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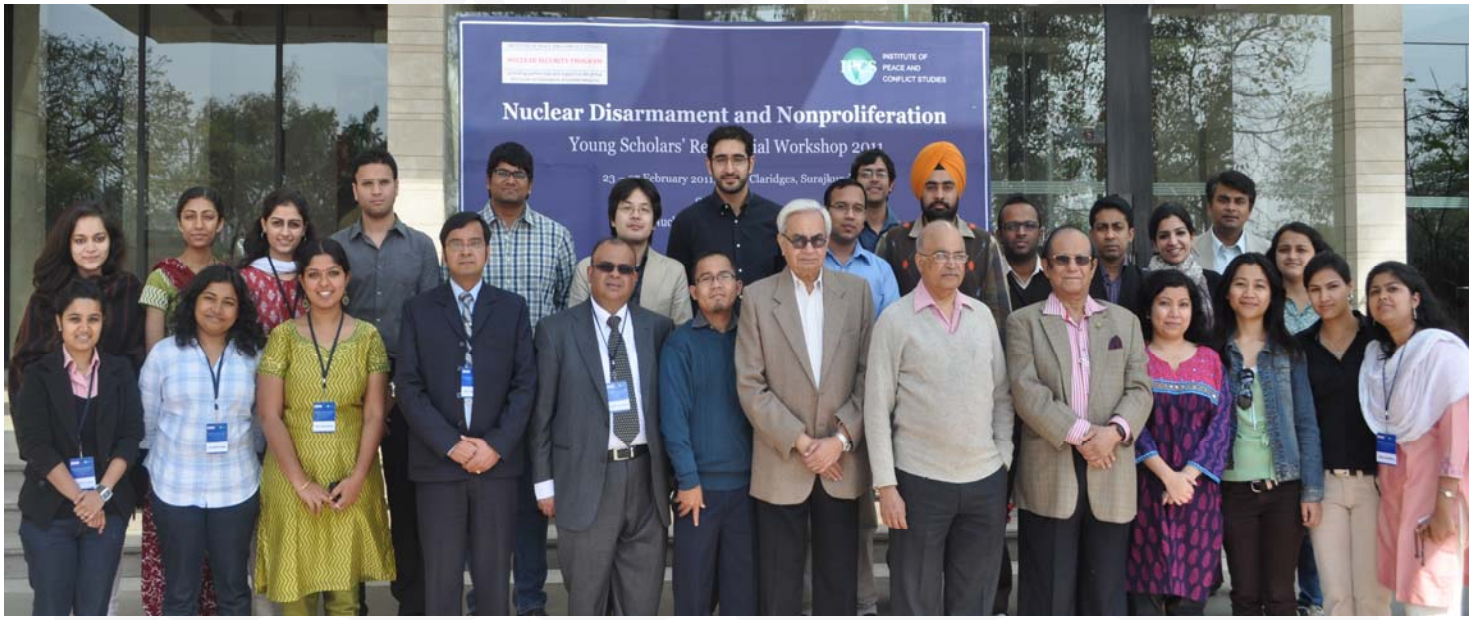
THIRD ANNUAL YOUNG SCHOLARS' RESIDENTIAL WORKSHOP 2011

NUCLEAR DISARMAMENT AND NONPROLIFERATION



INSTITUTE OF PEACE AND CONFLICT STUDIES
NUCLEAR SECURITY PROGRAM
providing partnership and support to the global discourse on elimination of nuclear weapons

SUPPORTED BY
NUCLEAR THREAT INITIATIVE
(NTI)

IPCS WORKSHOP REPORT

23 - 27 February 2011

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YOUNGS SCHOLARS' WORKSHOP 2011

An Introduction

The centrality of nuclear weapons to the global security paradigm ensures also its permanence as a critical challenge of the 21st century. The IPCS Nuclear Security Programme (NSP) seeks to respond to this challenge through the provision of independent, objective assessments of nuclear disarmament and non-proliferation issues, and supplement existing policy debates and strategic analyses.

Since its inception, the IPCS has been working on various issues related to disarmament, especially Nuclear Disarmament. We are the only research institute in South Asia that focuses on all aspects of Weapons of Mass Destruction (WMD), including Chemical, Biological and Radiological weapons. The Institute has undertaken numerous projects, both on an individual and collaborative basis, on the issue of WMDs. The Nuclear Security Programme aims to strengthen the Institute's efforts on the above issues. This project is supported by the Nuclear Threat Initiative (NTI).

As a new debate on the relevance of nuclear weapons and the future of nuclear power for peaceful purposes enters the post Cold War era, a number of myths, facts and queries are inadvertently raised and questioned. India's role in opposing nuclear weapons, while at the same time grudgingly having to accept it owing to geo-strategic compulsions and its quest to explore the nuclear renaissance, reflect a South Asian perspective on the debate. For capacity-building and the incorporation of major strategic debates within the parlance of younger scholars, the IPCS actively engages with the academic and strategic community through the medium of the Institute's annual workshop.

The Institute of Peace and Conflict Studies (IPCS), as part of its Nuclear Security Programme supported by the Nuclear Threat Initiative (NTI), organizes an annual workshop for young scholars that provides basic introduction to nuclear disarmament, regional security issues and provides opportunities for research on nuclear issues.

