affect us all. NIAS, under the leadership of its Founder-Director Professor Raja Ramanna and subsequently under the distinguished leadership of Professor Narasimha has scaled great heights in multidisciplinary research.

The International Strategic and Security Studies Programme is only about a decade old. It was the brainchild of Professor Narasimha,

my predecessor as Director NIAS. Over the years, this programme has established a name for itself as an independent high-calibre technology-focused think tank in the domain of international strategy and security studies. NIAS played a critical role as a track-two dialogue partner with the Committee on International Security and Arms Control (CISAC) of the National Academy of Sciences of the United States after the nuclear tests of 1998. This workshop is, in some sense, a logical corollary to these traditional NIAS activities. It, however, departs from the past in one significant way. When Dr. Vijayalakshmi here mooted the idea of a workshop on Indo-US relations, the only decision we took about its nature was that it should not only look at the strategy and military dimension but also at the economic, political and institutional dimensions as well. At the time we started looking at the design of the Workshop – and this was around July-August of 2005 – we had no idea that Indo-US relations were likely to undergo a potentially major paradigm shift. We hope that during the course of the next two days, this collection of outstanding talent from all over India can collectively engage in a constructive debate over the many thorny issues that confront the two great democracies of the world – India and the United States. With your help I think, we can come to some terms with these complex problems.

We have with us today His Excellency, the Governor of Karnataka, Shri T.N. Chaturvediji. We thank you, Sir, for taking time off from your very busy schedule to be with us today. We know that Karnataka is keeping you very busy recently. Sir, your scholarship, your erudition and your love for knowledge will be a source of inspiration to all of us in the tasks we are setting for ourselves. We look forward to your continuing and lasting involvement with NIAS and our activities.

This Workshop has been made possible because of the generous support extended to NIAS by my erstwhile colleague Dr. Madhavan Nair, who is currently the Chairman of the Space Commission. I would like to thank Dr. Madhavan Nair, Chairman ISRO and many

other colleagues from ISRO for helping us with the organization of this Workshop.

I should, at this point, also mention the good wishes that Mr. Jaswant Singh has conveyed to the deliberations of this Workshop. He was supposed to be a part of this session but could not finally make it because of some schedule problems during his recent visit to Pakistan. In his letter to me he has wished the Workshop all success.

I would be incomplete in my welcoming remarks if I do not place on record my appreciation for the work of my colleagues - Professor S. Chandrashekar, who heads the International Strategic and Security Studies Programme here as a Visiting Professor and two of his dynamic colleagues, Mr. Arvind Kumar and Dr. Sonika Gupta.

I would also, before I finish, like to thank each and every one of you who are participating in this workshop for taking time off your busy schedules to be with us at NIAS. I look forward to a very interesting two days of lively, stimulating and illuminating discussions. Thank you.

Prof. Vijayalakshmi: Thank you, Dr. Rangan. I am sure that all of us will be eagerly waiting to hear His Excellency, Governor of Karnataka, Shri Chaturvediji.

Inaugural Address - His Excellency Shri T.N. Chaturvedi, Governor, Karnataka:

Dr. Kasturirangan, very distinguished participants in this important National Workshop on “Changing Contours of Indo-US Relations”, Professor S. Chandrashekar, Professor K.P. Vijayalakshmi, and other colleagues and Professors from NIAS, esteemed ladies and gentlemen.

It gives me great pleasure to be here at this great institution. As Dr. Kasturirangan mentioned and as most of you are also aware, NIAS was founded by one of our great countrymen, J.R.D. Tata

and imparted vitality and creativity by another great Indian, the late Dr. Raja Ramanna. NIAS represents in a quintessential way the multiple dimensions that characterize and shape much of our lives, a seamless blend of the arts and the sciences with the practical, the philosophical and the human. I am extremely thankful to Dr. Kasturirangan for his very gracious remarks earlier.

I understand from Dr. Kasturirangan that all of you are present here to take stock of and chart the future course of Indo-US relations. This initiative of NIAS, in the context of the forthcoming visit of President George Bush to India, comes at the right time. We stand today at the threshold of a new era of cooperation with the United States that promises much for both sides. I am sure this meeting of some of the best minds in India through their deliberations will contribute significantly to the betterment of our relations with the United States.

I shall also take this opportunity to thank Dr. Madhavan Nair, Chairman of ISRO who has collaborated with the International Strategic and Security Studies Programme of NIAS in organizing this Workshop.

Friends, as a layman it has always been a great puzzle to me as to why the relations between the US and India have seen so many ups and downs. The US, as you all know, was one of the firm backers of the India's quest for independence from colonial rule. It supported post-independent emerging India and helped us during many situations of stress and strain during the early years. As two of the world's largest democracies there were obviously many more commonalities than differences between India and the US. Yet, as India tried to make the transition from a developing country into a developed country in the midst of several regional and geopolitical challenges, the relationship between the two countries became mired in many problems. At times these problems and perceptions appeared to be overwhelmingly difficult to resolve. Though we in India had much sympathy for the United States, we found that the US was following

the path of our former colonial masters and was therefore perceived naturally by us as acting against Indian interests. Clearly, the Cold War era and the division of the world into different ideological regimes created different worldviews and different perceptions of national interest. In spite of these differences in the political and strategic dimensions of the Indian relationship with the United States, let us also not forget that the USA has supported and helped India in many ways. The US is our largest trading partner. Many of our contemporaries as well as our children, maybe in some cases grandchildren, now live in that country. Many Indian students go to the United States to pursue higher studies in some of the best educational institutes in the world. The portals of Stanford, M.I.T., Harvard and many other world-class educational institutes that dot the landscape of the USA have been open to Indian talent. But even here, even in this sphere, and not infrequently, our highly endowed young men and women have to face difficulties and hurdles as regards grant of visas, extension of visas, mandatory occasional returns and so on. India on the other hand has been much more open, relaxed and liberal in its approach to scholars coming from other countries. I myself, if I might make a personal reference, had a number of occasions to speak to successive US Ambassadors, their Deputies visiting Congressmen and other dignitaries about this matter while working with the Government or even as a Member of the Rajya Sabha.

Friends, Bangalore is now as well known as many of the other knowledge centers of the world, thanks to IT sector and its phenomenal global impact over the last fifteen years. US needs have also largely driven the growth and development of this new knowledge industry. Yoga, Indian music, films, literature and many other aspects of our culture have always played a role in promoting our relationship with that great country. It is my belief that these unifying and integrating elements have not been stressed enough in examining the relationship between India and the United States of America. I see from the programme worked out by Dr. Kasturirangan and his colleagues that you are going to grapple with the issues of Indo-US relationships

in a holistic and multidimensional manner. It is my belief that it is indeed the challenge facing our country in dealing with the United States and that the multidimensional approach adopted by the agenda of the workshop is indeed the way to address this issue. The sessions of the Workshop - as seen from the schedule of the Workshop – talk about perceptions, problems and potential. I think these are important not only in respect of the past but also while we look to the future.

Friends, as we all know, the world of today is very different from the world of the Cold War era. At one level, the economic forces of the world are trying to integrate the world into one big market place. Equally challenging are problems of equitable distribution of the gains of economic development and the destruction and monopolization of the scarce valuable resources that all of us have to share. Global warming, the ozone hole, depletion of the global forest cover, other forms of the environmental and atmospheric pollution affect us all. At a social level there are problems of identity and alienation that are the sources of conflict and war. In this new context many of the considerations that conditioned and drove our past relations with the United States are no longer valid. These global forces of change not only provide us new opportunities but also raise new threats. We need different maps to navigate through these new and untested waters. The US too, has seen these changes in the global arena and is now looking at India in a slightly different way. We can even argue, though some may not agree, that there is indeed the potential for a paradigm shift in the relationship.

Ladies and gentlemen, while there is much to be hopeful about, there are still many differences between India and the United States that could act as roadblocks. Indian national interests and US national interests may now have many converging strands but there are still differences that at times could exacerbate our relationship. Past mindsets that find it difficult to cope with the new realities could also pose problems. One of the challenges before all of us gathered here is to identify such bottlenecks and suggest ways of dealing with them so that we can move the relationship with the United States to a new

and higher level that is mutually beneficial to both sides. To chart this new relationship with the United States through the relatively unknown unexplored emerging world order that is in our national interest and that is beneficial to both sides is the real challenge. I am sure that over the course of today and tomorrow, this august body will address these complex issues and come out with conclusions and approaches that would be useful to the country in finding solutions to many of these tangled issues.

I take this opportunity to congratulate Dr. Kasturirangan and his colleagues for a very well conceived and well-designed schedule for the National Workshop that is both focused as well as comprehensive in its coverage. Dr. Kasturirangan and his colleagues also merit our appreciation for their persuasiveness in bringing together such a galaxy of knowledgeable and experienced experts to participate in this National Workshop. I would once again like to thank NIAS for asking me to make a few observations as a layman before such a distinguished gathering at the commencement of the Workshop. I wish this National Workshop on “Changing Contours of Indo-US Relationship” every success. Thank you, ladies and gentlemen. Jai Bharat! Jai Karnataka!

Prof. Vijayalakshmi: Thank you, Your Excellency Shri Chaturvedi. I now invite Professor Chandrashekar to propose a vote of thanks for this session.

Vote of Thanks - Prof. Chandrashekar: Your Excellency Shri T.N. Chaturvedi, Governor of Karnataka, I would like to thank you personally for having taken time off to come here. We have always banked on you to bail us out of difficult situations and so far you have not disappointed us. I would like to take this opportunity to tell you that we will continue to make many more such requests and I know that you will help us in the complex problems and tasks that we have set ourselves to do. Thank you once again, for taking time off to come and be with us and to deliver the inaugural address.

I would like to take this opportunity to particularly thank Dr. Kasturirangan and Dr. Vijayalakshmi. The idea of organizing this Workshop was Dr. Vijayalakshmi's. It was she who persuaded Dr. Rangan that we should go ahead and do this. I would like to place on record my personal appreciation of the immense amount of hard work that she has put into this workshop. I am sure that with all of you here we will convert it into something that makes a major national impact.

I would also like to thank all the people who have come from all over India. I would like to thank Mr. K. Subrahmanyam particularly and the Task Force members for really giving us the stimulus to go ahead and do this on a fairly big scale. We had originally thought of a much smaller kind of programme.

I would also like to thank all the people who have come. I would particularly like to thank Ambassadors Lalit Mansingh, Arundhati Ghose; I would like to thank Ambassador Venkateswaran, Ambassador Ranganathan and all other ambassadors. I also see a lot of familiar faces. Dr. Arunachalam is here. Dr. Aatre is here. Dr. Ananth from IIT is here. We have a lot of distinguished Defence people. Air Marshal Patney is here. Admiral Jacob has always been a great source of inspiration. I would welcome all of you. Air Chief Marshal Krishnaswamy is here. So we are really grateful to all of you to be able to come and take part here.

On behalf of NIAS and Dr. Rangan I welcome you all and I hope we are able to do justice not only in terms of the Workshop itself, but also in terms of all the arrangements that we have made to make sure that your stay is comfortable.

I would also like to place on record my special appreciation to Dr. Siddhartha. He has always been very provocative and some of the provocations have always been very useful. We have in our planning of the Workshop generated lot of heat but in the process we have also generated sometimes a little bit of light.

I would also like to place on record our special appreciation to Mr. Vijay Nambiar for taking time off from his very busy schedule to be with us today. We all know that we are dealing with a very important issue and his presence here would be very useful to the Workshop. Thank you very much, Vijay for the effort you have taken and for coming here.

I think I have done enough and maybe we all need a break. I think we will have some coffee and then come back. Thank you very much.

Workshop Overview – Prof. Vijayalakshmi:

Distinguished colleagues, ladies and gentlemen, welcome back to this session. This session will provide an introductory overview of this Workshop. We are delighted that all of you found it possible to come here. This workshop is the initiation of an internal national dialogue to speak freely, frankly and exchange views. The objective is to get our narratives into a structured form so that when faced with upcoming policy decisions we are better informed and are clear about the stakes involved.

Let me just begin by giving a brief overview which we hope will set the tone for this Workshop over the next two days. I am going to request you for a written input so that we can bring out a report of this Workshop. An executive summary will be brought out at the earliest and presented to the government before the Presidential visit, which is almost upon us. This Workshop is therefore very timely. With the help of the wealth of experience and scholarship that we have present here we will be able to put together this report. So we would like this to be a no-holds-barred meeting in some ways. But this is really a workshop, which is like a chakra. It is supposed to spin and send off many more such workshops or seminars and conferences. We ourselves are thinking of this as a series. So with that let me just quickly run you through an overview of the workshop. The basic idea about the changing Indo-US relations is that the oldest and the largest democracies need to get together. We share the values of rule of law and essential, inviolate and equal dignity of all human

beings. These two values speak much more than the other political, strategic, social, cultural similarities. I believe that we want to hold on to these values as the basis of active engagement. We hope that this active engagement should serve the interests of peace, stability and maintenance of mankind's democratic rights. So in a sense, we should focus very critically on the way we want to interact with each other on the basis of our shared values.

The complexity of the landscape of Indo-US relations prompted us to look afresh at the bilateral relationship. In the past, the trajectory of Indo-US ties has had peaks, troughs and plateaus. The words 'peaks, troughs and plateaus' sometimes capture much more quickly than anything else, the restraints and the constraints, and the progress and the levels at which Indo-US ties have moved in the last fifty years. In particular, the Cold War has seen the famous American tilt towards Pakistan that kept the United States estranged with India and proved to be a major problem in our negotiations with them. Given the current scenario, the first session can tell us what and how they actually thought of us and why they are negotiating something different now. An historical overview would, I believe, help us to understand what kind of problems we are going to face in the future. During the 1960s our relationship was characterized by hostility, resentment and disdain – these are the words one keeps hearing in a very evocative manner. Sulochana and Nathan Glazer's book on Indo-US relations titled "Conflicting Images" captures this. It explains the sad state of Indo-US relations. Many Indian scholars as well as diplomats who have also been US academic Fellows have also written about it. There are papers with evocative titles like "Difficult Legacies - Positive Trends" – which are self-explanatory. The central question was why should this have been so? The US Foreign Service has also been very much in evidence explaining what this difficult puzzle is all about. Significantly, both sides came to the conclusion that the relations were one of estrangement rather than confrontation. However, there was evidently a minimum level of interaction between the two sides despite all the problems.

The end of the Cold War provided a fresh start to building new equations with each other as significant changes occurred in both political and economic domain. As we moved towards economic liberalization and reforms, the demise of the Cold War resulted in very significant developments in Indo-US relations. The workshop needs to focus on some of the following questions in order to find out the difference between myth and reality of a transformed relationship. For instance, questions such as: Are fresh winds of change bringing about a major transformation or is it temporary change? What are the key forces or the key drivers of this relationship? What are the sources of tensions? What are the sources of these perceptions? And what are the sources that help you get over the premised perceptions. A question regarding the strategic partnership centers on the theme that asks whether there really is a substantial change or is it only peripheral? These need to be looked into urgently.

We need to also debate the potential of Indo-US relations. One keeps hearing about a “watershed in Indo-US relations”, and “we will help India to become a major world power”. We need to ask ourselves, is this evolution in Indo-US relations a welcome change for us? What context is it taking place in? There is a configuration of international power in which our interests are going to be clearly defined. What is at stake for us? What are our interests, and where and how do we want to articulate our interests and how do we protect them? And what is the methodology we have? This is what this workshop is all about. How are India and the US going to talk to each other in getting together about how do we define and defend our national interest? This would pertain to the reality and potential of Indo-US relations.

One also keeps hearing about the “existence of common interests” between India and the US in policy communiqués or through the writings of scholars, observers and analysts in this field. This proposition may lead to the assumption that common interests would lead automatically to a better relationship. I want us to examine why we need to be more careful and put in more effort in the bilateral relations despite the so-called commonality of interests.

What we are looking for is the way we can integrate the several strands that impact Indo-US relations and I do believe that a multidimensional approach will help us do this. For instance, whether we need to develop conditionalities before we speak with the United States in economics and trade or do we have to have an understanding of the configuration of power in the international arena and develop common interests with the US as the nation we want to work with. These are some of the theoretical as well as practical issues that one would have to face despite working in a bilateral context about Indo-US relations.

Many more questions can be posed in the context of current changes in Indo-US relations. If there is a substantive transformation in the quality and intensity of consultation and cooperation, for example, in strategic areas, what is driving that? Is it sustainable? We are hearing that the unfolding of the NSSP has confirmed that the relationship has moved forward rapidly. Now we need to ask ourselves, is that really so? I think we are moving to an area where we have robust and fast-paced developments in military relations. This has been a continuum from 1992 onwards. Can military ties as one segment become a pillar, and the economic as another pillar, which will actually jointly develop confidence with each other? Will the understanding provided by these two pillars enable India and the US to confront jointly multilateral security issues? Will it enable them to jointly conduct peacekeeping and combat terrorism? For me, there is a question mark on 'jointly', how jointly can we do this? We have separate sessions that would deliberate these issues in detail.

Economic aspirations of countries in this integrated world, in my view have impacted both the terms of bilateral investments and multilateral negotiations and agreements in trade and commerce. Therefore, this is such an important element and very often I keep wondering that if we had a better trade relationship with a country such as the US, would it give us leverage on our political negotiations? We are looking to our esteemed colleagues present here to tell us how we can integrate this apart from critiquing the potential and

reality of Indo-US economic relations and trade relations. We would also like to understand how we could deal with this aspect with the United States, which is now according to many people in the world almost a hyper power.

Cooperation in high technology is now a critical part of the ongoing dialogue as well. I am not sure that these dialogues have reached any sort of major conclusions. Maybe they are in a process. Maybe they are beginning something. We need to understand this because this is something that India has held very dear and so has the United States. There has been a history, which has, I think, a great impact on this ongoing dialogue. So, we need to examine this as a very critical aspect of Indo-US relations. We are going to have Sri Anil Kakodkar to talk to us on this issue along with experts from the field in a dedicated session.

The legal framework and IPR is a serious issue in Indo-US relations. US domestic laws and institutions are not the same as WTO obligations. India is a member of the WTO. But when we negotiate with the US, the issues of compliance to US domestic laws do figure. This needs to be elaborated, clarified and perhaps we need to work at what are the linkages between IPR protection and the overall political dialogue. Legal and institutional barriers have played a part in the way Indo-US relations have developed in the past; for example the issues relating to the application of US domestic law popularly known as the Super 301 have clouded Indo-US dialogue in the past. We need to debate what role legal frameworks might play in the ongoing US-India dialogues in the medium and long-term future.

Ladies and gentlemen, thank you for your patience. These are very simple questions that I have but you can add much more richness to them. We are talking about ideological absolutes, which were really shaken at the end of the Cold War. We know that the Cold War has ended. But has it affected us deep down? That's one thing. What does it really mean when we say we envisage an extraordinary change in Indo-US relations? For, many a time I find that different

people have different answers to that question. There is no one voice in India. So we need to really ask ourselves, are we moving from estrangement to engagement, and then define the terms of our engagement. I think that's really the task for this Workshop.

We are also looking to you to help us understand what are the problem areas and roadblocks that require attention. How do we assess those opportunities and challenges that are ahead for the two of us?

These are, in some ways, partial questions. There are many more that I have not asked which may get highlighted as the workshop proceeds. I have actually prepared a very big speech but as I know that you are waiting to start the first session I am winding up. I hope this workshop will produce more initiatives which will follow up on what we have started. The idea of this Workshop is that each of the sessions or radials, if you will, can indeed provide meat for a whole seminar by themselves. I believe that we need to do this as a country and take it forward in a manner that can benefit policymakers. I am delighted that I have an opportunity to be a part of this. I am just a volunteer in this whole great thing that India is doing and I am really keen to hear all of you and I once again take this opportunity to welcome you and thank you for sparing your time, for your erudition and everything else that you will be giving to us in this workshop. Thank you.

Session I

Perceptions and Misperceptions in Indo-US relations



Left to Right: Ambassador Arundhati Ghose, Ambassador Vijay Nambiar,
Dr. K. Subrahmanyam, Ambassador Lalit Mansingh

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Chair: Ambassador Lalit Mansingh, Former Foreign Secretary

Ambassador Lalit Mansingh: Thank you, Vijayalakshmi, for that overview. We are going to discuss this morning the theme “Perceptions and Misperceptions in Indo-US Relations”. And to present our perspectives, we have a star-studded panel here. Let me briefly present them to you. Dr. K. Subrahmanyam, who requires no introduction. He is regarded as the *Bheeshma Pithamaha* of the strategic community of India and currently is the Chairman of the Task Force on Global Strategic Development. Then we have two absolutely outstanding diplomats, ambassadors who have had long, distinguished careers - Ambassador Vijay Nambiar, whose last assignment was as Ambassador to the U.N. in New York and he is now with the National Security Council, and the next is Ambassador Arundhati Ghose, also a very well known figure in the strategic community. She was Ambassador to the U.N. in Geneva. And then we have Dr. Lawrence Prabhakar, who is an Associate Professor in the Madras Christian College, Madras University.

Let me thank Dr. Kasturirangan for his dynamic leadership of NIAS and for having brought us all together. I am particularly impressed not as much with the quality of our panel as with the quality of the audience. It is really a galaxy or who’s who of people. So let me start the ball rolling on these issues by sharing some thoughts on Indo-US relations with you.

Having been associated with the United States throughout my diplomatic career but in a greater focus for at least fifteen years it has never failed to amaze me that in an affluent and knowledge-driven society like the United States, there can be such a massive deficit of knowledge of the outside world and particularly regarding India.

Here let me make a distinction between two types of misperception. One is at the level of society. It is how the average American looks at India and Indians. Second is the political perception or how the leadership of that country looks at India. I will not get into the societal misperceptions because that is not strictly what we are here to discuss. But I just make a passing mention of a book that was published by M.I.T. in 1958, titled 'Scratches on Our Minds', which is based on the survey of Americans at all levels of society and is a record of what they knew and thought about India. The results are simply amazing about the extent of ignorance that prevailed in the United States right up to the late fifties on what India is about. The survey mentioned that the principal source of information of most Americans was Kipling and therefore their knowledge of India was that of maharajahs, fakirs, tigers and snake charmers and so on. We are talking about the late fifties. It was a heroic effort on the part of our embassies and consulates to try to dispel some of this lack of knowledge and information.

In this session, we are going to focus on the attitude of the leadership. In this group I will include not only the administration, i.e. the government of the country, but also the Congress, which is very much a part of the decision-making process and also the think-tanks because in Washington they have a particular place in the decision-making process.

If you look back at the five decades of the Cold War, one can identify four major areas of misperceptions and consequently four major areas of differences between India and the United States. For the sake of convenience I call it the four Ps because they all begin with the letter P. One is Political ideology, the other is Pakistan, the third is Proliferation and the fourth is Private enterprise.

Let me first take up the issue of political ideology. It goes back to the roots of the Cold War and the US inability to appreciate India's policy of non-alignment. The Grand Ayatollah of American ideology of the Cold War was John Foster Dulles, the American Secretary of State

under President Eisenhower. It was Dulles who issued the fatwa that non-alignment was immoral and therefore you had to be with us or against us. There was no middle ground. The roots of the misperceptions started right there. Washington regarded India as a hostile country because India would not join the United States in its political alliances. If Dulles was speaking from his inner conviction I would probably respect him. What shocks us is the extent of ignorance that he had about our part of the world and the basis on which he took all these major policy decisions. Here is a small illustration of this. Many of you may have already read about this. It is a conversation between Dulles and the famous columnist and journalist Walter Lipman. This is a dinner conversation in Washington where Dulles triumphantly tells him, “We were looking for a country in South Asia which has people who could fight wars and thank God we have discovered that country. It is Pakistan”. Dulles adds, “The Pakistanis can really fight. Thank God they have got the Gurkhas.” Lipman says, “But, Foster, the Gurkhas are not in Pakistan, they are in India.” Dulles said, “Well, Never mind. They may be anywhere but at least, they are Muslims”, whereupon Lipman again says, “But, Foster, they are not Muslims. They are Hindus.” At this point John Foster Dulles gets very impatient and says, “Never mind” and sort of dismisses him. This was the information available to the Secretary of State of the United States based on which we had fifty years of differences on political ideology.

Let me get on to Pakistan. The image of Pakistan was that of a country dedicated to fighting international communism. This is what the Americans believed. The Pakistanis made them believe that they were actually the warriors who were going to fight international communism. For those of us who have known Pakistan and read about Pakistan know pretty well that the Pakistanis had no interest in fighting communism; their only exclusive and sole aim was to fight India. Therefore it suited Pakistanis very well. For some strange reason the Americans went along and believed that the Pakistanis could help them in fighting communism. So, the choice of strategic ally in South Asia was not democratic India but a country like Pakistan, which

was ruled by military generals. That was the beginning of the hyphenated relationship of the subcontinent. Pakistan - India was what the US was dealing with, and it was also the beginning of the zero sum game where as Pakistan's image improved, India's image diminished in American eyes.

Let me now talk about the role of private enterprise. While this was never explicit in American foreign policy, it was an important influence in their decision-making. What the Americans did not or could not understand was our socialist pattern. The very existence of large public sector undertakings in India was anathema both to American private enterprise and to the American leadership. Even a popular and powerful president like Jack Kennedy was unable to get support either within his cabinet or in the US Congress for the Americans setting up a steel plant in India. Eventually that steel plant went to the Russians who had to build the second plant even though that was earmarked in our policy for the Americans. The Americans thought that we were following a kind of socialist or communist pattern of economy and therefore they had little interest in investing in our country.

Finally on the issue of proliferation. This has been the most persistent misperception amongst the political elite in the United States, especially after the first Pokhran test in 1974. India was treated as a nuclear outcaste for nearly three decades. This restriction was lifted only last year when Prime Minister Manmohan Singh went to Washington and the July 18 agreement was concluded. The non-proliferation lobby was very powerful in Washington. It was not only powerful within the government it also had bipartisan support. It is strange that even in the time of President Clinton who, as we all know, enjoys a great public image in India, the US pursued a policy of "cap, roll back and eliminate" India's nuclear programme. First it has to be capped, it has to be rolled back and given up altogether. It is only after the Jaswant Singh – Strobe Talbot dialogue that Americans finally understood the reasons why we had gone nuclear, even though they did not condone it. After George W. Bush became

the President of the United States it was a fortunate development for India. The Ayatollahs of non-proliferation were finally requested to quit the administration. They left the administration but they joined the think tanks. They are still very powerful and the think tanks are still active preparing their doomsday scenarios from the imminence of nuclear war between India and Pakistan to India being a potential rogue state which can wreck the delicately balanced nuclear non-proliferation regime and so on. Now, I will not go into this in great depth because I am sure that Dr. K. Subrahmanyam and others will be throwing more light on this. So, this in sum, are the four major areas of misperception which caused the divisions between us and the United States.

To be fair, we had misperceptions on our side, too. This is what has also complicated the situation. At the societal level, the Americans have always enjoyed a very positive image. There is no question that the US has been regarded by our public as a land of opportunity, as a land of superior education, a land of promise where merit is not only recognized but rewarded, and therefore it came as no surprise that last year when the Pew Research Organization did a global survey, they came to the conclusion that the image of the United States is, in fact, the best in India, better than in many of the European countries which are friends of the United States. But Delhi's political perception was certainly not in sync with this popular perception and throughout the Cold War there was this belief that the United States was an evil force. There was a mirror image of how Dulles looked at India, in the perception of our own Ayatollahs here. Even people like Pandit Nehru who went on an official visit to the United States in 1949, came back convinced that the Americans were an evil force and they could not be trusted. At one point Pandit Nehru even wrote to the Chief Ministers saying, "Make sure that not too many people travel to the United States and also make sure that not too many people come from the US to India". So, there grew over a period of time a kind of paranoia within the government where the US was regarded as the supreme evil force which was trying to destabilize the world, trying to overthrow the government and so on. It was a

demonized picture of the United States. Of course, the CIA was seen to be an all-powerful force, the foreign hand was behind every corner and this was the kind of perception that the US enjoyed. The Cold War is over, but the Cold War mindset has not gone. We still have a lot of explaining to do on both sides in order to bring our two images in focus.

Now let me address some of the common misperceptions of the US at the moment, especially when people react to the agreement of July 18 last year. Now, one of the criticisms I have seen is that the relationship is asymmetrical and therefore, inherently of disadvantage to India, to which my response would be that in international affairs most relationships are asymmetrical because it is almost impossible to find two equally balanced, equally strong states. If you do find such states they are more likely to be adversaries than friends.

A second criticism, which is commonly heard, is that a partnership with India will result in India being reduced to a client, a satellite, a regional surrogate of the United States, to which my response would be that one must make a distinction between partnership and alliance. What India is going in for is a partnership with the United States, not an alliance. In an alliance may be, a country would be obliged to follow the strategic interests of its ally. In a partnership the partners decide what is in their interests and what is not.

That brings me to my second point, the suspicion that India is becoming a client state of the US is based on an unfortunate assumption that India is a passive state, a pliant state that does not have the courage to stand up and say 'no' to a stronger power. This is not borne out by the facts of history. Let me give you a few examples. In the early fifties when the West was scouting for allies, India definitely said 'no' to the United States. Similarly, when the Soviet Union requested India, invited India to join the Asian Security Pact, our leadership had the courage to stand up and say 'no', even though we were dependent in many respects on the Soviet Union. In 1974 and 1998 India defied all the big powers and went ahead with its nuclear tests.

Three years ago when the Americans requested us to send troops to Iraq we decided it was not in our national interest and refused. So, there is no question in my mind that India is not a country, which has to say 'yes' even though something may be against its national interest. Therefore the danger that India might one day become a client state, a satellite of the United States is really far-fetched.

There is a third argument, which says that the US wants to use India as a counterweight to China and this is against our national interest. To this my response would be that the China-US relationship seems to be much closer than even the Indo-US relationship seems at the moment. In particular, the Chinese economic relationship with the United States is certainly many times the size of the India-US relationship. Our total trade, which is the highest so far with the United States, last year was 22 billion dollars, compared to China's trade with the US, which was 125 billion dollars. It is not a question of India being used as a counterweight to China, but there is an interesting aspect that we must keep in our mind. It is true that our relations with China have improved considerably since 1988 when Rajiv Gandhi visited Beijing. However, there are certain aspects of Chinese policy, which are of concern to India. These are China's militarization and its interference in domestic affairs of our neighbours. China is said to be building a ring of military facilities in our neighbourhood. All these are matters of concern to India. The Americans too have their misgivings about China's military programme and its aggressive posture in many international issues. Therefore, I think we have a common interest, not in containing China, which would be foolish, but in keeping an eye on China and finding out how China's policies may impact India.

Finally there is the argument that we should discourage American investments in India because that will bring in American multinationals and their presence is not a very desirable thing. This is, of course, something that our business community has to deal with. I think, the best answer to this argument has been given by the Chief Minister of

West Bengal, Shri Buddhadev Bhattacharya. When he was posed this question Mr. Bhattacharya said he was not interested in what is called the colour of capital. That, I think, is the right answer.

When we look at the present situation, there is certainly less of misperception on both sides but there is still a lingering of the Cold War mindset, which we have to deal with. To me, it is not so much a question of misperception as, what I would call contravision. This is something that I would like to present before you. In this entire dialogue in the last five years with the United States, the Americans are taking a very long term, very strategic view of how India fits into their global framework. From India's side we have taken a somewhat shorter-term view of it and we are focused on the concrete advantages that we can derive from the United States in the short run. We are taking a somewhat tactical view of it as against the American strategic viewpoint. This is a gap, which has to be bridged, and this is how discussions like this in this kind of audience will bring the focus together so that we do not have misunderstandings of the past.

I will stop at this. We have a time constraint and we are anxious to hear our panelists. I will turn over to Dr. K. Subrahmanyam. I am very pleased that he spent the better part of his life removing misperceptions in American minds about India, and I find that he is devoting a lot of time now removing Indian misperceptions about the United States.

Dr. K. Subrahmanyam - *Historical Overview of Indo-US Relations*

Thank you, Mr. Mansingh, and what you set out was a very enlightening piece. Let me take it a little further. On the 26th of March, last year, an American official, Mr. Philip Zelikow, first talked to the press and said that the United States proposes to help India to become a world-class power in the twenty-first century. If such a statement had been made by any other major power in the world, I think the intelligence assessment machinery of that country, first of all, would have been taken to task "You didn't anticipate that this

was going to be announced”. Secondly, it would have burnt midnight oil to see what did the Americans meant by it. But in India we are saying, “No, there must be a trap in it. There must be a conspiracy behind it”.

The Americans are not noted for their charity. Therefore, if they are saying this, they must be looking at their own self-interest. When you look at the whole thing from their self-interest then you would be able to have a better understanding of the United States and its policies towards India - rather than if we continue with the bad memories we have of the United States from the days of the Cold War. During the days of the Cold War, the Americans despised India. Why? We were dependent for food on them. We were beaten by the Chinese and they thought that even the Pakistanis were going to beat us. It was later that they started changing their views about us, because we were able to beat the Pakistanis in 1971. In the eighties India’s economic growth improved and this was followed by economic reforms. The US realized that this was a new India that had survived fifty years as the only democratic power in the developing world. Therefore the US started looking at us seriously from 1989. As the Cold War was winding down they started commissioning studies on India. There was a whole series of studies on India that suggested that India had no strategic thinking. These were followed up by subsequent studies arguing the same.

As Ambassador Mansingh said, when the Americans take a long term view of something, they prepare themselves. They have set up a National Intelligence Council - which is a think tank attached to the CIA, to provide long time assessments. This think tank has come out with a document called ‘2020’ which says that the Chinese GDP will overcome the American GDP in about twenty years’ time. Thereafter China will continue to rise and the Americans are reconciled to the Chinese GDP overtaking the American GDP. The US is worried that China should not in any way overtake the United States in its preeminence in terms of competition, including industrial

production and innovativeness. The United States should remain the foremost competitive and innovative power in the world.

Secondly, the American view of the world today has been set out very clearly by Secretary of State, Condoleeza Rice in an article on 11th December 2005 in the Washington Post, of which unfortunately I found no mention in this country's media. She says, "Today's world is a balance of power". She doesn't talk about a hyper power or super power. On the other hand she uses language, which the Americans have not used for sixty years. She says, "Underlying the above policy is the limitation of our power and the justification for our humility". These are not words you have ever heard from the United States. This is the first time a Secretary of State is saying this. With only fourteen divisions, the US cannot do anything in Iraq. Therefore, they are looking at the world. In the world of six powers which constitute the balance of power, China is the nearest competitor, breathing down their neck. Europe is the second competitor. Europe is not an ally any longer because Europe does not need American protection against a mutual enemy. If China and Europe are going to be competitors, then the US needs other partners. They find India as an English-speaking country, which has got the largest population in the world, which will have a young age profile compared to China and Europe and which has got a talented population, which has contributed to the American science and technology, as a natural partner. Condoleeza Rice has gone on record saying that if long term US economic problems, including its social security problem, are to be solved; the US will need partnership with India.

We should find out what is the US' stake in India, in this partnership and not look for traps. Rice has also said, "Since the signing of the Westphalia Treaty in 1648, for the first time, among the major powers, there cannot be talk of a war or violence. On the other hand there is competition among them." She goes on to say that terrorism and pandemics are threats common to all. Bad governance in weaker states can also create potential threats to the rest of the world. She does not rule out war between a middle power and a great power,

but rules out war among the six great major powers of the world. For the first time India is included as one of the six major powers.

Unless we have a correct assessment of what the Americans are trying to do, we will not be able to formulate effective policy. We need to re-examine our assumptions on their good intentions and on their being charitable. We must assume that they are doing everything in their own interest. However, in pursuing their interest, what do they need from us? How can we benefit from this? That is statecraft. Unfortunately, we have not been used to statecraft, which was taught in this country by Bheeshma or Chanakya. For instance, for the last sixty years we knew of only one world, the world of bipolarity and non-alignment. Therefore we are a little behind the times. We are still trying to formulate policies to handle the new world and its new balance of power.

The US realizes that it cannot contain China. Rice says, “You cannot contain China. You have got to engage China”. As she said, how can you contain China when you have over 200 billion dollars worth of trade with China? The US never traded with the Soviet Union and therefore could contain it. She understands and accepts that today the US cannot contain China. Therefore you need a balance of power in Asia, in which she says India must be there. They are doing this because they have a larger vision, a larger scheme, a longer-term plan, as Ambassador Mansingh rightly pointed out.

With regard to the nuclear deal, we are concerned that “they don’t want us to go ahead with our fast breeder reactors.” Or “They want to cap our arsenal.” The American interests now do not require capping of our arsenal. The Bush administration doesn’t talk about our nuclear arsenal. We take seriously what the Ayatollahs there are saying, and not what the Bush administration is saying. The Bush administration has never told you what kind of arsenal you should have. Bush has announced a change in the thirty-year-old American policy of not using plutonium. He says that is the only way in which one can solve the future energy problem of the world. Therefore all the big nuclear

powers should get together to use the plutonium. Use of plutonium means fast breeder reactors. Therefore, the American policy now is not to throttle fast breeder reactors anywhere in the world. Anybody having done advanced research in fast breeders as we have done would now be welcome. Of course, there remains the little problem of getting exception from the existing US laws and getting the sanction from the Congress. In negotiating the deal, our approach whether fearful of the US or confidence in the US, will make a lot of difference.

At a recent Indo-US conference an Indian pharmaceutical man told the Americans, that if the US cooperated with Indian pharma companies, in five years, it will bring down US medical bills by 350 billion dollars – three percent of American GDP. Cheap Chinese goods in America keep American inflation down by half a percent and the Americans know that. Therefore, today it is not about the military but about economics and technology. It is about scientific research. The Americans are in a position to import brains and they want to import Indian brains. They have taken note of the fact that even as China ages India will remain young. Indian scientific-technology community is also English speaking and has established a major human bridge between the two countries. There are two million Indians living in the US today. Despite problems in the past, there is a major Indian Diaspora in the US. Whatever may have been people's view about the US, it still remains a preferred educational and immigration destination over any other country. The Americans are interested in outsourcing, establishing their R&D businesses in India. They are pushing to implement this strategy whether the Government of India agrees to it or not. You are not going to be able to stop it.

It is this continuing obsession with the bipolar world and the non-alignment, which, of course, was effective in the bipolar world. But, today the bipolar world doesn't exist. Today there is a balance of power world. Therefore we have got to learn how to handle it. The balance of power world itself gives one the flexibility to handle it. One can buy things from anybody. One can trade with anybody.

The American calculation is that in the next twenty years, India will be within the first four trading nations of the world. The Indian market will be the fourth or third largest market in the world.

There is another point I must emphasize. These are not the popular views in the United States. The situation today is like the situation in 1971 when Kissinger went to Beijing. He kept his strategies so tightly to himself; he would not share it even with the US Secretary of State, William P. Rogers. Kissinger landed in Beijing and put forward his strategy to Mao Zedong. He said that the US was prepared to help China against the Soviet Union and asked the Chinese to switch over and join them. The Chinese didn't delve into history to say that just fifteen year back the two had fought a war where two hundred thousand Chinese and fifty thousand Americans had died. Mao Zedong's own son, a MiG pilot was killed in that war. Mao didn't suspect a trap in this American initiative. The same people who conducted the 'Hate America' campaign previously were prepared to take that step. How far did they go to please the Americans? How many people in this country know that China gave military bases to American to watch the Russian missile tests? The Chinese supported Pol Pot regime in the U.N. China started a war with Vietnam to please the Americans. There are people in this country who say that we should have an independent policy like China. God save us if we are going to have an independent policy like China! Therefore we have got to think about this. This is totally a new situation.

The Americans started with a strategy of containment of the Soviet Union in 1949-50. Their objective was to win that war without fighting. Forty year later, they succeeded. The second strategic step they took was befriending China and winning it away from Soviet Union. They made China shed its communism and become capitalist. They succeeded in this too. Of course, one may argue that the Chinese got more out of it than the Americans. Now, they are trying to strategize the other major world power, India. The US wants to see how much its relations with India would help America to keep up its pre-eminent position. It is our duty to see how much we get out of it.

This is the present situation. If we look at it that way, then you would find that many of the things that the Americans are doing fall into place. Many of the overtures they are making are not traps but make sense, because they are not hyper power or a super power. They are the leading power in a balance of power world of six.

Chair: Thank you, Dr. K. Subrahmanyam. It is always a pleasure hearing from you. Let me request Ambassador Nambiar to briefly make his presentation.

Ambassador Vijay Nambiar - *India's Negotiating Approach and Strategies in Foreign Policy*

I shall certainly be brief. Let me first start by disagreeing with Mr. K. Subrahmanyam in one respect at least when he says that many people say India should be an independent power like China. I think that China's policy has been one of independence and that independence has provided the confidence to take steps that it has taken. China has not lost sight of some of the strategic problems that it will have with the United States despite the fact that it is building up very strong links on trade and in other areas. At the same time it has built up a momentum in trade relations which makes it almost impossible to have a confrontationist relationship. The kind of change in the US policies is perhaps today a reflection of China's extension of its own policies of power in this evolving situation.

Both Ambassador Mansingh and Mr. K. Subrahmanyam have made points, which make it less necessary for me to bring out any of the elements to which they have referred. Let me refer first to "Perceptions and Misperceptions" in terms of prisms. I am reminded of the Japanese film *Rashomon* where six characters look at a single event from different perspectives. Similarly, India and the USA look at things from their own prisms and even the description of events tend to take on a different dimension. There have of course been differences of perception during the Cold War.

There is a certain binary approach in terms of a negotiating position with the United States, it doesn't take the '*neti-neti*' approach which India does, which is an evolving, a very tenuous and tentative sense of closing out certain areas and moving into areas of lesser and lesser uncertainty. In our negotiations as well as in our approach to truth we tend to be a lot more tentative and therefore we are much more open-ended. This is expressed even in our diplomacy and in our approach.

Ambassador Mansingh talked about the four Ps and he talked about proliferation as one of them. Mr. K. Subrahmanyam also talked about proliferation. I want to refer to that aspect in terms of the US approach generally to proliferation. In the earlier years it was a very "nuanced" approach. There are political reasons why the US adopts a particular approach with regard to proliferation with each country. In 1961 for example, there was a reference to what is called the McGeorge Bundy memorandum, which talked about the anticipatory action pending Chinese communist demonstration of a nuclear capability. This showed that while the US would like to limit the number of nuclear powers, so long as they lacked the capability to do so, they would prefer that the first one be India and not China. But in 1974, after its *détente* with China, following India's underground nuclear explosion the attitude changed. In a meeting with Deng Xiaoping, Kissinger said that one of his colleagues suggested, in jest, that to oppose Indian hegemonism they should think of supplying arms and nuclear weapons to Pakistan and Bangladesh. Winston Lord was supposed to have made that statement but it was mentioned in a political discussion to the Chinese and the Chinese did not take it as a statement made in jest. It showed the overall approach of the United States to proliferation. Again in January of 1998 Robert Einhorn - now one of the Ayatollahs of non-proliferation - talked about how China was becoming an increasingly responsible state in the area of non-proliferation. When Mr. Einhorn's attention was brought to the fact that ring magnets had been sent to Pakistan, he said that it must have been done by non-state entities and in any case it was a very piffling, a very small thing. A few months later the attitude towards

the Indian underground nuclear test was diametrically opposite. So the US does not really have any dogmatic commitment to non-proliferation, but follows its larger political objectives in its non-proliferation policy.

Today, in the context of post-September eleven, there is a new prism, which emphasizes a lot more than just the traditional bipolar politics. As Mr. K. Subrahmanyam has said, there is the question of keeping US dominance in global affairs through innovativeness and competitiveness. The question of democracy is a new element, which has found renewed resonance. Condoleeza Rice's article states, that the fundamental character of regimes matter more today than the international distribution of power. Supporting the growth of democratic institutions in all nations is not some moralistic flight of fancy. It is the only realistic response to the present challenges. This accounts for the increasing reference to the Indo-US global democracy initiative. Another element in the new, let us say, the Bush prism, is 'big democracy', the sense of India being a big democracy of a billion people with 600 million voters. Apart from this, the liberalising economy, the common pluralistic societies and the melting pot are similarities between India and the US. The US is also looking at India as a countervailing power against China.

While the question of confronting China is obviously out of place in the present context, but there is a real concern about the impact of China's growth. This was graphically emphasized by Professor Ken Lieberthal recently in one of his articles. He argues that as China becomes the global manufacturing center, America's dealing with it requires addressing domestic changes involving education, wages and pensions issues. These issues are now calling into question, elements of America's domestic social contract. This is the way in which the Americans see the emerging economic impact of China on the US and its society. Lieberthal suggests that China is beginning to exemplify a different global development model – a Beijing consensus as distinct from a Washington consensus. While the latter posits open economies and financial systems, and is premised on the superiority

of democratic politics, the Beijing consensus posits far more state intervention in the economy, concern for political stability, and strong government to guide the development process. Therefore, while China makes this major engagement with the United States, it hasn't lost sight of its essential base, concerns and priorities. That is essentially what should inform and is, in a sense, informing the Indian negotiating approach as well as our overall foreign policy strategy. However, there has not been a deep kind of study made of the long term of the evolution of Indo-US relations. Perhaps the Task Force is one effort to try and see the long-term implications of these global strategic developments.

One should identify at least three elements of this long-term development. Firstly, the continuing salience of democracy and institutions of the open society despite the obviously binary approach which the United States will adopt in its engagements. The US has adopted a binary approach in terms of whether or not institutions of democracy in a particular situation are going to work to their advantage or not. Obviously there will be those kind of differences which we will have in our interface with the United States. The essential fact is that the salience of democracy is increasingly accepted by the United States.

The second is, of course, the question of keeping the strength and economic power of the United States. It is to meet these challenges that the US needs the strength of India. In some ways, there is a fit in terms of the emerging relationship between India and the United States. Here the demographic dynamic is an important aspect. In addition to what Mr. K. Subrahmanyam has said, I refer to George Bush's recent statement where he argued that it would be a mistake to not to encourage more bright people who can fill the jobs that are not getting filled up in America. He called upon the Congress to be realistic and raise the H1B visa cap.

The US idea of a partnership is obviously different from ours. It is a question of looking at things from a common perspective. It is their

expectation, from their prism, that if you are going to share a partnership you are going to look at issues in a similar fashion. Even when India and the US might have concerns that are not very different for example in the case of Iran, but there is an inability to appreciate some of the nuances of our geographical location, cultural interaction and our diplomatic constraints. I think, it is up to us to be able to impart some kind of education to diplomats in the United States of our concerns and of our constraints. I think that is happening. The question of whether or not in the actual pursuit of their objectives their drive is a little overwhelming. They try to divide Indian opinion, individuals have been commenting on division of public opinion in India. This again one should say is fair game because that's the job of any diplomatic activity. I would say that if some of the rigidity, some of the gaucherie, as it were, of diplomatic practice, it should not affect the larger relationship. That perhaps is at the nub of some of the controversies that arise in our dealing with the United States in terms of the diplomatic interface. Having said that, I think, I will stop. Thank you.

Dr. Lawrence Prabhakar – *Major Milestones and Turning Points and Their Implications for the Future of Indo-US Relations*

At the outset I thank God for the opportunity to speak at this seminar. I thank Dr. Kasturirangan, Professor Chandrashekar, Professor Vijayalakshmi and Arvind Kumar for enabling me to do this. Indo-US relations stand at the threshold of a transformation. I would like to highlight three points for discussion. I will look at Indo-US relations from a perspective of the neo-realist theories and the balance of power paradigm which Dr. K. Subrahmanyam eloquently elucidated. Secondly, there is the competitive dynamics of bilateral relations and the respective national interest which has been waxing and waning. The demands of respective national, political and economic considerations have determined the strategic perspective of India and the United States. Thirdly, there have also been cooperative initiatives that have fostered bilateral interdependence between the United States and India that have worked in terms of the national, regional and global concerns. The specific visions of grand strategy of the United

States and India have both reinforced and acted against the interests of both these countries in the pursuit of transformed relationships. That brings me to what we could call the major milestones and turning points that have implications for future India-US relations. First, I would like to mention the epochal years of the Indo-US relations, which span fifty years and the various issues and challenges that have been eloquently elucidated in various works by Indian and American scholars. Secondly, there are what we could call the issues and challenges of the global milieu, the global arena, which have impacted on the United States and India. Thirdly, what is now being envisioned as the transformational dynamics and what are the future pathways in India-US relations?

Looking at these three major objectives, we have about five different variations coming in India-US relations. The aspect of estrangement to engagement is one of the most important issues that has been debated. In this context, there has always been strong autarchic formations in India's economic and foreign policy that determine the pace of India-US relations. Indians have always had what one author says "the power of argument" where non-alignment was the premise rather than the argument of power. Of course, there has always been the US obsession with Pakistan and the hyphenation between India and the United States. This basically puts us into what is called the first phase of 'the roots of estrangement'. I am not going into the details but there are several milestones of the roots of estrangement, which starts as early as the Asian Relations Conference of 1947, India's drift to the Soviet Union, India's reliance on US food aid. Those have been major trigger points that led to the estrangement.

The second point is what you could call the realms of convergence, where India had to rely on the United States. This refers to the Chinese aggression of 1962. Then we find limited realms of convergence. Between 1965 and 1989 there have been very strong reasons for divergence even as India began to reassert its own autonomous foreign and security policy. Starting from the 1965 war and running all the way down to the US Nuclear Non-proliferation Act of 1978. This is

the period of India's reassertion to be an autonomous power. 1990 to 2004, I call this as the 'reemerging engagement' between India and the United States because the transformed geopolitical and geo-strategic milieu. This led to increasing convergence between India and the United States. In this whole process, it has been India that has offered leveraging strength to the United States than the other way around. This re-emphasizes the fact that India's strategic autonomy has always been there whether it is in cooperation with the United States in the global war on terror or in terms of a specific role, like the unique Indian role in the India ocean. There is much maritime convergence between India and the United States in the Indian Ocean in securing the sea lanes of communication. With these paradigms, I look into the basic changes which have come into Indo-US relations there.

I'd just like to mention a few important points, which will be possible pathways in India-US relations in the transformed milieu. We could expect perhaps not competition or cooperation but strategic convergence. Convergent security today is the dominant paradigm of international relations theory. India has to address the asymmetry deficit between India and the United States by looking into convergent areas and avoiding incongruent areas. There are core competencies of India that basically leverage India into better negotiating position. The buzzwords of today in terms of India-US relationship have been jointness and interoperability that would be the basis for a pragmatic basis of India-US relations in a transformed view. Thank you for the opportunity.

