IAEA Safety Standards on management systems - particularly DS349

Further needs in the area of management systems

Technical Meeting

IAEA, Vienna

1-4 April 2008

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International Atomic Energy Agency

Objectives of the presentation

- Provide information on the role of GS-R-3, GS-G-3.1 and DS349 within IAEA management system safety standards
- New guidance in DS349

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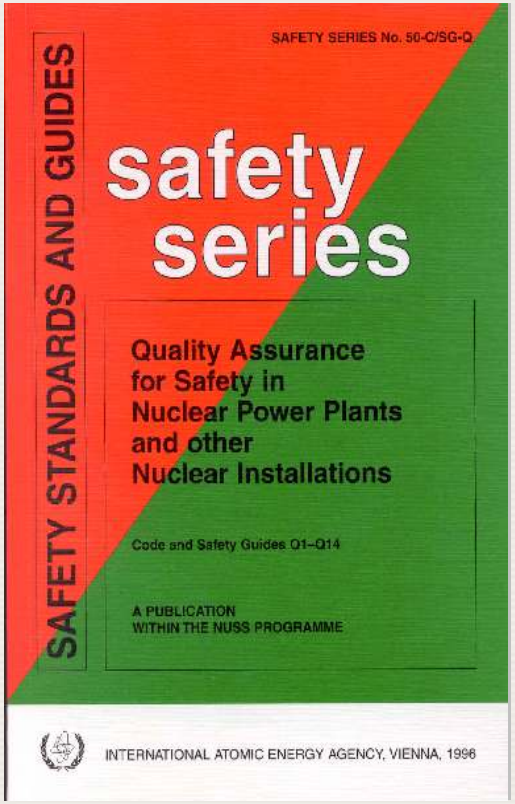
The IAEA has revised the 1996 Safety Standards 50-C/SG-Q: QA Requirements and Safety Guides



- Published in 1996
- Promotes structure:
  - Management
  - Performance
  - Assessment
- Recommended process approach

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Reasons for revision

- Considerable new developments in the management system practices and changes in the (Q) Management System Standards – ISO9001:2000
- IAEA/FORATOM Workshops and feedback highlighted the need to change – to introduce the concept of an integrated management system
- New challenges to the industry
- Harmonization of terminology with ISO 9001:2000
- Incorporation of Safety Report Series 22 findings (Comparison IAEA 50-C/SG-Q and ISO9001:2000 documents standards on QA/QM)
- Examples of ineffective management