This year twenty four students and practitioners from India, the United States, Japan and Germany attended the Third Annual Young Scholars' Workshop on Nuclear Disarmament and Non-proliferation, Surajkund, Haryana from 23 - 27 February 2011. Applicants for the workshop came from diverse academic and professional backgrounds, including sciences and journalism.

This combination fostered a valuable opportunity among young scholars for the exchange of views and provided a foundation for future networking among the participants. For a significant number of participants, the workshop represented their first orientation to the IPCS and its work on nuclear issues.

The primary purpose of the workshop was to help refine the ability to analyze objectively, and to assess the qualitative output from the workshop, a questionnaire soliciting comments and feedback was provided to the participants.

The Workshop syllabus included sessions on the following:

- Science of Nuclear Weapons
- The Nuclear Club: Programs, Policies, and Doctrines
- Regional Overview: China, Pakistan and Myanmar
- India's Nuclear Program
- Nuclear Weapons and National Security
- Indian's Nuclear Policy
- Indo-US Nuclear Deal
- The Nuclear Liability Bill
- The WMD Bill
- Nuclear Safety and Security
- Nuclear Terrorism
- The Non-Proliferation Regime: Overview, Strengths, and Challenges
- Nuclear Renaissance
- Moves towards Global Disarmament and Nuclear Weapons Elimination.

Following is the report of the workshop.

Session I
Welcome Address and Inaugural Address

Welcome Address: Aim and Objectives of the Workshop

Prof PR Chari
Visiting Professor, IPCS

This young scholars' residential workshop follows a mix of the Summer School Model and the Week-long Workshop Model to build capacity amongst young scholars on issues of nuclear disarmament, non-proliferation and international security. The workshop will have of a series of straight lectures, group discussions, presentations, simulation game exercise and film screenings. Its' success largely depends on the active participation of all the young scholars.

Inaugural Address : Nuclear Disarmament and Non Proliferation

Mr Venkatesh Verma
Joint-Secretary, Disarmament and International Security Affairs (D&ISA) Division, Ministry of External Affairs (MEA)

The debates of the early nuclear age remain unresolved. Nuclear weapons do not exist in a vacuum but in real international situations; they possess absolute destructive power. States possessing them are able to exert tremendous international power. Today, the P-5 as a Nuclear Weapons States (NWS) group is the driving force of the nuclear world. Nuclear weapons have not abolished war; instead there exists an uneasy correlation between the two. To resolve the fundamental issues of the nuclear age we need to either change the international system of power politics or the very nature of nuclear weapons. It is the fundamental responsibility of nuclear weapons states to practice restraint in terms of size of nuclear arsenal and the eventuality of their use, and to contribute to disarmament and non-proliferation efforts. Imperatives for nuclear disarmament and non-proliferation were first combined in the multinational Manhattan Project.

Abolition of weapons is an important pillar of nuclear disarmament; it has both, political and legal connotations. Unlike in the case of chemical and biological weapons, the process of delegitimisation of nuclear weapons never took off. Eventually, nuclear weapons got sucked into the Cold War confrontation. Since nuclear weapons could not be abolished they needed to be controlled. The 'control' of nuclear weapons is central to the notion of non-proliferation.

Proliferation is like water, it tends to seep through the cracks. Despite its near universal adherence the Nuclear Non Proliferation Treaty (NPT) cannot prevent the diffusion of technology leading to weapons development. The NPT's structure is ill-suited to detect the patterns or motives for proliferation. Universality of the NPT has reached its limit and no special change can be expected in the international political circumstances to accommodate those outside the treaty. The primary focus of the NPT remains the nuclear weapons states while states like Germany and Japan benefit from the nuclear umbrella provided by the US. Non proliferation is a set of legal measures to incentivise or disincentivise the spread of nuclear weapons and technology; it is based on consensus and within the confines of international law. However, counter proliferation measures like the Proliferation Security Initiative are more proactive and can plug the loopholes in non proliferation approach. There is no single model that explains proliferation and therefore there is no single solution.

The NPT regime is under considerable stress. There are no realistic prospects for nuclear disarmament. The French do not want to move towards total nuclear disarmament and the Russians believe in nuclear deterrence more than ever before. Pakistan has a very ambitious, open ended nuclear programme characterised by military dominated decision making, no serious restraints and plenty of resources. India's dynamic neighbourhood poses its own unique problems.

India and Nuclear Disarmament

India is a non signatory to the NPT and the Comprehensive Test Ban Treaty (CTBT). It has declared a voluntary moratorium on nuclear testing and adheres to NSG's national export controls. India supports the negotiation of a Fissile Material Cut-Off Treaty (FMCT). The Indo-US nuclear deal removed major irritants to India's nuclear industry and renewed strategic ties between India and the US. The NSG as well as the IAEA decided to formulate India-specific agreements for exemption and safeguards respectively. But it came as a bargain in which India had to separate its civilian and military nuclear programmes. The argument that India may divert uranium released from foreign supplies to its military programme is poorly supported. India's

nuclear weapons programme is not uranium-based and its breeder reactors are not meant for military purposes. Not everything outside the safeguards is a part of the military programme.

Session II
Nuclear Weapons and National Security
Why do states seek nuclear weapons?
Models of Proliferation

Prof Amitabh Mattoo
Honorary Director-General, IPCS

The most intuitive answer to why states acquire nuclear weapons is the existence of a security threat from an adversary. In his 1996/97 article in the International Security journal, Scott Sagan says that there is no parsimonious explanation to this issue and that in fact there exists a proliferation puzzle to be solved. He presented three models to explain proliferation – the security model, domestic-politics model and the norms model.

