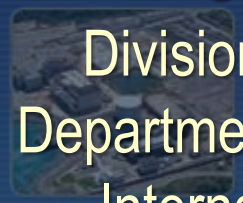
Human and Organizational Aspects of Assuring Nuclear Safety

IAEA's Approach to Leadership, Management and Culture for Safety
February 2016



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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
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EVOLUTION OF SAFETY CULTURE

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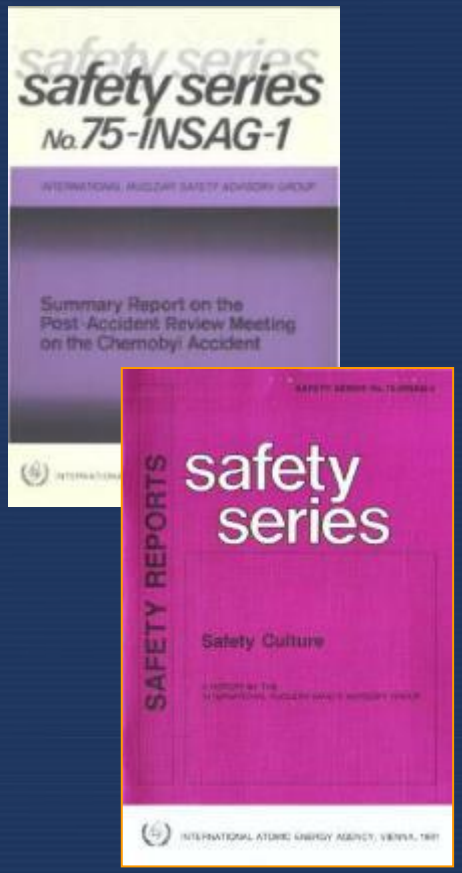
Introduction of the notion of Safety Culture



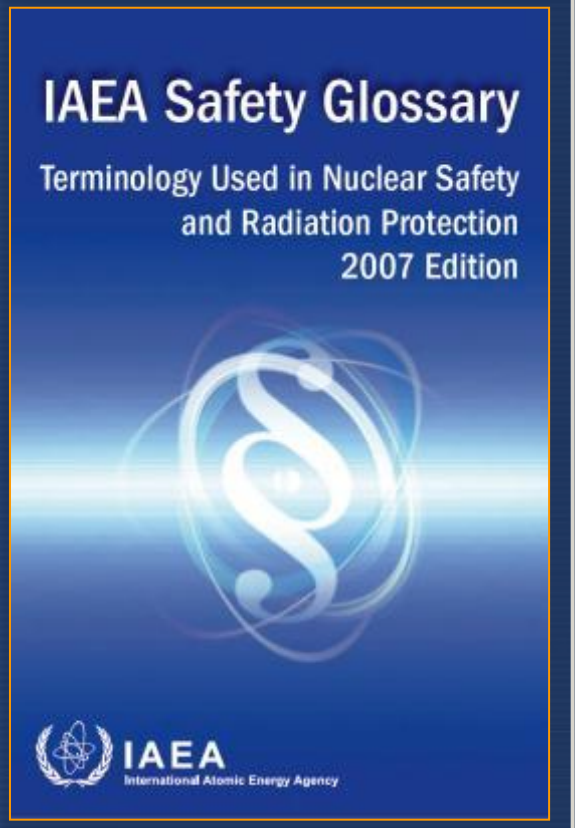
INSAG-1 (1986)

- *" … 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



IAEA Glossary (2007)

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

LEADERSHIP, MANAGEMENT AND SAFETY CULTURE IN IAEA SAFETY DOCUMENTS

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Hierarchy of related IAEA Safety Standards

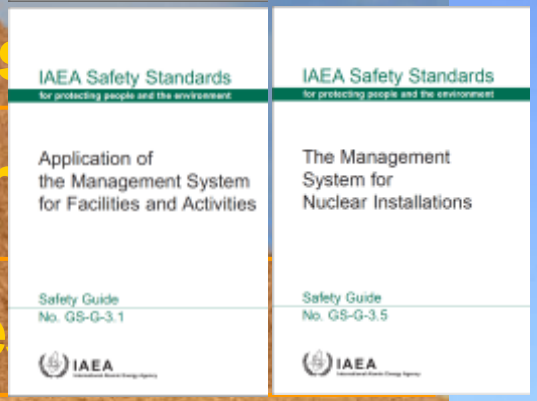
Principles for protecting people and environment

Safety Fundamentals

Safety Requirements

Safety Guides

Safety Reports, TECDOCs ...



