Establishing a Radioactive-Materials Management Center of Excellence (CoE) in East & Southeast Asia

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Outline

- East Asian needs
  - Other similar concepts
- Planning steps
  - Identify scope of CoE
  - Determine demand
  - Implementation steps
- Proposed curriculum
- Path forward

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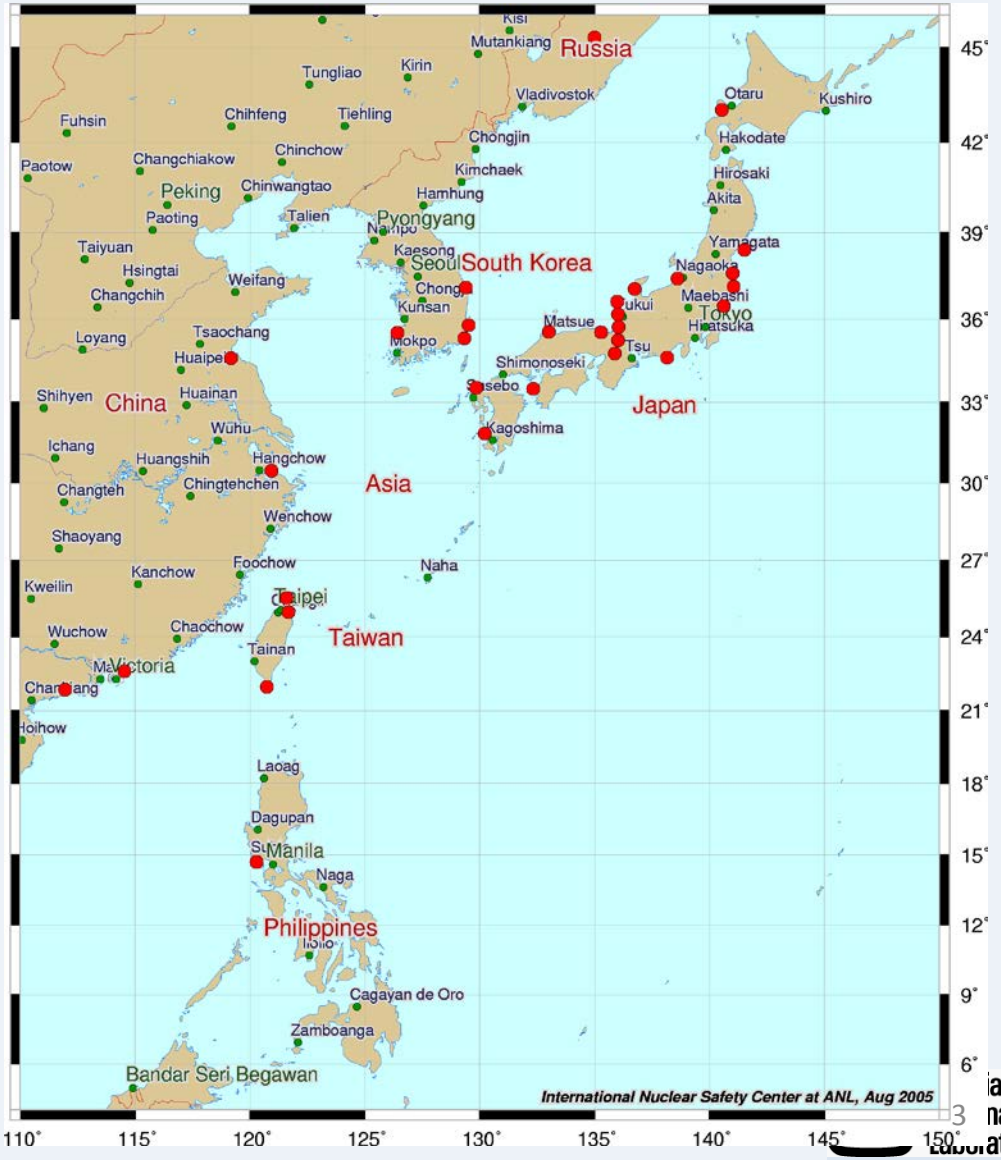
Status of East Asian Nuclear Power

- Red dots: existing nuclear-power plants in East Asia
- Other countries are pursuing nuclear power



Challenges to Nuclear Development

- Public concerns
  - Operational safety
  - Transparency
  - Terrorists
  - Alternative sources
- Safeguards & Nonproliferation
- Radioactive Materials & Waste
  - Handling
  - Storage
  - Disposal

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Existing East-Asian Resources

- Many nuclear-engineering departments in Japan, Korea, Taiwan, China,…

NE departments provide strong scientific training

Radioactive Waste Research Laboratory

- Research Overview
  - The Radioactive Waste Laboratory focuses on two research fields:
    1) radioactive waste management
    2) application of radiation and radioactive isotopes in industries
- Ongoing Projects
  - Waste Disposal Study on LLW and HLW
  - Development of Scintillators for X-ray and Neutrons
  - Radiation Level Monitoring in Nuclear Power Plants during Refueling Outage
  - Development of Neutron Radiography System

Why a Center of Excellence?

