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IAEA Approach to Safety Culture and Assessments

Regional Workshop on the development and implementation of effective IMS based on GSR Part 2

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Regulatory Activities Section
Division of Nuclear Installation Safety (NSNI)
International Atomic Energy Agency (IAEA)
Department of Nuclear Safety & Security

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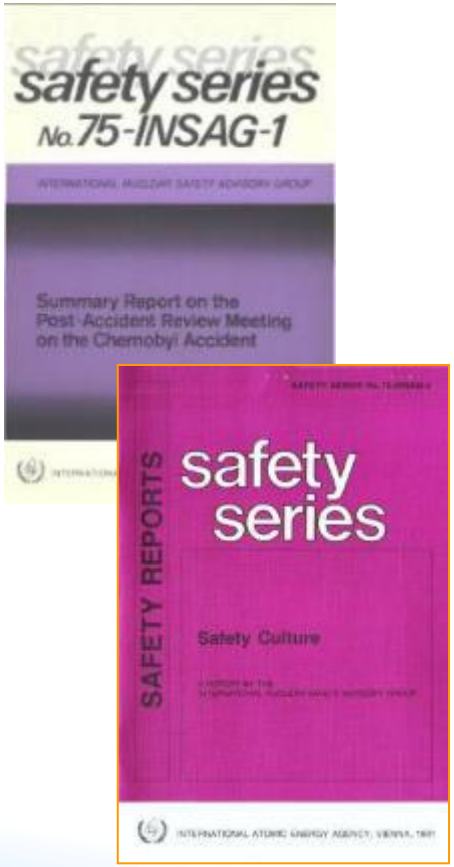
IAEA Approach to Safety Culture and Assessments

Outline

- Evolution of Safety Culture
- Leadership, Management and Culture for Safety in IAEA Safety Documents
  - Safety Standards and TECDOCs
  - IAEA Reports
  - Key Messages
- Leadership, Management and Culture for Safety in IAEA Peer Review Services
  - Goal and Objectives
  - IRRS Observations
  - OSART Observations
  - Specific Safety Culture Services
- Future Development
- Conclusions

EVOLUTION OF SAFETY CULTURE

Introduction of the notion of Safety Culture



INSAG-1 (1986)

- *" … formal procedures must be properly reviewed and approved and must be supplemented by the creation and maintenance of a 'nuclear safety culture' "*

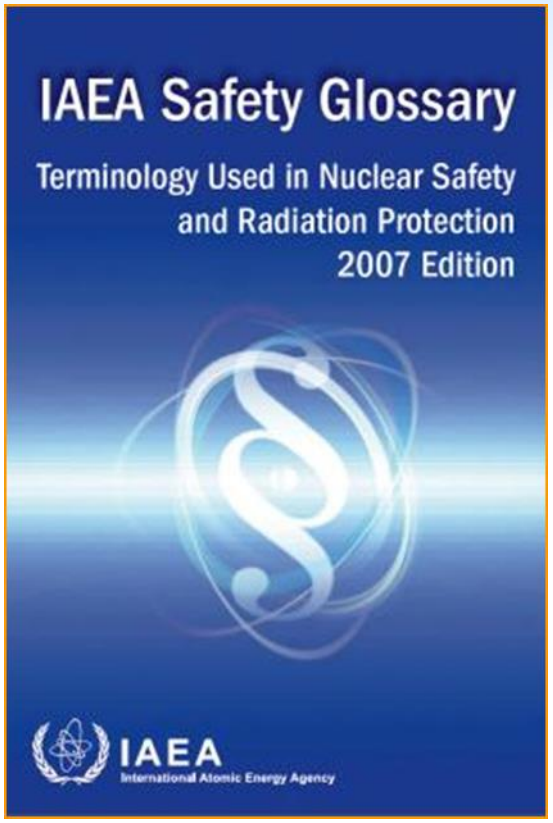
INSAG-4 (1991)

- *"Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance".*

Definition used in Nuclear Safety

The IAEA defines Safety Culture as:

"that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance".



