



*The Abdus Salam
International Centre for Theoretical Physics*



2257-50

Joint ICTP-IAEA School of Nuclear Energy Management

8 - 26 August 2011

Management Systems and Safety Culture

Monica Haage
*IAEA, Vienna
Austria*

IAEA's approach to management systems & safety culture



Monica Haage
m.haage@iaea.org

The agenda

- *What is culture?*
- *Safety culture*
- *IAEA's approach to safety culture*
- *Safety management & Safety culture*



IAEA

International Atomic Energy Agency

What is culture?

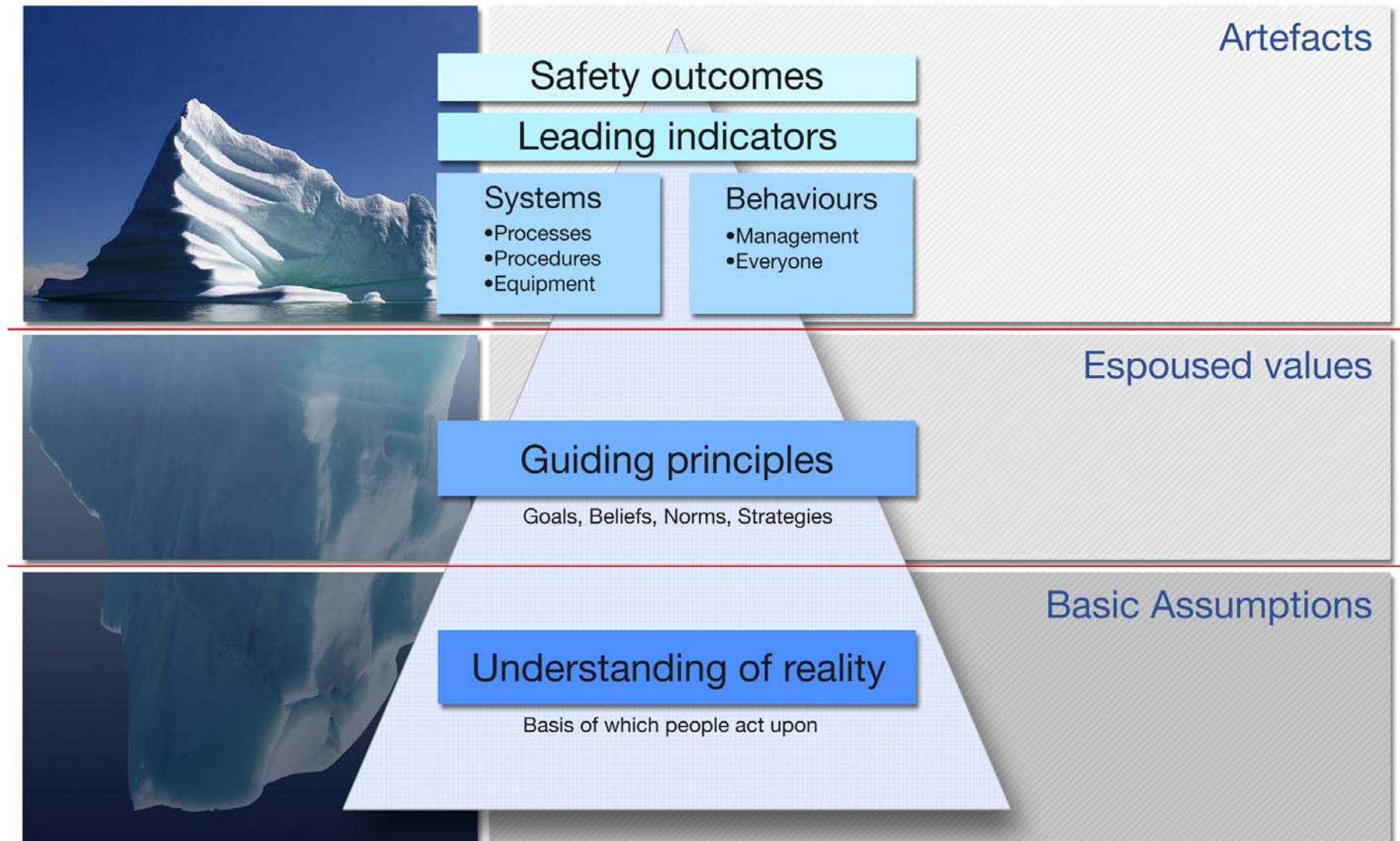
Most of the culture is below the surface



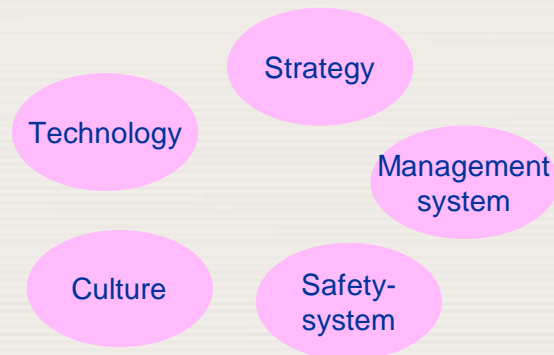
Above the surface we find the visible aspects of culture:
artefacts, people's actions,
language use

