

# IAEA Assistance in Helping Member States Develop Effectively Independent and Robust Regulators for Nuclear Installation Safety

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**IAEA**

International Atomic Energy Agency

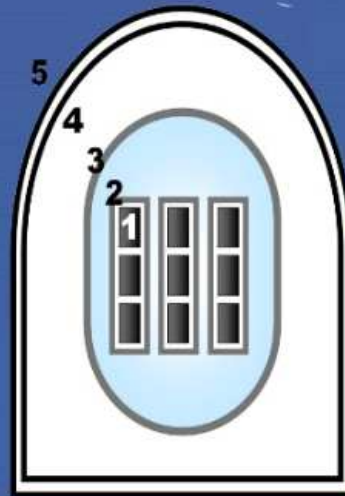
# Outline

- Regulatory Peer Reviews (IRRS) in the Context of DiD
  - DiD in an extended sense
  - Role of IRRS in DiD
  - DiD in the IRRS Process
- IAEA Safety Standards in IRRS on DiD
  - SF-1 – Safety Fundamentals
  - GSR Part 1 – Governmental, Legal and Regulatory Framework for Safety
  - SSG-16 – Establishing the Safety Infrastructure for a Nuclear Power Programme
- The IRRS Process
- Conclusions

## Defence in Depth Illustrated

PHYSICAL

- The fuel matrix
- The fuel cladding
- The boundary of the Reactor Coolant System
- The Containment System
- Mitigation of the radiological consequences of significant external releases of radioactive materials
  - Quality Assurance
  - Control systems (alarms)
  - Safety culture
  - Accident management
  - Emergency planning

