

# Capacity Building in Nuclear Security: Opportunities and Challenges

Workshop on Regional  
Capacity Building and Cooperation  
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- Nuclear science and technology uses can contribute to national well-being.
- nuclear and other radioactive materials are vulnerable to sabotage, stolen, lost or acquired illegally by individuals or groups that may use them for malicious purposes.
- States need to establish, implement, maintain and sustain a national nuclear security regime to protect against such acts.
- Human is one of the important elements in planning, implementation and evaluation of programs
- Capacity building is therefore essential activities to ensure the safe, secure and sustainable program of nuclear science and technology utilization.
- Building the capacity to develop, implement, and sustain a nuclear security regime is an essential responsibility of a State, but an International or regional cooperation provides benefits for all involving parties

- According to the IAEA, the objective of any State's nuclear security regime is
  - to prevent, detect and respond to nuclear security events, to protect persons, property, society and the environment from the harmful consequences of nuclear and other radioactive materials.
- An effective national nuclear security regime elements:
  - implementation of relevant international legal instruments,
  - information protection,
  - physical protection,
  - material accounting and control,
  - prevention of, detection of and response to malicious acts involving nuclear and other radioactive material;
  - national response plans, and contingency measures.

# Nuclear Security in Indonesia

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## National Policy on Nuclear Energy

- Peaceful usage
- Regulated and controlled by the Government
- ensure health and safety of the worker and public, and to protect the environment

# Introduction: Potential hazard and threats



- Vulnerability in illicit trafficking:
  - Archipelagic state,
  - Located between Asia and Australia continent and Indian and the Pacific Ocean
  - Consist of 17.508 islands, 37 international airports and 21 international seaports
- Terrors showed that the threats are real:
  - Bali Bombs: 12 Oct 2002 AND 1 Oct 2005
  - Ritz Carlton / J.W. Marriott Hotel: 17 July 2009
  - Low explosive bombs
    - Serpong area: April 2011
    - Mall Serpong: July and Oct 2015
    - Thamrin street, Jakarta: 14 Jan 2016

# Introduction: National Commitment on Nuclear Security



- active participation in enhancing global nuclear security through, i.a. Nuclear Security Summit (NSS)
  - NSS-I, 2010 in Washington: attended by Mr Vice President
  - NSS-II, 2012 in Seoul: attended by Mr President
  - NSS-III, 2014 in Den Haag, Netherland: attended by Mr Vice President
  - NSS-IV, 2016 in Washington: attended by Mr Vice President
- Establishment of specific units related to nuclear security activities.
  - BAPETEN: I-CoNSEP (Indonesian Center for Excellent in Nuclear Security and Emergency Preparedness)
  - BATAN: CSCA (Center for Security Culture and Assessment)
- Enhancement of national Training Centers to conduct nuclear security training courses.