The first model represents a realist security perspective which explains that threat from an adversary drives a state to acquire nuclear weapons and the absence of threats leads to renunciation or resistance to these weapons. A strong state will develop nuclear weapons and the weaker ones would try to find nuclear allies. The American, Soviet, French, British, Indian and Pakistani nuclear weapons programme were motivated by the fear of the adversary getting the weapons first.

India is a classic example of the domestic politics model which looks at the stakeholders within the domestic arena. Sagan points out that India stated that its weapons programme was motivated by the Chinese tests and yet decided to wait ten years until its own tests. A strong explanation is that the nuclear tests meant to regain the then Prime Minister Indira Gandhi's power within the country. The nuclearisation and then denuclearisation of South Africa also had much to do with motivations of its scientists, the potential victory of the African National Congress and the unwillingness of the white majority to give up the arsenals.

Sagan elucidates how a state's self image and understanding of international norms may lead to it seeking nuclear weapons. Despite traditional security-related explanations, the French nuclear weapons programme had much to do with the Fifth Republic's aspirations to improve the French international standing and De Gaulle's notion of French grandeur. Ukraine's decision to de-nuclearise was an articulation of the image of a responsible member of the international community and to dissociate itself with rogue states as well as attract support from western civil society and government.
Sagan's policy framework aims to prevent states from acquiring nuclear weapons. No one model fits all cases and one needs to look into the motivations before finding solutions. The non proliferation policy itself needs to be customised or differentiated.

Session III
India's Nuclear Policy and Strategy

Prof Swaran Singh
Professor of Diplomacy and Disarmament, CIPOD, JNU

Following 1947, disarmament stayed at the centre of the Indian strategic discourse because of general and strategic culture. Nehru formulated India's foreign policy. His mindset is inescapable - the focus was on idealism, nonalignment, and peace. In this discourse, the important fundamentals were

- Nuclear disarmament as a tool, not an end in itself. The end should be internal development and peace.
- Nonalignment became entrenched in domestic political discourse, and it influenced the nuclear decision with based on its attempt to steer clear of military alliances and emphasis on restraint.
- Importance of independence and autonomy.
- Emphasis on a time-bound, step-by-step process to disarmment.
- The extension of anti-colonialism in the effort to seek universal and non-discriminatory policies in international politics and within internatinal regimes

From the 1930s on, there was an ambitious focus on world peace. A US National Intelligence Estimate from 21 Oct 1964 says that India at that time had nuclear capabilities and would detonate in the next few years. Yet India did not detonate until 1974 due to its policies of restraint and multilateralism.

Indian nuclear policy between the 1960s and 70s was driven by national security concerns and fears over Chinese intentions. The team of Indira Gandhi and Raja Ramanna engaged in a national security policy of pragmatism. The 1962 and 1965 wars catalyzed a domestic debate about nuclear weapons. The partial test ban treaty made India appear foolish and the Pakistani nuclear programme stars following the bifurcation of Pakistan.

In the 1980s there was a focus on enhancing national stature and nuclear policy become more nuanced. Talk of disarmament ran in tandem with the development of a weapons program. India's internal nuclear program was in response to external pressures. Pakistan's claim to be "only a screw drive away from building nukes" and the building of a China-Pakistan nexus necessitated a response from India

The 1990s were a time of new partnerships and bold initiatives. There was a creation of a new world order with the USSR collapse. India needed a new pillar of support and the US came to

function as a hyper-power during this period. India's 1998 detonation upset the world. Strobe Talbott tells in his book of how the US was caught flat-footed. The 1998 detonation was a response to a collection of pressures – China, the rise of US, fall of USSR and external economic politics.

Today, there is a full-time Indian ambassador on disarmament. There is a greater faith in international norm/regime building and a lowered criticism of regimes that exist. India continues with low nuclear expenditures and limited arsenals (compared to Pakistan, whose arsenal may be larger than that of the UK). India's participation in UN has moved beyond peacekeeping. The current nuclear vision is that while the ultimate goal is still disarmament, nuclear weapons are a current necessary evil.

Session IV
Science of Nuclear Weapons
Different types: fission/fusion, breeder technology, Homi Bhabha Plan

Prof R Rajaraman
Emeritus Professor of Physics, Jawaharlal Nehru University

India possesses a large arsenal of nuclear weapons and over the years, considerable expertise has built, within the government and outside, on issues pertaining to nuclear weapons and nuclear energy. A scientific and technical understanding of nuclear weapons is necessary better policy/decision making and understanding the nature of the one's own arsenal. Close technological links exist between nuclear energy and nuclear weapons with potential for proliferation and as global terrorism gets more organised, imperatives for protecting nuclear materials become stronger.

Nuclear bombs are not synonymous with atom bombs. Nuclear energy is obtained by breaking the nucleus within an atom. A nuclear reaction may be a fission or fusion reaction. The nuclei of only a few atoms like Uranium-235, Plutonium-239 and Uranium -233 undergo fission when hit by thermal (slow) neutrons. Uranium-235 is not available in natural abundance and has to be extracted from naturally available Uranium-238 isotope in centrifuge reactors. In a fission reaction, a heavy nucleus absorbs other neutron/neutrons and splits into two or three pieces. A nuclear chain reaction occurs when one act of fission gives out neutrons which cause more fission and the process continues one after the other with negligible time gaps releasing huge amounts of energy. A chain reaction could be a controlled one or an uncontrolled one. An uncontrolled chain reaction of the super-critical type leads to explosion. Control rods are used to control the speed of the reaction. Heavy water or light water is used as a moderator to slow down the neutrons (light water absorbs excessive neutrons causing greater fission). Heavy water production is an expensive affair and most nuclear reactors in the world are now using ordinary water as moderators.