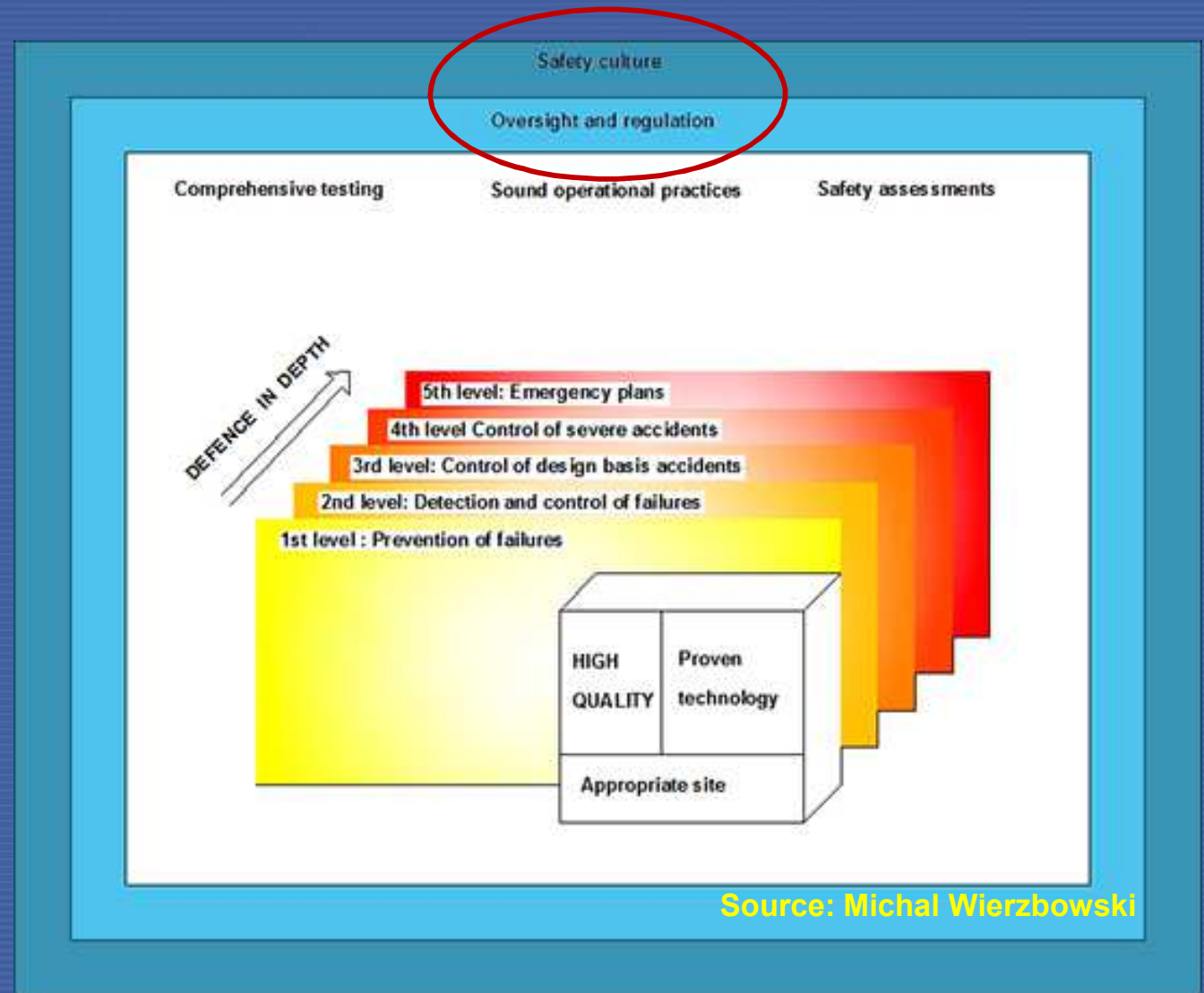


Based on INSAG-10:  
Defence in Depth in Nuclear Safety

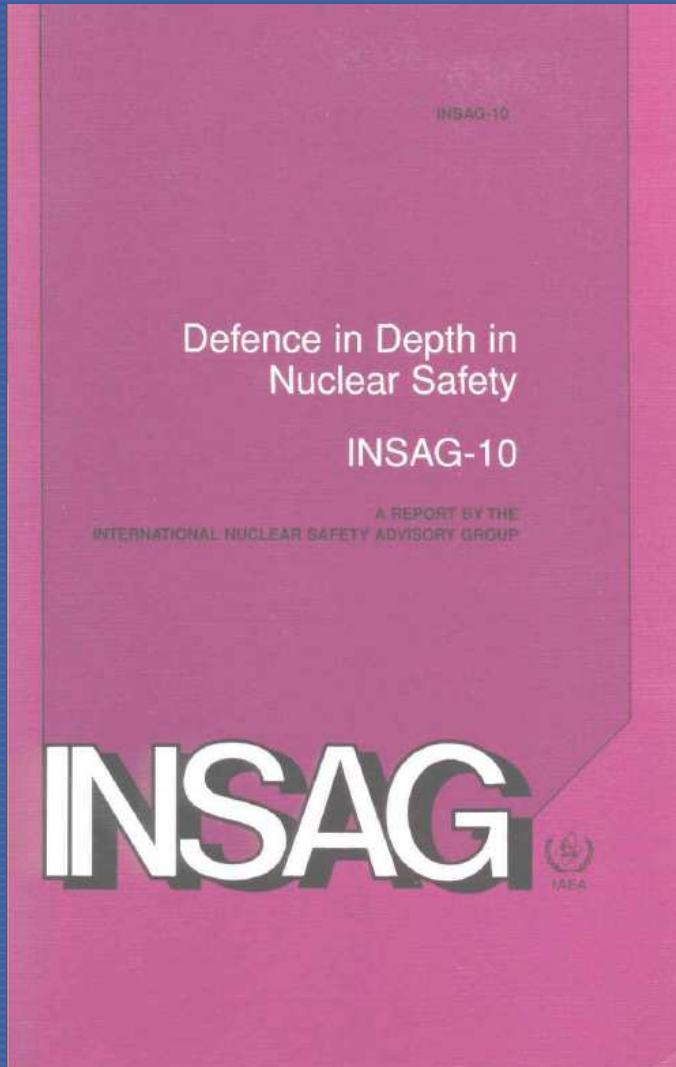
# REGULATORY PEER REVIEWS (IRRS) IN THE CONTEXT OF DiD

# DiD in an extended sense

- DiD is embedded into other components of nuclear safety
- Oversight, regulation and safety culture are determining such components
- IRRS safety review service is a tool of assisting nuclear safety regulators in contributing to DiD



# Role of IRRS in DiD



- **Para. 102:** In the context of a clear allocation of responsibilities between an operating organization and the regulatory body, the latter plays a role in implementing DiD **by setting safety objectives and by its own independent review...**
- **Para 104:** The implementation of DiD can also be improved by international co-operation. **International peer reviews ... will also contribute to this improvement ...**