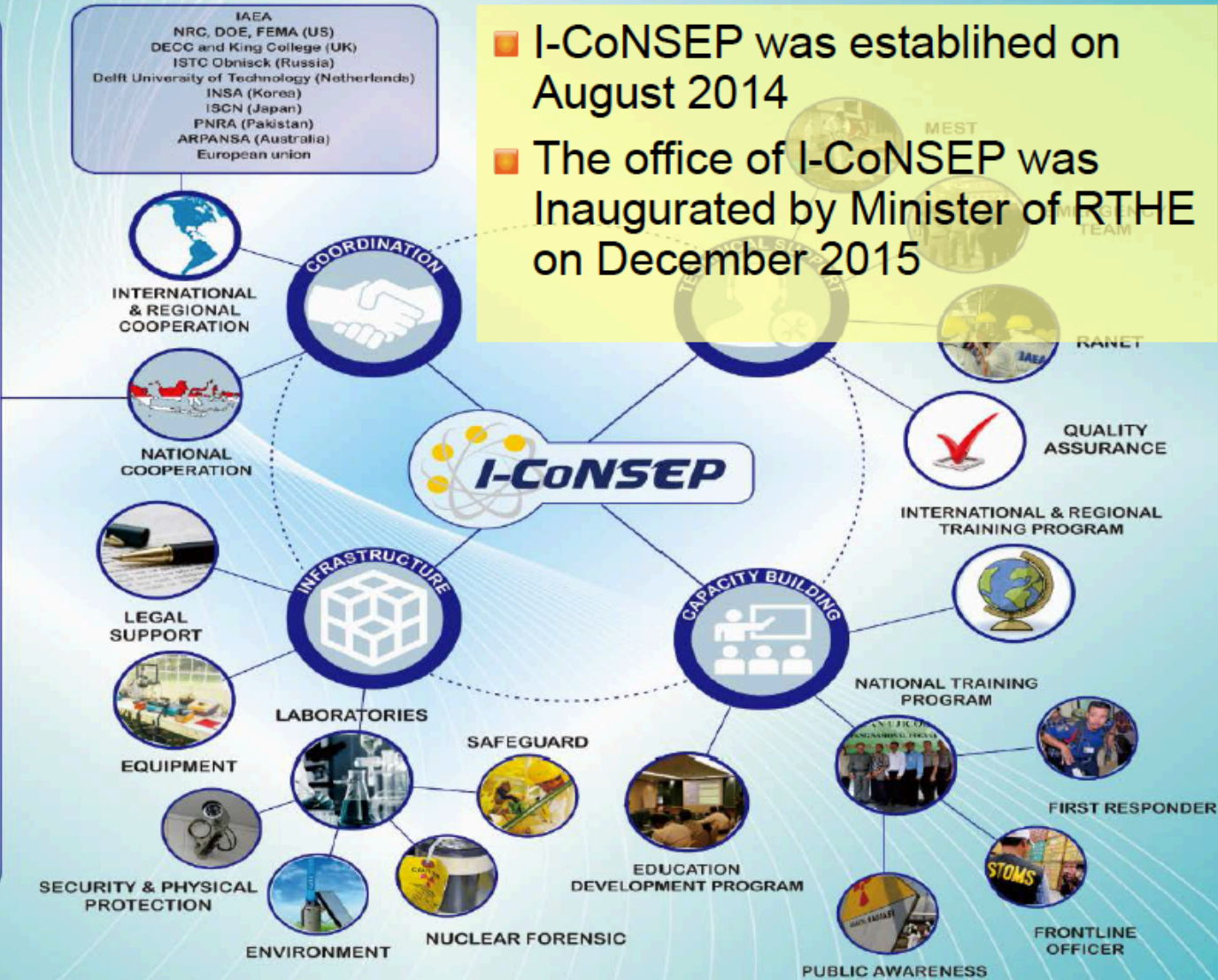
# I-CONSEP:

Indonesian Center of Excellent in Nuclear Security and Emergency Preparedness



IAEA  
NRC, DOE, FEMA (US)  
DECC and King College (UK)  
ISTC Obninsk (Russia)  
Delft University of Technology (Netherlands)  
INSA (Korea)  
ISCN (Japan)  
PNRA (Pakistan)  
ARPANSA (Australia)  
European union

- I-CoNSEP was established on August 2014
- The office of I-CoNSEP was Inaugurated by Minister of RTHE on December 2015





# I-CONSEP: Activities



Grant Distribution of Equipments	Number
Harbour (Seaport) Belawan	1 (RPM) 9 (handheld)
Local Government – BP Batam (Seaport)	37 (handheld)
Bitung Seaport	1 (RPM)
Makassar Seaport	1 (RPM)
Semarang Seaport	1 (RPM) – on progress
Presidential Security Force	13 (handheld) 1 (RPM)
Customs Headquarter	34 (handheld) – on progress

# I-CONSEP: Activites



Field Exercises	
Dirty Bomb (Radiological Dispersal Device/RDD), Jakarta-2004	
Nuclear Reactor Sabotage, Serpong-2010	
Nuclear Reactor Sabotage, Yogyakarta-2016	
Nuclear Reactor Sabotage, Serpong-November 2016	
Join Exercise / Operation with Coast Guard	NUMBER OF PARTICIPANTS
Ambon (2015)	52
Batam (2016)	43
Jakarta (2016)	115
Batam (2016) - Operation	64
Bitung (2014) - Operation	23
Batam (2014) - Operation	33
<b>TOTAL</b>	<b>330</b>

- Located in BATAN's facility in Serpong
- Inaugurated at 29 September 2014 as a coordination unit
- supported by some Centers of BATAN as well as by IAEA and CITS-UGA
- Mission:
  - Promoting nuclear security culture and its self-assessment
  - Conducting security culture self- assessment
  - Developing security culture and assessment methodology
  - Enhancing network, incl. CBRN security culture

- IPPAS Mission in 2001 and follow up mission in 2007 and 2014
  - Review of legal and regulatory basis for the physical protection of nuclear activities
  - Review of implementation of physical protection at three sites
- Developed National Design Basis Threat (DBT) and Physical Protection of Nuclear Material and Security of Radioactive Source
- Table top exercise on nuclear security events (Serpong 2010, Yogyakarta 2012 and Bandung 2013)
- Workshop on Vulnerability Analysis (2012), gap analysis in 2014 (INFCIRC 225/Rev.4 and Rev. 5) , performance testing in 2015 - 2016