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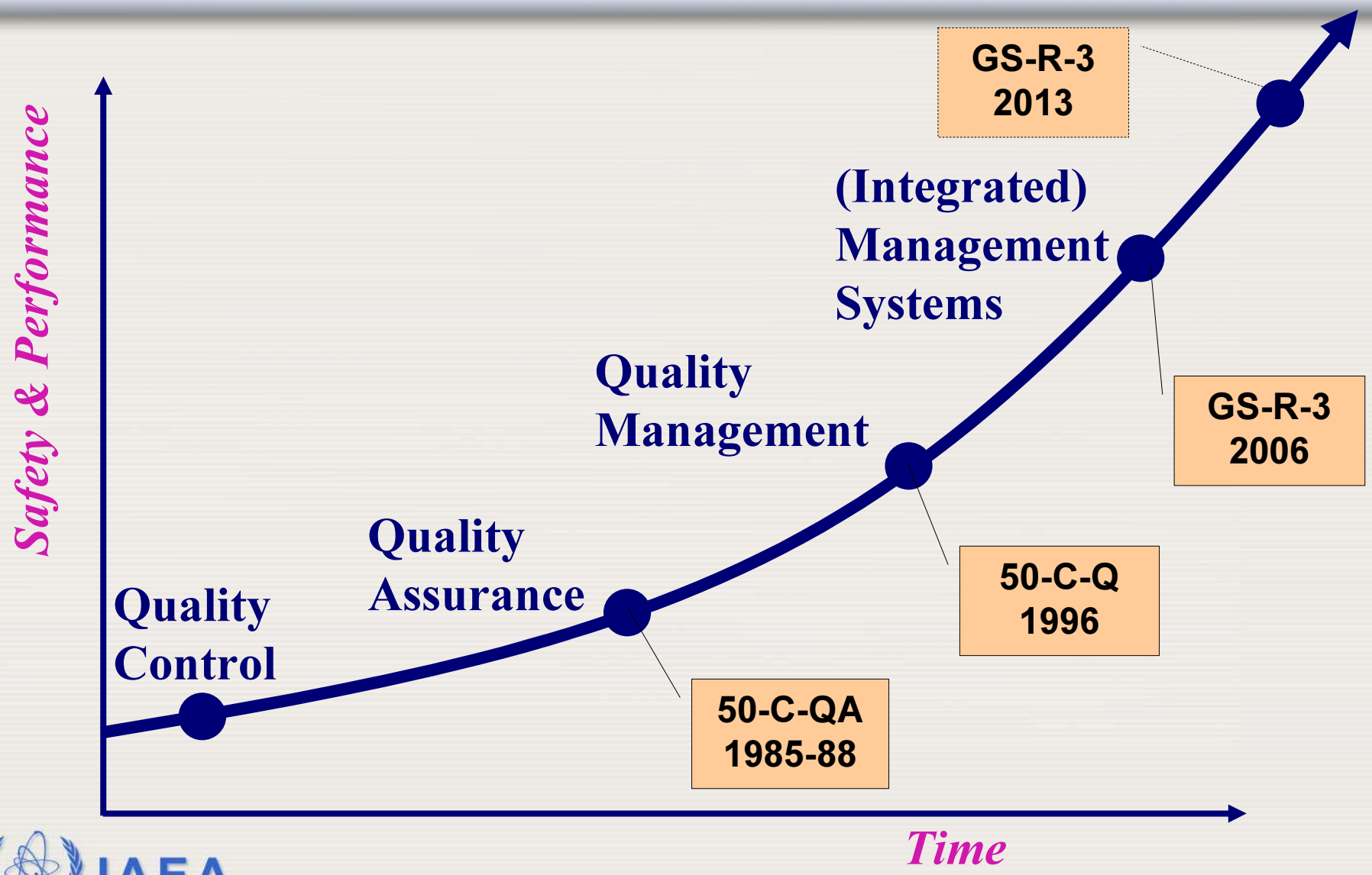
Evolution to Management Systems



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Integrated Management System

- A **single coherent** management system in which all the components, parts of an organization are **integrated** to enable the organization's **objectives** to be achieved
  - All management areas: **safety**, quality, environment, health, security, economical
  - Objectives, goals, strategies
  - Personnel, resources e.g. equipment, culture, policies, processes
  - One set of organizational processes (and their description) that address the **totality** of the objectives/requirements of the organization

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What does integration do?

- Enables the organizations mission and objectives to be achieved
- Defines all the processes and interfaces of the organization
- Integrates all activities, objectives and processes into one system
- Provides clear accountabilities and responsibilities
- Enables processes, people and resources to be aligned
- Enables consistency
- Controls the spurious generation of documents
- Provides management with a tool to assist in their oversight role
- Helps identify what needs improvement