Below the surface we find :
norms
values
fundamental assumptions of reality

Edgar Schein's Levels of culture

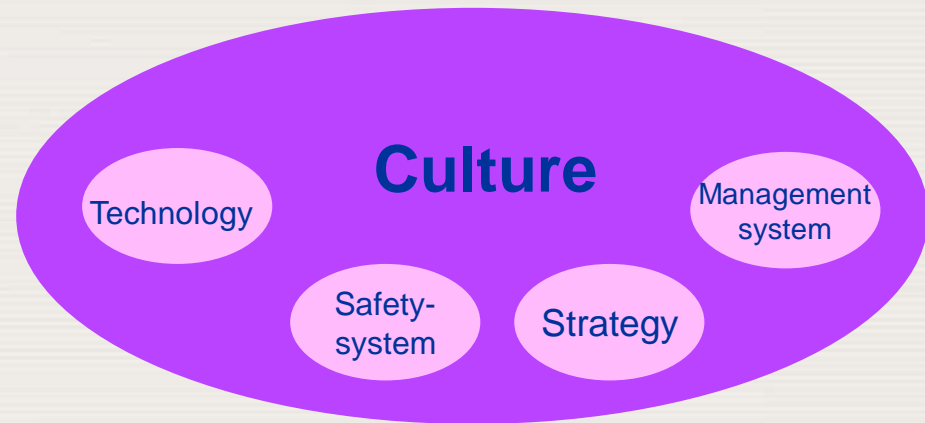


Two views of culture



*Culture as one variable
amongst others:*

The Variable Approach



*Culture as something
inherent in all aspects of
the organisation:*

The Metaphor Approach

Safety culture

IAEA's approach to safety culture



Monica Haage
m.haage@iaea.org



The IAEA advisory group INSAG

*“A vital conclusion drawn from this behaviour is the importance of placing complete authority and responsibility for the safety of the plant on a senior member of the operations staff of the plant. Of equal importance, formal procedures must be properly reviewed and approved must be supplemented by the creation and maintenance of a ‘**nuclear safety culture**’”.*

(INSAG-1, 1986)

The concept of the safety culture was now formally introduced in the area of nuclear safety.

The IAEA advisory group INSAG

Definition of safety culture

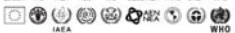




“Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receives the attention warranted by their significance”.

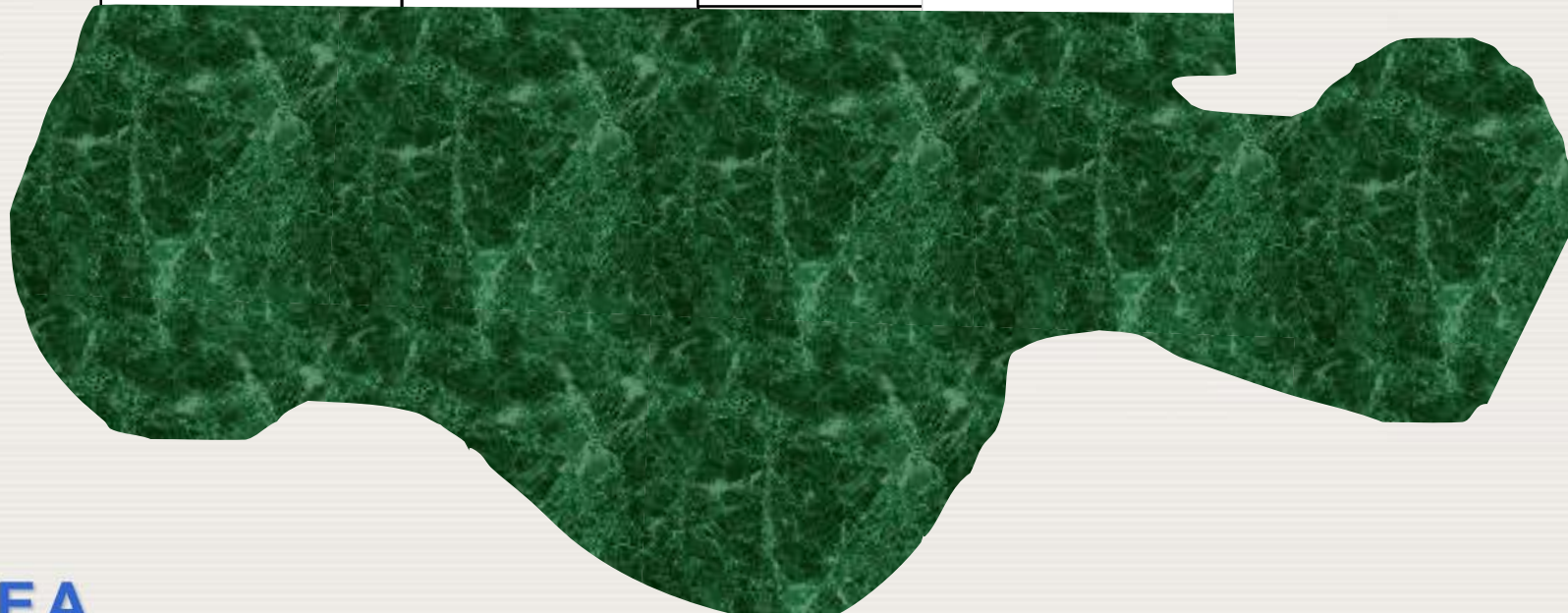
(INSAG-4, 1991)

***Safety management
&
Safety culture***

Structure (Safety Management)

Human actions (Safety Culture)

IAEA Safety Standards for protecting people and the environment	IAEA Safety Standards for protecting people and the environment	IAEA Safety Standards for protecting people and the environment	IAEA Safety Standards for protecting people and the environment
Fundamental Safety Principles <small>Jointly sponsored by Euronuc IAEA ILO ILO OECD/NEA WHO UNEP WHO</small> 	The Management System for Facilities and Activities	Application of the Management System for Facilities and Activities	The Management System for Nuclear Installations
Safety Fundamentals No. SF-1	Safety Requirements No. GS-R-3	Safety Guide No. GS-G-3.1	Safety Guide No. GS-G-3.5
			



IAEA Safety culture publications

Safety Fundamentals No. SF-1: Fundamental Safety Principles

Safety Requirements No. GS-R-3: The Management System for Facilities and Activities

Safety Guide No. GS-G-3.1: Application of the Management System for Facilities and Activities