## 1<sup>st</sup> Assessment

- Year: 2012-2013
- Method: survey and interview
- Object: three research reactors
- Assessment Team: 41, limited background members
- Without survey statement validation
- Numbers of respondent: 624 surveyed, 128 interviewed

## 2<sup>nd</sup> Assessment

- Year 2015-2016
- Method: survey, interview, observation and document assessment
- Object: multi-purpose reactor, nuclear fuel cycle technology center and radioactive waste
- Assessment Team: 32, more scientific background, incl. psychology
- With survey statements validation
- Number of respondent: 277 surveyed, 43 interviewed

# Training Centers



BATAN  
Education and Training Center  
(Pusdiklat)  
Pasar Jumat – Jakarta



BAPETEN  
Education and Training Facility  
(Badiklat)  
Cisarua – Jawa Barat

# Training Lab on Physical Protection



- Exercise on physical protection
- Scopes: National, international
- Potential for joint development and utilization with IAEA, ISCN, NNSA



# BAPETEN: Nuclear Security Training 2016



NO	TRAINING	DATE	Participant
1	Transport Radioactive Source and Nuclear Material	Feb	31 Person
2	Nuclear Security and Safeguards Regulatory Review	Apr	23 Person
3	Emergency Regulatory Review	Apr	17 Person
4	Radioactive Sources Security Officer for Licensee	Apr	38 Person
5	Radioactive Sources Security Officer	May	15 Person
6	Contingency Plan of Nuclear Security Event	Sept	40 Person
7	Table Top Exercise PPS	Oct	30 Person
8	Technical Guidance For Front Line Officer (FLO)	Nov	20 Person
9	Preparation Drill 2015 (BAKAMLA – BAPETEN)	Des	40 Person



# BATAN: Nuclear Security Training 2016



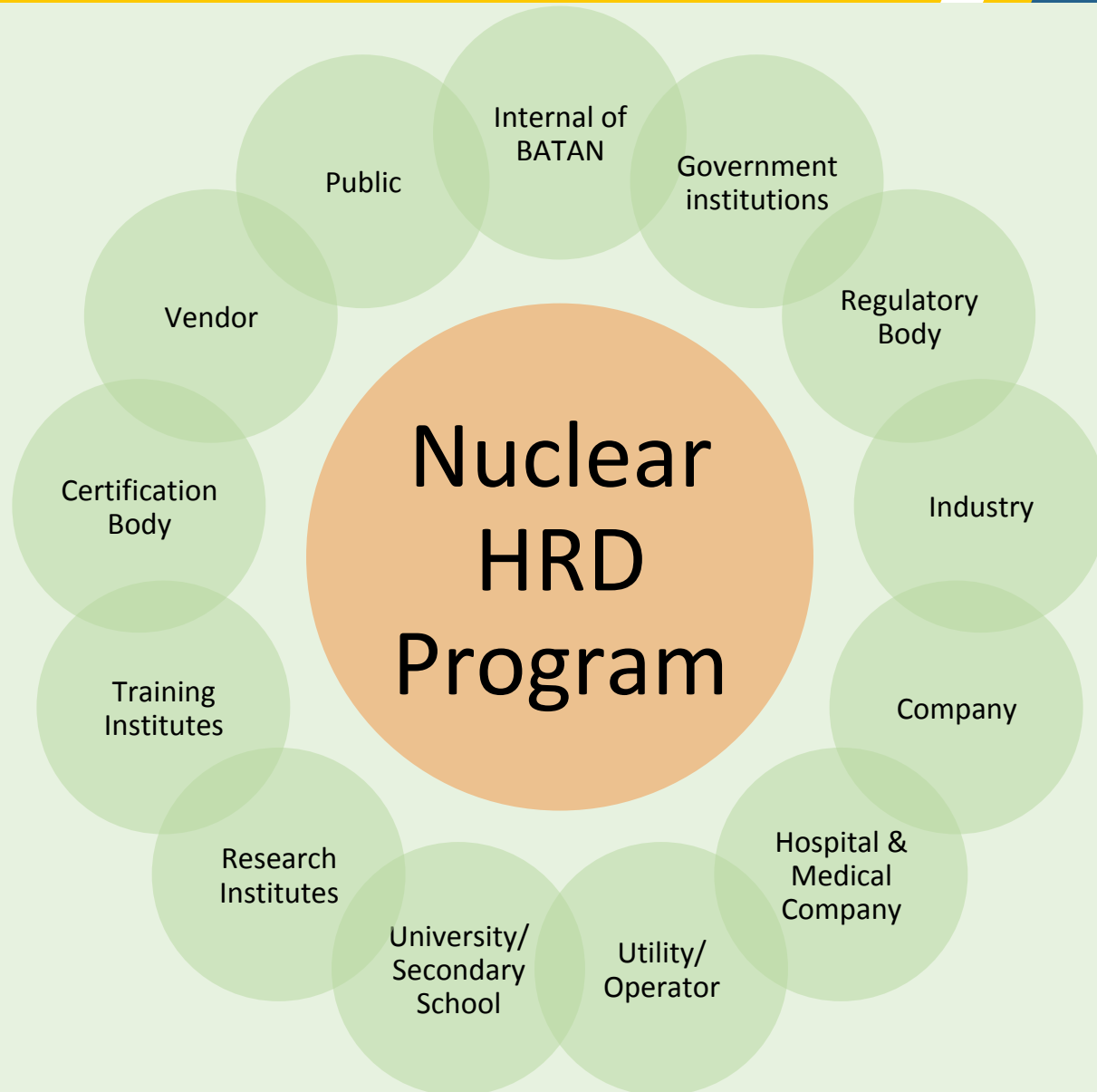
NO	TRAINING	DATE	Participant
1	Nuclear security culture, NSSC Indonesia in cooperation with ISCN	May	25 Person
2	IAEA Regional School on Nuclear Security	Oct	40 Person
3	Implementation of PPS on Nuclear Installation and Facility	Aug	25 Person
4	HRP Roadmap for RR – Cooperation with PNS	May	25 Person
5	Performance Testing of Response Personnel – Cooperation with USDoE	Apr	31 Person
6	Design and Evaluation of Physical Protection System	Sept	22 Person
7	Performance Testing :Contingency Plan – Cooperation with USDoE	Sept	25 Person
8	Safety and Security Culture Interface – Cooperation with UGA	Sept	60 Person
9	Security Plan of Radioactive Source	Oct	25 Person

