Session VI: Nuclear Safety and Security

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International Atomic Energy Agency

The IAEA Statute

- IAEA statute Article III, A.1 *"To encourage and assist research on, and development and practical application of, atomic energy for peaceful uses throughout the world; …"*

- IAEA statute Article III, A.6, *"To establish or adopt, in consultation …, standards of safety for protection of health and minimization of danger to life and property …and to provide for the application of these standards "*

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Safety History: Chernobyl

- Nuclear Safety lessons learned from the accident focused on identifying the weaknesses in and improving the design safety of VVER and RBMK reactors
- Acceleration in development of safety standards, guidelines and services to assist countries affected
- Department of Nuclear Safety was created a decade later
- 25 years later: Fukushima

"…Radioactivity does not respect national boundaries, or national sovereignties. Rules ensuring the safe use of large-scale nuclear activities should therefore be worked out internationally and accepted to apply everywhere…."

Hans Blix,
former IAEA Director General

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Security History: 9/11

- September 11, 2001 aftermath of terrorist attack:
- Security risks from outside groups or insider threats became of paramount concern surrounding nuclear power plant critical infrastructure
- Questionable whether reactors would withstand such attacks
- Apart from radioactive sources, reactors and other parts of the nuclear fuel cycle vulnerable to attack, e.g., reprocessing facilities and transport between sites

2003 Office of Nuclear Security, now a Division.

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Our frame of work, what we do.. our services

We develop safety standards & security guidance: Facilitating international consensus

We provide training and knowledge networks

We propose and conduct Peer Reviews :

- ✓ Self assessment & continuous improvement
- ✓ Openness and transparency,
- ✓ Identifying good practices & mutual learning

We support and promote the implementation of legal instruments i.e. conventions and codes of conduct

- ✓ Nuclear Installation Safety
- ✓ Emergency Preparedness and Response
- ✓ Nuclear Security
- ✓ Radiation, Transport and Waste safety

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Nuclear Safety and Security Programme Priorities

- Develop and strengthen capacity building and infrastructure in nuclear safety and security
- Contribute to global efforts to achieve worldwide, effective security
- Build national, regional and international emergency response capacity
- Strengthen control of radioactive sources and resolve denial and delays of shipments
- Improve medical, occupational and public exposure control
- Improve radioactive waste management

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Global Nuclear Safety and Security Framework

- Primary responsibility for safety and security rests with Member States
- Statutory Agency function: establishing standards and guidance and providing for their application
- Medium Term Strategy 2012 – 2017 Objective: promoting and improving nuclear safety and security through the global nuclear security and safety framework

"The Agency has a key role to play in ensuring that the expansion in nuclear power takes place in an efficient, responsible and sustainable manner…"
Yukiya Amano, Director General

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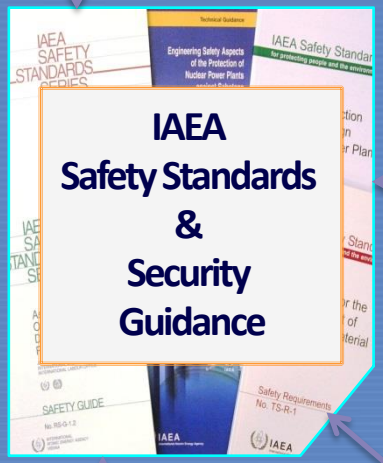
Promoting the Global Nuclear Safety and Security Framework

Conventions: NSC,JC, CPPNM, UNSCR 1540…etc.

International Instruments

CoCs: RRs & S&S of RSs



IAEA Safety Standards & Security Guidance

IAEA Safety & Security Peer Reviews & Advisory Services

Global Knowledge Network

Regulations & enforcements

National & Regional Nuclear Safety & Security Infrastructure

Research, Education & Training

Operation & use

Safety Standards Hierarchy

Safety Fundamentals

"...basic objectives, concepts, and principles of safety and protection in the development and application of nuclear energy for peaceful purposes..."