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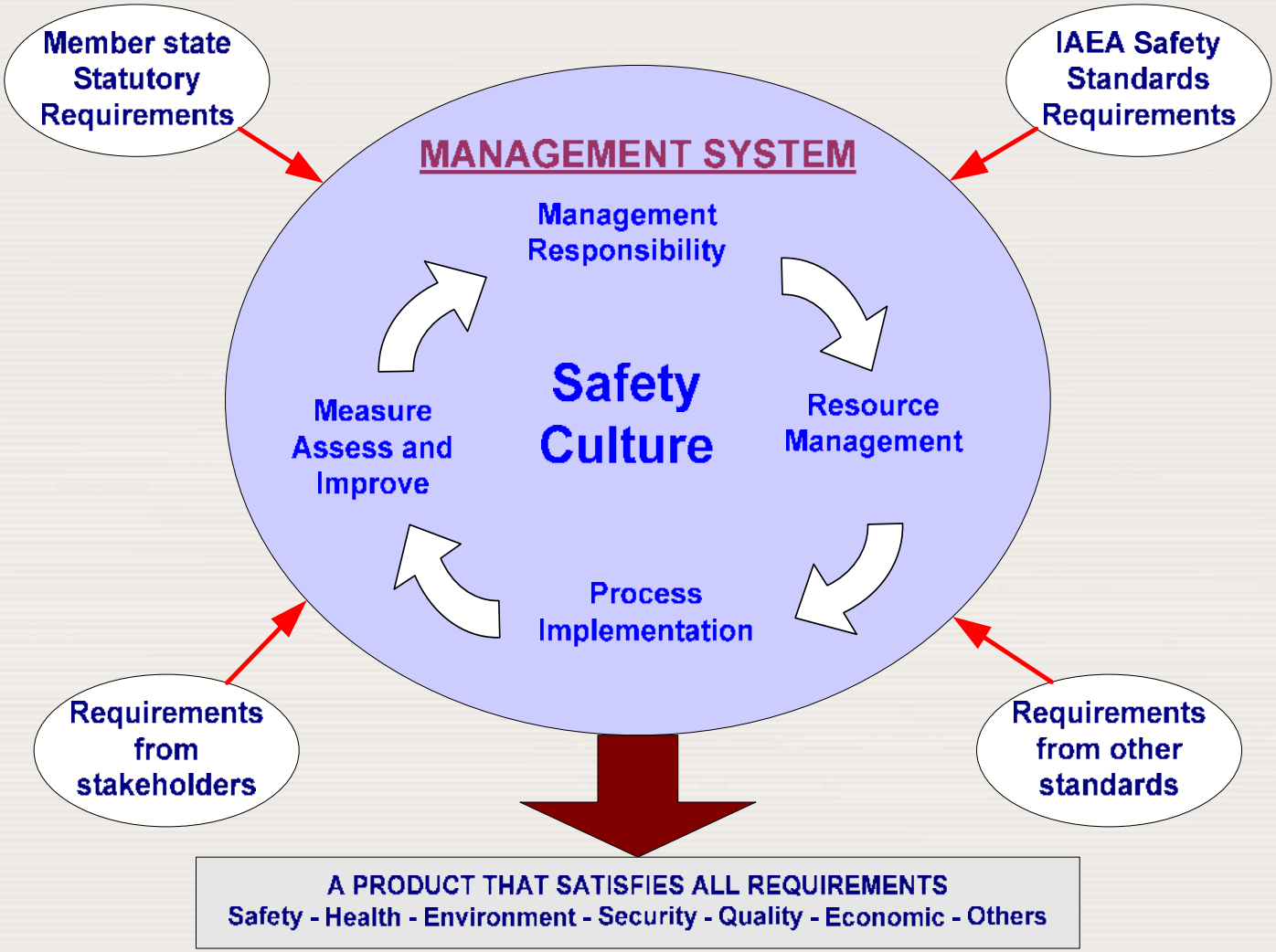
Management system model