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LEADERSHIP, MANAGEMENT AND SAFETY CULTURE IN IAEA SAFETY DOCUMENTS

Hierarchy of related IAEA Safety Standards

Requirements to be applied to meet the principles (shall)

Recommended ways of meeting the requirements (should)

IAEA Standards and Documents on Safety Culture

- **GSR Part 2:** *Leadership and Management for Safety* – which replaced GS-R-3
- **Safety Reports**
- **TECDOCs**

- Under development:
  - Safety Culture in the Regulatory Body
  - Guidelines on Safety Culture Self-Assessment for the Operators and Regulatory Body

IAEA Reports

International Experts Meetings IEM 5 and IEM 8

Safety Culture related conclusions:

- The establishment of an enduring safety culture remains essential.
- The accident highlighted the weakness in addressing human and organisational factors.
- The high level commitment of Member States to peer reviews … has to be maintained and enhanced.
- Regulatory Bodies should foster an environment that encourages licensees to invest in improvements beyond national requirements

Executive Summary of Fukushima Report*

- In order to ensure effective regulatory oversight of the safety of nuclear installations, it is essential that the regulatory body is independent and possesses legal authority, technical competence and a strong safety culture
- In order to promote and strengthen safety culture, individuals and organizations need to continuously challenge or re-examine the prevailing assumptions about nuclear safety and the implications of decisions and actions that could affect nuclear safety
- A systemic approach to safety needs to consider the interactions between human, organizational and technical factors. This approach needs to be taken through the entire life cycle of nuclear installations

* The Fukushima Daiichi Accident, *Report by the Director General*, GOV/2015/26

Key Messages

Safety culture is a subset of the culture of the whole organization, comprising the mix of shared values, attitudes and patterns of behaviours

Strong Leadership and Management for safety are essential for the development and for sustaining Safety Culture to achieve safe operation.

Organizations typically go through a number of phases in developing and strengthening safety culture.

- First, safety is compliance driven and is based mainly on rules and regulations (compliance with externally imposed rules) through management and supervision.
- Next, good safety performance becomes an organizational goal and is dealt with primarily in terms of safety targets or goals and leadership commitment.
- Lastly, safety is seen as a continuing process of improvement to which everyone can contribute

The systemic approach to safety addresses the whole system by considering the dynamic interactions within and among all relevant factors (human, technical and organizational)

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SAFETY CULTURE IN IAEA PEER REVIEW SERVICES

NSNI Safety Review Services

Peer Review Services

- Integrated Regulatory Review Service (IRRS)
- Site and External Events Design (SEED)
- Operational Safety Review Service (OSART)
- Integrated Safety Assessment of Research Reactor (INSARR)
- Safety Evaluation during Operation of fuel Cycle facilities (SEDO)
- Safety Aspects of Long Term Operation (SALTO)

NSNI Safety Review Services

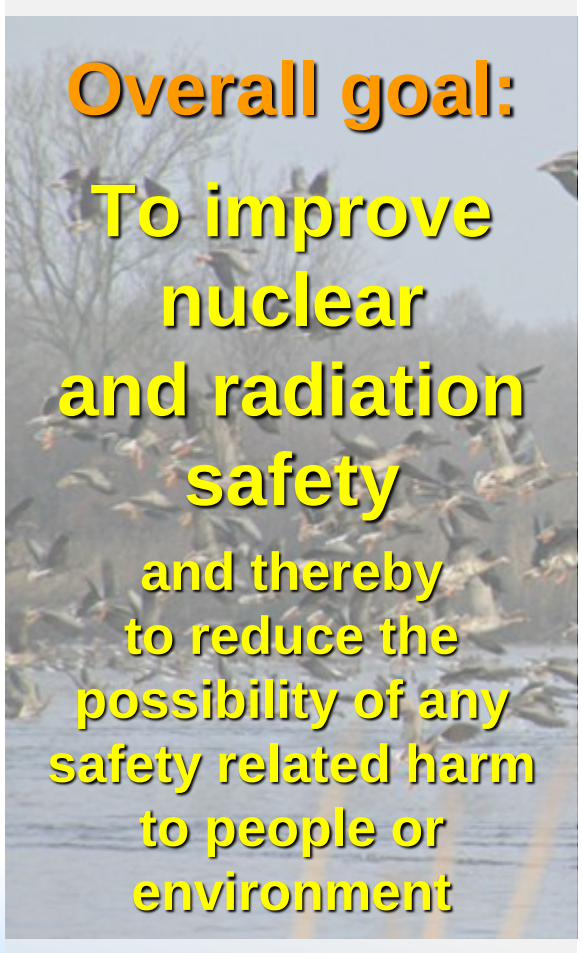
Technical Safety Review (TSR) Services

- Design Safety (DS)
- Generic Reactor Safety (GRS)
- Safety Requirements (SR)
- Probabilistic Safety Assessment (PSA)
- Accident Management (AM)
- Periodic Safety Review (PSR)