Safety Requirements

"...establish the requirements that must be met to ensure safety. Expressed as 'shall' statements" and governed by Safety Fundamentals..."

Safety Guides

"...recommend procedures for meeting safety requirements. expressed as 'should' statements, to comply with the Safety Requirements..."

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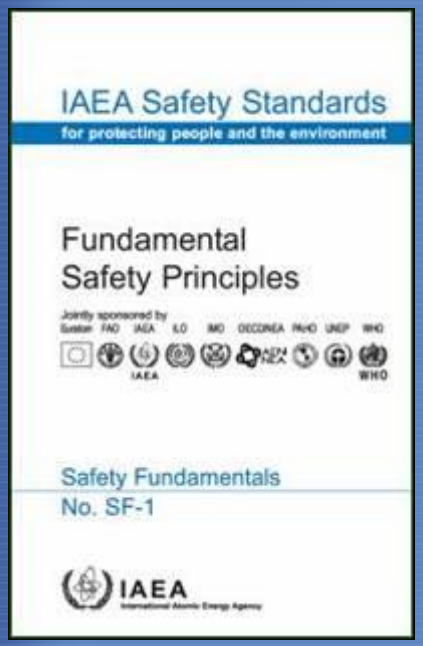
Development of Safety Standards

Principles

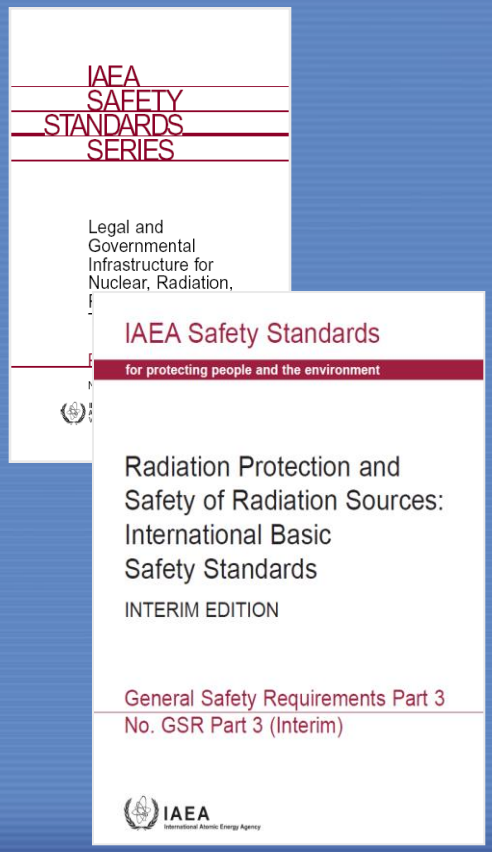
"Shall"

"Should"