Chair: I now invite Ambassador Arundhati Ghose to identify some of the points that came up during the panel discussions and to offer her comments, after which we would like to have a discussion.

Discussant- Ambassador Arundhati Ghose: Thank you very much, Mr. Chairman. It is very difficult to comment on these excellent presentations, which have been made. I'll try and make a few comments about the issue we are dealing with which is really this

session which is 'Perceptions and Misperceptions'. I think Ambassador Mansingh and Mr. K. Subrahmanyam have dealt with these misperceptions of the US. One should not look only at the facts. What is the impact? The world has changed. We have to adapt to a changed world and what is the situation in which we do this adaptation? Mr. K. Subrahmanyam said that one could approach it with fear or with confidence. We all know fear is a very dangerous thing on which to take decisions. In my view, so is overconfidence. I think prudence has a role to play because where does the ability or any strategy to deal with a new situation come from? It comes on the basis of experiences of the past.

There have been changes in the US policy. One believes that the Bush Administration is friendly towards India. They would like to help India in our efforts to become a big power for whatever reasons. Mr. K. Subrahmanyam has identified what their reasons are likely to be. What our reasons are is not so clear, apart from wanting to take maximum benefits out of the current situation. More important, to be able to cope with a single superpower or maybe a leading power, may not be a single superpower. The US is the leading power, which has a lot going for it vis-à-vis India. India has much less. I mean, the Indian expatriate community is as much of an influence on Indian decision-making as it is on the US decision-making. In fact, it has more influence on Indian decision-making. Similarly the US market is of interest to us just as our market is of interest to them. Politically, the US dominates the world and these are not misperceptions, if you don't mind.

I would like to make one or two points which have to do with what Professor Vijayalakshmi mentioned earlier. You know she has done a whole series of questions, like 'common interests'. Mr. Nambiar mentioned 'a binary approach'. This is true. Language means different things to different people. The India and the US may understand 'partnership' differently. Just because we speak English, doesn't mean we think in English, or think English or think American. We are coming from elsewhere. There is a gap, which needs to be consistently,

steadily overcome. When we have common interests, what does this mean? The way to achieve these common interests, let us say in Iran or in Vienna? Neither the US nor India wants a nuclear-armed Iran. This is the government's position. Our way of achieving it is by de-escalation, persuade Iran to not go the nuclear weapons way, keep the United States within the multilateral process. The US' way is to take the issue to the UN Security Council, where there is a threat of sanctions. We are both right in our own ways, but we don't agree on the way in which to achieve the same objective. So, we have that kind of a problem, which will arise. It will arise between two friendly countries.

There is a multilateral process, which is where India also situates itself, which can be put into action if the rest of the world does not agree with the US point of view. It has happened in the Chemical Weapons Convention. If the rest of the world does not agree with the US point of view, they will do it through the enabling legislation within their own country. In law, domestic legislation has primacy over international. I am talking about a difference, not in the interest, but in the way in which you achieve the interest. It is not necessarily either estrangement or confrontation, not hostility.

We have a Defence agreement with the US. I do not know how many people know anything about it. Nobody talks about it. Without that Defence Agreement, I do not believe July 18th Statement was possible. Of course, the Defence Agreement would not have been there unless these sanctions were going to be lifted. But we never talk about the Defence Agreement. We need to study it in detail and see what it means.

Finally, in the context of the nuclear deal, I would suggest prudence rather than confidence. Or fear, because confidence may become overconfidence. It does not mean that we have a wide vision and for that we give up our strategic alternative. No government can take a decision on what our credible minimum deterrent should be, unless they are faced with a particular situation. At the moment, somebody

might say two dozen weapons are fine for us. However, this may change five years down the line or ten years down the line. Can you take any actions today which would stop future governments from taking a decision on a credible minimum deterrent? So, all I am saying is, one is not against the Indo-US nuclear deal. I think July 18th was a very good deal. I am just worried that if we think that it is going to solve our problems, it is not. Even if it takes a longer time I think it is worth it, if we get the sanctions lifted against which we have fought for thirty years.

The issue really is that we are two different cultures; we are talking to each other. It is not to do with just misperceptions. We *are* different cultures. When we try and understand each other speaking in a language as ambiguous as English, I think, you do have a problem in understanding on an issue, which affects your national security, it is natural that we would be somewhat wary.

Finally, this question about whether it is fair for an embassy to divide Indian public opinion. Yes, I did say that. I do not think that it is fair. If the embassy feels it is fair, I do not think it is fair for us to be divided. What the embassy tries is its own business. I do not think that any negotiator, be he the National Security Adviser or the Prime Minister himself, can go forward with a split country behind him. The idea is to build up this consensus, showing what is in India's interest. There is not that consensus. That is quite clear to all of us.

Chair: Thank you, I want to thank Ambassador Ghose for those comments. I am sorry that constraints of time prevent us from hearing more from her. But we now have a very brief period of discussion. Let me request the audience to raise queries or make comments.

Question: The United States is very different from the Bush administration. Today Mr. George Bush is in the sixth year of his term. He is virtually a lame duck. He is an extremely weak president who is going to find it very difficult to get a consensus on any issue, within the Senate, the House, and with US public opinion. Our time

will probably be better spent meeting corporates in the US than meeting people in the Congress. These groups may be much more helpful to India than the Administration. We should take diplomacy beyond the narrow confines of dealing with the Administration and take it in a much broader context and build up opinion there.

Question: That there may be a terrorist group in possession of an atomic weapon anywhere from Multan to Maghreb is very much operating in the European and American mind here. We probably don't react in the same way here. There is a different in perception of how things will be twenty years down the line. There is an energy crunch giving rise to tough competition for energy resources. So, how should India evolve its thinking in terms of these factors?

Question: I have got a brief question for Mr. K. Subrahmanyam. In the context of the recent Russian-American Cooperation Agreement on processing of the spent fuel and the delay in the finalisation of the India-US nuclear deal, there are two aspects - one is the strategic aspect of availability of plutonium for India. Second is the economic and commercial aspect of India being a partner in selling and dealing with the spent fuel. In the absence of the finalisation of the agreement, would India lose out in the commercial and economic sphere while we may still gain in the strategic sphere?

Comment: I just wanted to comment on the question of perceptions and misperceptions. As it was rightly pointed out, there are two levels one can look at it – in terms of societal perceptions and misperceptions and the political world. The political world has been amazing in terms of the transformation that you see now. Going back to the fifties and sixties, if I may just take one or two minutes, I am reminded of statements made like Dean Acheson in his memoirs “*Present at the Creation*” where he has said in the context of non-alignment, “If the world is round, the Indians must be standing on their heads”. Then there is this unfortunate statement by Daniel Patrick Moynihan who said that all that India has to export is communicable diseases. Getting back to Kissinger's comment about the meeting between

Mrs. Gandhi and Nixon where he says it was a dialogue of the deaf. I am also reminded of another statement made by Scott Reid, the former High Commissioner of Canada to India, in terms of the perceptions of the Americans about Krishna Menon, whereby they said Krishna Menon used the fuzziness of his expression to deceive the Americans. But Scott Reid said, "I did not get that perception at all in dealing with Indians or in dealing with Krishna Menon." My point here is that I think, we see perhaps the type of misperceptions that have surfaced in the political world, in the official circles are a reflection of the state of relations between the two countries at that point of time. We don't see that happening now as often as we have experienced in the past.

Chair: Let me ask Dr. K. Subrahmanyam to respond first. Firstly to the question regarding the twenty-year perspective, whether there is any such perspective available, then on the proposed Russian-American cooperation on the use of spent nuclear fuel and then the question about the strategic and tactical aspects, whether any studies have been undertaken to identify these two areas.

Dr. K. Subrahmanyam: Thank you very much. First, on our side we do not have any such long-term studies or long-term perceptions. Let us be very clear about it. We do not even have a structure for these things. Just as Mr. Nambiar said even the very creation of this taskforce is considered to be a first step. Whether it would get thereafter institutionalized in some form or not, we don't know. But, as a whole, in this country, one must finally agree with George Tanham that we do not have a strategic culture as yet. What was the second question?

The Russians and the Americans evidently have been talking about this energy policy in which the plutonium will be put into use and will be made available to other countries commercially, and then they will take it back, even the reprocessed material and in due course that will finally bring down the amount of waste material which has got to be dealt with to a much smaller quantity. This has been under

discussion for quite some time. Ambassador Ronen Sen said he knew of these discussions when he was Ambassador in Moscow and therefore evidently this is something which the Russians and Americans have been talking for quite some time. Now they have brought into it other countries including China and Japan. The question whether we would get into it or not will depend upon whether we are able to successfully conclude the agreement with the Americans on the nuclear issue or we want to plough a lonely furrow on that. That is a question which people may raise with Dr. Kakodkar when he comes.

Thirdly, what is the threat perception? The threat perception of other countries today is not about a major war among the major countries but there is threat perception of two kinds. One is the role of non-state actors. There is a threat of non-state actors using either a dirty bomb or chemical or biological weapons. Some of these rogue nations and rogue scientists being involved in it and handing it over to jihadis is a real concern.

Then there is a perception of what they call ‘the failing states’. In this, of course, sometimes they have included Pakistan in that category, being a passage for various kinds of threats to the stable international order, and passing through those states. Today even if you have got a weak government, even avian flu can be a threat and a weak government may not be able to tackle it, and therefore it is those kinds of threats which dominate the thinking of people these days.

Chair: About the question on information on nuclear, defence and other issues and does the government plan to disseminate such information? I have looked around, I can’t see anybody from government and therefore I will ask Ambassador Nambiar to respond.

Ambassador Nambiar: I am not from the Ministry of External Affairs or the Ministry of Defence. I can say that much. I don’t know if in the present instance whether there has been any deficit of information as compared to other occasions. Perhaps there is a difference in

terms of the extent to which it has been covered in the press. The polarization of opinion which has taken place within the country has perhaps led to a questioning which leads to the impression that there is a deliberate hiding of information. My impression is that there is no such thing at all.

Chair: Professor Arunachalam, do you have some comments?

Dr. Arunachalam: I think most of the information is available if we are really looking for it. I think I will leave it at that.

Chair: Any other questions or comments? Happily none. So, thank you very much for your patience.

Summary of the session

Many participants felt that Americans by and large were ignorant about India. There were misperceptions at all levels about India - its people, its society and about the overall economic growth of the country. Indians too have not been able to understand Americans. Cold War compulsions reinforced misperceptions on both sides. India's pioneering role in the Non Aligned Movement created misperceptions in the minds of key policy makers in the United States about whether India could be trusted. Cold War rivalry and John Foster Dulles' labeling of NAM as immoral added to these misperceptions.

US – Pakistan relations also further reinforced misperceptions. The US belief that Pakistan was dedicated to fighting communism has shaped the thinking of the members of the strategic community in the US. However, this assumption was never true. The emergence of Pakistan as a strategic ally of the US created many irritants in the Indo-US relationship.

The US could never understand India's obsession with socialism and the adoption of a mixed economy model for development. In the past the US has also, at times, linked economic aid to India with conditionalities of compliant political behaviour.

On nuclear proliferation, the US has always been against India becoming a Nuclear Weapon State (NWS). It has consistently proposed a “cap, roll-back and eliminate” policy for India. Even after the end of the Cold War, proliferation related high technology controls have been a major obstacle towards the building of mutual trust between the two sides.

There were also differences within India about how to view the US. Many Indians saw the US as a land of opportunity. The US has been a preferred destination for Indians seeking higher education for nearly five decades. However, Indians occupying official positions have largely held negative opinions of US Government intentions. To many, the CIA hand or some hidden agenda was possibly behind every negative happening within the country.

These misperceptions between the two countries have created a historical divergence in Indo-US relations that has significantly shaped and dominated strategic thinking on both sides.

There was consensus that the Manmohan Singh and George W. Bush Joint Statement of July 18th, 2005 did represent a significant shift in the US position with respect to India. There was also agreement that this shift has been able to create a positive atmosphere that might be able to change some of the misperceptions on both sides.

All participants agreed that the “civilian nuclear deal”, part of the July 18th Joint Statement was a major contributor to the current positive climate. The tacit recognition of India as a de-facto NWS lent credence to the major shift in the nature of the relationship. Many participants felt that the nuclear deal and its successful culmination would be an important element in testing the robustness of the new relationship.

Participants differed in their views on how the emerging relationship was likely to unfold. Some participants felt that the relationship is asymmetric and likely to be dominated by the US. They felt that the

Indo-US partnership would reduce India to a client state. They drew subtle distinctions between partnerships and alliances.

Others felt that the US needs India as a counterweight to China and that the relationship would be more interdependent giving India some leverage in managing the relationship. Key policy makers in the US want to help India become a global power. Instead of understanding and exploiting this initiative, India has been looking for conspiracies behind US intentions. India must not suspect the US in the way it used to during the Cold War years. India needs to stop looking for traps in all American initiatives. The US seems to have a long-term view of how India fits in with their larger global strategic interests. Does India have a long-term plan for developing a cordial and healthy relationship with the US?

Participants pointed out that the issue was not about dealing with misperceptions in Indo-US relations. The real issue was how India should deal with the changed security environment. How can India reposition and adapt herself to the new geo-political milieu? The problem was not with India becoming a world power. The problem was rather what India would do after becoming a world power.

Most participants felt that there was no doubt that the US is and would continue to be the most important player in the geopolitical arena – at least as far as India is concerned. Therefore, improving Indo-US relations was crucial for long-term development and growth in the country.

Session II

Indo-US Economic Relations: Emerging Dynamics



Right to Left:
Dr. E. Sridharan, UPIASI & Prof. Manoj Pant, JNU

Session II

Indo-US Economic Relations: Emerging Dynamics

Chair: Prof. K.P. Vijayalakshmi

Prof. Vijayalakshmi: I have some announcements. Dr. Anil Kakodkar is arriving shortly that is by one o'clock. So we thought that instead of breaking in between for lunch, we could accommodate the economic session and then go straight with Dr. Kakodkar's special discussion at one and have lunch after that. It would save us a little bit of time because if we break now and then wait, the economic session gets delayed. But he is going to be here definitely by quarter to one. So we are starting our economic session where we have two presentations. I am sorry that the structure that we had, has somewhat taken a different dynamic by itself and we will have to adapt to changes to the original programme. This session is actually called "Emerging dynamics of Indo-US Economic Relations" which will start now. I imagine that with a lot of allusions made to the power of economics, the power of trade and all that we will find this session illuminating. We are going to begin this session with Professor Manoj Pant, who will focus on prospects for larger trade with the US and also the challenges and opportunities that face India as it moves forward in the trading world. Professor Chandrashekar, will present Professor Agarwal's paper on "Suspicious Cooperation to Uneasy Negotiations in Indo-US Relations" and critique it for us. Thank you very much.

Professor Pant is from the School of International Studies. He is a specialist on international trade and development and has several articles and books to his credit and he is also well known for writing columns in the newspapers and periodicals in which he tells the government what is it that it can actually do to prevent any kind of take over. So I think with that small introduction I will leave it to Professor Pant to start this session. Thank you.

Prof. Manoj Pant – *Indo-US Trade Relations and Potential for Future Cooperation*

Thank you, Viji. I would also like to thank NIAS and Dr. Kasturirangan for inviting me here today. The session suits me because I have to leave by the four thirty flight because I am off Saturday again somewhere.

I was asked to speak on Indo-US Economic Relations. Since the morning, I have been listening with great interest because like all economists we are so busy with our own terminology that we often forget that the other world is also building up its own terminology. It was quite fascinating hearing what people were saying - what someone thinks we should do, what person A said to B and person B said to C. I ultimately came to realise that trade is fortunately never between persons A, B and C. Trade is between a whole lot of companies and consumers in one country and companies and consumers in the other country. The issue therefore really is - has the end of the Cold War changed economic relations perceptibly? That is of course the issue that I am going to talk about. But I would also look at the more important issue - what do economic relations grow out of?

Challenging perceptions

Speaking anecdotally, I remember in 1991- 93 that I was visiting Columbia University. I was having dinner at the house of a friend of mine from the Indian Embassy. A lot of people from the Indian delegation including the security gurus were there. It was the year when Pakistan was trying to raise the human rights issue in the UN Human Rights Committee. Now during dinner after getting involved in all the discussions, the whole question of what we must do to change US perceptions came up. “We must do something. We must send so-and-so to talk to so-and-so”. I said “I think I have a simpler solution because I have lived for many years in that country. The simpler solution is what we must do to change US perceptions”. Further, the even simpler solution is “Try to change perception of the US in the US. Don’t try to change the perception outside the US. Try to change the perception of the US people and not just of a few

individuals because ultimately that is how change originates. The best way of doing that is by trying to engage the universities and that's where opinion is formed rightly or wrongly". A start could be made by making a few appointments of people who teach about Indian issues in American universities. It is good to see that this has been happening since then. I think that this is very important.

Let me tell you some of the aspects of India's strategies in changing US perception today. We recently completed a course for the Bush School of International Relations at the University of Texas, Austin. They had asked a colleague of mine (then in Maine) if he could conduct some courses for their students. They wanted to know that if we could do some short-term courses for them, as they wanted to be aware of the Indian political, economic and legal issues. They actually paid a fair amount to our university for us to conduct these courses. The minute they got back we got a whole host of people asking us whether they could also have courses conducted for them. We said "No, we don't normally conduct this course. This was a one-of-a kind thing." But these are ways of engaging an institution that will have a multiplier effect in changing perceptions.

Now, the difference is that the Americans today are extremely perceptive that the Indian mindset is very different. Indian mindsets do not understand the American and the Indian mindset still thinks of the "ugly American". I think, they (the Americans) are trying their very best to do something about it. Yet we always think about how to change a Strobe Talbot's mindset or somebody else's mindset and not about changing the thinking of people as such.

Indo-US Economic Strategic Relations

I have heard a lot about Indo-US strategic relations. Now from the economic perspective the relationship could possibly be strategic in the long run for the US. I think I do agree by and large with what Dr. K. Subrahmanyam said earlier. But can it be strategic for India? Certainly not. Strategic is something, which you can leverage for your own benefit. What is India's economic relation today with the

US that you can leverage for your own benefit? I will be happy to give you a few numbers later on if somebody wants but it is important to ask whether there has been a change.

First of all have the economic reforms of 1991 made a change in India. Certainly. From a total trade (total value of exports and imports on GDP), which was 10% in 1991 it is now near about 30% after India opened up to the world economy. This is very important because it says that out of every three rupees earned or made by the inland economy, one comes from someone engaged in trade. In other words, India is a trading nation - not a very big trading nation yet - but certainly a trading nation. The first important thing to understand is that India is in the trade world. Secondly, can India afford to ignore US in the trading world because we felt our strategic partnership is not a good thing? No, we cannot ignore the US, as the USA constitutes 30% of the world market. Now, I have heard a lot of talk about China. But China only constitutes about 5% of the world exports. So, it is not the same thing. You cannot say I am going to be part of the world trade environment, I am going to trade but I am going to ignore the US. That is obviously not possible.

Now where have we gone as far as trade is concerned? Well, as far as I know, the last figure I know is for 2004 - a figure that was supplied to the WTO by government statistics. The USA is not India's major trading partner. India's major trading partner is the European Union (EU), which accounts for about 23% of India's exports but the US with about 18% is very important. Of course, if you take the fact that the EU is not one entity but a divided house, (particularly France and some other countries) then I guess the single largest trade partner of India would be the USA followed by the UK. And the next big partner who has emerged only in the last three years is China / Hong Kong, which accounts for almost 10%. So you do have to think about trade relations with China, which I will comment on later. That is the first statistic as far as the partnership is concerned.

The second statistic that might be worth looking at is that India has always had a balance of trade surplus with the US in recent years. Now this was a great thing in the seventies because India was really constrained by the availability of foreign exchange. Anyone who was involved in the planning process in the seventies and sixties would know that whenever any particular programme which involved foreign exchange outflow was suggested to the Planning Commission the government said, “No., No, No. That we can’t do. The one thing we don’t have is foreign exchange.” But foreign exchange is not a constraint any more - at least not in the near future. So one cannot say a trade relationship which is based on the surplus, - India has a fairly large trade surplus as far as the US is concerned - is a good thing. I think we have to think of ways of buying many other things from them. But it is a fact that the trade surplus has been very much in India’s favour and they don’t buy very much from us. They buy about one third of what we sell to them. That is the second statistic as far as bilateral trade is concerned. The bilateral trade is about 21-22 billion dollars. The second highest bilateral trade is India-China at about 13 billion dollars or so. One thing however is interesting to note though. It is too early to talk about trends. In the last one year or so US exports to India increased by about 20%. This is a much higher increase in their exports than the increase to any other country in the world. There does seem to be some engagement taking place here.

Foreign Direct Investment [FDI]

One other aspect of the relation is also very important, and that is Foreign Direct Investment or FDI. Of course, we know that the US by far is the largest single foreign investor in India. Actually the numbers tell you that roughly about 20% of the stock of FDI in India is held by the US. I think it is higher because one of the largest partners of India as far as FDI is concerned is Mauritius but as we all know Mauritius does not do anything. Mauritius is basically a tax haven. If some one could disentangle the effect of Indian investment from Mauritius into the UK investment from Mauritius and the US investment from Mauritius then I think the figures will be still higher.

But certainly in foreign investment USA is the largest investor as far as India is concerned.

Services and Trade

Now we come to one more statistic namely the role of services. This is really the big thing, which I will talk about. Not just because people talk about IT services. Now, notice one thing. IT services have nothing to do with the strategic partnership between India and the US. In fact IT services have nothing to do with either the Indian government or the US government.

In 1995 when the export of IT services from India started, the Indian government in WTO was arguing that we should not have services as part of the WTO. Now they are of course having some problems with that. But India was the most vocal opponent of including services as part of the WTO agreement, because they did not know what was going to happen. Ironically, the joke in the economic circles is that we were doing quite well so far but now that the government has heard we are doing well, IT services might start dropping because the government is actively involved in the process. The exports of IT services from India to USA had nothing to do either with the US government or the Indian government. But it had a lot to do with the Indian Diaspora. The fact remains that had there been no Silicon Valley there would have been no Bangalore IT Valley either. For instance, the clusters we have seen - Bangalore is one and of course, Delhi, Gurgaon is the other big cluster - these IT-centered clusters that have developed, are only the relocation of Indians from Silicon Valley to India. Today when companies in the US ask for Indians to want to head offices in India, they have a waiting list. So it is not as if it has got something to do with simple plain labour or cost saving. It has got nothing to do with any strategies. It is simply that the US economy, in order to remain competitive vis-à-vis their biggest competitor (not China but Europe) they have to go to India for the IT services because of the labour costs on which they have to spend money.

IT, Outsourcing issues

The second reality before I leave the numbers about the US is something that I discovered a few days back. I am told (it is reported in many talk shows in the US) something that I think is an amazing reality. 42% of single unwed US women are below the poverty line. It is an amazing statistic. 42% of US women, single women, workingwomen, all women are below the poverty line. Now that is something, which has to be addressed by the people of the US. Frankly many of them are in the poverty line because the jobs they have lost have all gone to India. The problem with IT services is they are so easy to relocate anywhere in the world. You don't have to close down a factory. It takes only days to move an IT industry from one location to another. It doesn't take too long. But that's a problem that they have to address, too. I don't think the American Administration is aware of this. This is now being aired very popularly on television and believe me the US President worries more about what comes on the "Johnny Carson show" or the "Oprah Winfrey show" than what comes from Rashtrapati Bhavan in India. So that is one very important thing and one statistic that one might remember.

Strategic Partnership in Economics: Major irritants

Now coming to the issue of what is this strategic partnership that India has with the US in the domain of economics. I have already mentioned that it is almost zero in terms of India's leverage. But that's not the way to look at it. It may be zero for the US. What is it for you? There are two major issues where trade with US is going to be very, very important. One is in the field of textiles. Now textiles are the most crucial sector in India as far as poverty removal is concerned because they are mostly small-scale industries. Now there may be some displacement of the small-scale industry by the large scale, but still there is a partnership between the large and small. The country, which can determine your future as far as textiles are concerned, is the US. There is a EU market too for textiles. But the EU is a very small niche government market. The big mass market, which the Chinese exploit, is the US. So, this is going to be a major area where India is going to keep after the US. Unless you reduce

tariffs (in some areas where India exports to the US the tariffs are as high as 50%) you are going to have problems. Now, people will tell you that the average US tariff is about 3 to 4 %. It is however close to 50% - between 20 and 50% - on items exported from India to the US.

The other major irritant in Indo-US trade relations is in fact fisheries. This is of course now the subject of a separate agreement. If you actually go down to some of the coastal areas such as Kerala or Tamil Nadu or maybe in Orissa, for heavens sake do not talk to them about Indo-US strategic partnership. They will either shoot you or themselves or do both. The fishing industry is extremely upset because some of the detention procedures, some of the traceability requirements – I wont go into all the boring details - are really creating problems for poor Indian fishermen.

Indian Interests and Initiatives

Give these constraints and the logic of Indo-US economic relations what assessment can be made on the causes and trajectory of economic relations between India and the US. More fundamentally - what is India's initiative? What is India's interest? Obviously the Indian Economic reforms after 1991 are not a guarantee to better economic relations as they were supposed to be. There are still a lot of forces that would like to reverse it. The danger is that while one cannot go back to the pre 1991 situation we can come pretty close to that. The fact is that until there are reasonable grounds to show that economic relations - whether strategic or real - are going to make a difference on the ground level it will not become critical. As Dr. K. Subrahmanyam also mentioned this is precisely the American position. One thing I think the US and in particular the Republican government is serious about, is that they are actually opposed to any barriers to the IT trade though it is creating some differences at the ground level. The IT trade may make a major difference in the US not only with respect to relations with India but with other countries too. It could be the Philippines or some other place. Does the same logic hold good for India? Both India and the US have one thing in common.

We both have to be democratic societies. The Chinese do not get affected in the same manner. Unless these gains are projected at the ground level, it is going to be the “big irritant”. From the Indian point of view, if IT exports do fall, then there is going to be a big problem because it is a very big item. I may quickly mention that tourism, which used to be a big foreign exchange earner till the mid-nineties, is now replaced by service exports. In fact India’s current account surplus, except for the last year, has remained positive only because of the IT exports as part of services exports. Here two things are important in the India-US partnership. One is that there should be no move to try to prevent this. This can be done. Remember that the Services Agreement is still not finalized. The modalities are all being worked out. This is also not going to last for ever. The English advantage will last for some time, maybe five years more. This advantage will be replaced by other countries and by machines in the next five years. India needs to move up the value chain. India cannot do this without strategic technological partnership with the US, who is the major partner, because, it is in their interest, too. Not in the interest of the Administration, but the interest of the American companies. They had a problem in the eighties and nineties as all their studies showed that the US productivity and competitiveness were declining vis-à-vis the European countries. It is therefore evident that they need this partnership to improve their productivity.

The second issue of significance is that of technological partnership. The third important factor in Indo-US economic relationship is this cultural person-to- person contacts. The US is where almost all the migrating Indians are. One can easily ask “ Why don’t I start a strategic partnership with let’s say, Papua New Guinea? No one knows where it is.” In fact, amazingly, almost every single politician or senior bureaucrat, who do make a difference to these things, has some relative or the other who is actually in the US or works in the US. It is an important factor, very difficult to change. I don’t see how any government can change that. I don’t think even the Left could change that. So that’s very important – these cultural people-to-person contacts actually move India.

Finally, why is this particular Indo-US relationship more important than let us say the Indo-China relationship or the Indo-Australian relationship? Because it is based on the fact that India has a labour cost advantage. Indo-China trade is not based on a labour cost advantage. India is not going to be able to sell the option of more trade in this country unless people get involved and unless people get jobs. They are only going to be able to do that if some country comes to your country and buys from you something that their own labour cannot provide economically.

Indian and Chinese models: A Comparison

However it is not possible to expect that India is going to have a great India-China partnership in trade. In what commodity will they trade? Let me give you one small example. It is well known that in the WTO there is a lot of fighting going on about agriculture. Agriculture is at the centre-stage of all negotiations. An Indian commerce minister, of course, rightly said because he was in a political mood, “We will never sacrifice the interests of our farmer”. Where are the imports that are affecting Indian farmers in the last few years coming from? They are not coming from developed countries; they are coming from developing countries. For instance in Goa, they are worried that the Vietnamese are exporting spices and cashew to India using the Indo-Sri Lanka bilateral agreement. The Indo-Sri Lanka bilateral agreement is not an economic agreement. It is a political agreement. It is required for stability in the subcontinent, which is a perfectly legitimate reason. You try explaining this to the Indian farmer who has to find a job as his cashew farm collapsed due to the strategic partnership between India and Sri Lanka and there will be disagreement. In the same way the Northeast Indian states like Nagaland are complaining about what’s happening to ginger, because ginger imports are going to China, and China was not even part of WTO at that time. So the problem is actually going to come in these sensitive sectors, not from developed countries but from developing countries. Therefore it is trade with developed countries like the US that are important given that Indian interest right now is in employment related to trade. It is not the trade with developing countries. This is

why, just to end this issue, in the Doha Agreement when India was holding out till the last on health, education and so on, every single non-aligned country and developing country who had fired the guns from Indian shoulders left, as soon as they got some sops from either the EU or the US. All these countries always stuck to India till the end in WTO including Pakistan. Now, the point I am trying to make is that if trade is going to impact on poverty and on development, it has to be trade with the developed countries. Trade with developing countries is not going to have the same impact because the nature of the trade is different in the two cases.

To many the question of what are the lessons that India can learn from China in managing trade with the US has become the key to India's own strategy. Yet, the answer to this is quite negative as the lessons from China are zero. The reason is the following. At an UNCTAD educational workshop for bureaucrats in Asia, I was speaking on the investment issue to bureaucrats from China, South Korea and Cambodia. A question raised by the Chinese participant related to the competitive nature of Indo-China relations. My answer was that in my opinion, we are not in competition. I also pointed out that for Indians, the parallels that we see in Chinese behavior with other countries makes us uneasy. If the Chinese start on a fifty-year issue with Japan (which is the largest investor in China and a fairly powerful force) then where are the Indians? If China can fight with Taiwan (which operating through Hong Kong is the single largest foreign investor in China) then obviously economics doesn't seem to matter. The perception is that it may matter in the relations China has with the US but it may not matter in Chinese relations with India. My question to the Chinese was, "if therefore you change your stand overnight like you have changed over there in South Asia, I have no recourse, because I don't have a democratic system in China with which I can fight you". In India, an unpopular President like G.W. Bush will be fought through the US democratic system. In my view, how does India fight a non-democratic country if it ever has a problem? This is the primary concern with most or many Indian people. The fact is that they don't know. Despite boundary disputes, China's

relations with India have been good, except for a brief interlude in the sixties. The fundamental question remains; no one knows what the Chinese are going to do next. In the context of trade, they are perceived as very unreliable.

Another answer to the question - can India learn from China - is positive. For one the Chinese do set targets. In India when someone sets a target, everyone spends time knocking down that target. I mean a target is something you keep trying to achieve. Not something that is knocked down. The approaches towards setting growth rate targets reveal the wide gap that exists between India and China. While Indians hesitate to set a final figure and hover between 8 to 10% rather than 15%, the Chinese believe that when they say 8% they would land up with 5 to 6%. In other words the Chinese try to say 8% and maybe you get to 5%. But Indians say 2%, you try to achieve about 1% and actually end up getting 0%. This difference in the Chinese and Indian approach towards growth is not related to projections alone, but also to the psychology of the two countries. One thing we could learn from the Chinese is: Start believing in yourself. I think those of you who do engage in trade might start doing so.

Recently my travels have revealed that there are no economic seminars without Indian participation. Today the reaction of the trading world includes a definite interest on India and its actions. Most analysts agree that ignoring the Indian experience would lead to the drawing of wrong perceptions. This can have a strong impact on export trade regimes. In the fifties, for very good reasons, India could not get on to the export bandwagon. I don't know how long this current "India is the flavour of the month" bandwagon is going to last. However, my perception is that while it is there India should enjoy the attention instead of trying to wonder whether this must be a way to trap us and kill us later on. In effect, I would argue that we should try and see if we can get something out of it.

The second thing to learn from China: where did the Chinese investment come from? The reasons for this are still not well known

to many. A country, which till 1980- 81 was zero in the export map and zero in the investment map, became the country with the largest foreign investments by the end of the eighties. It also began exporting - about 70-80 billion dollars by the end of the eighties. There are few historical parallels to that. The reason for this is very simple. By the early nineteen eighties, both Singapore and Hong Kong had lost their GSP status and they therefore rerouted their exports through China. In China many argue that this is round tripping. Many Chinese who were living in Hong Kong were sending the money back to China and exporting to China. This is the whole issue going on today of round tripping, what India is saying is happening in export invoicing too. But the fact remains that the partnership of the Chinese was that the Chinese would provide the land and the people. There is no "Free labor movement" in China. They provide the labor force and the Hong Kong people provide the technology and the expertise. Think of India. This is exactly what has happened in IT services in India. It is the Indian who is providing the venture capital and the expertise and the Indian cities (except Bangalore) are supposed to provide the infrastructure. It is this kind of relationship that works. So that is the kind of thing that one can learn. The Indian Diaspora outside India could not contribute earlier to the economic benefit of India because they were not paid as the Chinese were. Currently the Chinese are not in a great position because of the way things are going - exports in services seem to be dominating international trade. Thus the Chinese are very keen to get into partnership with the Indians because they say we have the hardware you have the software and if we combine we would have the world. Maybe that's true. But the fact remains that this is the kind of NRI partnership that works. In short unless the NRIs find reasonable returns, they are not going to do anything for you. Herein too the Chinese experience has much to offer to the Indians.

In thinking about the future of Indo-US economic relations one needs to point out that as far as the strategy is concerned there has to be a larger understanding of the role of investor perceptions on India. It may be important for the US and for India that India is emerging as

a very important strategic power in Asia. It could also be true that the US has a hundred year plan in which they are going to use India to counter China in Asia. However if the question whether by 2020 India is going to rival the USA is to be answered then it is clear that such a projection is not borne out by any facts that I have seen. There will have to be some amazing development in terms of suspending the Government of India and democracy for some years – which may not be a bad thing. But barring that I don't see that happening in the next twenty years. What does seem to be happening is that for some reason, the global investor thinks that India is where the action is today. Now instead of worrying why they think that is where the action is, why not start figuring out what we can get out of the action? I think I will stop at that.

Prof. Vijayalakshmi: Thank you, Manoj. As expected, he has really made a presentation, which can be followed by almost all non-economists as well as by economists. As we ponder over things, two things need to be borne in mind that would add to our understanding. One is the statement by David Sampson, who was the Deputy Secretary of Commerce of the United States. He has made a statement that the volume of trade between India and the United States should have the potential to move from \$22 to \$231 billion, which is essentially a comparison between the trade levels that India and China have with the US. The second is the statement by President Bush in his State of the Union address where he has named India and China as formidable economic competitors to the United States in the years to come. So in a sense, this session is about India's defining its stakes in the new global order and how do we defend our interests and define our interests as I said. So, thank you, Professor Manoj Pant. This presentation has really used a huge canvass and yet compressed it look at some critical elements that we can reflect on and raise questions after the next presentation. Now I invite Professor Chandrashekar to present our second paper for this session, which is sent by Professor Manmohan Agarwal, who is Dean of the School of International Studies, JNU. He is a colleague of Professor Pant. He is a specialist on international trade and economy, also on the Indian economy, was

taught by Professor Jagdish Bhagwati, and is a graduate from MIT. I request Professor Chandrashekar, who is our resident expert on Business Practices, Corporate Strategy and of course, Economics to present it first and then we will have Dr. Sridharan to comment and discuss the papers and open it to you all for your questions. Professor Chandrashekar.

Prof. Chandrashekar - *Indo-US Economic Relations: Suspicious Cooperation to Uneasy Negotiations*

I would like to thank Professor Manoj Pant. I am going to have a problem. I am going to actually have two problems. One is, Professor Pant's presentation is as the Americans would say, "a difficult act to follow". The second problem is that I am actually reading the paper for somebody else and I hope I don't make any major mistakes. Viji, I must confess I am a technical person. I do have a Management degree but I spent a lot of my time as a technical person. So the problem is I am not at all an economist. I am not sure I know a lot of economics. Anyhow I will give it my best shot. Indo-US economic relations have always been what I would call "suspicious cooperation to uneasy negotiations". I think it is a very apt title.

There are three phases in Indo-US economic relations that clearly help in understanding the politics and development of bilateral relations. Though the US was a major supporter of Indian economic programmes in the fifties and sixties, there were ups and downs in the relationship. Fundamentally, the relations were marked by a considerable amount of distrust. The defining feature of Indo-US economic relations in this period was the state of India's agriculture. India came to depend on food aid from the US. In normal years, the US was willing to provide food aid in order to reduce the burden of its surplus food stockpiles. But occasionally the US tried to use the food aid to coerce India to change its foreign policy. Towards the end of the fifties the US did see India as a part of US Security interest. You can see for example that the Mutual Security Bill, sponsored by President Kennedy (at that time he was Senator Kennedy) was something that was perceived as being very important.

It was also important to the US that India did not go under during a “Balance of Payments” crisis. In order to help India in its Balance of payments crisis of 1958, the US, through the World Bank, provided major aid to India. The end of the fifties also saw the US persuading other European countries and Japan to provide aid to India while it provided 50% of the aid.

Despite an improvement in overall economic relations, which for a while was bolstered by improved political and strategic relations following the Sino-Indian war, elements of conflict over economic policies remained. The US Administration, and more particularly the US Congress, remained suspicious of India’s economic policies, plans, and the role of the public sector.

The Bokaro steel plant episode was part of a larger difference of opinion regarding the role of the public sector in India’s economic development. The refusal of the US to support public sector firms meant that the Indian Government had to depend on Soviet assistance to build up the public sector. Despite some hiccups the Soviets did provide technology for the public sector. Consequently during this period, India needed the USSR not only for political support but also to implement its economic development strategy. There were shortcomings even in the areas of economic cooperation. Under US pressure, the Indian Government changed its agricultural policies along lines recommended by the US Government. The biggest bone of contention, however, was India’s trade policy. Under the Import Substitution Industrialisation strategy adopted by the Indian Government, Indian industry was protected from import competition by high import duties and controls. These restrictions limited US exports. In the mid-sixties both the World Bank (WB) and the International Monetary Fund (IMF) were in favor of simplifying the complex set of import duties and export subsidies levied by India. They wanted the many rates to be consolidated into a few rates. Furthermore, they wanted the average rates reduced and insisted that the rupee be devalued. The World Bank produced a multi-volume report with many suggestions for policy change to be incorporated in

the Fourth Five Year Plan, for which preparation was underway. The Indian Government succumbed to the pressure from the US Government (pushed through the World Bank) in the mid-60s to change economic policies, particularly its agriculture and trade policies.

US food aid to India under the PL 480 Agreement was a major factor. It was very, very positive in the beginning – and then it went into a lot of problems. As the Indian perception of US interests and the US perception of Indian capabilities failed to connect there were problems. And if you look at the numbers, aid accounted for almost twenty percent of the investment in the second and third plans. US supplied more than 50% of this aid, which is substantial. So, contrary to popular impression, the US has never been totally against India. It has been very positive at least in the early part of our relationship. We are looking at a very large investment at least in terms of the plan size of those days. As I said, the “Licence Raj” and the issues associated with that were the major problems and you can see that maybe the strategic and the political dimensions of relationship that was discussed in the earlier session did play a part in some of these changing perceptions. The other major contribution that the US did make to India – let us not forget it - is the Green Revolution. Though a lot of it came through international channels, it was still largely a US-driven initiative.

You can also see that economic pressures were also linked to political behaviour. So, the US did apply economic pressure in order to change the political part of India. Food aid was used as an instrument of political policy and of course the repercussions on India were negative.

The second phase of the relationship, post the mid sixties post the mid sixties, reveals the complexity of the economic interaction between the two. In the seventies and eighties, the US had given up on India. The control regime was back and in a starker form as the US and the World Bank cut back on aid and a “Control Raj” made licensing mandatory. There were differences of opinion regarding the nature

of the international trading regime with the US wanting a stricter patent regime and inclusion of services trade in multilateral trade negotiations whereas India resisted these moves. Of course, after the economic reforms, things have changed. It has emphasized the fact that in the last fifteen years, India is one of the few countries in the world that has been able to sustain an average growth rate of between 6 to 7 %. So there is a basic reawakening of interest in India. So there is a huge opportunity for growth in India, if you are able to find the right combination of price, performance and delivery of the required service or product to the customer. So there is a lot of interest at the micro level and that is really one of the major opportunities that the US sees in India.

The Bangladesh War led to a further deterioration of the relationship. We all know that the US sent the Enterprise to the Bay of Bengal. The entire discussions between Indira Gandhi and Richard Nixon, the memoirs of Kissinger give a lot of detail about this phase of the relationship, reflect this mistrust. So, apart from the belief that India was really not worth looking at in economic terms, the relationship has also been clouded by the political perception that each country had of the other. This came in the way of taking the relationship forward.

Aid suspension had improved relations in a way since there was no longer any constant friction because of India's policies. Therefore conflicts instead of being direct - it was no longer Indo-US conflict - moved into the multilateral arena. What was the India position in the UN? How many times has India voted in favour of resolutions sponsored by the United States? So we can compile a lot of statistics, but clearly India was in the Third World camp. Now we are looking at the Cold War problem and associated with that the issues of being neutral or trying to be neutral in the Cold War environment.

On the international trade front, the US wanted a new round of trade negotiations that stressed agriculture, TRIPS and TRIMS. India opposed the new round and the inclusion of intellectual property rights

and services in the agenda. We are looking at TRIPS and TRIMS and the entire WTO-related issues such as the inclusion of services. Indo-US relations now moved to a new low in terms of support. The US actually voted against India's request for a loan in 1980-81 from the International Monetary Fund for balance of payments support; but India got the loan because of the support of the Europeans.

The private sector has always been there in India but maybe during the days of License Raj there were serious problems. Therefore growth in business-to-business level and technology exchange did not take place as much as it should have.

Everybody knows about the liberalization process initiated in 1991. We now see a new way in which some of these problems are being talked about. In the election campaign in the US recently – Business Process Outsourcing – was a major issue. It is seeing major growth in India. It is really taking off. If you look at Bangalore five years ago and now you can actually see the difference. So there is a lot of concern in the US that jobs are going away to India. Politicians in the US are trying to strike a delicate balance between job losses and business requirements. All the software companies, all the IT companies do want many of the knowledge-based kind of services, to move to countries like India. In the future Business Process Outsourcing is going to go up the value chain in terms of content. For example, today a lot of work on things like Application Specific Integrated Circuits, Chip design etc. - a lot of this high value work - is being done in Bangalore. But, overall, I would argue that the US corporate world is going to be pretty interested in making sure that India continues to be a major source of people, knowledge people for their economy.

I again come back to India-US positions. The WTO does represent a common minimum position. And there is a lot of commonality and after the WTO the level of commonality has increased significantly. Therefore, I feel, even though there may be differences, this would still be a major forum by which trade can be promoted.

Developed countries are still maintaining high rates of protection against exports from developing countries. I think that is a very valid statement. If you look at the liberalization that has happened in India and if you compare it especially in agriculture-related trade (we have some people who will cover it later) you will find that there are lots of restrictions on developed countries with respect to many of these areas. A very telling statement that Professor Agarwal makes is: the US collects more revenue from duties on imports from Bangladesh than from France. This is another kind of problem that we have to address.

As I said, India is becoming important in the global market. I think the major impact we have had in the last ten or fifteen years - especially in the last ten years - is making India a place where things are going to happen. One view of that would be that everybody is going to come to India. We really don't have to do anything. As long as we do not make too many mistakes things will be fine as long as India promises to be a growth market. Therefore the economic agenda in terms of growth is absolutely important if you want to look at any kind of strategic relationship or long-term partnership with the United States.

I would argue that if you look at micro- data we have crossed the threshold in many industries. I think Professor Pant was talking about the drug industry and he was talking about the IT industry. If you go back and look at the details of why these industries have taken off what has really happened you will find that there is a very complex combination of situations. Some of it is related to the Indian domestic context and some of it is related to relaxation of constraints because of the US domestic compulsions. For example, there was some kind of a deregulation of the norms by means of which companies could buy and sell licenses for producing drugs because of the high service costs in the US drug industry. So the FDA guidelines became relaxed a little bit and you could buy and sell some of those things. Many drug companies in India used that opportunity to get into the US market. So, that is the kind of thing that we can look at. But India is

still small and as somebody was pointing out the US is much bigger. One would therefore argue that the relationship, even if not equal, will be relatively more equal or at least less unequal.

Of course, the Indian objective is very clear. We are interested in the development of a more democratic international system of governance. The increased power of developing countries would be at the expense of Europe and Japan. The Europeans prefer a more rule-based system than the US, and India's preference is for a rule-based system. Of course, we have a major concern on energy. Would the US stand in the way? That is the kind of concern.

So we have a complex interplay of interests and conflicts. All countries want greater entry access to the Indian market. I say this is a growth market – no doubt about it. With greater market orientation, the movement of goods and the factors of production will be governed more by market forces rather than by government forces. The government strategic community and the political community may have less influence on the course of Indo-US relations than in the past. So I think if you open up trade and economics, maybe relationships between the two countries will move to a different level where strategic differences may not be as critical as they seem to be now.

Let's now look at this again. India needs energy security. We have to keep it in mind. In the short and the long term, we have to do a delicate balancing act, and how we play it out is important. We need to play a bigger role in the economic global international rule-making process.

I thank you very much for listening to me.

Prof. Vijaylakshmi: I thank Prof. Chandrashekar for presenting Dean Agarwal's perspectives on the potential and the realities as well as the challenges posed by Indo-US economic relations. I would call it an appraisal, actually. Perhaps 'hard-headed negotiations' is

the preferred title, and I think that's where we are. I now very quickly invite Dr. Sridharan to make his very brief comments, because we have a few minutes before moving to receive Dr. Anil Kakodkar.

Discussant - Dr. E. Sridharan: Thank you, Viji. I'll be very brief because there were supposed to be four speakers in this panel. Two of them haven't shown up, so I have to comment on only two. So I'll be brief and to the point.

On Dr. Manmohan Agarwal's presentation – it was an excellent presentation. However I thought it would have been more helpful if instead of a long historical account he had focused more on the theme of emerging dynamics. This was compressed and only there towards the end, so I don't have very much to add to what he says.

On what Prof. Pant said, I don't have any bone to pick with him. I agree with most of what he said. But I would like this group to focus more on the emerging political and strategic aspects and to take forward some of the issues that he raised when he talked about the key issue of leverage. I mean let's look at Indo-US relations in terms of where we have or can potentially have leverage which can be exploited for serving certain wider interests.

Now, as he said, the reforms will go on. I believe they will go on in a sustained way, but gradually. It will lead to increasing trade and investment. I mean the trade-GDP ratio will increase. FDI will increase. All of these will increase as India starts looming larger in the trade and investment profile of the US and the world. But the problem is, as pointed out, that for the next few years, India still remains very small. I mean that India will remain small in the foreign trade of the US and in their global investment flows. So then, do we have any leverage at all coming out of such an economic relationship?

Let me come to what he said correctly – that IT services is the crucial thing. I mean, it is not the crucial thing from the viewpoint of our development. What would probably make a much greater

difference to employment generation and relieving mass poverty is the growth of labour-intensive mass manufacturing not only in say textiles but also in a whole range of other things. That is beginning to happen in the last couple of years and is gathering momentum. Indian manufacturing industry seems to be getting more export-competitive across the board. We have pharmaceuticals and we have auto components. Increasingly more and more sectors will get more competitive and more export oriented. They will be able to attract FDI and India will probably become the next mass manufacturing platform in the next ten years.

But, coming back to leverage, I would like to actually take forward the IT services point where Prof. Pant said that the US needs India's IT services. They relocate software and IT-enabled services to India to help their competitiveness vis-à-vis their main competitors, which is not China – because China occupies a different niche – but really the other developed countries. This need will continue in the future. Now, let me just focus on even a narrower segment of this outsourcing that is now emerging to fit into the title of this panel, of “Emerging Dynamics”. This is the relocation or outsourcing of R&D, and not just software and IT-enabled services. This is a part of a very unusual pattern of economic relationship that India enjoys with the US over the last five years or so.

The Indian economic relationship with the US in terms of both trade and investment is unusual, compared to the historical pattern of the US' relationships with other developing countries in two respects. One is the very high ratio of services exports to export of goods in the Indian case. This is not the case with most developing countries. Even those that have enjoyed FDI and become successful exporters – in East and Southeast Asia - trade is overwhelmingly in manufactured goods.

The other unusual feature of US foreign investment to India is that it is in software and IT-enabled services to a large extent and increasingly in the outsourcing of R&D, which is a much smaller trend. But

sometimes you have to focus on the small things – the leading edge things. These can actually have a bigger multiplier, in terms of leverage, than if you look at the whole picture.

This is also unusual because normally you find that FDI first goes into low-tech manufacturing and assembly activities. It then upgrades, vertically integrates backwards into more complex stages of manufacturing of machinery and so forth, and then again backward-integrates into design and R&D in stages. But here you find that even before the growth of mass manufacturing on a significant scale the beginnings of R&D outsourcing following closely upon the existing pattern of software and services.

Does this give us any kind of leverage? I mean, you have these figures just coming out that we had 6.5 billion dollars FDI in the last year – in 2004-5. You already have announcements in the current financial year of something close to 6 billion dollars in hi-tech manufacturing design and R&D from just a few big companies. It actually would add up to more than that. So that's a very unusual trend that is picking up fast. Though these investments are quantitatively small, it gives them high-value stakes. This would, in my estimation, incline them to take India more seriously than if we had a large volume of textile exports going to them.

Now, let us take the recent defence co-operation agreement. I am not clear about how it will actually play out and what the full implications are. However if this outsourcing of contract R&D in areas like advanced software, telecom software, semi-conductor design, maybe a chip fabrication facility continues and if it cuts across the board into other areas such as pharmaceuticals, biotech labs, life sciences and so on would it not have an impact? Under the International Armaments Co-operation Program the US has 500-odd defence R&D MOUs with other countries. These arrangements have been extended from NATO to other allies and to any "other friendly foreign country", a new category introduced around 2001 by the State Department. Since 2002, we have been put into that

category and therefore we technically qualify to be in that “other friendly foreign country” category to which defence R&D agreements can be extended. Could we exploit the leverage that we seem to be acquiring through the outsourcing and contracting out of R&D with the new defence co-operation agreement? That is something I would just like to put on the table for this group to start thinking about.