Nuclear weapons production requires a much higher speed of chain reaction and a richer fuel than in civilian reactors. Uranium enriched higher than 90 per cent becomes weapons-grade. Plutonium is preferred over uranium as a reactor-grade as well as weapons-grade fuel. Plutonium is produced as a by-product from the U-238 fission reaction. Indian weapons are made from plutonium fuel. Pakistan is trying to shift from uranium weapons to plutonium weapons. Iran has a large number of centrifuges which can enrich uranium to weapons-grade levels – but the Iranian intent is debated. Materials, facilities and know-how which are sensibly meant for civilian use can be easily used to make weapons - therefore the fear of proliferation. Safeguarding is meant to ensure that no nuclear material or technology for civilian purpose is diverted for weapons-making.

For the last thirty years, India's nuclear programme has been indigenous, but it is proceeding at a slow place. Disposal of nuclear waste from reactors as well as weapons is a serious problem all over the world and no satisfactory techniques have yet been devised to deal with the issue. In India, there is a need to understand the issue at the technical level first and then taken up at the political level.

Session V
India's Nuclear Program, Policy and Strategy (Limited War and Cold Start)

Dr D Suba Chandran
Director, IPCS

The Rise and Fall of the Concept of Limited War
These concepts emerged from a particular environment, circumstance and literature. By Limited War we mean limited in time, battle zone, targets, resources, costs/benefits, and objectives. It has its origins in the 1940s with Liddel Hart who distinguished limited war from conventional war. His objectives were humanitarian. In his terms, any unlimited war is destructive.

At the global level, in the 1950s, limited war was a term used as a means to fight war, in order to replace the strategies of Mutually Assured Destruction (MAD) or Massive Retaliation. There was a search for an alternative strategy, as detailed in Kissinger's 1957 book, in order to limit cost the cost of war (William Kaufman 1956). Robert Osgood argued in 1957 that wars could be limited to local affairs. Halperin and Brodie talked about limited wars as proxy wars that would be defensive in order to loosen Soviet control, while maintaining deterrence. This would allow for demonstrations of strength in a nuclear age.

In South Asia, the 1990s saw a failure of political dialogue,

growing militancy in J&K, and the Pakistani use of non state actors. The Kargil War was an example that there was "space under the nuclear umbrella" for limited war (Gen Malik's book). Currently, has the time of limited war ended in South Asia? Is limited war only about space? There has been no support for limited war in South Asia on the international level. In conclusion, limited war is a military strategy of the Indian military, which arrived as a concept during a particular strategic environment. It needs to be examined whether this strategic environment has changed.

Ali Ahmed
Research Fellow, Institute of Defence Studies and Analyses (IDSA)

On Cold Start
Cold Start is the Indian military's idea of limited war. According to Clauswitz, there are two kinds of war - annihilation and limited war. A nation must be clear about what it wants from a limited war so as not to slip down the slope to annihilation. There was a change from this Clauswitzian conception with the nuclear age and the concept of deterrence. If a war were to be nuclear, how could it be limited to the lowest escalatory level?

Limited war is a deliberate hobbling of the power available to you so that the other side is de-incentivized to escalate. In Cold Start, the military mobilizes from a standing start in order to create offensive capability on the border. Its doctrinal impetus was structural, designed to address the problem of deterring Pakistan, to bring India's conventional arms advantage back into the picture from the period before proxy war and nuclearization took over. On the unit level, there was a strategic cultural change. Cultural nationalism became more offensive in point of view. On the organizational level, the army and air force engaged in a doctrinal battle, with the air force trying to do "shock and awe" and the army not wanting to be left behind. Cold Start is quick mobilization along a broad multiple-pronged front, with limited penetration, making sure military objectives don't trigger a Pakistani nuclear reaction.

There are some problems with Cold Start: The cumulative effect of the different military branches might not be easily communicated to Pakistan. Then there are the effects of mission creep which can give very little time for crisis management. Conflict can be dynamic and the Israeli model is problematic. What are the nuclear thresholds especially those of Pakistan?

Cold start has some advantages too - it functions as a kind of deterrence, and a military needs a doctrine to guide its acquisitions. It is questionable however whether this retraction from proxy war would this work. Indeed the Army Chief has said that there is no Cold Start. A doctrine is an operational reaction, tailored to a situation.

Session VI
Indo-US Nuclear Deal

Prof PR Chari
Visiting Professor, IPCS

The Indo-US Nuclear deal embedded in the agreement of 18 July 2005 was formalised and finalised in October 2008. The Deal has not been operationalised yet. The important features of the 2008 Deal were:

- It designated India as a "responsible state with advanced nuclear technology".
- It promised support for "full civil nuclear cooperation" with India.
- The US adjusted domestic laws and policies as well as those of the international regimes to enable full civil nuclear cooperation and trade.