Safety Guide No. GS-G-3.5: The Management System for Nuclear Installations

Safety Series No. 75-INSAG-4: Safety Culture

Safety Series No. 75-INSAG-15: Key Practical Issues in Strengthening Safety Culture

Safety Report Series No. 11: Developing Safety Culture in Nuclear Activities

Safety Report Series No. 42: Safety Culture in the Maintenance of Nuclear Power Plants

TECDOC-1321: Self-assessment of safety culture in nuclear installations

TECDOC-1329: Safety culture in nuclear installations

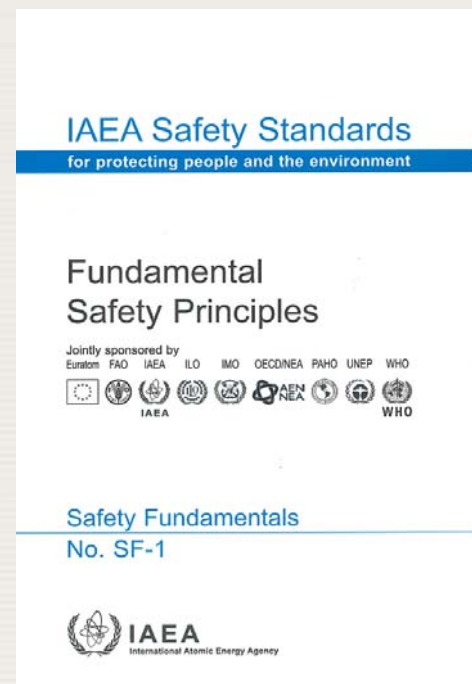
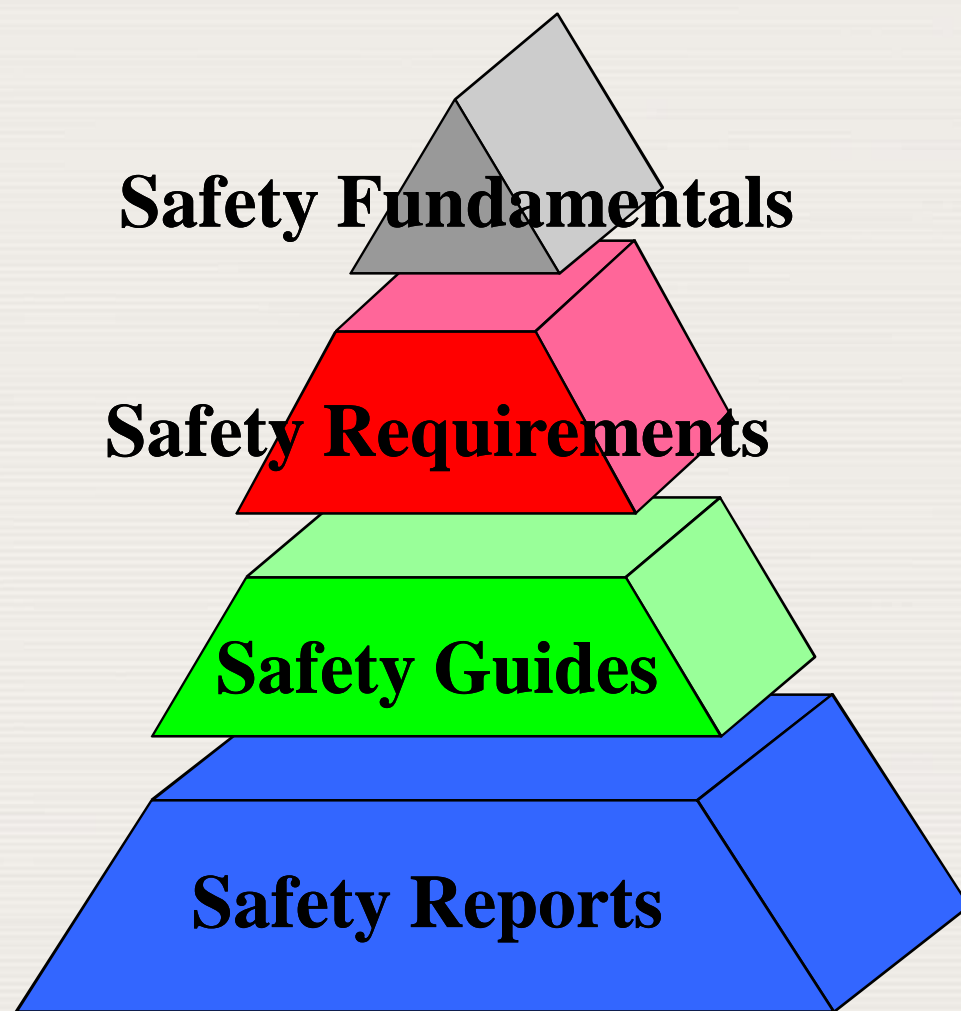
Integrated Management System (IMS)

Promoting:

1. Safety
2. Safety culture
3. Integration



SAFETY STANDARDS HIERARCHY



**Global reference for a
high level of nuclear
safety**

Safety Principle SF-1

Integrated management systems

Principle 3: Leadership and management for safety

3.12. “...Safety has to be achieved and maintained by means of an effective management system. This system **has to integrate all elements of management so that requirements for safety** are established and applied coherently with other requirements, including those for human performance, quality and security, and that safety is not compromised by other requirement or demands. The management system also **has to ensure the promotion of a strong safety culture...**”

