



Overview of WMD Proliferation Challenges

KHNP Training Program Nonproliferation, Safeguards, and Physical Protection Module

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Outline

- **Definitions**
- **Proliferation Status**
- **Nonproliferation Objectives**
- **Approaches to Achieving Nonproliferation Objectives**
 - The Nuclear “Nonproliferation Regime”
- **Challenges to the Nonproliferation Regime**
 - Focus on the Expansion of Nuclear Energy
- **Issues for the future**



Weapons of Mass Destruction (WMD)

- What do we mean by WMD?
 - Mass?
 - Destruction?
- Is there something inherently different (worse) about WMD?
- Are all WMD equal?
- Is WMD a useful category of weapons?
- Is WMD a “closed” category?

- Nuclear Weapons
 - A device with explosive energy derived from nuclear fission or fusion
 - Damage results from ground shocks, high temperatures and residual radiation

- Chemical Weapons
 - Weapons which exploit the toxic properties of chemical substance
 - Physical and/or psychological damage
- Biological Weapons
 - Weapons which disseminate infectious disease
 - Physical and/or psychological damage

- Radiological Weapons (???)
 - Weapons which use conventional explosives to disseminate radiological material

- Means of delivery (???)
 - WMD neutral?



Nonproliferation

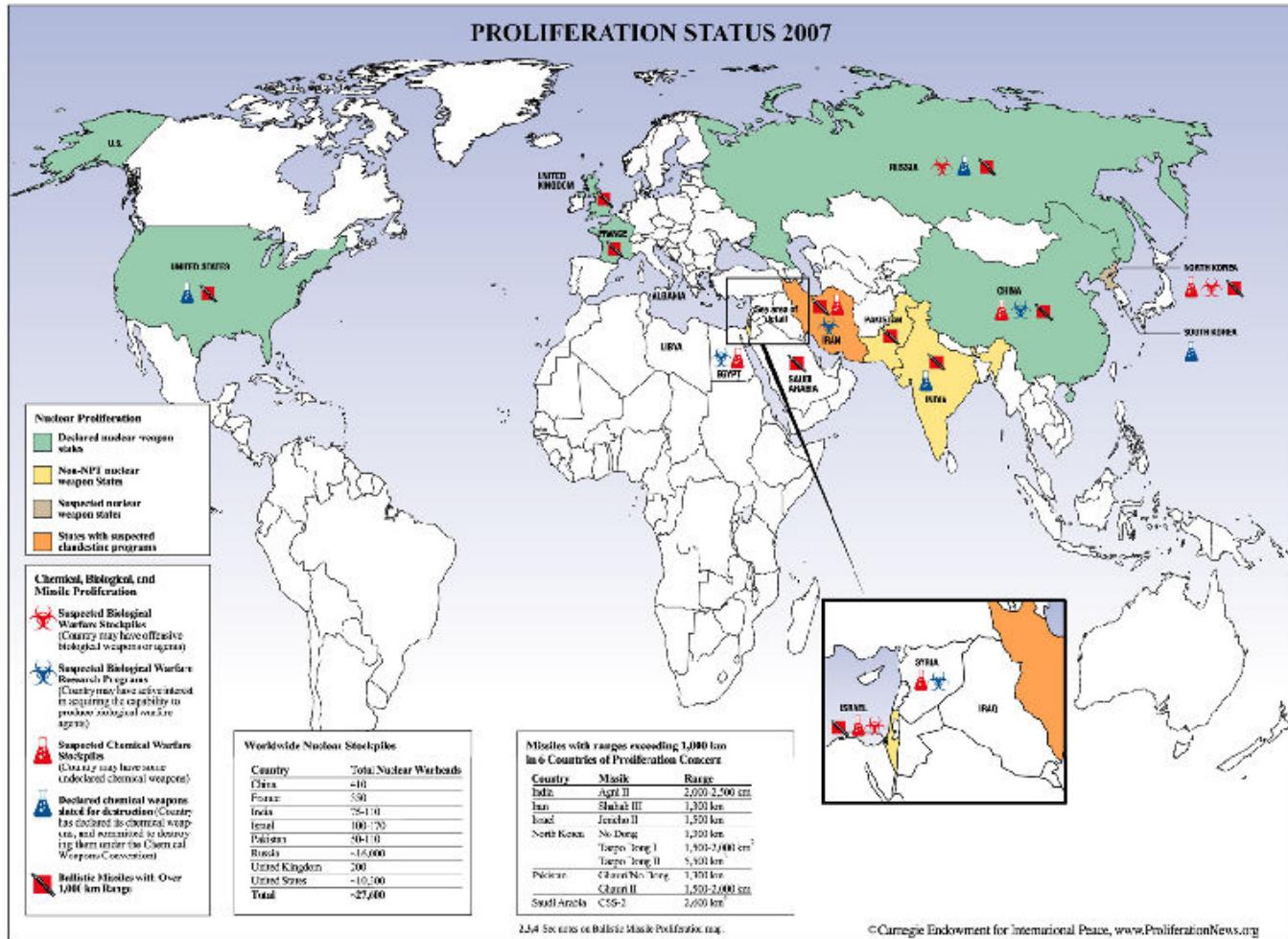
- What constitutes proliferation?
 - Numbers?
 - Identity of those possessing?
- Does it apply only to WMD?
- Can non-state actors proliferate?
- How is “nonproliferation” different from “counter-proliferation”
- What is the relationship between nonproliferation and “arms control”?