# Capacity Building in Nuclear Security

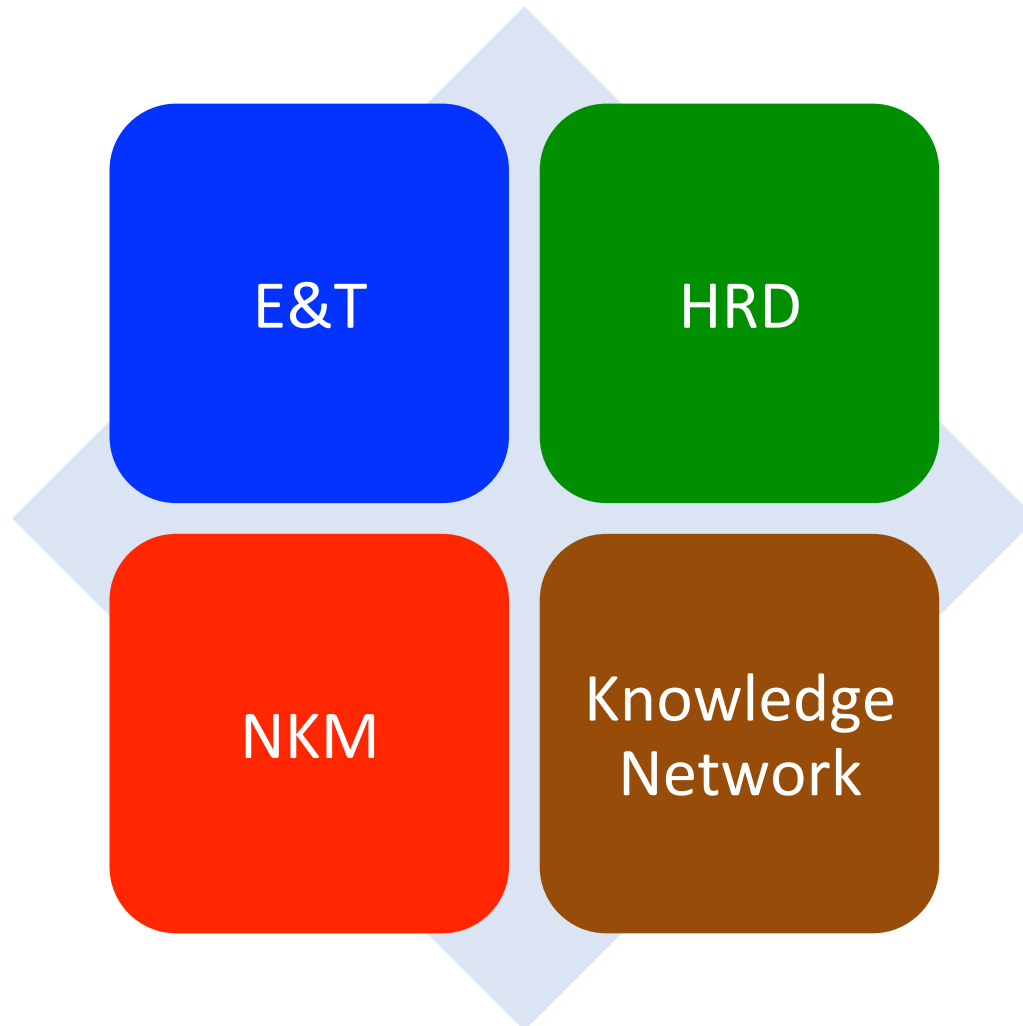
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# Framework for Nuclear HR