Advisory Service

- Safety Assessment Advisory Programme (SAAP)

Goal and objectives of IAEA Peer Review Services



Main objectives

- Providing the host country with:
  - objective evaluation of its improvement activities through peer review and scientific missions with respect to IAEA Safety Standards and guides
  - training and development of capability self-assessment and improving leadership, management and culture for safety
  - independent safety culture assessment service
- Promoting the sharing of experience and exchange of lessons learned among Member States

Integrated Regulatory Review Service

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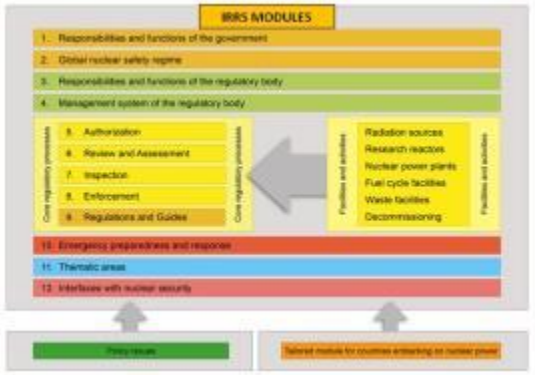
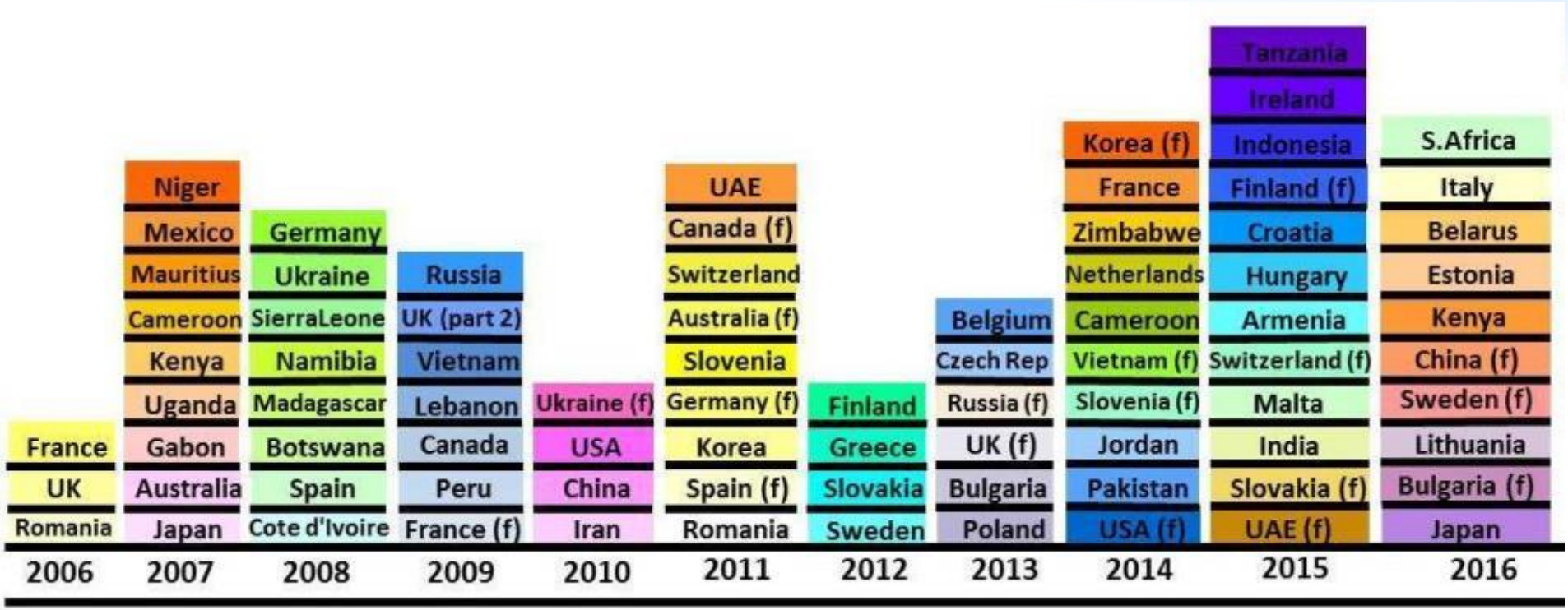
Main Facts (cont.)