- Types of proliferation risks:
 - States acquiring WMD
 - States using WMD
 - States providing (intentionally or unintentionally) WMD
 - Sub-national (terrorist) groups acquiring WMD
 - Sub-national (terrorist) groups using WMD

**Why does proliferation matter?
What is our nonproliferation goal?**



Who Has What?



Deadly Arsenals:
Nuclear, Biological,
and Chemical Threats
(Carnegie
Endowment, 2005),
and updated June
2007.



How Do WMD Affect Broader International Security Issues?

- What role do WMD play in current and potential conflicts?
- How would proliferation affect these conflicts?

- Great Power Relations
 - U.S.-Russia
 - U.S.-China
 - Role of India in the world
- Middle East
 - Palestinian-Israeli Conflict
 - Iraq
 - Iran
 - Struggle for regional leadership
- South Asia
 - India-Pakistan tensions
- East Asia
 - North Korea (DPRK)
 - Regional tensions
 - China-Taiwan
- Terrorism
- Africa
 - Ethnic and religious conflicts
 - Struggle for regional leadership
- Energy and resource conflicts
- South America



Nonproliferation Objectives

- **What's the problem we are trying to address?**
- **What is our objective?**
 - Stop more countries from getting WMD?
 - Stop sub-national groups from getting WMD?
 - Stop anyone from using WMD?
 - Mitigate the consequences of WMD?
 - Eliminate WMD?



Nonproliferation Motivations

- **Moral Imperative**

- Nuclear weapons (and bio and chem) are inherently worse than conventional weapons because of their ability to cause mass destruction. Therefore, preventing their spread and eliminating those which exist is of highest priority.

- **Preserve Status Quo**

- By preventing the spread of nuclear weapons we maintain the status quo international order. We are accustomed to a world in which only 5 countries legitimately possess nuclear weapons.

- **International Security**

- The world is more secure (not just for the status quo powers, but for all) if nuclear weapons (and bio and chem) are limited or even eliminated.