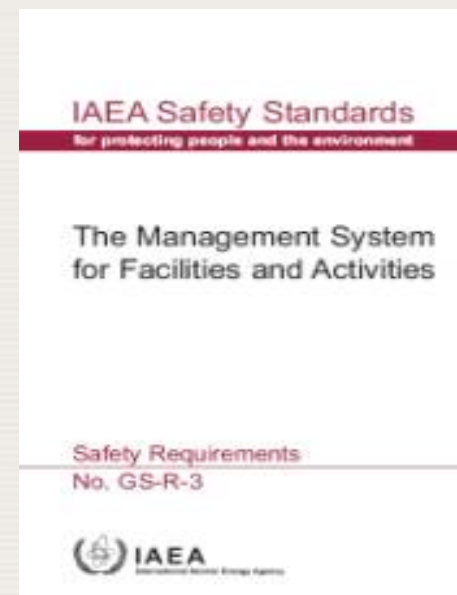
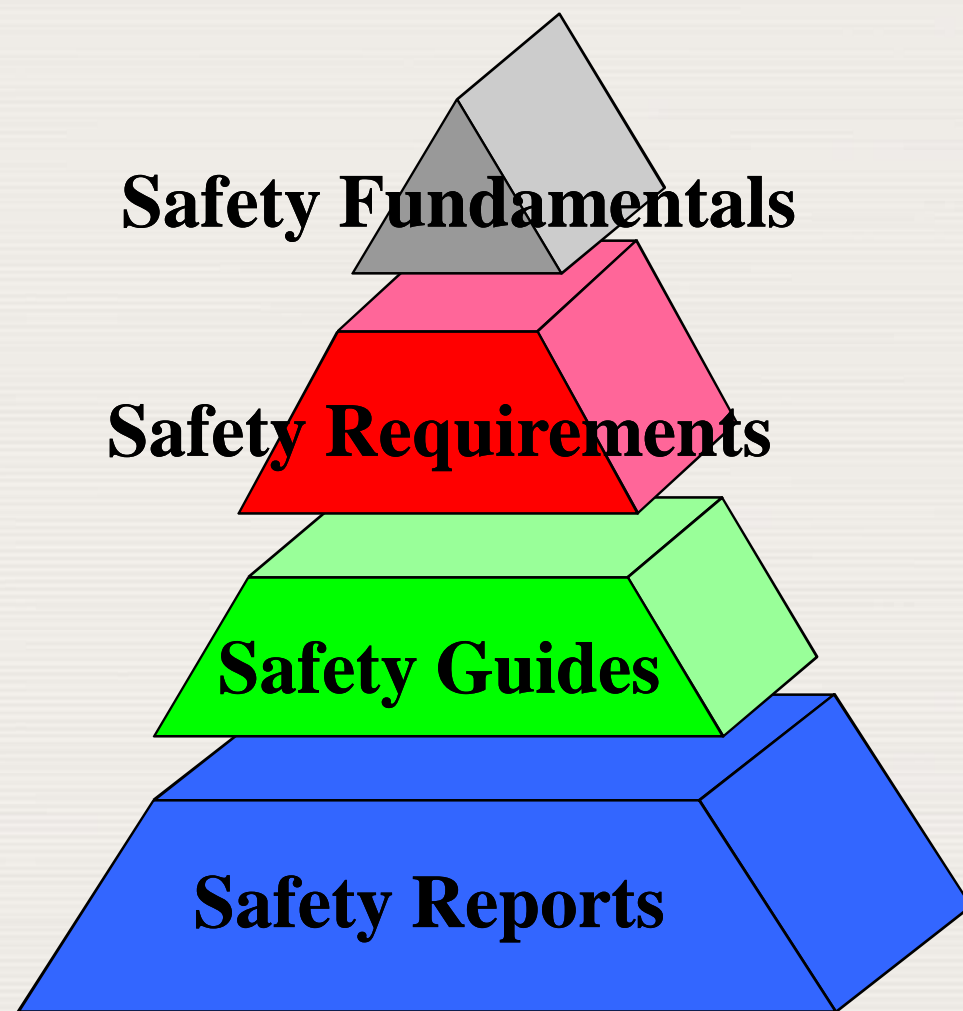
Safety Principle SF-1

Integration of 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 regards to safety.”*