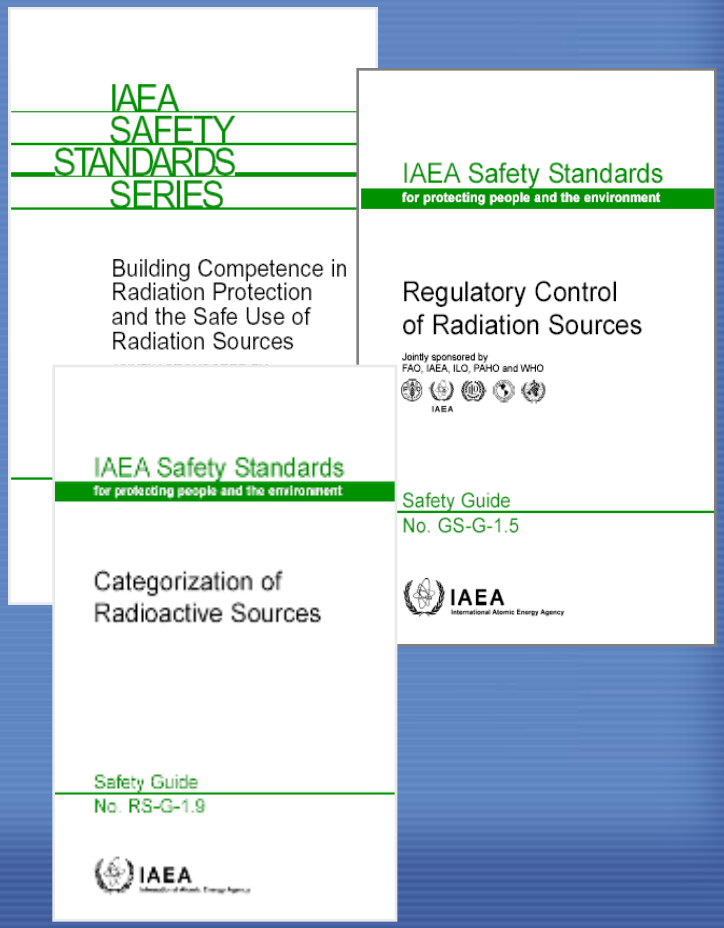
Safety Fundamentals



Safety Requirements



Safety Guides



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Process to Develop Safety Standards and Security Guidelines

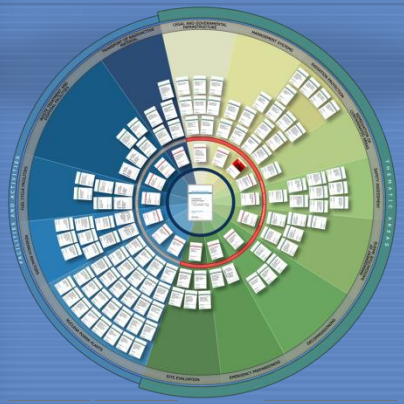
Process takes between 3 – 5 years from start to publication

Outline and work plan
Prepared by the Secretariat
Review by the Committees and Commission on Safety Standards

Drafting or revising of safety standard
by the Secretariat and consultants

Review
by the Review Committee(s)

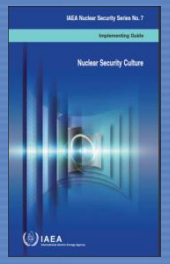
Member States



Endorsement
by Commission on Safety Standards

Establishment by the IAEA's Director General or BoG

Publication



- SF and SRs approved by BoG
- SGs approved by DG

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Current Status of the Safety Standards

Since the establishment of the Safety Standards Series

- Safety Fundamentals issued in 2006
- Safety Requirements established from 1996 to 2010
- In total 124 safety standards published

Updated “Status of Safety Standards” on the web site
http://www-ns.iaea.org/committees/files/CSS/205/status.pdf

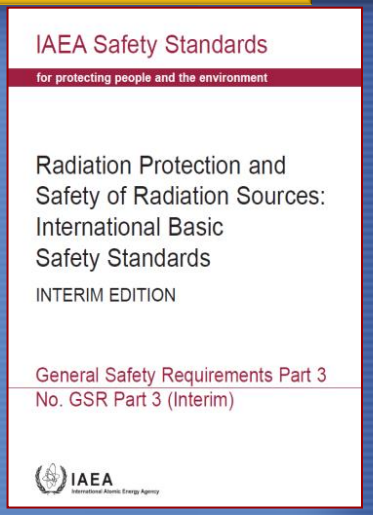
- Includes hyperlinks to the published safety standards in official languages
- Includes general information and a link to the IAEA Safety Glossary

A complete collection of the IAEA Standards can be downloaded from http://ns-files.iaea.org/standards/iaea-safety-standards.doc

BINDING NATURE OF IAEA SAFETY STANDARDS

- IAEA Safety Standards are not legally binding on Member States but may be adopted by them, at their own discretion

however...