- Augment *technical* capabilities with
  - Human-resources
  - Operational management
  - Policy concerns
    - National & International
  - Infrastructure support
    - Emphasize nonproliferation culture
  - For various radioactive materials:
    - Nuclear-reactor products
    - Low- and intermediate-level wastes

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Benefits of a Regional CoE

- Similar disciplines
- Develop consistent practices
  - Off-normal situations
  - Handling, transporting, storing, disposing
  - Record keeping
- Safety and security
  - International safeguards
  - Consistent nonproliferation policies

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Establishing a Regional CoE

- Scope of the CoE:
  - Needs
    - Public confidence
    - No diversion of material
  - Critical System Requirements
    - Regulatory issues
    - Transparency, comprehensive data availability
  - Major Functional Areas
    - Operations, material, monitoring, decommissioning

Hands-on and academic components

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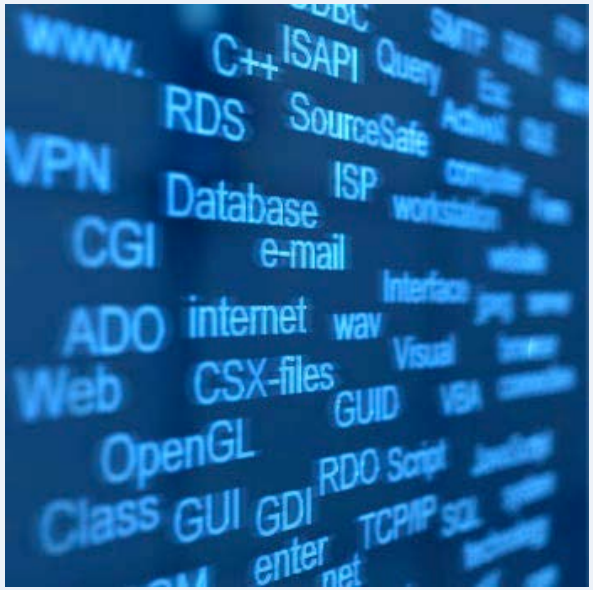
Disciplines Covered at a CoE

- Legal & Regulatory
- Tracking & Security
- Monitoring
- Operations
- Materials Degradation
- Knowledge Base
  - Transparent and current information
    - Radioactive-materials-management system
    - Operations, regulatory environment, etc.
    - Safeguards and security



Implementing a Regional CoE

- First step
  - What is demand in East Asia?
    - Broaden studies beyond Nuclear Engineering "technologies"?
      - Organization?
      - Focus?
- If sufficient demand, then prepare a "package" for potential CoE hosts
  - Use East Asian expertise

Further Implementation Steps

- Principles of a CoE:
  - Broad curriculum
  - Physical, engineering and social sciences
  - Coordinate management practices
    - Low- and Intermediate-level wastes
    - Other radioactive materials

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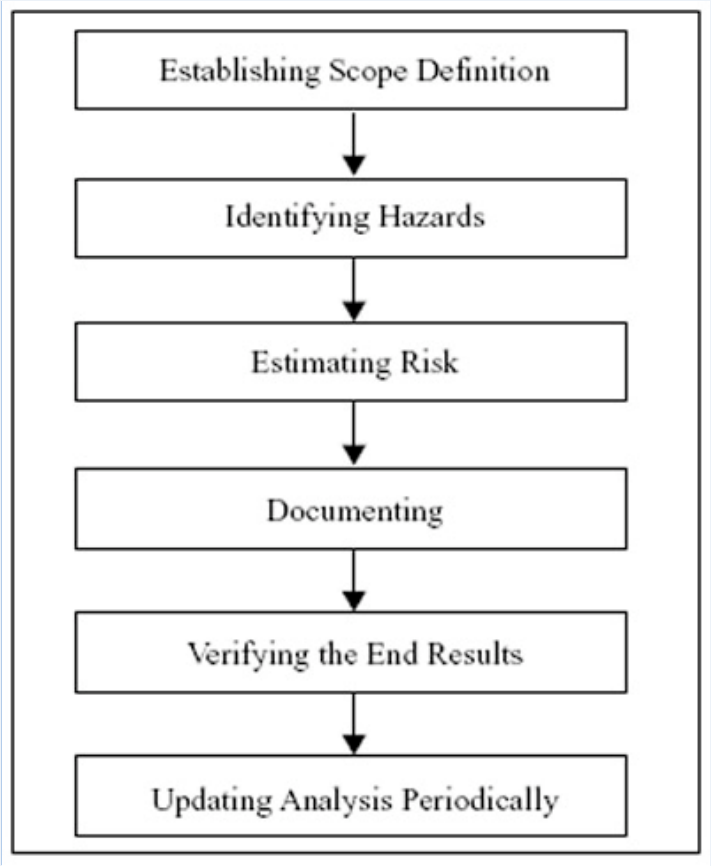
Example Fields of Study

- At-reactor *vs*. centralized storage
- Facility management
  - Siting
  - Design
  - Licensing
  - Operations
  - Security
  - Maintenance
  - Decommissioning

Additional Fields of Study at CoE

- Transportation
- Storage & Handling
  - LILW
  - Wet & Dry
- Performance Modeling & Risk Assessments
- Nuclear *Culture*
  - Safety & Security
  - Nonproliferation
- Knowledge Base
  - Best Practices
  - Monitoring & Transparency
  - Safety, Security, Safeguards

Probabilistic Risk Assessment



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Summary

- Systematic approach to *all* aspects of managing radioactive materials
  - Engender Nuclear Culture
    - safety, security, safeguards & nonproliferation
  - Awareness of scientific, technical, social & legal issues
- Experienced parties contribute as mentors
- Path forward
  - Bi-lateral meetings
  - IAEA coordination & experience
  - 2011 Workshop & Planning

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