Nonproliferation Approaches



Identify Elements of a WMD Program

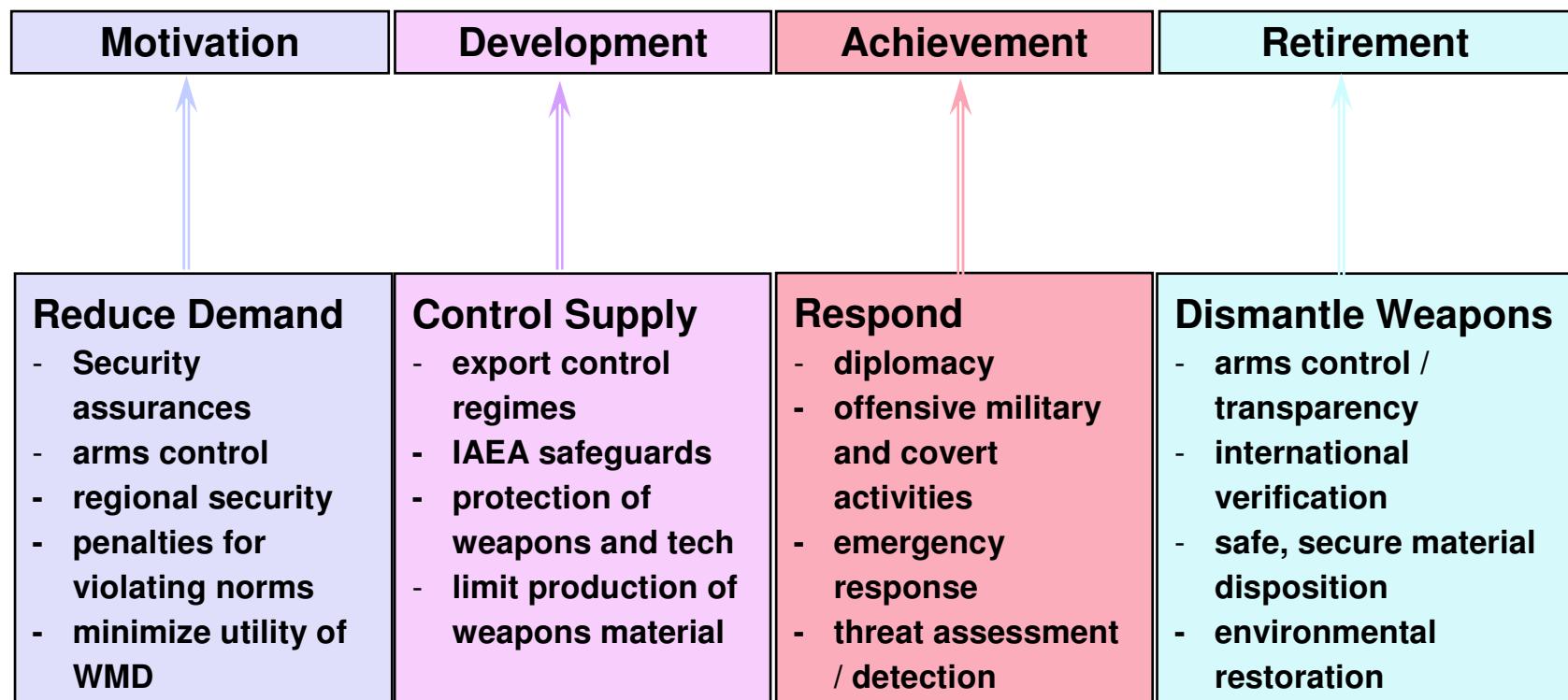
- **Motive**
 - Threat?
 - Status/Influence?
- **Expertise**
 - The weapon
 - Means of delivery
- **Money**
 - One bomb or a full program?
- **Material**
 - Nuclear: fissile material

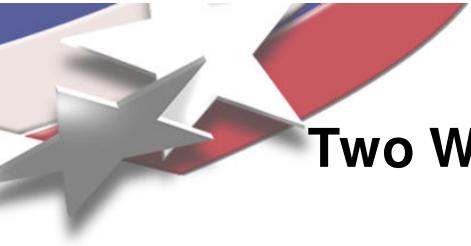


Two Ways to Think About Addressing Proliferation:

