

**International Experts Meeting on  
Human and Organizational Factors in Nuclear Safety in the  
Light of the Accident at the Fukushima Daiichi NPP  
Vienna, 21 – 24 May 2013**

***“Update on Nuclear Safety Action Plan with respect to  
Human and Organizational Factors”***

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Special Coordinator  
Nuclear Safety Action Plan*



**IAEA**

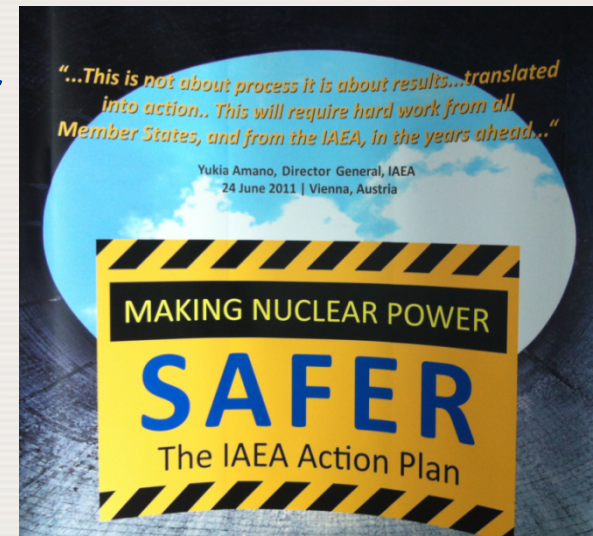
International Atomic Energy Agency

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- **Relationship with the IAEA Safety Standards SF, GSR Part 1, GS-R-3**
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# NSAP - Background

- IAEA Ministerial Conference on Nuclear Safety - June 2011
- IAEA Action Plan on Nuclear Safety
  - Approved by the Board of Governors September 2011
  - Unanimously adopted by Member States September 2011



## 12 Point Plan

Adopted by Board of Governors

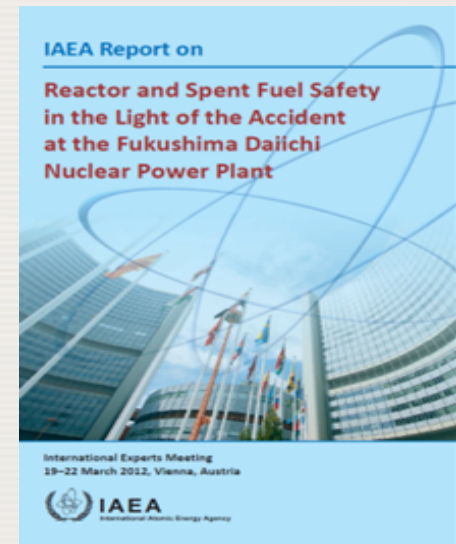
Endorsed by All Member States

**Actions on** IAEA Secretariat  
Member States

Other Relevant Stakeholders

# International Experts Meetings (IEMs)

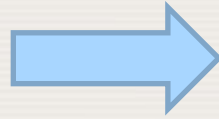
- Reactor + Spent Fuel Safety - March 2012
- Enhancing Transparency + Communication Effectiveness –June 2012
- Protection against Extreme Earthquakes + Tsunamis - Sept 2012
- Decommissioning and Remediation after a Nuclear Accident -Jan 2012
- **Human and Organization Factors in Nuclear Safety - this week**
- **Radiation Protection after the Fukushima – Jan 2014**
- **Severe Accident Management – March 2014**



