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# Nonproliferation - Multilateralization, Fuel Supply-Reprocessing-Reactor Countries

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Jor-Shan Choi

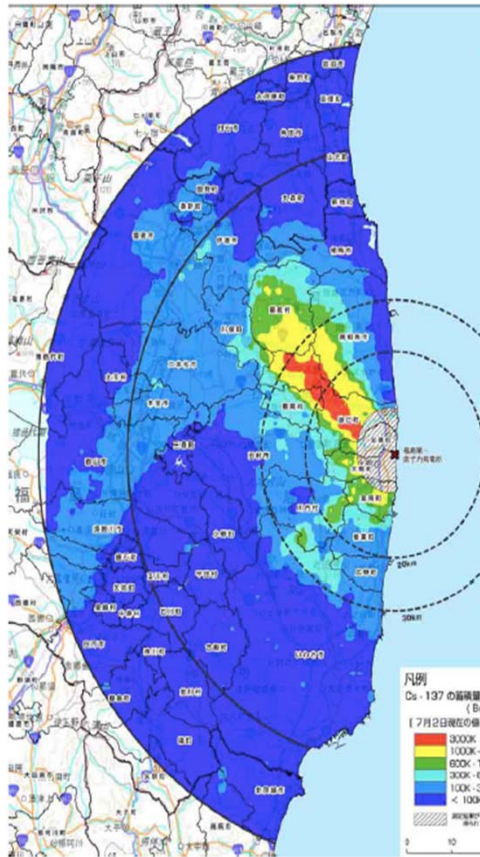
Berkeley Nuclear Research Center, UC Berkeley

Global 2011 Conference  
Makuhari, Japan Dec.11-15 2011

13 December 2011

# The Nuclear Disaster at Fukushima

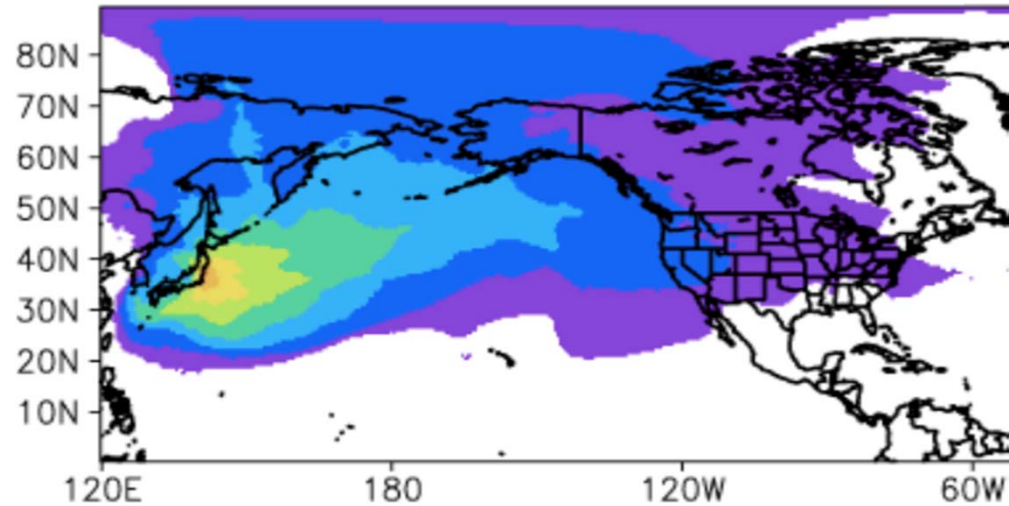
津波で浸水した区域 (福島第一原発)



人工衛星がとらえた福島第一原発。右から1、2、3、4号機。3号機から白い蒸気、2号機の壁の穴からも煙が(15日午前) = ロイター/デジタルグローブ社提供

Deposition  
Map of  $^{137}\text{Cs}$

Atmospheric  
Deposition of  
 $^{137}\text{Cs}$ ,  
accumulated  
from 3/14 to  
4/25, 2011