# General Concept of IAEA for Nuclear Capacity Building



- Capacity building for nuclear security: a systematic approach to education, training, **exercises, enhancing awareness, workforce management,** knowledge management and use of knowledge networks to develop and continuously improve the governmental, organizational and individual competences and capabilities necessary for establishing and sustaining an effective nuclear security regime.

# Capacity Building of BATAN



## Objectives:

### Education & Training

Building Competences

Preserving nat. comp. on NST

Public Outreach

### Human Resources Development

Effective Human Capital Management

### Nuclear Knowledge Management

Preserving NK

Preventing NK loss

Harvesting NK

### Nuclear Network

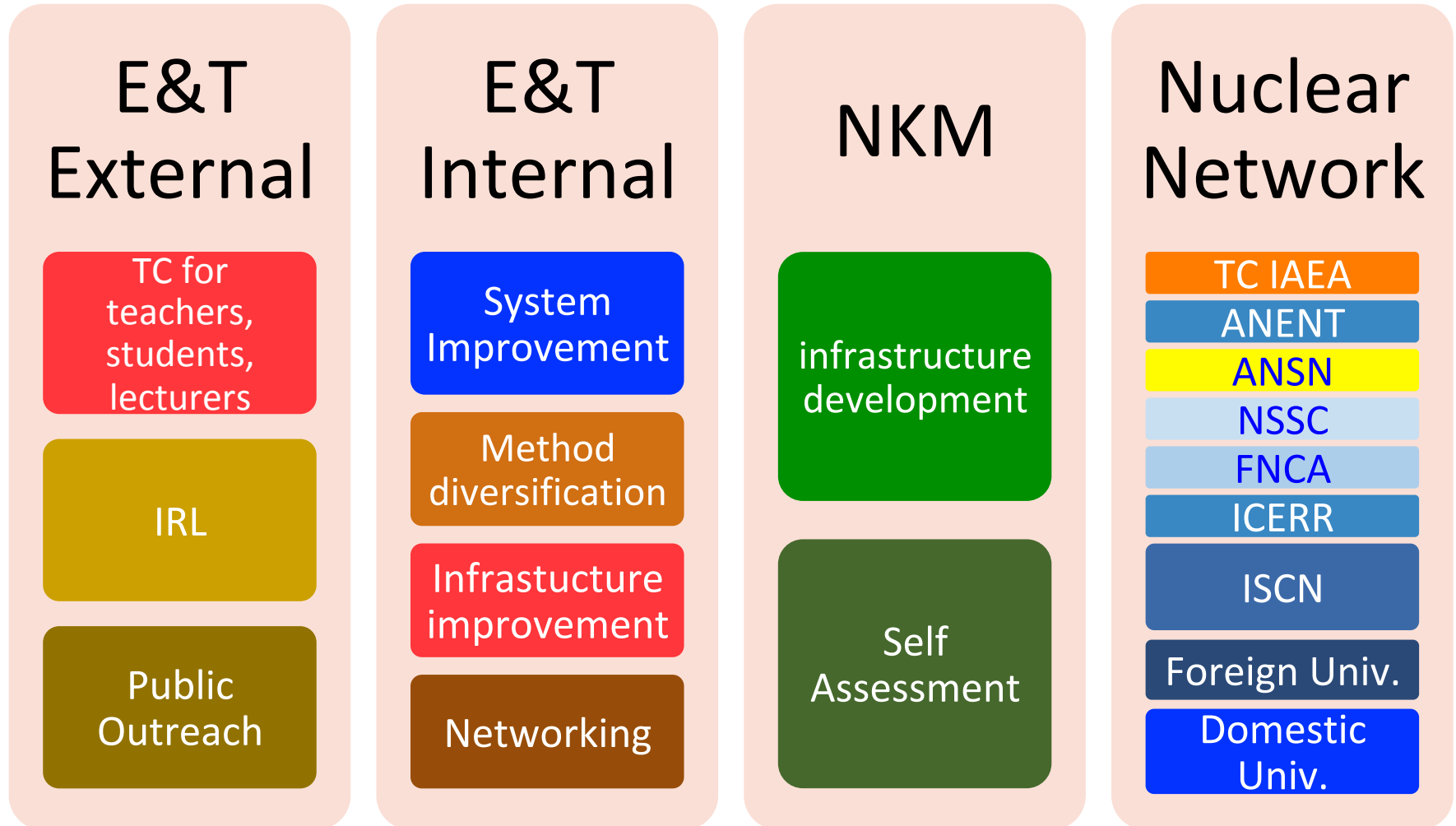
Building competencies

Stakeholders involvement

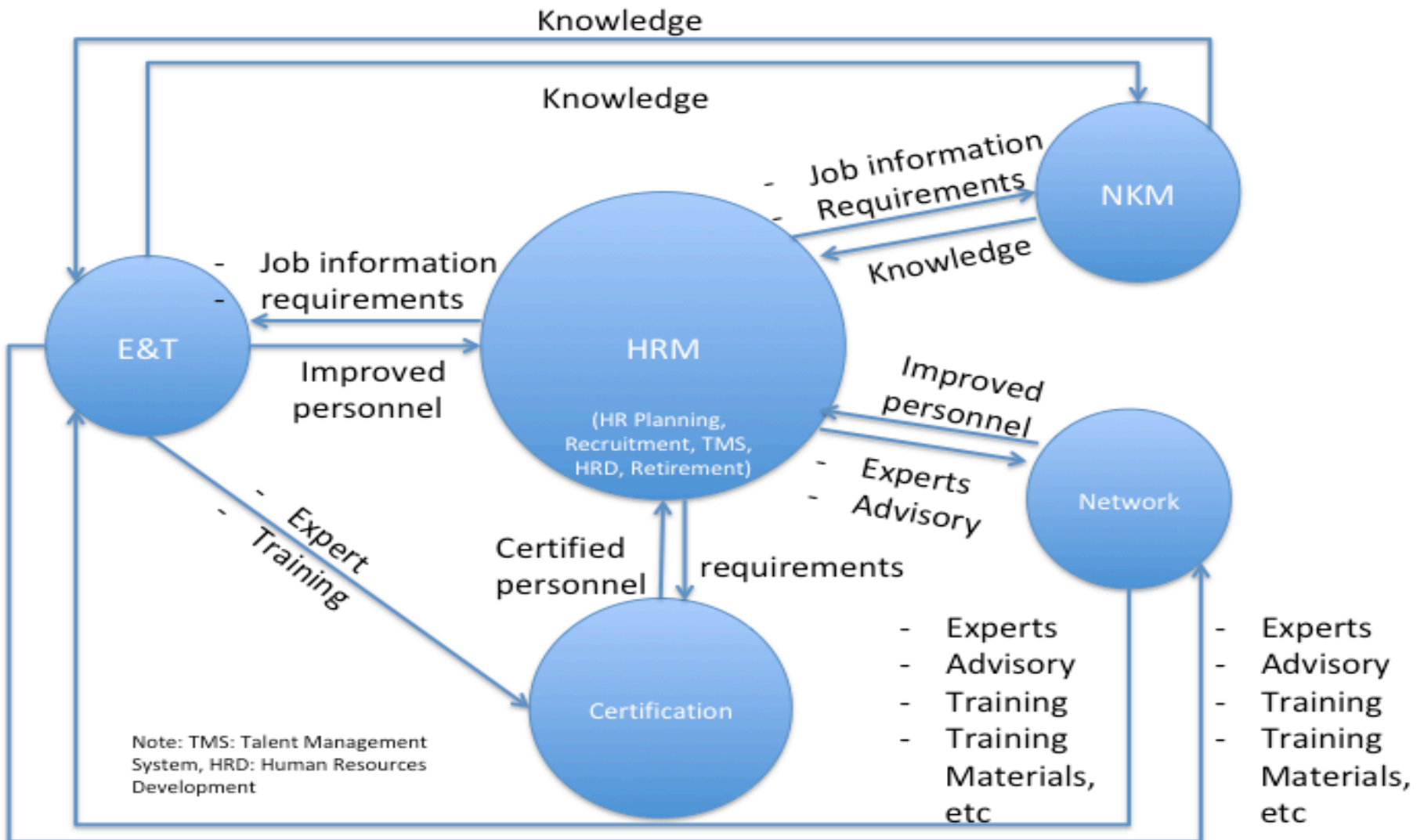
Public outreach

Increasing public support

## Activities:



# Integrated Capacity Building

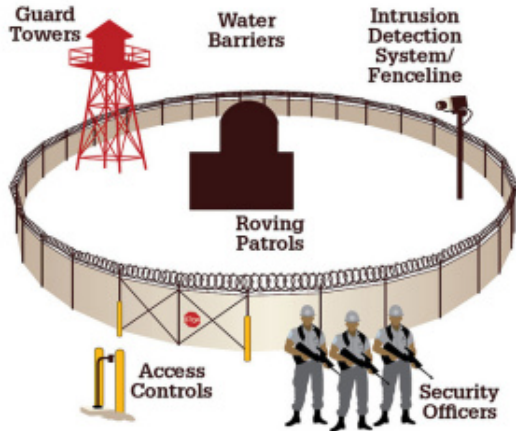




# Nuclear Security Training Scheme



## Security Components



**Introductory**

- Awareness