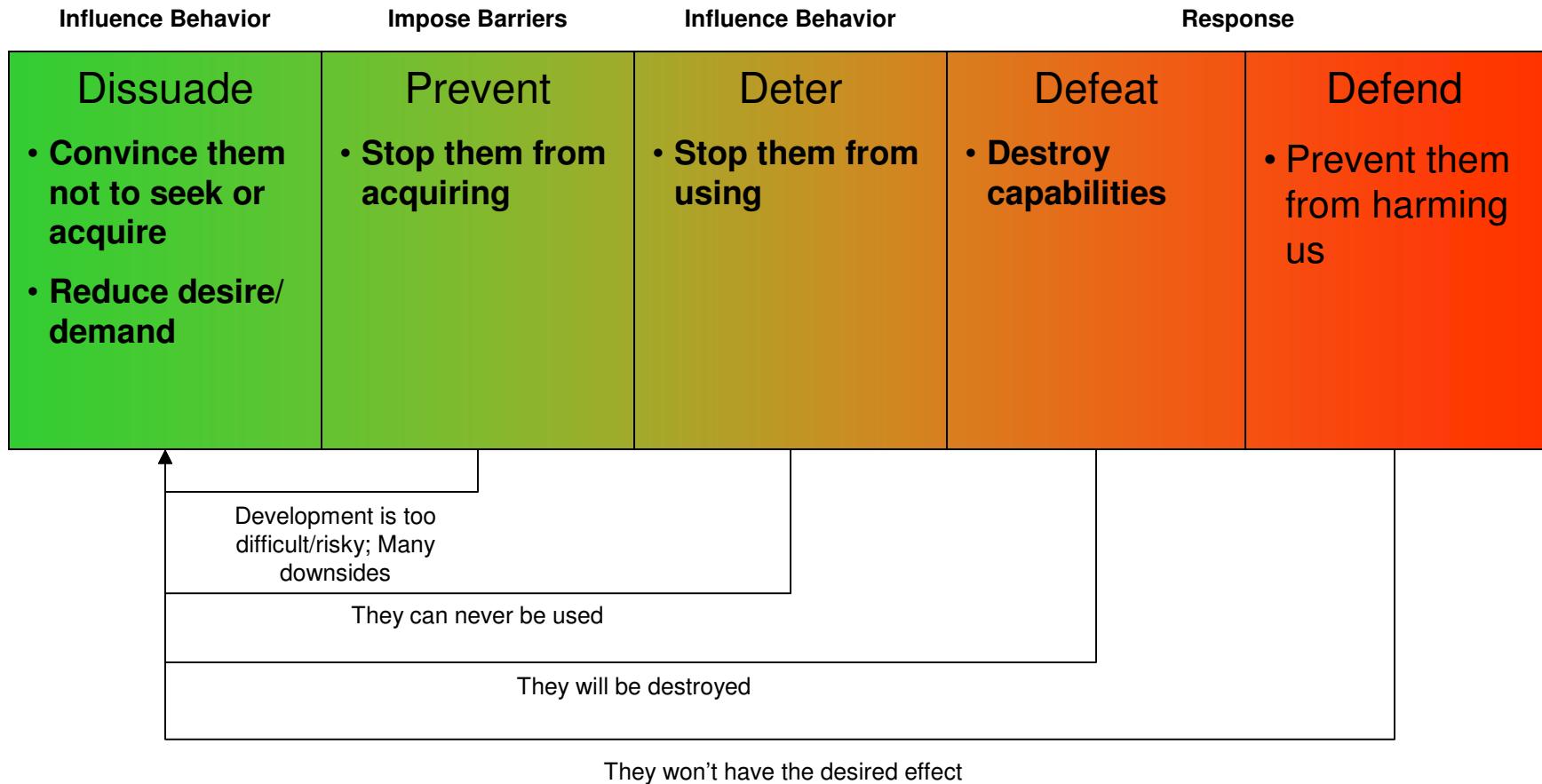
I. Proliferation Stages

Stages in Proliferation





Two Ways to Think About Addressing Proliferation: II. Response Strategies





Nonproliferation Treaties and Agreements

Nuclear Weapons	<p><u>Provisions of the NPT (Limit spread of weapons)</u></p> <ul style="list-style-type: none">• Non-nuclear weapon states (NNWS) commit not to develop or acquire nuclear weapons and to verify this commitment• Nuclear weapon states (NWS) agree not to assist NNWS in obtaining nuclear weapons• All countries agree not to export nuclear equipment or material to NNWS except under safeguards• All countries agree to facilitate exchange of peaceful nuclear technology• All countries agree to work towards future nuclear disarmament
Biological Weapons	<p><u>BTWC Provisions (Ban class of weapons)</u></p> <ul style="list-style-type: none">• Bans development, production, stockpiling, acquisition, or transfer of biological agents or toxins in quantities that have no justifiable peaceful purpose.• Bans weapons, equipment or means of delivery designed to use such agents for hostile purposes
Chemical Weapons	<p><u>CWC Provisions (Ban class of weapons)</u></p> <ul style="list-style-type: none">• Bans development, production, stockpiling, acquisition, or transfer of chemical weapons• Requires verified destruction of all chemical weapons and production facilities



Elements of Nuclear Nonproliferation Regime

Mandatory Measures

- No weapon material / technology transfers (Art I and II)
- IAEA Safeguards
- Nuclear Technology Assistance (Art IV)
- Disarmament (Art VI)

Non-Proliferation Treaty

- Non weapon states agree to not develop or acquire nuclear weapons
- Nuclear weapon states agree to:
 - Not export weapons or weapon useable materials / technologies
 - Provide technical assistance in peaceful nuclear technology
 - Work towards nuclear disarmament