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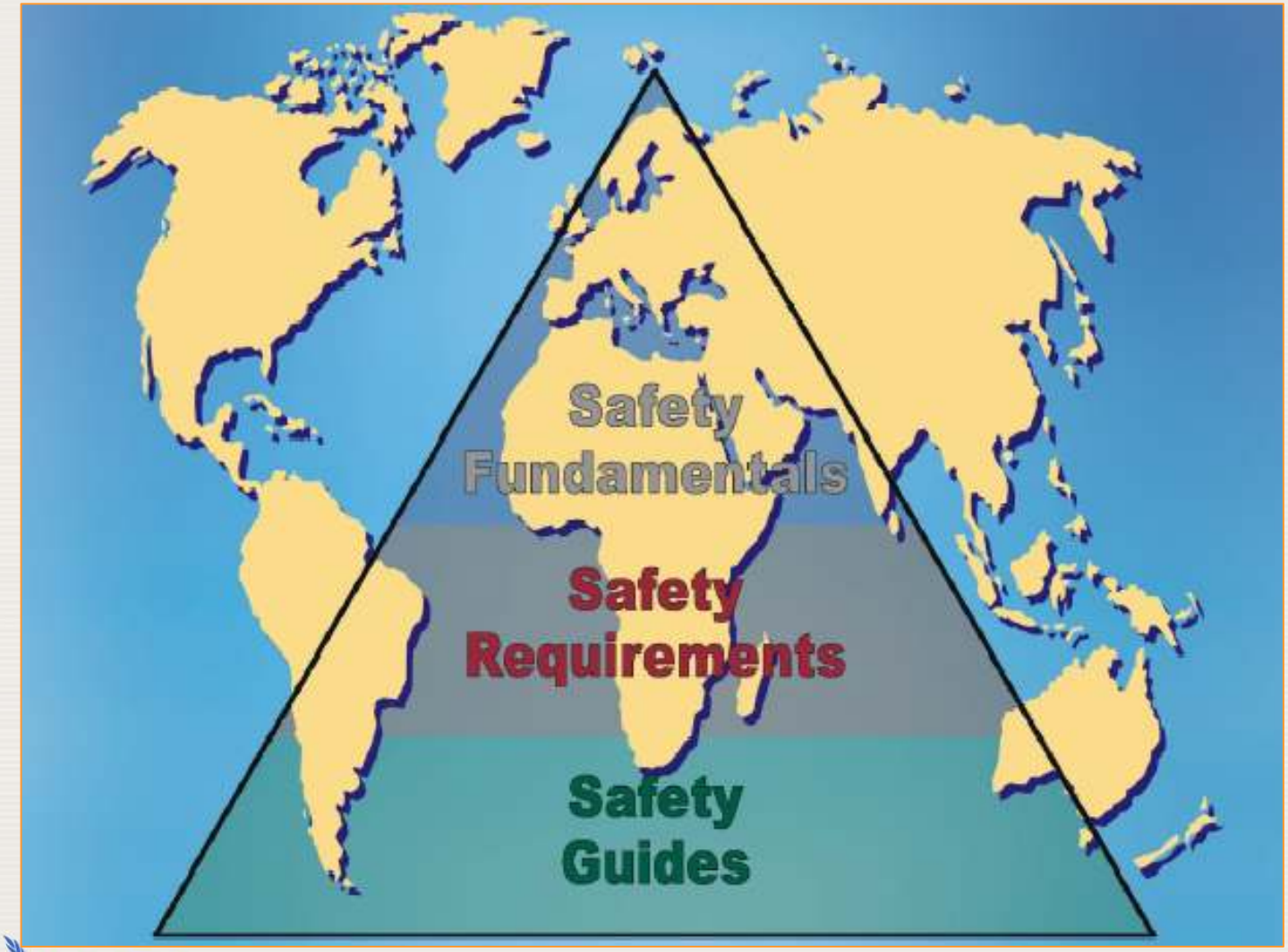
IAEA Safety Standards - Hierarchy



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Fundamental Safety Principles

- **Principle 3 - Leadership and management for safety**
  - Safety has to be achieved and maintained by means of an **effective management system**.
  - This system has **to integrate all elements** of the management system
  - The management system also has to ensure the promotion of a **safety culture**,
  - Recognition of interactions of individuals with technology and with organizations

