

---

# **An Integrated Approach to Nuclear Safety and Security :** **in the context of 3S (Safety, Security, and Safeguards)**

---

**Jor-Shan Choi**

Berkeley Nuclear Research Center

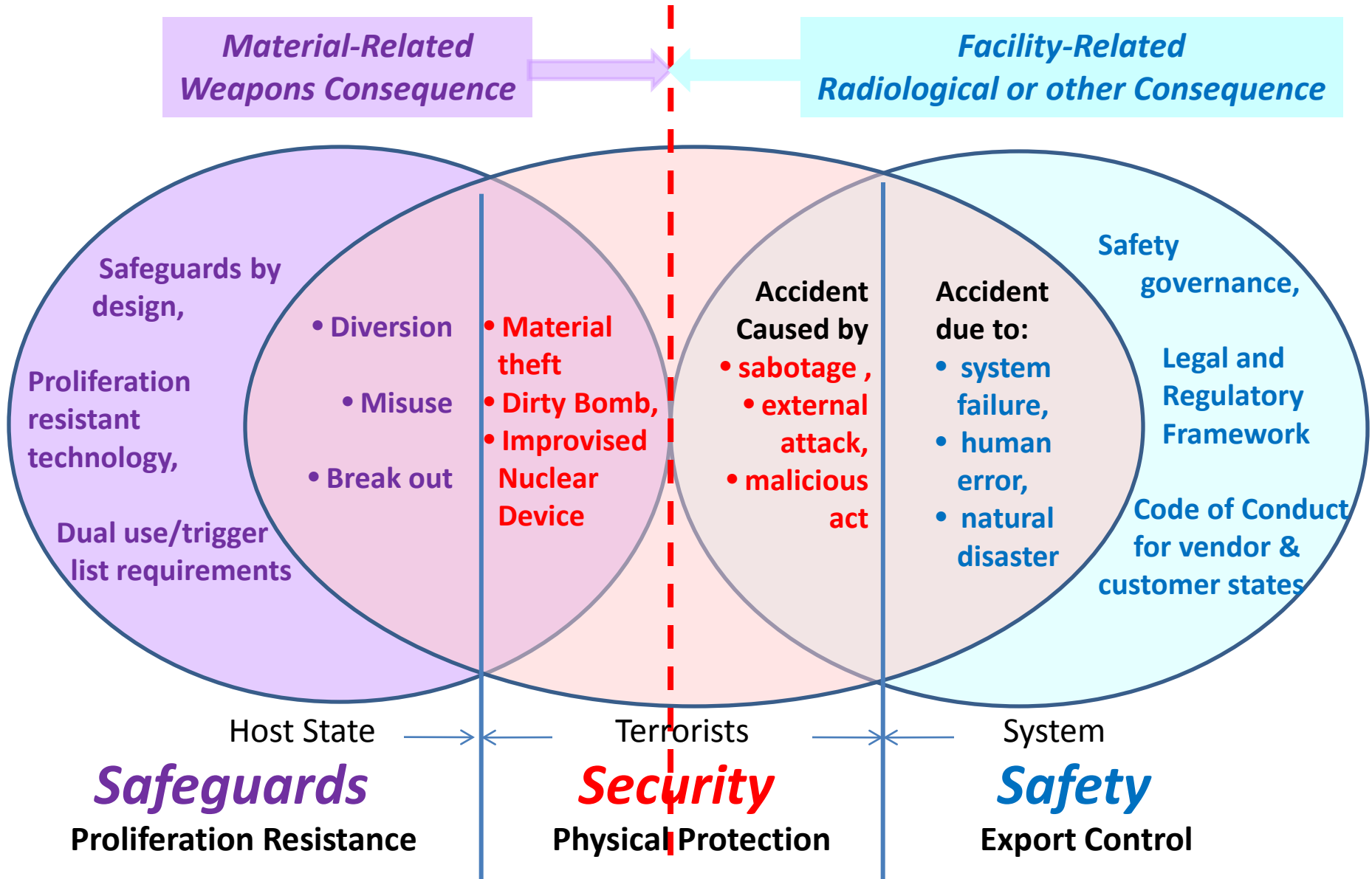
E-mail: [jorshan@yahoo.com](mailto:jorshan@yahoo.com), [jorshan@nuc.berkeley.edu](mailto:jorshan@nuc.berkeley.edu)