Requirements to be applied to meet the principles (shall)

Recommended ways of meeting the requirements (should)

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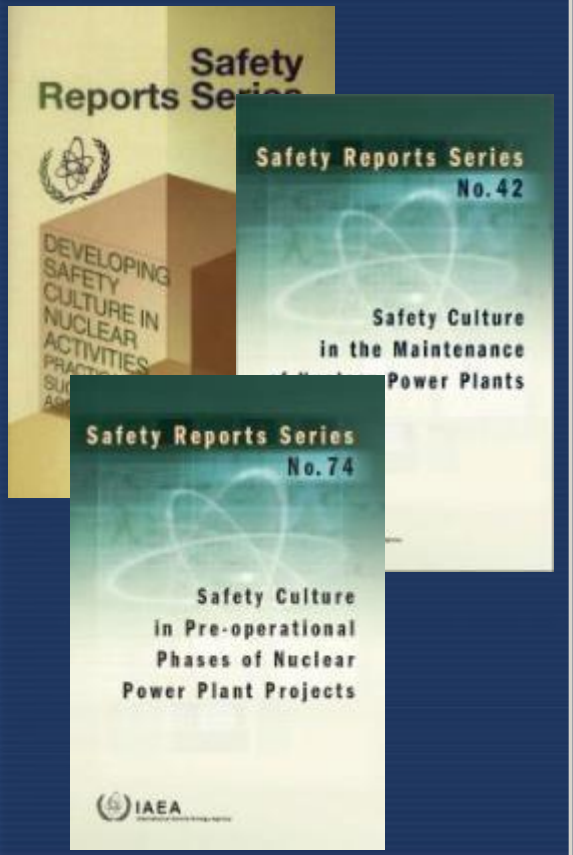
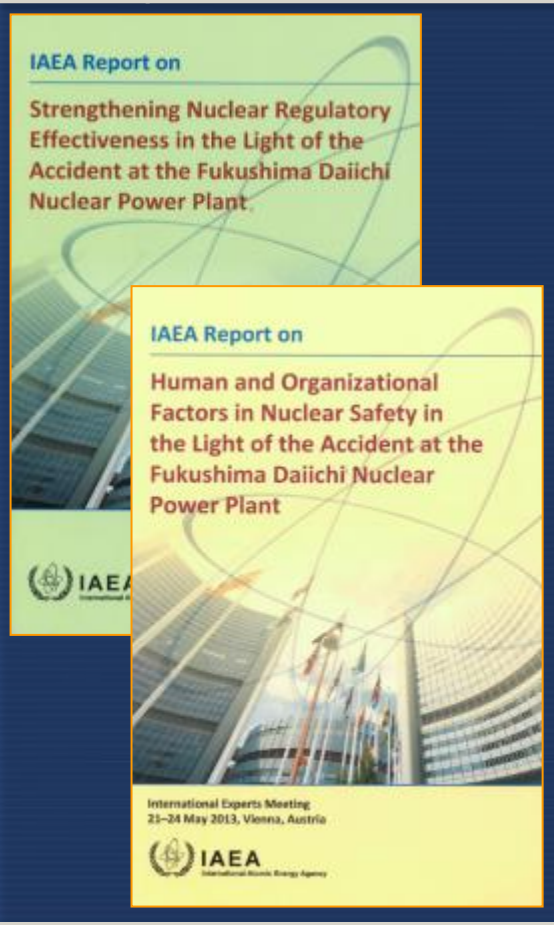
IAEA Standards and Documents on Safety Culture



- **GSR Part 2:** *Leadership and Management for Safety* – to replace GS-R-3 (under approval)
- **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)

SAFETY CULTURE IN IAEA PEER REVIEW SERVICES

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Goal and objectives of IAEA Peer Review Services

Overall goal:

To improve nuclear and radiation safety

and thereby to reduce the possibility of any safety related harm to people or environment