**Basic Training**

- Fundamental/Principle
- Regulation, Codes

**Intermediate Training**

- Specific
- Technical aspects

**Advanced Training**

- Expertise
- Trainer

# Nuclear Security Training Scheme



**Advance**

1. ITC on PPS Design and Evaluation ;
2. ITC on PPS for Inspection
3. Vulnerability Analysis of PPS ;
4. ToT for Self-Assessment Team on Security Culture;
5. ToT on PPSM ;
6. ToT on Vulnerability Assessment

**Interme-  
diate**

1. PPSM for Medic Fac,
2. PPSM for RR
3. Protection and Prevention Measures against Sabotage
4. PP Measures against Insider Threat
5. Contingency Plan
6. Gap Analysis on INFCIRC/225 Rev 5
7. PPS Performance Testing
8. Inspection of PPS
9. Evaluation of PPS

- 10 NMAC (Safeguards) For Supervisor
11. Computer Security
12. Intelegant Security
13. Nuclear Crime Scheme
14. Security Investigation
15. Nuclear Forensic
16. NS in Transport of NM and RS
17. Nuclear Security MS
18. PPS equipment

**Basic**

1. PPSM of NM and facility;
2. PPSM of Radioactive Sources;
3. School on Nuclear Security
4. INFCIRC/225 Rev 5
5. Nuclear Material Accountancy and Control (Safeguard)