- IAEA Safety Standards are binding on IAEA in relation to its own operations and to operations assisted by the IAEA; and
- Member States receiving IAEA assistance are obliged to apply IAEA Safety Standards
- Board of Governors have specifically requested that TC projects involving radiation sources should only be submitted for approval if the country has achieved a certain minimum level of radiation safety

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IAEA Peer Review Services

Integrated Regulatory Review Service (IRRS)
http://www-ns.iaea.org/reviews/rs-reviews.asp?s=7&l=47

Emergency Preparedness Review Service (EPREV)
http://www-ns.iaea.org/appraisals/emergency-reviews.asp?s=7&l=45

Operational Safety Review Team (OSART)
http://www-ns.iaea.org/reviews/op-safety-reviews.asp?s=7&l=49#osart

Integrated Safety Assessment of Research Reactors (INSARR)
http://www-ns.iaea.org/reviews/rr-safety-reviews.asp?s=7&l=51#insarr

International Physical Protection Advisory Service (IPPAS)
http://www-ns.iaea.org/security/ippas.asp?s=4&l=26

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Integrated Regulatory Review Service (IRRS)

- Compares national regulatory practices with IAEA safety standards and equivalent good practices elsewhere in the world for a requesting Member State.
- Provides opportunities for both the Regulator and the IAEA to learn about different approaches to the organization and practices of national nuclear regulatory bodies.
- Provides feedback to the IAEA on the application of IAEA safety standards and contributes to the harmonization of regulatory approaches among Member States.
- Follow-up missions encouraged and conducted two years from the first IRRS mission.

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Operational Safety Review Team (OSART)

- Provides advice and assistance to Member States in enhancing operational safety of operating NPPs, and also approaching operation, commissioning or in earlier stages of construction (Pre-OSART).
- Can be focused to review only a few specific areas or a specific issue (i.e., Expert missions).
- Follow-up visits are standard and are conducted between 12 to 18 months following the OSART mission.

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International Physical Protection Advisory Service (IPPAS)

- Created to assist States in strengthening their national nuclear security regime
- Is to review the State's physical protection and compare it with international guidelines and internationally recognized best practices
- Forms the basis for recommendations for improvements including follow-up activities and assistance
- Objective is two folded:
  - Help States translate international instruments on nuclear security and IAEA guidance into regulatory requirements for the design and operation of physical protection systems.
  - Provide State bodies and facilities with new concepts and discuss best practices on physical protection with experts from other countries.

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What is Capacity Building?

A systematic and integrated approach to develop and continuously improve governmental, organizational and individual competences and capabilities necessary for achieving safe, secure and sustainable nuclear power programme.

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Radiation, Transport & Waste (NSRW)

TC projects to support E&T in Radiation, Transport and Waste Safety

Africa
RAF9048 (2012-2015)

Asia and the Pacific
RAS9066 (2012-2015)

Europe
RER9109 (2012-2015)

Latin America
RLA9075 (2014-2017)

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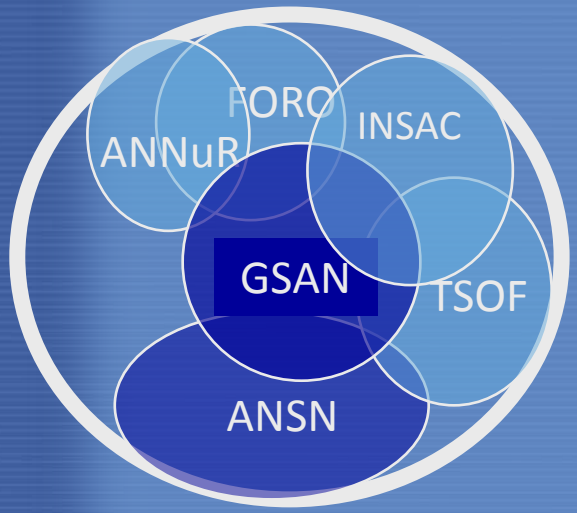
Networks



GNSSN

Global Nuclear Safety & Security Network

- GNSSN is the set of existing networks and information resources i.e. internationally accessible information and data sources, whether open or password protected.
- The aim of the GNSSN is to ensure that critical knowledge, experience, and lessons learned about safety are exchanged as broadly as they need to be.