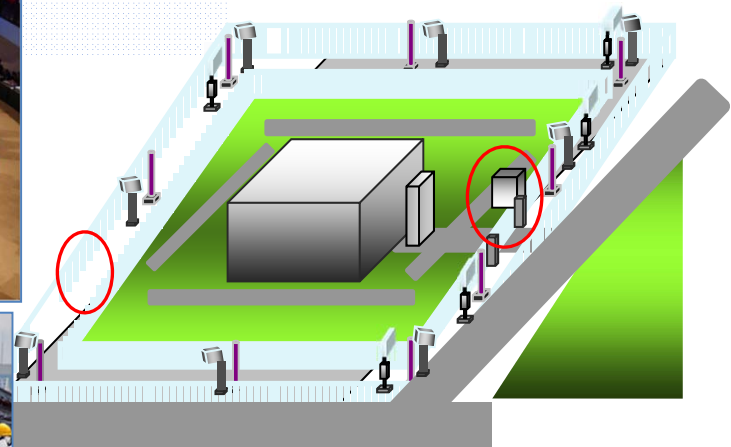


Reminded us again that

**the effects of nuclear accidents respect no border**

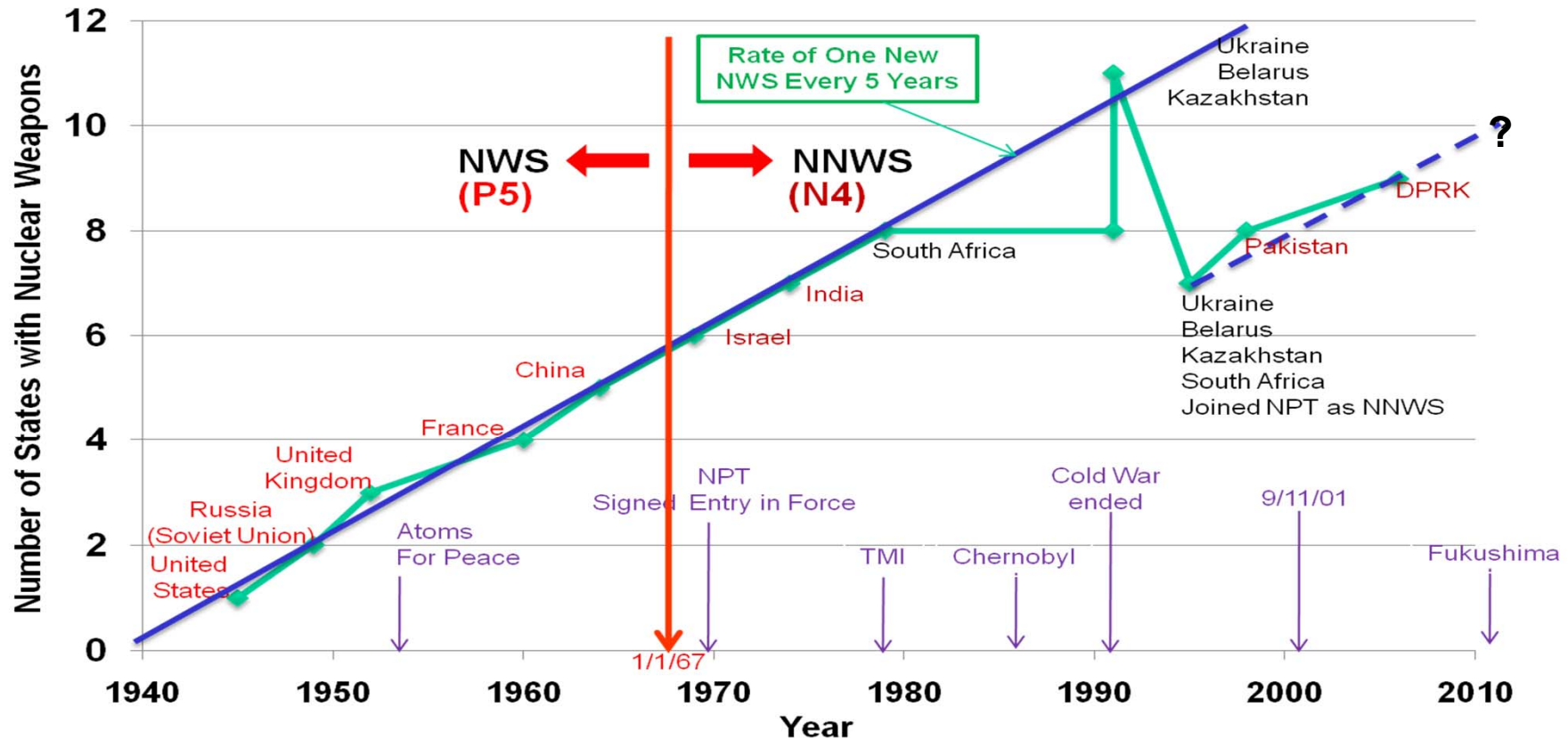
UN Secretary General, September 2011

The unthinkable prospect that terrorists could acquire and use nuclear or radiological materials or sabotage a nuclear facility for malicious intent



