



Department of Physics,
University of Kashmir, Srinagar

Cordially Invites you on the Occasion of the Special Lecture

*Progress in Global Nuclear Non-Proliferation and
Disarmament*

by

Dr. Vijay Sazawal
Director USEC, USA

Professor (Dr.) Riyaz Punjabi, Vice-Chancellor,

University of Kashmir has kindly consented to preside over the function.

Khawaja Farooq Renzu

Chief Commissioner J&K Scouts & Guides and Director Information, J&K Govt.

Will be the Guest of Honour.

Venue: IBN Khaldoon Auditorium, Allama Iqbal Library, University of Kashmir, Srinagar

Date: December 3, 2009 Time: 2:00 pm

RSVP: 9419933381, 9419071977

Professor Farooq Ahmad
(Head of Department)



Progress in Global Nuclear
Non-Proliferation and Disarmament

Presentation at the University of Kashmir

3 December 2009

Vijay K. Sazawal, Ph.D.

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by
DR. VIJAY SAZAWAL
Director USEC, USA
VENUE: IBN KHALDOON AUDITORIUM, ALLAMA IQBAL LIBRARY
UNIVERSITY OF KASHMIR, SRINAGAR
DATE: DECEMBER 3, 2009
TIME: 2:00 PM
Organized By:
The Department Of Physics, University Of Kashmir, Srinagar



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Nuclear Disarmament

- Act of reducing and eventually eliminating nuclear weapons towards the goal of nuclear weapons-free world
- Pro's:
 - It will lessen and hopefully prevent the possibility of a nuclear conflict, especially accidental discharge of nuclear weapons
- Con's:
 - It will undermine prevailing deterrence and create conditions for non-state actors, who may surreptitiously acquire nuclear weapons, to terrorize the world

How Did it All Begin?

- July 1945 - U.S. sets off the first atomic explosion
- August 1945 - Atom bombs were used in bombings of Hiroshima and Nagasaki
- August 1949 - Soviet Union explodes an atomic device
- October 1952 - United Kingdom explodes a nuclear device
- February 1960 - France explodes a nuclear device
- October 1964 - China explodes a nuclear device
- May 1974 - India explodes a nuclear device
- September 1979 - Israel (and South Africa) explode a nuclear device
- May 1998 - Pakistan explodes a nuclear device
- October 2006 - North Korea explodes a nuclear device

- ONLY South Africa has unilaterally shutdown its proven nuclear weapons program in a fully transparent and verifiable manner
- ONLY Canada being part of the U.S. team that designed nuclear weapons in 1945 chose not to pursue nuclear weapons at all

Going Beyond Nuclear Weapons - “Atoms for Peace”

- U.S. President Eisenhower in 1953 requested a special meeting of the U.N. General Assembly (UNGA) to discuss a new American initiative on peaceful uses of atomic energy
- Mrs. Vijaya Lakshmi Pandit, the President of the UNGA, agreed to the request and the meeting is held on 8 December, 1953
- President’s speech: “As much as the U.S. bears the burden of unlocking the dreadful secret of the atomic might, it pledges to you and to the world that it will devote its heart and mind to find the way by which the miraculous inventiveness of the man shall not be dedicated to his death, but consecrated to his life.”
- The President proposed that stockpiles of fissile material accumulated by nuclear powers be used to promote peaceful pursuits of the mankind in agriculture, medicine, and other peaceful applications
- Nuclear power – conversion of nuclear fuel into electricity – received special emphasis for bringing electricity to energy starved areas for development and uplifting of living standards.
- “Atoms for Peace” was the title of the speech by President Eisenhower, and put U.S. in a leadership role in promoting civil nuclear reactors around the world.

Top Nuclear Power Countries (September 2009)

| Rank | Country | Reactors | Capacity |
|------|----------------|----------|------------|
| 1 | USA | 104 | 107,023 MW |
| 2 | France | 58 | 65,880 MW |
| 3 | Japan | 53 | 48,200 MW |
| 4 | Russia | 31 | 23,242 MW |
| 5 | Germany | 17 | 21,492 MW |
| 6 | South Korea | 20 | 18,393 MW |
| 7 | Canada | 21 | 15,367 MW |
| 8 | Ukraine | 15 | 13,880 MW |
| 9 | United Kingdom | 19 | 12,540 MW |
| 10 | Sweden | 10 | 9,361 MW |
| | | | |
| | India | 17 | 4,120 MW |
| | Pakistan | 2 | 462 MW |