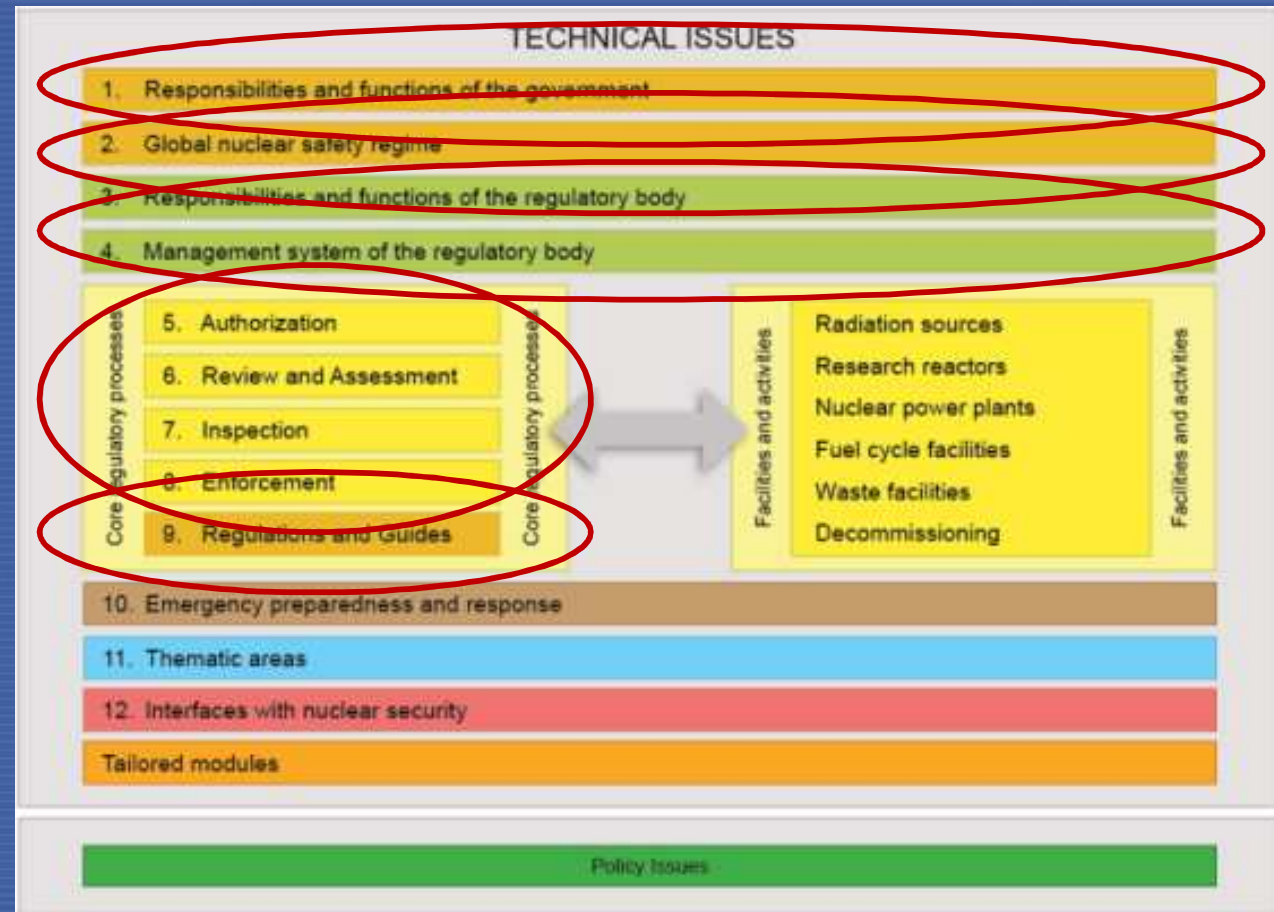
# DiD in the IRRS Process

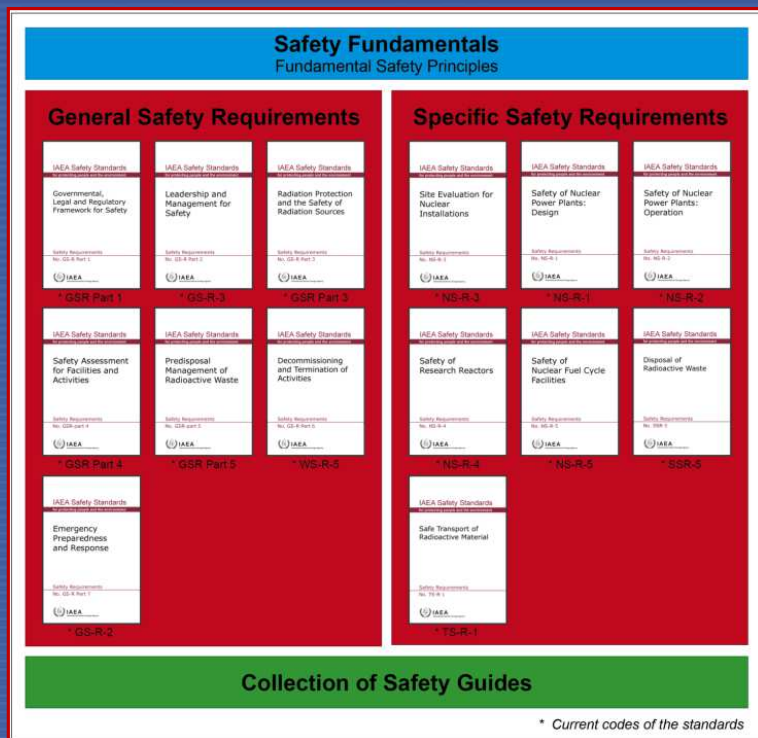
**Level 1:** legal and organizational framework of nuclear safety