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 for 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

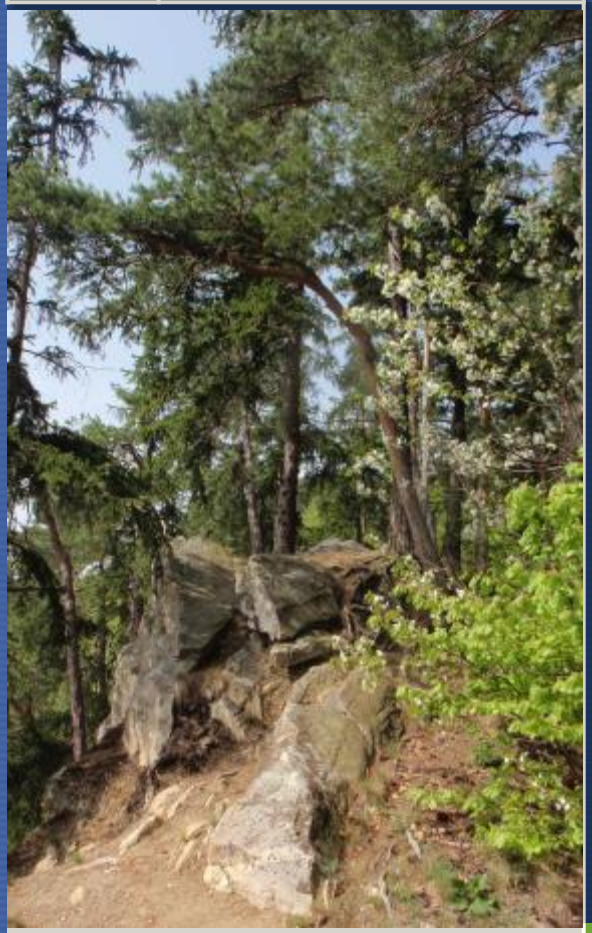
IRRS observations related to Safety Culture

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 Body
  - 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

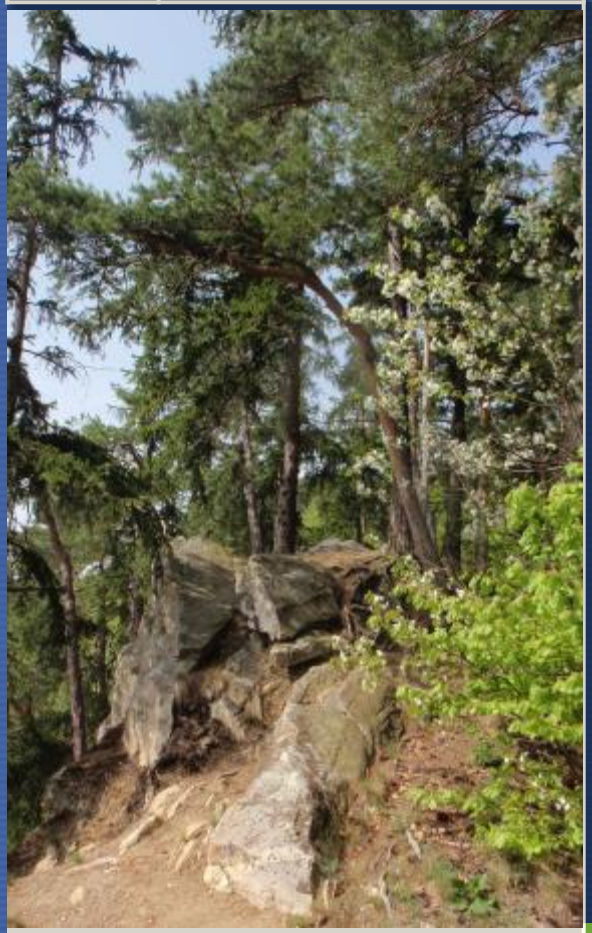
OSART observations related to Safety Culture

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
- Human performance, Human Factors, and Safety Culture activities incorporated in continuous improvement programmes

Specific Safety Culture Services

Regulatory Body

- Safety Culture self-assessment questionnaire
- Development of Safety Culture Self-Assessment guides 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

- Publication of GSR part 2 and associated guides
- 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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