# Nuclear Safety Action Plan

## 12 ACTIONS

*Human and  
Organizational  
Factors*



**Assessment of Safety Vulnerabilities**

**Strengthening Peer Reviews**

**Emergency Preparedness and  
Response**

**National Regulatory Bodies**

**Operating Organisations**

**IAEA Safety Standards**

**International Legal Framework**

**Embarking Countries**

**Capacity Building**

**Communication**

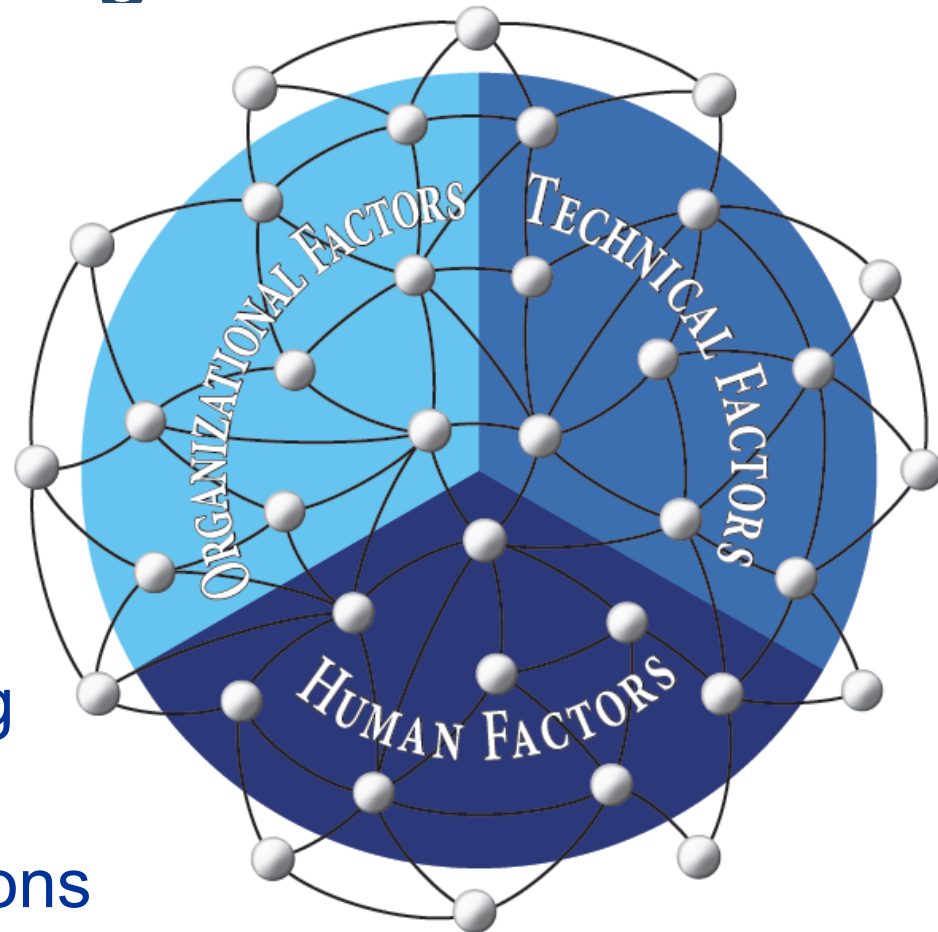
**Protection of People + Environment**

**Research + Development**

# Human and Organizational Factors

- The contributing **technical factors** in the Fukushima accidents are being identified, reviewed and initial countermeasures are taken on international and national levels.
- However, similar efforts are needed **to identify lessons learned on Human and Organizational factors** in the light of the Fukushima Accident in a integrated manner and systemic approach.
- Human and organizational factors including safety culture are **crosscutting issues** involved in the Fukushima Daiichi accident influencing the consideration of external events, design, severe accident management, including operator training, the functioning of national organizations and emergency preparedness and response

# Systemic Approach – The Interaction between Individuals, Technology and Organization

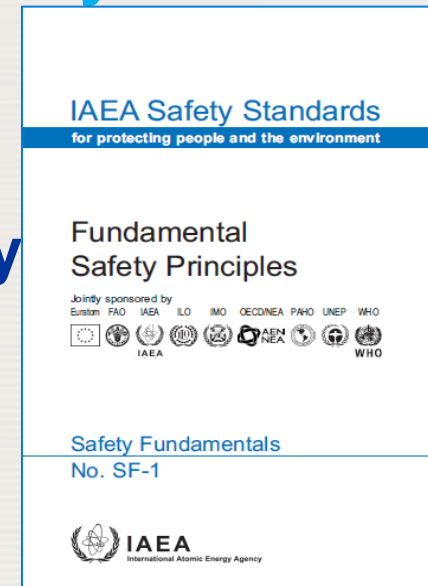


- Competences
- Decision making process
- human interactions
- Communication

# Fundamental Safety Principles SF-1

## Principle 3: Leadership and management for safety

### The Interaction between individuals, technology and the organization - ITO



3.14. *“An important factor in a management system is the recognition of the entire range of **interactions** of **individuals** at all levels with **technology** and with **organizations**. To prevent human and organizational failures, human factors have to be taken into account and good performance and good practices have to be supported.”*



# Fundamental Safety Principles SF-1

## Global Safety Culture

3.13. “A **safety culture** that governs the attitudes and behaviour in relation to safety of **all organizations and individuals concerned** must be integrated in the management system.