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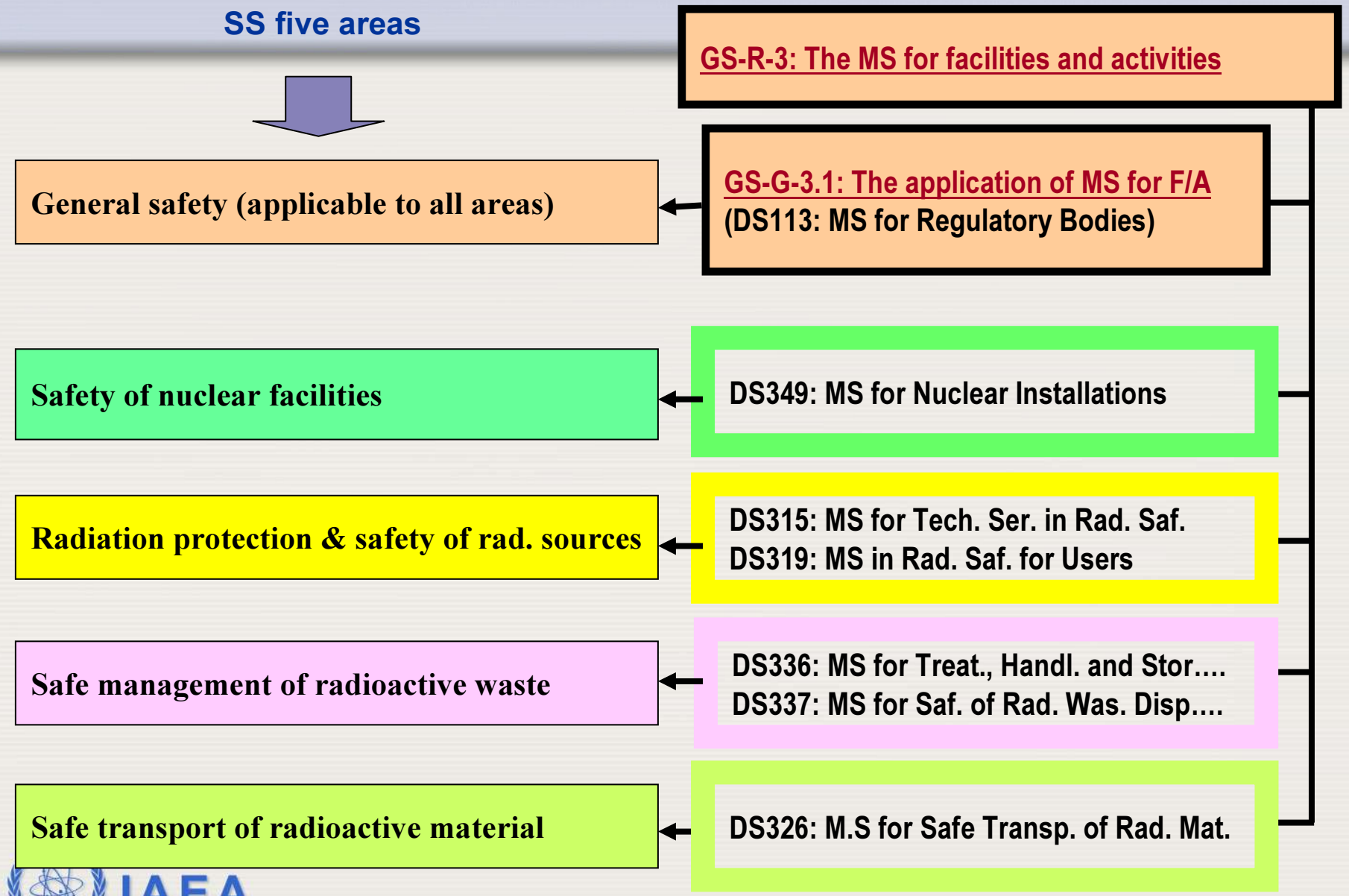
Structure of Safety Standards for MANAGEMENT SYSTEMS – current status



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Scope of GS-R-3, GS-G-3.1 and DS349

Applicable for the establishment, implementation, assessment and continual improvement of management systems for:

- Nuclear facilities;
- Activities using sources of ionizing radiation;
- Radioactive waste management;
- The transport of radioactive material;
- Radiation protection activities;
- Any other practices or circumstances in which people may be exposed to radiation from naturally occurring or artificial sources;
- The regulation of such facilities and activities.