GSAN

The Global Safety Assessment Network provides focused collaboration on safety assessment capacity building in support of global nuclear safety harmonization, especially in the expanding and developing nuclear programmes worldwide.

NSSC

International Network of Nuclear Security Training and Support Centres assists member states to build capacity in nuclear security through human resource development, technical and scientific support.

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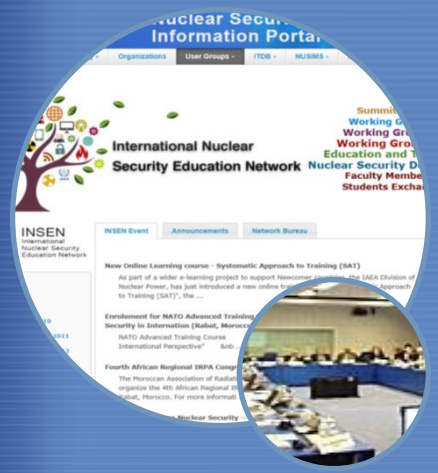
Networks



ANSN

ASIAN NUCLEAR SAFETY NETWORK

The objective of the ANSN is to pool and share existing and new technical knowledge and practical experience to further improve the safety of nuclear installations in Asia. The model could be further used for other regional nuclear safety networks and, eventually, for a global network

RANET

Response and Assistance Network

The IAEA Response and Assistance Network Capacity Building Centre, coordinates several training activities related to nuclear and radiological emergency preparedness and response

INSEN

International Nuclear Security Education Network

The network's mission is to enhance global nuclear security by developing, sharing and promoting excellence in nuclear security education.

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IAEA Support to Newcomer Countries

All newcomers are working closely with the IAEA, using IAEA guidance and hosting international peer review missions

IAEA INIR mission team and Belarus counterparts at the Ostrovets site, June 2012

Preparatory work at the Ostrovets site, March 2013

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NS Role in TC Programme

- *NS Supports the development of the TC programme right from the start and through this support helps in building capacity in Member States.*

- Input of NS on safety related aspects of Country Programme Framework (CPF) is the key for success.
- By building safety and security elements in the CPF a firm basis is established.
- NS regularly provides input in the development of projects. (concepts, projects, activities.)
- Bulk of support comes from the Technical Officers (TOs) for each project.
- Safety reviewer role in determining the adequacy of radiation safety infrastructure.

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TC facilitates the Department of Nuclear Safety and Security in Implementing Major Programme 3

3.1 Incident and Emergency Preparedness and Response

3.2 Safety of Nuclear Installations

3.3 Radiation and Transport Safety

3.4 Management of Radioactive Waste

3.5 Nuclear Security

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Radiation Safety Information Management System

RASIMS

http://rasims.iaea.org/

RASIMS.Contact-Point@iaea.org

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Content of RASIMS

- Country Profiles provide a summary of information on the radiation and waste safety infrastructure in Member States receiving Agency assistance.

- Member States that receive assistance from IAEA are obliged to meet several ‘conditions’, one of these being that they apply IAEA Safety Standards*.

* Note: Although IAEA Safety Standards are generally non-binding on MS, those MS that receive assistance from the Agency are obliged to apply the Safety Standards, e.g.: through the ‘Revised Supplementary Agreement’

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Uses of RASIMS

In this context, RASIMS is used for a range of purposes, including:

- During the **'radiation safety clearance'** process prior to the provision of radiation sources to Member States
- During the design of technical cooperation **(TC) projects** (National and Regional) to ensure they are based on identified safety needs
- In general, to provide an overview of States' progress in **applying IAEA's safety standards** (e.g.: when preparing for IAEA missions, briefs for IAEA Management, etc)

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IAEA Action Plan on Nuclear Safety

12 Point Plan

1. Safety Vulnerabilities
2. Peer Reviews
3. Emergency Preparedness and Response
4. Regulatory Bodies,
5. Operating Organisations
6. IAEA Safety Standards
7. Legal Framework
8. Embarking countries
9. Capacity Building
10. Protection of People and Environment
11. Communication
12. Research and Development

✓ ***Strengthen*** ✓ ***Enhance Effectiveness***

Actions for:

IAEA Secretariat

Member States

Other Relevant Stakeholders

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Action Plan (contd.)