Voluntary Measures

- Bilateral Assistance
- IAEA Additional Protocol
- Physical Security Convention
- Regional Safeguards implementation (Euratom, ABACC)

Bilateral or Country-Specific Activities

- MPC&A (Russia +)
- Global Material Security Initiative

- IAEA training and assistance (physical security)
- Coop. Agreements

- Reactor Fuel Returns
- HEU/LEU conversion
- RERTR

Multilateral Activities

- Nuclear Suppliers Group
- Zangaar Committee

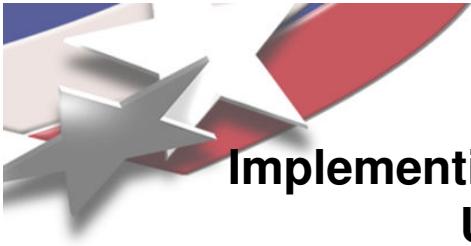
- MTCR
- UNSCR 1540

- Proliferation Security Initiative
- GICNT



Challenges to the Nuclear Nonproliferation Regime

- Non-state actors seek nuclear material and expertise
- Wider availability of sensitive nuclear technology, material and expertise
- More potential de facto nuclear weapon states in the future
- Increasing world-wide demand for nuclear energy
- Growing number of NWS outside the NPT
- Dissatisfaction with the NPT



Implementing Nonproliferation: Example of Specific Goals for the U.S. National Nuclear Security Administration

- Reduce weapons stockpiles, materials and infrastructure
- Secure WMD materials, technology and expertise
- Detect and/or prevent undeclared weapons development, acquisition programs, or use of nuclear weapons by rogue states or terrorists
- Strengthen commitment to nonproliferation norms
- Secure and/or dispose of high-risk nuclear materials and equipment
- Reduce the proliferation risk of the global expansion of nuclear energy



Nuclear energy and nuclear nonproliferation

- Global energy demand expected to at least double by middle of next century.
- Much of the demand will come from rapidly expanding economies in China and India
- Other developing countries planning nuclear energy programs
 - Indonesia
 - Vietnam
 - Thailand
- How to expand the use of nuclear energy without risking additional proliferation?



Approaches to reducing the proliferation risk of the nuclear fuel cycle

- **Changing the existing nonproliferation regime**
 - Denial strategies
 - Prevent countries from acquiring enrichment and reprocessing technology (either selectively or across the board)
 - Moratorium on development of additional enriching and reprocessing capacity
 - Multilateral cooperation strategies
 - Multinational approaches to fuel cycle services (fuel supplies, waste and spent fuel disposition services)
 - Voluntary or mandatory
- **Strengthening the existing regime**
 - Require implementation of the IAEA additional protocol
 - Enhance nonproliferation culture within industry
 - Develop advanced “proliferation resistant” fuel cycles
 - New approaches to monitoring

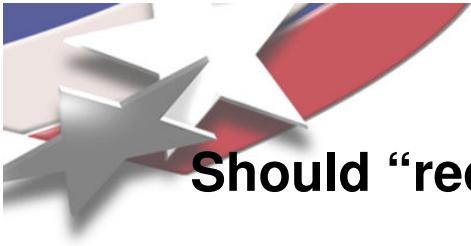


Which strategies will be most effective in the future? Has “controlling supply” achieved its limits?

Stages in Proliferation



Strategies to **prevent**, **rollback**, or **mitigate** consequences of proliferation



Should “reducing demand” take more precedence as a strategy against proliferation?

- Resolve regional security concerns
 - territorial disputes
 - natural resources
 - legitimate concerns of sub-state actors
- Enhance partnerships with countries in vulnerable regions
 - Build capacity to design and implement cooperative agreements
 - Seek to integrate into international community
- Reward countries that set good examples
 - Increase international prestige
 - Economic incentives
- What about the “hard” cases? Iran and DPRK?

Should nonproliferation be an implicit (rather than explicit) goal?



Can military means effectively “respond to threat?”

- Iran (development stage)
 - Conventional or nuclear strikes against nuclear facilities and government?
 - Chances for success?
 - What would be overwhelming force?
 - Unintended consequences?
- DPRK (achievement stage)
 - Same questions as above with complications:
 - demonstrated nuclear weapon capability
 - proximity to Seoul

*Should “counter-terrorism” take center stage in “hard” cases?
What impact would this have on “reducing demand?”*