**Level 2:** international assistance and co-operation

**Level 3:** Organization, responsibility and management system of the regulatory body + regulations and guides

**Level 4:** Regulatory oversight functions





# IAEA SAFETY STANDARDS IN IRRS ON DiD

# SF-1 – The Fundamental Safety Principles

## Principle 8: **Prevention of accidents**

**Para. 3.31:** The primary means of preventing and mitigation of consequences of accidents is DiD...

**Para. 3.32:** DiD is provided by an appropriate combination of:

- An effective management system with a strong management commitment to safety and a strong safety culture
- ...



IAEA Safety Standards  
for protecting people and the environment

## Fundamental Safety Principles

Jointly sponsored by



Safety Fundamentals  
No. SF-1





# GSR Part 1 – the very basis of IRRS

IAEA Safety Standards  
for protecting people and the environment

Governmental, Legal  
and Regulatory  
Framework for Safety

General Safety Requirements Part 1  
No. GSR Part 1



## In Requirements 25 and 26 on **Review and Assessment:**

**Para 4.45:** In the process of its review and assessment of the facility or activity, the regulatory body shall take into account such considerations and factors as:

...

(13) The relevance of applying the concept of DiD ...

# SSG-16 for embarking countries

## Review of safety assessment:

**Para 2.217:** ... The assessment should also demonstrate that the structures, systems and components including the barriers incorporated into the design fulfil the safety functions required from them and that adequate DiD and safety margins have been incorporated

## Design safety:

**Para 3.51:** The key design safety principles and issues that should be taken into account in the design include:

- The concept of multiple barriers and DiD ...