SAFETY STANDARDS HIERARCHY



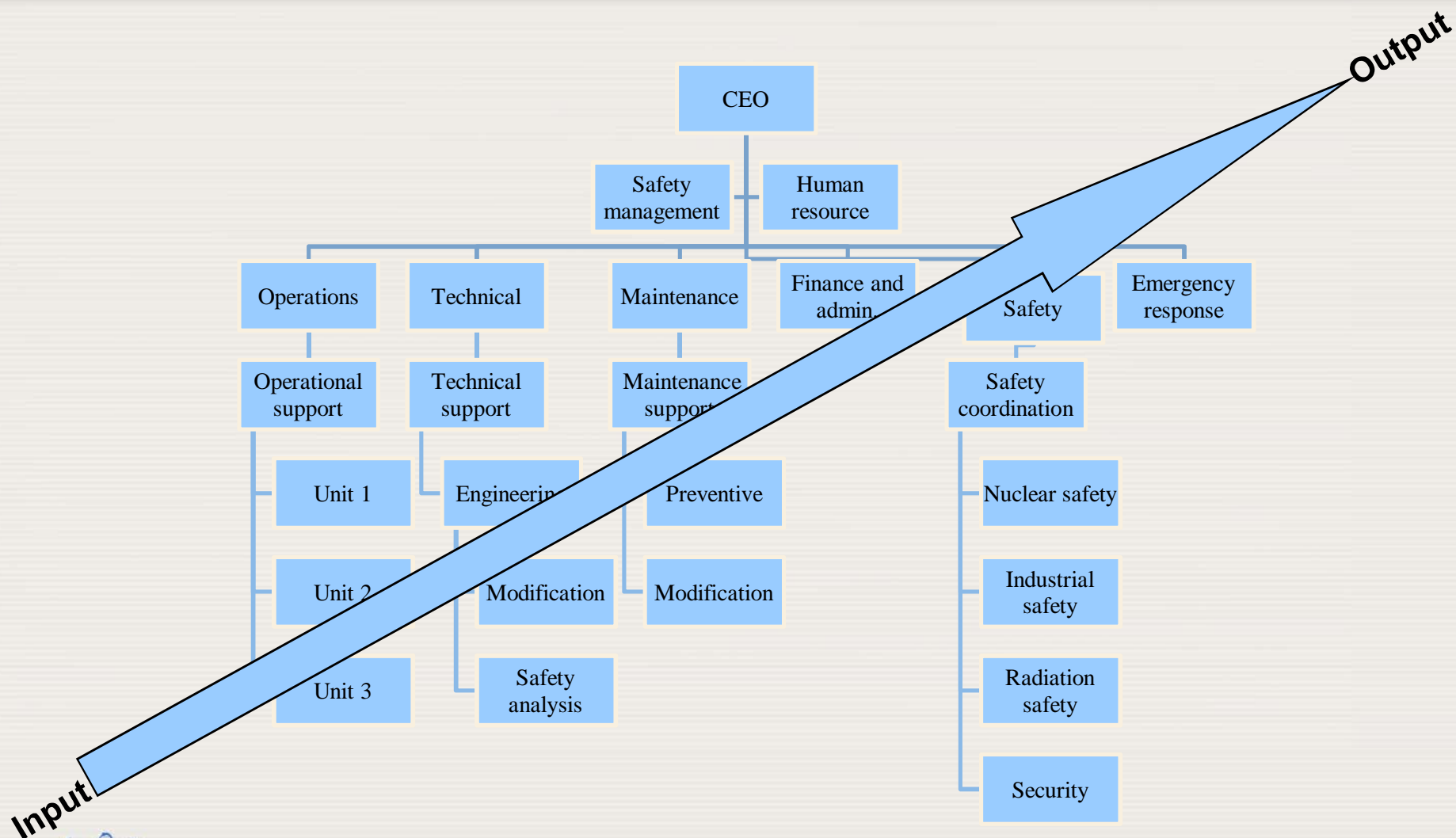
**Global reference for a
high level of nuclear
safety**

Safety Requirement GS-R-3

1.5. “The concept of this publication is based on two key concepts: that work may be structured and interpreted as a set of interacting processes: and that all individuals involved contribute to achieving safety and quality objectives.”

1.8. “The objective of this publication is to define requirements for establishing, implementing, assessing and continually improving a management system that integrates safety, health, environmental, security, quality and economic elements to ensure that safety is properly taken into account in all the activities of an organization”

Process to facilitate integration



Safety Guidance GS-G-3.1

Introduction (background, objective, scope and structure)

Management system (integrated management system, implementation, interface arrangements, safety culture, grading, documentation, information structure)

Management responsibility (management commitment, satisfaction of interested parties, statutory and regulatory compliance, organizational policies, planning, responsibility and authority for the management system)

Resource management (Provision of resources, involvement of individuals, managing information and knowledge, financial resources, human resources, competence, awareness and training, infrastructure and the working environment)

Safety Guidance GS-G-3.1

Process implementation (process management, process mapping, process responsibilities, process interfaces, document control, control of products, measuring and testing equipment, control of records, purchasing, communication, managing organizational change)

Measurement, assessment and improvement (monitoring and measurement, self-assessment, independent assessment, responsibilities of the assessment unit, management system review, review input, review output, non-conformances and corrective and preventive actions)

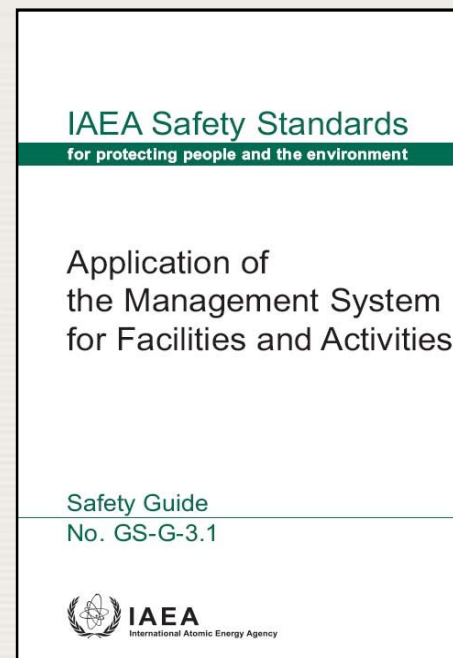
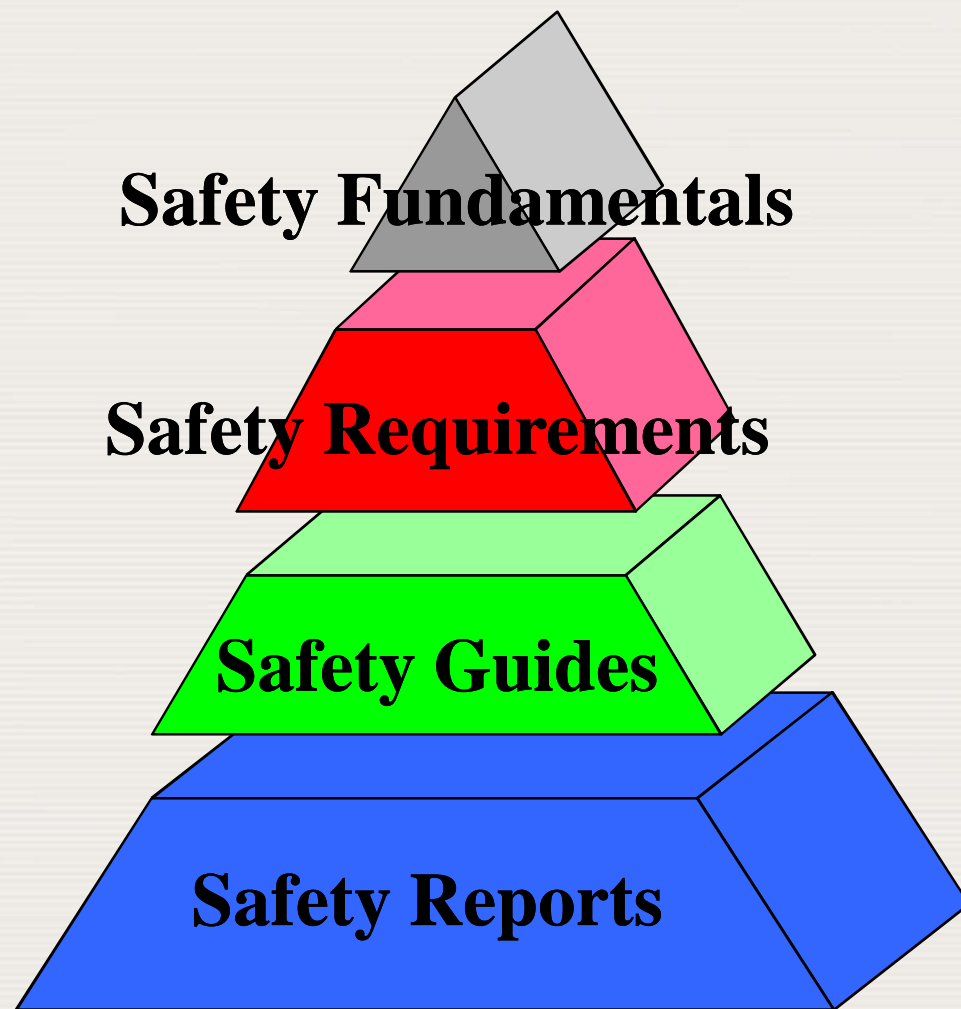
Appendix