Raises the concern that **nuclear security should not be entirely nationally focused and voluntary**

# The slightest possibility that a NPT signatory country could become a nuclear weapons state



not only cause regional/global instability, but also

**undermine the technological foundation of nuclear energy**



# 3S and Multi-National Approaches (MNA)

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- A country's right to control its nuclear materials and infrastructure must be balanced with protecting the international community from nuclear crisis,
- The safety, security, and safeguards (3S) of nuclear materials and facilities have significant transnational implications,

---- cited from K. Luongo, JAEA Forum, Dec. 2011.

- “...To adequately safeguard the international community, we must have strong international consensus and action”.

---- cited from UN Secretary General, Sept. 2011.

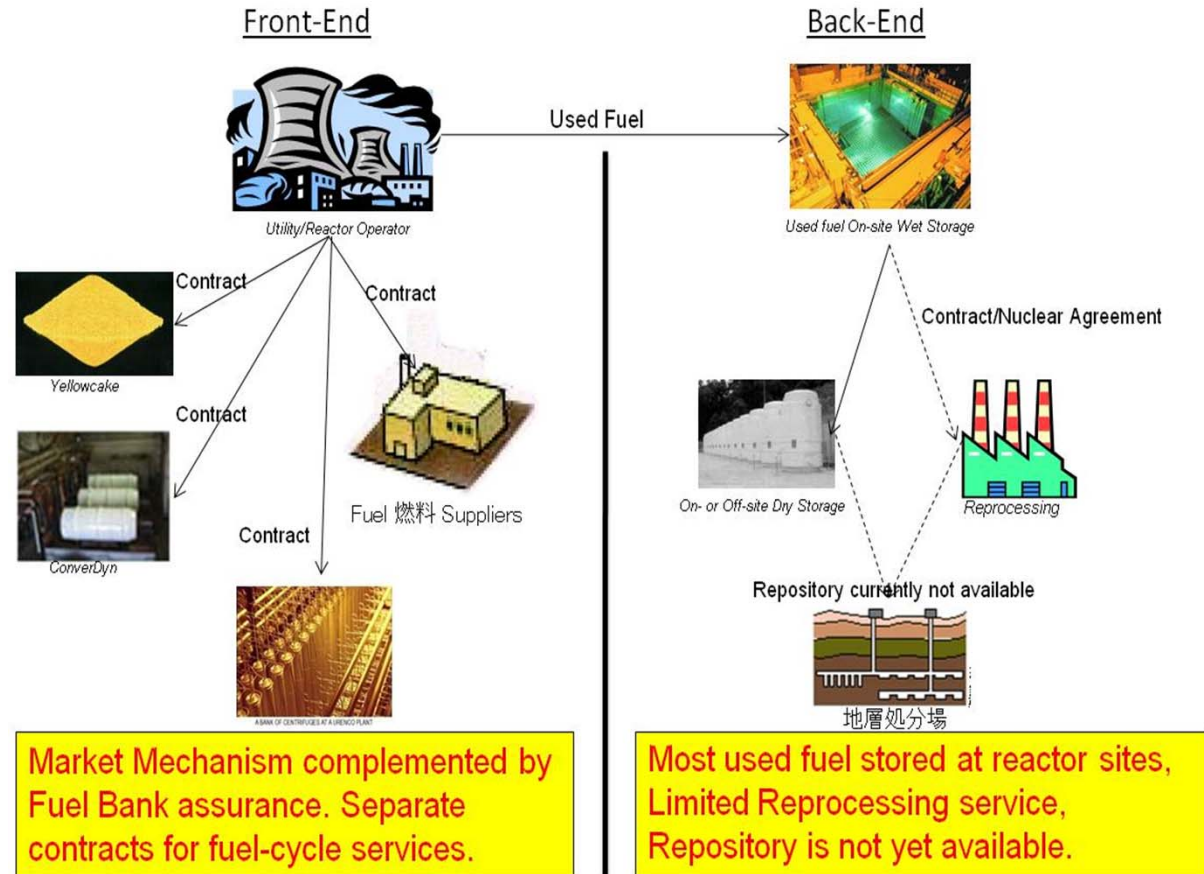
**There is a need for a new strategic paradigm, e.g., a multinational approach for a global nuclear governance based on 3S (Safety, Security, and Safeguards) in the applications of nuclear energy**