Areas of work

- Responsibilities and functions of the government
- Global nuclear safety regime
- Responsibilities of the regulatory body
- Management system of the regulatory body
- Authorization
- Review and assessment
- Inspection
- Enforcement
- Development of regulations and guides
- Emergency preparedness and response (regulatory aspects)
- Additional Areas
- Interfaces with Nuclear Security
- Tailored module for countries embarking on nuclear power

Integrated Regulatory Review Service (2)



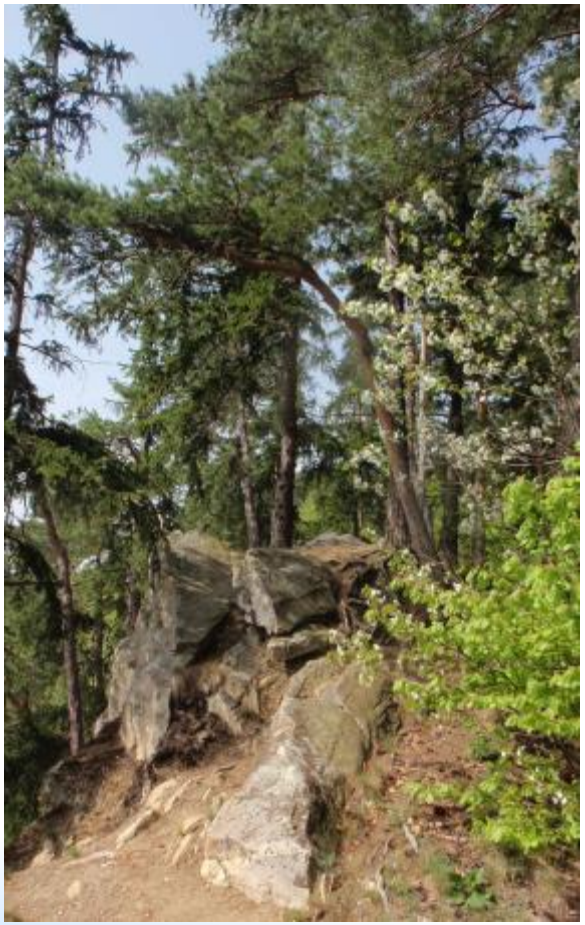
IRRS observations related to Safety Culture

Safety Culture is reviewed in context of management system with emphasis on leadership

- 27 findings (Recommendation or Suggestion)
  - 19 related to Safety Culture of the Regulatory
  - 8 related to the oversight of the licensees' Safety Culture
- 9 Good Practices
  - 5 related to the Regulatory Body
  - 4 related to the licensees

NOTE: The observations were compiled from 72 missions (2006-2015) to 18 nuclear countries and to 2 non-nuclear countries

Examples of observations



Findings

- The Regulatory Body management system should address, promote and support a strong Safety Culture
- The Regulatory Body should develop and implement Safety Culture policy

Good Practices

- Management promotes Safety Culture by positive incentives
- Implementation of Open Door Policy, Non-Concurrence Process, Differing Professional Opinions
- Safety Culture training sessions

Operational Safety Review Service (OSART)

Areas of work

- Leadership and management for safety (LM)
- Training and qualification (TQ)
- Operations (OPS)
- Maintenance (MA)
- Technical support (TS)
- Operating experience feedback (OE)
- Radiation protection (RP)
- Chemistry (CH)
- Emergency preparedness and response (EPR)
- Accident management (AM)
- Human-technology-organization interaction (HTO)
- Long term operation (LTO)
- Commissioning (COM)
- Transitional period from operation to decommissioning (TRAD)
- Use of PSA for plant operational safety improvements (PPSA)

Operational Safety Review Service

Key Figures

OSART Missions 1983-2015

OSART missions to operational plants	164
OSART missions to plants under construction/commissioning	22
OSART mission to corporation	2
Total Missions	**188**