India is seeking membership in all the export control and technology regimes – Nuclear Suppliers Group, Missile Technology Control Regime, the Australia Group and the Wassenaar Group. Under the terms of the deal, India agreed to:

- Identify and separate its civil and military nuclear facilities
- Voluntarily place all civilian nuclear facilities under IAEA safeguards
- Continue and maintain a unilateral moratorium on nuclear testing
- Work towards negotiating a multilateral FMCT (although the treaty is nowhere in sight)
- Refrain from transferring enrichment and reprocessing technology (India's record on export controls is impeccable)
- Enact comprehensive export control legislation; and
- Harmonise policies with and adhere to the MTCR and NSG guidelines (this was also a part of the India-US joint statement during President Obama's India visit in 2010).

Both India and the US had good reason to enter into this deal. The US made an exception for India, although the deal undermined the spirit of the NPT. Besides sharing congruent political structures - liberal democracies, federal governments and market economies – which make them natural friends if not allies, India is the second fastest growing economy in the world and the US considered it as a source of capital for reviving its own struggling economy. India is seen as a political ally in Asia, besides Japan, to balance the Chinese power. For India, the deal facilitated access to advanced nuclear technology and to the import the much-needed natural and low-enriched uranium fuel for its civilian reactors; it thus removed constraints on the energy programme which has been heavily dependent on Pressurised Heavy Water Reactors (PHWRs) and inhibited by the shortage of natural and low enriched uranium. It marks the beginning of a strategic partnership with the US, redefines India's anomalous nuclear situation and recognises India's de facto nuclear weapons status.

The overall impression of the deal is very good but there are still some loose ends. The suppliers' objections to the Indian civil nuclear liability Act, has obstructed the deal from coming into operation. According to the Act, the compensation liability for the operator (the NPCIL in India) has been capped at $10 billion and section 17B of the Act gives the operator right to recourse for compensation from the supplier in case of an accident where the supplier is at fault. The issue was largely influenced by the lessons learnt from the Bhopal Gras Tragedy of 1984. The Japanese stakes in companies like Areva, GE and Westinghouse are very high and the Japanese are not very comfortable with supplying nuclear technology to India without India signing the NPT or CTBT. The Indo-US deal also became one of the most divisive issues in Indian politics.

Session VIII
China and Pakistan: Nuclear Program and Policy

Prof Srikanth Kondapalli
Professor in Chinese Studies, JNU

On China
China has strengthened and modernized its nuclear arsenal, changed its posture from minimum to limited deterrence and is also importing civilian nuclear technology from international companies. All these affect its stockpiles, training, as well as modernization. Like India, China has adopted the NFU policy but now uses "conditional NFU." The Second Artillery Corps is taking care of China's nuclear as well as conventional warheads, making it difficult for potentially target countries to judge whether an incoming warhead is nuclear or conventional. Highly sophisticated early warning systems are thus needed. At the October 2009 Beijing parade there were eight varieties of multiple entry missiles displayed, most of which were tactical missiles (conventional payload emphasis).

The Indian Ministry of Defence (MoD) reports that Indian cities could be targeted by Chinese nuclear weapons. Despite four strategic dialogues with China including an Indian proposal for a non-targeting agreement, China remains reluctant to accept India as a *de jure* nuclear weapons state. Both sides are ratcheting up in order to take up the other's deterrence capability. According to the Indian foreign secretary, there is a Sino-Indian hotline in operation. After the Indo-US deal, there was much talk about nuclear "parity" for Pakistan.

Chinese nuclear evolution went from Mao's "paper tiger" to the real tiger of development. In 1993, the Chinese government stated that "nuclear weapons are an important pillar of great power status." There's been a shift in discourse from minimum to limited deterrence in Chinese military journals.
Currently, there are newspaper accounts of China moving away from its NFU posture. There has also been a shift in nuclear assets after the earthquake. An increased arsenal size would make China a candidate for START 3. China has shifted from its Cold War triad to the new triad and is putting over a quarter of its military budget into research and development (unlike India). There have been lots of missile tests, for missiles who's purpose is to counter aircraft carriers. This may just be shifting of previously targeted missiles, not escalation. China produces 60-70 missiles a year (according to Pentagon).

Dr D Suba Chandran
Director, IPCS

On Pakistan
There is no official Pakistani nuclear doctrine; it is more of an understanding. General Kidwai's interview and its discussion of redlines could be policy, but it could also simply be signalling. Pakistan decided to go nuclear after the defeat of 1971, which was a loss of territory and blow to national pride. India's conventional superiority was an issue, as was the US-Pakistani chill after 1971, the 1974 Indian tests, as well as Zia's domestic politics. Nuclear weapons became nuclear "nationalism" (A.Q. Khan heroics).

Pakistan has a series dilemmas related to nuclear issues - weak state structure, A.Q. Khan's credibility issue, unarticulated nuclear doctrine making it difficult to defend its position, fears of non state actors from the US and Europe, a perceived need to maintain a strategy of deliberate ambiguity, funding support for an Islamic/Sunni bomb, willingness to use nukes in a crisis situation yet assure international community of deterrence and finally, its command and control structures.

For Pakistan, the usual doctrinal questions are even more complicated – Are nukes like any other weapon to be used in war strategy? Are they weapons to deter war? Are nukes political weapon? or all of the aforementioned? Doctrine is not formally declared (necessary ambiguity), and there is a desire for flexibility in terms of actual use, and threat of use. Pakistan's unwritten nuclear doctrine is India-focused – will that focus remain? Pakistan doesn't believe in the Indian NFU. There is talk about minimum credible deterrence but a refusal to say what minimum is. The fluid concept of "minimum" seems to keep going up in order to maintain credibility. The fundamental question is not India's nuclear capabilities, but what Pakistan perceives them to be. This is a political/psychological issue.