*Safety culture includes:*

- Individual and collective commitment to safety on the part of the leadership, the management and personnel at all levels;
- Accountability of organizations and of individuals at all levels for safety;
- Measures to encourage a questioning and learning attitude and to discourage complacency with regard to safety.”

# IAEA SS: GSR Part1

## Requirement 1: National policy and strategy for safety

- *The promotion of leadership and management for safety, including **safety culture***

## Requirement 19: The management system of the regulatory body

- *The third purpose is to foster and support a **safety culture** in the regulatory body through the development and reinforcement of leadership, as well as good attitudes and behaviour in relation to safety on the part of individuals and teams.*

## Requirement 29: Graded approach to inspections of facilities and activities

- In conducting inspections, the regulatory body shall consider a number of aspects, including:- **Safety Culture and Management Systems**



IAEA Safety Standards  
for protecting people and the environment

Governmental, Legal  
and Regulatory  
Framework for Safety

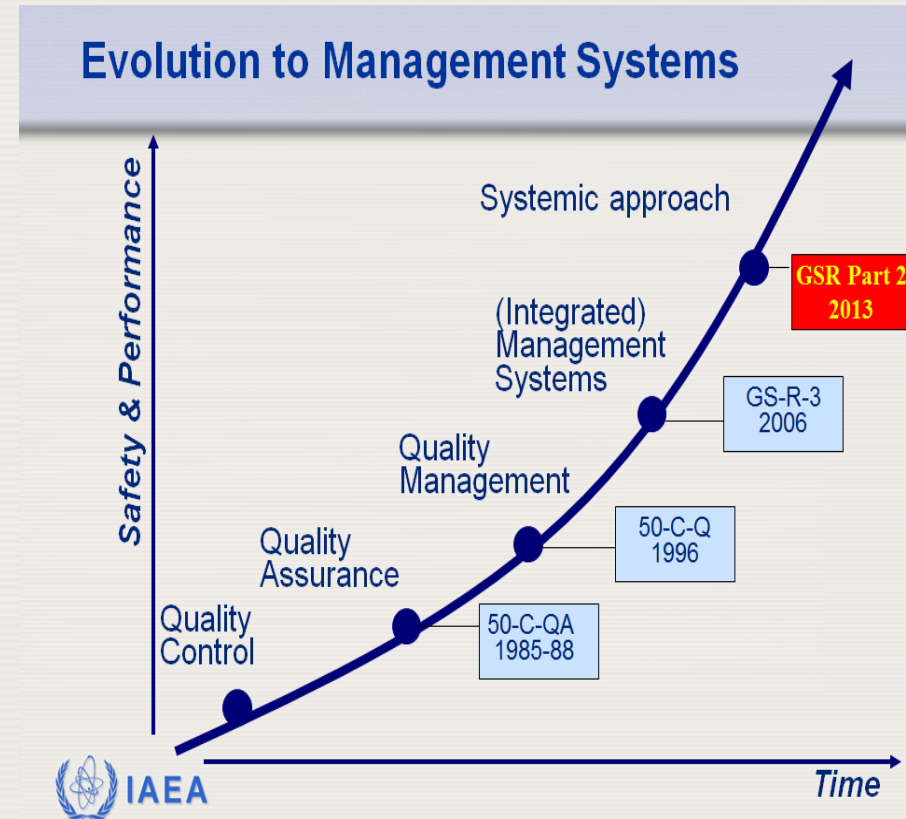
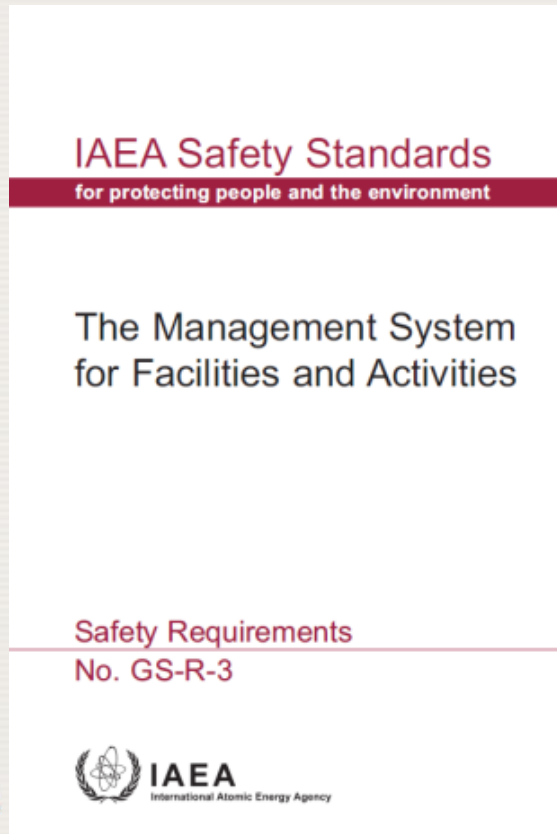
General Safety Requirements Part 1  
No. GSR Part 1