Israel, for example, has exploited this route to build up its defence industry in a major way, although in the nuclear field, in terms of transfer of nuclear equipment and technologies, they are subject to the same sanctions as us because they are outside the NPT. But they have an extensive program under a MOU which was negotiated from 1976 to 1981, and then again a major agreement in late 1983, where they have a whole range of R&D co-operation in the defence field. They have very successfully exploited this and become a significant arms exporter.

So I am just putting forth something for this group to think about in terms of where we can find leverage in the emerging dynamics of the relationship. On the whole I agree with what Prof. Pant said that overall we are very small on the US radar screen and will remain so. So with that very brief forward-looking comment, let me finish.

Prof. Vijaylakshmi: Thank you, Sri. I think we really want to applaud you for the extempore but very relevant observations. Keeping in mind the interest of time, ladies and gentlemen, may I request some very brief interventions, please – and indeed they have to be brief but I would like you all to cogitate on what has been said so far. Prof. Pant is here, so if there are any critical aspects and perspectives you would like to share with us, we have a few minutes before we go in to invite Dr. Kakodkar.

Question: I now live in Bangalore and the growth rate of Bangalore - the calculations have lots of errors because some companies have headquarters in Bangalore, some in Mumbai – making all the

corrections, the growth rate of Bangalore, last year, the GNP of the city, if you like, is 42 per cent. When you explain this to an economist, he says it cannot happen; that's why our roads are crowded, the buildings are crowded, and every service is over-stretched.

But an interesting thing is, when we look into the global software industry and the global IT-enabled industry, the market for software is about 300 billion dollars, and we are not even about 10 per cent. If we look at this amount in relation to what's happening to Bangalore (I think one of them said oh, it's an impossible city) I say Bangalore is blossoming. We are going to see the equivalent of Bangalore in many other cities and this is an opportunity. In this kind of cooperation nobody can really actively influence it. It has nothing to do with nuclear control. But it has everything to do with a view. The American view suddenly has changed from what Ambassador Lalit Mansingh called snake charmers and maharajas to that of saying, "Oh, Indian; oh, software" as you go through an immigration counter. Suddenly you see recognition for the blue passport as that of a clever person. You go to the store, you do some calculation there and then they tell that you are the clever lot. This is so important for changing the mental attitude of the citizens of the United States and that is beginning to happen.

The second thing that Prof. Sridharan touched and it's a very interesting thing. For the first time, we have laboratories in Bangalore – foreign-owned laboratories in Bangalore – doing cutting-edge technologies. When I saw what they were trying to do in some advanced jet engine blades and said does your country allow that, they said no. These are the engineers who can do that, so we have moved this work. Yesterday we heard about Shell Laboratories moving in here and they said that's going to be their renewal work While we are afraid of the bottom kind of the service industry migrating to the Philippines or Ghana, these are areas where I think things are going to be very, very important.

It is so important because we have General Motors doing very badly abroad but doing very well in India. We are now talking about General Electric, Google coming to India. I can write about a number of them that are now coming in here, and that's going to provide a very unique opportunity. I think, while we're looking at saying what will happen if the service industry goes, the service industry is going to have many new incarnations and we should cultivate this incarnation.

But the question that arises is – where are the engineers? And that itself is going to be our problem.

Chair: Thank you. A very quick one, please?

Question: Talking about economic strategies, one thing comes to my mind – the recent purchase of Boeing by Air India – 38,000 crores – and another 11,000 crores is what Indian Airlines probably will buy. There is an offset – something like 35-40 per cent or whatever that is. That's in the region of 15,000 crores. This is money that they have to offset, largely from American industry into Indian industries. This has to be done within a specified number of years after delivery of the last aircraft – which is something like ten years. If you take it as a ten-year period – even that's not very clear – that means the kind of offset that has to be absorbed is on an average 1000 crores a year.

Can't we have a strategy here to absorb this offset? It's very interesting, that the Minister of Civil Aviation has given it to the Minister of Commerce who in turn has given it to the State Trading Corporation to manage this offset. Between all of us, I must voice some concern about this. It is not that we don't have brilliant people there. But our way of doing things is an issue. We are unable to focus, unable to have a strategy. I felt that I am an aeronautics man and I've been taken up this matter with Dr. Kasturirangan to influence the government into forming an Aeronautics Commission or a strategy of that sort.

But since we are buying aero planes can't we put this so-called focus as a strategy into aeronautics in India, or for that matter into any one particular sector? But there is no one hearing. There isn't a strategy in this country, even when there are opportunities coming. Do you know that at least from defence, not a single offset deal has been converted 100 per cent. The last was the Jaguar offset. We hardly converted something like 20% and by then the period got over. And we're going to lose this – that's my fear.

I believe that we must also use this as a strategy to focus on some specific areas of offsets. Thank you.

Chair: Thank you. Yes, but we're really running out of time, so can I give you one minute, please?

Question: Prof. Manoj was talking about R&D. I think you should visit Honeywell, Bangalore and look at the amount of not just software work but hardware work that they are doing for the US. How many people have they employed? Three thousand highly qualified engineers. Can they grow to 6000? The problem comes back to where are we going to produce the engineers? But it's not just software. Even in the hard-core hardware areas foreign companies are using Indian talent. Where are most of them coming from? Space, Atomic Energy and Defence including DRDO. All of them are my workers – people who were working for me – as everybody knows pretty well.

Chair: So in a sense, we are looking at separation of intellectual abilities and facilities in India, perhaps, between the civil and the military and the defence. But are there any specific questions to Prof. Manoj?

Question: As was just pointed out by Dr. Aatre and the previous speakers, intellectual capital is our real strength. That is why our IT industry is doing well. I do not want to make any comment as regards Bangalore or IT industry. But I would like to say this much. The IT industry does not exhaust the entire economic capabilities of this

country. Moreover, there are manufacturing and productive activities that will also be sustained and improved through research and development about which something has been said. We are aware that this will really help to underline this strength and sustainability for the future of the IT industry itself. The service industry does not and will not always work in a vacuum. I feel, that particularly in this session, there should have been some representatives, from either ASSOCHAM or FICCI. Because it is in the framework of the policies laid down by the government, (represented by the finance ministry or the commerce ministry) that economic strategies or collaborative strategies in economic co-operation will be worked out largely by the private sector. I mean, maybe private-public sector co-operation, etc. But it is no longer on the shoulders only of the government. That is why I thought that probably this session could have had this. The session could have been much more fruitful with some inputs from these groups. Thank you very much.

Chair: Thank you, Sir. We do hope that this session was useful to all of you. We do take the suggestion seriously. We are having CII representation tomorrow on another session. So industry representation has been included. But right now, I'll have to call the session to a close. Thank you all very much for your very, very interesting and intricate arguments and the integration that you have shown in terms of what multi-dimensional approaches have to be. I will have to give you all a few minutes break while I go and invite our star of today's discussions Dr. Anil Kakodkar. So just give me a few minutes. Thank you all for being a great audience. I thank the panelists of the session as well. Thank you.

Summary of the session

The last five decades have seen more downs than ups in Indo-US economic relations. In the fifties and early sixties relations were good and the US was a significant contributor to India's economic development. It also provided critical food aid. India's socialism and the large role of the public sector in her economic development agenda did not go down well with US business interests. India's non-alignment

policy and her inability to support US in Vietnam created further schisms in Indo-US relations. Food and economic aid were used as levers by the US government to make India behave. There was no obvious and visible American business lobby that could argue India's economic case. Both political and economic relations suffered as the Cold War heightened and both countries increasingly followed diverging strategies in spite of many common interests including democracy. As economic relations between the US and India moved more into the multilateral domain and as India initiated initial economic reform, trade between the two countries saw some improvements in the 1980's. The last decade has seen the emergence of a strong pro India economic lobby in the US that has served to moderate the impact of political crises between the two governments.

After the economic reforms of 1991 the Indian economy has grown at a significant rate. The reforms have set at rest US business misconceptions about the socialist nature of the Indian economy. The IT revolution and the export of IT services to the US have created a strong business lobby in the US to argue India's case. India has become a destination for US R&D interests. Cooperation in high technology areas including strategic technologies could further increase interdependence.

India is also beginning to emerge as a major market. The rise of India as an economic power has made it a more important player in many global fora. Given this emerging Indian trajectory of greater economic interaction with the world, it is likely that economic relations will be largely insulated from political problems in Indo-US relations.

India's rising economic power is viewed seriously by the US. It now depends on India for meeting a significant part of its services requirements. It is evident that the US needs an active partnership with India to improve its productivity. While the US has understood the dynamics of the emerging world economic order it is not very clear whether Indian strategic thinkers have understood these forces

fully. Some participants felt that the US is actively trying to change this Indian mindset.

The balance of trade is currently in India's favour. The US has always been India's largest trading partner. However US exports to India are picking up and as the Indian economy opens up to a freer trade regime, opportunities in India are likely to grow. There could be minor irritants between the two countries in areas like textiles or some non-tariff barriers in areas like fisheries. However, these are not likely to influence the growing trade between the two countries in any significant way.

The imperatives of Indian economic development including its need for energy, foreign investment and trade will force India to deepen and widen its engagement the US. As India moves towards a more market oriented economy and as mutual interdependence grows there is likely to be greater convergence of economic interests between the US and India. These could also spillover into co-operation in the multilateral arena.

There was a consensus that Indo-US economic relations would grow at an increasingly faster rate. Some participants felt that though there would be an increase in trade, the relationship would be dominated by the US. Others felt that the relationship would become more interdependent giving India greater leverage over the US in other areas. There was also agreement that Indo-US economic relations in the future will be relatively immune from the negative effects of geopolitical and strategic disagreements. If used wisely economic relations could become a proactive stabilizing force shaping the larger contours of Indo-US relations.

Special Session

India's Nuclear Technological Capability & Potential for Collaboration



Dr. Anil Kakodkar, Chairman, Atomic Energy Commission
delivering the Special Address

Special Session
Dr. Anil Kakodkar Speaks on
India's Nuclear Technological Capability &
Potential for Collaboration

Chair: Ambassador Arundhati Ghose

Prof. Vijayalakshmi: I want to call this special session to order. We welcome Dr. Anil Kakodkar for this very, very special session. We thank him for specially coming to NIAS – the NIAS team resoundingly welcomes you – and we're also hoping that you will be able to satisfy, in some measure, some of these very critical issues that we have been debating since morning. Of course, your very special interventions will go a long way in helping us understand this critical and important issue.

I invite Ambassador Ghose, who has already taken a great deal of interest in this issue, to kindly chair this session. Thank you. Welcome to this workshop on Indo-US relations on behalf of NIAS and Dr. Kasturirangan.

Chair: Thank you very much, Vijayalakshmi. It's a great honour and in spite of people being hungry, I see that they are all agog waiting to hear what Dr. Kakodkar has to say – I must say, so am I today.

One did speak in the morning about the need to build consensus in the country before you enter into negotiations with any foreign party. I think that one is looking forward to hear from Dr. Kakodkar, one of the key elements in building the consensus. Nothing more from me – Dr. Kakodkar.

Dr. Anil Kakodkar: Thank you, Chairman. I must, first of all, apologise to all of you, and particularly to Dr. Kasturirangan. I was planning to be here tomorrow, and it was late evening yesterday that I came to know that it can't be; so I requested, actually I telephoned

Dr. Kasturirangan to request my leave of absence. But then, whatever you say, I can't say no – and so I'm here. I also recognize that because of the delay in the flight, it's now well into lunchtime. So I shouldn't be speaking for too long and that makes my job easy. What I intend doing in a very short time – maybe 15 or 20 minutes – is to run through my own perspectives on what's happening in the US, what's happening in the world at large and of course, what's happening and what we would like to see happen in India, and then from there, pick up areas of convergence – areas where we can define a win-win situation, because it's only win-win situations that are really lasting.

I want to start with the way things have evolved and are likely to evolve in the US in so far as the nuclear area is concerned. We are all aware that the US was the country where nuclear power grew very rapidly. In fact, in comparison to other power technologies, nuclear power did rise very rapidly in the US. Even today, the US produces as much nuclear electricity – nearly as much nuclear electricity as we produce total electricity in the country. This is in spite of the fact that, for the last decade, no new nuclear power station has been added in the US. So obviously, in spite of such rapid growth, they got into a period of stagnation. When the time came for the reactors to be taken off the grid because the license period was over, they went through a major exercise of plant life extension. At one stage this appeared to be a formidable job, but the US Nuclear Regulatory Commission (NRC) and the industry, in what I think was a remarkable partnership, re-adjusted their frameworks and today we are seeing reactor after reactor undergoing an additional 20-year licensing period. Some of them have even been upgraded. So if you now see nuclear power generation in US, although no new plants have been added, nuclear power generation has in fact gone up.

About eight or ten years back, there was, I think, a reversal in approach to nuclear power in the US. The NRC started talking about a new licensing policy. The US Government gave special incentives for getting new reactors licensed. In fact they did say that in ten years' time, they would like to see at least one reactor - one new

power plant - coming on stream and I think they are moving on course. The US Government also launched the Nuclear Energy Research Initiative under which they created special funds to be given to the universities and invited a large number of ideas on which research projects could be funded. This was essentially to ensure that the almost zero state that they had reached in universities in terms of nuclear engineering gets revived and reversed, and this has started happening.

Then of course, came Kyoto, and as you know, the US rejected Kyoto for its own reasons – reasons which I think are valid. There was this Committee chaired by the Vice President which looked at the energy situation in the US in the years to come and that gave a very important place to nuclear power in the US Energy Future. In fact, there was a slogan in the US at one stage that said that the US answer to Kyoto is more nuclear power back home. Then they quickly got into the Generation Four Initiative Forum, which is a consortium of ten countries that is looking at new reactor designs – innovative reactor designs – which will possibly go on the grid maybe thirty years from now. It's not a short-term program – it's a long-term program. Different ideas are on the table as a part of the Generation Four Initiative Forum. The interesting thing is that out of the six proposals which are being worked on, four are (some people call it four-and-a-half) are fast reactors, which is a kind of a big change from the traditional US policy. This is because the US has not been adopting and had in fact shunned the reprocessing and recycle in fast reactors. You cannot conceive of a fast reactor without recycle. So, starting from the time of the Jimmy Carter policy change, the circle is fully reversed, as it were.

There are of course a lot of other activities. They are very concerned about knowledge management because the professionals are all old. They are all retiring. Even if one were to continue running the existing reactors or, for that matter, even if the reactors were to be shut down, you have to make sure that everything is safe, till the entire thing gets de-commissioned. This in itself is a process that takes several decades

because you go through a period of mothballing and then the actual de-commissioning operation takes place. The question is from where would they get the people to ensure that things are safe. They also realized that if the technology or the industry is in a stagnant mode, you cannot get young people to get into the program. And that has led to, I think, a new awareness in terms of how to get on with the nuclear business in the US.

So to sum it up, there is, in fact, a significant shift in the energy perspective in the US. From a perspective which was based on the premise that there is plenty of uranium, there is plenty of oil, and one can do without reprocessing and recycle, there is now a recognition that energy, worldwide, is going to be in short supply and one has to look at options which give much larger energy potential and that this cannot be obtained unless one adopts the closed nuclear fuel cycle.

Of course, this has also been driven - I would say primarily driven - by the growth of the economy in Asia. If you look at the requirement of energy in the industrialized countries in the West their population is stable. There is no need for them to enhance their per capita electricity consumption and therefore, there is not likely to be a net increase in the energy requirements in these countries. Of course they would need new systems to replace the old systems. You will bring in new technology for the new systems, but one does not see large energy additions in net terms at this time. But the growth of economy in Asia and the demand for large-scale energy worldwide has led to the thinking that there would be an escalation in prices, that this would hurt the economy unless there is a much larger increase in energy availability. The situation is likely to be difficult even for the western industrialized world in the absence of large-scale use of nuclear power. This is the way I see the US mindset as it exists today.

On the R & D plane, there has been sustained awareness in the US about maintaining technology leadership. For a short time in between, commercial factors drove the US away from basic research. But I think this was only for a short time. This was the time when the US

started the super-conducting super-collider project and stopped it halfway. That was also the time when the US, although it was a partner in ITER, withdrew from ITER. I am aware of several basic research activities in the US that were being questioned in a very harsh manner on whether the funding of these activities was justifiable. I think that things have changed since that time. Today, not only is there R&D in some very select areas where they see their direct interest, but across the board you see a lot of growth in R&D. The question again for them is from where would they get the scientists to run these research programs. The latest case in point is the linear collider, a very ambitious project. On a technology plane, it is beyond the large hadron collider, which is just coming up at CERN, Geneva, which will become operational some time next year. This is going to be the state of the art machine. Residual fundamental questions that would still remain to be answered after the capability of the linear hadron collider is taken into account would be the big issue. The answers to these questions, would determine the new form of the charged particle accelerator machine. There are, of course, many other proposals, but the linear collider is the one which the world community is looking at. At least for the last two years, I have a series of letters from various labs in the US. They have visited us several times. They have met DST. As a matter of fact, in the month of March, they are going to have a big meeting right here in Bangalore. A very large group is coming to India. They all come with a very specific agenda of creating ties with us.

I am sure all of you know that as a result of our work at the large hadron collider in CERN, India is today an observer country at CERN. Only European countries can be members of that European organization and all other countries have to be observers. There are only some four or five observer states. The United States is one. Japan is another. There are a couple of others. India is also one.

So there is this renewed awareness in the US about ensuring technology leadership and I think there is also awareness that the

young Indian scientific human resource is an important factor in the US getting that technology leadership.

The third element of what drives the US nuclear policy is, of course, non-proliferation. Now, from a technical perspective, I think things really changed after TMI, when Jimmy Carter enunciated the policy that fissile material will not be separated. The US had already determined by that time that they had excess fissile material over and above what was needed for their security requirements. They also felt that having fissile material floating around, even if it was under safeguards, could pose risks. So they started a restrictive regime where fissile material should not be separated. So there was this no-recycle policy. Back then the US stopped a good number of fast-reactor research facilities. There was also a lot of preaching done worldwide, that reprocessing is expensive, and that the “once-through fuel cycle” was the best.

But I think they realized as they got close to the completion of the design for Yucca Mountain storage facility that the repository would be full even before it was commissioned. They would still need to handle a lot of spent fuel. Some years back, there was a study – it was not a decision - but there was a study. According to the study it would be best for the US to follow a mixed option - a once-through fuel cycle where the spent fuel is conditioned and put in a repository; along with some of the spent fuel being re-processed and recycled. It's only now, in the last few days that you see that they are trying to introduce a Bill and they have asked for some sanction to be able to get started on that activity. I think this is also prompted by the Russian initiative dealing with the reliability of fuel supplies. Now there is of course a gorgeous name given to it – the Global Nuclear Energy Partnership. It was earlier called the Global Nuclear Energy Initiative.

Anyway while there was recognition on one side that one cannot escape recycle, there were also serious concerns with regard to proliferation issues. They, of course, assumed a bigger proportion in view of the so-called US perception of the axis of evil. You also had

these proposals – seven-point proposals from President Bush – where some additional conditions were articulated, constraining the rights of countries who are part of the NPT. Although a NPT country is fully eligible for carrying out its own peaceful development, this proposal prohibits the transfer or development of enrichment and reprocessing technologies to a country unless the country already possesses them. This is a new transformation of the same argument that now says that one can assure fuel supplies to a facility provided the country does not get into its own fuel cycle activity. There are different shades to this. But the point is that a new regime is emerging, which is beyond what NPT would expect of NPT signatories.

So to sum it up, I think there is now recognition for the closed fuel cycle. New arrangements to prevent the spread of fuel-cycle technologies are likely to be put in place. The Global Nuclear Energy Partnership is a new term, but there are many other partnerships that the US has floated, essentially to make sure that the additional security issue arising out of the large-scale circulation of fissile material in civilian use does not become a serious problem. Typically, these other partnerships include a Regional Radiological Security Partnership that is more concerned with issues related to nuclear terrorism such as the dirty bomb. There are things like the PSI, the CSI and others, which I am sure all of you know better than me.

Now the question is, in this whole thing, where does India position itself? Before we go into that, I think it is better to take stock of existing areas of cooperation between India and the US. I want to put forward some salient points. It all started with Tarapur and here I am talking about the institution-to-institution cooperation. The scientist-to-scientist collaboration has been always going on and there are strong individual-to-individual links between Indian and US scientists. So I am not going to talk about that. I am talking about the large-scale country-to-country linkages. I think it began with Tarapur. All of you are aware of the history of Tarapur, so I am not going to deal with that. Then sometime during the time of Secretary O’Leary, there was a very high-profile visit to India that triggered collaboration

between the Nuclear Regulatory Commission (NRC) of the US and the Atomic Energy Regulatory Board (AERB) that I think, started moving quite well. They had a few rounds of very interesting and useful discussions. It of course stopped following the '98 tests and again got revived, about two or three years back. It has been, in my mind, a very intense and very fruitful cooperation. Prof. Rama Rao is here and it all started at the time when he headed the AERB. Today it is a productive co-operation. There are, in fact, opportunities for Indian scientists from AERB to spend time in US facilities and there have also been visits from the US people and now we are talking about some joint activities. I think they are very impressed with the way we have managed the Indian reactors, particularly Tarapur. I still think they are finding it difficult to believe that we could maintain such an old reactor and run it in such a good condition. They are absolutely amazed about that. So this is one thing that started, had a break in between, but is still going on.

At the Brookhaven National Lab (it's one of the US Department of Energy laboratories) - and this is again very interesting - we have a long-standing collaboration on the Relativistic Heavy-Ion Collider. The Indians have been participating in a fairly old experiment, PHOENIX. Even today, if you go into that tunnel, at the place where the detectors are located, you would find maps signifying the countries who are participating in this project. You can find the Indian tricolour there. It has been there for the last ten years. It's there even today. Following the 1998 tests, it became difficult for Indian scientists to go there because they couldn't get visas. However, as a part of the collaboration, we had already agreed for making some equipment in the central workshops at BARC. These had to be delivered for some experiments there. You will not believe this. The equipment was made and delivered to the Brookhaven National Lab after 1998. The US scientists followed the procedures given for assembling the equipment in the experimental station and the equipment was put to use. Indian scientists and their US counterparts were in e-mail contact to share ideas on what to do and how to do it. After this they have published papers – scientific papers - that carry the names of both American

and Indian scientists from BARC as co-authors. Though the scientific collaboration did continue there are of course still difficulties for BARC scientists to go to the US because of visa restrictions.

More recently, the same Brookhaven National Lab, has another experiment, STAR. The scientists from the Variable Energy Cyclotron Centre have, in fact, made a fairly large segment of the detector. A lot of experimental data gathering is presently on using that detector. And of course, there is a very live discussion in the context of the linear collider, as I mentioned to you.

Worldwide, as I said earlier, in the nuclear energy arena, there may be work going on in Europe and North America. However the real growth is taking place in Asia – India, China, South Korea, Japan and Taiwan. There is therefore a race for being in the forefront of technology, a race in terms of energy economics and also a race for positioning one's country in a proper place in the new emerging world order. I think we should look at whatever we do in terms of international nuclear cooperation keeping in mind this context.

Now coming to India as you are all aware, the Indian program is ambitious. It may be small in megawatts, but I think it's very tall in terms of its technological achievements and ambitions. There is not only recognition about our excellent performance in the area of thermal reactors; but there is also a lot of recognition in terms of our strides in fast reactors. In fact, if you scan the scientific literature (I am talking about peer reviewed papers) and then classify them under fast reactors or heavy-water reactors, you would find that Indian publications would be the best or very near the best in terms of both quality as well as numbers. This may have perhaps missed the attention of the Indian community but it has not missed the attention of the international community.

There is of course our long-term interest in thorium. Everybody knows in the rest of the world that at this moment thorium is not an area of priority interest because they have plenty of uranium. Now that the

rest of the world has reconciled itself to the recycle of uranium, there is an equally large energy potential in thorium. However I must inform this gathering that there is an important technical difference. Once you decide on a recycle option and you ask yourself a question - if I want to compare fertile material (Uranium 238 versus thorium) and I am living with a given amount of fissile material to start with, which is a better fertile material? The answer would be, that at a low level of technology, when you cannot go to high burn-ups, uranium is a better option. However at an advanced level of technology, when you can go to high burn-ups, thorium is a superior option. I have no doubt, that in the years to come as recycle technology comes to stay; people will start getting attracted to thorium on its merits, rather than from considerations of the availability of the energy resource. For us, of course, there is no option, because we do not have too much uranium. So our interests in thorium are, of course, quite clear.

So with this background, what should we do? I think there are multiple options. You can talk about fast reactors, you can talk about thorium, you can talk about a number of other technologies such as for example, accelerator technologies that I was talking about when discussing basic research. Accelerators have a role in energy technologies because through them you can get better growth rate in thorium. Or you can talk about accelerator technologies because accelerator-driven systems are excellent incinerators that can burn long-lived radioactive waste very effectively. Even with regard to fast reactors you can talk about them either in terms of breeders to grow the energy potential or you can talk about them as plutonium burners. You can also talk about fast reactors as waste transmutation systems. You can of course deploy these technologies in different ways. I am very certain that the West, till such time as they position themselves well, would drive all these technologies from the point of view of not energy, but non-proliferation, which means burn plutonium or transmute waste. I am sure many of you are aware of the history of Superphoenix. The Superphoenix is a French reactor. A 1300 megawatt system, which they decided to de-commission. I think it's an excellent technology that came little ahead of time. They had a problem on the secondary

storage side. At that time, the French government was strongly influenced by Greens and they decided to de-commission that reactor. When the discussions were going on about that decision, a big argument was made that the Superphoenix can be used for burning excess weapons grade plutonium. After a lengthy debate even this argument did not succeed and they decided to shut down that reactor. The point I am trying to make is that these technologies can be deployed for a variety of purposes and that it is the national interest and not the international interest that should drive the way in which we deploy these technologies.

So the important point is that we should remain autonomous in terms of how we would want to develop and use these technologies. We must maintain a very high S&T strength in our country so that we can chalk out our future path in an autonomous manner. This should really drive our negotiating strategy. We must maintain strategic independence; we must ensure the integrity of the three-stage fuel cycle. This is needed, not because Bhabha suggested we follow that route, but because of very fundamental reasons. These fundamental reasons are embedded in the energy resource profile that exists in India. Above all, I think we must maintain autonomy in our research and development work.

So I view Indo-US cooperation from this broad perspective. I deliberately avoided getting into the immediate nitty-gritty because I think this is a community of strategic thinkers. Maybe I think you should all take yourselves to a very high plane and think about the way things evolve. I must also tell you that I am a champion of the Indo-US treaty. The media in some places makes me look as if I am an obstructionist. I am a champion. But I am also a champion of using that treaty from an Indian standpoint and I think we must negotiate that treaty well and I think it's possible to get into a win-win situation.

There are several symbiotic relationships between imported technology and Indian technology. For example, if you have light-

water reactors, the energy that you can extract per tonne of uranium can increase manifold if you take a fuel – enriched fuel – put it through a light-water reactor. You then take the fuel that comes out of the light-water reactor and use it in a heavy-water reactor. The fuel that comes out from the heavy-water reactor can then be used in fast reactors. I think there are a lot of such benefits that one can derive. I would for one suggest that you do not restrict your thinking in terms of options to what has been said by the West. That is because they have been talking about options from a stagnant position. I think the options they suggest are surely there. But there are many more options that one can think of. Since we are equally interested in uranium since without uranium thorium cannot start and of course we are very interested in thorium, I think we have many more options and that we should keep them open.

Thank you very much.

Chair: We have a few minutes of time. I hope Dr. Kakodkar would agree to take maybe one or two questions from the floor?

Dr. Anil Kakodkar: Yes, yes – as many as you like.

Question: Dr. Kakodkar, thank you for that very lucid and very logical exposition. The draft report of the Planning Commission's Committee on Energy has recently been released. They say that in the next thirty years, the bulk of our energy requirement will continue to come from coal. Except that in thirty years' time our coal deposits – domestic coal deposits – will be exhausted. Hydro can be increased, but it can't provide more than five to six percent. They have come to the conclusion that the bulk has to be provided by nuclear power. Now do you agree with that, and how much of nuclear power do you think we'll be able to produce, let's say in the next thirty to fifty years?

Dr. Anil Kakodkar: Well, I not only agree, but whatever is there in that report is entirely consistent with a report that we prepared in

DAE. We prepared a report on a fifty-year perspective – in fact, it's available on our website – and the Planning Commission study is with a thirty-year perspective. So if you segment the fifty-year perspective and take only the thirty-year period, whatever is said about nuclear energy in the Planning Commission study is very similar. That is because we have been a party to that discussion.

The point is like this. There *is* an energy crisis in the country, and that crisis is bigger than what most people think. This is again arising essentially out of the same consideration that the economy is growing fast and if you want to support the fast growth of the economy, you must have the matching energy resources. Although there is this perception that India has plenty of coal, even this stock of coal may be inadequate in the light of the fast energy growth that we may see over a thirty or fifty year horizon.

What we have done in our study is that we looked at the programs of all ministries – all energy-related ministries – and accounted for the most optimistic projections made by different segments. We of course, worked out the total energy requirement based on economic growth. If you subtract one from the other, that tells you what is the niche area for nuclear and that was the purpose with which that report was made. It looks to us that the niche area for nuclear in the fifty-year horizon is around 20-25%. In a thirty-year horizon, that percentage is a little smaller.

Though finally it will be the economics that will decide what source takes what share, if we can do better, we should certainly make that attempt. This is exactly where this international co-operation comes in. I look at anything coming as a part of international co-operation as an addition. Now, this addition is important in the near term, say over a twenty, thirty or forty year horizon. In fact this certainly is the most important rationale for developing such co-operation. Of course, co-operation is important in its own right.

But there is another important part to this and that is, you go forward maybe another thirty-forty years. Ask yourself a question on whether in the long run, energy production in the country should be based more on indigenous resources or based more on imported resources. In the case of hydrocarbon, we have the situation today: where in spite of having gone aggressive on exploration of hydrocarbons, we still import a very large part of our hydrocarbons. Now energy is a thing where you can justify import very easily because it has a large multiplier effect on the economy. So it's not as if you have to produce everything indigenously. Japan is in fact, surviving mostly on imports. However, for a large country like India, I think there will always be this question of balance of payments. I wouldn't call it an issue, but if you produce that much within the country, you have an advantage and that advantage is not small. So it is important that, in the long run that we should be in a position to produce more nuclear electricity from indigenous fuel resources. It's absolutely important. If we allow ourselves to be driven to a position where in the long run we cannot produce energy from thorium then for all time to come, we would be dependent on imported uranium. It's not going to happen today. It's going to take time. If however we lose that option, then we will be virtually in the same situation as we are with respect to hydrocarbons today. So that is where this balance is required. I think co-operation is important, but we cannot accept each and every demand that is made as a price for that cooperation. For the reasons I have stated here I think we have strength enough to get into a more balanced negotiation.

Chair: Thank you. I think there is something wrong in the figures that you quoted. Isn't it true that from either the Planning Commission 30 year perspective or the DAE 50 year perspective 'you will continue to rely on coal and hydrocarbons.

Dr. Anil Kakodkar: Yes, even in 2050 we would be heavily dependent on coal.

Chair: That's right. And your nuclear just goes up – a bit. I think there is – there was a question here? Yes.

Question: Does separation mean, for example, when you do a fuel fabrication, you have to duplicate everything – one for the civilian, one for the military? I mean, the American demand reminds me of what you have in the religious festivals, one kind of food you make for the Brahmins and one that you make for the other people. You mix it and there's some pollution and that kind of stuff.

Dr. Anil Kakodkar: Let me share with you the way I see the separation between the civil-and the military. The interpretation of the July 18 statement is that you carve out a civilian domain with which you can have full international civil nuclear cooperation. You organize a framework that will assure everybody that there will be no diversion from this civil domain into the Indian military domain, or for that matter, to any other country. That is the meaning of this separation, the way I understand it.

Now having agreed to that we identify a few facilities (few or some or whatever) and then put them voluntarily under IAEA safeguards. Through this mechanism we create this assurance that there will be no diversion of any material because it will be subject to oversight of an external body. As long as that requirement is met, that there is no apprehension of any diversion, I think that should suffice. Now, you can have a civilian activity in a military facility. Something from a military facility can be brought into the civilian domain. The reverse is not true. Something in the civilian area cannot be taken to the military domain. Now, this is an important point for us to make our decisions. The argument that anything that produces electricity is civilian because power generation is civilian almost amounts to mean that military does not use electricity. So I think there is no definition of what is a civilian facility. It is for us to decide and create a credible assurance that there will be no diversion and that there be no fear that there will be diversion. And as long as it is recognized that India has her own strategic needs and that India should be free to fulfill its

strategic needs and requirements there should be no problem. I think the discussion of what is on the strategic side is not on the table. In fact, I would not even want to discuss that. That is what the July 18 statement means. I hope I have answered your question.

How did the Indian program begin? The Indian program began as a civilian program. Whatever one might say, I have been living in this program since the year 1963. It was all along a civilian program. But it was a comprehensive program in the sense that the possibility of having to make or derive some benefit on the military side, should it become necessary, was always kept open. But it was not as if something was built essentially for a military activity. So this whole program is very intertwined. Today if you decide and separate, it virtually means that either you cripple your strategic activity or create duplicated strategic activity. Now, the question is – why should we do that? So that is the point.

If, for example, you take the fuel cycle facility, they provide supplies on both sides. So I must keep it outside the civilian domain. In fact, if you see the US, they also had defined some criteria. There are some four or five criteria. Even if you apply those criteria, I am okay. Now, the important thing is to many separation means you divide the DAE into two (I'm quoting from what the media has used to attack us) In the United States, the Department of Energy (DoE) is only one. DoE does not only the civil nuclear and the military nuclear, it also does coal, oil and everything that connects with energy. In France, it is one organisation, in Russia it is one, in China, it is one.

Chair: Yes – there is one hand up there. A very brief one, very fast.

Question: As a complete layman, I've been seeing a lot of media reports that we absolutely *have* to go through this agreement. Otherwise there'll be a catastrophe, a decline in our program, and we'll be in very serious trouble if we don't agree to this agreement. In a worst-case scenario, that this agreement does not take place, is this catastrophic scenario accurate?

Dr. Anil Kakodkar: Well, first of all, I think approaching any negotiation from a desperate position is bad. So even if we are desperate, I think approaching it that way is bad. But I must tell you, that we are not desperate. But that does not mean that we are not keen. We are keen. But the Indian program is there and it will go on. For me negotiating cooperation or preparing conditions for cooperation is not new. It's not a few months old but several years old. I have been always sending a message to everybody that the Indian program will go on – with you or without you. So that's the answer.

Chair: Dr. Kasturirangan wanted to ask a question

Dr. K. Kasturirangan: Dr. Kakodkar didn't answer the questions that I was looking for. This is really related to a long-term strategy which I thought they would have already evolved. Notwithstanding the suggestion of the US under this agreement that you have to separate the civilian, the non-civilian and the research component, I thought that such a separation must already be an integral component of your long-term strategy on how to develop the civilian program. In our experience we always found that when you have a civilian program, it is an accepted program in which international cooperation naturally becomes a feasible and you do get technologies that are at the cutting edge and there are no inhibitions on cooperation. The question is, what kind of diffusion takes place between the civilian and the military? What kind of institutional mechanisms should one establish, not because the DAE is a proliferator, but because there could be other known means through which a proliferation could take place and both the parties know this very well. So if this separation is for form's sake only, maybe one should look at the agreement in a different way, with the proviso that we are confident enough to do what we want, irrespective of the outcome of the deal. Today there are fifteen and odd reactors that are operating and a few more are likely to be commissioned. This is still far below the targets that have been set by the DAE. To meet those targets you are really looking for systems that are available in the country with fast turn-around times. The turn-around time is one question – I don't want to go into

the details of that. But taking advantage of the agreement in terms of what you said and keeping in mind both a long-term and a short-term perspective, you do need whether one likes it or not, a larger amount of power from nuclear sources. So this is the sum total of an overall programmatic direction that one analyzes today. How do we go about reconciling these tradeoffs?

Dr. Anil Kakodkar: That's already a part of strategy, but just to tell you about the turn-around time. Today NPC is constructing reactors in four-and-a-half years. No other country has built it faster. NPC is currently constructing eight reactors simultaneously. No other country at this point of time is constructing so many reactors at one point of time. There are of course constraints of fuel. We have been working on the possibility of bringing in the private sector for at least three-four years now. We have to go through amendments to the Atomic Energy Act, and that itself is such a long-drawn exercise. But it's there in the pipeline already. I must also caution about the realistic situation. I would like to give examples of Argentina and Brazil. When these countries joined the NPT, or before that, the pseudo-NPT, there were a lot of promises that they will get all kinds of things. So many years down the line, they haven't got much. Of course, they don't require energy so much they have a huge hydro base. That is another story. On the other hand, Brazil recently developed a new enrichment technology. Of course now that they are a part of the NPT as a non-nuclear-weapon state, it is to be subjected to IAEA safeguards. There is a huge debate raging about how much Brazil should reveal in terms of its technology to facilitate safeguards.

So these are some of the points that we have to deal with in this is real-life world.

Chair: Well, thank you very much, Dr. Kakodkar. I am going to catch you, even if you try and avoid me, at some other time, to get my questions answered. Thank you all very much and I know we would like to thank Dr. Kakodkar very much.

Dr. Anil Kakodkar: Thank you.

Session III

Changing Security Environment and Implications for Indo-US Cooperation



Left to Right: Air Chief Marshal S. Krishnaswamy (Retd.),
Maj. Gen Dipankar Banerjee (Retd.), Prof. Christopher S. Raj

Session III

Changing Security Environment and Implications for Indo-US Cooperation in Defence

Chair: Admiral P. J. Jacob (Retd.)

Prof. Vijayalakshmi: Ladies and gentlemen, thank you all for being here. In continuation of the national workshop on Indo-US relations, this is our session on cooperation and defence and emerging security challenges that India and the United States face. We have a very distinguished panel, and to conduct the proceedings, I request Admiral Jacob to take over as Chair. We have three panelists and one discussant – Prof. Christopher Sam Raj from SIS, JNU, from the Department of American Studies, General Banerjee from the Institute of Peace and Conflict Studies, Air Chief Marshal Krishnaswamy – and Dr. Lawrence Prabhakar will be our discussant for this session. I now request Admiral Jacob to take over and chair this session and preside over it. Thank you.

Admiral Jacob: Good afternoon, ladies and gentlemen. I know a post-lunch session is always a drowsy session, but I understand that one of the presenters has some very informative slides – that should help to keep the interest alive.

The subject that we have today is ‘Changing Security Environment and Implications for Indo-US Cooperation in Defence’. I felt, when I was looking at this, that the most appropriate way to kick off this session on the changing security environment and implications for Indo-US cooperation would be to recall the preamble to the new framework for the Indo-US defence relationship of June 2005, which came as quite a surprise to a lot of people. This preamble states that the United States and India have entered a new era. We are transforming our relationship to reflect our common principles and shared national interests. As the world’s two largest democracies,

the United States and India agree on the vital importance of political and economic freedom, democratic institutions, the rule of law, security and opportunity around the world. The leaders of our two countries are building a US-India strategic partnership in pursuit of these principles and interests.

Ten years ago, in January 1995, the Agreed Minute on Defence Relations between the United States and India was signed. Since then, changes in the international security environment have challenged our countries in ways unforeseen ten years ago. The US-India defence relationship has advanced in a short time to unprecedented levels of cooperation unimaginable in 1995. Today, we agree on a new framework that builds on past successes, seizes new opportunities, and charts a course for the US-India defence relationship for the next ten years. This defence relationship will support and will be an element of the broader US-India strategic partnership.

The US-India defence relationship derives from a common belief in freedom, democracy and the rule of law, and seeks to advance shared security interests. These interests include:

- Maintaining security and stability;
- Defeating terrorism and violent religious extremism;
- Preventing the spread of weapons of mass destruction and associated materials, data and technologies; and
- Protecting the free flow of commerce via land, air and sea lanes.

Why has there been a sudden spurt in Indo-US cooperation, especially in strategic spheres? After all, India has been a stable democracy ever since independence, and indeed as a bulwark against the spread of communism, epitomized what the US looks for in strategic alliances. However, the perceptible thaw in Indo-US relations has only been a recent phenomenon. While part of this shift may be attributed to purely economic considerations, in that India is a vast market for both commercial and military goods from the United States – it would

be too simplistic to assume that there are no broader strategic compulsions.

While some may not take India's aspirations of becoming a global player in the near to medium term too seriously, there can be little doubt that its influence is spreading beyond the environs of South Asia. It is equally obvious that the new security environment after 9/11, with its attendant issues such as drug and arms trafficking, terrorism and insurgency, requires something beyond a unilateral approach.

A study by the United States Naval War College states, "We need tangible Indian support because our strategic interests and objectives are global, while the military and other means at our disposal to pursue them are not keeping pace. American force posture remains dangerously thin in the arc, many thousands of miles long, between Diego Garcia in the Indian Ocean and Okinawa and Guam in the Pacific."

This approach is further amplified by Ashley Tellis, the former aide to Blackwill, who opined:

"In those Asian areas of critical significance to vital US interests that would warrant the commitment of US resources, including force on a unilateral basis if necessary, India will indeed remain a peripheral actor. But as its capabilities grow, so will its influence, even if it is limited. And that influence can help advance shared bilateral interests if relations with New Delhi are adroitly managed."

In these critical areas, he writes, "Indian power could be dramatically magnified if it were to be applied in concert with that of the United States. In such circumstances, Indian resources could help to ease US operational burdens." He goes on to say "Indian power will be the most relevant in those geographic and issue-areas lying in the interstices' of Asian geopolitics. In those areas, great power interests are neither obvious nor vital. Consequently, their incentives to enforce

certain preferred outcomes unilaterally are poor. In such circumstances, rising powers like India can make a difference because their substantial – though not still dominant – capabilities can swing the balance in favour of one coalition or another.”

For its part, the undeniable influence wielded by the United States in the region cannot be ignored by India. The region is home to vast geographical, historical and economic diversity. Inevitably, perhaps, the region is an area where many differing cultures, religions, ideologies and political systems compete and struggle to survive or expand their own interests. As a result, it is replete with regional conflicts, a struggle for power in the Persian Gulf, the Indo-Pakistan conflict in South Asia, internal strife in Sri Lanka and Indonesia, to name just a few.

Even before the invasion of Iraq and the war on terror in Afghanistan, the United States maintained considerable presence in the region, with the capability for power projection deep inland as envisaged by their “Forward from the Sea” posture. They have military presence or arrangements for access almost across the entire Gulf region. It would be naïve to expect this situation to change dramatically in the near future, or to discount the tremendous influence that is wielded by the United States in the region, and indeed in the affairs of the world at large.

In the uni-polar world of today, the US often acts without the semblance of a consensus. Post 9/11, the “either with us or against us” yardstick has been applied brazenly to use force to unilaterally achieve their strategic objectives. Even in Iraq, the absence of WMD and the worsening situation on the ground leads one to believe that the invasion has probably caused more problems than it set out to solve.

The road to democracy has also not been very smooth, and the recently-concluded elections have yet to manifest itself in tangible improvement for the country and its citizens. The invasion has also

led to speculation as to who would be the next target of American unilateralism, notable among them being Iran. Iran's arguments to acquire uranium enrichment expertise may be legitimate, but a mere subterfuge for achieving the status of a nuclear weapon state to fulfill its aspirations of being a great power, and also for becoming secure.

On the other hand, though India has a historical association with Iran, it voted against Iran in the meeting of the Board of Governors of the IAEA in September 2005, and again on February 4, 2006. The future of the Iran-Pak-India gas pipeline also seems to be in jeopardy, and, not only may India be forced to rethink on it, but recent statements by the Pakistani Prime Minister in Washington suggest that they too may ditch the project if the US offers them the same nuclear deal as they have with us.

It is also apparent, despite statements to the contrary, that the United States has a considerable role to play, even in reducing tensions between India and Pakistan. A major hurdle in the development of Indo-US relations in the past has been what has sometimes been referred to as the 'third country prism'. For a long time, US-Pak relations had an adverse effect on US-India relations. Development of the US-China relations had the same impact. In the post cold-war era, strategic planners in both countries have obviously seen the benefits of stronger ties and greater strategic and military cooperation.

To expand more on this subject, we have with us today three speakers – Prof. Christopher Sam Raj of the School of International Studies, Jawaharlal Nehru University who would be speaking on emerging security challenges and implications for Indo-US cooperation in defence, then we have Maj. Gen. Dipankar Banerjee, who is the Director of the Institute of Peace and Conflict Studies in Delhi, who will speak on the emerging security challenges and implications for Indo-US cooperation – an Army perspective. Air Chief Marshal Krishnaswamy, former Chief of Air Staff will speak on emerging security challenges and implications for Indo-US cooperation – an Air Force perspective. Since there is no separate slot for the Naval

perspective, I have taken the liberty of covering it with a broad brush in my opening remarks. Finally we have as our discussant, Dr. Lawrence Prabhakar, Associate Professor, Madras Christian College, Chennai. May I now request Prof. Christopher Sam Raj to start his presentation.

Prof. Christopher S. Raj - *Emerging Security Challenges and Implications for Indo-US Cooperation in Defence*

Thank you, Chairman, Admiral Jacob. I think from what you said, we are all at ease after lunch; you have brought us to attention by your presentation. My problem is that I am sandwiched between two military men. I thought, rather than talking defence, I should use the word ‘security’ implications. I am not an expert because I have not fought a battle – they all have. I have not even carried a gun – they all have. I am grateful to the organizers, and especially the Director of this institute, Dr. Rangan, and also my colleague Vijayalakshmi for inviting me for this important seminar today. We have heard a lot of details. My interest has always been to make a theoretical structure on the notions relating to behaviour of States, nations and how especially a superpower formulates its own security structure in the current context.

One needs to understand the global polarity concept. How the security environment has been changing? In the context of polarity, we have seen a major difference especially since 1991. The power structure and the Indo-US security relations too have differed over the years. In a nutshell, the terrorist attack or the destruction of the New York World Trade Centre transformed the global security environment. The end of the Cold War, implosion of the USSR, equally brought bipolarity to an end. There has been in the American administration since the senior Bush administration and subsequently Clinton a lot of discussion as to what is the real threat emerging. In this new configuration, America has emerged as a lone superpower. But, how does it function in this existing environment is a challenging question. The US in the current context believes absolutely in the realpolitik as a tool of their diplomacy.

Academic opinion is divided on this global theory that has emerged – the polarity theory. One view says yes, there is a new realist theory, that there is a unipolar world signaling to one superpower. Another position is brought and analysed in the clash of civilisation by Huntington – this is the academic debate which is emerging. He said there is a uni-multilateral power situation. There is one power, that is the United States, and there are many smaller powers. America has not yet abandoned multilateralism and the aspects related to multilateralism.

As the global situation emerged after the collapse of the Soviet Union, one finds one plus four powers in the whole political and global structure. This had one superpower that is the United States, although in the morning we heard from the doyen of our security community, Mr. K. Subrahmanyam, saying there is only a leading power. I have my doubts. If we go on the literature on what constitutes the definition of a superpower, we just can't deny that America is a superpower. If you go into Morgenthau's theory of what a country and a power's capabilities are, you cannot deny it. So these are realities. As an Indian, we may find it very satisfying that it is a leader. But it is a superpower. One superpower is emerging. Who are the other major powers in this whole thing? China, European Union, Japan and Russia. India doesn't figure in the first ten years or the decade of post Cold War in the literature or in the American foreign policy.

The American interest during the Clinton administration was only to cap, roll back and eliminate our nuclear program. And what did they threaten us with? The threat was, as you see, they looked at Japan and the need to rethink on Japan. Re-structural rhetoric aspects of Japan, China, and then the rogue the emerged. The concerns of the post-9/11 – and the Islamic fundamentalism emerged as a new global threat.

Now this is the existing global environment. You have one power and four great powers (China, the European Union, Japan and Russia). The post-Cold War global environment affirmed the rise of American

unipolar power and the other major states are not making systematic choice to pull away from and balance against the US. Hence, the main security concern of these states, both in Europe and Asia, was how not to distance from the United States, because it is a powerful nation, but how to prevent the United States drifting away from various structures of international community and world structures.

A set of academics who opposed and rejected the idea of polarity upheld that post-Cold War phase has to be attributed to globalisation. Indeed, the post-Cold War liberal triumphalism produced a globalisation school of thought that attacked the state-centric, power politics assumptions of realists and neorealists on which the core idea of polarity theory rested. Globalists emphasised the diffusion of power away from the state and military sector to other actors and other sectors. The globalist perspective is generally understood to be the antithesis of realism's and neorealism's statist, understanding of the international system structure. Globalisation is rooted mainly in cultural, transnational and international political economy approaches.

This is a globalization process which you also saw at the time when America was not clear what is the threat. There we see these things operating into a whole operation. As I see, perhaps de-territorialisation of world politics appeared to be the guiding theme of these globalists. There have been two versions of de-territorialisation or borderless environment of the world politics. The stronger versions whether Marxian or Liberal has upheld that de-territorialisation has taken the state, and the state system, off the centre stage of world politics. Milder versions leave the state and the state system in, but put lots of non-state actors and systems through and alongside them. In a globalised world, we see a borderless situation – borderless states are all treated as one – and information and all the things move on in that situation. And that's why you found the possibility of Indo-America relations taking place. In the ultimate analysis, the progress of the globalisation phase is almost synonymous with Americanisation of the world politics which once again affirm a unipolar view.

In the whole ten-year period, the first decade of the post Cold War, or until 1995, there is one Indo-US multi-cooperation stock-taking by the American Foreign Office. As I was moving into this in detail – I am just bringing it – having put the structures on our relationship, there is a formal agreement in 1995. But that doesn't operate on a full scale till you have moved into another situation – the post 9/11 scene. That is where a list of a whole lot of – all kinds of joint operations and joint inter-polarity – emerge after 2001. Hence, the Indo-US defence cooperation agreement of 1995 has been strengthened after September the 11 event.

In between, we are constantly under pressure on the issues relating to NPT & CTBT. The only change we saw, was during the Kargil conflict. One can even say – somewhere I have written saying that Kargil almost changed what was felt in 1971 – the tilt of the United States on Pakistan. There was a change – and there is a tilt of the United States towards India. Now once again, the pressure is kept on non-proliferation. Finally, it ends with Clinton going off from the issue, because CTBT is no more an issue, even in the United States. The Congress refused to accept it, refused to ratify it. It is more or less, the Indo-American relationship in the changing structure of the first decade of the post Cold War. The focus was more on Europe; the focus was more on what was developing in Europe, as you would see, because they were polishing the policy of intervention – policy of humanitarian intervention – a new concept which the Americans finally accepted for intervening even in Bosnia and Kosovo.