Campaign for Nuclear Disarmament – A Brief History

- 1955 – Russell-Einstein Manifesto: 11 scientists and intellectuals warn of dangers posed by nuclear weapons and call for détente
- 1957 – The first conference is held at Pugwash, Canada, between western and Soviet intellectuals to follow-up on the call by Bertrand Russell (U.K.) and Albert Einstein (U.S.A.)
- 1985 – International Physicians for the Prevention of Nuclear War (IPPNW) advocates abolition of all nuclear weapons
- 1988 – Rajiv Gandhi presents an “Action Plan for Ushering in a Nuclear Weapons-Free World,” at the U.N. that calls for elimination of all nuclear weapons by 2010
- 2007 – Former American Secretary of States – Kissinger, Schultz, Perry, along with former Senator Nunn propose a program to eliminate all nuclear weapons
- 2008 – Dr. Mohamed El Baradei, Director-General of the International Atomic Energy Agency (IAEA), spoke at the U.N. General assembly and asked U.S.A. to take a leadership role towards a nuclear weapon free world, “Nuke Zero”
- 2009 – President Barack Hussein Obama delivers a speech in Prague, Czech Republic on 5 April, “Today, I state clearly and with conviction America’s commitment to seek the peace and security of a world without nuclear weapons.” This message is reinforced on 10 July after the G-8 Summit in L’Aquila, Italy
- 2009 – President Obama chairs a Summit-level meeting of the United Nations Security Council (UNSC) on 24 September and proposes the UNSC Resolution 1887 that revitalizes commitment towards a world without nuclear weapons. This was the first time in the 63-year history of UNSC that a meeting was chaired by a U.S. President
- 2009 - President Obama wins the Nobel Peace Prize on 9 October

Nuclear Non-Proliferation Treaty (NPT)

- NPT is the most widely accepted nuclear arms control agreement in the world today. The treaty was proposed by Ireland and Finland
- Opened for signature in July 1968, and entered into force in March 1970
- Defines the Nuclear Weapons States (NWS) as countries who detonated a nuclear device before 1967 and no other (Article 9)
- Of the 5 declared NWS under this treaty, U.S., U.K., and Russia signed the treaty on its opening, China in March 1992, and France in August 1992
- A total of 187 countries have signed the treaty
- Israel, India and Pakistan have never been signatories
- North Korea withdrew from the treaty in 2002
- Originally constructed for a duration of 25 years, the treaty was extended indefinitely by a consensus of member-nations during the NPT Review Conference in New York City on 11 May 1995

Three Pillars of NPT

- NPT uses a “three pillar” approach to nuclear disarmament comprising of:
 - Disarmament
 - Non-Proliferation
 - Peaceful use of Nuclear Technology

Disarmament

- NPT is the only binding commitment in a multi-lateral Treaty to the goal of disarmament by the nuclear weapon states (NWS) which have signed the treaty
- Article 6 commits NWS to “pursue in good faith on effective measures relating to the cessation of the nuclear arms race at an early date and on a treaty on general and complete disarmament ...”
- U.S. and Russia, by far have the largest stockpile and inventory of nuclear materials and delivery systems, and therefore have to be at the forefront of any disarmament process

Non-Proliferation

- Article 1 of the Treaty commit NWS not to transfer nuclear weapons or help any other country in acquiring nuclear weapons
- Article 2 commits non-NWS not to acquire nuclear weapons, nor manufacture such weapons
- Establishes a safeguards system under the responsibility of the International Atomic Energy Agency (IAEA) which is authorized to conduct inspections to verify compliance with the Treaty (Article 3)

Peaceful Use of Nuclear Technology

- Article 4 of the Treaty acknowledges the “inalienable right” of the member states to research, develop and use nuclear energy for peaceful (non-weapons) purposes
- A key weakness in the Treaty is a lack of any reference to controlling the spread of enrichment and reprocessing (“ENR”) technologies, which are necessary for a closed fuel cycle for a civilian nuclear power station, and yet are also key to nuclear weapon program and hence have grave proliferation implications
- “Right” to ENR technologies must comply with Articles 1, 2, 3 and 4 of the Treaty, and is at the cutting edge of policy and legal debates

Preventing Nuclear Proliferation Through Export Controls

- 1971 – **Zangger Committee**: Created a “Trigger List” to prevent export of fissile materials, or materials and equipment related to ENR technologies that would assist in production of fissile material
- 1974 – **Nuclear Suppliers Group** (previously called the “London Club”): Created in response to the Indian atomic test which demonstrated that non-ENR technologies can also be turned to weapons development. Consequently the export controls were imposed on a much broader list of materials and equipment
- 1987 – **The Missile Technology Control Regime** (MTCR): Prevent proliferation of unmanned delivery systems capable of delivering weapons of mass destruction (WMD) through voluntary export controls
- 1996 – **The Wassenaar Arrangement**: A multilateral regime to ensure transparency in exports of “dual-use” goods and technologies (successor to COCOM)

The Score Card

- Countries that have fully and unequivocally adhered to rules and spirit of the NPT (U.S. Perspective):
 - Austria/Belgium/Bulgaria/Canada/Czech Republic/Denmark/Finland/France/Germany/Greece/Indonesia/Ireland/Italy/Japan/Latvia/Lithuania/Netherlands/New Zealand/Philippines/South Korea/Romania/Spain/Sweden/Taiwan/United Kingdom/United States
- Countries that were nuclear weapons states, disarmed, and joined NPT:
 - South Africa/Belarus/Kazakhstan/Ukraine
- Country that is a signatory to the NPT which acknowledged its weapons program and disbanded it:
 - Libya
- Countries where United States and many other countries have barred any nuclear related exports:
 - Cuba/Iran/Iraq/North Korea/Sudan/Syria
- All remaining countries are “restricted destinations”, regarding nuclear exports with limitations of one kind or the other