In regards to Gen Kidwai's Interview and Redlines – how much are signals? How much are actual redlines? He outlined the Pakistani nuclear redlines as follows:

- Territorial integrity (no more 1971)
- Economic strangulation
- Survivability of defence forces
- Political destabilization and large scale internal subversion

What impact might a nuclear Iran have on Pakistan's nuclear posture? Might Pakistan agree to provide a nuclear umbrella to Saudi Arabia? Might Pakistan adopt an NFU but increase its arsenal? What about a fissile material treaty? How to maintain long-term ambiguity? Could command and control issues be symptomatic of failure as strategy? Is Pakistan using the US fear in order to maintain military dominance over nuclear weapons? This is a form of nuclear blackmail.

Session IX
Sino-Pak Nuclear Deal

Prof Srikanth Kondapalli
Professor in Chinese Studies, JNU;
and
Dr D Suba Chandran
Director, IPCS

The imperatives of the Sino-Pak Nuclear Deal can be reasoned through four points – economic, strategic, defence and political. It is argued that China's deal with Pakistan is in the same light as its' nuclear cooperation with 14 other countries and in the interest of Pakistan's external security concerns. Politically and strategically, the Sino-Pak Deal is a response to the Indo-US nuclear deal. Although Pakistan is a major non-NATO ally of the US, it has not been offered a deal alike the nuclear deal with India by the US. Pakistan needs a strategic partner in the international community and the Sino-Pak nuclear deal strengthens its relations with China. The deal is strategically important to china too. The US-China clash of interests is now manifesting all around the world, particularly in the Middle-East. China has assisted Iran in the development of its nuclear programme (China is known to have provided Iran with uranium hexafluoride and conventional and ballistic missile technology). The growing Chinese influence in the Middle East is detrimental to the US' strategic hold over the region.

The Chashma nuclear power plants agreement between China and Pakistan bear similarities with the 123 agreement between India and the US. To that, China added the grandfathering clause for the Chashma 3 and 4 nuclear plants that it plans to build for Pakistan. China is party to several international nuclear regimes and insists that it abides by their rules. It has unfailingly reiterated that its nuclear exports are meant only for peaceful purposes and that the recipients of Chinese nuclear technology and materials have to accept IAEA safeguards and cannot re-transfer nuclear material without permission. However, China has clandestinely sold nuclear facilities (weapons designs, uranium enrichment technology, weapons-grade uranium, ring magnets and dual-use technology) to Pakistan since the 1970s. The George Washington University released de-classified documents evidencing Chinese assistance in Pakistan's nuclear programme. China avoided any official statement on the AQ Khan black-market revelations. China rejects the proliferation charges levied against it.

Speculation is rife that China is also building nuclear facilities in Myanmar and plans to place its submarine-launched ballistic missiles (SSBNs) in Pakistan. However, there is no concrete evidence on this and no cables pertaining to Chinese plans have been leaked yet. Future developments regarding the Sino-Pak deal are unclear – China may go through with the deal without an NSG waiver invoking the sovereignty clause or engage in quite diplomacy with the NSG. The deal has been described by some analysts as the extension of a Chinese nuclear umbrella to Pakistan and necessitating India to develop it's ballistic missile defence preparations. China has a strong political influence in Pakistan. The Sino-Pak deal has been cynically promoted as an equity issue with India.

Session X
Iran: Nuclear Program and Policy

Amb KC Singh
Former Indian Ambassador to Iran

Iran is the oldest global hegemon. Shiasm is as combination of the Prophet Mohammad's family with Persian culture and the focus shifted to Qom as a religious centre. The Safavids were contemporaries of Mughals and there was much intra-Persian influence including intermarriage. What's been inherited by Muslim India has come filtered through Persia, like Urdu. The Pahlavi Shah wanted to go back to a prehistoric past, pre-Islamic past while Khomeini went too far into religion. The current regime suffers from paranoia and anxiety over living up to an historic past. There is a desire to project power, reaching toward Mediterranean through Syria. It has forward posts in Lebanon and The Palestinian areas. Iran is very important right now, especially with Egypt's Jasmine Revolution. The US is concerned. Which regime might be next?

These circles back to Iran, which decides to go down the nuclear root. Back in 1979 the nuclear option was not desirable to Khomeini, who was known to have termed these weapons as 'unislamic'. The Iranian nuclear program most probably started in 1960 with the Shah. Iran fought a war with neighbouring Iraq in the 1980s. Iraq by this time was in possession of chemical weapons. In 1990 Iran's head Rafsanjani restarted the nuclear weapons programme. Iran was helped by Pakistan's AQ Khan. The Iranian facility was unveiled by a dissident Iranian group. Once the Libyans came gave up their nuclear ambitions, the international focus went towards Iran. Bit by bit they Iran conceded. Iran went one step forward and two steps back.

Iran has stated that it has enriched uranium to about 20 per cent.

The Iranians have have enough uranium material for one device. The current ayatollah is insecure with his religions credentials being questioned; he therefore relies on leaders like Ahmadinejad. Iran will face serious problems when the current ayatollah dies. One country which is in the gravest concern about Iran's nuclear developments and programme is Israel.