**Introductory**

1. Introduction to Nuclear Security;
2. Nuclear Security Culture

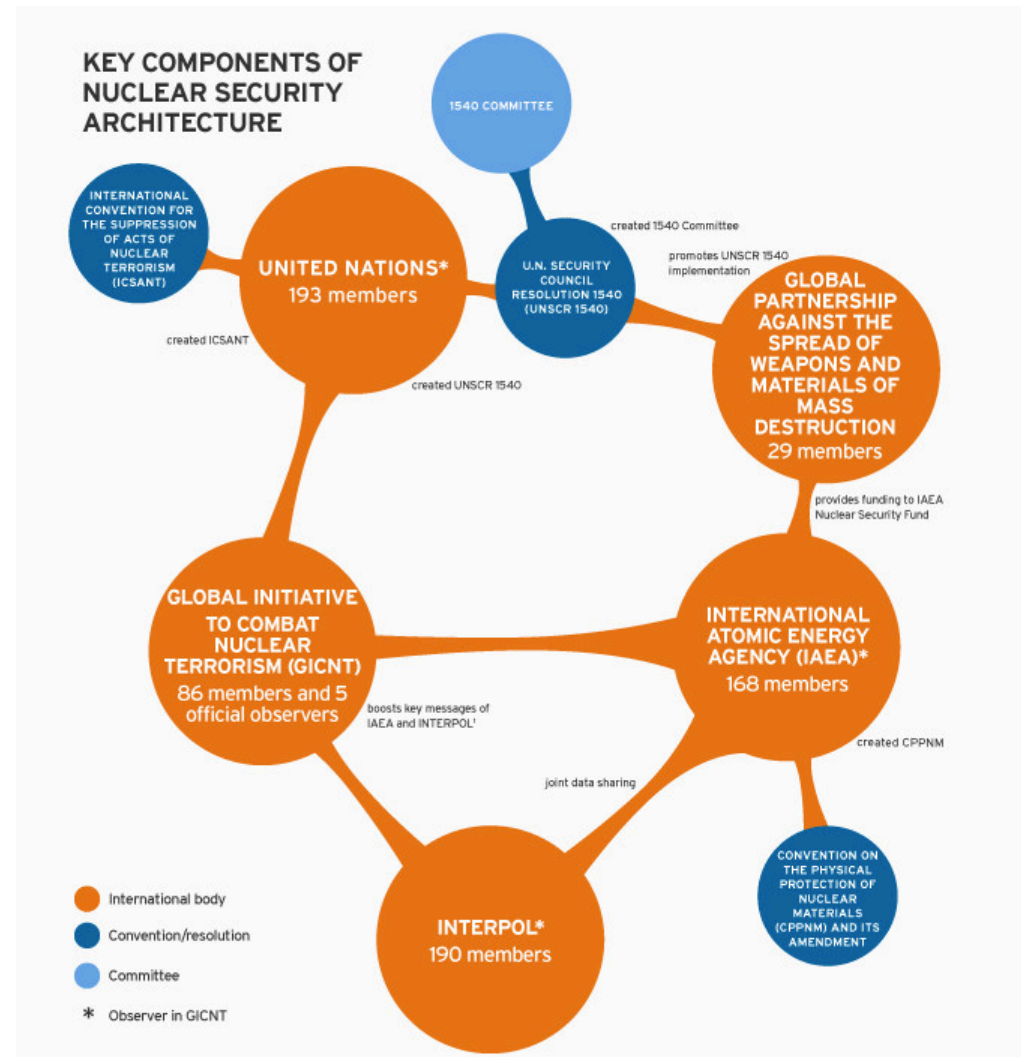
# Opportunities and Challenges

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# Opportunities: Nuclear Security Summits

- Nuclear Security Summits: increased awareness and commitments among countries and relevant institutions
- Nuclear security architecture is established



<https://www.brookings.edu/blog/order-from-chaos/2016/04/04/takeaways-from-obamas-last-nuclear-security-summit/>

# Opportunities: IAEA



- the IAEA activities in strengthening the nuclear security framework globally and in coordinating international cooperation in nuclear security.
- Nuclear Security Plan 2018-2021: GC(61)/24
  - Development of a suite of training courses, based on IAEA Nuclear Security Series guidance, and making these training courses available for delivery by NSSCs;
  - Continue training and train-the trainers programmes taking account of the IAEA Nuclear Security Series and adapting the courses as appropriate, within the Agency's mandate, to meet the needs of Member States;
  - Promoting the NSSC Network to support international adoption of the Agency's human resource development efforts following the systematic approach to training process and holding Agency courses and exercises at NSSCs where possible; and
  - Assisting States in developing NSSCs to facilitate regional and international cooperation in human resource development, technical support and scientific support for nuclear security.

- Main planned outputs in this area for the period 2018-2021 include:
  - Modular training programmes covering all aspects of nuclear security following a systematic approach to training; and