IAEA Safety Standards  
for protecting people and the environment

Establishing the  
Safety Infrastructure  
for a Nuclear Power  
Programme

Specific Safety Guide  
No. SSG-16

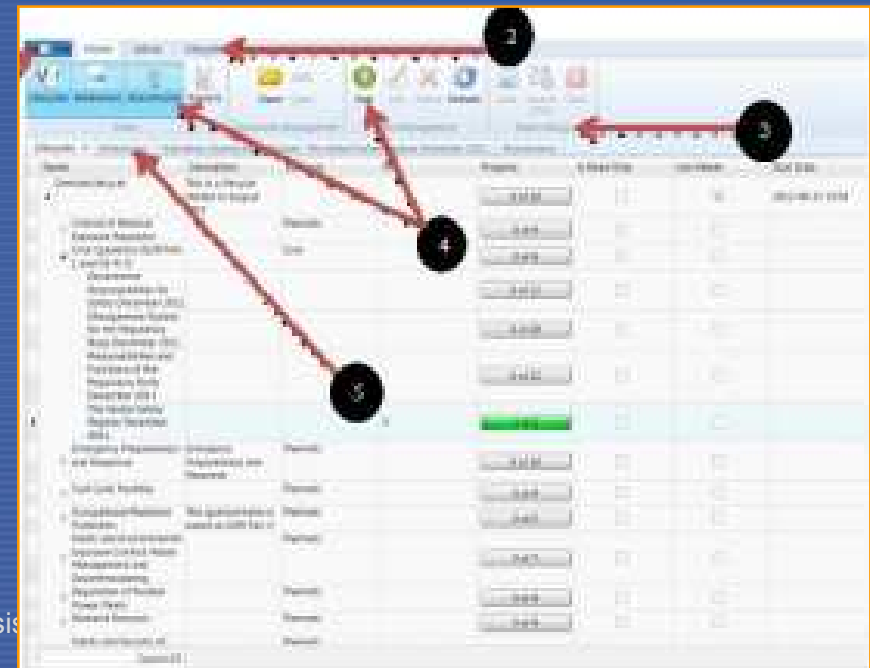




# THE IRRS PROCESS

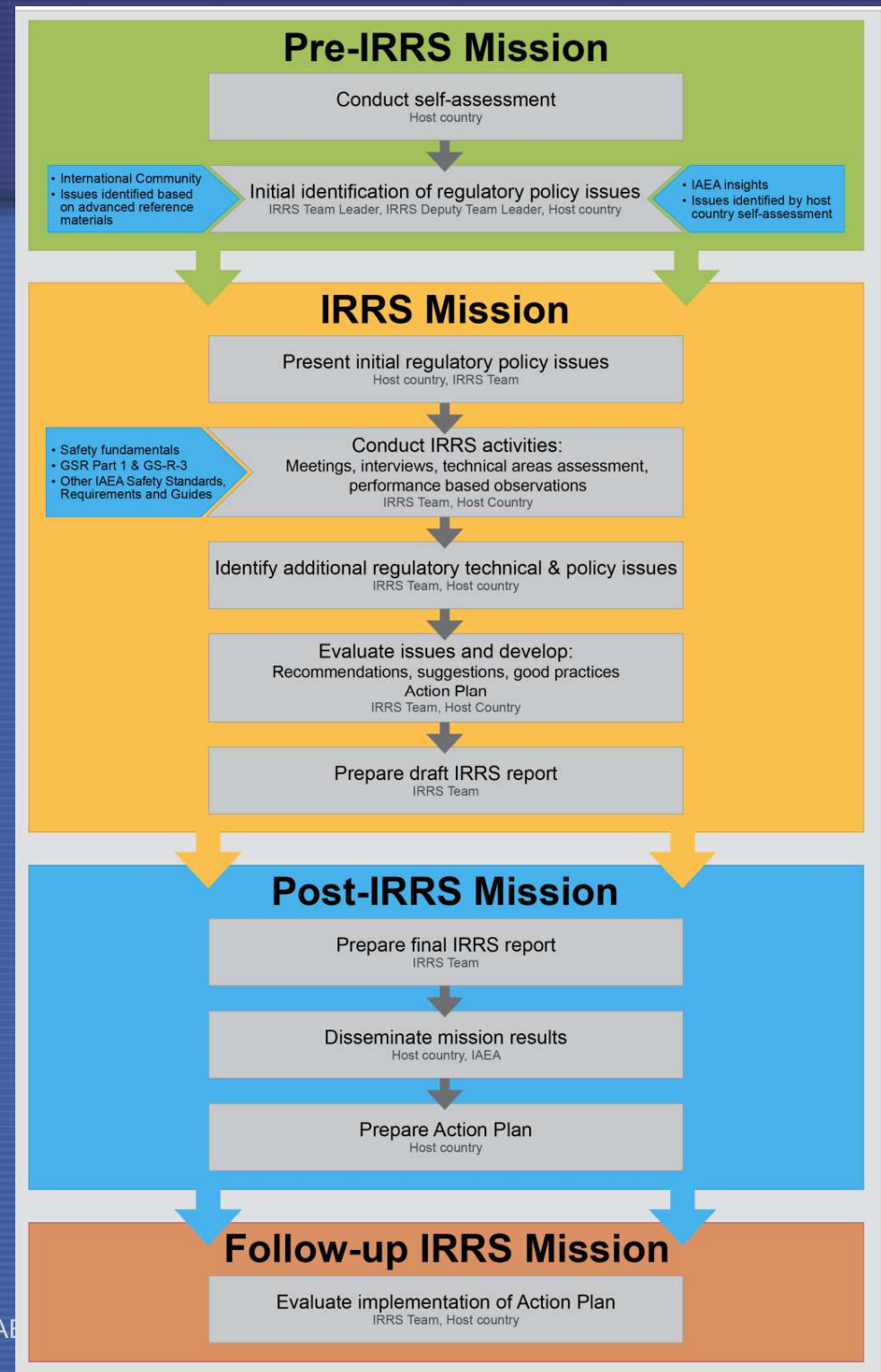
# Self-assessment

- **SARIS** - Self-Assessment of Regulatory Infrastructure for Safety (formerly SAT)
- **Methodology and tools** (software) developed to support Member States' routine and regular self-evaluation of the national infrastructure for nuclear and radiation safety
- Based on **IAEA safety standards**.
- **Available** on IAEA website



# IRRS Process

- Prep-meeting: 6-9 months before the IRRS mission
- First mission: 10 days
- Report finalization: about 3 months
- Follow-up mission: after 2-4 years, 7 days