Session XI
Nuclear Safety and Security and Nuclear Terrorism

Wg Cdr Ajay Lele
Research Fellow, IDSA

President Obama expressed in the 2010 Nuclear Security Summit, that nuclear terrorism could become the single largest global security threat in the future. Till date, no empirical data is available on the use of nuclear weapons by terrorists. We may therefore have to rely of certain social science techniques to talk about this issue. Nuclear terrorism may involve terrorist organisations acquiring nuclear devises/weapons and their delivery mechanisms, sabotage of nuclear sites, radiation leakages caused by aerial attacks on facilities, use of radiological weapons or, what some experts talk of, the 'suitcase bomb' (a small bomb of below 1KT).

Conventional use of nuclear weapons by terrorists seems highly unlikely. Dirty bombs do not cause large scale damage but the psychological effect of such an attack is very large. Hence these are called weapons of mass 'disruption'. The US national intelligence sources and Wikileaks has revealed that terrorist organisations like the Al Quida are trying to secure nuclear material beyond that required to make a dirty bomb. Terrorists in possession of nuclear weapons can cause fear and blackmail and negotiate from a position of unsurpassed strength.

A nuclear terrorism scenario in South Asia needs some consideration. India's adversarial relations with Pakistan and China, Al Quida's links in the region, the ghost of the AQ Khan network, a growing WMD bazaar on Pakistan's north east frontier and increasing business in the South Asian nuclear industries - all point towards theoretical possibilities of nuclear terrorism in the region. International networks like that of AQ Khan do not die hard; instead they facilitate acts of nuclear terrorism. Hoax cases are highly possible. Terrorist organisations follow a 'copy cat syndrome' – a terrorist outfit will wait for another to use nuclear weapons first. This explains why no terrorist has used these weapons yet. Terrorist organisations may also backed by state actors. Threats of nuclear terrorism could also come from religious cults (like the Rajneesh Cult) or a disgruntled scientific community.

A SWOT analysis reveals that nuclear terrorism has its own weaknesses like the difficulty to access technology and judge impact of attack, possibility of alienating sympathisers and loose popular support. As of now, the threat of nuclear terrorism is not overwhelmingly definitive but suggestive.

Dr D Suba Chandran
Director, IPCS
To discuss nuclear terrorism, we need to first assess whether

nuclear weapons fit the agenda of the terrorist groups. If territoriality and selective targeting are factored in then terrorist organisations will neither intend nor afford to use nuclear weapons. Essentially, there is a distinction between militants and radicals. There exist military groups with political orientation, political groups with ideological orientations, radical groups and even criminal groups. The damage caused by these groups through their activities is many a times over exaggerated. But groups like the Lashkar-e-Toiba which is operational even in areas where it does not belong and not completely independent of state influence, are most likely to use WMDs against India. Unfortunately, India is unprepared to handle a WMD terrorist attack.

Session XIV
Non proliferation Regime
Overview, Strengths and Challenges

Prof Rajesh Rajagopalan
Professor, Centre for International Politics, Organization and Disarmament (CIPOD), JNU

Regimes are defined as a set of implicit and explicit norms and rules that lead to certain expectations of behaviour. They need not be formal institutions. A regime is a broader concept than a treaty. The notion of regimes in International Relations came from the liberal perspective; regimes were seen as instruments to end conflicts, reduce the uncertainties of the anarchical international order and facilitate international cooperation. Implicit in these arguments was that regimes are neutral and states became party to them because all were interested in cooperating. But alternative explanations point out that regimes result from power politics and represent the systemic balance of power resulting from the power politics.

The Nuclear Non-proliferation Treaty (NPT) regime was based on three prominent ideas: limit the spread of nuclear technology through international control mechanisms, spread the wealth of nuclear energy around the world with the Atoms for Peace Programme as a classic example and finally, the eliminate nuclear weapons. Two important events led to the formulation of the NPT – the Cuban missile crisis (1962) and the Chinese nuclear test (1964). The NPT regime slowly strengthened from 1970s to 2005. The Indian nuclear tests of 1974 immediately led to the

tightening of the treaty rules (particularly Article 4 relating to civilian nuclear programmes) pertaining to technology transfers and nuclear exports. The end of the Cold War and the Iraq operations were followed by the most serious efforts to strengthen the NPT regime in the form of the dual scope safeguards rule. This rule called for a country's entire nuclear programme to be put under IAEA safeguards even for the smallest of nuclear transfers. The NPT Review Conferences of 2000 and 2005 indicated the weakening of the regime. The 13 steps agreed to in 2000 had not advanced in 2005. However, the 2010 RevCon showed some positive signs without any real progress. The treaty's RevCons concentrate only on the future plans with no assessment of the past steps.

The major problems afflicting the NPT Regime include a lack of consensus amongst members, non compliance on the part of the nuclear holdouts (India, Pakistan and Israel as well as Iran and North Korea), disagreement on the NPT Articles 4 and 6 and conflicting demands for freer nuclear commerce and a nuclear fuel bank programme. The US proposal for scrapping the NPT withdrawal clause enjoys little support. The NPT regime will also face tough times as the world moves towards a multi-polar system. The non-proliferation approach is stronger than the nuclear disarmament one because the dominant world powers are more committed to the former.