# IAEA SS: THE MANAGEMENT SYSTEM FOR FACILITIES AND ACTIVITIES – GS-R-3

- To improve the safety performance of the organization through the planning, control and supervision of safety related activities
- To foster and support a strong safety culture through good safety attitudes and behaviour in individuals and teams

## GS-R-3



# Convention on Nuclear Safety

## “ARTICLE 12 HUMAN FACTORS”

Each Contracting Party shall take the appropriate steps to ensure that the capabilities and limitations of human performance are taken into account throughout the life of a nuclear installation. “

The Summary Report from the **Second Extraordinary Meeting**, August 2012 Particular attention should be given to these in preparation of National Reports for the next Review Meeting.”

## **Working Group on Effectiveness and Transparency - Area #9: Safety Culture.**

“What is not working within the framework of CNS:

- Concept not well understood in the technical community
- Some reluctance to deal with the topic of safety culture
- Special expertise is needed (behavior scientists)
- Sometimes hidden under safety management
- Guidance on how to and what to report is not clear
- Too little time is devoted to safety culture discussions in RMs

# IAEA Peer Reviews: IRRS Missions

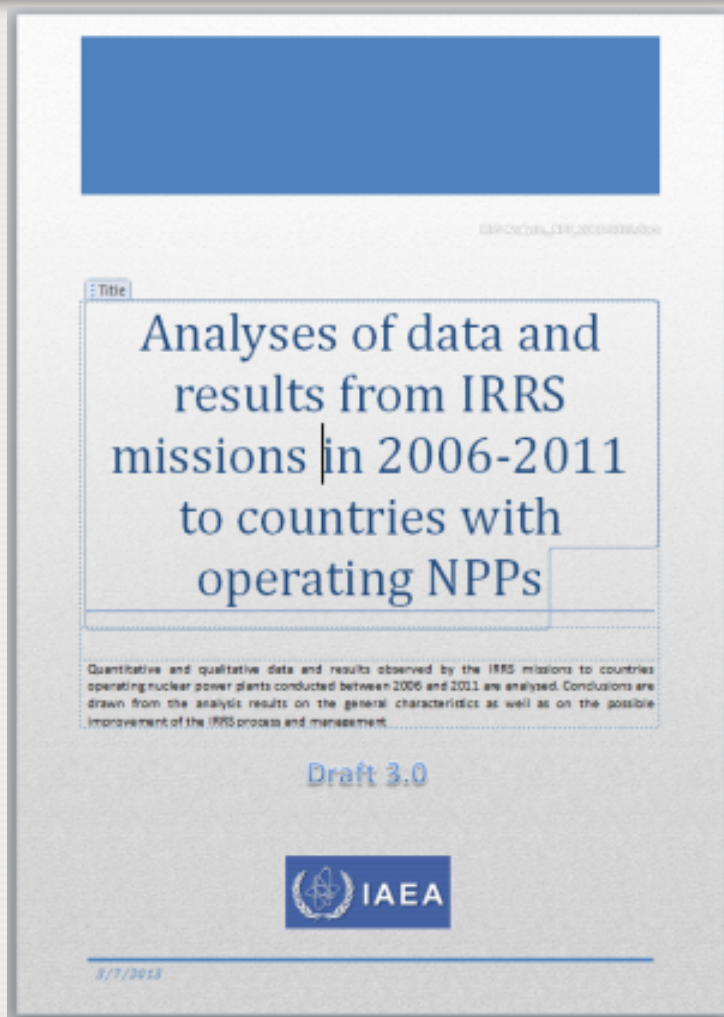
- Integrated Regulatory Review Service (IRRS) is a peer review of the host country's nuclear and radiation safety regulatory framework against the IAEA Safety Standards
- Modular review by international experts (15-20)
- Mission report with Recommendations, Suggestions, Good Practices (findings)