Safety (Culture) Requirement GS-R-3

*“The management system shall be used to **promote and support a strong safety culture** by:*

- Ensuring a **common understanding** of the key aspects of safety culture within the organization;*
- **Providing the means** by which the organization supports individuals and teams in carrying out their tasks safely and successfully, taking into account the interaction between **individuals, technology and the organization**;*
- Reinforcing a **learning and questioning attitude** at all levels of the organization;*
- Providing the means by which the organization continually seeks to **develop and improve** its safety culture.”*

SAFETY STANDARDS HIERARCHY



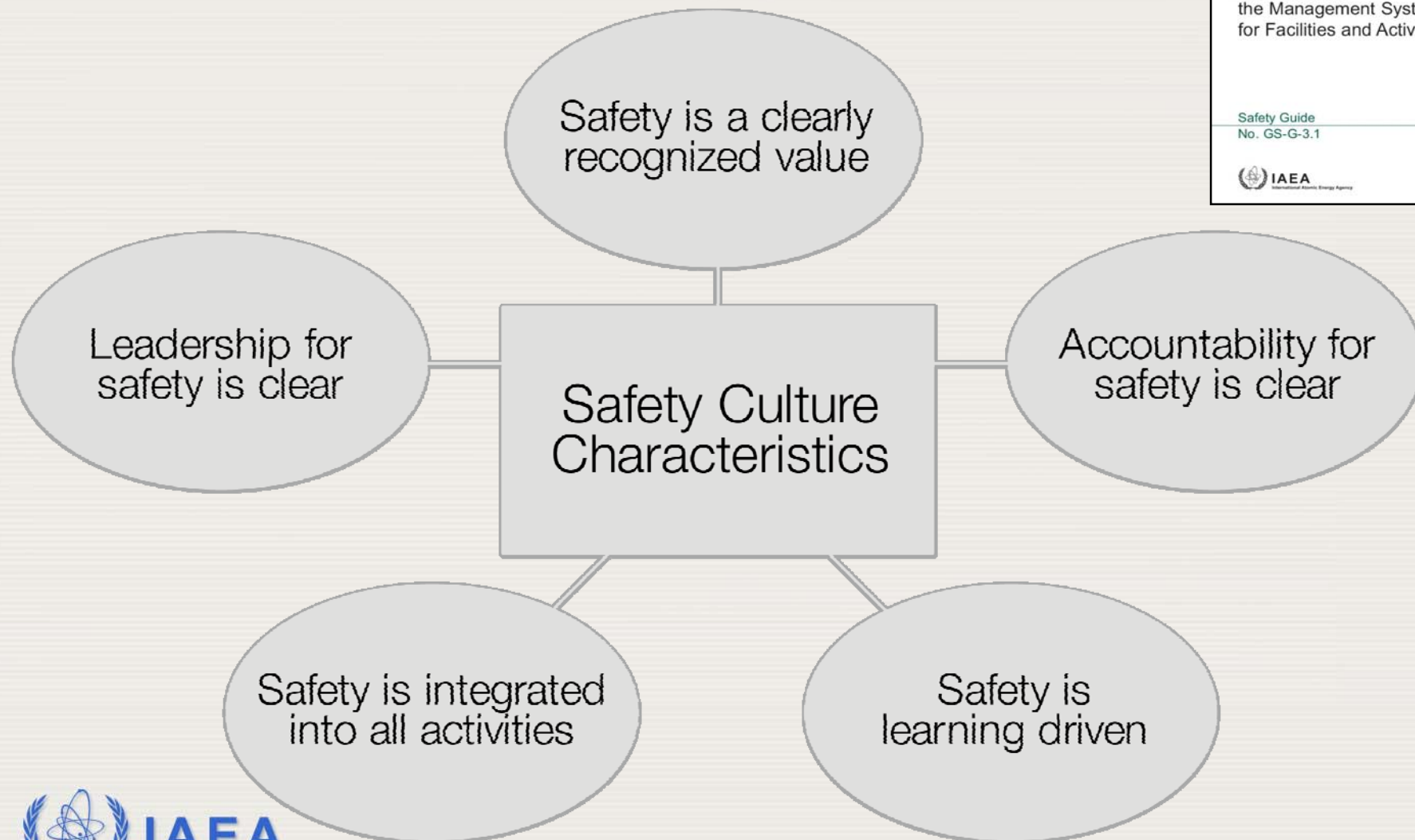
**Global reference for a
high level of nuclear
safety**