Session XV
Nuclear Renaissance
How real is it? Nuclear Energy

Prof R Rajaraman
Emeritus Professor of Physics, Jawaharlal Nehru University

Nuclear Energy: Current Status and Future Prospects in India
The initial enthusiasm about nuclear energy at the global level subsequently slowed down because of major nuclear accidents, the opposition of green parties and the problem of nuclear waste (radioactive and spent fuel waste disposal). But, environmental concerns and the improved safety features in nuclear plants have renewed interest in nuclear energy. In 2005, 370 GWe was generated from 443 nuclear reactors the world over. Even the US intends to build new nuclear power plants as articulated in its Nuclear Power Programme 2010. The 2010 CIGI Report suggests that increasing number of states are interested in building nuclear power plants. However, not all countries have the requisite consumption capacity for even a standard 1000 MW nuclear power reactor.

The phrase nuclear renaissance does not apply to India. Presently, India has a 4.8 GW nuclear energy capacity with another 2.2 GW underway. Sanctions on the Indian nuclear industry and lack of efficient oversight by the Atomic Energy Commission (AEC) have restricted nuclear energy growth to only 5 GWe in the last 40 years; nuclear energy contributes to only 4 per cent of the total electricity production in the country. There are plans to increase nuclear energy production at a much faster pace to contribute to the total projected energy requirement of 400 GW. The proposed expansion of nuclear facilities through foreign builders is expected to add 10 GWe within 6-7 years. But the target of 25 GWe by 2020 seems difficult to achieve. Amongst other problems is the issue of land acquisitions for building nuclear power plants. The thorium stage of Bhabha's three stage plan will need considerable time to develop.

Prof PR Chari
Visiting Professor, IPCS

The future of nuclear energy in India
The term nuclear renaissance (meaning rebirth) is an exaggeration. There are several conventional sources of deriving clean energy apart from nuclear power. For instance, hydro electricity provides peaking power. Some experts advocate conservation practices like admixing ethanol with petrol. Arguments for every source of energy will have counter-arguments. Therefore we cannot be absolutist about any one particular source.

Fossil fuels account for 80 per cent of India's energy requirements. To reduce this figure to a much lower level is a difficult task and fossil fuels will continue remain crucial for India's energy requirements. Nuclear fuel, which accounts for less than 5 per cent of India's total electricity generation, needs high finances, which if borrowed, need to be repaid with interest. Atomic energy may be clean, but it creates tremendous nuclear waste. Added to this, is the primordial fear of radioactive fallout from nuclear reactors. The AEC of India has for long been fixated over the weapons' programme and has therefore ignored the energy programme. India's breeder technology is in urgent need of a peer group review within India with regards to cost, feasibility, issues, problems and solutions. There is little information available on safety mechanisms in Indian nuclear reactors while official estimates about nuclear energy availability are at most, fancy.

Nuclear energy may be significant, but all available sources of energy need to be exploited. A right balance needs to be struck between the supply side management and the demand side control.

Session XVI
Moves towards Nuclear Disarmament and Nuclear Weapons Elimination

Prof R Rajaraman
Emeritus Professor of Physics, Jawaharlal Nehru University

When the Gang of Four published their two articles in the Wall

Street Journal, they made a respectable argument about nuclear disarmament. But, they could not create a major impact on the decision makers in the major nuclear weapons states and no serious strategic steps, than those already taken, were advanced towards global nuclear disarmament. It is ironical that such scholarly work has created only limited consciousness about the issue. A Nuclear Weapons Convention is not yet in place. Nuclear disarmament therefore remains only rhetoric. Political will and popular movement are important instruments for nuclear disarmament. In India, particularly, public opinion has been conditioned into accepting that India 'needs' nuclear weapons.

Prof PR Chari
Visiting Professor, IPCS

There are four ways to look at the goal of global nuclear disarmament – feasible but undesirable, desirable but unfeasible, desirable and feasible, and finally undesirable and unfeasible. No serious steps have been taken towards nuclear disarmament by any nation; Obama backtracked from his Prague Speech commitments, India spells the rhetoric of disarmament while arming itself. Armament is not only the increase in numbers but also greater sophistication of the arsenal. One needs to understand the essential truths about nuclear weapons – that they are unusable, they cause destruction on the side of the user and the victim causing not only human and material destruction but social chaos and disintegration. It is an over exaggeration to state that nuclear weapons enhance deterrence.

The post Cold War period has seen a shift from conventional wars to sub conventional conflicts and nuclear weapons are useless in such conflicts. The real nuclear threats arise from the possibility of accidents or smuggling of nuclear materials. This however does not mean that efforts towards nuclear disarmament should cease - the START process to reduce the number of warheads, the CTBT and FMCT to put qualitative and quantitative end to testing and fissile material production, de-alerting nuclear arsenal with appropriate safeguard mechanisms. There is utmost need to revive the peace movements (which almost died away after the 1980s) since peoples' power can propel the efforts towards nuclear disarmament.

Maj Gen Dipankar Banerjee
Mentor, IPCS

Ever since the science of nuclear weapons has developed, it has been stolen and spread. Initially, the only purpose of nuclear weapons was to deter a conventional war on one's own territory. However, despite the arrival of the absolute weapon has not put an end to wars. Non State Actors have added a new dimension of threat and there is an urgent need to come up with ways in which these Non State Actors could be deterred. A global approach to nuclear disarmament does not exist presently; but several serious and technologically feasible ideas have been forwarded by experts like Scott Sagan (Base Camp approach), Michael Krepon (200 = 0 approach), the Global Zero Approach and others. These could be implemented.

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Glimpses from the Workshop ...