Fissile Materials Inventory

- Highly Enriched Uranium (HEU)
- Separated Plutonium (Pu)
- Eleven Countries possess potential “weapons capable” nuclear material, but nearly 90% of the stock is in either Russia or the United States
- Nearly 95% of launch vehicles to deliver nuclear bombs are either of Russian or American origin
- Consequently, a key step in global disarmament are mutual reductions by Russia and the United States in the number of nuclear weapons and delivery systems

Key Treaties Towards Nuclear Disarmament

- 1963 – Partial Test Ban Treaty (PTBT)
- 1972 - Strategic Arms Limitation Talks (SALT-I)
- 1972 - Anti-Ballistic Missile Treaty (ABM)
- 1979 - Strategic Arms limitation Treaty (SALT-II)
- 1987 - Intermediate Range Nuclear Forces Treaty (INF)
- 1991 - Strategic Arms Reduction Treaty (START-I)
- 1993 - Strategic Arms Reduction Treaty (START-II)
- 1993 – Megatons to Megawatts Program
- 1996 – Comprehensive Test Ban Treaty (CTBT)
- 2000 – Disposition of Surplus Plutonium
- 2002 – Moscow Treaty
- 2009 - Moscow Summit on 10 June: Bridge Mechanism to extend START Beyond 5 December (?)

Megatons to Megawatts Program

- 20-year Program goal is to convert highly enriched uranium (HEU) from nuclear weapon cores into reactor fuel to generate electricity (1993-2013)
- 500 metric tons of HEU from 20,000 nuclear warheads will be eliminated
- The electricity generated by transforming the weapons grade material to reactor fuel will produce electricity for a major international metropolis for at least 500 years

Key START Issues Under Negotiation by the U.S. and Russia

- Limits on deployable nuclear warheads
- Limits on delivery vehicles (nuclear capable bombers and land or submarine based missiles)
- Possibility of allowing conventional (non-nuclear) weapons on strategic land or submarine based ballistic missiles
- Missile Defense Systems
- Verification Procedures
- Destruction of surplus nuclear bombs is not addressed under START
- Need to close a deal by 5 December 2009 in order to prevent the lapse of START-I

Conference on Disarmament (CD)

- Established in 1979 to promote general and complete disarmament under effective international control
- It is an autonomous body that negotiates multilateral arms control and disarmament measures recommended by the U.N. General Assembly. Works by the Consensus rule.
- Key areas of focus:
 - Chemical Weapons Convention (1992, in force 1997)
 - Comprehensive Test Ban Treaty – CTBT (1996, not in force yet)
 - Fissile Materials Cutoff Treaty – FMCT (not negotiated yet)
 - Radiological Weapons – RW (tabled)
 - Prevention of Arms race in Outer Space (tabled)
- Related Conventions:
 - 1980: Convention on the Physical Protection of Nuclear Material
 - 1986: Convention on Early Notification of a Nuclear Accident
 - 1994: Convention on Nuclear Safety

2010 NPT Review Conference

- Next 5-year Review to be held in New York in May 2010

- Issues for discussion:
 - Strengthening the NPT
 - Ratification of “Full Scope Safeguards” by all NPT signatories and unfettered access for IAEA to verify such safeguards
 - Irreversibility: No going back from disarmament treaties once a nation commits to it
 - Signing the CTBT
 - Continuing Moratorium on nuclear weapons testing
 - Fuel Banks/IEF/Fuel Leasing
 - Proposal on placing excess fissile materials under IAEA
 - Reinvigorate the CD (general and complete disarmament)

Recent Developments

- G-8 Summit Meeting on 8 July 2009 resulted in a joint declaration on moving towards a world without nuclear weapons
- Passage of UNSC Resolutions 1540 (2004) and 1887 (2009) reiterates:
 - Binding Commitment on all U.N. member nations against proliferation of all weapons of mass destruction, whether nuclear chemical or biological.
 - A revitalized commitment to work for full and complete disarmament
- A Global Nuclear Security Summit in Washington on 13-14 April 2010

Campaign Towards “Nuke Zero”

Stopping by Woods on a Snowy Evening by Robert Frost

Whose woods these are I think I know.
His house is in the village, though;
He will not see me stopping there
To watch his woods fill up with snow.

My little horse must think it queer
To stop without a farmhouse near
Between the woods and frozen lake
The darkest evening of the year.

He gives his harness bells a shake
To ask if there is some mistake.
The only other sound's the sweep
Of easy wind and downy flake.

The woods are lovely, dark, and deep,
But I have promises to keep,
And miles to go before I sleep,
And miles to go before I sleep.