IAEA Safety culture characteristics and attributes (GS-G-3.1)

IAEA Safety Standards
for protecting people and the environment

Application of
the Management System
for Facilities and Activities

Safety Guide
No. GS-G-3.1



Safety is a clearly recognized value

Attributes

- **High priority to safety: shown in documentation, communications and decision- making**
- **Safety is a primary consideration in the allocation of resources**
- **The strategic business importance of safety is reflected in business plan**
- **Individuals are convinced that safety and production go 'hand in hand'**
- **A proactive and long-term approach to safety issues is shown in decision-making**
- **Safety conscious behaviour is socially accepted and supported (both formally and informally)**

Leadership for safety is clear

Attributes

- Senior management is clearly committed to safety
- Commitment to safety is evident at all management levels
- Visible leadership showing involvement of management in safety related activities
- Leadership skills are systematically developed
- Management assures that there is sufficient and competent staff
- Management seeks the active involvement of staff in improving safety
- Safety implications are considered in the change management process
- Management shows a continuous effort to strive for openness and good communications throughout the organization
- Management has the ability to resolve conflicts as necessary
- Relationships between management and staff are built on trust

Accountability for safety is clear

Attributes

- **Appropriate relationship with the regulatory body exists, which ensures that the accountability for safety remains with the licensee**
- **Roles and responsibilities are clearly defined and understood**
- **There is a high level of compliance with regulations and procedures**
- **Management delegates responsibilities with appropriate authority to enable accountabilities**
- **Ownership for safety is evident at all organizational levels and by all individuals**

Safety is learning-driven

Attributes

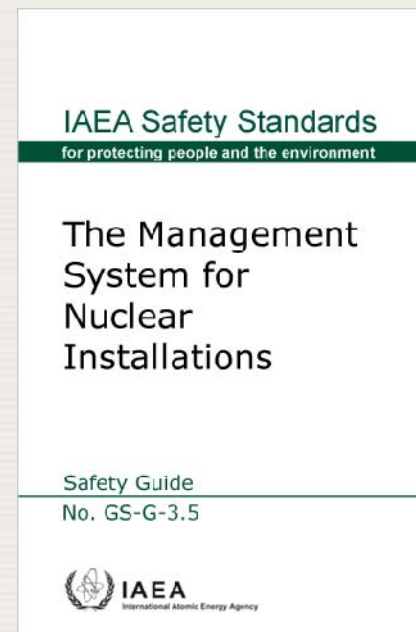
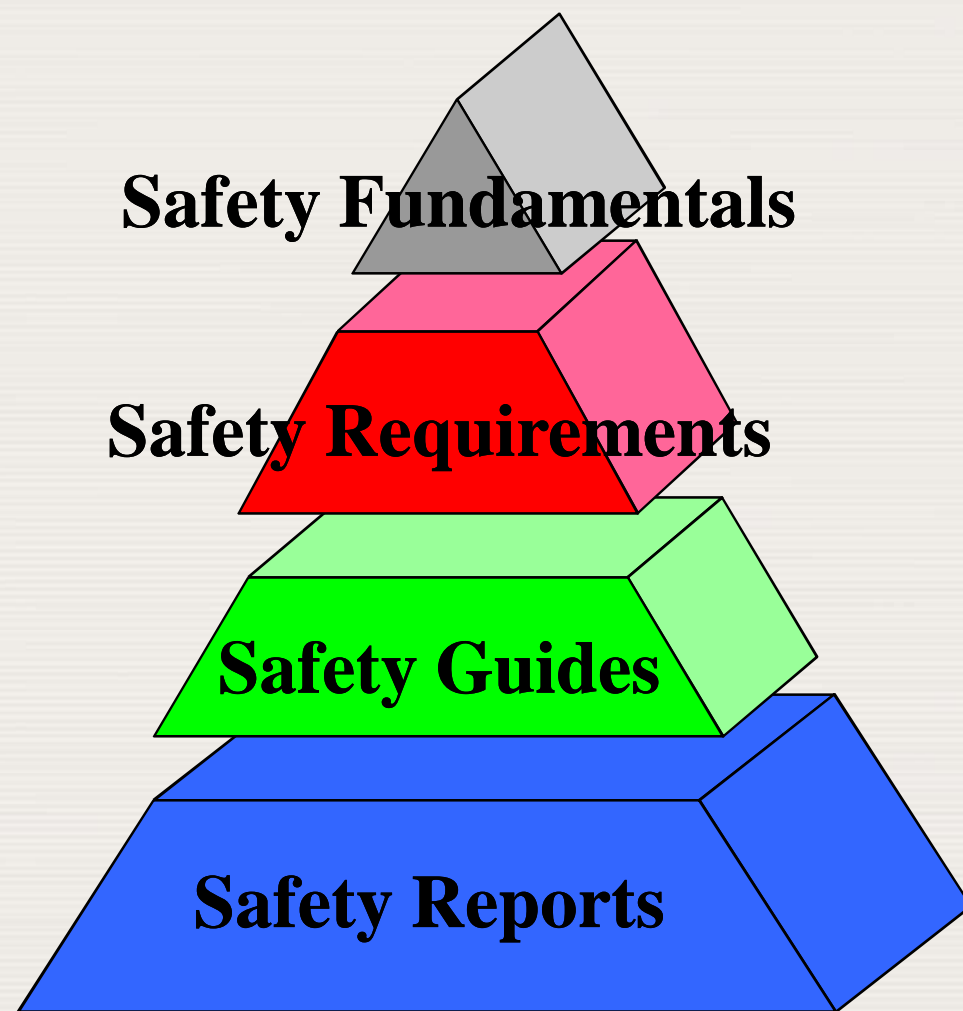
- **A questioning attitude prevails at all organizational levels**
- **An open reporting of deviations and errors is encouraged**
- **Internal and external assessments, including self-assessments are used**
- **Organizational and operating experience (both internal and external to the facility) is used**
- **Learning is enabled through the ability to recognize and diagnose deviations, formulate and implement solutions and monitor the effects of corrective actions**
- **Safety performance indicators are tracked, trended, evaluated and acted upon**
- **There is a systematic development of staff competencies**