# IRRS Missions held 2006-2013

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

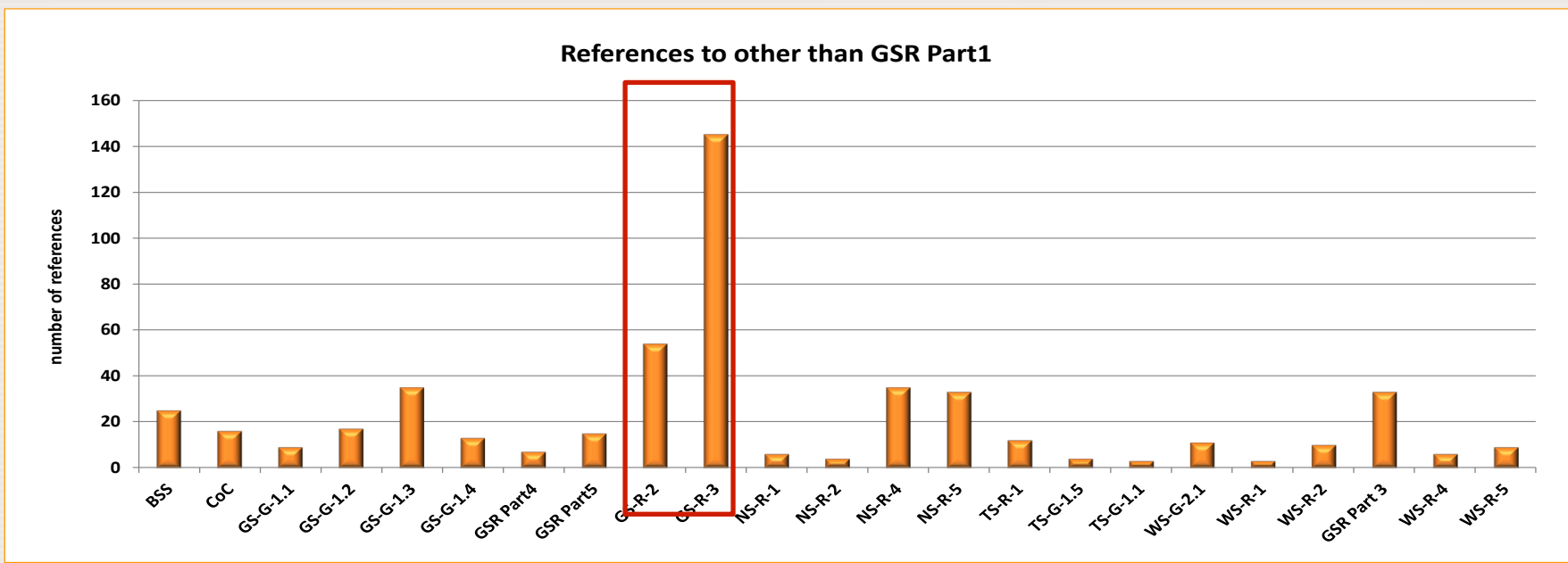
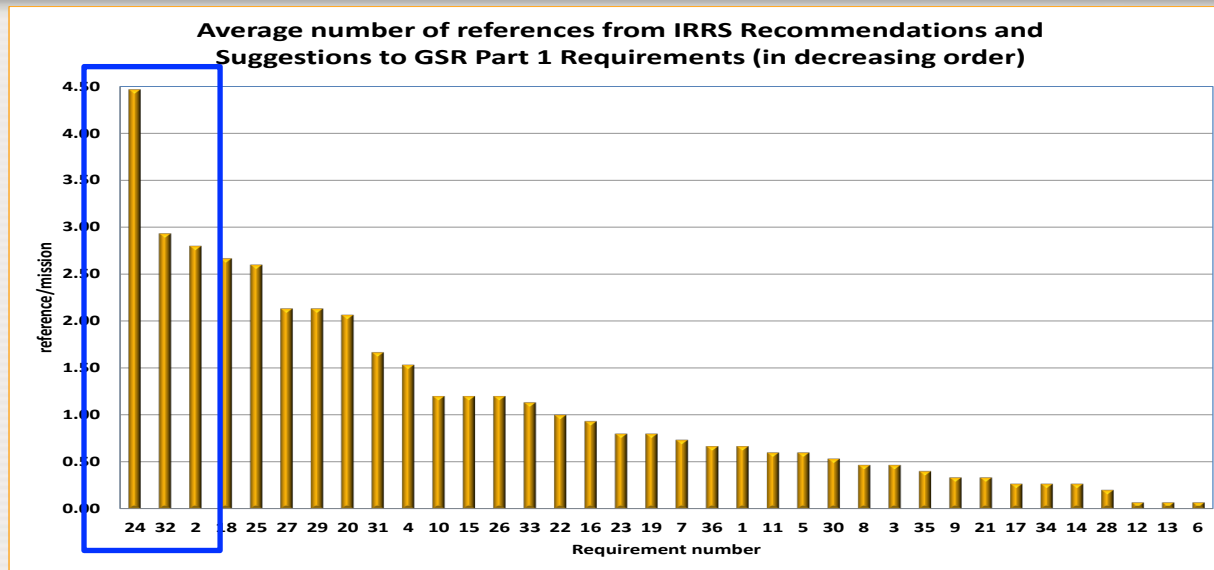
# Analysis of IRRS Missions