# MNA on Nuclear Fuel Cycle (NFC)

## Issues:

- **Technology**
  - Dual use
  - **Proliferation**
- **Front-end**
  - Reliable supply
  - Monopoly
- **Back-end**
  - Used fuel storage
  - Waste disposal
- **Security**
  - Facility protection
  - Transportation
- **Institutional**
  - Small program
  - NIMBY/NIMTO

## Current business practice for fuel-cycle services

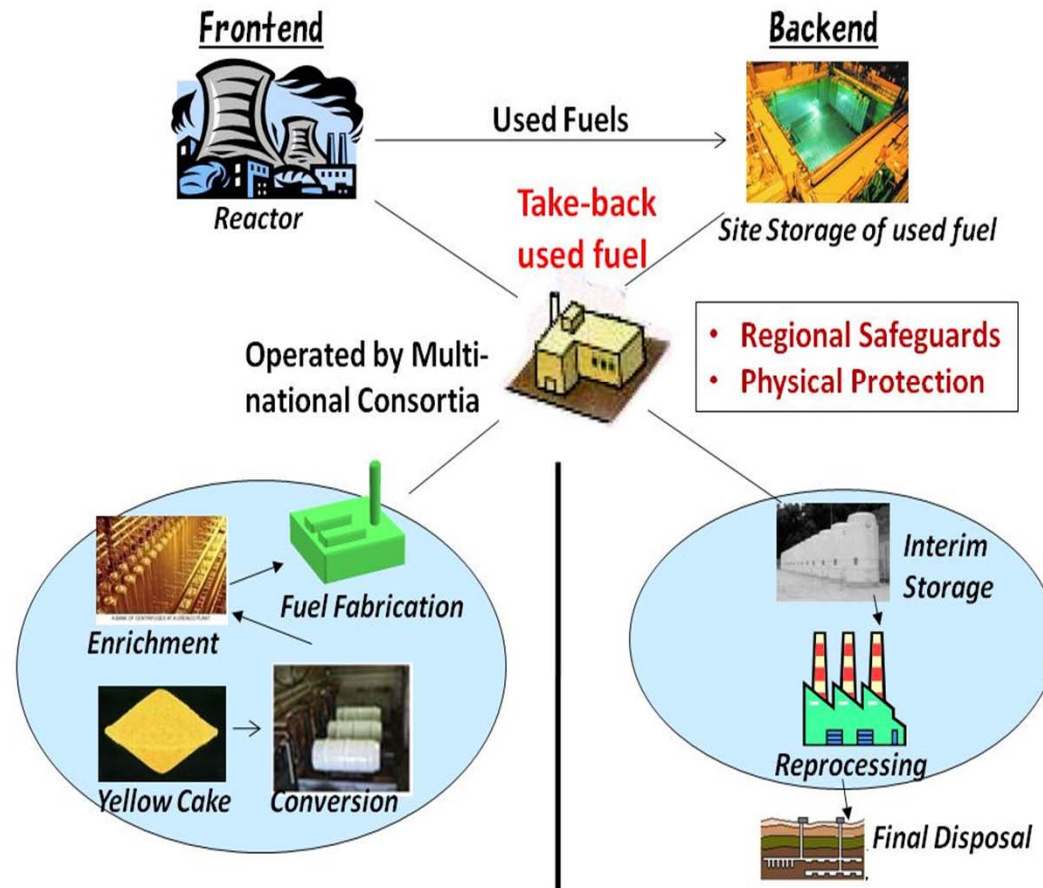


**Can MNA help in resolving these issues?**

# MNA for completing the NFC

- Even not a “grave” **interim storage** is needed as a “funeral home” for used fuel.
- Can multi-national **consortia** facilitate take-back/away of used fuel?
- Can MNA provide a better 3S assurance for enrichment or reprocessing facility?
- Can MNA facilitate **R&D** for final **waste disposal** (grave)?

## Package Deals for Future Nuclear Fuel Cycle



**Can multi-national consortia provide packaged NFC deal?**