Covers the lifetime of facilities and the entire duration of activities

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The Main Objective of GS-R-3, GS-G-3.1 and DS349

Management System requirements and guidance is established to ensure that **safety** is not compromised and is not found in a separate Management System

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DS349

- Meets GS-R-3
- It provides supplementary recommendations to those provided in GS-G-3.1 on how to comply with the requirements
- It supersedes Safety Guides numbers Q8–Q14 of Safety Series No. 50-C/SG
- Recommendations throughout the lifetime of a nuclear installation

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Scope of DS349

- Recommendations provided in the main text, paragraphs (e.g. for design 5.84–5.140) and the appendix
- Meets IAEA requirements listed in DS349
- Takes into account other IAEA Safety Guides: extensive recommendations

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DS349

- To support the management system of those organizations responsible for research, site evaluation, design, construction, commissioning, operation and decommissioning for a nuclear installation;
- An aid in the assessment by the regulatory body of the management system of a nuclear installation;
- To assist to define any specific element that should be included within the supplier's management system for the supply of products

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Management system

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Responsibility

- The management system should define the responsibilities of those persons responsible for each process (sometimes referred to as ‘process owners’) and of the managers and functions in the organizational structure, so that there are clear lines of authority and accountability
- The persons responsible for each process should support the operational direction with the responsibility of developing effective processes and ensuring that they remain effective.

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Safety culture

- Safety culture is that type of organizational culture, where safety is a value of utmost priority, considered essential for the long-term success of the organization
- The issue is to make that safety culture strong and sustainable, so that safety becomes a prime responsibility or main focus for all types of activities

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Safety culture - characteristics

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Safety culture - example from the industry

- A good safety culture creates the necessary conditions for a high safety standard, which is a prerequisite for nuclear power operation.
- A good safety culture is based on a strong and committed leadership.
- A safety culture program has to involve everyone.
- Safety culture is something that must constantly be worked for.
- A good safety culture builds confidence.
- A good safety culture is profitable.

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Patric Ramberg, *Former President OKG*

Safety culture

Weak safety culture – high business risk

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Grading of application of requirements

- To establish the necessary grading for an item, service or process, the responsible individual should be guided through a series of questions
- Application of the management system requirements should be most stringent for the highest grade; for the lowest grade, application of the management system requirements may be the least stringent