- Missions conducted to 107 sites in 34 countries

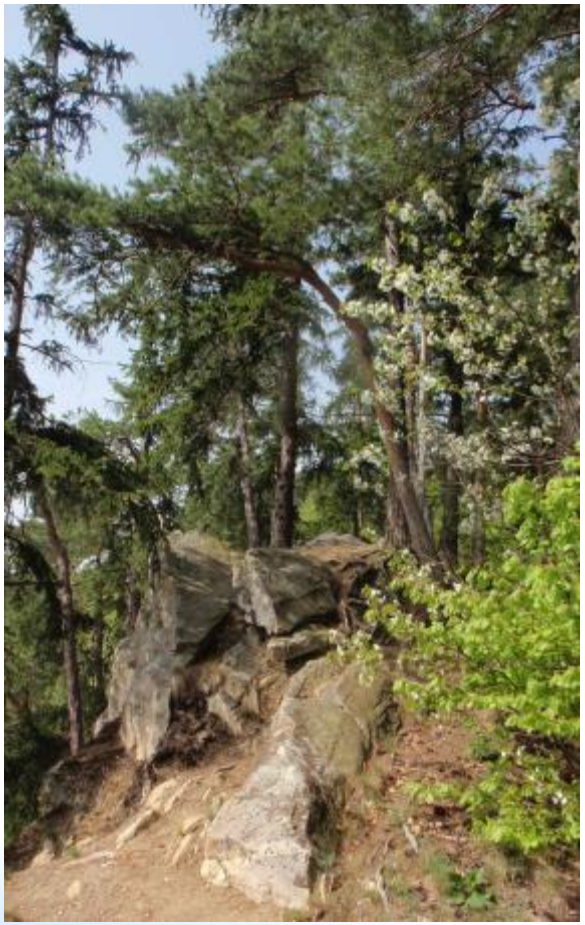
OSART observations related to Safety Culture

Safety Culture is reviewed in context of leadership and management for safety

- 62 findings Recommendation and Suggestion
- 139 Good Practices (9 directly related to Safety Culture)

NOTE: The observations were compiled from 28 missions (2011-2015) to 20 nuclear countries

Examples of observations



Findings

- Management and leadership of standards and expectations in both nuclear and industrial safety should be strengthened
- An integrated management system needed to be Implemented
- Good Assessment practices for safety performance needed to be developed to inform improvement programmes.

Good Practices

- Planning and implementing resource management programmes- including staff competence and development.
- Communication practices

Specific Safety Culture Services

Regulatory Body

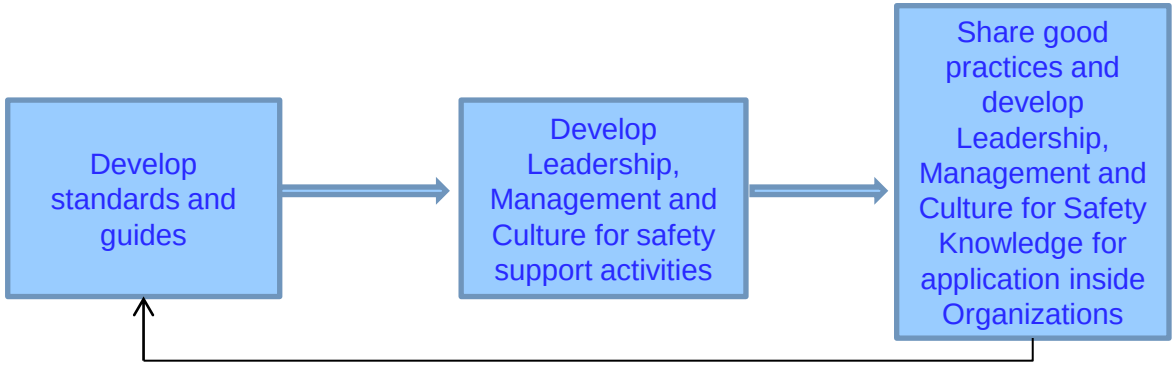
- Safety Culture specific questionnaires (under development)
- Safety Culture Self-Assessment guidelines in progress

Operating Organization

- The Programme to develop an Organization's capability for self assessment and continuous improvement
- Senior management leadership workshops
- Independent safety culture assessment and follow up missions

Future Developments

- Development of guides in support of GSR part 2
- Safety Culture services for the Regulatory Body
- Leadership for safety services for the Operating Organization
- Harmonization of Safety Culture frameworks for nuclear installations
- Safety Culture for facilities with radiation hazards
- Interfaces between Safety and Security Culture



Conclusions

Safety Culture framework for Regulatory Bodies needs to be further developed

- Safety Culture needs be assessed

Management Systems and leadership in practice that integrate safety, develop and support a strong Safety Culture in Operating Organizations

- Safety Performance needs to be reviewed with respect to the leadership and management of human and organizational factors

Understanding external influences on an Organization's Safety Culture needs to be developed

- Dynamic interactions within and among all relevant factors (human, technical and organizational).

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Thank you!