Simultaneously, where they disagreed on issues, you have another thing developing in the international arena – democratisation of foreign policy. You take issues out of the UN, and whoever is interested in the global level, and out of that emerged the treaty which was called Banning of the Land Mines.

So that is how things were in this situation where threats were not there, but things changed after 9/11. The global security environment changed – shifted – and citizens were shocked as they saw in real

time, how the building – the most important building in the United States – was collapsing. In a motion, you have President saying that he is not going to allow anything to happen. And he is going to be chasing whoever it is. The day after September 11 event, General Richard Myers was asked at the Congressional hearings why the mightiest military in history had failed to protect the heart of American power from a group of men brandishing “boxcutters.” In those early shocked hours, the incoming Chairman of the Joint Chief of Staff had no ready reply but the unvarnished truth “we are pretty good if the threat is coming from outside,” Myers said. “We are not so good if it is coming in from inside.”

There is now a threat they never visualized as it emerged in the current form. So you find that a new threat has been identified. For this audience, I would like to say that this threat as it is identified, is terrorism. The first major statement – even President Truman went to the Congress – on 12th March, 1947 – the words that he used were, “Terrorists supported by Communists”. The word ‘terror’ had come up even in the containment formulation of the containment policy. There, ‘terrorist’ was identified with ‘communist’. As we now see, as he went before the Congress in September, he clearly says, the ‘terrorist’.

For the first time, the United States has found something to pursue. That’s very important. So you know, the only superpower now has been able to identify the threat and out of the threat comes the formulation of the war on terror. In 1947, it was containment, now it is the war on terror, and declaring the operation Enduring Freedom Military Campaign in Afghanistan. In 1947, they were looking for allies. Now, a new term – you are talking of partnership and alliance.

The one thing that America is constantly looking for is a coalition of willing partners. That’s also a new thing, that is okay, we don’t want you as partners, neither as allies, but wherever you have convergence of interests then I think the American policy makers have absolutely a different take.

Soon after the “Operation Enduring Freedom” Campaign in Afghanistan, especially from January 2002, President Bush turned American attention and resources away from Al-Qaeda to lead a crusade against Iraq’s Saddam Hussein. On 15 September 2002, President unveiled the new National Security strategy of the US. It highlighted the primacy and balance of power. It talks about organising coalition and also about acting all alone for self-defence. The most important aspect of the national security strategy is the statement that codifies all the new aspect of exceptionalism. It adopts the doctrine of preemptive action and has made no mention of the United Nations in this context; presumes that the US. is the sole judge of the legitimacy of its own or anyone else’s preemptive strike. The document emphasised the deadly threat posed by the weapons of mass destruction (WMD).

In the current circumstances, how does the world superpower, having come out with a theory of their operation, going to behave in the international system. They are going to replace regimes which do not contribute or do not see eye-to-eye with them. They will be using the pre-emptive strikes and also unilateralism as a part of the whole thing. What does this whole thing mean to us and everyone else?

In the post 9/11 scenario, the world is in the midst of a great geo-political adjustment process. Governments and people around the world see that the United States is out of control. You find literature – even the American writers have written that the United States is out of control. They don’t want to have discussions or consensus, and want to take unilateral actions. The rise of terrorism has made the United States respond by mobilising its military power, searching out new enemies and threats. The United States is now at war. Now, the security environment is in precarious condition.

Chair: Thank you Professor Sam Raj. We will now have General Banerjee – for fifteen minutes?

Gen. Dipankar Banerjee - *Emerging Security Challenges and Implications for Indo-US Cooperation: An Army Perspective*

Dr. Kasturirangan, Admiral Jacob, distinguished friends. I thought there'll be 20, but there's only 15 minutes for my presentation, but that's ample time. Fortunately, I have a power-point presentation, which allows me to skip certain portions. Hopefully, you'll be able to follow the thread of what I'm trying to present. The presentation is titled 'Indo-US Strategic Relations in a Changing World'. There is, per se, no *Army* view. The Army by and large does what national policies determine. Within that context, of course, it shapes policies of implementation and it provides more detailed guidelines. I think we should need to look more on the Indo-US strategic relations in order to understand as to where this relationship is really going and why.

I suggest this should be seen really in the backdrop of tectonic changes that have taken place in the last decade and a half. There's no need to go through this – there are several others who have done it much better, but let me highlight some of its characteristics. These are the emergence of liberal democracy, free-market economics, political freedoms and the consequent general prosperity and well being around the world of which India itself is a shining example. In this new world order the US is undoubtedly a super power, some call it a hyper-power at least in a military sense.

Beginning with the demise of the Soviet Union in the end 1980's to the terrorist strike on September 11, 2001 and the subsequent global war on terror, these changes include the emergence of new power centres, realignments in the international order, dramatic changes in the nature of likely future confrontations and the emergence of new strategic issues. The changes have also been both substantial and unexpected. In turn these have posed new questions about how to shape policies and in the case of India how to change old mind sets. With the demise of the Soviet Union the bipolar global confrontation came to an end and the era when the world was divided in to two opposing blocks also ended. The idea of liberal democracy, free market

economics and political freedom prevailed over totalitarian systems and state controlled economies.¹ There was consequently an explosion of democracies around the world and an attempt at finding new moorings. While India had always been democratic and an open society, its ideas of state power and economic policies were shaped by the reality of the bipolar world and its own strategic compulsions. The post Cold War world allowed it to reshape these policies.

The US found itself suddenly as the unipolar power in the world. Yet, this power was not entirely unqualified. For a while it dominated in most areas of political and military power, it did not still have sufficient influence to shape the world order according to its wishes. This was because one consequence of globalisation was the diffusion of power among many countries and even actors, all of whom were not easy to control. There also emerged a new category of non-state actors, not accountable to the world community but who nevertheless wielded power and influence to play a critical role in world affairs. This would be clearer after 9/11 when the US dependence on other countries for specific support would become evident.

The end of the Cold War also found India in very favourable circumstances. Its many decades of investment in human resources and in democracy finally came through. With dependence on the Soviet Union removed, it began to emerge as an independent player able to look after its own strategic needs without external support. Even though it was among the last of the major countries to give up

¹ Francis Fukuyama's "End of History" thesis may not have been conclusively proved. Indeed, we may presently be witnessing a tentative return to socialist market policies and state control and hence a return to 'ideology' in some countries of Latin America, Russia and in the former Soviet Union. Yet, the central thesis of the superiority of liberal democracy and free market economy has been clearly established at least for our times. It is also a powerful lesson for India never to contemplate a return to rigid and outdated ideologies of an earlier era.

antiquated state controls over its economy, it was able to do this and restructure itself successfully because it had inherent advantages. In turn this led to an unleashing of its economic power. Initially this was hesitant and slow, but by the early twenty first century it had reached a stage of hyper yet potentially sustainable economic growth. A lot of this was led by information technology, scientific innovation, entrepreneurial abilities and the ingenuity of a bright young leadership keyed on to the world. Unlike China, its economic growth is not through the less sustainable models of high foreign direct investment, through joint ventures with international companies using indigenous surplus labour for low cost manufacturing. The jury is still out on which will prevail, even though we need to acknowledge China's very substantial lead in most sectors.

It was natural that the combination of these several factors would bring these two "estranged democracies", the USA and India together in a common global partnership.

To examine the potential and possibilities of Indo-US strategic relations in the emerging era, it is important first to analyse the emerging global power structure and examine a few important issues. First one should be clear about the countries that will play a critical role in the future world. Next, is a brief look at the changing security environment. What are the long and short term challenges that nations will face? Where are they likely to emerge in the future? Next, is an examination of the nature, content and future direction of Indo-US strategic relations. Where is it now and which direction is it headed in the near term?

Finally, there are issues of Indian national interests, for it is entirely irrelevant to pose the above questions in a vacuum. The goal must be to clearly contextualise these to Indian interests. For too long we have been accused of lacking a strategic vision and unable to articulate our strategic needs and formulate policies over the long term. We have to make a conscious decision now to do this. There is no doubt that the future belongs to a new generation of Indians, whether in

India or around the world. For what has been proved beyond a shadow of doubt, particularly in the last decade, is that the empowered global Indian is indeed second to none on this planet. How do we translate this enormous potential to ensure that India itself emerges as a leading country in the comity of nations in all its various dimensions? That is a challenge to which the country and its leadership will have to address itself with vision, clarity and determination. I have no doubt that developing a collaborative strategic relations with the US on terms that India itself will determine will facilitate this process .

Emerging Global Power Structure

The present global power structure is clearly unipolar with the USA enjoying a clear lead in most elements of comprehensive national power, a situation that is likely to continue for the mid term future. Its strength lies in its democratic structure that can readjust policies, the enormous wealth of its human resources and the lead it continues to enjoy in the world in areas of high technology. As long as American universities can attract the best brains and talent from around the world in substantial numbers, it will continue to be the global leader. Yet, slowly and inexorably this will change. First, China and then others will challenge this lead, initially perhaps in one or two areas and later over a wider spectrum. Even though India is in the lead among countries supporting US policies and has the most favourable opinion of it, yet there is an unwillingness to accept this reality in a political sense.

Before proceeding further it is necessary briefly to look at the elements of power that will shape destinies of nations in the future. First, is *knowledge* and the intellectual ability of a nation's citizens to shape tomorrow's world. This will call for scientific advancement, ability to innovate, develop knowledge in the frontier areas of technology and exploit these to successful commercial and technological breakthroughs. It also calls for an ability to manage and exploit this knowledge through entrepreneurial and managerial excellence. It is a nation's ability to exploit these frontiers of knowledge rather than resources that will determine their position in

the world. More than factories and industrial establishments, it will be universities and research centres that will be the hallmark of a nation's advancement. While there are selected areas of excellence in India and a culture of prizing individual scholastic achievements, overall among major countries Indian education system is among the weakest. This must change.

Second, is the availability of a critical mass of human resource. A major power will always need sufficient numbers of well trained, healthy and enabled working people well in excess of retired and dependent population. While countries such as the European Union, Russia and Japan have the numbers at present, the demographic balance is slowly turning negative for them. Due to cultural factors these countries will be unable to rectify this through immigration. The one child norm is likely to decrease Chinese population even in the near future, which though helping its per capita GDP growth fairly rapidly in the short term, will begin to impact negatively soon after. Only the US and India stands best in this category. In both countries the challenge will be to ensure that the population is provided good education and health care to ensure that they are a strength rather than a liability. Again, more than any other country in the world India has the largest numbers of disadvantaged people.

Third, is the ability to globalise and interact with the world. Here, India and China have an advantage due to their large diaspora spread around the world. But, India scores in its comparative mastery over English, the world language. China is trying very hard to catch up but still faces many years of work in this area. Other major countries too lack behind India. The back office functions and information technology support provided in India not only earns money and provides employment, but has also a powerful influence in globalising the young and spreading Indian cultural influence around the world.

Fourth, is the assured availability of energy at reasonable prices. It is true that oil and natural gas are global commodities and will be available at internationally regulated prices to all customers. But, it

is also a finite commodity subject to control and cartelisation. All emerging powers will require large quantities of oil and gas for the next 30-40 years till cost effective and assured technological alternatives are available. Hence, assured availability of energy will be a critical factor for future growth and hence its denial to others a likely source of conflict. Japan, the EU and India are the most vulnerable. Both the US and China have made adequate provisions and likely to be less affected by major turbulence.

Finally, are the other factors that determine comprehensive national strength. Among others are; effective economic and foreign policies, positions of influence in the global hierarchy, a military technology complex, competence of the armed forces, cultural cohesion and others. Here India along with Japan has major disadvantages. Neither are permanent members of the UN Security Council, the official high table in international affairs. India is not even a member at least as yet, of the G-8 industrialised countries.

In considering the above, challenges for India stands out dramatically. Even as it is poised to break into the top league through exploiting its advantages, it has to address and rectify its major shortcomings. Enormous efforts and resources need to be diverted towards revamping the educational system, improving health care for all and to dramatically transform its creaking national infrastructure. It has to aggressively look out for energy sources, develop indigenous capabilities and participate in global scientific experiments for alternate sources. It has to aggressively search out a greater role for itself in the world through participation in international organisations and institutions. All this calls for a mind change in governance.

Efforts for all this will have to come from within India and no one will help it achieve a greater role for itself in the world. But one country, which has the maximum potential to help India in these objectives and least objection to doing so, is the United States. Both countries national interests happily coincide at this historic moment and both see advantages in it for themselves. Condoleeza Rice's

statement in India in March 2005 committing the US to support India to become a major world power is borne out of this reality and not out of any sense of inherent goodwill. For, this is entirely in the US' own strategic interests.

Considering the above, the candidates for global leadership in the coming decades stand out. The USA will remain in the lead. China is rapidly catching up and will remain the second most important player challenging the US in a number of critical areas and particularly in Asia. Its economic influence will be felt earlier than later. The European Union is the next candidate. Although it is the strongest economically, its weak political association reduces its collective influence. It is expected to come together in trade, currency and domestic policies as well as form a common foreign and security policy. But, it will not have a common armed force and national interests will still dominate and detract from the Union's effectiveness. Both Japan and Russia have major demographical problems. Japan's economy is back on track and still remain a powerful force, but may weaken comparatively. Russia has turned the economic corner, but it is still heavily dependent on its prime resource, oil and natural gas from Siberia. Domestic governance, overall political weakness and its comparative isolation are powerful negative factors. It still derives its international position from the throwback of the communist era and its possession of a large strategic weapons arsenal.

India is clearly the sixth power in this constellation. Its strength lies in its youthful population, the enormous vitality of its people and their knowledge potential, their entrepreneurial ability and all of which is encapsulated in a vibrant and effective democracy. India is clearly a nation of the future.

Changing Security Environment

The threat to security in today's world is less likely to come from an aggressive war launched by a hostile power. For, an overt aggression has become a much less effective form of inflicting lasting

punishment on a country or to achieve political objectives. International diplomacy, howsoever limited, faulty and hesitant still remains a more effective and less costly form to affect punishment against an errant state. Indeed the international strategic environment is characterised by uncertainty and unpredictability. Threats to security will come from least expected sources, from shadowy organisations, taking shelter behind legitimate activities and organisations to strike in an asymmetric manner.

These threats may be divided in to two broad categories. One set are non-strategic and long term. The other threats are likely to be sudden and more imminent. Let me try and explain.

Non-Strategic Threats

These may be characterised as distant and long term and come about not necessarily through hostile actions but circumstantial changes. These may be tabulated as:-

- Climate changes, such as global warming, environmental degradation and others causing sudden and more frequent natural disasters that are not targeted or caused by any particular country or a group of states.
- Energy shortages leading to exorbitant costs and difficult access. May come about due to economic factors or because of disturbance or instability in major producing countries. Apart from immediate adverse effects, it may have the potential to cause long term economic down turn in targeted countries.
- Health anxieties and spread of infectious disease either through design when it becomes biological warfare or spread through natural causes. These can become pandemic and may cause loss of lives in tens of thousands.
- Narcotics and human trafficking, money laundering and other effects of globalisation that can be taken advantage of by non-state actors to terrorise and destabilise a country.

Strategic Threats

These are deliberate efforts caused by definite acts of hostile powers with the aim to destabilise and undermine a nation. It could be through covert attacks or through blackmail or coercive threats short of actual use of force. Some examples may be:-

- Proliferation of Weapons of Mass Destruction (WMD).
- Domination and denying the use of oceans and space by others.
- International terrorism carried out by ideological groups with extremist views.

There are several such possibilities which cannot be precisely identified and which will always attempt to use surprise and asymmetric capabilities to inflict maximum damage. Even the threat of use of force in many cases will have an effect of inflicting enormous financial loss to a target country. The credible threat of anthrax immediately after the 9/11 attacks caused the loss of several billions of US dollars on the US economy due to shutdowns and expensive precautionary measures.

Which countries or states or agents are likely to pose such a threat?

It is hard to imagine a state in the comity of nations today, which may pose such a major challenge to the international body. Yet, the possibility of states suddenly changing character or being influenced by hostile powers cannot be ruled out. Therefore, sudden accretion of military capabilities particularly when not transparent or based on sufficient reasoning may be an important cause for international concern. The emergence of 'rogue' nations with little acceptance of international norms or laws may be another. Finally, these may even be 'failed' states which through its own failure become a prey of non-governmental entities capable of taking it over and then using it as a cover to mobilise resources for asymmetric attacks.

Countering these threats will require international norms, legal frameworks and robust preventive mechanisms. It will also require credible early warning intelligence with global reach.

Developing a Counter Military Force

It may be argued that such threats are best left to the United Nations to counter. Indeed India with its long involvement with peacekeeping under the UN will probably find this option politically least objectionable. With both legitimacy and an ability to muster an international force, it has the potential to be most effective. Yet, there are substantial limitations. It lacks credibility, cannot often work out a suitable mandate and has limited resources. Besides, all nations, particularly major states will always prefer an independent capability to deal with contingencies affecting its national interests.

What sort of military force will India require then in the coming decades? It will have to be a highly flexible force, capable of mobilising with speed, with long range strike capability possessing top of the line military equipment. Numbers of men in uniform are not the most important as long as they are superbly trained to handle the complex machines and equipment of tomorrow's battlefield. The force must be capable of net centric warfare on a 24/7 basis for sufficiently long periods. Large portions of the weaponry will need to be indigenous and all should be capable of being maintained in-country. Space will increasingly become a platform for intelligence gathering and deployment of communication gears and sensors. Hopefully, substantial weaponisation of space will be prevented through collective action in the near term. Other capabilities will need to include long range manned fighters, blue water maritime capability adequate for prolonged operations far from the shore. Ground forces will have a very large element of Special Forces with support and logistics capability to sustain operations for fairly large numbers well away from the home base.

Such an overall capability will have to be acquired fairly quickly, indeed to match India's rapid economic rise. In the short term, this

will only be possible through extensive cooperation in technology, doctrine, weapon design and tactical collaboration with the US.

Indo-US Strategic Relations

Indo-US defence cooperation arrangements were shaped by developments in the post Cold War era from the early 1990s. Lt. Gen. Kicklighter of the Pacific Command in his initial visit to New Delhi was posed a challenge by the then Vice Chief of the Army Staff Lieutenant General Rodrigues, to come out with a framework of cooperation between the two armies. In his next visit to Delhi Kicklighter brought back an outline. In a few years these were to be finalised and emerge as the “Agreed Minutes” that were signed by the Defence Secretary William Perry and the Home Minister of India in January 1995. This laid out the framework under which the two armed forces were to cooperate in the future.

It visualised closer ties between the civilian defense leadership, uniformed officers and defence production and research organisations. An annual strategic dialogue was also set up. The burgeoning defence cooperation and interaction particularly in this century have been unprecedented and among the most intense activities that the US armed forces have undertaken with any country in the world save perhaps its closest allies.

Strategic cooperation with any country must be supported by a common vision, shared values, and a convergence of interests. Indo-US relations today is characterised by a happy convergence when all three; vision, values and interests coincide. There may be occasional differences on particularities and it is not likely that all three will continue to coincide indefinitely in the future. Actually, it may be possible to argue that in the first fifty years, neither our vision nor interests converged even though we may claim that our values were similar. But, this convergence today endows this relationship with both hope and the prospect of longevity.

On the basis of ten years of working these arrangements and based on greater confidence and trust in each other's armed forces and respect for their capabilities, it is now possible to move forward to the next ten years. The outlines of this future cooperation are based on the New Framework for Defence Relations, an agreement that was signed on 28 June 2005 at Washington, DC between Donald Rumsfeld and Pranab Mukherjee. The concrete aspects merit a quote in detail:

“In pursuit of this shared vision of an expanded and deeper US-India strategic relationship, our defence establishments shall:

- (a) Conduct joint and combined exercises and exchanges;
- (b) Collaborate in multinational operations when it is in their common interest;
- (c) Strengthen the capabilities of our militaries to promote security and defeat terrorism;
- (d) Expand interaction with other nations in ways that promote regional and global peace and stability;
- (e) Enhance capabilities to combat the proliferation of weapons of mass destruction;
- (f) In the context of our strategic relationship, expand two-way defence trade between our countries. The United States and India will work to conclude defence transactions, not solely as ends in and of themselves, but as a means to strengthen our countries' security, reinforce our strategic partnership, achieve greater interaction between our armed forces, and build greater understanding between our defence establishments;
- (g) In the context of defence trade and a framework of technology security safeguards, increase opportunities for technology transfer, collaboration, co-production, and research and development;
- (h) Expand collaboration relating to missile defence;
- (i) Strengthen the abilities of our militaries to respond quickly to disaster situations, including in combined operations;

- (j) Assist in building worldwide capacity to conduct successful peacekeeping operations, with a focus on enabling other countries to field trained, capable forces for these operations;
- (k) Conduct exchanges on defence strategy and defence transformation;
- (k) Increase exchanges of intelligence; and
- (m) Continue strategic-level discussions by senior leadership from the US Department of Defence and India's Ministry of Defence, in which the two sides exchange perspectives on international security issues of common interest, with the aim of increasing mutual understanding, promoting shared objectives, and developing common approaches.

This is a very long and an ambitious agenda. Two questions immediately arise, answers to which will determine the permanence or otherwise of these arrangements. One, is a strong, independent, democratic and independent India in US interest? The other, is a world of values and ideas under US leadership in India's interest?

On the first set of issues, some sections in India have expressed reservations. They are not fully aware of the magnitude of changes that are currently in progress in the world and India's role in them. These doubts have for the present been completely demolished by US commitment to help India become a major power. The logic of this has been explained by others from an US perspective and need not be laboured on here.

The second question too is relevant. Who sets the values and ideas in the US? The values and ideas of the founding fathers in the US as enshrined in its Constitution finds easy resonance in India. But not those of the neo-conservatives with their grandiose dreams of global conquest through US military supremacy and force of arms. Therefore, some differences are bound to arise, particularly such as over Indian troop contribution to Iraq. But, there are likely to be several other possibilities where both India and US will find it easy and mutually beneficial to cooperate.

What then is this relationship all about? Let us first consider what it is not. India will patently not be :-

- An eastern sea-board for the US.
- An alliance against China.
- A surrogate or subordinate to do the US bidding in Iraq or elsewhere if it is not in India's interest.

Some constituencies in the US, surely not the government, may well have some expectations of India's support in these areas. These should be quickly put to rest. India is far too conscious of its sovereignty to suffer any easy erosion. On China, India will always have its own interests and concerns, which will be often independent of the US.

Instead what it must aim to be and there lie the challenge, are:-

- A partnership of equals based on shared strategic objectives.
- With neither side threatening the core interests of the other.
- Cooperating and supporting vital national interests of each other.
- Ensuring a stable, secure and prosperous Asia.

Continuous dialogue and interaction will shape the relationship and a commitment to make it work. India's value to the US and indeed its true worth is based on Sunil Khilnani's description of India, "as a bridgehead of effervescent liberty on the Asian continent". Within the ambit of such broader perceptions it is not difficult to work out a set of common interests in a diverse set of issue areas.

- Promoting democracy, particularly in Asia.
- Preventing single power domination of Asia.
- Eliminating threats from state sponsors of terrorism.
- Arresting further spread of WMD and related technologies.
- Advancing economic development and spreading prosperity.
- Protecting global commons, particularly SLOC and Space.
- Preserving energy security.
- Safeguarding global environment.

Indian Strategic Interests in the Coming Decades

In addition to common and shared interests between India and the US there are specific national interests for India which this partnership should address and which will be an issue of continuing concern to New Delhi. These may be broadly divided in to three categories; world order and regional interests, economic interests and defence interests.

Among world order and regional interests the following may be quickly tabulated:-

- US support for permanent membership of the UN Security Council and the Asia Pacific Economic Community.
- It should be possible to expand the G-8 to G-10 which would include China and India.
- Closer consultation and dialogue on issues of concern in Central and Southeast Asia.
- An informal trilateral consultation process between the US, India and Japan.

In technology and economic areas a number of issues are of great importance to India. Even though both investments as well as commerce in the US are entirely a private enterprise, whatever governmental restrictions on technology transfer and investment remain should be done away with. Of particular importance are:-

- Joint collaboration in developing new energy sources. Facilitating oil and natural gas pipelines where possible or at least not to put any hurdles on the way. Much can be achieved through joint projects on developing an energy grid in Asia.
- Creating leverages to ensure that savings, pensions and security funds from the US are invested in the secure and burgeoning Indian financial institutions.
- Further opening up of selected areas by India to permit greater inflow of capital funds from the US.

- Taking up joint projects for high technology cooperation in advanced scientific areas in bio technology, nano technology, pharmaceutical industries and other areas.

In strategic areas a number of opportunities lie ahead. Great progress has been made in developing joint training and inter-operability systems. We need to continue to strengthen these areas and build on doctrine, battlefield support and establish cooperation on the joint production of high value military equipment. Major strategic cooperation cannot be achieved without larger projects on joint design, development and production of major defence systems and equipment. No strategic partnership can be sustained without greater tie up between defence technology laboratories, research establishments and design centres. Finally, there has to evolve a better arrangement for sourcing weapons and equipment from each other. A conscious attempt should be made to develop synergy in these areas. A suggested list of possible future cooperation areas are listed below:-

- Joint development and production of a multi-role fighter aircraft.
- Greater cooperation in UN Peacekeeping operations.
- Joint development and production of theatre missile defence system for India.
- Collaboration for protecting the SLOC in the Indian Ocean.
- Strategic Forces cooperation – doctrine, training and equipment.

India and the US are poised today to cooperate as never before in the greatest endeavour of our times; to maintain peace and stability in a world increasingly under challenge from a diverse and often unpredictable threat. Some are caused by nature. Others by states and yet others by shadowy non-state actors acting on their own. Each country might well attempt to meet these challenges on its own. Some threats that are intimately national will necessarily have to be countered by each separately. But, a majority of these will call for collective action consciously meeting the essential requirements of each.

This is uncharted territory. There are wide differences in perception and policies separating the two nations. There are other priorities and relationships. In each country there are competing domestic interests. Yet, overall the benefits too are substantial and the prospect of positive outcomes to both nations is large. The future is full of challenge and not the smallest of these is nurturing this relationship. As in all such cases it will require a heavy dose of pragmatism, maturity and a high sense of statesmanship able to look beyond the horizon to the coming decades of this emerging century.

Air Chief Marshal Krishnaswamy: *Emerging Security Challenges and Implications for Indo-US Cooperation: An Air Force Perspective*

It is difficult to hold a long session after lunch. So I would try and stick to points that I have been asked to touch upon. I shall just touch upon the changing contours of Indo-US relations, emerging security challenges implication, and views of the Air Force of my time.

Well, as you probably know, I headed the Air Force in a very difficult time. We were nearly at war; we had just a couple of days to really cross the border, but we stood in that that state for about a year. Subsequently, our own and international pressures persuaded us to establish better relationship with the neighbourhood as well as internationally. We are now going places! Around that time, I became Chairman of the Chiefs of Staff Committee. The three Services coordinated to establish service-to-service relationship with friendly foreign countries and talk to their military. My experiences were unique and I share some of these instead of giving a lecture.

The first part that strikes me now is the contour of the Indo-US relation. To start with, is a simple statement that we never had any relation with USA and we now have built some relationship. To be frank, so far there's nothing exciting and nothing very strategic about this relationship though there is a great expectancy from certain quarters. India, as a country is proud. When we take decisions, it is

such a grinding machinery that we go through - between ministries and departments and up and down the so-called Silos and within the Services too. It takes so long and with speculations galore, it almost threatens the relationship. Nevertheless, we went ahead and it was a positive start.

From the perspective of the military, the 'Strategic Relationship' is yet to be established with United States. I don't quite follow the arguments that one hears on this issue since they are quite diverse. While we do have defence cooperation with many countries, we are not yet familiar with a strategic military relationship. Currently, from a political perspective, India and USA may feel that the relationship would be of strategic value to both. Some examples of defence cooperation that we have between the Air Forces are those with Singapore, France, Israel, South Africa. The military to military relationship with USA is nothing very significantly different from that with these countries. We enjoyed exercising with the Singapore Air Force, the French Air Force, the South African Air Force and few others. As far as America is concerned, we also have some exchange of postings. We have – one of our fighter pilots is posted there – a post that is there for the last six years or so. Our pilot participates in training American fighter pilots Every three years, he is changed and a new guy goes. Similarly, we have one American pilot with us. So in general we are quite familiar with Air Force to Air Force relationships but this is very different from military strategic relationship.

At times, the strategic relationship is wrongly perceived as obtaining weapon systems from the USA. I do see a number of American companies knocking at the doors of Air Headquarters and Ministry of Defence, wanting to sell aeroplanes and ships and guns. There may be a surprise coming! By the time our bureaucracy and Ministry of Defence and Finance go through the processes and negotiate, patience may run out that could melt down such strategic interests. It is important that we perceive the military as an institution. In a democracy, the power of such institutions is relatively small. There

are other elements more important in building a strategic relationship between two countries. Military element is plugged-in at the later stage of building the relationship.

Now, as far as India is concerned, what kind of strategic relationship does it wish with the United States? That will decide the kind of a military-to-military relationship we ought to have. As yet, there is no convergence - no real focus on what India is expected to do with the United States. First and foremost is political convergence. That is, whether the Parliament decides to establish a relationship with the United States of a strategic significance, where the military also joins, in the manner directed. That is yet to happen.

Indian military has *never* operated under anyone else's flag other than UN. I doubt very much that Indian military would work under another nation's flag – say in Iraq or anywhere else even if being a strategic partner. US understands this well. The concept of being a coalition partner but not under the UN flag is very new to India. And the Americans know it and we know as well. Before embarking on such a mission, the deliberations that would go on at political levels will deep and very demanding. The arguments have to justify the action.

The little bit of policing that we do during the so-called fight against terrorism, and escorting ships or aeroplanes searching for survivors or whatever it is, these are of a routine nature. Terrorism – it's very interesting that until 9/11 happened the United States never acknowledged that we have problems across the border, and that we face cross-border terrorism. When our relationship with Pakistan went sour after a few incidents of cross-border terrorism, the Americans did not acknowledge our actions to be right. We said that we are facing this since 1989. But when the single incident of 9/11 occurred, the US woke up suddenly! We do see here that national interests also dictate perceptions.

We lose a soldier – statistically average one per day since 1989. In fact, the total casualty is more than that. And certainly the Americans know about it. They refuse to acknowledge that Pakistan as a State supporting cross-border terrorism. Post 9/11 gave us an opportunity to look for strategic partnership – that we shall fight terrorism together. But I think the Americans are gradually turning around; and they are seeing what we see and acknowledge. Hizb-ul-Mujahideen would not have been blacklisted if it wasn't for 9/11. If it was not for 9/11 we would still be fighting the same way as before then.

Both sides need to absorb the related issues. USA should no longer hyphenate India and Pakistan. Though they say that they do not, on ground this has not happened. India, however big we may be in the region or however global we may go, Pakistan would always be an important ally to USA. What solution are we going to evolve in Kashmir? Is there a compromise? I cannot visualise a compromise. The valley belongs to India. What does America think about it? They say, you keep dialoguing, you'll find a solution! But it is a very sensitive issue.

It is very doubtful that even if ever join America as a coalition partner, it is very doubtful if the US would ever join us in our fight against terrorism in Kashmir, not that we are seeking their support. We are quite capable of handling it ourselves. But, the indifference of US to our sensitivities and principles are at times perplexing.

Hence, there *are* these so-called *Lakshman rekhas (red-lines)* somewhere. That what are these strategic partnerships – where should we be heading? First and foremost, is the congruence; the political congruence. And from there, it could dictate where we go.

Now, coming back to the interesting part of the Air Force – we are, after all, an institution under political control and guidance. If the political directive permits us to exercise and train with the US military or Singapore or France or South Africa, it is good for us – adds to our training value. In fact, before the United States, we exercised

with the French Air Force with their Mirage 2000 – (a more advanced variant to the ones that we operate). I was fortunate to be on the chair when all the international exercises fructified.

It was very, very interesting when we started off. Initially the USAF was apprehensive over our minimal capability to support their operation in India. They wished to know if our runway is strong enough and if we have adequate drinking water. They wished to know if our crash rescue system is good enough and also our medical facilities. They wanted to test our runways and facilities which we denied. It took quite a while – discussions and visits to plan the training exercises in India. But they got started after over a year of deliberations.

The Americans got used to it and when we started flying; they brought the F-15s and we had the MIG-21s and our other conventional aeroplanes. They were not ever interested to see our combat aircraft since they were the old Soviet designs and way below the more advanced machines that they had brought. They were not too keen to know about what tactics that we would follow while were very secretive about their own. But then, when the exercise started they realised that we were different to what they thought and what were briefed about. The exchange ratio against American aeroplanes in the first exercise we did in Gwalior was around 85:15. That means, they lost 85% of their aeroplanes against 15% of ours. It was a serious exercise – the rules of the games were made before the start – and closely monitored using electronic systems. For us, it was certainly a matter of great importance and pride.

What was interesting was that before they left, they came and saw our cockpits. Our crew got along very well indeed. A certain level of mutual understanding and respect was built. They were very straight forward, honest and forthright. Subsequently, we exercised with the F-16s of Singapore Air Force. They are trained by Americans and employed similar tactics. They followed the American books and rules. This was very interesting. We found that we could handle them pretty

well. However, in certain areas such as avionics and sensors, the American machines were superior to our own; but we learnt to combat them effectively. It was like playing cricket or soccer.

The admirable part is that the US Military is very systematic. They strictly follow rules and highly disciplined. While we may have the desired skills, the US military is very powerful with resources that are truly mind-boggling. Their war-fighting follows lessons learnt over very many years. They flew 300,000 hours over Iraq before they launched the offensive. They knew their adversary very well before ever taking the first action.

We took our Jaguar strike aircraft to Alaska on an exercise with US forces – all the way with the support of aerial re-fuelling tankers. Our aircraft passed through Canada. There we had to change an engine when a blizzard was blowing and the temperature was minus three. Our men worked that whole night in that condition. Next morning, the news paper in that town reported praising Indians' capability and effort.

In the Alaskan exercise, our team completed all the missions despite poor weather conditions. Some US forces did not fly in that weather where as we did. Quality of our machines and management were very superior despite the age of our machines. Next to our detachment was parked the German Tornados. They had brought 180 tonnes of support system while we managed with some 25-30 tonnes. Our men did us proud and also enjoyed every minute of their stay and work there.

After our detachments came back, a second round of exercises was held with the Americans. It was a similar show as the one before. This time, F-16s were brought and the location was Kalaikonda. We are now expanding our facilities and capabilities to hold larger exercises with foreign Air Forces. We feel very good about it. However, how these move depends on the directions and decision of our government.

My last word is that we have to get involved as a nation. Today our infrastructure is weak. Bangalore certainly deserves better roads. Politics is consuming time but action on ground is not forthcoming. My apprehension is that while we talk a great deal as becoming a great power, a regional power, we are not getting anywhere near it.

The United States is far too busy – they got caught up in the Middle East, they're going to stay there very long. They spend seven billion dollars a day for their actions in Afghanistan and Iraq. Iran is now bothering them. US is expected to have the ability to fight on two fronts at the same time. But it seems very difficult and nearly impossible. They need coalition partners in working towards world peace and stability. Despite all the effort and expenditure, the US today is very unpopular – a tragedy indeed!

I sense a vacuum in the far-east due to preoccupation of US in the middle-east. It is difficult under these circumstances for the US to provide the umbrella over Japan and beyond. When I visited Japan, I could hear of the same apprehension being expressed at the higher end of their military. However, the might of US forces should not be under-estimated nor their will.

Where does this take us to? We are certainly emerging as a regional player – mainly due to our performance in the economic field. To be a regional player, we need other strengths too. Our political system should see beyond the domestic policies. Our political system is far too enmeshed in its survival having very little time to look at regional responsibility. We have to start believing, firstly, that we *are* a regional power. Regional power requires the integration of all elements – that is, the economy, military, sound polity, etc. – and then our projection as the stabilizing influence. We must build ourselves to be a stabilizing influence in the region. We should promote business, well-being, peace and happiness. India should now gear up to that position. To gear up, the first action required is to think in those terms I strongly believe that we earn that position by being so located geographically and the population that we support. We are entrusted

with that responsibility and so we must pursue it. America, which is on the other side of the globe, should not matter to our context. Being Indian, to be proud of being an Indian is vital for any strategic partnership to be meaningful. Our destiny is in acting with responsibility and maturity as a regional power.

Discussant - Dr. Lawrence Prabhakar

Thank you, Admiral Jacob. We have had three presentations. One was an academic presentation that gave a theoretical formulation of what the United States policy and strategic direction was in the post Cold War period and in the post 9/11 period. The presentation was focused in terms of the doctrinal evolution of how the US was leveraging power on the rest of the world as it confronted a post Cold War, post 9/11 situation. The second presentation was diagnostic. General Banerjee elucidated the threat and challenges matrices of the post-Cold War and post-9/11 period. He analysed the entire spectrum of threat perceptions analysis, and then juxtaposed the reality and the facts of India-US military collaboration. The third presentation was an hands-on assessment presented from the perspective of a practitioner of Air power. Air Chief Marshal Krishnaswamy gave us an operational perspective couched with his personal and service experience that candidly analysed the state of affairs.

The changing contours of the India-United States relations in the area of defence cooperation has witnessed a transformation in terms of convergence in the areas of defence technology collaboration and military interoperability between the two powers. The nature of India-United States defence relations has been a sensitive area in the bilateral relations that extends to the 1960s when the United States was a primary supplier of defence equipment and military hardware to India. However the United States had used the hyphenating influence of Pakistan in matters of arms sales to India.

Parameters of India-United States Military Cooperation

India-United States military cooperation could be successful with the following parameters:

- a) The imperative for the United States to eliminate all technological sanctions against India as that is anachronistic to any meaningful partnership between India and the United States
- b) The need to evolve common standards for defence collaboration, defence procurement for India;
- c) India and United States could evolve joint ventures in defence production with Indian participation like the Indian-Russian Brahmos;
- d) Enable Indian participation in phased manner in ongoing US defence production programs and involvement in US led multinational defence production programs
- e) Develop capabilities in joint operations—interoperability.
- f) Defence collaboration and participation of India in US defence ventures would have the following advantages:
 - i) Indian capacities in technology assimilation;
 - ii) Indian participation in US led technology development;
 - iii) Indian technical human resources to be tasked for US led technology and US R& D initiatives in India and the United States;
- g) India should initiate its own learning process of the US strategic policy process and should be able to accrue lessons from US strategic review process, like the US QDR 2006; Joint Vision 2020; US Sea Power 21 that was a follow on to the Operational Maneuver from the Sea; US Forward from the Sea; US Defense transformation strategies and technologies, evident in its Revolution in Military Affairs and Revolution in Naval Affairs.

It would be appropriate to state that the scope of India-US strategic cooperation should be premised on certain guiding principles in which the viable interests of India are secured.

The first and foremost is what we could call the *convergence of strategic principles* between India and the United States in which

whatever is convergent between India and the United States is basically what will be operable.

The second point is, basically, autonomy of action, both in foreign and defence policy. *Autonomy of action* basically strengthens India's position in any transaction between India and the United States. Most importantly, when it comes to a bilateral relationship, it has to be based upon certain inter-operable joint capabilities between India and the United States, where the learning curve experience should benefit India. Well, these could be what I would call the guiding principles of what can be called a bilateral relationship engagement.

Looking at the point of defence technology, India has much to gain from the United States, not from what we could call the individual platforms, but the extent by which the integration of technologies have come into it – popularly known as Net-centric warfare capabilities or the cutting edge of revolution in military affairs. So that will basically come from what we will call as the inter-operability with US Forces, where we learn much in terms of the adversarial tactics.

It also comes in terms of the possible transfers – these are all in what you could call hypothetical mention – possible transfers of defence technology to India. It also comes from how much India could technologically assimilate the US capabilities given to us, and the ability to produce it within our own defence technological sphere. Most importantly, one value addition which India would perhaps gain from the United States is how the US strategic reviews could impact upon India's strategic culture. Now, what they had was a US Quadrennial defence review (QDR) of 2001, which came before 9/11. The QDR's 2005 & 2006 have completely different orientations. What learning experiences India will have from the kind of institutional learning processes of the United States in the form of the QDR 2005 & QDR 2006 is something that India has to accrue.

India *could* gain from what the US has envisioned in its *Joint Vision 2020*. The JV 2020 envisages the doctrinal evolution of developing joint warfare capabilities and the operational dimensions. This is one area into which the Indian armed forces could gain. The other notable aspect of the US doctrines has been the US Naval Sea Power 21. This document envisions new capabilities in the twenty first century. The US Sea Power 21 is the roadmap to naval transformation and it predicates on the autonomous use of sea power. It envisages the leveraging of US power from the sea to the littorals.

The Indian Ocean is an important maritime hub into which the United States has its own area of interest, which almost coincides with India – from the Straits of Hormuz to the Straits of Malacca and going beyond east of Singapore to northern Australia.

The United States also looks into how they would like to overcome ballistic missile threats in the periphery and also weapons of mass destruction. They have envisioned various ways of what is known as the anti-missile defence systems. These are learning points for India when it comes to the aspect of it. Finally, what we look into is the whole concept of transformation – defence transformation – military transformation, which the United States has envisioned into it. These would areas for focus and development for India.

As Dr. K. Subrahmanyam eloquently pointed out, India needs to have a strategic culture wherein it needs to have a learning process – from its competitors and from its partners. Strategic culture would be the knowledge capital on which a robust Indian strategic policy and decision making process is structured on long-term policy and planning perspective and that would be the basis for a viable India-US defence partnership for the future.

In conclusion the session on *Changing Security Environment and Implications for Indo-US Cooperation in Defence* has inferred the following issues:

- a) It inferred the role of United States in the global arena in terms of its grand strategic visions, priorities and roles;
- b) The discussions centered on the nature and scope of India-US synergies in defence partnership and its derivatives;
- c) The discussions were querying into the substantive issues of defence cooperation and India's strengths and requirements; and
- d) The discussions did probe the prospective role of India and the United States in a transformed global order that would be increasingly predicated on a balance of power system.

Now these are issues which probably the audience could perhaps raise, and we could have a meaningful discussion. Thank you very much.

Chair: Thank you, Dr. Prabhakar. I think the discussant has done the job of summing up very well and the floor is open for questions to anybody.

Questions: Two questions – in the context of fighting terrorism and so on, it appears to me it's important that we have the capability to do what I call 'surgical strikes' to the extent that your military operation may be confined to as narrow a place as a specific building. Is there a Indian military thinking to develop such capabilities, and are you doing anything in that direction at all? Because I don't think large-scale conventional warfare will take place. Even between '71 and Kargil, for example, there seem to be a paradigm shift in terms of how you fight and so on. Are we able to make surgical strikes at narrow what you call undesirable enemy targets and so on – are you developing such capabilities? That's one.

The second is, from the talk of Gen. Banerjee, I got the impression that for now, we have developed the Brahmos missile with Russia. That seems to be a success and so on. As far as the Americans are concerned, we have a lot of ideas on paper, but nothing has come. Is that correct? Is there any attempt to get anything?

Air Chief Marshal S. Krishnaswamy: With regard to surgical strikes, we have the capability – we have the necessary wherewithal, and we have the skills, we have the machines, we have the weapons, whatever. But what is very important for us to know is that use of air power – politically and in the country as we are – we are very nervous about it. Now, use of air power is seen as escalatory. I’ve had some very tense moments – and then we were there, ready to go at very, very short notice. There’s no point in bringing up which date and time – that’s irrelevant. On the other hand, I must also tell you – because it came in the newspapers subsequently – we *did* precision strike in this period of tension at a particular time. We’ve done that – for a particular reason. You know, they had come in and they had occupied something near the Kargil heights, and we did surgical strikes.

But what is important for us to know – and this is where a lot of difference is between us and the United States or other western forces who are more at ease with the use of air power, also of course, the Israelis and so on – is that we see it as escalatory, and then we doubt *ho jayega kya* – will it happen? What if it doesn’t happen?

There is always a risk-taking and the ‘will’ to use it. The ‘will’ is certainly lacking. Third is, it is lacking not because of lack of courage, but the lack of information and knowledge and familiarity with the forces and the weapon system.

If you talk about coalition, for example the many coalition operations the Americans and the West had done, they always had a political representative, with a Force Commander, to take decisions on targeting. There were conditions like when a strike aircraft was flying, the President of France had intervened and said no. Halfway through, the aircraft was called off. This is during the Bosnia deployment. Therefore, targeting is also acknowledged – or supervised, or accepted or whatever it is – at the political level and the government level.

In our case, it is absent despite the fact that there is a necessity today, especially if you're going to become regional and so on and so forth, that the decision makers of the government and the political level – we, as a democracy – it is time they have to be trained as well.

The last part is about Brahmos or whatever it is, I would say – the others would say about the respective weapon systems, the ground and the Navy – we are not dying for the American system. We have pretty good systems. Of course, the Americans have some super-duper systems – certainly more than what we have – but we're not actually craving for it. We'll do it in our own way. Our problem is, the weapon system must marry with the aeroplanes and other operating systems. And that's very difficult. We are very happy with our inventory. But if we have to go for the next generation of machines, then of course, it has to be seen in a comprehensive manner.

Major General D. Banerjee: The question of use of air power for anti-terrorist strikes will doctrinally – using force internally, within the country, whether counter-insurgency operations or even counter-terrorism operations – the doctrine of minimum force applies. Air power has never been a part of the military force in terms of the minimum force's doctrine. We have never utilized air power. Well, there have been one or two very minor examples – I did not want to go into details of it. There have been some very, very minor examples as an exception, which have been used, which is more an aberration, I would say, than a normal course of employment. Across the border, yes, that restriction will not apply; but other conditions would, perhaps, apply. In the case of Sierra Leone, we had a little bit of skirmish under the UN peace-keeping operations. A certain amount of Air power was used in that context.

On the possible technology deal regarding equipments with the US, we have not yet – because of the fact, as the Air Chief Marshal mentioned – have not yet had any major developments on that. But enormous discussion, etc. are going on is one indication. Of course,

the American companies are extremely keen in order to be able to develop such a relationship with India. Of course they are looking for this market. The Indian arms market continues to be an extremely large and sophisticated market. This time, for example last week, in the defence exhibition in Delhi, all the leading American companies were there in large numbers – a significant presence, at the highest executive levels – and so they are exploring their possibilities. And wherever it meets with our requirements and within our budgetary thing and technology, etc., deals will be struck – I have no doubt. When and how, that is of course a different question.

Chair: May I say a few words about the entire thing of the Indo-US cooperation that has been kicked off with this defence relationship. While I would say that we're not falling over our feet to get into it, but at the same time, there are a lot of aspects which are of great benefit to India. I think if you look at the way the United States' Armed Forces is structured, the kind of strategic thinking that that country has, the amount of effort and the amount of money that they are putting into their R & D, I think they are very, very far ahead of most of the countries in the world as far as technology is concerned. And I think one has just got to look at some of theirs – when you say precision strikes, I can say, okay, local precision strikes, yes, certainly we have the capability. But when you can sit at sea, a thousand miles away, and do a precision strike on a target deep inshore, I think we need to really take a look at all this.

While I would say that I think we should go into this whole thing with an open mind, with the United States, while we should not allow our national interests to be compromised in any way, but wherever we can gain and benefit from the experience and expertise that they are prepared to share with you, I think there is nothing wrong in taking it.

By and large, I think our Forces have so far been configured for a war which was fought in the past. I think they really need to look into the future and see the kind of battlefield that will evolve in the year 2020 or 2030. Are we working towards configuring our armed

forces for that kind of a war? Are we networking our armed forces, which has to be really a top-down approach, it cannot be that each individual surface keeps making its own systems. I think we need to have a lot of economy which we exercise when we look at systems which are to be used by all three services. Look at surveillance. Look at any of these areas. I think we have a long way to go and the first step towards becoming a major power in the region is to understand where your weaknesses are, so that you can build on these and overcome these weaknesses.

So I am not so negative about what is happening as far as Indo-US relations are concerned. Certainly, the US is doing it for its own interests – no doubt about it. And we are not going into it from a position of weakness. We are going into it from a position of strength. Our economy is growing, our technology is increasing. But there *are* certain cutting edge areas where we would certainly benefit from US involvement. I let it rest at that. Any other questions?

Comment: I would like to mention that in terms of cooperation in the defence field with the USA, the US approach based upon their past experiences with NATO and other countries is that there is a three-tier way in which they approach it. From the Indian side, for the LCA, we started looking for some components for the LCA to begin with – apart from other things like computers. Then the US side in fact turned around and said, you are coming and asking me for these things. If we get to know what exactly you need, we can put together what is called a machine area approach, where it's aeronautics or LCA. That's how the machine area cooperation between India and the US, a governmental agreement, was signed in 1987.

Hence, one is co-development, and the next one in the pyramid is co-production, where you have identified something of a product. There is a US company prepared to come and invest and you also are prepared to make matching investments, and it will be like what you

call licensed production with respect to systems of Soviet origin or Russian origin.

The third – and this is important to know – the nature of the beast. They insisted on Service-to-Service cooperation. When we went to talk about technology development and maybe importing a few sub-systems, they said can we also include Service-to-Service co-operation. And so Service-to-Service co-operation was introduced, and thereafter there have been some exchanges between the armed forces of India and those of the USA.

I think there is one area in which – I mean if you are talking of something contemporary and therefore cutting edge, and therefore of relevance to us in the future – some amount of cooperation has already begun in missile defence. There have been exchanges, visits, at the expert levels. How exactly it blossoms out, matures out, we have to wait and see, but certainly in terms of one of the advanced stages of concern – to them of course... Plus, we possibly could do software development of a certain class, in our real time – fast. So missile defence is an area in which some interest is emerging.

There's concern – you know, it's like Blanco's ghost, always hovering in the background – the US will, at any time, turn the tap off. You know, that is retrospective application. You have a contract now; they'll say, according to the 1987 Act, sorry, we can't go further, and they can adduce any number of arguments, including how you voted in the UN. But this concern about turning off of the tap by the USA is not just of concern to India alone. We are not unique. The NATO countries are equally worried about it and therefore, two years ago, there has been something of an agreement between NATO countries, where there is co-production going on, and the USA, and this is called the 'Statement of Principles' (SoP).