Safety is a clearly recognized value

Attributes

- **High priority to safety: shown in documentation, communications and decision- making**
- **Safety is a primary consideration in the allocation of resources**
- **The strategic business importance of safety is reflected in business plan**
- **Individuals are convinced that safety and production go 'hand in hand'**
- **A proactive and long-term approach to safety issues is shown in decision-making**
- **Safety conscious behaviour is socially accepted and supported (both formally and informally)**

SAFETY STANDARDS HIERARCHY



**Global reference for a
high level of nuclear
safety**

Safety Guidance GS-G-3.5

Specific guidance for nuclear installations*

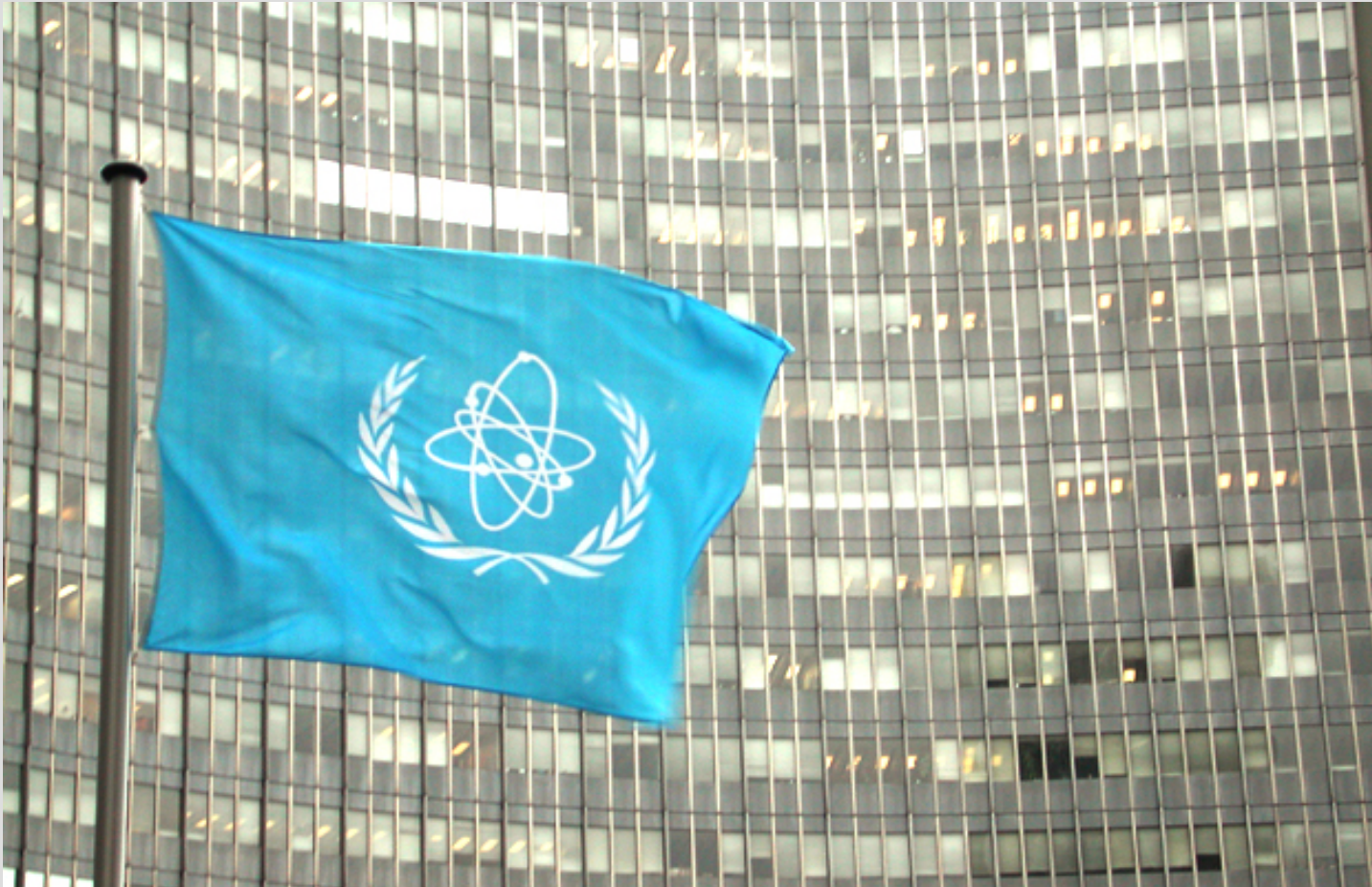
- More detailed and focused guidance
- Further explanation of the five safety culture characteristics and the attributes
- Improving safety culture
- Warning signs of a decline in safety culture
- Concept of interaction between individuals, technology and the organisation
- Continuous improvement
- Assessment of safety culture
- Comprehensive appendix guidance for all phases

* Nuclear power plants, other reactors (research and critical assemblies), nuclear fuel cycle facilities

Integrated Management System







...Thank you for your attention