- Facilitate the development of the infrastructure necessary for Member States embarking on a nuclear power programme

- Strengthen and maintain capacity building

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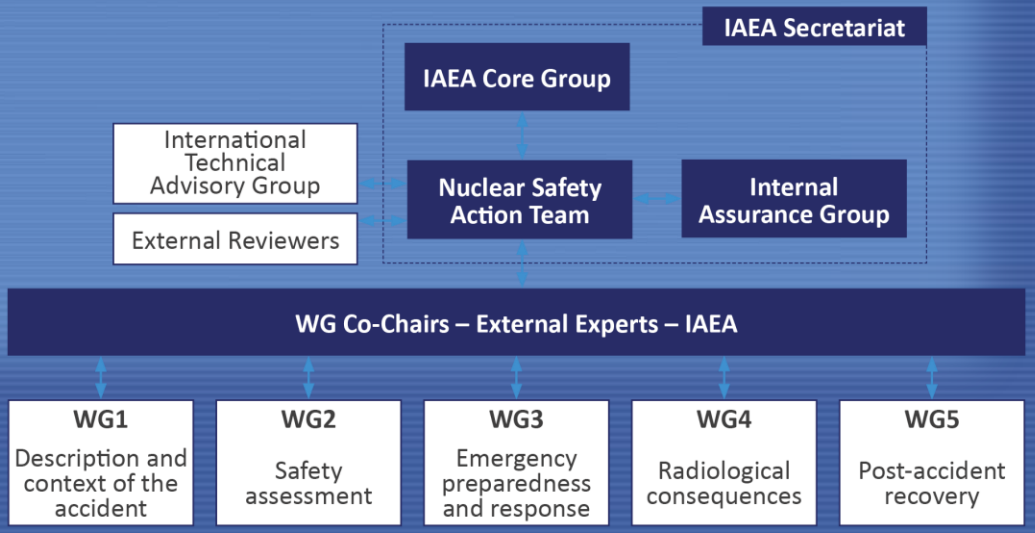
The Report on the Fukushima Daiichi Accident

- Report by the IAEA Director General:
  - Executive Summary
  - Summary Report
- Technical Volumes:
  - Description and context of the accident
  - Safety assessment
  - Emergency preparedness and response
  - Radiological consequences
  - Post-accident recovery



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Bottom line

- Without an appropriate safety infrastructure in place, it is not possible for a Member State to take full advantage of the benefits of nuclear technology. TC and NS work together to help a Member State to have such an infrastructure in place.

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Key Documents – additional information

- IAEA Annual Report: https://www.iaea.org/sites/default/files/anrep2013_full_0.pdf
- Nuclear Safety Review 2014: https://www.iaea.org/About/Policy/GC/GC58/GC58InfDocuments/English/gc58inf-3_en.pdf
- Nuclear Security Report 2014 (on GovAtom): http://www-govatom.iaea.org/DocumentDetails.asp?Language=English&Path=f:\websites\govatom\govatomdocs\govdoc\2014\gov-2014-36-gc(58)-141\gov-2014-36-gc-58-14.doc
- Measures to Strengthen International Cooperation in Nuclear, Radiation, Transport and Waste Safety 2014 (on GovAtom): http://www-govatom.iaea.org/DocumentDetails.asp?Language=English&Path=f:\websites\govatom\govatomdocs\govdoc\2014\gov-2014-40-gc(58)-19\gov-2014-40-gc-58-19.doc
- The Agency's Programme and Budget 2014-2015 GC(57)2: https://www.iaea.org/About/Policy/GC/GC57/GC57Documents/English/gc57-2_en.pdf

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Working to Protect People, Society and the Environment

Thank you

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