# Nuclear Safety and Terrorism

**Session:** Regency Room
**Date/Time:** February 19, 2013 / 14:00-15:15

**Moderator:** William Charlton, Nuclear Security Science & Policy Institute

**Speakers:** Jonathan Herbach, Utrecht University
Hwang Il Soon, Seoul National University
Naoi Yosuke, Japan Atomic Energy Agency

**Rapporteur:** Shawn Fitzgerald, Massachusetts Institute of Technology

## Session Sketch

William Charlton, Director of the Nuclear Security Science and Policy Institute at Texas A&M University, led the panel discussion by introducing the topic of nuclear safety and terrorism by introducing two separate, yet linked, concepts of nuclear safety and nuclear security. He noted that risk permeates all complex systems, and we normally approach risk management by both lowering the likelihood of an incident as well as mitigating the consequences in the event of an incident. He explained that by assuming the probability of an incident is low, we underestimate the risk associated with both safety and security incidents. As an example, we have had multiple core incidents when traditional models predict that the probability of any one event is extremely low. Dr. Charlton proposed five steps to improve risk analysis: 1) integrate safety and security in system design and operation; 2) enhance safety and security culture at all levels; 3) understand flaws in traditional risk analysis; 4) engineer increasingly resilient systems; and 5) improve crisis management globally.

Jonathan Herbach, Researcher at the Center for Conflict and Security Law at Utrecht University, highlighted the efforts of the international community to codify nuclear security issues within international law. He noted that risk and threat perception associated with safety is reflected in the international legal regime that took shape after the Chernobyl incident. After 9/11, there has been greater focus on the issue of nuclear security within the

international legal sphere. The Convention for the Suppression of Acts of Nuclear Terrorism of 2005 defined nuclear terrorism as a crime for the first time. Possession of radioactive material and/or devices, sabotage of nuclear facilities, and threats against those facilities with the intent to harm are acts of nuclear terrorism as defined by the Convention. Dr. Herbach concluded his remarks by observing that nuclear safety remains the responsibility of the state, and that states only adhere to those measures of international law to which they have subscribed.

Hwang Il Soon, Professor at the School of Energy Systems Engineering at Seoul National University, commented about concrete steps the nuclear community might take in order to improve both the nuclear safety and nuclear security regimes for power plants, spent nuclear fuel (SNF) storage, and research reactors. He also noted cyber terrorism as a growing threat to nuclear infrastructure. Dr. Soon suggested the following mechanisms to enhance safety and security posture: 1) development of sheltered interim storage of SNF; 2) ruggedized, self-sustaining underground control towers for power plants; 3) early-warning defenses at nuclear sites; and 4) institutional measures such as legislation and international cooperation.

Naoi Yosuke, Deputy Director of the Integrated Support Center for Nuclear Nonproliferation and Nuclear Security of the Japan Atomic Energy Agency, began his remarks by highlighting examples of infiltration at nuclear sites in France, Sweden, and the United states over the past year. He observed that this capability demonstrates a threat to nuclear infrastructure by potential terrorists that wish to gain access to protected sites with the intent to sabotage those facilities. Mr. Naoi noted that the Fukushima incident reveals the vulnerability of nuclear infrastructure to both safety and security incidents. He said that the countermeasures against safety and security incidents are similar, and systems must be engineered with both in mind. Mr. Naoi concluded his remarks by highlighting several lessons learned from nuclear safety aspects of operations that impact nuclear security: 1) emergency preparedness; 2) the need to foster a joint safety and security culture; and 3) the need to gain synergy between safety and security considerations.