JAEA International Forum on Peaceful Use of Nuclear Energy  
and Nuclear Security

9 December 2011, Tokyo, Japan

# 3S (Safety, Security, & Safeguards)

International Initiative on 3S-based Nuclear Energy Infrastructure was First Proposed in the G8 Summit 2008 at Chitose, Hokkaido, Japan



# Integrated Approaches on 2S – Security Summit

## 2010 – Washington DC

Securing nuclear materials and and prevent illicit nuclear trafficking and nuclear terrorism

*Material-Related  
Weapons Consequence*

- 
- A Venn diagram with two overlapping circles. The left circle is purple and labeled 'Safeguards'. The right circle is light orange and labeled 'Security'. The intersection is shaded pink. Inside the intersection, there are two columns of bullet points. The left column lists 'Diversion', 'Misuse', and 'Break out'. The right column lists 'Material theft', 'Dirty Bomb', and 'Improvised Nuclear Device'.
- Diversion
  - Misuse
  - Break out
  - Material theft
  - Dirty Bomb,
  - Improvised Nuclear Device

*Safeguards*

*Security*

## 2012 – Seoul, ROK

Will focus on nuclear security and nuclear safety

*Facility-Related  
Radiological or other Consequence*

- 
- A Venn diagram with two overlapping circles. The left circle is light orange and labeled 'Security'. The right circle is light blue and labeled 'Safety'. The intersection is shaded light brown. Inside the intersection, there are two columns of text. The left column is titled 'Accident Caused by' and lists 'sabotage', 'external attack', and 'malicious act'. The right column is titled 'Accident due to:' and lists 'system failure', 'human error', and 'natural disaster'.
- Accident Caused by
- sabotage ,
  - external attack,
  - malicious act
- Accident due to:
- system failure,
  - human error,
  - natural disaster

*Security*

*Safety*

# 2S Interfaces – Challenge & Opportunity

3S	Safety	Security	Safeguards
<b>Interface with</b>	Security	Safeguards	Safety
Convention/ Agreement	Convention of Nuclear Safety, CNS	Convention of Physical Protection on nuclear material, CPPNM	Comprehensive Safeguards Agreement, additional protocol with IAEA
Good practice, Membership, Coalition of Willing	Regulatory body, INPO, WANO, Export/Import regulations, etc	PSI, UNSC1540, GICNT, CPPNM/Facility, etc.	Nuclear Suppliers Group, Zangger, nuclear-weapons free zones, MNA, etc.
Major events	TMI (1979), Chernobyl (1986), Fukushima(2011)	9/11/2001, Elicit trafficking	South Africa, Iraq, DPRK, Iran?
Specific Characteristics	Openness, Transparency	Confidentiality, Vulnerability	NPT-based, IAEA-centric & confidentiality with states
<b>Challenge</b>	Harmonizing nuclear safety and security	Overcoming states' sovereignty on security	Enforcing grand bargain of NPT and NSG export norm
<b>Opportunity</b>	Seoul Security Summit, 2012	Achieving the goals of 2010 Security Summit in Washington DC	Empowering IAEA roles on safeguards, Pursuing Code-of-Conduct for export norm

# Remark

---

- An International Initiative on 3S-based Nuclear Energy Infrastructure was first proposed in the G8 Summit 2008 at Chitose, Hokkaido, Japan,
- There will be many lessons to be learned from Fukushima (3/11/11), just as they were in previous accidents such as TMI and Chernobyl,
- We need a new strategic paradigm in the development and expansion of nuclear energy: based on 3S (Safety, Security, and Safeguards),
- More importantly, we need better understanding of the inter-relationship in the interfaces with safety-security, security-safeguards, and safeguards-safety,
- Recovering nuclear materials in Fukushima would present Japan, a non-nuclear-weapons-state, a 3S challenge.