You see, the US has cast-iron clauses in the Arms Export Control Act. They can't go and change that – it's like changing the Indian Constitution. However, the subterfuge that they have now brought

in with respect to Europe is something called the Statement of Principles. What it really says is – if you’re going to turn the tap off, please tell me 6-12 months ahead – give me 6-12 months’ notice so that I can find alternate suppliers – you know, for spare parts and assemblies and materials.

I think the SoP that has been worked out between NATO and the USA is of relevance to India, because our fear about the turning off of the tap is genuine. It is also true that the NATO countries also have a genuine fear, to the extent that NATO has solved the problem in one particular way, whereby they get 6-12 months’ breathing time before the tap is completely turned off. If you’re able to introduce that SoP – kind of – we can change it – you know, we are great drafters, the second-oldest profession – and therefore it is possible to assuage some of the feelings, some of the fears, some of the apprehensions, but not all – but that is the direction to go. That is all I have to say. Thank you.

Chair: Thank you very much.

Participant: Can I say a point?

Chair: Okay, the last.

Comment: Thank you. I just have a few comments to make, and particularly with respect to the presentation by Prof. Raj. His entire analysis is based on the premise that the US will continue to be the superpower or the hyper-power and the world is a unipolar system. I would say the argument is little debatable, because going by what Mr. K. Subrahmanyam brought out, is that this has been a transitory phase where the US has been able to exert a certain element of unilateralism. But I think the world has now entered the beginnings of a balance of power phase, and that’s going to mature. In that context, it becomes very credible that the US needs, from a long-term perspective, India as a strategic partner. The US needs – for its own national interests – India as a strategic partner.

So now we need to gain from our point of view how we capitalize and what are our shortfalls in this. If you are emerging as a great power, then the three elements – the military power, economic power and technological power – have to be credible. For that to be credible, you need to have control over critical technologies and innovative processes. That is where we lack considerably in that area. Therefore, our strategic approach and our strategic relationship with the US must take a long-term view on how we get access to these critical technologies and innovative processes. That's the way I think our entire strategy must be laid on a foundation and that's the way we need to progress.

Military power, if it is dependent on imported technologies, is not credible in the larger context of the global player. And Therefore, this is an important thing. Similarly, technological power – today's technology, for the first time in human history – you have a technology that can be used simultaneously for the military and the civil uses. And therefore it assumes tremendous economic and technological relevance. This is where we need to access that through an appropriate strategy and that strategy has to be a long-term strategy.

Chair: Thank you. A quick answer because I think we're running out of time.

Prof. S. Raj: You said the United States will not be a superpower. It is only in movement and as the process moves in, it will have to confront a leading power. Then I said the definition of superpower suits the United States – the components and everything. But the point I would like to raise is that while we presume that it will come to a leading post, at the same time, the superpower also does things to retain its pre-eminence. Today they declare 439 billion dollars as defence expenditure.

I also said that the basic concept in which it retains super power is hyper-securitization. They have already identified the threat, and that threat is always related to the building up of its own defence. The

balancing factor is that the superpower fears countries like India – mainly – Russia and China coming together as a balancing factor. If you see the various crises that came, every time the budget went up. Your benefit also, you know, NSC-68 how to solve the issue of increasing budget, they were the first people to say – NSC-68 said let's introduce deficit financing of the budget.

How do you meet this situation of hyper-securitization? It will always keep it up to retain its pre-eminence.

Chair: Thank you very much.

Ambassador Ghose: Admiral Jacob, may I ask one question? It's a very brief one. I was wondering, that when we talk about convergences and divergences that enhance or animate Indo-US defence relations – and whether we call it cooperative, whether we call it other names – but just the relationship. What would you say about our joint efforts on PSI, for example? We've sort of agreed along and said we're doing the CSI, but not the PSI; then we cited other reasons and so on. What kind of things are we willing to do? I think Air Marshal raised the question – will the Americans come and fight in Kashmir along with us? But Kashmir is an internal problem. Maybe we don't want them to come with us. But what are the things that we are jointly willing to do.

Summary of the session

Two major landmarks in the Indo-US Cooperation in the area of defence were the “Agreed Minute on Defence Relations between the United States and India” signed in January 1995 and the “New Framework for the US-India Relationship” signed in June 2005. These agreements provide evidence of the common interests of the two countries in:

- Maintaining Security and stability
- Defeating Terrorism and violent religious extremism
- Preventing the spread of Weapons of Mass Destruction and their related technologies

- Protecting the free flow of commerce via land, air and sea

There was clear agreement that even though the US was a super power with a global presence it definitely needed suitable partners across the globe especially in the Asian region. The nature of the threats facing the United States was such that superior military power alone was not adequate to deal with each and every situation confronting it. In a world of “more equal powers” major military wars between the bigger powers was unlikely. India was well placed to be partner to the US. In the past, the US preference for Pakistan as a partner has had a negative impact on Indian views of the US. One can argue that the development of closer relations with China by the US has also clouded Indian perceptions. However these perceptions are changing in the post 9/11 and the post Iraq world.

There was consensus that both countries needed each other in the increasingly complex world of today. However, some participants did raise the issue of what the relationship meant in terms of Indian military involvement. In the minds of important decision-makers in the US, the bilateral relationship should not be construed to mean that India could be used as:

- An eastern seaboard for the US
- An ally against China
- A surrogate or subordinate state to do the US bidding in Iraq or elsewhere

The relationship should rather be a partnership of equals based on shared strategic interests with neither side threatening the core interests of the other. A tolerance for each other’s geo-political compulsions could be the basis for a long-term relationship. Only such an approach from both sides could help in the creation of a more stable, secure and prosperous Asia.

The participants also felt that though the current thaw in Indo-US relations could have been influenced by economic considerations,

military to military cooperation has been an important contributor to the improved relationship. In spite of the nuclear tests of 1998 the relationship has survived and even become stronger. They also felt that high technology cooperation between the two countries in the area of defence could result in a win-win situation and further strengthen the relationship.

Participants differed on the relative importance of the Army, Navy and the Air Force to the US. The Navy was clearly very important to the US in the context of the current strategic scenario. While interoperability between the defence forces of both sides would be important, the larger direction of the relationship would depend upon cooperative endeavors in other areas – weapons procurement, joint developments and joint ventures and the development of a more interdependent defence industry. In the past, strategic differences between the US and India had moved the Indian defence industry away from the US. India did not see the US as a reliable supplier of advanced military equipment. This should change. There was agreement that the potential for cooperation in the defence area was big and could be of mutual benefit.

While economic considerations may have played some role in the altered perceptions that the US may have had about India, military to military cooperation has also had a significant impact on the nature and strength of the relationship especially in the recent past. This should not be overlooked when negotiating with the US on the other dimensions of the relationship.

Public Lecture

**Challenges and Prospects for
Indo – US Relations**



Dr. G. Madhavan Nair, Chairman ISRO &
Dr. K. Subrahmanyam at the Public Lecture

Public Lecture
on
Challenges and Prospects for
Indo – US Relations

Speaker : Dr. K. Subrahmanyam, Chairman, Task Force
on Global Strategic Developments, GOI

Chair : Dr. G. Madhavan Nair, Chairman, ISRO

Prof. Vijayalakshmi: Ladies and gentlemen, we welcome you to this public lecture which is a part of the national workshop on the Changing Contours of Indo-US relations – a national workshop that has been conceived by Dr. Rangan and the NIAS team. This evening we have Shri K. Subrahmanyam, the strategic guru, who very kindly consented to share with us some of his perspectives on strategic issues. We also have with us, Mr. Madhavan Nair, Chairman ISRO, to chair this session. ISRO has generously funded this workshop. I invite Mr. Madhavan Nair to say a few words about Shri K. Subrahmanyam.

Dr. Madhavan Nair: A very good evening to all of you, Shri K. Subrahmanyam, Dr. Kasturirangan, distinguished participants, invitees, ladies and gentlemen.

I consider it a privilege to chair this evening's lecture session. Of course, the topic, 'Changing Contours of Indo-US Relations' is very, very appropriate. I must congratulate Dr. Rangan and his team for taking up the topic in a timely manner and bringing together such a galaxy of people to address various issues to formulate something like an outline as to what we should be doing in the current context. My congratulations to the entire NIAS team for this effort, and of course ISRO is ultimately going to benefit out of some of these things. That is why, in our selfish interests, we have supported this programme.

ISRO has been fortunate to have created some relationship with US agencies, especially in the beginning phase, with NASA. We had cooperation in rocket launches and studying atmospheric phenomena and so on. Later, we graduated to utilization of the satellite communication and remote sensing applications. We had very strong relations in the early phase of our programmes. We were gaining strength in building our satellites and the launch vehicles. Certain negative factors got into the relations between the institutions in these two countries. As time progressed, our technical strength in various areas, and also our persuasive powers with some other agencies who are working on this, especially the NASA, NOVA and academic institutions, and some of the industries in this field saw an upward trend. Now, we are seeing a positive recognition of our own – there are areas where even the US can benefit out of cooperation with us. Similarly, we are also trying to explore the avenues where we can rope in the strength of the US industries and academic institutions.

One of the fine examples is what we are carrying out in the *Chandrayaan* mission. We have made significant progress there, and we are going to have two payloads from the US, flying in our own *Chandrayaan* mission. This will be a landmark event as far as the scientific exploration of outer space is concerned. I consider these as positive indicators. I don't want to take much of your time on these topics, but I am sure these will unfold in the subsequent presentation and discussions.

I have the privilege of introducing Shri K. Subrahmanyam, the doyen of strategic planning in the country. This audience does not need a formal introduction to this great personality. He can be called a strategic analyst, journalist, or a very proud civil servant who has served the country in many capacities. You know of his powerful analytical capability and how he has looked at various issues in an independent and unbiased manner, and brought out specific recommendations.

Immediately after the Kargil war, he chaired the Kargil committee. The report of the committee is outstanding. It has benefited many agencies that are working in this field. Right now, under the present government, he is heading the team for global strategic developments – the Task Force, and its report is expected soon.

With the globalized economy and the type of cooperation which we have with various nations across the globe, this Task Force report is quite eagerly awaited. I'm sure it will throw light onto how we want to progress on this. Earlier he has served in various capacities. The most important thing which strikes all of us is his observation capability with respect to what is happening in the country as well as abroad, at his analysis and sharp focus on the issues, and how they have been brought to the policy makers and the government level to see that they are implemented.

As you know, he received his M.Sc. degree in Chemistry from Madras University in 1950, and immediately, he joined the Indian Administrative Service. He has worked in various capacities and has been a Rockefeller Fellow in Strategic Studies at the London School of Economics. Later, he took the leadership as a director of the Institute for Defence Studies and Analysis, IDSA, in 1975. There again, he has made a significant contribution in carrying out the activities of this agency.

K. Subrahmanyam has authored a number of books –I could count fourteen of them – and quite a few of them came out at a time of critical events like the Bangladesh war. This book is one of the few documents available on this history. He has also authored works on nuclear myths and realities, superpower rivalry and the Indian Ocean – these are the other topics on which remarkable books have been brought out. You must be anxiously waiting to listen to him.

Let me invite Shri K. Subrahmanyam to deliver this evening's talk on this occasion. Thank you.

Dr. K. Subrahmanyam: Thank you, Dr. Madhavan Nair, Dr. Kasturirangan, my colleagues as well as distinguished participants. You'll have to forgive me for talking sitting, due to health reasons, I am not able to stand for a long time.

Today, there is a lot of debate in this country about the Indo-American relations and a particular characteristic of the debate is that there is an enormous over-burden of distrust of the United States in this country, as there is distrust of India in the United States. Even though both these countries are democracies, they are 'estranged democracies'. Why is it that these two democracies were estranged for so long and why is it now that there is a change in the direction in their relationship?

The estrangement between the two countries was not a natural one. President Roosevelt was strong supporter of Indian independence, but the Americans were misled by the British. The British told the Americans that even though there were 2.7 million Indians fighting in the Second World War, the overwhelming majority of them were Muslims. This misinformation was deliberately fed to the Americans. The British argued that since Gandhi and the Congress Party started the Quit India Movement at the height of the Second World War, they could not be trusted to side with the Allies in the confrontation with the Soviet Union. At the same time, India's situation was militarily very important. The British thought that since whole of India will not be with them, the best thing is to have at least a part of India with them. That is how the British created Pakistan.

From that time onwards, the British had been telling the Americans that Pakistan was absolutely important to guard the oilfields of West Asia and to prevent the Soviets from advancing into this area. As a Muslim country, Pakistan would be fervently anti-Communist, while you could not trust India to be that.

At the same time, in India, Jawaharlal Nehru had to formulate a foreign policy taking into account the fact that he could not afford to

alienate the Soviet Union or China. The reason for that was that the Communist Party of India at that time was in insurgency. There was insurgency in Telengana, Kerala, and Bengal, and therefore, he did not want the external powers to support the Communist Party in their insurgency. So he decided that he should cultivate the Soviet Union. This, in fact, paid off. In 1951, Stalin advised the Indian communists to call off the insurgency.

India had to balance between the Soviet Union and the western democracies. Among the western democracies, the erstwhile masters of India – the British – were not always helpful to us. So the policy of non-alignment was adopted. This was made use of by the British as well as the Pakistanis to say to the Americans that since India was not with the US, it was against the US.

Secondly, at that time the Indian position did not command admiration in the United States. We were heavily importing food for years altogether. In the 60's, there was a book called *Famine 1975* which was circulated all over the world. In that book, it was predicted that there would be a big famine in the world and you can't save everybody, and therefore India didn't deserve to be saved.

To add to this, in 1962, China defeated India. In 1965, the Americans knew war was coming, but they played their war games – they are available in publication – and they came to the conclusion that Pakistan would beat us in that war. For all these reasons, the Americans didn't have a very high opinion of us in the 60's. Till, of course, the Bangladesh war when we were able to beat Pakistan and allowed an independent Bangladesh to emerge.

In the 80's the Americans decided to wage war against the Soviet Union in Afghanistan. The Pakistanis, of course, assured the Americans that they would help them in waging that war. In retrospect, India decided very wisely not to get involved in that war. If we had got involved in that war, today there would have been an *al Qaeda* in

this country. It is because we kept out of it that we don't have *al Qaeda* in this country.

That is the history from 1945 till about 1990, when the Cold war ended. The Cold War ended in victory for the Americans. Their containment policy won, and the Soviet Union broke up. Originally, in 1947, when George Kennan proposed the strategy of containment it proposed to contain the Soviet Union militarily, politically, and economically. It was expected that finally, there would be forces released within the Soviet Union, which would break it up. That is what happened.

The Cold War was a unique event in history. It was the first instance in history in which two major powers, armed to the teeth and possessing the capability of destroying the entire human civilization several times over, confronted each other for forty years and finally ended the war without exchanging a single shot. Of course, one can argue that it was the result of nuclear deterrence. But once it happened, the popular impression was that America became the sole superpower. But that was not the truth. What really happened was that there were two poles mainly because the various other nations of the world, like Western Europe, Japan and China felt threatened by the Soviet Union. So they joined with United States and you had just the two poles.

Once the Soviet Union broke up and the threat was removed, these nations started asserting their own independence and the world became a balance of power, a poly-centric world. Unfortunately, even today, most people don't recognize it. That is a part of the problem. In 1991-92, you could say that a balance of power of five nations – major nations – emerged in the international system. That is, the United States, the European Union, Russia, China and Japan.

Dr. Kissinger wrote a book in 1994 called *Diplomacy*, in which he said that the future international structure would be a balance of power. He added that there probably could be a sixth nation joining it, and that would be India. A person like Kissinger was able to foresee

that as early as 1992. In the early 1990s, the US started taking an interest in India. It was a surprising thing to the US that this enormous number of people (900 million then) could be kept together under a democratic administration. Something that was unparalleled in the world. Of all the ex-colonies, only two were able to sustain their democratic constitution left behind by the colonialists – India and Sri Lanka. That in itself was something which impressed people.

Secondly, in 1991, we started our liberalization program and our growth rate went up to 6%, our exports rose and our foreign exchange balance started rising. Then finally, in 1998, we carried out our nuclear tests. To the Americans these were indications of India becoming the sixth balancer of power. Up to the Second World War, the major superpower or the sole superpower of the world was the British Empire. The Second World War destroyed the British Empire, weakened Britain, and America emerged as the sole superpower of the world. In 1948-49, the Americans planned their containment strategy which would defeat the Soviet Union without fighting a war. In 1970, the Americans again found a new strategy when Kissinger went to China. Up to that point of time, China was an ally of the Soviet Union. He weaned China away from the Soviet Union, promised to help them, and in the process, he persuaded China to give up Communism. China was the main Communist country, but today it is as capitalist as any other capitalist country in the world. Kissinger used China in order to step up the containment of the Soviet Union that finally resulted in the break up of the Soviet Union.

In the present situation, the Chinese economy has grown so fast that the Americans anticipate that China will overtake them in terms of GDP in the next twenty years. Even if each every Chinese gets one-fourth the income of an American, the Chinese total income would be higher than that of the United States because they are four times the American population. The Chinese are producing so many engineers and scientists that the Americans are worried about their losing their pre-eminence as the global scientific and technological leader. They are not worried about the military aspect because the American

military expenditure is equal to that of the next forty five nations in the world. In the next five years or so, it is expected that the American military expenditure will be half of the global military expenditure. The Americans have equipped themselves with a capability which is unbeatable.

The Americans will have a military capability which will make them unbeatable by anybody else, but that would not mean that the Americans can go anywhere and do anything in the world. The reason for that is the Americans have abolished the draft. Today, it is very difficult to re-introduce draft in the United States. The American Army is now limited to 14 divisions. With 14 divisions, you can do certain things; you cannot do it all. In today's world, you can go and defeat another army, you can punish and destroy another country's valuable targets, but you cannot go and occupy a country and subject the population of a country perpetually to military occupation, which Hitler could do. Therefore, there is a limit to the exercise of military power.

Secondly, the major nations of the world, except Japan, are all nuclear weapon nations. There cannot be a war among them because they will destroy each other. War is meant to be for political reasons, at the end of which you are supposed to come out as a political gainer. A nuclear war will not leave a political gainer or loser. There will be losers on both sides. Therefore in the future, the Americans can assert their supremacy only in terms of their being economically, technologically and scientifically the supreme power in the world.

The US is aware that the Europeans are no longer very loyal and humble allies of the United States. The Europeans built the Airbus aircraft and compete with the US Boeing aircraft. The Europeans built their own Galileo satellite system. The Chinese will become the second largest market of the world and therefore, they are competing with the Americans. China is also the only major nation which is not a democracy. The US has doubts about China abiding by the rule of law. Therefore this time the Americans are looking for not allies, but

partners. If the US discounts the EU and China, that leaves Russia, Japan and India. In a few years times India will become the most populous nation in the world. Because of China's one-child policy, their population will age much faster than the Indian population. Populations of Japan, Russia and Europe are already ageing much faster. Therefore, the India will have a younger age profile and a talented population, and will be the third biggest market in the world, next to the United States and China. If English-speaking, democratic, multi-cultural India can be won over as a partner, it will be to the advantage of the US. This is the reason why they came out with the declaration that it is the intention of the United States to help India become a world-class power in the 21st century.

Now you may ask a question – what is all this? The Americans showed up as very charitable people – we haven't seen them to be like that. Are they doing it for our good, because they like us and suddenly they have grown fond of India? No, the Americans are doing it for their own purpose, in their own interest. The Americans have already a history of doing this kind of thing. World War II ended. Their former enemies Germany and Japan were in shambles. The Americans rebuilt those countries, those economies. Not because of any sense of guilt, but because they felt that unless they rebuilt Western Europe and Japan, if they were left poor and destitute, they would become victims of communism. Therefore, if communism were to be contained, they should build those countries and make them their allies. It worked.

Then as I mentioned, in 1971, Kissinger went to China. China was in the throes of the Cultural Revolution and at the height of communist excesses. They won China over to the side of the Western alliance. Following this China grew so fast that today it is overtaking other countries in the world, and the trade between the United States and China is 200 billion dollars, with about 80-100 billion dollars in China's favour.

Now the US had decided to help build India. Condoleezza Rice has said if the United States is to solve its problems successfully –

problems like its social security, Medicare – a partnership with India is necessary. It is for these reasons they are doing it and we must understand that. If we understand that they have a stake in this relationship, and they are doing it for their own purpose, then you have a little more of leverage in trying to deal with them. This is the reason for the sudden change in the American attitude. But there are problems. When originally the policy of containment was proposed by George Kennan, it was not very popular. Most of the Americans in those days were thinking of confronting the Soviet Union militarily. The sophistication of the policy of containment was not easily understood. Over a period of time, of course, it came to be accepted. When Kissinger went to China, he didn't even mention it to William Rogers, the United States' Secretary of State. Kissinger kept only the President informed. It took years for them to bring it out into the open, and after 1971, it took nine years before they could send an Ambassador to China.

Similarly, now, they are trying to befriend India and make it a partner. Again, this is a policy proposed by a few people. Foremost among them is the Secretary of State Condoleezza Rice. Mind you, all these ideas come from intellectuals there – not from politicians. George Kennan, of course, subsequently became a professor in Princeton University and Kissinger originally taught History in Harvard. Condoleezza Rice was the provost of Stanford University, and she is also a professor of International Relations. Her idea of reshaping the international structure is shared between three or four people in her department.

There are objections to this policy from the arms control and the non-proliferation lobbies. There is also opposition from the politicians. The Bush administration had to get over this opposition in its endeavour to partner with India. Similarly, in this country too, there are few people who appreciate this. The world is globalized. There will be no major wars between major powers. You may say Manmohan Singh understands it. Manmohan Singh said from the Red Fort that today all the world's financial flows are available to India's

development. In fact, the world is friendly to India's development. You didn't hear such statements from any previous Prime Minister. But, again, he is in a minority. Most of our politicians or political parties, our media, academia, are still to adjust themselves to this new reality. That is where the problem today is.

There is certain inevitability about it this changed reality. There are people who ask me why do you think we should go with the United States? There are others who have come out with a very fanciful idea that China, Russia and India should form a triangular group in order to stand up to the American domination. The answer is very simple. We have to ask most of them, where is your son, or daughter, your nephew or niece? Are they in Beijing and Shanghai and Guangzhou or Moscow? No. they are all in New York, Boston, Los Angeles, and San Francisco.

There is already a large Indian Diaspora in the US of nearly two million people. In another ten to twenty years, it will increase to five million. When the Indian population crosses a particular level in the United States, you will have a critical mass with which you would be able to influence political decisions of the United States, just as the Jews do in the United States. Some beginnings in this have already been made. How many people would know that the person who is helping the Under-Secretary Nicholas Burns negotiate the nuclear deal is a Bombay-born Indian, Ashley Tellis? So the process is on and you have to ask yourselves the question as to what will happen in due course about this.

Now we come to the soft power of the United States. The most effective weapon that the United States has is the English language. India is one of the countries that have English as an official language. Then, of course, come all the other things – music, McDonalds and everything else that goes with soft power. There is also the element of India's soft power; for example, when I want to hear the best *Thyagaraja Uthsavam* on DVD, I get it from Cleveland. Are we

going to have a similar relationship with China or Russia? It's not going to happen however hard you might try.

The Americans need brain power. That's why, George Bush has said in his latest speech, asking Congress to increase the number of H1-B visas. With ageing populations, countries in Europe will have to import more population from outside; they will have to increase immigration. This immigration will most probably take place from the south of the Mediterranean to the north of the Mediterranean, with all its complications.

The Americans also are increasing their population through immigration, mostly of Hispanics. However, the Hispanics come in by crossing the frontier illegally, and are absorbed in low-paid jobs. You are not getting computer engineers, software engineers and other kinds of skilled people from Latin America into the United States.

In a speech delivered at the Asia Society, Nicholas Burns has said that India is going to have the largest young skilled population. Therefore, we've got to cultivate it. This is the reason why things are changing. Of course, one could ask whether the US is going to treat us as equals. Perhaps not for quite some time to come. It won't come by stipulating it. You'll have to earn it. You'll have to assert it.

Similarly, they have been arrogant, and they will continue to be arrogant till such time that they realize that it doesn't pay to be arrogant vis-à-vis India. So all those things are what we have got to establish. The question is whether it is in the hands of this nation. We should be able to do that.

This is what I have been trying to say. If you find flaws in it and if you can fault the logic, then we can discuss these issues and I am prepared to correct myself.

Discussion

Question: What makes you think that the Americans would be so dependent so on Indian intellectual power? Already the software people are saying that India is not going to be a destination for a long period of time. The business can move to other more attractive places. They talk of competition from Eastern Europe, China, and from other Asian countries. What gives you this ground for optimism that there is no competition for India in this Indo-US relation?

Dr. K. Subrahmanyam: The answer is not in terms of industry and investment, I agree. That is partly because of the fact that we are still to make the climate in this country more congenial to that kind of investment. If somebody had come and visited India last week and looked at our airports, of course nobody will be coming to invest in this country. Therefore, those are the kind of problems which we have to get over.

But if you look at what the major American companies are doing in terms of R&D, then – lots of people have made comparisons between what happens, the setting up of centres of R&D in India and China – have always said that India has won over China and is very much in advance of China. While they are thinking about Eastern Europe in terms of outsourcing, but in terms of R&D, there is no question about India's lead over all the other nations.

Question: The Republicans and the Democrats are quite divided in their own attitudes to either of one of them but there emerges a common approach to India. Well, there are some differences, but generally they look at it reasonably together. Whereas in India, I find it's quite chaotic. We are now looking at this coalition politics to continue for quite some time to come. For us to sustain a quality relationship – or very futuristically we are talking about India being a great power – but we need political strength. It's not good enough to have money and brains and all these things that we've talked about. Political stability is vital. When we look at way India is moving, what is the

future? On one side, we are very clear in terms of education and research and business and so on – it's going on beautifully. But what about our political system? Does it matter? Does it mean anything? If so, how is it going to correct itself? And where is the trigger?

Dr. K. Subrahmanyam: It's a very good question. But then, let's look at our own history. John Galbraith said there is only one functioning chaos in the world, and that is India. We were relatively more orderly in our political system till the 90s. At that time, our growth rate was what used to be called the Hindu growth rate of three-and-a-half per cent. Our growth rate started increasing to six per cent and later on to seven percent, eight per cent only when, to some extent, our politics has become a little more chaotic.

Now, the point in hand is that this chaos and instability in within a system of rule of law, which is a part of this chaotic coalition politics and it permits this seven-to-eight per cent growth rate. If only that can be solved, your growth rate will go up to ten per cent. The second point is the fact that in this country, the Armed Forces are disciplined and totally under civilian control. That's a plus factor.

When this happens, let me also tell you, economics will also start influencing politics. Thereafter, the politicians will start being influenced by the business houses; politics will become interest-based politics. Though it is inevitable, you will have to wait for it. American politics of the 19th century was a highly chaotic and handled by what they used to call the Robber Barons. It became disciplined politics – moral politics – only after Roosevelt.

Therefore, it is a question of expectations. You may say well, it may not work out that way, and your coalition politics may degenerate. Yes. Everybody makes his calculations on that. So long as you are able to hold free and fair elections and enforce it, then many of these things have got a self-correcting mechanism.

Question: In the morning lecture you lamented the lack of a strategic culture in India.. With your long experience, what would you recommend be done to develop a strategic culture within India? Secondly, in the evolving relationship between India and the US, how should China be handled?

Dr. K. Subrahmanyam: The first one is, yes, I still say that India is yet to develop a strategic culture. But at the same time, as it happens, I have memories of what happened in 1962, when we found out, suddenly, that the Americans and the West would not give arms to us to fight the Chinese. We had to look to the Soviet Union. In those days our political awareness was so low – I remember as an official in the Ministry of Defence, I had to go to go and talk to officials in the Ministry of Defence and External Affairs as well as all the uniformed people.

At that time people didn't know that there was a conflict between Soviet Union and China. People thought that they were both Communist countries and would go together. The issue was how can you trust one Communist against another? People asked that how can we buy MIG aircraft from Soviet Union and be sure that the Russians won't let us down. It took quite a long time to persuade people that there was a conflict between Soviet Union and China and that we could trust the Russians. Now everybody is so used to the Russian supply of defence equipment to us. I can tell you – the Navy opposed our getting submarines from the Soviet Union. The Air Force appointed a committee which said scrap the MIG project.

Therefore, in one sense if you say that at that time also the leadership of the government had to formulate its policy and had to pursue that irrespective of the fact that it didn't have much popular support. But once you pursued it, later popular support gathered and now the situation is that today people are worried about giving up Russia as a supplier of armaments. So these things have happened before and for me it is nothing new.

In those days, when we signed the Indo-Soviet treaty, and Mr. Venkateswaran, who has signed that letter of eleven Ambassadors was the Joint Secretary who went along with D. P. Dhar to negotiate that treaty. There were accusations that there are secret parleys in process and that people were kept in ignorance. There were also fears that India would become a poodle of the Soviet Union. I had said at that time that you can make Hungary a poodle, Czechoslovakia a little pet, but you can't make India, an elephant, a pet. And I am saying the same thing today. In those days, of course, I was denounced as a Soviet agent. My point is, at that time, that was a good policy for India, and now this is a good policy for India. The problem is that in India we do not have a broad enough structure to create a culture for policy-making. It has still to be done by the leadership at the top. This will develop over a period of time because I still believe in the force of logic and the circumstances.

On the second question, till now people thought in a non-aligned world with bipolarity, you have got to be with either side or stay out of the power politics. You had only three options. In a balance of power world, there are five others. You have got five options. It's a new flexible world. It is not in a bipolar world where if you deal one country you alienate the others. The balance of power world was there with the Europeans from 1815, the Congress of Vienna, till 1914, the outbreak of the First World War. But people in the India are not familiar with that.

Question: Sir, I have been following all your writings and all these years I have always considered you as my guru. It is very difficult to disagree with you and your sense of logic.

You also told us, in the course of your discourse that the Americans need us as much as we need them. Americans need us to help them solve their problems. You also referred briefly to the kind of leverages that we might have. I wonder whether we have really exercised those leverages. I get a feeling often that the Americans want to make us a dependent power.

I would also like to know from you what space you assign to questions of national honour, prestige and public sentiments. I am keeping in mind the kind of a statement which the American Ambassador made here and our Foreign Office came up with a lacklustre, below-average reaction to that. We could have been a little more forthright; we could have been a little more categorical. Knowing full well that the Americans need us, we can be more assertive. I think we blink too often and perhaps that is not necessary. Perhaps if you were there in the Foreign Office, you would have handled it differently. I don't know. How do you react to it?

There is a growing perception we are not really dealing with all the major powers in the same fashion in which we deal with the Americans. With the Americans, we are more subdued. Would you like to react to this?

Dr. K. Subrahmanyam: We are so subdued with the Iranians and you are talking about the Americans! There are people who say that if you vote against Iran, the Iranians who have been carrying on proliferation for sixteen years, who are being assisted in proliferation by Dr. A. Q. Khan of Pakistan, will be angered. And they expect you to be afraid of Iran. Yemen being a Shia country has voted against Iran. Indonesia, Libya, Algeria have abstained from the Iranian vote. In India people are apprehensive that the Muslims will get angry if we vote against Iran. Therefore, that is a matter of dealing with different countries differently. When I said Indians do not have a strategic culture that is exactly what I meant. If you understand your own leverage, you will behave properly; if you don't understand your leverages, then you won't. That is the problem.

Question: For a hundred years, the world economy was Euro-centric or American centric. Twenty years from now, it would have shifted to Asia, and that probably is the writing on the wall that the Americans are seeing. Therefore, they are looking at us as a long-term strategic partner. Their security strategy states that they will prevent the rise of a military and technological competitor. As you mentioned, they

see the European Union as the biggest and closest rivals, and you can see their strategies preventing the European Union from consolidating and becoming a political entity.

While they take steps to leverage India as a strategic partner in the longer term, do we see, finally, the change of the United Nations' P-5 system on a more rational basis?

Dr. K. Subrahmanyam: Yes. That will happen over a period of time. As I mentioned, the six balancers of power – the Americans have already accepted Japan as a country which deserves to be a member of the Security Council. Over a period of time India too will be included but not Germany, not South Africa, not Brazil. However, you have got to wait for it and you should not, in the meantime, go about alienating other people.

Chair: I think we have had a very interesting discussion so far and I think with what Mr K. Subrahmanyam has deliberated in such a crisp, logical manner. But I am sure the questions will remain in the minds of some of us whether we are going from a bipolar regime towards a balance of power regime or a unipolar regime. The questions perhaps may still be lingering in the minds of people.

There is no doubt that in times to come, one of the oldest democracies and the largest democracy have to work together for the benefit of mankind. In that process, I think India can gain much by developing our strengths and demonstrating it in various fields – to start with, the intellectual strength, the economic strength and, above all, the political strength. I hope that a time will come when we will be able to have this process continue in a manner where we are equal partners in this process. Thank you.

Prof. Vijayalakshmi: After all these thoughts for the future, I think we'll have to put up a case to Mr. K. Subrahmanyam that there *is* a nascent strategic cultural thinking in India and that's the reason this workshop was conceived. There is a growing impetus and impulse

within India that is seeking to define for itself its place in the world and the way it would like to conduct its world affairs.

We take the words of Shri K. Subrahmanyam very seriously and want to thank him for a splendid lecture. I also want to thank Shri Madhavan Nair for very graciously conducting it. I think his introduction and his summing up was also equally masterly.

I want to thank all of you – you have been a great audience, you've asked some wonderful questions and we hope to see more of you. This workshop is the beginning of a great dialogue on strategic cultural thinking in India. This is an internal conversation, which all of you are welcome to join and tell us what you think. Thank you very much.

Session IV

Prospects for Indo-US Cooperation in High Technology



Left to Right: Dr. S. Banerjee, Dr. V. Siddhartha,
Prof. Roddam Narasimha, Prof. P. Rama Rao and
Dr. K. Kasturirangan

Session IV

Prospects for Indo-US Cooperation in High Technology

Chair: Prof. P. Rama Rao, Member, Task Force on Global
Strategic Developments

Prof. Vijayalakshmi: Let me welcome all of you once again to this session on high technology and the complex issues related to it. To lead us into the discussion, I invite Prof. Rao to chair this session.

Prof. P. Rama Rao: Dr. Kasturirangan, Prof. Narasimha, Dr. Banerjee, Dr. V. Siddhartha, Shri K. Subrahmanyam, Dr. Aatre, our colleagues from the Task Force, Air Marshal Patney, Shri Tarundas, Prof. Ananth and distinguished colleagues.

Until yesterday afternoon, till Dr. Kakodkar left, I was to be a discussant in this session. Thereafter Dr. Kasturirangan kindly asked me to chair this morning's session. I feel very privileged to do this job because we have a very distinguished panel. Each one of our four speakers has devoted almost all his professional life to this subject. We are indeed fortunate to have their views.

The topic of this session is 'Prospects for Indo-US Cooperation in High Technology'. I wish to follow the pattern set yesterday and take this opportunity to make a few preliminary remarks.

What are the prospects for this cooperation like? The simple answer is - excellent! However, I must add that there has been so far no demonstration of any major accomplishment in the area of high technology coming through Indo-US cooperation. Individual informal collaboration between scientists in India and scientists in the United States is clearly very large in scale maybe larger than between India and any other country in the world. Perhaps these are the largest between any two countries in the world.

There are also, on a much smaller scale, collaborations between institutions here and institutions in the US, university groups here and university groups there, some R&D labs here and some R&D labs there. A more recent important development is that several multinationals are coming into India and setting up their R&D labs. Dr. Sridharan made a reference to this yesterday.

There are also instances of Indian companies and Indian specialist groups performing hi-tech work on a contract basis for some of the entities in the US. We understand that WIPRO for instance is developing software for a US military aircraft system. I expect Prof. Narasimha would give more examples of this kind.

There have been several initiatives between the Government of India and the Government of the United States. I can give you a picture of the historical development of the various mechanisms. However since that will take a long time I shall desist from doing so. Right now, there is the Indo-US Science & Technology Forum, the High Technology Core Group as well as the programs under the Next Steps in Strategic Partnership. Yesterday, Prof. Vijayalakshmi said that this is going very well. I am not sure. We will probably hear from Dr. Siddhartha on how well these are proceeding.

There was another good question that was asked yesterday. Do we have a structured strategic group in this country? Thinking and analyzing how the Indo-US relations are expected to pan out in the next two or three decades and linking these to international strategic developments is clearly important. The answer given by the learned Chairman of the Task Force to the above question was that there is no such strategic thinking or group. He went on to add that maybe the creation of a Task Force marks a small beginning towards the creation of such a group.

If you asked me the same question on whether there is a strategic group looking at the potential of Indo-US cooperation in Science & Technology - for that matter in high technology - my answer again

would be no. Whatever has been going on has been taking place on an ad hoc basis and there's a lot of work to be done. What are the key elements, then, of building a self-sustaining, meaningful and mutually profitable partnership between India and the US? Clearly, the foundation upon which such an edifice of S&T cooperation or hi-tech cooperation can be built is mutual dependency and not just mutual appreciation. I want to emphasize this – not just mutual appreciation, not merely mutual respect - but more importantly, mutual dependence.

India, no doubt, will benefit from US capacities and capabilities. India also has resources and the inherent strength to enhance dependency of the US and to provide benefits to the US through such a partnership. How are we to achieve such a meaningful partnership? In fact, I have replaced the word collaboration / cooperation. It says cooperation, but I have replaced this word 'cooperation' with 'partnership' following yesterday's thesis.

Apart from building human resources - I will come back to this in a minute - I think we have to, first of all, identify areas for initiating projects. Before I do that, I wish to point out that in the area of Science & Technology there are not many people in this country who are anywhere like Mr. K. Subrahmanyam – well versed in their own discipline and having an appreciation of what's happening in the world at large. I am happy that Dr. Siddhartha has devoted quite a lot of energy to this issue. He is now spending 50% of his time with DRDO and the other 50% with MEA. I would like to humbly submit that there must be more such people in a larger number of strategic as well as non-strategic departments and agencies. We would then be able to identify suitable areas and projects.

I want to just take a minute to give you an illustration of what can be clearly of interest to both countries. One of them is counter-terrorism. The US is worried about that. We are concerned about that. There are a whole lot of technologies to detect WMDs (Chemical, Biological and Radioactive Devices) and to deactivate them. Then there are environment-friendly technologies. These are in fact, of interest to

the whole world. The President of the United States has come up with the idea of a zero-emission coal-based power plant. Can we have a joint project?

Thinking along the same lines bio-fuels, bio-products, and integrated bio-refineries are other areas of promise. I have seen one good initiative of a solid oxide fuel cell based power generation and distribution system for our rural areas. These two areas offer the possibility of a third rural revolution in the country after the agricultural and dairy revolutions.

The third area I would like to mention is mathematics. Recently, under the chairmanship of Dr. Kasturirangan, a small group of us have tried to identify mathematics as a potential field deserving substantially greater support. There is a great deal of potential for cooperation in this very basic field.

The last area I would like to mention, because it has got something to do with what I am going to say towards the end, is manufacturing. In the area of manufacturing, the marketplace of the future is expected to demand greater product variety along with shorter product life because of rapid obsolescence. These requirements would need more and more rapid innovation. A direct implication of this is that the quantum of engineering, design and retooling involved in the reconfiguration of manufacturing systems as well as the cost associated with them as a fraction of the total manufacturing cost, will continue to grow. Obviously, this places a demand on a very large number of highly skilled engineers and cost-effective sources from where such engineers can be drawn.

India should seize this opportunity. If we can learn to put our act together the revenues from such activities, per capita, and also per product, will be significantly greater. China has chosen mass production of low-cost low-tech items, and this can be a different kind of parallel. This will also enhance India's competitiveness.

I do not want to mention nuclear or space because we have two eminent and very erudite speakers. But I do want to touch upon defence. Yesterday, General Banerjee said something about joint projects for futuristic systems. I think that's the direction to go. I just want to illustrate this with the example of the Brahmos missile. It's a project – in fact, it's a program – between India and Russia. I'm not getting into the details of the product, or what has come by way of design, etc. But I do want to refer to the structure of the project.

The structure of that organization is a joint venture. Both the governments have put their money in it. The venture they have created has a great deal of freedom with which it can operate to induct manpower or expedite procurement etc. If you need to go abroad to sell this is a good study to look at. I know for certain that we have learnt a great deal not only in terms of basic design or technology, but also in terms of the manufacturing systems that the other country puts in place.

Can we do something similar? For instance, if WIPRO or Satyam get a huge project from General Motors, they are immediately able to open a centre and recruit a thousand people. We must also be able to do that in joint ventures in the area of defence, in areas such as aero-engines, futuristic military aircraft and so on and so forth – the examples given yesterday. I feel that we have to think completely anew. Otherwise we are worried about departmental personnel and all kinds of things. I do not want to go into details, but we should think innovatively.

Finally, if you are going to achieve all of this, there is one urgent necessity and that is to revamp our higher education system. From where do we get the engineers? That was the question asked yesterday. We have to revamp our education system again in a very innovative fashion. I do not believe this can be achieved by depending solely on publicly supported institutions. This is one area where a public-private partnership has to be encouraged. As of today, we do not have an imaginative legal and regulatory framework to promote this. I think

nothing is more urgent than this. Institutions that are in a position to generate human resources of the required calibre in large numbers, will be the keys to unlocking future possibilities in Indo-US cooperation in high technology.

I now have great pleasure in inviting Dr. S. Banerjee to talk about the future possibilities of cooperation in the nuclear area. Dr. Banerjee.

Dr. S. Banerjee - *Prospects for Indo-US Civilian Nuclear Cooperation*

I would first like to thank Prof. Kasturirangan for giving me this opportunity of sharing some of our ideas on the future possibilities of international collaboration in the nuclear program. I will perhaps talk more about international collaboration because in the nuclear area it is very difficult to single out a single country and have a collaboration program with that country because many of these technologies have international connotations.

What I want to cover first is about the evolution of the Indian nuclear program. It is very important to know how we grew from very meagre resources to the present situation. Without this story of the evolution it is not possible for us to assess what are the possibilities of future growth through international collaborations.

You see we started with some guiding principles. The guiding principle is that, first, we wanted to have an indigenous development of technology. Rarely do we handle the total technology. When I say total technology I mean you have to start from the resources i.e. you mine the resource to make the fuel, develop the technology to do the reprocessing, take care of waste management and manage the entire fuel cycle. Such histories of total technology development in our country are very few and the nuclear area is one of them. This was one issue that was decided right at the beginning. We wanted to be self-sufficient in our indigenous resources.

The second important thing was adopting a closed fuel cycle. Till about a year back, this is perhaps one area where we have been opposing almost the entire world, particularly the United States. Only in the recent past (I think in the recent IAEA meeting) have the United States representatives openly said that they now have the option of going towards the closed fuel cycle. There are two reasons for us to do this. One is, that we can make the best use of fissile and fertile materials. The other is that this will reduce the waste burden. Otherwise, the nuclear waste will live very long – several tens of thousands of years – and this can be reduced to a few hundred years if we can burn or incinerate them. This is nuclear burning in a reactor or an accelerator-driven system.

Finally, there is the three-stage program, which also starts from the very basic point that we have a very meagre uranium resource, but a very large thorium reserve. We have about one-third of the total thorium of the world in our country.

I just want to show you this picture to tell you that when you build a nuclear reactor (we have two more reactors coming up in Kaiga) it doesn't really disturb the environment. If you drive down to Kaiga from Goa, you will find that you are going through deep forest, and suddenly you come to this station. It doesn't have a large railway yard to keep the fuel; it doesn't have an ash pond to keep the ash; so this really does not disturb the environment in any way. Of course, we have no quantitative way of establishing that but I think this picture tells us more than quantitative numbers.

We started working on the Pressurised Heavy Water Reactor (PHWR) that depends on natural uranium as fuel and I will very quickly run through some of the points. This has some weaknesses like low burn-up, because it contains only 0.7 per cent of Uranium 235. That is the fissile material, so the burn-up is low. But it has a very efficient use of U 235. If you take it per ton of uranium mined this is perhaps the best use of Uranium 235.

We have heavy water, both as the moderator and coolant. That requires the development of heavy water technology – an extremely difficult technology. Setting up and running a heavy water plant is a very difficult task. We have done it. Coming to the on-load fuelling you have to develop a fuelling machine. Though it is attractive in one sense you have to carry out entry into the reactor core daily. Compared to other types of reactor systems like Pressurized Water Reactors here you have to enter the core every day.

Neutron economy is one point that is very important. In nuclear technology we have resources – the fissile element is one resource, the fertile element is another resource and the third resource, which we normally forget, is neutrons. From where will these neutrons come? Neutrons can come from a fission process. Today, of course, we know that neutrons can come from other processes. But that is still far off. Maybe for the next twenty years, these other neutron sources are not going to play a major role in the nuclear energy program.

So the neutron economy of this reactor is perfect and this is excellent physics design. But it has very complex engineering and it needs a very careful choice of in-core materials. The neutrons are best utilized if we do not allow them to get lost by capture. They should be entirely used by either the fission or conversion processes. In a PWR a large pressure vessel is not required.

When we embarked upon this program in the late 60s, we were not in a position to build large pressure vessels. Even today, I think I will not say that we can build a 1000-Megawatt Reactor Pressure Vessel (RPV) in the country. So this is one advantage in going for PHWR where by distributing the pressure across different pressure tubes - a technology that we could manage - we are reducing the size of the pressure vessel.

So there are many challenges. Again I just list out the challenges in this slide and also say that we have fulfilled all these and successfully met all of them. From a very low-grade resource, we have finished

fuel; and the performance of the fuel is very good. We have also perfected making the in-core structural components and mastered heavy water technology. In fact we had two alternative technologies and both of them are running. We have also economized on the energy requirements for heavy water production. Finally, the heavy water production capacity today is fully consistent with the power program and there is no difficulty for us to expand this program.

Very sophisticated equipment has been developed. These have also been transferred to industry and Indian industry is geared up for meeting our requirements. We have also developed computerized reactor control systems and our capabilities in repair, refurbishment and life extension are very good. Today we can definitely call ourselves world leaders in PHWR technology. Countries like Canada and others as well are interested in taking our technology, provided the Nuclear Suppliers' Group allows that to happen.

As for operating experience, we have a record capacity utilization in PHWR. We have also reduced the construction time, which was in the region of ten to twelve years, to four-and-a-half years. This is again some kind of a world record. Look at the capacity utilization shown in this slide. So this is the Indian PHWR. The Indian PHWR, which was operating earlier at a gross capacity factor as low as about 70% has exceeded the world maximum and we have reached 91%.

The present situation is seen in this slide. We have the reactors and what is marked in red, are the reactors that are in operation, and the ones in blue are under construction and they are in these sites. If you draw a circle here, you can find the centre of the circle, which is somewhere here. The radius is typically over 800 kilometres because this is the coal pit of the country and in nuclear power stations today economics work at distances that are a little over 800 kilometres from the coal pit.

Now, let's get back to the back-end of the fuel cycle. This is one area that we wanted to emphasise right from the beginning. Through

reprocessing plants in Kalpakam and Trombay we have been using this spent fuel reprocessing to get plutonium out of it. Because we thought of a closed fuel cycle, reprocessing is a must for us. Supply of fuel to the fast breeder reactor, which is the second stage of the Indian nuclear programme, comes from this reprocessing. We have also been operating a vitrification plant for high-level waste on a regular basis. Here is the picture that shows the vitrified or rather the liquid material that is coming out of the pot to get vitrified. This is the plant that we have in Trombay.

So the thrust area of development today is the multi-component reprocessing of thoria based fuel (uranium, plutonium and thorium based streams). These are some of the areas that we are working on. I just want to remind you of what I mentioned earlier about the minimization of the waste burden. In this plot, you have the ingestive radio-toxicity index on the Y-axis and the time after the shutdown in years on the X-axis. If you talk of a once-through fuel cycle, you can see that the toxicity level is quite high. Coal also has a toxicity level and that is indicated here.

So the once-through fuel cycle will have a very extended period of toxicity - it is a thousand years. In a closed fuel cycle, where plutonium is burnt in the fast reactor, it comes down very drastically and it comes very close to the toxicity level of coal. If you have further incineration with an accelerator-driven sub-critical system, you can reduce it down even below the radio-toxicity level of coal.

Since open and closed fuel cycles have become a topic for newspapers, it is useful to understand the physics of it a little more. What we have from the mining of uranium is the processed fuel that goes into the nuclear reactor. In some countries, the philosophy was that the spent fuel would be put into a waste disposal site in a deep geological repository. Essentially, you are taking out uranium and you are creating a plutonium mine. The plutonium in the repository has a half-life of over ten thousand years.

We thought this was not proper for the environment and we wanted this spent fuel to cycle back into the next-generation reactor, or even into the same reactors. We can then burn the fuel – incinerate the fuel – and get even more energy. This has a tremendous advantage because, as I mentioned, uranium contains only 0.7 per cent of U235 and 99.3 per cent of 238. When we do this recycling this U238 part gets utilized and we can get the maximum energy out of the whole system.

These slide shows you the three-stage plan that is often talked about but rarely elaborated so nicely. This is our first-generation reactor, which I just now mentioned – the Pressurised Heavy Water Reactor. Natural uranium is the input. It delivers as output the depleted uranium, and plutonium. And, of course, it gives electricity. But with our limited resources of uranium, we cannot build up our whole system based on this. So power generation will be there in the PHWR, and we are building an inventory of plutonium out of the spent fuel from these PHWRs.

With this inventory, we will be having Fast Breeder Reactors in which the more and more plutonium that we burn, we generate higher amounts of plutonium, and with that breeding, it is possible to increase the total inventory and expand the power program. We can go right up to about ten thousand megawatts of capacity with the PWHR but with Fast Breeder Reactors we can produce about 50 times more power and the power program can expand.

Then comes the third generation reactor which is Uranium 233 fuelled. Uranium 233 is not a naturally occurring nuclide. It can be produced only by irradiation of thorium. Then we get uranium 233. Once we get thorium into the form of uranium 233, we can get electricity. In our sustainable power program, whatever be the level that we have achieved through the second generation, we can sustain it for centuries more by using thorium. But there are many technological obstacles. I wouldn't say that these are very trivial, but this is where the path lies. This is what we have decided upon, right from the beginning.