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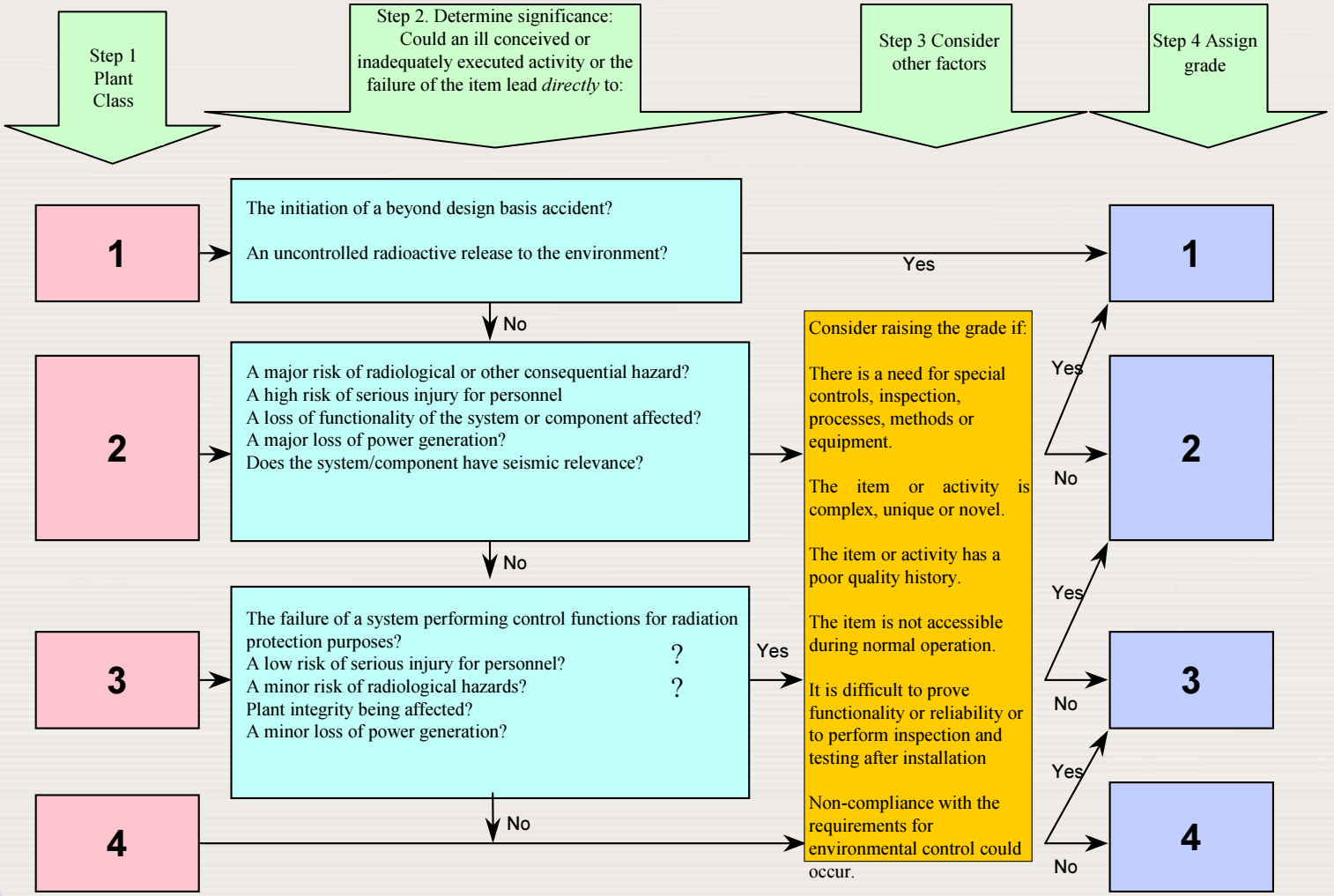
Grading - Example



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Grading examples

- Type and content of training;
- Level of detail and degree of review and approval of instructions;
- Need for and level of detail of inspection plans;
- Degree of in-process reviews and controls;
- Requirements for traceability of material;
- Type of and level of detail in procurement documents;
- Type of assessment;
- Records to be generated and retained.

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Responsibility of management

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Meeting the expectations of interested parties

- Identify and agree which of the interested parties' expectations are to be satisfied and should ensure that they are communicated throughout the organization
- Translate the expectations identified into requirements on the organization
- Communicate the requirements throughout the organization

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Responsibility and authority for the management system

- An individual reporting directly to senior management shall have specific responsibility and authority for:
  - Coordinating the development and implementation of the management system, and its assessment and continual improvement;
  - Reporting on the performance of the management system, including its influence on safety and safety culture, and any need for improvement;
  - Resolving any potential conflicts between requirements and within the processes of the management system.

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Resource management

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Managing information and knowledge

- Knowledge management is an integrated, systematic approach to identifying, acquiring, transforming, developing, disseminating, using, sharing and preserving knowledge that is relevant to achieving specified objectives

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Human resources

- The organization should maintain a human resources plan that deals with both numbers of staff and competence levels
- A model that covers, for example, the demographics of the organization's personnel and the projected use of contractors
- Effects of ageing on its workforce and establish a detailed plan
- The lead time necessary to recruit and train key personnel such as reactor operators

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Process implementation

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Process implementation

- Specify, develop, implement, maintain and improve all the processes that are necessary for it to achieve its goals, strategies, plans and objectives