## Action items from NSAP

1. **Analyse** past IRRS mission results (in 2.4)
2. Strengthen IRRS by incorporating **lessons learned** (in 2.1)
3. Seek potential **improvement** of the IRRS process (in 2.4)
4. Assess and enhance **effectiveness** of IRRS (in 2.4)
5. Develop **criteria** for the improvement to the **effectiveness and efficiency** of IRRS process (in 2.4)
6. Strengthen **transparency** of IRRS (in 2.1)
7. **Enhance** the IRRS for peer review of regulatory effectiveness (in 4.2)
8. Encourage MS's to voluntarily and regularly **host** IRRS (in 4.3)

# Analysis results – references to IAEA safety requirements (example)

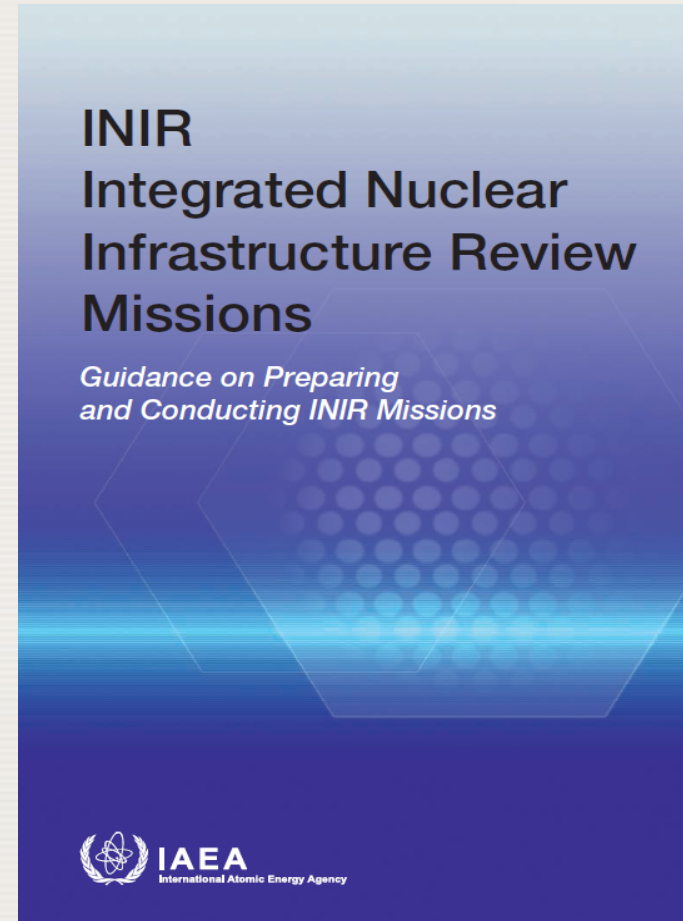




# IAEA Peer Reviews: INIR

Includes several topic on Human and Organizational factors:

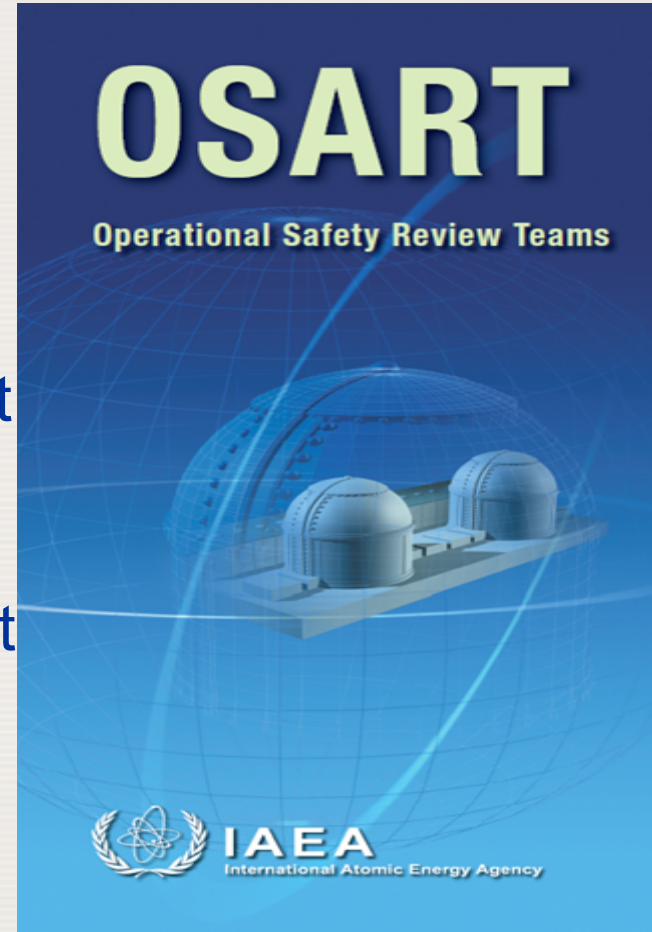
- Crosscutting issues
- Management
- Human Resources Development including Capacity Building and E&T
- Interactions among organizations



# IAEA Peer Reviews: OSART

## Includes a Methodology on Safety Culture Assessment:

- based on behaviour science and experiences in assessing safety culture
- Methodology is used for self-assessment and independent assessment
- Five methods to capture data – document review, observations, interviews, focus groups, survey



# Activities *Leadership and Management for Safety*

- Safety Standards
  - Revision of the GS-R-3/GSR Part2 - reinforced requirements on leadership, safety culture improvements
- Documents and Technical Meetings:
  - New Safety Report on Safety Culture in Pre-Operational Phases of Nuclear Power Plant Projects – Published in September 2012
  - New TECDOC on Regulatory Oversight of SC in Nuclear Installations – Published in May 2013
  - Leadership, Human Performance and Internal Communication in Nuclear Accidents (draft to be issue 2013)
  - Management of Organizational Change in Nuclear Organizations(draft to be issue 2013)
  - Two more Safety Reports to be published shortly – How to perform safety culture self-assessment & How to continuously improve safety culture

# Activities *Leadership and Management for Safety*

- Training Workshops for 2013:
  - Leadership and Safety Culture for Senior Managers, Vienna 10-13 September
  - IAEA's Safety Culture Assessment Methodology, Vienna 18-22 November
  - Global Safety Culture – National Cultural Impact on Safety Culture, Vienna 3-6 December
- On-Going Training and Support Missions:
  - Training and support on safety culture self-assessment for licensees, Belgium
  - Training and support on safety culture self-assessment for regulatory bodies, Pakistan
- IAEA Safety Culture Perception Survey:
  - Safety culture perception questionnaire