Here is our present situation – 13 operating reactors, five reactors under construction with several in the planning stage. In fact, today, these five reactors (two of which are being constructed with Russian collaboration), I think we are the country with the largest number of new reactors under construction. In fast-breeder reactors we already have twenty years' experience of the 40-megawatt thermal fast-breeder test reactor; we are going towards the prototype fast-breeder reactor, which is 500 megawatts and is under construction. In this slide you see 530 Gigawatts is the power potential compared to the 10 Gigawatt power potential for the first generation reactors.

Then it is possible for us to go for the thorium-based reactor and here the power potential is very large, and the availability of an accelerator-driven system can raise the power potential even beyond this.

Just to recapitulate the major highlights. Our reactors are among the best performing in the world. We have the largest number of reactors under construction. With all this why do we need help from outside? As you see our per capita energy consumption today is there in this plot. The USA is here, the OECD countries are here and India is here. So India, in 2050, by our calculations, would typically need about 6000 KWH units per capita. This is a reasonable value. It is not to the US standards but even if we take this lower value, we need to have a tenfold growth in electricity. Tenfold growth in electricity is not a small job. For this to happen, it is clear that at least 20-25% share of that electricity has to come from a nuclear resource. So this is really a very big challenge.

This is the present scenario. In the present scenario 3360 Megawatts is the installed nuclear capacity. We have five more reactors coming up, and that will take the installed capacity to 4780 Megawatts. Two more light water reactors being constructed at Koodangulam (these are Pressurized Water Reactors or PWRs) will take the installed capacity up to 6780 Megawatts. I am absolutely sure this is going to happen in a couple of years' time. Then we have the Fast Breeder Reactors under construction, so this adds up to 7280 Megawatts.

Then we come the projects planned till 2020. Out of those, we have eight PHWRs of 700 megawatts and four fast breeder reactors of 500 megawatts each. But these too depend on the further mining of uranium. The PHWRs of 700 megawatts will come up only when our mines are open and more and more of uranium is mined in the country. But this is sustainable with our own uranium. The fast breeder reactors come from our own resources of plutonium. The AHWR comes with our own resources. But these light water reactors – six of them with a capacity of 1000 megawatts each – which are being planned are supposed to be imported. This depends on the Nuclear Suppliers' Group allowing this import to occur into our country.

Finally in 2020 we can get to 21180 Megawatts. But this is too small a figure and that is the issue. Can we increase it through international collaborations? In the Fast Breeder Reactor, we have 20 years experience on the Fast Breeder Test Reactor (FBTR) that we are successfully operating with mixed uranium carbide and plutonium carbide fuels. We have reached 150,000 megawatt day per tonne, again a kind of a world record, without a single fuel-pin failure.

We have also reached maturity in the molten sodium technology. The FBTR fuel discharged at 100,000 MWday per tonne has been successfully reprocessed. This is the first time that a plutonium rich carbide fuel has been reprocessed anywhere in the world. There is adequate plutonium inventory in spent fuel to begin the construction of a commercial 500 Megawatts Fast Breeder Reactor (FBR) that started in 2004.

What are the prospects for the growth of nuclear power through fast reactors. The initial growth is supported by plutonium from the PHWR. During this time, metallic fuel has to be developed. The present oxide fuel does not have a very good breeding ratio. The doubling time is large. That doubling time has to be reduced by introducing metallic fuel, and this development process is now going on. With improved breeding ratio using metallic fuel, the doubling time will be reduced, and we can then have a faster capacity growth.

But all this is time consuming and that is the big problem. So we have been talking about international collaboration and the Indo-US dialogue on nuclear energy has started. A few significant events have happened in the last couple of years. It first started with meetings between the Atomic Energy Regulatory Board (AERB) and the US Nuclear Regulatory Council (USNRC). Several of these meetings have happened and Richard Meserve the Chairman of USNRC visited us. You can see that he has mentioned that they had an interesting briefing on the extensive upgrades that have been undertaken or planned. He also says "It is clear that your action in improving safety is parallel to activities in the United States." So here is recognition by USNRC that our safety system is as good as theirs.

So we are in this process. Then there are many scientific collaborations. There is one example I can give on the R&D collaboration in accelerator physics and high energy physics. As you can see there are many items that are identified by a Memorandum of Understanding. The Institutes that are going to participate in this collaboration are also listed.

So as I explained to you, these magenta bars show our planned growth today. Demand is very high. From 20,000 megawatts, by 2020, can we go to 30,000 or 40,000? Or even 40,000 in the next ten years? So this is just a plot of that type, which is a kind of wish list for us. Is it possible for us to get there? With our own resources, it is not possible for us to take any of these paths. With international collaboration, there is a possibility.

Let me now just give an example just to see who gets the benefit in international collaboration or cooperation in nuclear technology? I have two slides. This is the advantage to India. What is our advantage? We will have a faster build up of our power generation capacity in the next two to three decades. I am not talking of capacity after forty years. After forty years using our indigenous resources, will get the same result. We can also induct large sized power plants (1500 Megawatts plus) into our system. Today our power plants are

540 megawatts; we can raise it to 700. With international collaboration, we may be able to jump to 1500 Megawatts today.

In this context, I just mentioned to you that the United States has not built a nuclear reactor in the last 25 to 28 years. So the United States does not have anything to offer immediately. But there are countries like France and Russia. France has a 1500 or 1650 Megawatt plant ready that they are selling; Russia has a 1000 Megawatt and there are announcements that they have even a 1500 Megawatt Pressurised Water Reactors (PWR) available today. So if one wants to induct this kind of large sized plants, the two countries that can really give it are Russia and France. But everything depends on the clearance from the Nuclear Suppliers Group.

This will lead us to PWR technologies that are extremely important for us. We have only PHWR technology. In parallel, if we have PWR, then our whole technology as well as industry growth will go in a little different direction. Import in the initial period, followed by indigenisation, and vendor development can fuel industry development. Reactor pressure vessel development is also possible within the country.

Uranium enrichment, which is now being done on a somewhat pilot plant scale, can be done on a commercial scale. We can import fuel (yellowcake) that can be supplied to Indian PHWRs. This is yet another point which is rarely mentioned. We do not want to go entirely into PWR technology but want to have a parallel growth of PHWR *and* PWR and this PHWR can be fuelled by importing yellowcake and not processed fuel. We want to take something like yellow cake (magnesium diuranite or ammonium diuranite) and from there we can process fuel. With the growth of the PHWR program with imported uranium, we can have a capacity growth of as much as 1000-2000 megawatts per year that can be supported by Indian industry. So here we are not talking of importing any finished product. We are only talking of importing the fuel material. From there, we can have our own growth.

What is the advantage to the world? I think Indian expertise in PHWR technology can be made available to others. This is very important. We can make small sized plants of 200-500 Megawatts that will be suitable for countries initiating their nuclear power programs. There are a large number of countries who are interested in that and we can export. Today, again, we can't export because of NSG.

Many countries like Canada would like us to share our experience in operations and component replacement. We can provide them that. Export of fuel, structural materials and heavy water are all possibilities. India plays a leading role in Fast Breeder Reactor technology development. We have taken the lead. We are now the only country running a commercial fast breeder reactor and after a few years we may be the leaders in the world to deliver this technology.

It is also possible for us one day to become the leaders in Thorium fuel reactors, in which the other countries have not shown interest. It is possible for us to develop, and disseminate knowledge on these to other countries. One point that is extremely important for us to remember is that the price of fossil fuels in the international market will be essentially determined by the Indian energy demand. Because when 1.5 billion people having something like the per capita demand I have just indicated, very large electricity consumption is required. Our economic growth is bound to happen and we will pay any price for fuel. If we pay any price for that, the world fossil fuel prices will be essentially determined by us.

So if we can keep our fuel and energy costs low, it is an advantage to the world. It would save a significant amount of the Carbon dioxide burden. Finally, we can also make an important contribution through radiation technology in healthcare, agriculture and food preservation. I will jump a few things. We have many concepts of innovative reactors. One of them is the Advanced Heavy Water Reactor (AHWR). I will not go into the details. If there are further questions, I can come back.

Then we are talking of nuclear energy in the hydrogen economy. This is something that is extremely important. Many countries are interested in this and here again we are interested to participate with others to develop a substitute for petroleum. And that is possible only when you can get hydrogen. Often we make the mistake that hydrogen is a source of energy. Hydrogen is not a source of energy. Hydrogen is only a carrier of energy, just like electricity.

So we have to make hydrogen from something and that something should not be hydrocarbons. We want to make hydrogen from water. Only then is it possible to have a sustainable energy supply for fuelling internal combustion engines. That is why it is important for us to get into hydrogen. We have just started the work and here again international collaboration is going to be extremely profitable.

There is one more thing that I want to mention. The simultaneous presence of two reactor systems - the PHWR and the PWR - will make Indian PHWRs cost-competitive when compared with imported PWRs. In fact, we can say that we can be cost competitive even by today's standard. But if you take imported fuel, our PHWR will be cheaper when compared to the best PWR anywhere else in the world. So this kind of a cost competitiveness will drive both the systems to work more and more efficiently.

There are also options for the fuel cycle. The spent fuel of a PWR, can be fed as the fuel for a PHWR. There are different schemes. One scheme is to use enriched uranium in PHWR for increased burn-up. An early introduction of thorium for in-situ conversion and burning are also possibilities in the fuel cycle. This will really open up the possibilities of very big changes in the scenario. Finally the growth in plutonium inventory will result in a faster growth of fast reactors. There are many challenges ahead and exploration is the biggest challenge for us today. What I am showing here in this slide is what is called Reasonably Assured Resource (RAR). This is the estimated additional resource. There are good possibilities of finding additional large deposits within the country. Unless we have our own resources

we cannot dictate terms. That is possible if we can get our exploration activity going and for that geophysical tools are needed. We are developing electromagnetic aerial survey tools. We cannot buy these from abroad because of restrictions.

Development of the fast reactor fuel cycle and development of thorium fuel cycle are other challenges. The development of the thorium fuel cycle is particularly challenging because of an extremely difficult step of reducing the uranium 232 content (which is present in U-233) to a level of 10 ppm from a 1000 ppm level. These materials are extremely gamma radioactive and so are their daughter products. So unless this separation is possible the thorium fuel cycle cannot be developed.

So there are many big challenges on the path. These, I would say, are technological challenges. We are sure that we along with our next generation will meet them.

The other major challenge is to use molten heavy metal and salt as coolants. We are now working at higher and higher temperatures. Reactors will not work on steam or steam temperatures like 300°C. They will work at 1000 or 1000+ degrees temperature. Heavy metals like lead, bismuth or molten salt could be used as coolant. This is again new technology. The United States worked on the molten salt reactor development (a very nice concept) years back, in the 60s. It had been abandoned. Today again there is a revival of interest in this kind of concept. Online removal of fission products and in-situ breeding are some possibilities.

This is R. K. Laxman's cartoon in 1957, when Nehru formally inaugurated the DAE establishment and this is today's situation, when we have complete mastery over the fuel cycle. PHWR operating efficiencies exceeding 90%, fast reactor development, embarking on commercial fast breeder reactor development and widespread use of radiation and isotope technology are realities today.

We call it ‘winds of change’. I finish with my quotation from Mahatma Gandhi “I do not want my house to be walled in on all sides and my windows to be stuffed. I want the cultures of all the lands to be blown about my house as freely as possible, but I refuse to be blown off my feet by any.”

Thank you very much.

Dr. Kasturirangan - *Prospects for Indo-US Civilian Space Cooperation*

Thank you, Chairman. I will be rather brief. Even though 15 minutes is rather short I will try to make it in 15 minutes. What I propose to do is to give you a little overview of the way the space program has evolved. These have ramifications on the discussions that we have on the collaboration with the United States. After the evolutionary part of it, we will also look at the current state of relations that we have developed in space with the United States in the recent past. Based on that as well taking into account the present level of discussions and their outcomes and the willingness of both the parties (to the extent that we are able to make some judgments on it), we would make certain projections about the future.

These projections are necessarily going to be not too speculative. Nor are they going to be too ambitious. They would be in conformity with the spirit of discussions that is currently taking place between the agencies. From the US the agencies involved would of course be the National Aeronautics & Space Administration (NASA), the National Oceanographic & Atmospheric Administration (NOAA) and some other agencies including the State Department. From the Indian side, the agency would be the Indian Space Research Organization (ISRO). In the later part of our discussions if there are any further questions some of my colleagues from ISRO are here and will try to clarify these.

Space, as you may know, completes 50 years since the launching of Sputnik on October 4th next year. The International Astronomical

Union and the United Nations are looking into organizing some special events to celebrate. As most of you know, Sputnik was followed by Yuri Gagarin's manned flight and Alan Shepard's flight as well.

As you can see space has evolved from these early beginnings. When we try to understand what space has done in the last fifty years one area of great impact have been scientific missions. Scientific missions have made major breakthrough in looking at the high-energy component of astronomy and in enhancing our ability to look at the earth and its environment. Forays into planetary exploration have also greatly added to our knowledge.

On the other side, you have telecommunications, which can be point-to-point, point to multi-point or multi-point to multi-point communications and broadcasting satellites. Navigation satellites are also finding new applications in areas like air traffic control. India has contributions in science through scientific missions like the AstroSat and Chandrayaan Projects. The INSAT series represents a major contribution in telecommunications. The IRS series of remote sensing satellites and the Kalpana series of weather satellites use the synoptic perspective from space and make a major contribution towards managing natural resources and the weather. Expendable launchers like the PSLV and GSLV represent Indian contributions to Space Transportation Systems that complement the re-usable vehicles like the American space shuttle and the Russian Buran. Though the Buran has been shelved the American Space Shuttle is still operational.

This gives you a broad kind of a scenario on how space has evolved over the last fifty years. Of course there is this question of man and space – man landing on the moon as well as the work currently going on in space habitats - which would provide a permanent presence for humankind, both in the near earth orbits and ultimately in other planetary systems. Of course, China has been the most recent entrant into the area of manned space flight.

Now, if you look at how the space has evolved in India you can see several phases. The first phase (between 1963 and 1970) was what we can term as the capacity-building phase. Capacity building was primarily to develop human resources, to create a certain level of infrastructure and to conduct some meaningful experiments. These activities logically transitioned into phase two of the programme, going into what can be termed as proof of concept projects. The proof of concept projects did not stop with capacity-building or scientific exploration but went into an application domain to actually demonstrate the efficacy of a space system. Projects in this phase tried to address key questions with regard to the role of space systems in meeting supplementing or complementing services provided by conventional systems.

The third phase has been the experimental era, where we try to do an end-to-end kind of an effort, like the Bhaskara remote sensing satellite and the Apple communications satellite. Satellites became an important component of the experimental era. In phase two, satellites were never built but they were a part of the plan. The definition of what the satellite system should be came out of the experience of Phase two, which then fed into the experimental systems in Phase 3.

Experimental systems are characterized by low investments, short time frames, an ability to demonstrate a certain capability and to develop hands on experience on an end-to-end basis by working closely with the users. These are the four characteristics of the experimental era. This phase proved that certain capabilities are extremely useful for the country in the context of its developmental status and in turn took us logically into the next phase - the operational era.

The operational era is what we are witnessing today. The Indian Remote Sensing Satellites, the Indian National Satellite Systems and other systems like that provide routine services to the country in a variety of domains such as communications, broadcasting, remote sensing, meteorology and so on. The most recent entrant into this operational domain is the plan for getting into navigational systems.

The current operational phase also includes Phase five, globalization. This involves extending the space capability to working with several communities across the world that are engaged in space efforts. It also involves using the capacity and the capability that we have built up over the years into what we call a commercial domain to the extent that they could be commercialized.

This represents the five phases of evolution of the Indian Space Programme. What I am showing you here is of course, the first sounding rocket launched by India. This was the first effort to launch a rocket, and this particular rocket was a US supplied Nike-Apache rocket. The experiments carried out were for sounding the upper atmosphere, to look at the magnetic fields and things of that kind.

We now go into the specific role that the US has played in these five phases through which India's space program has evolved. If you look at Phase one - the US role in the capacity-building phase – you look at the establishment of the Thumba Equatorial Rocket Launching Station. The US helped with the supply of sounding rockets and of certain instruments that were flown like magnetometers. These were given as a part of the initial capacity-building phase in which the US played an important role.

To establish capabilities in remote sensing through flying instruments on aircraft they provided film systems and gave other help for taking aerial photographs. ISRO engineers were trained at the Massachusetts Institute of Technology and the Lincoln Laboratories. This was primarily aimed at system and configurations studies on the required capabilities of a communication satellite for meeting India's development needs.

ISRO engineers and scientists also got trained at the Willow Run Laboratories at Michigan in techniques related to remote sensing. The United States also gave us on a permanent loan (they call it permanent loan because they cannot give it to us for free) a ground station that was used at the Physical Research Laboratory for

receiving satellite signals for an ionospheric survey experiment. You can call it a topside sounding of the ionosphere. These were all a part of the US contribution to early capacity building. Their contribution was quite significant.

In Phase two, which I said, was the phase that provided proof of concept, the US role was critical in both communications and remote sensing. The first major initiative in which US help was critical was the carrying out of the Satellite Instructional Television Experiment (SITE). The US moved their Advanced Technology Satellite (ATS 6) from the Pacific to the Indian Ocean to conduct one of the largest sociological experiments ever carried out in the area of developmental communications.

The satellite based developmental education programmes were meant to help agriculture, environment and many such things. 2400 villages participated in it and there were something like 200,000 rural people who benefited from it. This really paved the way for the early definition of what an INSAT satellite should be. So here we used the Advanced Technology Satellite to try and reach developmental education to rural India.

The uniqueness of this satellite, especially the power levels at which this particular satellite was beaming signals, was such that with a chicken-mesh antenna of hardly ten feet diameter one could establish a ground system. This was at that time the most apt system on the ground to work in the rural areas. The US built ATS 6 was also probably the most powerful satellite ever built at that particular point in time. So they moved it – NASA moved it – and we worked with this particular satellite for one year.

The second component of the cooperation in phase 2 shown in the next picture is remote sensing. In this area too the US provided substantial help to establish what a remote sensing satellite can do for the country. The US pioneered remote sensing from space by establishing an operational system called the LANDSAT system. The

US gave us the entire coverage of the country in terms of LANDSAT imageries, which was then put to use by several users in the country in areas such as hydrology, oceanography, agriculture, forestry and geology. In many of these areas, these kinds of images were used for the first time. The US also supplied the necessary technology for establishing a ground station at Hyderabad for receiving the signals from the LANDSAT satellites. This is the Hyderabad ground station that was established with support from the United States in Phase two.

In Phase three we were building satellites like the Aryabhata, the Bhaskara and the Apple satellites. In parallel the development of the SLV 3 rocket was also taking place. This phase was dominated by procurement of components and materials that were used in the design and development of our experimental satellites and rockets. One of the important features of the early phase of the Indian space program has been the cooperation in the procurement of various materials and components.

Indian engineers were more oriented to the western line of technology development, both because of the fact that you have familiarity with such systems and because of the availability and cost competitiveness of such systems. US components and materials therefore implicitly served as an impetus to orient the Indian Space Program into a western mode of working. The US also helped in conducting configuration studies of INSAT. This came out of the SITE experience and studies were carried out at both MIT and the Fairchild Company.

In the next picture, we see that in the operational phase, we bought four INSAT satellites. We found that the time frame for India to build its own INSAT satellite system was inconsistent with the needs of the country for establishing a satellite-based communication and broadcasting system. The first four satellites in the first-generation INSATs were therefore all procured under a commercial contract with Ford Aerospace - a US based company. These first-generation INSAT satellites really ushered in the operational communications

era in India. Forty engineers were a part of this procurement team. Indian engineers got hands on experience with the company in the design, development and testing of these satellites.

Three of these satellites – the INSAT 1-A, 1-B and 1-D were also launched with US launch vehicles. The Delta rocket and the shuttle were both used for these launches. The US continued to supply components and materials.

The next picture shows the final phase – the phase of globalization and commercialization starting from 1990 to today. As a first step in the commercialization of our capabilities in remote sensing we signed a major agreement with an American firm, the Earth Observation Satellite Company (EOSAT). They agreed use their extensive experience in marketing remote sensing data across the world to help India market imagery from the IRS series of satellites. So Indian IRS satellites became available as data sources across the world. Ground stations were established and the contract was extended through a second company Space Imaging when EOSAT merged with other companies. By 1995, we had a ten-year agreement. Today this has resulted in something like eighteen to nineteen ground stations across the world, which receive data from the Indian Remote Sensing Satellite series including the most recently launched Resource-Sat. These are all a part of an agreement with an American company that has been going on well as a commercial arrangement.

Another major milestone in Indo-US cooperation in space has been an agreement that was signed in 1997 that deals with earth and atmospheric sciences. The importance of this particular agreement, I should say, was that until then, there was a serious problem in working together with the United States in several areas of space other than the ones that we mentioned. In fact, we wanted to expand it, but there were difficulties.

One of the irritants in this area was the real time supply of weather data from the INSAT satellites. Prof. Rama Rao who is here with us

today, was then the DST Secretary. He worked very closely with us in trying to see how we could make available the INSAT data. Ultimately we succeeded in convincing various Indian agencies on the need for this agreement. This agreement also enabled us to get data from the US Defence Meteorological Satellite as well as data from the advanced instruments flown on the NOAA satellites. This data has been critical for getting a global view of the weather and for building regional models of the weather that is very important for us.

More recently the supply of components and materials became limited because sanctions were imposed on ISRO after Pokhran. Both sides started taking a re-look at this in 2001. The US President and the Indian PM initiated some discussions on civilian cooperation in high technology areas. For the first time the US started loosening up a little in terms of components and materials. Finally, after five years of the lapse of the DST-DOS-NASA-NOAA agreement, we renewed this agreement for the second time. The US was glad to renew the agreement, which is now working well.

The next slide shows some observations, on how the program is working. We have the high technology cooperation, which has been initiated. The second thing is with respect to the next step in the strategic partnership, and I don't have to elaborate upon this. There was a very major conference that we had to discuss the various issues of the cooperation between India and the US in the coming years. This was a very major meet in Bangalore. We had something like 150 visiting scientists, government officials, company people, NGOs and so on from the United States who participated in this conference. The purpose was to identify specific areas in their respective domains where India and the US could strengthen their relationship in space. This first meeting on Indo-US joint cooperation in space took place in 2005 - last year.

Currently, the Jet-Propulsion Laboratory, John Hopkins University and the Brown University from the United States are interested in flying their radars and other kinds of instrument payloads on India's

first planetary mission Chandrayaan. There are also ongoing discussions on critical aspects of technology safeguard agreements. Many of you may be aware that safeguards have been a major irritant in Indo-US technology assistance agreements. This has also affected our relations. Discussions on these have been going on for some time. How we move forward on these technology assistance agreements and their related safeguards may well hinge upon some of the suggestions that would emerge from you at the end of this talk. If we can negotiate this well it will also lead to the United States loosening up its controls with respect to satellites that could be launched with Indian launch vehicles.

I would like to make some overall observations on Indo-US cooperation. I have already pointed out that the US did play a key role in all phases. In the initial phases it was the US who supported and had an upper hand with India being on the receiving side. Most of the time, we were getting support from them; we were able to get training from them. We were able to get these and even the know-how as well through the supply of components. In the current operational phase the relationship has been transformed into a mutually beneficial one. In the future commercial cooperation can even go beyond this.

In the next slide we see that we have been looking at missions which could be in the area of science, like Chandrayaan or it could be on applications as we will see a couple of slides later. Joint ventures are another area that could emerge. Sourcing components and materials is also a major area of cooperation. Finally, India and the US could also cooperate in policy making at the international level. In fact, there are many areas in the policy domain (international treaties, international conventions) in which there could be tremendous synergy between the US outlook and the Indian outlook, because of our own stature and maturity as a space power. This could serve to bring us together.

Other areas where we could share common interests could be management of space traffic disaster management, the exploitation of lunar and planetary sources and the protecting of space objects against interference.

Irritants have always been there between the two countries and these have had a major impact on relations. Notwithstanding these irritants, we did achieve quite a lot by working with them. You had a Missile Technology Control Regime (MTCR) that came in and started applying brakes on components and materials. There were other stricter efforts to control the flow of materials and technologies to India. But I should say that this by itself never stopped the US from supplying materials. US companies were allowed and still do export materials and components to India. Some of them are critical, but they did allow this.

In 1992, the US imposed sanctions on ISRO and Glavkosmos, primarily because we went ahead with an agreement with Glavkosmos of Russia (then the USSR) for getting cryo-stages and the technology for building cryo stages for powering the upper stage of the Indian Geosynchronous Satellite Launch Vehicle (GSLV). The United States objected to this deal because it was in violation of the Missile Technology Control Regime. There were a lot of arguments and counter-arguments about the logic of this whole thing because nobody uses cryogenic systems for missiles. But the fact remains that they did interpret the MTCR in a way that was convenient for them and put a brake on the supply of the technology from Russia.

Subsequently, in 1998, when BARC and the Atomic Energy establishment went ahead with their nuclear explosion, ISRO was the one that was targeted. When we said that when Atomic Energy does something, why we should be punished for it, we were told that the US will impose sanctions on those entities that will make India notice that there has been a sanction. They said that ISRO is the right organization on which we can apply the sanctions because it

will have an impact that will be noticed. They said this from the State Department. So you can look at the way they work.

So we don't have to assume that what Atomic Energy will do tomorrow will not affect space and we can be insulated from their actions. We are certainly affected and there are some connections. That happened at the State Department level, not here.

I would like to make some observations on the sanctions imposed on the space program. They had no major impact. I don't want to go into the details of why there was no major impact. But I should say that what Mr. K. Subrahmanyam has been mentioning all the time, the question of strategic planning and strategic thinking is very important. Strategic planning and strategic thinking are important components of the space program that has been developed to a very high level of sophistication. We think ten years ahead on what could go wrong. We also think about the implications if cooperation breaks down then and look at our options and our alternatives. This has become an integral part of our work just like the worries that you may have about space system failures and the kinds of work around plans that would be needed to retrieve the mission. A space system has a failure analysis board. This failure analysis of a space system has been reasonably well transferred into a well-grounded system mode of thinking. The system thinking culture including the ideas of reliability, failure modes and contingency plans have influenced us in working cooperatively with the United States. I think this kind of thinking is very important in many other areas too.

The European policy of space autonomy has also helped India. India has also made significant progress in establishing indigenous capabilities in critical areas. These will become important in the future in terms of how we may be affected by sanctions. If you have to apply sanctions, it has to hurt us. If you have to hurt us, then we should be denied something. What are the kinds of things that are available today that can have such an impact. Not too many things are available. Therefore it makes more sense to cooperate rather than put all kinds

of brakes. I think that particular era – the sanctions and controls era - has passed. That is what I want to convey as a message through these comments.

We now come to the future prospects. The core program of ISRO, which is on the social side (communications, education, healthcare, remote sensing, navigation), I think India is going to have a certain amount of autonomy. What I mean by autonomy is that we will go alone on most of these systems. The launch vehicle has already reached a level where we do not have to depend on technologies from outside. These will have a very high level of autonomy when it comes to going alone.

So there is a core program of ISRO that will be driven by national interests and we will go alone in this part. But what is important is that on some of the technologies that go into these core programs, we will continue to work with the United States like in the past. Probably we would want to look at how we could strengthen this part of it for reasons of quality, sophistication and cost-effectiveness.

Programs involving cooperation with the United States (the expansion component of the programme) will be related to planetary exploration, environmental missions and future space transportation systems. This would be almost exactly along the lines that Anil Kakodkar mentioned yesterday about the ITER project where the international community has come together. There could be similar examples in space. For example areas like hypersonic flights, reusable space transportation systems and air breathing concepts for propulsion systems are likely to become important 25-30 years or even fifty years into the future. There are good possibilities that we would be able to work together in such areas.

The last area is related to the use of the space station itself. India has not been a partner in the space station, but there is now the possibility of getting some time in the space station for conducting experiments. We could even work with them in trying to create a

module that could be fitted onto the space station in future, before going on our own autonomous way for building a manned habitat in space.

Finally, commercial cooperation is another area of promise. Ventures like the IRS initiative in global marketing for building cost-effective systems that address global needs can be thought of. We have been discussing such ideas with companies like Boeing for marketing launch vehicles like PSLV. This would allow US launcher companies to have our rockets in their manifesto. Joint ventures where we bring in our expertise in building satellites like EduSat for the benefit of the developing world is another possibility. There are a billion to two billion people who are untouched by the benefit of space. Here we have proposed to the United States that we could work together in trying to bring the benefit of space to these untouched two billion people. There could also be a market in it, and as C.K.Prahalad has said, there is enough room at the bottom of the pyramid. Corporate interests could influence the formulation of international policy. I did mention something about this. These are other areas -commercial cooperation and joint ventures - that we could be working on together.

Finally I would like to say what the erstwhile NASA administrator said in 1995, when we met together in Washington at the Indian Ambassador's residence. He made this very interesting observation to the Ambassador and me that the US, India and Japan could be natural partners in the 21st century space endeavour. I see no reason why this cannot be so. So far all the indications are that this could certainly happen.

At what level could this happen? Of course one part of it is our own strategic thinking and strategic maturity. To work with them, we have to first safeguard our interests. But I have found that we can certainly safeguard our interests while working with them. The US is a fountainhead of technology and let us not overlook this aspect. Certainly, working with them has many advantages. The MTCR and related arguments often come in when discussing cooperation with the US. We have given our own reasons why the MTCR should not

be a problem. We have shown the same moralistic posture as them with regard to our adherence to the MTCR principles. We have also told them, in our own negotiations, that if we had not applied MTCR to ourselves, we could have made billions by providing the technology we have developed to other countries. This essentially means that we would have never come to you for high technology support or any cooperation. We could have, rather, bought it from you, because I know that there is a price. When you ban something, there is an extra price that you have to pay for it. We could have easily managed it.

This kind of arguments have been very well articulated with the United States State Department, and we have done our share of it as far as space is concerned. Ultimately, I think that we should also mount a certain level of think tank work between India and the United States. It is not sufficient that we, in a closed room, debate amongst ourselves and then try to come out with various possibilities. I think it is time that the think tanks there and the think tanks here work together to look at solutions that could be mutually beneficial. We can certainly safeguard our interests and also ensure that it is part of our own plan.

All I have to say before I conclude is that we have been a little proactive in trying to move forward in planetary and other explorations simply because all these countries look for dates and they put artificial cut-off dates. If you are not there where you should be by that artificial cut-off date, I think you are out of that system. Then, in the view of the international community you have to fight your way in. This can be a very difficult and painful process. If we can stop that from happening by working with the same devils who have been working against us all this time, I think that is the best way that we can squarely meet the challenges of the 21st century.

Thank you.

Chair: Thank you very much, Dr. Rangan. I now have pleasure in requesting Prof. Narasimha.

Prof. Roddam Narasimha: Mr. Chairman Dr Rama Rao, Dr Kasturirangan. Thank you for inviting me here to speak at this meeting. I'll try and see if I can stick to fifteen minutes.

Now, this meeting is about the changing contours of Indo-US relations. Having heard presentations on nuclear technology and space, I see that I have been asked to speak about high technology, but that's a very wide sector, and I certainly won't be able to do justice to it, both because of shortage of time and lack of competence.

But there are two areas where I do want to say something. One is aeronautics and the other is computing. As time is short, may be I will just say two sentences about computing at the end. Two years ago, we held a meeting between NIAS and a US team led by the National Academy of Sciences, to look at counter-terrorism in particular. The volume that we prepared on that occasion, will I hope come out fairly soon, perhaps later this year, so I will not talk any more about it.

With regard to aeronautics let me spend a few minutes on how it has evolved over time. Now talking about Indo-US relations in aeronautics is relatively easy, because for a long time there was very little happening. If we go back to the 1940s, when the industry was set up, Hindustan Aeronautics (originally called Hindustan Aircraft) was a private company. There was a fairly large American presence at that time. In fact, it might come as a bit of a surprise to people here who don't know the early history of the aeronautical enterprise in India that the first leaders of Indian R&D were people who went to the United States for education based on scholarships given by an American engineer who was here at HAL during the Second World War.

In the 1950s Indo-US relations had already become somewhat volatile, and the contours of the relationship were well described by Mr Subrahmanyam yesterday on the two occasions when he spoke.

It looked as if by the 1950s and 60s there was little of any significance in aeronautics between India and US. The aeronautical equipment that India got - aircraft and the rest of it - largely came from Europe and Russia.

Europe was quickly seen as an unreliable supplier. We all remember - certainly people of my generation remember - the difficulties that India experienced in obtaining spares for the Ajeet and other aircraft during times of conflict. A few years later, as relations with the Soviet Union developed, the Soviets were seen as more reliable suppliers and the relations between India and the US as far as aeronautics was concerned had become really weak.

There is, however, a major difference between aeronautics and nuclear and space technologies in terms of the way that India has developed. This is that the licensed production of aeronautical equipment designed elsewhere in the world was possible in India. Such production was not always frontline equipment, but many aircraft have been manufactured that way in India. Though there was very little technology transfer, you can say that to some extent industry learnt some production technology from these projects. These projects were once again not from the United State but by and large from Western Europe and Russia.

The other big difference is that commerce has been a major factor in aeronautics. This has its good and bad points. The fact that certain products of technology have been commercially available in aeronautics has led to a different course of evolution in that field. Today, there is another big difference, and that is that there is, in the United States, a very large community of Indian origin that is very closely involved with various US aeronautical enterprises.

The turning point in these relations came after Mr. Rajiv Gandhi became the Prime Minister. Somehow, the chemistry seemed to go right all of a sudden. He represented a new generation with fewer political hang-ups. He was an aeronautical person and a technology

buff himself. He looked forward to the 21st century and it looked as if, for a short while, relations between India and the United States were going to improve substantially. There was a Reagan-Gandhi initiative that led not only to a variety of science and technology schemes but also to procuring a Cray super-computer for weather prediction. I am going to come back to that if I have the time to touch on computers at all.

But most importantly, from our point of view here, some agreements linked directly to the future of the LCA project were concluded in the 1980s. One of these was that the United States agreed to supply to India a small number of F-404 engines to power the Light Combat Aircraft. Other systems were also discussed, and by about 1998 there was some work going on in the United States on the flight control system of the LCA. In fact, the system was actually flying on one of the platforms in the United States at the time of the Pokhran II explosions. Pokhran II brought to a grinding halt all cooperation on the LCA. As we all know, on the same day on which the explosions took place, the team of Indian engineers who were working with this US company were told to go home.

So there was an abrupt end to what seemed like a developing relationship between the United States and India in aeronautics. This was a setback to the LCA project. It was also a setback to the Advanced Light Helicopter project, the Dhruv, because once again there was a problem about a power plant. Despite the setbacks, the programmes did not grind to a halt. Things were delayed somewhat, and we took a few years to recover from it, but of course, after that, the project development has gone on.

Now, let me come back to the major theme of this session and ask, What are the prospects? In my own view - in fact, I would echo what Prof. Rama Rao said - the prospects are excellent. But one has to add an 'if' to it. They are excellent only if - if and only if - both countries handle the thing well. This goes back to what Mr. Subrahmanyam and others have been saying - that we have to

have a strategy. We have to agree on what the ground rules of that strategy are. We have to be clear on what our objectives are. If we are clear on these, though there will be problems and hitches in between, I think the prospects are excellent.

Since 1998, the world has changed. Right now, without any further assistance from the United States, LCA prototypes are flying. From all the reports that we have, it's flown well, and supersonically. Several hundred test flights have been carried out. Wherever the envelope has been tested, it has met what has been projected for it. So in many ways, I think the LCA project has gone well. It doesn't mean that it's going to go well in the future, and in fact this can be a matter of major concern, but I will not touch on that right now.

Similarly, the Advanced Light Helicopter had also been set back by a couple of years because the power plant for it was not available after 1998. The project has since recovered from this setback and several variants of it have been certified for Army, Navy, Air Force and civilian use. It is flying, and under production

The other major development that has taken place since 1998 is that civil aviation in India has taken off spectacularly. Growth rates that we used to associate five years ago only with China are now characteristic of India as well. I won't touch on that a great deal because it is a matter of common everyday experience. The number of airlines, aircraft and flights in India has multiplied enormously and the fares have fallen. As for growth rates now, figures of 20-30 per cent are being freely talked about.

India has become one of the major purchasers of civil aviation equipment in the world today. The centre of gravity of civil aviation has been shifting eastwards for several years now, and I think that in the coming years this trend will become even stronger.

The other development that has taken place is that many companies in the United States have set up business in India now, to do research,

development and design. GE, of course, is a major force in Bangalore. Honeywell has a growing presence, and many others, like Rolls Royce, are trying to set up shop here.

So what is happening now seems ironic to me. For a long time, we have agonized in India that our R&D, our research, design and development in particular, have been weak. We have an enormous amount of self-inflicted criticism on the way that we have done this work ourselves. However, the same research and development scientists and engineers - the same ones we worked with in our labs - now start working for other companies at great financial benefit to themselves. It is clear to me, therefore, that the commercial value of the work that is being done in India has been vastly underrated, first of all by ourselves.

Looking at the way that developments have gone people usually take one of two extreme views. On one hand there are those who say that the policies that we have adopted in previous years have left us in technological isolation and that if we do not work with other countries this technological isolation will increase. On the other hand there are those who are afraid that working on projects with countries like the United States may lead us into becoming technology service providers or technological clients rather than people who are a major force by themselves in the world.

I very strongly believe that technological collaboration is possible without loss of strategic autonomy, provided an appropriate strategy is adopted. Let me just give two examples. Let's take the LCA. The future of the LCA depends on a mixture of proper management and appreciation of the economics involved and of course on technology. There are certain ideas about how this may be done. But what is relevant to this meeting is best highlighted by looking at the engine. We go back once again to the engine because it seems that, by and large, the LCA air frame development has gone very well, although it's taken time. There were maybe one or two problems with other systems but there is a somewhat larger problem with the engine.

The SA to RM, giving the Brahm Prakash Memorial lecture here in August 2005, said that a major cause for concern (I am quoting him) "has been the lack of success in the indigenous development of propulsion systems". He said that, in spite of the fact that we have large manufacturing infrastructure for license produced systems - and these include many engines made right here in Bangalore and in Nasik- we have had this problem. The problem includes aero-engines for both fighter aircraft and unmanned air vehicles, IC engines for tanks, naval propulsion systems and so on. He said one grey area in the LCA program is the Kaveri engine.

I think therefore that it is worthwhile trying to formulate a strategy that can be seen as beneficial to both the United States and India. One sign of what might happen is a recent statement made by the CEO of Pratt & Whitney who offered to join DRDO in a partnership for making the Kaveri a world-class engine.

The point here is about partnership. The point here is also about a world-class engine. Now, you may ask how that is possible. It is possible because there are industries in the world that are right now finding out that they do not have an engine of this class in their repertoire. India has spent a fair bit of money developing that engine and is, let's say, not far from getting there. But if you wanted this engine and we went about developing it entirely by ourselves, I think it will be done but it will take time. By that time technology may have changed.

If, therefore, Indo-US high technology relations are improving, one test I would say is whether we can work on the Kaveri engine as a joint venture, where a US company will also be interested in it as a product to add to its repertoire and we will be interested in ensuring that the joint development and certification of the engine can be completed within a time-bound schedule.

I take the LCA as only one example. In fact, there are other examples, but I don't have the time to go into them. So let me just state the

principles that we might adopt if we are looking at joint projects. I agree with Prof. Rama Rao that eventually, whether this is a success or not will be determined by exactly what happens on well formulated joint projects.

I believe that in aeronautics, the future lies in:

- public-private partnerships within the country - and that's a point I've argued elsewhere and so won't spend too much time on it,
- international partnerships like the ones that might take place between India and the United States.

It is essential to change the paradigm on which the aircraft industry has been moving in India. There are several reasons for it. One is wealth creation. If we do not turn these industries towards wealth creation, they will be unable to attract young talent. We are already losing them, and that loss will become more and more severe as time goes on. I also believe that we have to maintain our strategic autonomy in critical technologies. Otherwise we will degenerate into bit players in the world.

Thirdly we have to reduce development time cycles. The long, slow, steady policy that India has adopted in technology development will no longer work. We have to build on our domestic strengths; and these strengths are in fact substantial. The country now suffers from underestimating the strengths it has. Basically our human resources - our research and development base - are actually now considerable, and could be built up in an appropriate policy regime.

We have therefore to learn to exploit the opportunities that are offered by globalization, and those opportunities are vast. And I think we can do that without sacrificing our strategic autonomy.

How do we do this? We do this, first of all, by selecting areas where we want to go ahead for joint ventures and joint developments.

Without giving up a commitment to strategic autonomy, we have to loosen controls on joint research, design, development and marketing. We have to push civil aviation in a big way, extracting what you may call spin-backs from civil aviation into military aviation. We have to push offset arrangements, because we are now becoming major customers for civil aviation in the world.

Civil aviation in the world now is characterized by competition between Airbus and Boeing. Although there is much concern in the US about outsourcing, the outsourcing that takes place to India now is extremely small.

I personally believe that in the coming decades - if we do it correctly it can happen certainly in the next ten years, but may be even in the next five years - Indian aerospace in general and aeronautics in particular can be India's next big buzz like IT and BT and so on, because the resources are there. The experience is already there. We can make competitive arrangements with other major players in the world.

My fifteen minutes are up. I'll just say two things about computers. First of all, computers have now ceased being the major worries that they were ten years ago. If that is so, it is because of the major parallel computing efforts that were undertaken in this country. Now, none of these efforts has been commercially successful. So sometimes people criticize the parallel computing efforts in this country. However they have done one important thing - they have removed the country's vulnerabilities in terms of computing. This has been done at very little expense. Just the other day, we celebrated twenty years of the parallel computing effort in India at the National Aerospace Laboratories. I estimated that we had spent less than ten crores on the whole program but we have made ourselves invulnerable. It's well worth it. But on the other hand, if we join up with somebody now, we might be able to do things that we were not able to do till recently.

So let me conclude by saying that the prospects are excellent. We don't have to sacrifice our strategic autonomy - we can, in fact, actually gain. But we have to sit down and work out a careful strategy for doing it.

Thank you.

Dr. V. Siddhartha - Export Control and Technology Denial Regimes and their Implications for Indo-US Relations

We cannot get a full understanding of the fit of the technology component in the emerging dynamic of the US-India relationship unless we understand the geo-strategic context. That context has been provided by Shri K. Subrahmanyam yesterday both in his presentation during our conclave here and also what he said at yesterday's evening lecture. Further, in support what Professor Narasimha has just said, I will try to identify the necessary, but not necessarily the sufficient conditions to be able to fashion the kind of technology relationship that both India and the US could benefit from – a true partnership of co-equality, without India being drawn into becoming a bit player and a dependent on the United States.

My starting point is that a repositioning of India in regional and world affairs is now a geo-strategic imperative: It is not just a ruling establishment yearning. I think it necessary to re-iterate this point – and here I endorse what Shri K. Subrahmanyam said and has been saying for some time – because some political formations in this country have been voicing their apprehension that the emerging dynamic of the Indo-US relationship is being driven largely by the two hundred million middle class in this country which has a certain dual sentiment vis-à-vis the US, captured in the pithy title of a presentation that Jairam Ramesh – now a minister in the Union Cabinet – made several years ago to a US audience: “Yankee go home, but take me with you”!

Such strategic (re)positioning of India in world affairs requires an active strategy. It will not happen automatically. That strategy has to jettison India's historical posture of the mere reactive preservation of "maximum available autonomy at the lowest possible cost"; to quote from Professor Narasimha, who also noted in a different context: "The world will not leave us alone, even if we wish to be left alone". This point is poorly appreciated. Without an active strategy of repositioning, our new generation will inevitably be saddled with stultifying, anxiety-ridden *status quo* paralysis and global diminution in the face of the inexorable rise of a China, that is disdainful – if not contemptuous – of India, to the Number One world power in another thirty years or so, possibly sooner, particularly when it will have established a full-spectrum military and human presence in Space. (I will come to that again a little later.) The geo-strategic significance of this inevitability is still not widely appreciated in a significant segment of our elite.

The foundational elements of a repositioning strategy in geopolitical terms are: First, you have to grow rapidly to become a geo-economic pole in the globalised world economy. We moved about a decade ago from being G-77 non-aligned cheer-leader to G-15 co-player. Since then we have moved along to G-8 plus 3 – recall India was invited to the G-8 meeting in Scotland along with Brazil and China. Then later into the future, perhaps contemporaneous with a restructuring of the United Nations Security Council (UNSC) – although on that development there is still a question mark – we should be counted in a G-5+. Exactly how and when this will happen is still a matter of conjecture.

Second, India will remain a Nuclear Weapon State until nuclear weapons are altogether eliminated. (The opening preambular paragraph of our WMD Act, 2005 says that we are a Nuclear Weapon State).

Correlated with that is the third – again little appreciated – requirement: The acquisition of geo-military reach by becoming,

among other things, a military co-occupant of Space – until the militarisation of Space is ended. If you do not become such you will not get the military reach that you require to be a even a regional power, never mind a global one.

When the above three foundational elements are well on their way to irreversible achievement, the world will, perforce, invite India to be a permanent member of the board of “Global Governance Incorporated” – the permanent membership of the UNSC. The admission of India into permanent membership of the UNSC will also depend on whether we are able and willing to bear the economic and military costs of setting the ‘rules of engagement’ in the emerging global order – the real world of real power, that includes technological power – which latter I shall come back to in relation to what Dr. Banerjee said in his presentation. There are no free lunches.

Now, is the above understood in our political establishment? At one level it is. The following quote from the Prime Minister’s address on November 11, 2005 at the fortieth anniversary of the Institute for Defence Studies and Analyses is important to attend to because, while the imperative of repositioning of India in the world system was identified by his immediate predecessor, the Prime Minister recognized the technological dimensions of that imperative in his address thus: “I have said in the past that our security policy in the emerging global order must be based on three pillars. The first must be to strengthen India economically *and technologically*.” Note how technology is identified as an independent driving factor. It is not a derivative of economic policy – a point often not understood by lesser economists. “Second, to develop adequate defence capability making optimal use of modern *science and technology* so that we can effectively meet all contemporary challenges to our security.” This is the second reference to science and technology and its role in a country whose most pressing “contemporary challenge” to its security is terrorism. “And finally we must develop partnerships in strategic, economic and technological spheres, to enlarge our policy choices and developmental options.” Technology is again referenced

as an independent vehicle for the development of [international] partnerships.

It is of seminal significance in my judgment that technology is explicitly identified as an integral component of all three pillars of security policy as thus enunciated by the Prime Minister as an elaboration of what his predecessor had said with regard to the necessity for India to be repositioned in the international system.

I come now to the way in which the bilateral relationship with the US in controlled technologies has evolved over the past two decades. In summary, it went like this:

Post the Indira Gandhi-Ronald Reagan meeting at Cancun there was signed in November 1984 an Indo-US Memorandum of Understanding (MoU) for a sub-class of items and technologies whose export from the US is controlled under US Law. The ‘Cray’ computer was purchased for the India Meteorological Department under the terms of this MoU.

The US-led Missile Technology Control Regime (MTCR) came into force in 1987, Then in March 1988, the MoU implementation procedures were laid out in detail. Nevertheless the MoU was effectively dead after our Agni test in 1989 (and also because of Gulf War I). MTCR was further tightened after – among other happenings – the ISRO-DRDO link was revealed by (now President of India) Abdul Kalam in a Brahm Prakash Memorial lecture that he delivered in August, 1990.

New sets of “sanctions” were slapped after our 1998 nuclear tests. During 1999 – 2000 you had the Singh-Talbott dialogue that went into thirteen rounds. In November 2001 the PM and the US President met in Washington DC to agree on the partnership statement to “qualitatively transform US- India relations.” One of the means of qualitative transformation was the agreement to “discuss ways to stimulate bilateral high-technology commerce.” In 2002 India and

the US announced the establishment of the High Technology Cooperation Group (HTCG), the first such group set up by the US with any country. In February 2003, the US and India signed a “Statement of Principles on US – India High Technology Cooperation” and in July 2003 at the first meeting of the HTCG that took place in Washington an Action Plan was agreed upon that covered *inter alia* “Policy Review for Dual Use Exports”.

In August 2003 the US added “missile defence” to the earlier “Trinity Issues” of co-operation in Civil Nuclear, Civil Space and High Technology trade. The expression “strategic partnership” came into bilateral use by end-2003. It was in January 2004 that the Next Steps in Strategic Partnership (NSSP) were announced by the Prime Minister of India and the US President, to cover now the quartet of Civil Space, Civil Nuclear, “High-Technology” and Missile Defence.

On September 17, 2004 the End-Use Visit Arrangement document was signed. On September 22 the US notified a new licensing policy.

Periodically updated Indian export control regulations have been in existence for over a dozen years. They are called the SCOMET (Special Chemicals, Organisms, Materials, Equipment and Technologies) regulations. On 15 of July 2005, our Department of Commerce notified the NSG – MTCR concordant revised SCOMET regulations as one of the reciprocal steps that we had agreed to take under NSSP to bring our export controls in line with “international norms” without necessarily becoming full members of international export control regimes such as the MTCR.

On July 18, 2005, the landmark Indo-US joint statement announced “completion of NSSP”. By then the reciprocal steps that had been intended to be taken under NSSP had been taken by both sides, although there was one then-pending matter with regard to control over export to India of “NP2” items i.e. items controlled by the United States for non-proliferation (“NP”) reasons unilaterally, - i.e., outside of the Nuclear Suppliers Group (NSG) guidelines and lists. The

elimination of this control was effected in August, 2005 after NSSP was declared ‘completed’, when the US notified in its Federal Register (equivalent to our Gazette notification) removal of the licence requirement for export of such items to India. This regulatory detail is very illuminating of the effect on US policy of the potential size of the Indian market for US-origin controlled technologies, because one of the NP2 items is oscilloscopes – high-end oscilloscopes - widely-used in our telecom sector mostly made by the well-known US firm Tektronix. More than ten million US dollars worth of such oscilloscopes were imported into this country, even when a US export licence for these was required, over a period of about two-and-a-half years since the setting-up of the HTCG.

I now come to the mismatch between US intentions vis-à-vis Indo-US trade in controlled technologies and our understanding of those intentions.