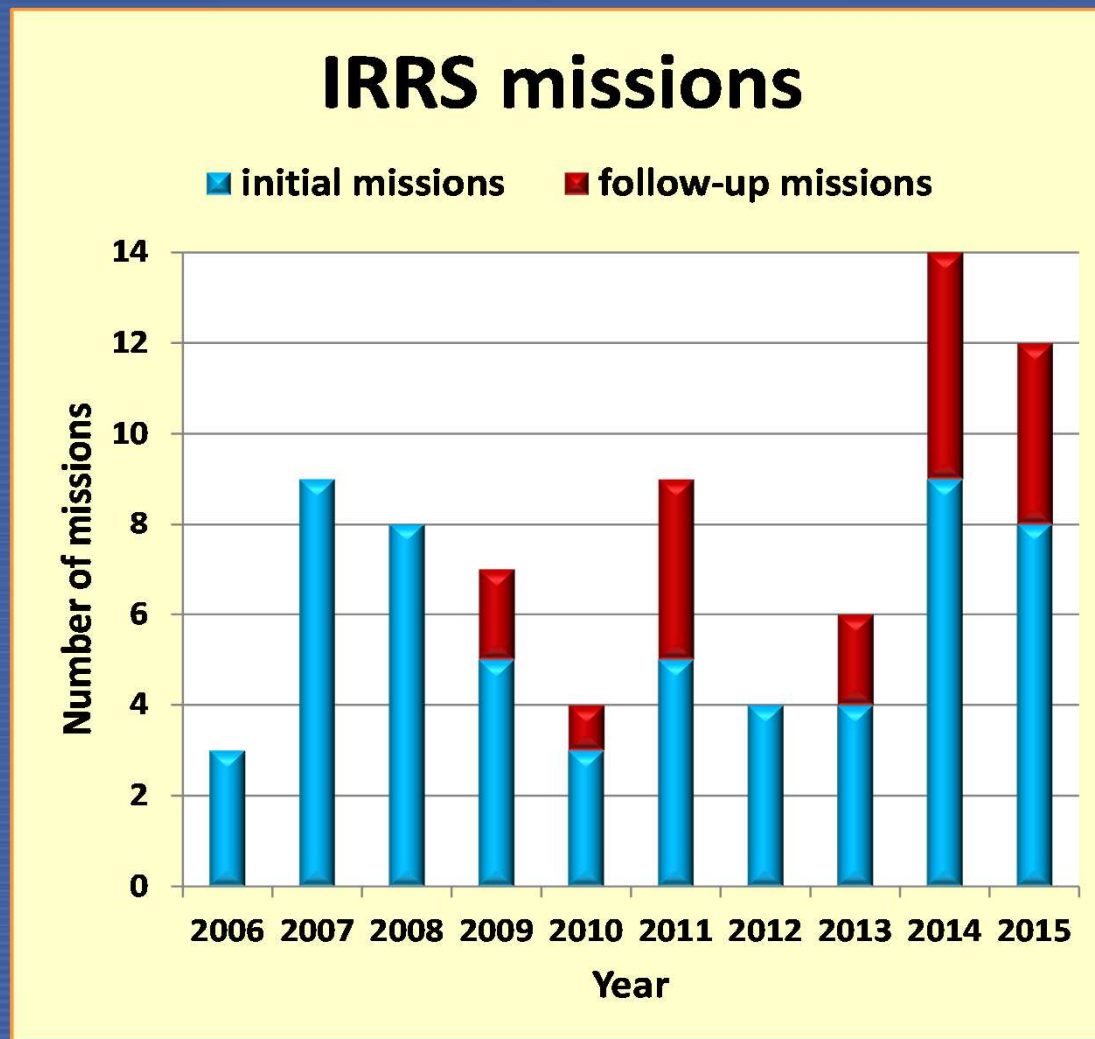
# Missions 2006-2013

	Niger				UAE		
	Mexico	Germany			Canada (f)		
	Mauritius	Ukraine	Russia		Switzerland		
	Cameroon	Sierra Leone	UK (part 2)		Australia (f)		Belgium
	Kenya	Namibia	Vietnam		Slovenia		Czech Rep.
	Uganda	Madagascar	Lebanon	Ukraine (f)	Germany (f)	Finland	Russia (f)
France	Gabon	Botswana	Canada	USA	Korea	Greece	UK (f)
UK	Australia	Spain	Peru	China	Spain (f)	Slovakia	Poland
Romania	Japan	Cote d'Ivoire	France (f)	Iran	Romania	Sweden	Bulgaria
2006	2007	2008	2009	2010	2011	2012	2013
3	9	8	7	4	9	4	6