  - Textbooks and course materials on nuclear security, including for a master's degree in accordance with the revised IAEA Nuclear Security Series No 12. The material will be made freely available, through the NUSEC portal, to academic institutions who are members of the INSEN network for them to use either as part of an existing course or for new courses.
  - • E-learning courses in all official languages.

# Opportunities: US



- US: National Nuclear Security Administration
  - Maintaining the stockpile
  - Nonproliferation
  - Counterterrorism and Counterproliferation, etc.

<https://www.brookings.edu/blog/order-from-chaos/2016/04/04/takeaways-from-obamas-last-nuclear-security-summit/>

- China: The State Nuclear Security Training Center
  - Analytical lab – destructive assay
  - Environmental test lab
  - Physical protection Testing Fields
  - Response force training & Exercise Facility
  - Mock Nuclear Material Bunker
  - Integrated training facility for NMCA
  
- Japan: The Integrated Support Center for Nuclear Non Proliferation and Nuclear Security (ISCN)
  - Nonproliferation technology development
  - Material measurement, detection and forensics technology development
  - Capacity building and infrastructure development support
  - Transportation and research reactor fuels support
  - Policy research, etc.



- Korea: The International Nuclear Nonproliferation and Security Academy
  - Education and training
  - Sharing best practices
  - R&D
  - Technical support
- Indonesia:
  - CSCA
  - i-consep
  - Training lab on Physical Protection

# Challenges:



- Establishing integrated Capacity Building
  - E&T, HRD, NKM, NN
- Effective programmatic arrangement among institutions and CoEs
- Diverse capacities and needs among countries
  - Training Scheme
  - Technical Matters
  - Trainer development

<https://www.brookings.edu/blog/order-from-chaos/2016/04/04/takeaways-from-obamas-last-nuclear-security-summit/>

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