HRD, Education and Training Activities in Nuclear Security

Division of Nuclear Security
Department of Nuclear Safety and Security
“…to continue to focus on human resource development, education and training, assisting states to meet their national responsibilities and international obligations.”

2013 International Conference on Nuclear Security Ministerial Declaration: “…welcome the IAEA’s support for capacity building in States, upon request, including regulators, law enforcement agencies and industry, developed in cooperation with Member States, and recognize the importance of the collaborative International Nuclear Security Education Network (INSEN) and Nuclear Security Support Centre (NSSC) network.”
Human Resource Development for Capacity Building in Nuclear Security

**Comprehensive Training Programme**
**Objective:** To raise awareness, to fill gaps between the actual performance of personnel and the required competencies and skills and, to build-up qualified instructors/trainers

**Nuclear Security Support Centres**
**Objective:** To support member state capacity in nuclear security through human resource development, technical and scientific support

**Nuclear Security Education**
**Objective:** To support the development of teaching material, faculty expertise and preparedness, and the promotion of nuclear security education in collaboration with the academic and scientific community

**Ultimate Goal:** To develop capabilities for supporting sustainable implementation of the international legal instruments and IAEA guidelines for nuclear security worldwide, and to foster nuclear security culture
IAEA Nuclear Security Training

• 37 courses in the Training Catalogue covering all aspects of nuclear security
  • Additional courses – Member State requests through official channels
  • Modularized and standardized
• Over 80 training courses offered in 2014, with over 2000 trained participants from 43 Member States
• Developing recommendations on introduction of a Systematic Approach to Training (SAT), human resource needs assessment, educational and training needs analysis, and a national training programme
• 6 E-learning modules on basic topics in nuclear security
Nuclear Security E-Learning

- 6 basic E-learning modules in nuclear security
  - Use of Radiation Detection Instruments for Front-Line Officers
  - Transport Security
  - Computer Security
  - Nuclear Material Accounting and Control for Nuclear Security
  - Radiological Crime Scene Management
  - Physical Protection

- Available on the Nuclear Security Training Portal

- Additional modules to be developed from 2015 onwards

- Translation of E-learning modules into other languages in 2015

- <Triple Bar in Nuclear Security>
  - Awareness-raising course developed by a Member State based on the Nuclear Security Series

http://nucleus.iaea.org/NSNS/Training
Primary objectives are:

- Develop **human resources** through the implementation of a tailored training programme
- Develop a **network of experts**
- Provide **technical support** for lifecycle equipment management and **scientific support** for the prevention and detection of and the response to nuclear security events

**Phase 1 - HRD**

1. Training needs assessment
2. Training programme design and development
3. Training implementation and Evaluation

**Phase 2 – Tech.**

4. Technical & scientific support services
5. Long-term sustainability of nuclear security capabilities
Assistance in Establishing NSSCs

- Methodology on how to establish and maintain an NSSC
- Assistance in the analysis and assessment of training needs
- Support to the development of tailored national nuclear security training programmes
- Assistance in training and development of instructors
- Facilitation of training for and providing guidance on technical and scientific support
- Provision of technical equipment (on a limited basis)
IAEA Nuclear Security Education

- Increased interest in nuclear energy and nuclear security globally
- Requests from IAEA Member States for support in capacity building and human resource development
- IAEA Nuclear Security Series (NSS) No. 12 – *Educational Programme in Nuclear Security*
  - Published in 2010 (currently under revision)
  - Master of Science Programme
  - Certificate Programme

http://www-pub.iaea.org/books/IAEABooks/8363/Educational-Programme-in-Nuclear-Security
Achievements in Nuclear Security Education

- INSEN Network (141 members from 50 MS)
- Development and peer review of teaching materials and textbooks
- Professional Development Courses (PDCs) for faculty members in the different areas of nuclear security, attended by over 250 faculty and instructors from over 30 member states
  - Over 50 INSEN members reported a new course, module or degree programme on nuclear security started at their home institution, since they became an INSEN member
  - 70% of INSEN members report an increase in the number of students interested in nuclear security
- Pilot M.Sc. degree programme in nuclear security based on NSS12 curriculum and INSEN teaching materials.
Master’s Degree Programme in Nuclear Security

- First six students graduated in December 2014 with a degree from TU Delft (jointly with a European Consortium)
- Two new Master programmes to be launched in 2015-2016
- Curriculum is based on NSS 12

**Participating Institutions**
- Delft Technical University, Netherlands
- Brandenburg University of Applied Sciences, Germany
- Vienna University of Technology, Austria
- University of Oslo, Norway
- University of Manchester, UK
International Nuclear Security Education Network (INSEN)

- Established in 2010
- INSEN membership is informal and open to any educational and research institution already involved or planning to be involved in nuclear security education in the future, or any competent authority that is interested or involved in nuclear security education
- INSEN current membership:
  - 141 registered institutions from 50 IAEA Member States

**Mission:** to enhance global nuclear security by developing, sharing and promoting excellence in nuclear security education
International Network for Nuclear Security Training and Support Centres (NSSC Network)

Established by consensus in February 2012 at a topical meeting in Vienna

Mission
• To contribute to the global efforts to enhance nuclear security capacity building through an effective and collaborative network of nuclear security training and support centres

Priorities:
• Coordination among NSSCs
• Identification of needs and capabilities
• Sharing best practices, lessons learned, and resources
• NSSC benchmarking/technical visits
• Facilitating regional collaboration
• Encouraging link with higher education

Membership
• Currently 50 member-states
• Membership open to all IAEA Member States through official channels

Terms of Reference adopted on 31 March 2015
INSEN and NSSC Network on the Map
Bridging Nuclear Security Education & Training

IAEA-ICTP International School on Nuclear Security:

- Announced by the Italian government in 2010 at the Nuclear Security Summit in Washington, USA and reinforced at the Nuclear Security Summits in 2012 and 2014 as a continued initiative
  - Supported each year by the Italian Government
  - Next school scheduled for Spring 2016

2014 Regional School on Nuclear Security in Jakarta, Indonesia

- Additional regional schools envisaged in 2016-2017 due to high demand
  - 2016 – Egypt and Indonesia
  - 2017 – Latin America, Africa
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BACKUP SLIDES
HRD activities with highest demand for the support (based on a representative set of INSSPs)

- Training / Educational Needs Analysis, Gap Analysis and Capability Assessment, and identification of necessary resources
- Development of Nuclear Security HRD programme
- Preparing and implementing national training programmes in the nuclear security field
- Training and development of instructors
- Establishing Nuclear Security Support Centres
- Education activities in support of national nuclear security infrastructure (including establishment of educational programmes and participation in Master’s Degree programmes in nuclear security)
- Participation in IAEA training courses in the area of nuclear security
# Training Catalogue

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<td>Development of a Mobile Expert Support Capability</td>
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<td>Security in Transport of Radioactive Material</td>
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<td>Security of Radioactive Sources</td>
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<td>31</td>
<td>Security Management and Security Plans for Radioactive Material and Associated Facilities (Workshop)</td>
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<td>33</td>
<td>Use of Nuclear Material Accounting and Control for Nuclear Security</td>
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<td>34</td>
<td>Vulnerability Analysis of Physical Protection System</td>
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<td>35</td>
<td>Train the trainer course on “physical protection of nuclear material and nuclear facilities”</td>
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<td>36</td>
<td>International Physical Protection Advisory Service (IPPAS) (for host countries’ representatives)</td>
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<td>37</td>
<td>International Physical Protection Advisory service (IPPAS) (for potential team members of IPPAS missions)</td>
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Example areas of IAEA support to HRD in Nuclear Security

- Support in the development of National HRD Strategic Programmes in the area of Nuclear Security
- Nuclear Security Education
- Nuclear Security Training
- Workshops and seminars
- Assistance in establishing Nuclear Security Support Centres (NSSCs) and Centres of Excellence
- Support to Networks (NSSC Network and INSEN)
- Support to Instructor training and development
- Support to Regional cooperation
- Support to introduction of SAT
- Seminars for Senior Managers and personnel on HRD
- Expert Missions to Support Overall Needs Analysis and HR planning for personnel carrying out Nuclear Security functions
- Support in self-assessment of national capacity building and HRD programmes for Nuclear Security
Prerequisite courses
- NS.PR1. Applied mathematics
- NS.PR2. Basic nuclear physics

Required courses
- NS1. Introduction to nuclear security
- NS2. International and national legal framework regulating nuclear security
- NS3. Nuclear energy, nuclear fuel cycle and nuclear applications
- NS4. Methods and instruments for nuclear and other radioactive material measurements
- NS5. Effect of radiation, safety and radiation protection
- NS6. Threat assessment
- NS7. Physical protection systems design and evaluation
- NS8. Physical protection technologies and equipment
- NS9. Security of nuclear and other radioactive material in transport
- NS10. Detection of criminal or unauthorized acts involving nuclear and other radioactive material out of regulatory control
- NS11. Interdiction of, and response to, criminal or unauthorized acts involving nuclear and other radioactive material
- NS12. Crime scene investigation and forensic techniques
IAEA Recommended List of M.Sc. Courses (NSS12)

Elective courses
- NS13. Nuclear material accountancy and inventory control of other radioactive material
- NS14. Vulnerability assessment of physical protection systems
- NS15. Risk assessment and management of State nuclear security measures
- NS16(a). Physical protection systems for nuclear and other radioactive material, sources and facilities
- NS16(b). Physical protection systems for radioactive material and sources
- NS17. Import/export and transit control mechanism and regime
- NS18. Nuclear security at major public events
- NS19. Nuclear forensics and attributions
- NS20. Infrastructure and procedures for detection and response to incidents involving nuclear or other radioactive material out of regulatory control
- NS21. Cooperation of stakeholders at national and international level
- NS22. IT/cyber security
- NS23. Nuclear Security management
INSEN Structure: Working Groups (WG)

**WG I: Develop Educational Materials**
- Coordinate the development of peer-reviewed textbooks and instructional materials
- Incorporate results of nuclear security research in instructional materials

**WG II: Promote Faculty Development and Student Exchange**
- Promote faculty professional development and cooperation among educational institutions
- Assist in curriculum development
- Establish a mechanism to facilitate the exchange of students, faculty, and researchers

**WG III: Promote Nuclear Security Education**
- Promote nuclear security education
- Promote INSEN
- Provide materials to be uploaded on the NUSEC portal
NSSC Network Structure: Working Groups

A. Coordination and Collaboration

- Survey and map NSSC location and areas of specialization at the national, regional or international level
- Facilitate exchange of information and experience, and identify similarities and differences between NSSCs
- Facilitate cooperation and collaboration in evaluation of training and support programmes
- Identify needs for support and available resources to meet those needs
- Strengthen collaboration with INSEN

B. Best Practices

- Identify criteria for best practices, taking into account IAEA and other guidance
- Identify best practices for training and support broken into scope and/or categories, recognizing the importance of job task analysis
- Identify the relevant practices that should be provided in the network
- Identify any characteristics basic to all NSSCs

C. Promotion of Nuclear Security Training

- Facilitate sharing of training course materials between all members of the Network
- Facilitate sharing of lessons learned in an effort to promote nuclear security training
- Facilitate sharing of processes and methodologies for Network members to use in the analysis of training needs and design and implementation of training programmes