The three strategic departments of Atomic Energy, Space and Defence R&D – commonly referred amongst the cognoscenti as “Trimurti” – were given to the impression that, subject to India taking firm legal and effective administrative measures to prevent unauthorised export out of India (known as “nuclear proliferation”), of controlled technologies imported into India from the US, or those that India had itself developed on its own. It is in US interests to enable a significant enhancement of India’s strategic autonomy, via technology-supply to Trimurti because such enhancement will serve US regional interests without threatening US global interests. Our belief and understanding was that high technology cooperation – with which the NSSP began – was about the US at least not impeding – even if it could not actively assist – India’s self-movement on the road to significantly enhanced strategic autonomy; albeit within the maximum allowable discretionary stretch of US law as made applicable, for example, to non-NPT, non-NATO US ally, Israel. However, for that discretionary stretch to be exercised by the US, existing Indian export control law and regulation needed to be brought into concordance with MTCR and NSG norms, as far as the items

controlled by those two regimes are concerned. This exercise was completed by mid-2005 and notified by our Department of Commerce three days before the July 18 joint statement.

The end-use verification “arrangement” document was signed between the US and Indian sides on September 17, 2004. The arrangement is applicable to any US origin item exported from US or re-exported from third countries. The arrangement includes verification of compliance with licence conditions and US Government officials have the right to inspect the exported item at the location in India where such exported item is actually being used. Entities under contract to GOI are subject to this arrangement. There are other post-shipment verification arrangements even at non-Trimurti locations. Clearly, these arrangements are vehicles for the extra-territorial application of US law and regulations to industrial activities pursued even wholly within India.

It is now apparent that our expectations from the NSSP were quite different from US objectives.¹ Trimurti’s experience of the end-use verification arrangement reveals quite clearly that for the US, high-technology cooperation means the following. “Let’s work our Export Control regulations so we can enable US companies to sell more dual-use high-technology to the Big Emerging Market in India, but now be extra careful: Apply US law extra-territorially so that these transfers do *not* contribute to enhancing India’s strategic autonomy”. In particular, make sure that these technologies cannot, by second-order diffusion – explicit or otherwise – get into Trimurti.

I thus now come to the last - or nearly the last – item of my presentation: What is the future trajectory of Indo-US trade in controlled technologies?

¹I was told yesterday by Dr. Kakodkar that they (i.e. DAE) never had any such expectations.

The Indo-US joint statement of July 18, 2005 recognises that India has a military nuclear programme (implicitly accepting it as “legitimate”) and brings India onto an international platform of nuclear discourse as a “part of the solution” rather than as a “part of the problem”, thus enabling procurement of fuel for reactors without full-scope IAEA safeguards (but subject to what you heard yesterday from Dr. Kakodkar about civil-military separation etc.). Notwithstanding the Indo-US joint statement and any implementing arrangements, we should be under no illusion that Trimurti access to US origin “dual use” technologies controlled for nuclear and missile non-proliferation reasons will ease significantly even in the medium term. However, on the conventional military side, indications in bilateral discussions with the US are that mutually beneficial programs of equality-respecting R&D cooperation can be mounted, particularly in institutions and facilities operated by the US Department of Defence.

So, what is the prospect in the medium term for Indo-US relations in controlled technologies? Trimurti experience with NSSP and the End-Use verification arrangement engenders the ‘minimum credible suspicion’ that facilitating bi-lateral trade with the US in controlled technologies by, for example, civil-military separation and technology fire-walling is tantamount to facilitating technological “divide and rule”. However, we can promote greater two-way flow and trust in Indo-US trade in controlled technologies if we now take all the steps of legislation and executive action – of the kind that major NATO allies of the US, such as Canada, United Kingdom, Germany and a few others have taken – to ensure that there is no extraterritorial application of technology controls to in-country access of our strategic sectors to required supplies and technologies ‘contaminated’ by, or with, US origin plant, equipment and technology.

Can such countervailing legislative and regulatory steps be taken? Indeed they can, but taking them will call for devoting time and attention to tedious detail in such arcane regulatory topics as industrial licensing and foreign investment guidelines. If we take such steps,

will the supply of US-origin controlled “high-technologies” to commercial industrial sectors slow or halt? No, it will not. Why? Because the US itself has on its statute books such kinds of measures; and because of what Shri K. Subrahmanyam said yesterday about India’s place in balance of power relations in the global order, in which trade in controlled technologies plays a central role: This geo-strategic factor cannot be over-emphasized. However, if we do not institute the necessary measures; if we allow ourselves to be frightened by free-trade ogres of our own making, or – worse still – are just lazy and do not ourselves take the necessary legislative and administrative countervailing steps, the US will have no reasons not to apply its export control regulations in the most restrictive ways, including extra-territorially. So, the real “next steps in strategic partnership” with the US are the ones *we* have to take in domestic law and regulation, so as to maximize the advantages that can undoubtedly accrue to both countries, through full-spectrum Indo-US co-operation and trade in technologies now controlled not only by the US but also increasingly by an India that should (will she?) seek *quid pro quos* for sharing them with its strategic partners. And what of the longer term? Normally I do not quote foreigners but this is so apt, I thought I would put it down. “However, the larger geo-strategic impact (of the July 18 deal) is more uncertain as the consequences of this and the subsequent agreements on the alignment of forces in the new international system now emerging will take many years to become evident.” It is actually taken from an opening statement made by Henry Hyde, Chairman of the United States House International Relations Committee in Hearings (on the Deal) on 8 September 2005. Such an apposite public statement from someone at the heart the US system is uncommon. It is a very realistic assessment indeed.

Thank you very much.

Chair: Thank you very much. So we will have some questions. Because we stared at nine forty-five and we have ended up at eleven

thirty we have taken exactly an hour and 45 minutes. So I expect some spillovers. Fifteen minutes. A few questions.

Air Chief Marshal S. Krishnaswamy: My request to Dr. Kasturirangan is, if he could tell us about the ISRO contribution in the planning and development of military needs of Space and whether there is some thinking of cooperation now that there is so much willingness to cooperate in this sector between US and India and whether this cooperation will spill over to meeting the military and security requirements as well.

Question: Sir, if I can add on to the Air Chief Marshal's, particularly because of the importance of the Space military sector. What we heard is that the denial regime will be in force particularly in the Indo-US cooperation on Space that the west says they are going to be applying to any technology that meets military requirements. Will this not be a concern?

Dr. K. Kasturirangan: They understand that once you start getting into the civilian Space domain it is going to have certain military implications simply because of the fact they are dual use items ultimately. The question of optimal resources sharing for the total resource we are creating for the country is something that has been in debate in the US itself. A major change that has occurred in US policy in recent times has been to see how civilian systems could be used for military applications. This has been a major change in their policy and because procurements are dictated by other considerations (cost considerations are not so important) there is no question of a separate major budget for a satellite that can do something more. A defence satellite today costs five times more than the same satellite in the civilian domain. Private companies also try to build satellites that they get launched. These are all considerations that dictate what they do. I see no reason why a separate logic will be applicable to this country and certainly there are investments that are happening in this country. These investments obviously would be for capabilities

like Space systems and the Space systems will be optimal largely for meeting the civilian requirements of the state. If it is applicable in the context of sharing the resources with the military, then it is up to a policy decision at the political level to see if this is so. I don't see a problem because that is the only way to optimize the total resources. But there will be only a civilian satellite. That much I can tell you.

Question: This is with respect to the fuel cycle. U232 you said is a problem at thousand parts per million. You have reduced this to ten. I didn't get the impression that you have solved that problem. Is that correct or have you solved the problem?

S. Bannerjee: No, we haven't solved the problem. We are just working on it. Yes, but there are two aspects. One of the things is that Thorium can be introduced in a system much earlier, if you can do that burning *in situ*. This problem doesn't exist if you can take thorium in an enriching system and then thorium can be burnt *in situ* and then there is no problem. This is short term. But to have a very sustainable thorium- based U233 based reactor one has to separate U 233 from U232. We are tackling the problem. It is not an insurmountable problem. The problem is that the whole operation has to be done in hot cells. That's what we have been planning now.

Question: In terms of getting fuels for our rockets and so on do you see much progress in collaboration with the Americans. I have a second question which also I want to ask you. This is in terms of both India and US as societies. There is a lot of information that is available in the public domain which probability is not desirable. You can see, for example, my house. That is not so bad. You can also see the uranium facilities and the various sites and so on. Is there some attempt to understand this complex problem? It is not just Space it is legal, political and a lot of things are involved here in terms of what is a desirable communication, what is not a desirable communication? Can we work together on this?

K. Kasturirangan: You know, so far as propellants are concerned, I don't think we have to depend on any country. Obviously, that is one of the critical areas where we have developed our own autonomy. Expendable vehicles systems of today as well as for the future including the Mark III of the GSLV would not need any kind of propellant from anywhere outside. The second is with respect to the futuristic systems. I said that in future space transportation systems that are recoverable and reusable would be needed. Their development hinges on the optimization of their trajectories in the atmosphere through using air-breathing technology engines and so on. There is an element of development happening on this both in ISRO and DRDO. I am sure that there could be scope simply because it is a long range programme and there could be several interesting technologies in areas like computational fluid dynamics, high temperature materials, combined propulsions and so on. In this area certainly there are possibilities but that hinges on the overall time and many other aspects of the discussion currently in progress between the ISRO and the agencies concerned in the USA. Regarding the other part of your question - the Google thing - I think we are going to have to accept a certain amount of relativity in this world now? Ability to look at things from Space is not going to be any more the preserve of one or two countries. Many countries are developing this capability. You have to assume that that you are being watched all the time. So, whatever precaution you take including what you want to do in your bedroom is something that is your concern.

Chair: We will close this session now. And luckily we have a tea break. And all the four speakers are available to you for further questioning. Thank you very much. Thanks to all the speakers for the very illuminating presentations.

Summary of the session

The Workshop debated at length the various issues related to Indo-US Cooperation in the field of high technology. A large part of the discussions were devoted to cooperation in the nuclear, space and strategic technology domains.

The US is a big user of nuclear energy. However, historically it made a choice that it would not invest in fast breeder technology. Recently it has changed its mind and it now believes that recycling and burning of high level wastes in a secondary cycle would be in its interest. This is partly a response to the growth in energy demand in Asia and the resulting greater competition for scarcer fossil fuels. Burning of high-level radioactive waste in a second reactor would also confer major economic and environmental benefits. This has renewed the US interest in fast breeder technology. India, of course, has significant expertise and technology in this area. Placing such reactors under safeguards could jeopardize Indian economic interests through leakage of technology. India needs to position herself properly in this emerging international order. The current Indian three-phase approach to its nuclear development – thermal reactors, fast breeder reactors and eventually thorium reactors - is a consequence of a well thought plan based upon Indian resources and Indian perceptions of how the international order will function. There is no doubt that international cooperation will enable India to increase its power generation capabilities. A stronger and more robust Indian nuclear industry could develop with critical foreign technology in the civilian power sector. The enhanced supply of uranium through the easing of restrictions could also help us build more power plants based on indigenous technology. The world may also in turn benefit from Indian technology in some critical areas. There are many emerging areas of nuclear technology where collaboration would be useful. The Indo-US nuclear deal could become a win-win situation for both countries. But one must remember that it is “national interest” that should determine India’s international posture. India must preserve strategic autonomy on all matters related to her technology options and not trade it away lightly. There was agreement that the outcome of the Indo-US nuclear deal would be a crucial test of the intentions of both sides to make the necessary investments for moving Indo-US relationship to a higher plane.

The US has played an important role in all phases of the Indian Space Programme as it evolved from the early experimental phase

to the current operational and globalisation phase. Current cooperative endeavours in Space Sciences, Communications and Remote Sensing are substantive and significant for both sides. Major irritants in the relationship have been the MTCR and the periodic imposition of sanctions on various space establishments. In spite of these problems Indo-US relationship in Space has increased and moved forward. If the relationship further improves with the removal of many current constraints such as the MTCR and export control laws, India and the US can gain significantly through cooperative ventures in the commercial, technology and science domains.

The Workshop also addressed other areas of technology that had both strategic and commercial dimensions. Aeronautics and Computing were chosen as examples to illustrate the prospects and problems posed by collaborative ventures in such areas. There was growing recognition in the US about the potential of Indian engineering and technology talent. Most major multinational companies have set up big R&D centers in India. Would this commercial recognition translate into specific projects in high technology areas? If this were so, what would it mean in terms of technology development in areas like civil aviation? Can India and the US collaborate, for example, in the development of a joint aircraft engine that caters to the needs of a growing civil aviation market in India? Can similar initiatives take place in other emerging areas like supercomputing and encryption? In many of these areas the prospects for cooperation are good because of significant Indian capabilities built up over the years. Can these mutual interdependencies be converted into tangible products and services of benefit to both sides?

Counter-terrorism, environment friendly fuels, manufacturing, defence technologies and mathematics were identified as other areas having high potential for cooperation.

Some participants felt that technology would be one of the key elements of a re-positioning strategy for India in the post 9/11 world order. To be able to deal with this increasingly important force, India

needs a proactive Science & Technology Strategy. “Economic Power”, “Nuclear Weapon Power” and “Space Power” should be the critical factors addressed by such a strategy. Many members of the strategic community believe that the passage of the recent export control law by India promotes India’s strategic autonomy in the key areas of nuclear, space and defence technologies to the maximum extent possible under current US laws. This belief may be misplaced. While this may enhance export of dual use items to the big emerging market like India, the US through its “India – US End Use Visit Arrangement” is trying to prevent the transfer of such technologies into areas that may be critical for India’s strategic autonomy. Thus the Indo-US Agreement may not ease US restrictions on technology transfer to “Proliferation Sensitive Entities” within the country. India must be prepared to confront and deal with these issues. High technology cooperation on the conventional military side may not be subject to these same restrictions and may benefit through the easing of restrictions.

Session V

US and Indian Legal Systems and Its Implications for Indo-US Relations



Right to Left: Prof. K.P. Vijayalakshmi, Mr. Tarun Das,
Prof. Rupa Chanda, Prof. M.J. Vinod

Session V

US and Indian Legal Systems and Its Implications for Indo-US Relations

Chair: Prof. Jayagovind, Director, NLSIU, Bangalore

Prof. Jayagovind: In the last session I was trying very hard to understand what the speakers stated about a high degree of economic co-operation between India and the US. But when it comes to legal matters, it is rather easy to understand if you say India and US are the two greatest democracies, one is the oldest democracy and the other is youngest democracy. It is how some of the public understands the context of Indo US relations. The question however is whether both being democracies include a common system that has facilitated the relationship between the two countries. Anyhow we are apparently going to focus on the trade relations, intellectual property systems so on and so forth. These are the issues, which are very much relevant in fostering the economic and technological cooperation between these countries. I have been told that we must conclude by one fifteen and therefore whatever I wish to say I will reserve it to the end. All the speakers are given exactly ten minutes. There are three speakers – Mr. Tarun Das, Professor Rupa Chanda and Professor Ramakrishna. I intimate them in advance that they must complete their presentation within ten minutes that I have been strictly expected to be so. Let me now call upon Shri Tarun Das, Chief Mentor of Confederation of Indian Industries. He will be speaking on United States Systems versus Indian Systems, World Trade Organizations, and TRIPS.

Tarun Das – US Systems vis-à-vis Indian System: WTO/ TRIPS
Thank you, Mr. Chairman; I walked fast here so that it won't be deducted from my ten minutes. Dr. Kasturirangan, it is nice to be here at the NIAS. I hope you will have me back again soon for more than ten minutes.

On Trade: Listening to Dr. Bannerjee from BARC was very revealing and what I learnt from him was that India can emerge as a global leader in nuclear power development if we get out of our isolation and participate in the global network for nuclear power and technology development. That seems to be the kind of feeling I get in other areas also. This session is essentially on trade and I have a similar message there that in the trade area while we have had a very limited basket of our exports in the past like textiles, gems and jewelry, leather, that whole scenario is changing and you have seen pharmaceuticals, automotive components and other products where there is much more of science, technology and engineering involved in the product. So it is not as basic as it has been and we have seen that in America also we can occupy leadership position in trade in this kind of engineered products. We don't have to be just small players.

Second aspect, of course, is the services sector. You all know about the IT sector. So I don't need to expand on the success that has been achieved and I agree with the previous speakers that we have really only touched the very small corner of the potential of the IT business. But when I look forward, today we are at roughly 25 billion dollars of bilateral trade between India and the US in products and maybe another 15 billion dollars in services say, so a total of about forty billion dollars. I would say that we will go to about 100 billion dollars in a few years and then much beyond that. And the balance of trade will be in India's favour, which it is today. So it is not an issue where the balance of trade is going to be in their favour and they will be exporting more and we will be exporting less into the US. We need to keep that in our mind because it is not an one-way traffic. It is a two-way traffic.

On Investment: There is a new development in that we are now investing in the US. And we are acquiring US companies. Tatas have acquired a telecom company. The Federal Agencies have given security and other approval to Tatas. For that, Ranbaxy has acquired pharmaceutical companies; Bharat Forge has acquired automotive

companies. So this is the new trend you are seeing where India is putting its footprint in the US economy and in the US market which was never there before and this will multiply as we go forward.

Going beyond IT: In the knowledge industries we are going to go beyond just IT and I will spend a moment on health care. In a recent study for example, a brief study which we have done and which we discussed last week in Washington with their Department of Health, Department of State and the National security Council some interesting facts emerged. The US spent 1.5 trillion dollars on health care last year. Their own estimates of their own National Intelligence Council and the Health Department are that they will spend 3.5 trillion dollars on health care by 2015. Now 10% saving on that is 350 billion dollars. They will have a shortage of nurses in USA of one million by that time. Now, the health care cooperation between US and India is going to make the IT look like small-scale industry. Just think of it because there is no other country in the world with which the US can partner in health care as much as they can with India. The increasing of US dependence on India in a whole range of industries, manufacturing and services is accompanied by a corresponding increasing US vulnerability because of their high cost and loss of competitiveness. Hence the partnership with India is enabling them to retain or regain their competitiveness over the next ten to fifteen years. So there is a lot of mutuality there.

On WTO and multilateral Agreements: India can start negotiating a Free Trade Agreement with the US. It will come in phases. It can come over a ten-year period. But we are ready because we have more to gain by accepting their markets because we have the human resources, talent and we have the technology to access their market than they have vis-à-vis us.

Regarding the specific issues of WTO and TRIPS which are largely a technical subject some significant observations can be made. The TRIPS issue has been discussed between US and India since the nineties. Now they want a strict patent regime. We resisted that in the

past. Now the shoe is on the other foot. We have become exporters. So we need patent protection. Ranbaxy needs patent protection. Wockhardt needs patent protection. So we do not have very big differences with the US law because our interests are converging as exporters of products and services where IPR is important. So, that past history is not applicable. But still we have differences. One is on TRIPS on public health where in public health there is a paragraph six - amendment issue - which allows poor countries to use compulsory licensing route to import patented drugs from the cheapest suppliers to contain an epidemic. The debate with the US is that what are the diseases to be covered, what is the import eligibility, what is the supply eligibility and what are the safeguards. So far we don't have a solution on this. The US is worried about the misuse of this provision for selling patented drugs. Countries like India and Brazil have argued that putting stringent conditions would make the provision completely useless to us. I believe we can negotiate with them. We should not be afraid to negotiate and we can try to come to some kind of a bilateral understanding, which will work in our interest. We have to shed our concern that we cannot negotiate on an equal footing with them. We can.

The second issue is TRIPS and the conventional biodiversity. This is a disclosure of the source of biological materials and related traditional knowledge in patent applications. The two countries USA and India have differences on whether such a patent-based system is necessary to ensure the equitable sharing of benefits from genetic resources. Again, I think, we would need to get into a dialogue with them intensively and put a time line and come to a compromise solution which works mutually for both of us. We have submitted to WTO that we refute the US views that disclosure requirements would increase uncertainties and lead to additional burdens and obligations on patent applicants and offices. So, these are the two issues and I just want to conclude by saying that in our own national interest, not in their national interest, we need to prove the efficiency of our legal system. We don't need to be worried about opening legal services to the Americans because I don't think that is an issue. I think our

lawyers are on a par with them and we have enough non-tariff barriers in our legal system to prevent the Americans from penetrating too much – They will never be able to figure out how our courts work and how our systems work. So I don't think we need to worry about the American taking us over. We will take them over, in fact. So, I see that as an opportunity, not as a threat.

Finally, as we come out of our, you know, from 1947 to 1991 we were in a closed regime, economic regime, a closed trade regime, a closed investment regime. And so when we started opening up with a gun at our back in 1991, because the country was facing bankruptcy, we were scared, we were scared of competition, private sector was scared, they were flabby, they were inefficient, and they were uncompetitive. In the last fourteen years that has changed now. By the very fact that we are going out into the world, we are acquiring companies, we are exporting now. The situation has changed. By the very fact that we are going out into the world, we are acquiring companies, we are exporting now. The situation has changed. We are no longer defenders. We are more in the mould of aggressors. And this applies to a whole set of civilian industries, and I think beyond civilian to other sectors where we are technology leaders. We don't have to be running scared whether it is Space, whether it is nuclear, whether it is defence and all that. So, on the trade side I see a great potential for us. I see a partnership and I see increasing dependency of the US on India. Thank you.

Chair: Thank you, Mr. Tarun Das. Now, let me call upon Professor Rupa Chanda to make her presentation.

Prof. Rupa Chanda - *Institutional and Legal Barriers to Indo-US Trade*

Thank you, everyone. I will try to be brief. I am not a legal expert. I am going to be mainly focusing on the institutional aspects and in this I have taken a rather comprehensive view of what I regard as barriers in Indo-US trade both merchandise as well as services trade vis-à-vis the non-tariff barrier issues and the regulatory issues. This

is broadly what I would like to cover, if time permits. And then get to some of the divergence or convergence of positions between India and the US in the WTO negotiations. Indo-US trade is about twenty billion dollars. It has been growing quite rapidly. And there is an overall surplus in favour of India. Also one should recognize that there is a bit of an asymmetry in the sense that the US is an important market for us but still we don't find India figuring very important as a source of inputs, but that also suggests that there are probably some barriers that can be done away with and there is tremendous potential for growth. In the services area, of course, the IT and IT-enabled services may serve as a major focus, and in addition, as Mr. Tarun Das has mentioned, there is tremendous scope in a variety of other areas, such as health care services, other professional services, accounting legal and so on. I will also talk a little about some of the barriers in services in particular.

As an FDI source US is important but again if you look at how important India is in terms of the share of total US outputs it is not so large. But again that might reflect on a variety of investment related regulations and with liberalization you can expect India to become an increasingly important market, especially with the opening of telecom, retailing and so on. Also you see increasingly outward investment by Indian companies but still there is tremendous scope to grow. There are projections that have been projected in the dialogue which point to the US merchandise 40 million dollars and inclusive of services something like 60 million dollars by 2008, provided as someone puts it, the NTBs (non-tariff barriers) are done away with. This is the projected trend in terms of Indo-US trade. Again you can see the asymmetry here in terms if India's exports to the US versus the other way and of course, the surplus that we have. The US is a very important market for us. Eleven per cent of our world share of trade is with the US. It figures as one of the top ten in goods sources as well as the top ten as export destination.

This is in terms of FDI. Of course, we do see extensively and cumulatively FDI has been increasing. But of course there is a

divergence between what is approved and what actually flows in, again reflective of institutional issues and absorptive capacity issues. What I would say is that if there are lots of barriers within the Indian economy, which would have to be removed, if you want to really exploit the full potential of Indo-US merchandise as well as services trade. This is, as you can see, the divergence. About one fourth of what is approved is actually realized. Some of the actually there is quite a diversification also. You have lot of the services sector, which are important. And then you have also in food-processing etc. which, I think, increasingly will see US are coming in. This is another important point to appreciate and says that India is a major exporter and one of the top five and in fact in some areas the topmost exporter of professional manpower to the US. Seventeen per cent of all skilled immigration from Asia go to the US. And if you compare with China, we are way ahead in terms of the usage of the immigration visa for the skilled category. I think, the story is quite clear if you look at specific areas like IT, medical and health. This is the comparison with China, for instance, 1989 to 1999 in terms of usage of H1 visa. This is going to be one major area of discussion and it already is in the context of the WTO negotiations – the whole issue of regulatory hurdles to movement of professional service providers from India to the US – the whole range not just of immigration regulations but as well recognition- related issues, economic needs test and other sub – federal type of regulations which prevent people from going and practicing.

India's trade is much lower with the US. What does that signify? Basically it represents a variety of barriers, which still exist between India and the US. Look at the exports vis-à-vis the other countries. Of course, China is way out there. There are reasons related to labour laws and so on. Investment also, as I mentioned, we are very small in terms of the overall share of outward investment. So, what are the main factors that are affecting Indo-US trade and investment flows?

One is, of course, that India still has relatively higher tariffs compared to other countries in the regional emerging markets. In fact, there is

a recent study that out of 135 emerging markets India is among the top in terms of agricultural tariffs in particular. Administrative and procedural issues on both sides seem to be very important and non-tariff barriers, a whole slew of them technical barriers to trade, sanitary and phytosanitary standards, testing, labeling, certification issues, labour and environmental clauses which are attached to trade. Increasingly these are becoming important. As Indian manufacturers go up the value chain these are going to be more and more important. If you look at the advantages of companies like ITC, for instance, which want to export food products, there are tremendous amount of barriers in the United States, the European Union with regard to testing, labeling, certification, equivalence, in a variety of national standards, where often countries apply even more stringent standards than that. They detain consignments. They don't explain the reason for detention. These are some of the discriminatory kind of barriers that India is trying to address. This will have to be done bilaterally but also at the multilateral level trying to discipline the use of this kind of non-tariff barriers.

Antidumping is another major issue, several sectors having time and again been subject to this, for instance, shrimp, steel, safeguard measures, for instance, in the textile industry with the MFN quotas having gone away there is this possibility that safeguard measures will be used in case of flare-up of imports from India into the US market, which is exactly what is happening with China in the US and China in the EU.

Investment-related regulations are more on our side in key sectors where US is pressing us to open up in areas like retail distribution, to relax further in the telecom sector, in banking removing some of the conditions with regard to the type of establishment, in IPR issues which, I am sure, the next speaker will speak about more.

Then labour market regulations, one of the main issues in the service sector trade between the two countries, even issues of subsidization for even issues like subsidization, for instance, in agriculture,

Agriculture subsidies in the US, which undermine market access in areas such as cotton and sugar. Government procurement and distribution issues in the Indian case i.e. lack of transparency. This has been brought up in the WTO negotiations where the US has been very resistant on having transparency in government procurement as one of the things under the Singapore issues.

What are the main US concerns if you look at merchandise trade? First and foremost, it is tariffs- that our tariff rates are still higher and in the WTO context they are pressing us to bring down the higher level tariffs faster with what they call non-linear tariff reduction. Then, of course, there are the additional, the multiplicity of taxes within India. So once it enters the country the interstate commerce and levies and so on. Issues of information and transparency, but there isn't proper publication of information.

There are other issues of nomenclature; there are issues of classification, import-licensing issues in some sectors still continue for instance, in the automotive sector. Customs procedures – that there are discriminatory valuation criteria, there are problems of consistency in classification; there are extensive documentation requirements. Again these are procedural regulatory kind of barriers. I am not saying that this is only specific to India. We also face various kinds of regulatory hurdles in those markets. But these are things that, over time, with administrative streamlining would definitely help in terms of expanding trade.

Some focus needs to be given to the following issues that impinge on the legal terrain of the two countries.

Fertilizer subsidy regime: This is another issue raised by the US regarding the preferential subsidy if you procure domestically as opposed to getting through imports.

Standards and certification issues: Again there is discrimination in terms of standards that are applied on foreign products.

Sanitary and phytosanitary standards or SPS issues: There is the issue between India and the US regarding almonds exports, for instance, from US to India because the application of sanitary and phytosanitary standards and some of these are found to be not consistent with what are existing international standards. India's concerns are again mainly non-tariff measures. There are some estimates done recently which say that about 44% of our exports to the US market are subject to non-tariff barriers. The US is a major applicant of non-tariff barriers. If you look across developed countries their tariffs especially on manufactured products are quite low while in certain sectors like textiles and leather. But, on the other hand as tariff protection has gone down, non-tariff barriers have definitely gone up. Some of the main factors – especially in, agricultural and agro products that are subject to non-tariff barriers and certain types of manufactured products apply to South Asia as a whole. It is not unique to India. It is an issue that has been raised by developing countries. It is something that deters value addition, as well. Repeatedly, these are going to become more and more important over time as traditional forms of protection go down. For instance, the contaminations issue in marine products regarding pesticide residues which are subject to international testing are not specific to the US but they apply in general to India's exports to a variety of developed markets.

Textiles: Standards on quality, use of dyes, for instance, Import procedures, pharmaceutical registration requirements. These are of course, major regulatory issues, which affect trade. Some examples, specific to the US elucidate it further. Steel exports affected by antidumping duties, shrimp exports affected by sanitary and phytosanitary standards, antidumping duties, even environmental clauses such as whether the excluded devices were used or not.

Textiles exports which have grown last year about 30% or so from the Indian to the US market. But increasingly there are detentions and there are delays because of security checks. There are all kinds of labour-related, work place norms, environmental and safety norms,

which have been applied. So these conditionalities lead to delay and are hurdles in the expansion of trade relations. Mango exports have the issue of fruit fly, for instance. Leather exports, again on sanitary and phytosanitary norms. Another example regarding food products. Again certification by Indian labs will have to be considered equivalent to a lab there. Often India has to adopt the same kind of technology like EU has in particular. So labeling and certification become major problems unless you have institutional mechanisms to cover for those costs, it is very difficult for small-scale manufacturers to try and export.

Licensing, packages, public health security and bio-terrorism are other major issues in the US post-September Eleven. For example, US requires detailed tests of production areas for fruits and vegetables, estimations of certified residue and stipulates the exact method and the technology that has to be applied. It has paved the way for a lot of arbitrariness in the entire procedure, and a lack of transparency. Often, if you look at the causes of detention, a large number of cases just not explained why they are detained. These are the variety of reasons why. Now the problem in some of these kinds of barriers to trade is that countries do have autonomy to impose their standards. But then do they impose it in a manner, which is non-discriminatory and did not constitute unnecessary barriers to trade. These are going to be the difficult issues to negotiate bilaterally as well as multilaterally.

From the US side, in services, the main issue is customs barriers. If you look at the bilateral nature of trade, US wants to access our markets through movement of capital through commercial presence, we want to access the market mainly through movement of people and now increasingly through offshore.

In some of the sectors, the US wants us to move much faster, for instance, in insurance, banking. If you look at the banking there they feel there are too many restrictive conditions on the nature of commercial presence they want banking presence to be there in

multiple modes at the same time not through only ATMs and wholly owned subsidiaries and so-called branches. In accountancy, there has been a major issue regarding the setting up of foreign account firms in the country. They want other conditions also addressed. Foreign mail usage, you know, whether we can do auditing, financial auditing.

Foreign accountants to be equity partners: In the legal services area they want foreign law firms to be established here. This is very much resisted by the Bar Council of India. In telecom they want even faster liberalization, higher equity leading to 100%, actually it is very reflective if you look at the service sector negotiations and you see what the US has been requesting from India. They have been tracking our liberalisation trends very carefully and they are interested in asking us to pre-commit to further and further levels of FDI utilization. In most of the cases they are asking for seventy-five percent or 100% opening up which is what we are gradually autonomously opening up towards, in some of the key sectors. It maybe noted that they are already required in the WTO context. In fact, what they are asking for- that if you open up in terms of FDI we open up- we may perhaps give you more access in terms of movement of people. So there is a quid pro quo kind of negotiating tactic going on. In retailing again. There has been a series of discussions in this area. Recently we have announced 51% opening up and even perhaps liberalizing further. This is another major area, which they have been pressuring in terms of movement of capital.

If one were to summarize what are the issues between the US and India, it is really about stringent, non-transparent regulations and procedures. They want a secure and legal framework. They find the processes in our courts too slow. That affects the repeat investment from their country. Anti-competitive practices, slow bureaucracy, government, institutional, judicial issues become very important. For us it is really the movement of people and recently in response to the backlash to outsourcing some of the issues regarding the ban on government outsourcing and its possible spillover in the private domain. So the issues really are immigrations-related barriers. This

discretion that the US keeps on applying in terms of raising and lowering H1B quotas from 65 to 150 and 195 and then bringing it down - NASSCOM, in particular, has been particularly lobbying for more certainty in terms of the immigration regime. In fact, we have been arguing in the WTO negotiations that H1B is not the way to give market access for temporary movement of service providers because H1B is something that can eventually be used for permanent residence and nationality change. So we should have a completely different kind of visa which allows companies to send people over fast, independent professionals to move fast, contractual service suppliers and we have a particular proposal for that a movement of people but the main target market is the United States. The US unfortunately, because of security concerns, is not heeding that proposal for the time being. But, for demographic reasons, in future perhaps there will be some shift in that direction. The other issues are really again reach parity issues requiring people of similar case to be paid exactly at par. Normally the displacement conditions in certain sectors. Mutual recognition and so on. So the procedural and again the discriminatory aspects, the non-transparent aspects of visa denials, the clearance procedure and so on, which is what India has raised.

Economic Needs Test: The fact that in certain sectors you can't go unless you meet certain economic means criteria. That is not very clear. What criteria are applied? How do they translate into numbers that are going to be allowed for entry? Again regulatory issues.

Recognition: We don't have mutual recognition agreement in professions like health, accountancy, and legal with the United States. Again, there is a national level issue, and then there are sub-federal level issues. So in different states you may have different conditions. You may need to be a resident in that state. You may need to set up a firm in order to be able to practice. It is very difficult because these kinds of jurisdictional issues have to be discussed bilaterally. How well one can get around this problem of recertification of our

professionals to be able to practice there. India has been pushing very hard for discipline on qualification and licensing procedures under the WTO negotiations so that there is more transparency, more consistency across countries.

The issue of outsourcing in particular which raised a lot of concern with the government's outsourcing ban and India was afraid that this might spill over into private outsourcing, though for the time being there doesn't seem to be any such issue. Government procurement is another area that has been raised by the United States that they are preferential; towards domestic producers they favour Indian public sector enterprises. The judicial system and enforcement issues because of – especially ITI-related violations.

Antidumping: This is something that on both sides they are both major users of antidumping. China, of course, is one of the biggest recipients of antidumping action, but this is something one has to be discipline much more in future. India wants informal curbs on the use of antidumping measures. Within the WTO we have divergences, definitely. In agriculture, because the US wants us to bring down agricultural tariff, we want them to bring down the export subsidies.

In industrial products, again, divergent positions. We have been raising the issue of the small scale sector sensitivities and employment displacement. The US is asking India as a big developing country to bring down the industrial tariffs faster- with some sensitivities for special sectors. In IPRs we can see some convergence because of our larger pharmaceutical companies but there are largely divergent positions especially in the TRIPS, public health and the bio-diversity area.

Services sector: There are divergence and convergence because we both have an aggressive agenda in services. So, as far as the modalities of negotiation are concerned, the two countries are coming towards the same kind of approach. Both of us want very fast negotiations in services through unilateral discussions in services so

that a critical mass of countries can move through negotiations faster. As far as other issues are concerned especially on movement of people India has asked for the service provider visa which unfortunately is not going anywhere right now but it has a very bold set of proposals regarding service provider professionals. The US has not made any change in its offer at so far in the negotiations. The EU, interestingly, has. There is tremendous scope for expanded trade. But there remain a lot of regulatory and other institutional barriers. As far as India is concerned there are the more conventional kind of barriers, I would say, investment restrictions, high tariffs and transparency issues. But on the US side they are really non-tariff barriers and movement of people related barriers. Finally I would add that if India really has to exploit the full potential to go for a FTA, a lot of the usual domestic constraints that we talk about in India regarding infrastructure, labour laws and so on would also have to be addressed. There is no way you can realize the potential without that. Thank you.

Prof. T. Ramakrishna – *Comparative Analysis of Indo-US Legal Frameworks with Special Emphasis on IPR*

Honourable Chairperson, distinguished delegates, I will be just going through the synergies and the divergences between the IPR legislations in US as well as India. I will perhaps just skip the first few slides. The US has the constitutional mandate for protecting Intellectual Property Rights (IPR). Article 1, clause 8, section 8 has clearly indicated that the objective here is “to promote the progress of science and useful arts and for that purpose secure for limited times to authors and inventors exclusive right to their respective writings and discoveries.”

The role of IPRs in the global economy is well understood by all of us and therefore I will just quickly run through these slides. The US has realized that the economic product of US is conceptual. A similar trend will be seen in India as well as China. IPRs capture these intellectual assets and have been creating powerful incentives for

innovation. They permit the recouping of R&D investments through exclusive rights being granted for a limited time. Revenue generation comes through technology licensing. If you just look at the US it generates \$45 billion annually through technology licensing. Worldwide technology licensing may generate \$100 million annually.

Looking at the US patents obtained by Indian assignees from 1995 till 2005, you find a steady increase in the number of patents except for 2004, when there was a slight dip. However, if you just look at the Indian patents granted to Indian applicants the figures here indicate that applicants who obtained patents in India have also obtained patents in other jurisdictions. One major jurisdiction is the US and amongst these the CSIR ranks first. It has the largest share of all patents granted to Indian assignees by the US.

You can just have a quick look at the differences between patent laws in the US and India. As regards patentable subject matter, there are inclusions and exclusions. As far as inclusions are concerned, anything that has a human hand shall become a patentable subject matter. Anything under the sun, which has a human hand, can be patented particularly in the US. As a consequence we find right from the oil-eating bacteria of Chakravarti up to the State Street Bank case, various inventions have been patented including the business method. As far as exclusions are concerned there are very broad exclusions. Abstract ideas, physical phenomena and the products of nature are excluded from patentability.

However, when we come to India, you find patentable subject matter defined more in terms of product and process patents. However, products for food, medicines and drugs became patentable after 2005. As far as exclusions are concerned in section 3, we have a very long list of exclusions, keeping in mind our economic, socioeconomic and cultural aspects. Inventions that are contrary to public order are excluded. Administrative arrangements are excluded. Medical procedures would be completely outside the purview of protection. Derivatives of known substances, unless significantly different in

efficacy, are outside the purview of protection. Plants and animals, except microorganisms are still outside protection. Business methods are not patentable. We have added here that particular products that are traditional knowledge are also outside the purview of patent law. Mr. Tarun Das was referring to the disclosure requirement regarding sources of materials in patent applications. India has been pushing for full disclosure on sources of materials. This is a bone of contention in WTO. India is insisting on inclusion of this particular requirement under the Patent Law itself, whereas the US has been consistently opposing it. I don't know will happen. When I last interacted with the representatives from US Industry they had not changed their views. That is the impression I got in a direct dialogue with them. Well this is as far as patentability criteria are concerned.

Even on utility and novelty we have certain specific differences. For example, the US guidelines on "specific substantial and credible utility" are more difficult to interpret especially in biotechnology inventions. We have a clearer focus on industrial applications.

When it comes to a question of novelty the US has a twelve-month grace period during which a product can be on sale ("on sale bar") before the patent can be filed. The US also gives a twelve-month grace period for filing patents after publication. Early conception of the invention also gets priority in the US. On utility, as far as India is concerned, if you just satisfy the industrial application criteria it would be sufficient. We don't have the grace period for "on sale bar"- which means that if a product is on sale it cannot be patented. Similarly the grace period for publication is limited to scientific publication and not all publications. Early conception has no value unless you file. In India we follow the "first-to-file system".

As for as 'non-obviousness' is concerned we recently made certain specific changes Whereas US Patent Law considers economic considerations as of secondary importance, we have given it primary significance after the 2005 amendment that broadens the threshold of non-obviousness in deciding on patentability.

As far as the procedure is concerned we have certain specific differences, which would affect the cost of litigation and not just the quality of the patent. Interference proceedings that deal with identical or similar inventions by two different parties are in place in the US whereas we don't have such interference proceedings. Re-examination and re-issue procedures are in place in the US. We do not have that. The US does not have opposition proceedings but we have both pre-grant and post-grant opposition proceedings.

When it comes to a question of infringement we do not have a sufficient body of jurisprudence knowledge that has been developed in India. In the US, "claims construction", the application of the "doctrine of equivalence" and "prosecution history estoppel" determines infringement of patents. In India, we do not have case laws. We have also not accepted "prosecution history estoppel."

There are also differences in how the two countries provide defences for dealing with infringement actions. In the US inequitable conduct (not disclosing material information relevant to the grant of the patent), patent misuse and research exemptions (for drug approval, philosophical use or idle curiosity) are defences that can be used against infringement actions. In India too inequitable conduct is a ground for revocation of the patent. No patent misuse provisions are available in India. As far as research exemptions are concerned, the drug approval exemption is broader in India than in the US. General research exclusions are also available for research and for education. Therefore research exemptions in India are broader in scope in comparison to the US. This is also in the interest of our own industry.

US industry and US academia have several concerns on Indian Patent Law. Mr. Tarun Das referred to this also. We in India have to look at the social costs of the strengthened patent regime when we confer patent rights. How do we deal with the social costs? Compulsory licensing in case of a failure to work the patent is one provision that is available. We have this new clause - Section 92 (A)

– according to which an Indian company can get a compulsory license for manufacturing and exporting drugs to address public health problems to countries without manufacturing capacity. This is in consonance with Para 6 of the Doha framework dealing with drug exports to countries without manufacturing capacity. This is a matter of concern to the US.

The US industry and academia also have concerns about the last item shown on this slide. Under the Indian Patent Act generic producers of new drugs (mailbox applications) can continue to produce these drugs and only need to pay reasonable royalties to the patent holders of these drugs.

There have also been several occasions where changes to US Patent Law have been influenced by earlier Indian legislation. The Patent Reforms Act of 2005 is a Bill introduced in the US House of Representatives on June 8th 2005. The proponents of the proposed changes have been high technology (IT) companies. They have suggested several changes. These include changes in “first inventor to file”, changes in the definition of “priority”, elimination of the “best mode” requirements, elimination of the 18-month publication exception and allowing assignees to file patents without the signatures of the inventors. These are some of the major changes that have been suggested to US Law.

If you just go back two or three years, India had also suggested these changes because of the enormous cost of filing infringement suits and also because of the quality of patents. Priority of invention would no longer be determined by reference to the invention date but rather by the date of filing. Novelty would be destroyed by 3 categories of events. If the invention is made known to the public by the inventor 1 year before the filing date, or if the invention is made known to the public by a 3rd party anytime before the filing or if the invention is in a patent issued or filed by another inventor, novelty would be destroyed.

There are also 3 categories of limitations to “prior art”. The proposed definition of “publicly known” to what is “reasonably and effectively accessible” is somehow going to limit the scope of “prior art”. The elimination of the “best mode” provision removes some subjective issues from litigation and is aimed at international harmonization.

Ask and consent assignee filing is another change being proposed. Under this, proposed assignees can file regardless of the inventor’s amenability. This change reduces the formalities. They have also proposed a post-grant opposition system. It would allow anyone to challenge the patent itself without going through a litigation process. A nine-month window following patent grant is there for opposing a patent. As of now the complete burden (including litigation) is imposed on the opposer. Grounds on which opposition can be filed include all issues of invalidity (utility, novelty, statutory bars, non-obviousness, sufficiency of disclosure etc.). These are all the grounds on which opposition can be filed. These changes to US patent law may bring their system more in tune with our Indian system. The USPTO decision on the challenge to the patent is supposed to be taken within one year.

As we can see this draft Bill is being discussed by the US House Judiciary’s Committee’s Sub-committee on Courts, the Internet and Intellectual Property.

Let us now take a very quick look at Copyright Law. As far as the subject matter is concerned, we find it is very broadly and clearly defined in US law as original works of authorship that is fixed in any tangible means of expression covering a variety of creative works. Indian copyright law covers original literary, dramatic, musical and artistic works. Sound recordings and cinematographic works are also covered.

As far as “fair use” doctrine is concerned we find that specific guidelines have been laid down by judicial interpretations in the form of a “cumulative effect test”. The purpose and character of the use of the material, the nature of the copyrighted work, the amount and

substantiality of the portion used and the effect of the use on potential market or value of the copyrighted work are the factors taken into account in applying the “cumulative effect test”. As far as India is concerned we do not have specific tests but purposes under which it could be considered as “fair dealing” are indicated.

With regard to Digital Rights the US has the Digital Millennium Copyright Act (DMCA). It refers to Internet-related issues. Since the US is a member of the WIPO Copyright Treaty (WCT) and the WIPO Performances and Phonograms Treaty (WPPT), it has come out with this particular DMCA covering a wide range of rights for the Copyright holder as well as the Digital Rights holder on the Internet. We do not have any similar parallel Act in our country since we are not parties to the WCT or the WPPT.

There are some differences in the duration of the copyright as we can from this slide. I shall skip this since it is not necessary.

I shall touch briefly on Trademark Law. The Indian Trademark Law perhaps is quite effective in safeguarding US interests and US Law is also quite capable of protecting our interests.

As far as Integrated Circuit is concerned there are no substantial differences that we find between the two legislations. Since India is also emerging as a producer of integrated circuits we thought we would like to have this legislation in place. The register has already come into existence.

I will close after looking at one final aspect. Protection of confidential data provided for gaining market approval is an issue that the US has been raising quite often. A TRIP (under section 7 Article 39) has mandated that such protection be provided. We do not have a separate legislation for general data protection in our country. We find that the US has the Gramm-Leach-Bliley Act (covering personal financial data) and the Health Insurance Portability & Accountability Act that covers personal health information. The US has protected clinical

data since 1984. One of the concerns of the US is that India should grant such a protection. We do not have any distinct protection for clinical data in our country - no legislation whatsoever.

Well, IPR is an area where Indian and American interests intersect. Hence harmonization and effective enforcement to ensure a strong foundation in the lasting economic and political partnership between the two countries is the need of the hour. Thank you very much for your kind attention.

Chair: Thank you, Professor Ramakrishna. Now we have Professor M.J.Vinod from the Department of Political Science Bangalore University to summarise and initiate discussions.

Discussant - Prof M.J.Vinod

Mr. Chairman, all of you will agree with me that we had three very interesting and useful presentations. There are a few issues that I think can be raised and this perhaps can be further elaborated in the discussions. One could look at certain broader issues that have been raised in all the three papers, particularly, focusing on the theme of the session viz., IPRs and WTO.

One issue that has been coming up repeatedly is the whole question of 'what can be patented' and 'what cannot be patented.' Professor Ramakrishna raised this issue in his presentation itself. I think it is also necessary to look into the whole problem of proliferation of applications for patents and the fact that it could also lead to a situation where we have all types of frivolous claims being made. Even in the US there is a report of the US Federal Trade commission, which says that almost a hundred applications are filed everyday. This could be a future possibility in India as well.

Coming to the question of the Patent Amendment Act 2005, some substantial changes have been made in terms of India's commitments in keeping with the WTO requirements. I think a few problems can surface here. One is the question of the extent to which the introduction

of the 'product' patent in India as of January 1st 2005 could perhaps result in creating spurious monopolies for commodities or products which are basically in the realm of day- to- day use by the citizens of our country, and what type of implications it could have. Mr. Tarun Das raised the question of the commonalities or the convergences between India and the United States when it comes down to patents - he has provided us a new rationale to seriously ponder over. Perhaps we should look in the direction of strengthening the patent regime in India. While we do this, we also cannot be blind to certain concerns. One of those concerns, I think, is the question of 'compulsory licensing', and the 'procedures' that we could think of in terms of compulsory licensing. We need to look into these areas, and make them more understandable from the point of view of the common man and thereby enhance its effectiveness. Moreover, the procedures tend to be rather ambiguous. Hence the need for greater clarity about these procedures. This needs to be pursued within a reasonable time frame.

Professor Chanda raised issues pertaining to the divergent views India and the United States have about public health. This is indeed an extremely important issue as well as an area of concern. There is a certain anxiety today about the impact of the Patent Amendment Act 2005 on drug prices in India as well as the availability of some of these drugs. Of course, going by the technicalities, the drugs introduced between 1995 and 2005 will not be affected to the extent that royalty would have to be paid by the drug manufacturers. But the problem is one where at this stage we have no idea about what constitutes a 'reasonable' royalty and 'what is not a reasonable' royalty. As far as the old generic problem is concerned, perhaps we need to look into the old drugs, which are not affected by the act. Yet the rate of obsolescence of the old drugs, I think, is very fast and this would have its own impact on the public health institutions and arrangements that we have within our country. So Indian pharmaceutical companies could lose the opportunity to develop processes for drugs that are patented. Now, the fact is that we will have to go through the process of compulsory licensing to actually

manufacture these drugs within our country. So, the main catch here - I don't know whether I should use the word 'catch' - is that the drugs which will not be patented, are those that do not already exist in the market. I think there is a major challenge that we face on that front both for the present and as far as the future is concerned.

In terms of the US domestic laws, I just have a few comments to make before I wind up. Professor Ramakrishna did refer to the comparative basis of the Indian and the United States domestic laws. He gave us a very broad, sweeping understanding of it. There are a few issues that I would like to raise. One is that the various Acts passed by the US Congress from time-to-time, especially since 1980 - culminating with the Omnibus Trade and Competitiveness Act of 1988, have probably to be corroborated with various judgments of the United States Supreme Court and only then, I think we could understand them in a holistic sense. That is something that we have to do constantly to really understand the effectiveness of these domestic Acts. The second point I would like to make is regarding the Common Law System that exists in the United States and the impact this has had on the patent laws that have been passed by the US Congress or the judgments of the US Supreme Court. Again I would urge our attention on this issue. Moreover, there is the distinction that is made between the 'product of nature' and the 'product of man' in the US perspective. Hence from the US perspective anything under the sun that is made by man can be patented. In this respect the two countries have differences over what 'we have' and 'what will come into place in the future.'

We also need to grapple with the notion of utility and the question of applying these concepts to the Indian perception of inventions and discoveries. This is where I think, there are certain issues that we need to look into, viz., how the Americans look at the 'cost of invention', how they look at the 'cost of discoveries.' Differences can be brought out in terms of the European experience too vis-à-vis the American experience. The Indian experience perhaps is slightly

different in terms of what we consider as an invention and what we consider as a discovery, and the type of impact it has in terms of the responses we come up with, in keeping with the requirements of the WTO as far TRIPS is concerned.

In a nutshell I think we have had three very good presentations. But, the fact is that the patent laws/perceptions have evolved over the years. In spite of the WTO conditionalities, 'patents' may not be perceived as an 'absolutist concept'. The entire debate over patents has reflected particular national interests, traditions, cultures and belief systems. It has also reflected differing levels and stages of techno-economic development on the ground. Therefore, there are still many grey areas to be investigated in spite of India agreeing to the conditionalities of the WTO as far as TRIPS is concerned. My ultimate question is can we consider the Indian Patent Amendment Act 2005 as an 'absolutist' law? Thank you.