# Activities *Capacity Building & Cooperation*

## *Methodology for Self-assessment of Capacity Building in Member States*

- Methodology available in the NSAP web-site
- Pilot assessments

## *Safety Culture and Management Systems*

- Technical Meeting on 'Safety Culture during Pre-Operational Phases – Practical Working Methods to Increase Safety'. South Africa.
- Joint IAEA-Foratom workshops on Management Systems (12th meeting 20-22 November 2013)

# Activities *Managing the unexpected – ITO*

## Technical Meeting on Managing the Unexpected from the perspective of ITO, June 2012 Vienna

- Building a shared platform of knowledge
- Facts and Lessons learned from the Fukushima Nuclear Accident and other severe accidents
- Practical Application of; Managing the unexpected, Safety Culture and ITO
- Development of a methodology to perform ITO analysis
- All presentations filmed and available on IAEA website <http://gnssn.iaea.org/NSNI/EaT/TM/Pages/MtU.aspx>

# Activities: *E&T and E-learning Project*

- Strategic Approach to E & T in Nuclear Safety 2013–2020 March 2013
- Safety Report “Managing the Competence of the Regulatory Body, 2013
- Training Packages for Safety Infrastructure (SS-G-16)  
<http://www-ns.iaea.org/tech-areas/safety-infrastructure/>
- E-learning modules for newcomers to nuclear power, based on the IAEA ‘Milestones’ Approach and Framework .
- Modules for the 1<sup>st</sup> phase of the project  
<http://www.iaea.org/NuclearPower/Infrastructure/elearning/index.html>

e.g: Implementing a Nuclear Power Programme

- Developing a Human Resource Strategy
- Stakeholder Involvement
- Management of a New NP Programme
- Construction Management



# THE IAEA COMPREHENSIVE FUKUSHIMA REPORT

IAEA will play the leading role in producing a comprehensive report based on the understanding of the facts and Agency's assessment of the accident.

The report will consist of:

- An **executive summary**
- A **scientific/technical** report

- **Working Groups (WGs):**
- **International Technical Advisory Group (ITAG)**
- **IAEA Internal Core Group**



International Atomic Energy Agency



NSAT  
Nuclear Safety Action Team

Welcome to Nuclear Safety Action Plan Platform

**MAKING NUCLEAR POWER SAFER**  
The IAEA Action Plan

**NSAT**  
Nuclear Safety Action Team

**Accommodations**  
[Small text describing the platform's purpose and contact information]



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- Safety assessment – WG2
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- Lessons learned
- Conclusions

***HUMAN AND ORGANIZATIONAL FACTORS***

**CROSS-CUTTING ISSUE**



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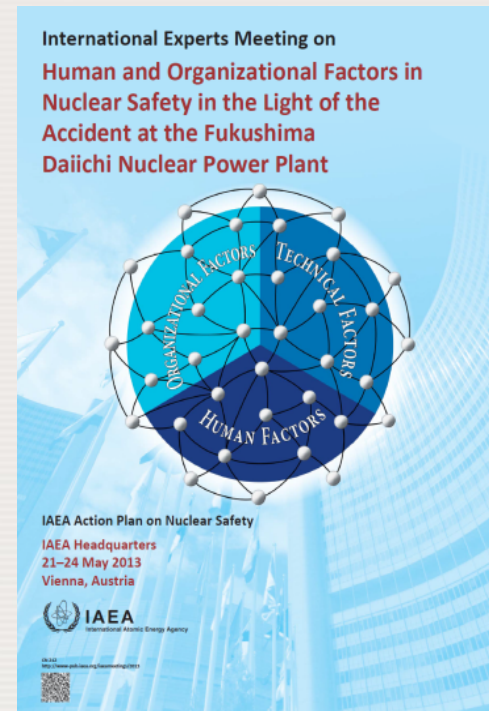


Fukushima Comprehensive Report

# Activities *International Expert Meeting 5*

## IEM5 Objectives

- Gathering and share knowledge and experience gained in the light of the Fukushima Daiichi nuclear accident concerning human and organizational aspects — in particular, the interactions between individuals, technology and organizations and their influence on nuclear safety — as well as to identify lessons learned and best practices.



# CONCLUSION

It is expected that this IEM will identify for IAEA and MS, the necessary concrete actions and next steps to be carried out in the framework of Human and Organizational Factors to introduce tangible safety improvements.

# Thank you

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