# Missions 2006-2013: Site Overview



# Missions – past and future



# IRRS Guidelines



Integrated Regulatory Review  
Service (IRRS) Guidelines for  
the Preparation and Conduct  
of IRRS Missions

Vienna, May 2013

Services

## IRRS Targeted Consultancy Report

*No.10 - On Member State  
Preparations to Host, Conduct and  
Follow-up an IRRS Mission*

A series of consultations covers the main areas, cross-cutting issues and most of the thematic areas of the IRRS missions. Additionally, general issues on the conduct of the entire mission, on the preparation of the mission report, as well as on the preparations of the host organizations are also included into the scope of the consultations. The main objective of the series of consultations is the enhancement of the efficiency of the future IRRS missions to the all Member States.



11/11/2013

Targeted Consultancy No. 10 Report.docx

- Recently revised (slight changes)
- Published in May 2013
- A series of **Targeted Consultancies** was held for collecting experience and advice for a thorough revision





# Results of an IRRS mission

- Missions report, including observations:
  - **Recommendation**: non-compliance with IAEA Safety Standards
  - **Suggestion**: a way of further improvement
  - **Good Practice**: unique feature worth of recommending to others



# Analysis, Development, Evaluation



# Member States involvement

- Invitation of a mission by government or authorized organization (RB) by letter sent to DDG NS – recommended at any stage of the nuclear program when the RB is thought to be fully developed (once in 10 years in EU)
- Self-assessment and Advance Reference Material (including Action Plan)
- Hosting the missions – interviews with RB counterparts
- Follow-up mission in 2-4 years – review progress in issues brought up by the initial mission
- Team members invited from among MS experts (+ EU expert pool)

# Basic IRRS Training Course



- First edition: 21-24 October 2013
- 60 participants from 38 Member States
- 16 Training Modules
- 3 Information Modules
- Test Questionnaires on each Module to evaluate the effectiveness of the Training
- On a recurring basis



This activity is conducted by the IAEA, with funding by the European Union. The views expressed in this presentation do not necessarily reflect the views of the European Commission

Assistance to NS Regulators



# IRRS Homepage on RegNet platform

IAEA NUCLEAR

 **IAEA** | RegNet International Regulatory Network

Search this site...

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Integrated Regulatory Review Service (IRRS) 

Integrated Regulatory Review Service (IRRS)

What is IRRS?

IRRS Structure and Process

IRRS Basis

How to request an IRRS Mission

EC-IAEA Cooperation - IRRS in the EU

IRRS related publications and documents

List of IRRS references

IRRS History

IRRS Worldwide

IRRS related events

Frequently Asked Questions

Contact

IRRS Restricted Area

## Welcome to the IRRS Homepage



The International Atomic Energy Agency (IAEA) Integrated Regulatory Review Service (IRRS) is a peer review service designed to strengthen and enhance the effectiveness of national regulatory infrastructure for nuclear, radiation, radioactive waste and transport safety and the security of radioactive sources whilst recognizing the ultimate responsibility of each state to ensure safety in these areas. The IRRS process sets out to accomplish this expressed purpose through consideration of both technical and policy issues of a regulatory nature against IAEA safety standards and where appropriate, good practice elsewhere.

Peer exchange on technical and policy issues gives insight into the efficiency and effectiveness of the legal and governmental framework and regulatory infrastructure for safety, by focusing on issues arising from the state's self-assessment and the evaluation of technical areas and policy issues against IAEA safety standards. Through this process opportunities for improvement are explored and potential improvement strategies identified which may be shared with other states. The regulatory review process directly draws upon the wide-ranging international experience and expertise of IRRS Review Team members.

The IRRS recognizes that organizational structure and regulatory processes vary from country to country depending on national legal and administrative systems, the size and structure of the nuclear and radiation protection programme, financial resources available to the regulatory body, social customs and cultural traditions. The IRRS process allows for such variations within a single integrated review service.

### News on IRRS

Title

[IRRS Follow-up mission to UK](#)

[Publication of the new IRRS Guidelines](#)

[Technical Meeting on RegNet](#)

[CS on GNSSN and RegNet development](#)

[Technical Meeting on The Integrated Regulatory Review Service Team Leaders for sharing experience and improving the implementation of the service](#)

[ENSREG-IAEA Coordination Group Meeting](#)

### Resources

[Regulatory Infrastructure](#)

[Self-Assessment of Regulatory Infrastructure for Safety \(SARIS\)](#)

[Nuclear Installation Safety](#)

[Radiation, Transport and Waste Safety](#)

## http://gnssn.iaea.org/regnet/irrs/pages/default.aspx

During an IRRS mission, recommendations and suggestions may be offered to the host country. Recommendations are related to items of direct relevance to safety as referenced in IAEA safety requirements, while suggestions relate to items not essential to compatibility with IAEA standards, but which may enhance the effectiveness of the national nuclear and radiation safety regime and/or improve the organization or performance of the regulatory body. Good practice identified may be documented for consideration by other states.