Chair: After the excellent summing up by Professor Vinod, I have very little to say but I wish to make only two observations. Shri Tarun Das and Professor Ramakrishna spoke about TRIPS, harmonization of intellectual property rights, so on. Professor Rupa Chanda raised some of the non-tariff barriers, which have been hindering the promotion of trade between India and the United States. Harmonisation of IPR has been taking place over a period of time. TRIPS is a major example for that. But this harmonization is taking place as per the US model. That is probably something inevitable, after all, these powerful people call the shots in nationally and internationally. The concerns of developing countries are that these are some of their vital interests that have to be taken note of. For example, Ramakrishna raised the issue of protecting the traditional knowledge disclosure requirement of prior information which have been obtained from other sources by the patent applicant and so on. As far as non-tariff barriers which have been constraining Indo-US trade are concerned, the World Trade Organisation provides a mechanism for that. After all, when we speak about technical barriers to trade, sanitary and phytosanitary measures etc. it is well understood

that every state has the right to protect its vital national interest. But this protection of vital interest should not be turned into protectionism. WTO provides for some kind of dispute settlement mechanism. Again, of course, this has been very extensively used, but the problem has been from the United States side to some extent in the sense that the United States does not really – no – there have been occasions when the United States sought to defy the rulings of the World Trade Organisation. Of course, it is for other countries really, developing countries, European countries, I mean other developed countries to join together to strengthen the World Trade Organisation mechanism. With this now I will open for questions and answers.

Question: One of the recent industrial accidents, which occurred in Bhopal, revealed the tardiness with which claims and compensations for the affected families were actually disbursed. I wonder what is likely to happen in terms of the US legal system in terms of corporate accountability. You know, it is such a great word. But when it comes down to overseas operations of such companies like Union Carbide in the past and I hope it is not repeated in the future. What are the safeguards available, legal or otherwise, to protect the interests of populations which are devastated. You know, a few thousand people died there. Thank you.

Chair: Well. I am afraid whether the question is covered by any of the presentations made so far. As far as this particular Bhopal issue is concerned, the United States rescinded jurisdiction over this Union Carbide but it found that Indian courts are better suited to try the case. I think that this issue has not been really covered by any of the presentations.

Question: I would like the Chairman to tell us as to what is the degree of interface between institutions like the National Law School and our Ministries of Commerce and Trade, particularly when it comes to fine-tuning our own responses to some of the complex issues at the WTO. In fact that is an issue which you are the right person to tell us something about that.

Chair: I think there has been quite a bit of collaboration between the governmental departments and academic institutions. Government wants academic institutions to provide some kind of research inputs for various policy decisions, which they have to take. There is a greater awareness on the part of the government. But we are still not out of the groove of the past.

First of all there are two questions here, whether academic institutions are rising up to the expectations of the government. Lots of things have to be improved upon in our academic infrastructure as well, to make the research more focused upon the practical problems and come up with the proper solutions. There is also a mindset that the government knows everything and not much is required from outside. Lots of things have to be improved from both the sides.

Prof. Rupa Chanda: I think that the government is changing its attitude quite a bit. I am part of the Expert Group on services with the Ministry of Commerce and we have extremely interactive discussions. At least that part of the Ministry of Commerce has been taking all kinds of stakeholders on board in different sectors. For instance, the work I did on the movement of people became our position paper at the WTO and that is now the basic paper which is being used for a coalition of countries that have an interest in this issue. Similarly there are other academics that are working on the off shoring issues. There has been a tremendous involvement by them. Next week, for instance, there is a meeting with the Ministry of Health on this whole health services issue, medical tourism, the movement of nurses, because of the nurses' shortage in developed countries. So they are taking us on board. Similarly, even at the WTO ministerial there is for instance, there were academics they're as part of the thing. So it is improving. I wouldn't say how it used to be that government knows best and academics don't know anything know. It is also for the academics to get actively involved in public policy issues.

Question: This is a question to you, Professor Chanda. It is an issue which Dr. Siddhartha and I have discussed with various people, concerning security. As foreign companies increase the proportion of investment they make in this country or set up industries here, when they make products which are of interest to, let us say, the Indian Armed Services or generally of national strategic interest, it looks as if there is no legal regime in India, whereby products that they make in India on our soil can, when necessary, be used by our defence services. That is to say, somebody sets up an industry here make something and say, "No, I can't give it to you because US Law does not permit me to give you what I am making here". I am sure Dr. Siddhartha can put it in much more precise way than I can. I may be right or wrong, Dr. Siddhartha. What is the legal position? Why is it that in our Companies Act these issues are not considered more seriously? I mean, if I can't buy a valve made by a sophisticated company set up here, on my aircraft, shouldn't I have the right to say, "No, Sorry, you can't make it here. Or you must actually by law supply it to me and I will pay you what the price is".

Chair: Are you saying that Government of India cannot buy a product made in India? This is something strange to me. What is my right? If it is open to any private person, why can't government buy it? Or government can procure it through some private party.

Question: It is an American company which is making something.

Chair: No, no. American companies making something for sale in India or outside India. Is it not? I mean, they can't be sold within India. Is that what you are saying?

Question: That is precisely the point. It seems to me that there is a blind spot in the Indian Companies Act about goods, commodities, systems that are actually required by the security industries in the country. Part of the reason must be that for a long time we have had no private sector doing this at all. It was only the public sector industry. So the Companies Act doesn't even consider this possibility. But

then in the case of, for example, if you wanted to buy a Moog valve, they won't sell it to you. It's made here, in this country.

Answer: (Dr. V. Siddhartha) While it is unfortunately true that you cannot buy. Recently in one of the joint ventures which the DRDO set up with a foreign company they put that clause in because it doesn't exist in India that the technology which comes from abroad but gets manufactured in India can be sold specifically the Indian Armed Forces. This was specially put otherwise it doesn't exist.

Our Company Law does not have this in general terms, only as a part of your agreement that you make for one particular system. We can have corresponding legislation to prevent this from happening. The way we do that is to simply copy US legislation. The US has legislation called the External Foreign Provisions. The External Foreign Provisions will point to that which is illegal for any person operating in the United States to impose any conditions at all on any person in the United States with regard to the end use of those commodities or products which are made inside the United States regardless of the source of technology. The US, Britain, Canada, right across the border, they have what are known as Extraterritorial Measures Preventions Acts, which prevent foreign companies because of the external foreign provisions. If you impose such conditions, we are allowed to do one of three things. Starting from shutting you down, throw you out, etc. It is a long list of things and prevents you from accessing our markets on products unconnected with what you are making in this country. In other words, similar to what, for example, the United States says and has said in the past, "If you don't accept our textiles, we will prevent the import of pickles". We can do the same thing. Now, cross-sectoral sanctions. It is up to us to read every comma, full stop, semicolon, start drafting the thing, presenting it to the United States and saying, "Now, you tell me how is this different from what you yourself are doing". If you don't do that and if you are lazy, you must expect all of this that is happening.

Question: Sir, I have a point. In December you find an IPR agreement, which relates to defence products with Russia. That, essentially, is to put a certain amount of constraint on your freedom to exploit even for your own requirement in terms of upgrade or exploitation and further development etc. without paying substantially to the original designer of the product. Now this IPR can become a significant barrier in the Indo-US relation in terms of our ability to access technology as well as to exploit it in our own way for further development. So what kind of a mechanism or what kind of a solution are we looking at?

Chair: Have specific restrictions as you have indicated have been imposed?

Question: I must also add that fundamentally major military products, critical products are not patented, for very obvious reasons.

Question: I am just coming up with a related question. i.e. When there is outsourcing of R&D either relocation of R&D facility by a majority multinational owned lab to India or outsourcing from a multinational to an Indian company to develop a certain product, what is the patent provision which applies, what happens to the individual inventor i.e. the person or persons who actually developed the product, do they have a patent right to that? It has a big economic impact because of further diffusion, further entrepreneurship - somebody who has worked in a lab, Indian or MNC lab is developing, doing R&D for outsource R&D, then that person can spin off and become an entrepreneur and set up his own company, if he has some IPR rights in what he has done. If he does not, then it affects the spread of technology within India. So between the company and the individual who works in that lab, whether it is an Indian or an MNC-owned lab, what is the intellectual property right of the individual?

Answer: I shall take up the second question first and then move on to the first one. As regards the off shoring of activity or outsourcing

of activities to the Indian countries are concerned there are two or three specific issues that have come up, what is the kind of contractual arrangement that has happened between the two entities- is one major factor which determines the extent of use of IPRs. If I can just narrate a specific instance that has happened in Bangalore itself. One of the biotech companies, which is a contract research organization, which has been working on specific product in India, which is completely outsourced by the American company, the Indian scientists are working on it, but the contractual arrangement explicitly indicates that any IPR generated in the course of the experiment in India shall be assigned completely to the sponsor company. At the time of contract they have signed the particular agreement and automatically you find that by virtue of the contract the IPR would belong to the sponsor company. This is what has been happening. However, we find a general trend in these companies, these days that as the research activities on specific products gets over, those informations have been utilized plus they come out with a new proposal, develop a new product and in the course of developing new product they have developed their own IPR strategies to ensure that the company in India would retain the IPRs.

Chair: Well thanks; time allocated for this session is over. So, hence the session is closed. Whatever questions you have, speakers are available. You can contact them later.

Summary of the session

Trade between India and the US is currently at about \$ 40 billion - \$ 25 billion in products and \$15 billion in services. Trade is growing and India is seen as a major destination for US investment. The balance of trade is currently in India's favour. Higher tariff protection by India is also seen as a problem by the US.

India is emerging as an important player not only in IT but also in other areas like drugs, and auto components. Opportunities in the US health care industry currently worth about \$ 1.5 trillion could be the next big market. There are many areas including nuclear power

in which India can emerge as a big player. India is becoming increasingly important to the US.

One of the current issues engaging the attention of both sides is the movement of people between India and the US. Visa quotas and security driven rules of the post 9/11 world could become barriers.

There continue to be problems between India and the US with some provisions of the TRIPS arrangements. These have to do with rules of licensing of drugs during epidemics and issues related to protecting bio-diversity. Improvements in Indian internal processes and greater transparency in rules and procedures are seen as important by the US. Labour laws in India could also become a constraint for greater trade. In the larger context of the relationship these are relatively minor blimps. However, there is a need for India to improve the efficiency of its legal system.

Prof. Vijayalakshmi: Thank you all very much. I want to thank all of you for making this a great success. I know I am the villain of this piece, but we do have a small change in the programme. We are wrapping up right now and that won't take many minutes. I think in a few minutes we are trying to conclude this workshop because there have been requests on popular demand that they have to leave and so we want to thank all of the panelists and the Chair for being so gracious in allowing a very good discussion. I think it has been an excellent idea to have this session because it has really followed both technical and the details of intricacies of judicial systems and so on. So what we were looking for in some way has been realized. We shall just take a couple of minutes to recap for all of you and for us really to, as organizers of this workshop, this has been very sobering. I must say this last couple of days We have had some extraordinary elements creeping in - foundational elements - of new strategic thinking on Indo-US relations. I am not talking about the lack of strategic culture alluded to by people but I am saying there was a foundational element here and that was the aim of this workshop

and it will be pursued continuously. We have also gone some distance in covering or uncovering the black box that has accompanied discussions on Indo-US relations. The multidimensional approach we thought would work has been vindicated by the proceedings of this workshop. I think it has worked, because we have been enriched by the depth and scope of the discussions. Though they look as if they are very specific issue areas but they actually have had some tremendous connectivity that we can see and established. We also have found that there is tremendous scope for Indo-US relations to expand. But the walk that we have to walk from the ground reality to its potential is going to be the tough road which requires serious strategic thinking. Even more importantly what we discovered is the need to have strategic decision making. We look to all of you for continued support because this is an initiative that we just began and we are hoping for ripple effect from this workshop. We are hoping that this will act as a force multiplier – and we will bring out a more strategic decision making in this country and establish a more integrated approach to the very complex landscape of Indo-US relations in the years to come. What was the history is quite clear but now, I think, there have been so many new dimensions and the matrix is not two-dimensional any more. We have a very quick word of appreciation from Mr. Arvind Kumar who will propose a vote of thanks individually to all of you and thank you all very much for making this workshop go some way in what we hoped would be a great dialogue, nationally – let me also say that we hope to bring out a report, so any writings of yours that you would like to send to us, we would be very happy to include. Thank you all very, very much and I just hope to see you all again.

Vote of Thanks - Arvind Kumar: On behalf of the Director and the Faculty of this Institute and the organizing team of this national workshop on Changing Contours of Indo-US Relations, I have a pleasant task to propose a vote of thanks to each one of you. Let me at the outset thank Shri K. Subrahmanyam, Chairman of Task Force on Global Strategic Developments and all the members of the Task Force, Dr. Tarun Das, Professor Rama Rao, Air Marshal Patney,

Commodore Bhaskar, Professor Ananth for taking time off from their schedules and participating in this workshop. I thank all the Chairs, Speakers, Discussants and the Rapporteurs for their participation. This workshop was a great success because of all these contributions. I particularly thank Ambassador Lalit Mansingh, Shri K. Subrahmanyam, Shri Vijay Nambiar, Dr. Lawrence Prabhakar, Ambassador Arundhati Ghose, Professor Manoj Pant, Dr. Sridharan, Admiral Jacob, Professor Samraj, Major General Dipankar Banerjee, Air Chief Marshal Krishnaswamy, Professor Rao, Professor Narasimha, Dr. Siddhartha, Dr. Banerjee, Professor Jayagovind, Professor Tarun Das, Professor Rupa Chanda, Professor T. Ramakrishna and Professor Vinod for their useful and important insights without which this workshop would not have achieved the articulated objectives. I also take this opportunity to thank Ambassador Venkateswaran, Ambassador Nazareth, Ambassador Krishnan, Ambassador Ranganathan and Ambassador Khaleeli for their participation at this workshop. I thank all the invitees Dr. Santhanam, Dr. Ramchand, Dr. N. Prabhakar, Dr. Anuradha Reddy for sparing time out of their schedules and made this function a great success. This workshop would not have been possible without the generous support from ISRO. I thank ISRO and more particularly Shri Madhavan Nair for taking time out of his hectic schedule and chairing yesterday's evening talk. I also would like to make a special mention of participation from ISRO scientific community, Dr. Rajeev Lochan, Dr. Sridharamurthy, Dr. Ninan, Dr. Sundaramaiah, Dr. S. Satish, Dr. Gopalakrishnan for their participation. I also would like to make a special mention of Shri Krishnamurthy and Shri Guru Prasad for helping us in managing the media. I also would like to thank our administrative staff Captain Joseph, Sriram, Miss Lalitha, Srinivas Aithal, Miss Girija, Miss Gayathri and Mr. Sasidharan who has been sitting here since yesterday helping us arrange the logistics inside the auditorium. I like to make a mention of our Dean Prof. Rajagopal, who never said no to anything and was always behind us and readily agreed to support all our endeavours in the planning and organization of this workshop. Once again I thank each one of you for making this workshop a grand success. Thank you.

Observations and Policy Implications

We can conceptualise the relationship between India and the US as a set of interdependent and linked forces along the five dimensions that are the major themes of the Workshop. These dependencies and the relative strength of the forces shaping the relationship can be conceptualized as a network of relationships with each of the nodes representing a particular force. Figure 1 is a conceptual representation of the current state of Indo-US relations.

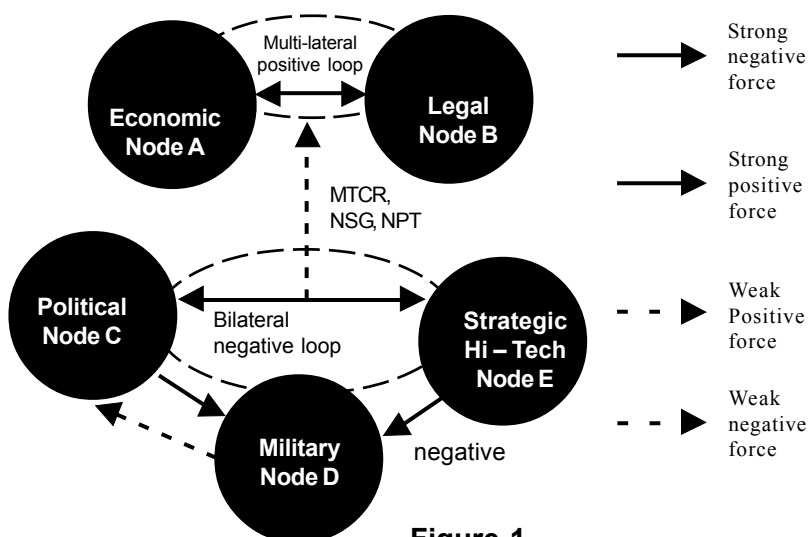


Figure 1

Figure 1 shows that the economic and legal nodes and the link between them has moved away from a bilateral Indo-US focus towards a multi-lateral WTO mode of working. Bi-lateral economic and trade relations can therefore be viewed as a subset of the larger emerging global trade regime.

With a significant decline in direct US aid to India this has meant that trade and economic relations have not suffered because of negatives in bilateral geo-political or strategic relations. Legal regimes for business operations and IPR protection have been shaped by global

trade compulsions rather than by bilateral Indo-US geo-political relationships.

The dynamic growth exhibited by some export driven sectors of the Indian economy, has also created a strong pro-India lobby in the US. While the current interests of this lobby may be largely economic it can and will emerge as a significant force that can serve as a counter to any future downturns in political or strategic relations between the two countries.

One could expect this lobby to proactively change the contours of other dimensions of the relationship so as to see a greater convergence of US interests with Indian interests.

In contrast to the economic and legal nodes, the political, military and strategic technology nodes are largely driven by bilateral government-to-government level interventions.

These nodes of the relationship form a closed dynamic loop that has operated relatively independent of the economic and legal loop.

Though sanctions and control regimes (dual use items, MTCR, NSG) also affect the economic and legal nodes, their impact on commercial trade is relatively small in the larger context of trade between the countries.

The formal and informal sanction regimes in high technology trade and transfer have however affected potential opportunities for cooperation both in the military and high technology areas like space and nuclear energy. They have also clouded perceptions and influenced the political and military nodes negatively on both sides.

Apart from economic forces, the other major positive force shaping the contours of the relationship is the military to military cooperation that we have witnessed over the last ten years.

This cooperation has withstood the negative impact of the 1998 nuclear tests and seen a major strengthening after the *Al Qaida* sponsored 9/11 attacks in the US. US geo-political and strategic interests along with its economic interests are forcing it to take India's military capabilities more seriously.

For the US to get India on its side it has to alter the negative feedback loop linking the strategic high technology node with the political and military nodes into a positive feedback loop. India has to be able to trust the US as a reliable partner if the relationship has to come good and flourish in the future. The US rightly believes that if it can alter this loop through the nuclear deal it will be able to significantly change the contours of the relationship. This would of course be the first step towards a partnership and would need to be followed up with other initiatives that build on this new relationship.

If the deal does not go through it is likely to reinforce the existing negative feedback loop between the political, military and strategic nodes and have a major impact on bilateral ties between the two countries. The agreement on civilian nuclear cooperation would be crucial for altering the current negative dynamic that is influencing the relationship between the two sides.

The civilian nuclear deal encompasses all dimensions of the relationship between the two countries. It is therefore a test case for the new emerging partnership between the two countries. It is obviously important for India but it is arguably as important for the US too.

Figure 2 below represents the altered relationship that would result if the nuclear deal goes through and is followed up by positive moves from both sides.

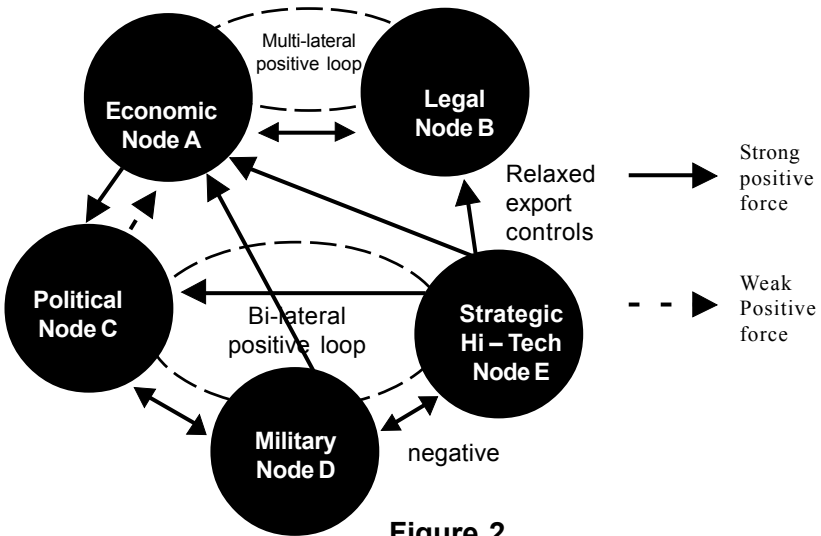


Figure 2

Given this understanding of the dynamic of the contours of the Indo-US relationship we would assume that the negotiating position of the Indian side on the specifics of the nuclear deal appears to be reasonably strong. We should, therefore, not assume that we are bound to take whatever the US offers. Within reasonable bounds the US would be amenable to look at the strategic part of the Indian interest favourably. This gives India more negotiating leverage than what many analysts think.

If the deal goes through and both countries respond positively to their mutual concerns and agree to work on the basis of converging common interests we would expect a positive spiral of trust beginning to emerge from the relationship. It could herald the beginning of a new relationship between the two countries.

If the civilian nuclear deal does not go through, bilateral relations between the two countries in the political, military and strategic cooperation domains will be negatively affected. It is also likely that the potential for economic cooperation and the positive role it could play in reinforcing the relationship between the two countries in key areas like energy will not be fully realized.

Annexure I

The Defense Framework

Signed on June 28, 2005 in Washington DC by
Minister of Defense of India, Pranab Mukherjee
& Secretary of Defense of the United States, Donald Rumsfeld

New Framework For The US - India Defense Relationship

1. The United States and India have entered a new era. We are transforming our relationship to reflect our common principles and shared national interests. As the world's two largest democracies, the United States and India agree on the vital importance of political and economic freedom, democratic institutions, the rule of law, security, and opportunity around the world. The leaders of our two countries are building a US-India strategic partnership in pursuit of these principles and interests.

2. Ten years ago, in January 1995, the Agreed Minute on Defense Relations Between the United States and India was signed. Since then, changes in the international security environment have challenged our countries in ways unforeseen ten years ago. The US-India defense relationship has advanced in a short time to unprecedented levels of cooperation unimaginable in 1995. Today, we agree on a new Framework that builds on past successes, seizes new opportunities, and charts a course for the US-India defense relationship for the next ten years. This defense relationship will support, and will be an element of, the broader US-India strategic partnership.

3. The US-India defense relationship derives from a common belief in freedom, democracy, and the rule of law, and seeks to advance shared security interests. These interests include:

- maintaining security and stability;

- defeating terrorism and violent religious extremism;
 - preventing the spread of weapons of mass destruction and associated materials, data, and technologies; and
 - protecting the free flow of commerce via land, air and sea lanes.
4. In pursuit of this shared vision of an expanded and deeper US-India strategic relationship, our defense establishments shall:
- A. conduct joint and combined exercises and exchanges;
 - B. collaborate in multinational operations when it is in their common interest;
 - C. strengthen the capabilities of our militaries to promote security and defeat terrorism;
 - D. expand interaction with other nations in ways that promote regional and global peace and stability;
 - E. enhance capabilities to combat the proliferation of weapons of mass destruction;
 - F. in the context of our strategic relationship, expand two-way defense trade between our countries. The United States and India will work to conclude defense transactions, not solely as ends in and of themselves, but as a means to strengthen our countries' security, reinforce our strategic partnership, achieve greater interaction between our armed forces, and build greater understanding between our defense establishments;
 - G. in the context of defense trade and a framework of technology security safeguards, increase opportunities for technology transfer, collaboration, co-production, and research and development;
 - H. expand collaboration relating to missile defense;
 - I. strengthen the abilities of our militaries to respond quickly to disaster situations, including in combined operations;

- J. assist in building worldwide capacity to conduct successful peacekeeping operations, with a focus on enabling other countries to field trained, capable forces for these operations;
 - K. conduct exchanges on defense strategy and defense transformation;
 - L. increase exchanges of intelligence; and
 - M. continue strategic-level discussions by senior leadership from the US Department of Defense and India's Ministry of Defence, in which the two sides exchange perspectives on international security issues of common interest, with the aim of increasing mutual understanding, promoting shared objectives, and developing common approaches.
5. The Defense Policy Group shall continue to serve as the primary mechanism to guide the US-India strategic defense relationship. The Defense Policy Group will make appropriate adjustments to the structure and frequency of its meetings and of its subgroups, when agreed to by the Defense Policy Group co-chairs, to ensure that it remains an effective mechanism to advance US-India defense cooperation.
6. In recognition of the growing breadth and depth of the US-India strategic defense relationship, we hereby establish the Defense Procurement and Production Group and institute a Joint Working Group for mid-year review of work overseen by the Defense Policy Group.
- The Defense Procurement and Production Group will oversee defense trade, as well as prospects for co-production and technology collaboration, broadening the scope of its predecessor subgroup the Security Cooperation Group.
 - The Defense Joint Working Group will be subordinate to the Defense Policy Group and will meet at least once per year to perform a midyear review of work overseen by the Defense Policy Group and its subgroups (the Defense

Procurement and Production Group, the Joint Technical Group, the Military Cooperation Group, and the Senior Technology Security Group), and to prepare issues for the annual meeting of the Defense Policy Group.

7. The Defense Policy Group and its subgroups will rely upon this Framework for guidance on the principles and objectives of the US-India strategic relationship, and will strive to achieve those objectives. Signed in Arlington, Virginia, USA, on June 28, 2005, in two copies in English, each being equally authentic.

Annexure II

Joint Statement between President George W. Bush and Prime Minister Manmohan Singh

18 July 2005

Prime Minister Manmohan Singh and President Bush today declare their resolve to transform the relationship between their countries and establish a global partnership. As leaders of nations committed to the values of human freedom, democracy and rule of law, the new relationship between India and the United States will promote stability, democracy, prosperity and peace throughout the world. It will enhance our ability to work together to provide global leadership in areas of mutual concern and interest.

Building on their common values and interests, the two leaders resolve:

- To create an international environment conducive to promotion of democratic values, and to strengthen democratic practices in societies which wish to become more open and pluralistic.
- To combat terrorism relentlessly. They applaud the active and vigorous counterterrorism cooperation between the two countries and support more international efforts in this direction. Terrorism is a global scourge and the one we will fight everywhere. The two leaders strongly affirm their commitment to the conclusion by September of a UN comprehensive convention against international terrorism.

The Prime Minister's visit coincides with the completion of the Next Steps in Strategic Partnership (NSSP) initiative, launched in January 2004. The two leaders agree that this provides the basis for expanding

bilateral activities and commerce in space, civil nuclear energy and dual-use technology.

Drawing on their mutual vision for the US-India relationship, and our joint objectives as strong long-standing democracies, the two leaders agree on the following:

For the Economy

- Revitalize the US-India Economic Dialogue and launch a CEO Forum to harness private sector energy and ideas to deepen the bilateral economic relationship.
- Support and accelerate economic growth in both countries through greater trade, investment, and technology collaboration.
- Promote modernization of India's infrastructure as a prerequisite for the continued growth of the Indian economy. As India enhances its investment climate, opportunities for investment will increase.
- Launch a US-India Knowledge Initiative on Agriculture focused on promoting teaching, research, service and commercial linkages.

For Energy and the Environment

- Strengthen energy security and promote the development of stable and efficient energy markets in India with a view to ensuring adequate, affordable energy supplies and conscious of the need for sustainable development. These issues will be addressed through the US-India Energy Dialogue.
- Agree on the need to promote the imperatives of development and safeguarding the environment, commit to developing and deploying cleaner, more efficient, affordable, and diversified energy technologies.

For Democracy and Development

- Develop and support, through the new US-India Global Democracy Initiative in countries that seek such assistance, institutions and resources that strengthen the foundations that make democracies credible and effective. India and the US will work together to strengthen democratic practices and capacities and contribute to the new U.N. Democracy Fund.
- Commit to strengthen cooperation and combat HIV/AIDs at a global level through an initiative that mobilizes private sector and government resources, knowledge, and expertise.

For Non-proliferation and Security

- Express satisfaction at the New Framework for the US-India Defense Relationship as a basis for future cooperation, including in the field of defense technology.
- Commit to play a leading role in international efforts to prevent the proliferation of Weapons of Mass Destruction. The US welcomed the adoption by India of legislation on WMD (Prevention of Unlawful Activities Bill).
- Launch a new US-India Disaster Relief Initiative that builds on the experience of the Tsunami Core Group, to strengthen cooperation to prepare for and conduct disaster relief operations.

For High-technology and Space

- Sign a Science and Technology Framework Agreement, building on the US-India High-Technology Cooperation Group (HTCG), to provide for joint research and training, and the establishment of public-private partnerships.
- Build closer ties in space exploration, satellite navigation and launch, and in the commercial space arena through mechanisms such as the US-India Working Group on Civil Space Cooperation.

- Building on the strengthened nonproliferation commitments undertaken in the NSSP, to remove certain Indian organizations from the Department of Commerce's Entity List.

Recognizing the significance of civilian nuclear energy for meeting growing global energy demands in a cleaner and more efficient manner, the two leaders discussed India's plans to develop its civilian nuclear energy program.

President Bush conveyed his appreciation to the Prime Minister over India's strong commitment to preventing WMD proliferation and stated that as a responsible state with advanced nuclear technology, India should acquire the same benefits and advantages as other such states. The President told the Prime Minister that he will work to achieve full civil nuclear energy cooperation with India as it realizes its goals of promoting nuclear power and achieving energy security. The President would also seek agreement from Congress to adjust US laws and policies, and the United States will work with friends and allies to adjust international regimes to enable full civil nuclear energy cooperation and trade with India, including but not limited to expeditious consideration of fuel supplies for safeguarded nuclear reactors at Tarapur. In the meantime, the United States will encourage its partners to also consider this request expeditiously. India has expressed its interest in ITER and a willingness to contribute. The United States will consult with its partners considering India's participation. The United States will consult with the other participants in the Generation IV International Forum with a view toward India's inclusion.

The Prime Minister conveyed that for his part, India would reciprocally agree that it would be ready to assume the same responsibilities and practices and acquire the same benefits and advantages as other leading countries with advanced nuclear technology, such as the United States. These responsibilities and practices consist of identifying and separating civilian and military

nuclear facilities and programs in a phased manner and filing a declaration regarding its civilian facilities with the International Atomic Energy Agency (IAEA); taking a decision to place voluntarily its civilian nuclear facilities under IAEA safeguards; signing and adhering to an Additional Protocol with respect to civilian nuclear facilities; continuing India's unilateral moratorium on nuclear testing; working with the United States for the conclusion of a multilateral Fissile Material Cut Off Treaty; refraining from transfer of enrichment and reprocessing technologies to states that do not have them and supporting international efforts to limit their spread; and ensuring that the necessary steps have been taken to secure nuclear materials and technology through comprehensive export control legislation and through harmonization and adherence to Missile Technology Control Regime (MTCR) and Nuclear Suppliers Group (NSG) guidelines.

The President welcomed the Prime Minister's assurance. The two leaders agreed to establish a working group to undertake on a phased basis in the months ahead the necessary actions mentioned above to fulfill these commitments. The President and Prime Minister also agreed that they would review this progress when the President visits India in 2006.

The two leaders also reiterated their commitment that their countries would play a leading role in international efforts to prevent the proliferation of weapons of mass destruction, including nuclear, chemical, biological and radiological weapons.

In light of this closer relationship, and the recognition of India's growing role in enhancing regional and global security, the Prime Minister and the President agree that international institutions must fully reflect changes in the global scenario that have taken place since 1945. The President reiterated his view that international institutions are going to have to adapt to reflect India's central and growing role. The two leaders state their expectations that India and the United States will strengthen their cooperation in global forums.

Prime Minister Manmohan Singh thanks President Bush for the warmth of his reception and the generosity of his hospitality. He extends an invitation to President Bush to visit India at his convenience and the President accepts that invitation.

Washington, DC
July 18, 2005

Annexure III

India-US Joint Statement, 02 March 2006

President George W. Bush and Prime Minister Manmohan Singh today expressed satisfaction with the great progress the United States and India have made in advancing our strategic partnership to meet the global challenges of the 21st century. Both our countries are linked by a deep commitment to freedom and democracy; a celebration of national diversity, human creativity and innovation; a quest to expand prosperity and economic opportunity worldwide; and a desire to increase mutual security against the common threats posed by intolerance, terrorism, and the spread of weapons of mass destruction. The successful transformation of the US-India relationship will have a decisive and positive influence on the future international system as it evolves in this new century.

Reviewing the progress made in deepening the global partnership between the United States and India since their Joint Statement of July 18, 2005, the President and the Prime Minister reaffirm their commitment to expand even further the growing ties between their two countries. Consistent with this objective, the two leaders wish to highlight efforts the United States and India are making together in the following areas, where they have:

For Economic Prosperity and trade

(1) Agreed to intensify efforts to develop a bilateral business climate supportive of trade and investment by:

1. Welcoming the report of the US-India CEO Forum, agreeing to consider its recommendations aimed at substantially broadening our bilateral economic relations, and directing the Chairs of the Indo-US Economic Dialogue to follow up expeditiously with the CEO Forum;

2. Endorsing the efforts of the US-India Trade Policy Forum to reduce barriers to trade and investment with the goal of doubling bilateral trade in three years;

3. Agreeing to advance mutually beneficial bilateral trade and investment flows by holding a high-level public-private investment summit in 2006, continuing efforts to facilitate and promote foreign direct investment and eliminate impediments to it, and enhancing bilateral consultations on various issues including tariff and non-tariff barriers to trade in goods and services, and preventing the illicit use of the financial system.

(2) Sought to expand cooperation in agriculture by:

1. Launching the Knowledge Initiative on Agriculture with a three-year financial commitment to link our universities, technical institutions, and businesses to support agriculture education, joint research, and capacity building projects including in the area of biotechnology.

2. Endorsing an agreed workplan to promote bilateral trade in agriculture through agreements that: lay out a path to open the US market to Indian mangoes, recognize India as having the authority to certify that shipments of Indian products to the United States meet USDA organic standards, and provide for discussions on current regulations affecting trade in fresh fruits and vegetables, poultry and dairy, and almonds.

(3) Reaffirmed their shared commitment to completing the WTO Doha Development Agenda (DDA) before the end of 2006, and agreed to work together to help achieve this outcome.

For Energy Security and a clean environment

(1) Welcomed the successful completion of discussions on India's separation plan and looked forward to the full implementation of the commitments in the July 18, 2005 Joint Statement on nuclear

cooperation. This historic accomplishment will permit our countries to move forward towards our common objective of full civil nuclear energy cooperation between India and the United States and between India and the international community as a whole.

(2) Welcomed the participation of India in the ITER initiative on fusion energy as an important further step towards the common goal of full nuclear energy cooperation.

(3) Agreed on India's participation in FutureGen, an international public-private partnership to develop new, commercially viable technology for a clean coal near-zero emission power project. India will contribute funding to the project and participate in the Government Steering Committee of this initiative.

(4) Welcomed the creation of the Asia Pacific Partnership on Clean Development and Climate, which will enable India and the US to work together with other countries in the region to pursue sustainable development and meet increased energy needs while addressing concerns of energy security and climate change. The Partnership will collaborate to promote the development, diffusion, deployment and transfer of cleaner, cost-effective and more efficient technologies and practices.

(5) Welcomed India's interest in the Integrated Ocean Drilling Program, an international marine research endeavor that will contribute to long-term energy solutions such as gas hydrates.

(6) Noting the positive cooperation under the Indo-US Energy Dialogue, highlighted plans to hold joint conferences on topics such as energy efficiency and natural gas, to conduct study missions on renewable energy, to establish a clearing house in India for coal-bed methane/coal-mine methane, and to exchange energy market information.

For Innovation and the Knowledge Economy

(1) Emphasizing the importance of knowledge partnerships, announced the establishment of a Bi-National Science and Technology Commission which the US and India will co-fund. It will generate collaborative partnerships in science and technology and promote industrial research and development.

(2) Agreed that the United States and India would work together to promote innovation, creativity and technological advancement by providing a vibrant intellectual property rights regime, and to cooperate in the field of intellectual property rights to include capacity building activities, human resource development and public awareness programs.

(3) Agreed to continue exploring further cooperation in civil space, including areas such as space exploration, satellite navigation, and earth science. The United States and India committed to move forward with agreements that will permit the launch of US satellites and satellites containing US components by Indian space launch vehicles, opening up new opportunities for commercial space cooperation between the two countries.

(4) Welcomed the inclusion of two US instruments in the Indian lunar mission Chandrayaan-1. They noted that memoranda of understanding to be signed by ISRO and NASA would be significant steps forward in this area.

(5) Welcomed the US Department of Commerce's plan to create a license exception for items that would otherwise require an export license to end-users in India engaged solely in civilian activities.

For Global Safety and Security

(1) Noted the enhanced counter-terrorism cooperation between the two countries and stressed that terrorism is a global scourge that must be fought and rooted out in every part of the world.

(2) Welcomed the increased cooperation between the United States and India in the defense area, since the New Framework for the US-India Defence Relationship was signed on June 28, 2005, as evidenced by successful joint exercises, expanded defence cooperation and information sharing, and greater opportunities to jointly develop technologies and address security and humanitarian issues.

(3) Reaffirmed their commitment to the protection of the free flow of commerce and to the safety of navigation, and agreed to the conclusion of a Maritime Cooperation Framework to enhance security in the maritime domain, to prevent piracy and other transnational crimes at sea, carry out search and rescue operations, combat marine pollution, respond to natural disasters, address emergent threats and enhance cooperative capabilities, including through logistics support. Both sides are working to finalize a Logistics Support Agreement at the earliest.

(4) Welcomed India's intention to join the Container Security Initiative aimed at making global maritime trade and infrastructure more secure and reducing the risk of shipping containers being used to conceal weapons of mass destruction.

(5) Reiterated their commitment to international efforts to prevent the proliferation of weapons of mass destruction.

(6) Building on the July 2005 Disaster Relief Initiative, noted the important disaster management cooperation and their improved capabilities to respond to disaster situations.

(7) Recognized the importance of capacity building in cyber security and greater cooperation to secure their growing electronic interdependencies, including to protect electronic transactions and critical infrastructure from cybercrime, terrorism and other malicious threats.

Deepening Democracy and Meeting International Challenges

(1) Recalled their joint launch of the UN Democracy Fund in September 2005 and offered the experience and expertise of both Governments for capacity building, training and exchanges to third countries that request such assistance to strengthen democratic institutions.

(2) Welcomed the decision of India and the United States to designate a representative to the Government Advisory Board of the International Centre for Democratic Transition (ICDT) located in Budapest to facilitate cooperative activities with ICDT.

(3) Agreed that the Virtual Coordination and Information Centres set up in September 2005 should be further strengthened and a bilateral meeting aimed at developing a practical programme for utilization of its services be held soon.

(4) Expressed satisfaction at the expedited USFDA drug approval processes that strengthen the combat against HIV/AIDS at the global level and encourage greater corporate participation to meet this challenge, including the establishment of the Indo-US Corporate Fund for HIV/AIDS.

(5) Agreed to expand bilateral efforts and continue cooperation in the area of medical research and strengthen technical capacity in food and drug regulation in India as well as address the concern on avian influenza, including agreement to reach out to the private sector, develop regional communications strategies, and plan an in-region containment and response exercise. The President welcomed India's offer to host the International Partnership on Avian and Pandemic Influenza meeting in 2007.

(6) Welcomed India's membership in the Coalition Against Wildlife Trafficking, a partnership through which we will collaborate in the fight against illegal trade in wildlife and wildlife parts; we also

welcome the opportunity to strengthen longstanding work together on the conservation of wildlife through cooperation on park management and ecotourism.

President Bush thanked Prime Minister Singh and the people of India for the warmth of their reception and the generosity of their hospitality.

New Delhi
March 2, 2006

Annexure IV

Programme

Day I 9th February 2006

- 8.30 - 9.00 am Registration
- 9.00 - 9.30 am Inaugural Session
- 9.00 - 9.10 am Welcome Remarks
Dr. K. Kasturirangan, Director, NIAS
- 9.10 - 9.25 am Inaugural Address
His Excellency **Shri T.N. Chaturvedi**
Governor, Karnataka
- 9.25 - 9.30 am Vote of Thanks
Prof. S. Chandrashekar
Visiting Professor NIAS
- 9.30 - 10.00 am Tea / Coffee**
- 10.00 - 10.15 am Workshop Overview
Prof. K.P. Vijayalakshmi
Visiting Professor, NIAS

10.15 - 12.15 am Session I

Theme: Perceptions and Misperceptions in Indo-US Relations

Chair: **Shri Lalit Mansingh**
Former Foreign Secretary

Speakers: **Shri K. Subrahmanyam**
Chairman Task Force on Global
Strategic Developments, GOI

Historical Overview of Indo-US Relations

Dr. Lawrence Prabhakar

Madras Christian College, Chennai

*Major Milestones & Turning Points and
Their Implications for the Future of
Indo-US Relations*

Ambassador Vijay Nambiar, Deputy NSA

*India's Negotiating Approach and
Strategies in Foreign Policy*

Discussant: **Ambassador Arundhati Ghose**, IFS (Retd.)

12.15 - 1.15 pm Session II

Theme: Indo-US Economic Relations - Emerging Dynamics

Chair: **Prof. K.P. Vijayalakshmi**

Speakers: **Prof. Manmohan Agarwal**
Dean, SIS, JNU (In Absentia)

*Indo-US Economic relations: Suspicious
Cooperation to Uneasy Negotiations*

Prof. Manoj Pant, International Trade,
SIS, JNU

*Indo-US Trade Relations and Potential
for Future Cooperation*

Discussant: **Dr. E. Sridharan**
Academic Director, UPIASI, New Delhi

1.15 - 2.15 pm Special Address by **Dr. Anil Kakodkar**
Chairman, AEC

*India's Nuclear Technological Capability
& Potential for Collaboration*

2.15 - 3.15 pm Lunch

3.15 - 5.30 pm Session III

**Theme: Changing Security Environment and Implications
for Indo-US Cooperation in Defence**

Chair: **Admiral P. J. Jacob, (Retd.)**
Member, NSAB

Speakers: **Prof. Christopher S. Raj, SIS, JNU**

*Emerging Security Challenges and
Implications for Indo-US Cooperation in
Defence*

Major Gen. Dipankar Banerjee, (Retd.)
Director, IPCS, New Delhi

*Emerging Security Challenges and
Implications for Indo-US Cooperation:
An Army Perspective*

Air Chief Marshal S. Krishnaswamy (Retd.)
Former Chief of Air Staff

*Emerging Security Challenges and
Implications for Indo-US Cooperation:
An Air Force Perspective*

Discussant: **Dr. Lawrence Prabhakar**
Associate Professor, Madras Christian
College, Chennai

6.30 - 7.30 pm Public Lecture

Topic: Challenges and Prospects for Indo – US Relations

Chair: **Dr. G. Madhavan Nair**, Chairman, ISRO

Speaker: **Dr. K. Subrahmanyam**, Chairman
Task Force on Global Strategic
Developments, GOI

7.30 pm Dinner

DAY II 10 February 2006

9.30 - 11.15 am Session IV

**Theme: Prospects for Indo-US Cooperation in
High Technology**

Chair: **Prof. P. Rama Rao**, Member
Task Force on Global Strategic Developments

Speakers: **Dr. S. Banerjee**, Director, BARC

*Prospects for Indo-US Civilian Nuclear
Cooperation*

Dr. K. Kasturirangan, Director, NIAS

*Prospects for Indo-US Civilian Space
Cooperation*

Prof. Roddam Narasimha

Chairman, Engineering Mechanics Unit,
JNCASR & Member, NSAB

*Prospects for Indo-US Cooperation in
High Technology*

Dr. V. Siddhartha

Emeritus Scientist, DRDO

*Export Control and Technology Denial
Regimes and their Implications for
Indo-US Relations*

Discussant: **Prof. P. Rama Rao**, Member, Task Force
on Global Strategic Developments

11.15 - 11.45 am Tea/Coffee

11.45 - 1.15 pm	Session V
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**Theme: US and Indian Legal Systems and Its
Implications for Indo-US Relations**

Chair: **Prof. Jayagovind**
Director, NLSIU, Bangalore

Speakers: **Shri Tarun Das**, Chief Mentor, CII

*US Systems vis-à-vis Indian Systems:
WTO/TRIPS*

Prof. Rupa Chanda, IIM, Bangalore
*Institutional & Legal Barriers to Indo-US
Trade*

Prof. T. Ramakrishna
NLSIU, Bangalore

*Comparative Analysis of Indo-US
Legal Frameworks with Special Emphasis
on IPR.*

Discussant: **Prof. M. J. Vinod**
Department of Political Science,
Bangalore University

1.00 - 1.15 pm Summing up by **Dr. K.P. Vijayalakshmi**

Vote of Thanks: **Arvind Kumar, NIAS**

Annexure V

List of Participants

Dr. V.K. Aatre

*Former Scientific Advisor
to Raksha Mantri*

Prof. Manmohan Agarwal

*Dean, School of International
Studies, JNU*

Prof. M.S. Ananth

Director, I.I.T., Chennai

Dr. V.S. Arunachalam

*Former Scientific Advisor to
Raksha Mantri*

Maj. Gen. Dipankar Banerjee (Retd.)

Director, IPCS

Dr. S. Banerjee

Director, BARC

Ms. Stuti Banerjee

CAWES, JNU

Cmde. Uday Bhaskar

Deputy Director, IDSA

Prof. Amaresh Chakrabarti

CPDM, I.I.Sc.

Ms. Rekha Chakravarthi

Stella Maris College, Chennai

Prof. Rupa Chanda, IIM (B)

Prof. S. Chandrashekar

NIAS & IIM(B)

Mr. Tarun Das

Chief Mentor, CII

Lt. Gen. Ravi Eipe (Retd.)

*Director, Asia Centre,
Bangalore*

Ambassador Arundhati Ghose

IFS (Retd.)

Mr. S. Gopal, IPS (Retd.)

Mr. V. Gopalakrishnan

ISRO

Mr. B.R. Guruprasad, ISRO

Dr. Sonika Gupta, NIAS

Vice Admiral P.J. Jacob (Retd.)

*Director, Dua Consulting &
Member NSAB*

Dr. A. Jayagovind, Director,

NLSIU, Bangalore

Prof. P.S. Jayaramu

*Dept. of Political Science,
Bangalore University*

Dr. Anil Kakodkar

Chairman, AEC

Dr. K. Kasturirangan

Director, NIAS

Ms. Ranjana Kaul

Dua Associates

Mr. Agrim Kaushal

*Deputy Secretary, National
Security Council Secretariat*

Ambassador A.M. Khaleeli

IFS (Retd.)

Ambassador N. Krishnan

IFS (Retd.)

Air Chief Marshal S. Krishnaswamy

(Retd.)

Former Chief of Air Staff

Arvind Kumar, NIAS

Mr. Rajeev Lochan, ISRO

Ambassador Lalit Mansingh

IFS (Retd.)

Air Commodore M. Matheswaran

Prof. S. Mohan, I.I.Sc.

Ms. Sindhu G. Murthy

Stella Maris College, Chennai

Dr. R.G. Nadadur, ISRO

Prof. Rajaram Nagappa

MIT – Anna University

Dr. G. Madhavan Nair

Chairman, ISRO

Prof. M.D. Nalapat

Dept. of Geopolitics, MAHE

Mr. Vijay Nambiar

Deputy NSA

Prof. R. Narasimha, Chairman,

*Engineering Mechanics Unit,
JNCASR, New Delhi*

Ambassador P.A. Nazareth

IFS (Retd.)

Mr. Jacob Ninan, ISRO

Prof. Rahul Pandit, Chairman

IRC, I.I.Sc.

Prof. Manoj Pant

CSDILE, SIS, JNU

Prof. J. Pashupathy, I.I.Sc.

Ms. Yashothara Pathmanathan

*Dept. of International Studies,
Stella Maris College, Chennai*

Air Marshal (Retd.) Vinod Patney

*Member, Taskforce on Global
Strategic Developments*

Dr. Lawrence Prabhakar

*Madras Christian College,
Chennai*

Mr. N. Prabhakar

DRDL, Hyderabad

Ms. Uma Purushotamman

CAWES, JNU

Prof. Christopher S. Raj

*Chairman, CCUS & LAS,
SIS, JNU*

Prof. S. Rajagopal, NIAS

Dr. K. Ramchand

*Former Director, Centre for
Airborne Systems, Bangalore*

Dr. T. Ramakrishna

NLSIU, Bangalore

Ambassador C.V. Ranganathan

IFS (Retd.)

Dr. S. Rammohan, IRAS

Dr. P. Rama Rao

*Member, Taskforce on Global
Strategic Developments*

Dr. Anuradha Reddy

DRDO HQ

Mr. K. Santhanam, Former Director

IDSa, New Delhi

Mr. S. Satish, ISRO

Mr. K.R. Sridharamurthi, ISRO

Dr. V. Siddhartha, DRDO HQ

Mr. K.N. Shankara, ISRO

Dr. E. Sridharan, UPIASI

Dr. K. Subrahmanyam, Chairman,

*Task Force on Global Strategic
Developments*

Lt. Gen. (Dr.) V.J. Sundaram (Retd.)

NIAS

Mr. V. Sundaramaiah

ISRO HQ

Mr. A.P. Venkateswaran

Former Foreign Secretary

Prof. K.P. Vijayalakshmi

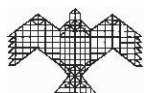
NIAS & JNU

Prof. M.J. Vinod

*Dept. of Political Science
Bangalore University*

International Strategic & Security Studies Programme

The International Strategic & Security Studies Programme at NIAS promotes and conducts research that addresses the strategic and security concerns of India. It has over the years carried out a number of studies in technology dominated areas of international security - nuclear weapons and missiles. NIAS has also facilitated exchange of knowledge and views between interested groups working around the globe on issues related to international security. The programme has broadened its technology focus to look at other dimensions of security such as economic and energy security. The programme focuses on the region with a special emphasis on China and Pakistan.



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NATIONAL INSTITUTE OF ADVANCED STUDIES

IISc Campus, Bangalore - 560 012, India

Tel: 2360 4351 / 6594 / 2760 / 2050 Fax: 2360 6634

Email: arvind@nias.iisc.ernet.in

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