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Process model

- Many organizations have a structured approach to developing their processes to achieve integrated management
- A major component of the management system is the process model
  - Core
  - Support
  - Management

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Process management – Generic processes

- Control of documents
- Control of products (*Inspection and testing)*
- Measuring and testing equipment
- Control of records
- Purchasing (including commercial grade items)
- Communication
- Managing change

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Project management

- Managing a project in accordance with the agreed scope, schedule, cost and safety/quality requirements, and dealing with all the challenges and risks encountered from the pre-planning phase to the completion of the project

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Assessment of workplace risk

- For all activities performed by individuals at the installation or by contractors' personnel that may pose a particular risk of injury, harm or damage
  - Area assessment
  - Task assessment
- These risks need to be assessed as an integral part of the work planning process. Risks should be considered early

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Selection of the principal designer

- The organization should select the principal designer who will have the responsibility for specifying the design requirements and for approving the design output on its behalf.
  - The responsibilities of the principal designer should include:
  - Definition of the base requirements and specifications;
  - Involvement in design reviews;
  - Involvement in design verification;
  - Approval of the detailed design;
  - Review and approval of design changes at all stages;
  - Control of interfaces;
  - Review of relevant applications for non-conformances.

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Configuration management

- Configuration management is the process of identifying and documenting the characteristics of the systems and components ensuring that consistency is maintained between the design requirements, the physical configuration and the configuration documentation of the installation and its systems and components

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Inventory management

- To ensure that spares and other consumable items are available when required for use so that safety is not compromised
- Inventory register
- The procurement process is suitable to maintain stocks at an acceptable level. This can be achieved by:
  - Forecasting demand;
  - Understanding lead times for the manufacture and procurement of spares and consumable items;
  - Monitoring spares and the issue and usage of consumables;
  - Establishing minimum stock levels and minimum stock reorder levels;
  - Taking historical information into consideration.

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Protection of the environment

- A process that identifies the activities, products or services that may have a significant impact on the environment and put in place controls to reduce or eliminate their impact
- To determine its objectives and targets for the protection of the environment on the basis of the nature, scale and impacts of its activities, products and services:
  - Emissions to air and water;
  - The impact of the process for radioactive waste management;
  - Contamination of land;
  - Contamination of water sources;
  - Use of raw materials and natural resources;
  - Other local environmental and community issues.

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Regulatory interface

- A process to ensure regulatory and statutory requirements are identified and describe how they are implemented.
- To ensure that interface arrangements are established with all relevant regulatory bodies.
- Meetings and reporting and communication routes.

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Measurement, assessment and improvement

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Safety culture assessment

- It is difficult to review all the layers of a safety culture, as some aspects are not manifest or may not even be demonstrable at a conscious level. Several different assessment tools should be used to determine the status of the safety culture of the organization
- The possible assessment tools include the use of interviews, focus groups, questionnaires, observations and document reviews

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Summary

- DS349 Provides guidance for the application of GS-R-3 at nuclear installations (includes and supersedes the guidance in 50-C/SG-Q8 to Q14)
- Provides supplementary guidance to the generic guidance in GS-G-3.1

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Summary

- DS349 Provides guidance on management system for different stages of a nuclear installations
  - Research and Development
  - Siting
  - Design
  - Construction
  - Commissioning
  - Operation
  - Decommissioning

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…Thank you for your attention

Complementary activities (I)

- Management of Continual Improvement (TECDOC 1491, Published)
- Management of Change in Nuclear Facilities (TECDOC, under final publication 2008)
- Management System for Research Reactor Operating Organizations (TECDOC, under final publication 2007)

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Complementary activities (II)

- Attributes of effective management systems
- Leadership guide document
- Process implementation
- Grading of application
- Technical meetings (April 2008)
- SCART missions
- IAEA support services on Enhancement of Management Systems
- Comparison of IAEA Management System Standards with ISO 9001:2000 standard (In publication) and NQA-1 (2008)

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