[GSR Part 3](#)

[Safety Standard GS-R-3](#)

[More IRRS references...](#)

# IRRS on the IAEA official website



The screenshot displays the IAEA.org website with a blue header. The IAEA logo and name are on the left. Navigation tabs include 'About Us', 'Our Work', 'News Centre', 'Publications', and 'Nucleus'. A search bar is on the right. Below the header, a horizontal menu lists 'Nuclear Safety & Security', 'Nuclear Applications', 'Nuclear Energy', 'Nuclear Safety & Security' (selected), 'Safeguards', and 'Technical Cooperation'. The main content area features a sidebar on the left with a tree view for 'Nuclear Safety & Security', including 'Safety & Security Framework', 'Technical Areas', and 'Services for Member States'. The 'Integrated regulatory review services' link is highlighted. The main content area has the title 'Integrated Regulatory Review Service' in red, followed by the 'IRRS' section. It includes a photograph of a nuclear power plant and a paragraph describing the IRRS's purpose. A right sidebar contains 'Resources' (Regulatory Infrastructure, Radiation, Transport and Waste Safety, Nuclear Installation Safety, IRRS platform on RegNet, Self-Assessment of Regulatory Infrastructure for Safety (SARIS)) and 'Related documents' (Safety Standard GS-R-3, Code of Conduct). A 'Page links' section at the bottom right shows the 'IRRS process' link. A blue banner at the bottom of the page contains the URL: <http://www-ns.iaea.org/reviews/rs-reviews.asp?s=2&l=9>.

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International Atomic Energy Agency

NS IAEA

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↑ Nuclear Safety & Security

- ▶ Safety & Security Framework
- ▶ Technical Areas
- ▼ Services for Member States
  - ↑ Home page
  - Education and Training Appraisal Service (EduTA)
  - Education and Training Review Service (ETRES)
  - Emergency preparedness reviews
  - Engineering safety reviews
  - Integrated regulatory review services**

## Integrated Regulatory Review Service

### IRRS

The IAEA Integrated Regulatory Review Service (IRRS) is designed to strengthen and enhance the effectiveness of the national regulatory infrastructure of States for nuclear, radiation, radioactive waste and transport safety and security of radioactive sources whilst recognizing the ultimate responsibility of each State to ensure safety in the above areas. This expressed purpose of the IRRS is to be accomplished through consideration of both regulatory technical and policy issues,



**Resources**

- Regulatory Infrastructure
- Radiation, Transport and Waste Safety
- Nuclear Installation Safety
- IRRS platform on RegNet
- Self-Assessment of Regulatory Infrastructure for Safety (SARIS)

**Related documents**

- ↑ IRRS Guideline
- ↑ Safety Standard GS-R-3
- ↑ Code of Conduct

**Page links**

- IRRS process

Radiation safety appraisals

- RR and FCF safety reviews
- Safety assessment reviews
- Safety culture reviews
- Site & seismic safety reviews
- Transport safety appraisals
- Waste safety appraisals

any potential overlap of the topics addressed by such services (which cover wide-ranging thematic areas) the IAEA has developed the IRRS to offer an integrated approach to the review of common aspects of any state's national, legal and governmental framework and regulatory infrastructure for safety. The IRRS regulatory review process provides the opportunity for peer review of both regulatory technical and policy issues in any state regardless of the level of development of its activities and practices involving ionizing radiation or nuclear programme, and





# CONCLUSIONS

# Conclusions

IAEA promotes and supports the establishment of a global nuclear safety regulatory framework

- Effectively independent and robust regulators are the key input in this pursuit by strictly adhering to the overall safety objectives standing to the base of the IAEA safety standards
- Mature, effective and always up to date, the **Integrated Regulatory Review Service (IRRS)** is an effective mean of reviewing compliance of regulatory bodies status and activities with IAEA safety standards
- **IRRS gives assurance to both the nuclear community and the public** that nuclear and radiation safety regulators are regular subjects of an international peer review process and contributes to the application of DiD.



# THANK YOU FOR YOUR ATTENTION



Photo: Vilmos Friedrich

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**IAEA**

IAEA Assistance to NS Regulators