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Development and Implementation of an Effective Safety Management System

L.3.2

Key Elements of the Management System

L.3.3

Luis Lederman
Structure

- Evolution of the integrated management system concept
- IAEA standards on management systems
- IAEA standards and ISO9001:2000
- Requirements for Management Systems for Facilities and Activities – GSR 3
Problems associated to QA/QM Systems

Quality Manuals & Procedures sit on shelves

The actual production of documents is seen as the primary objective

Quality is the role of Quality Department

Quality has been considered to be all about obtaining signatures

N. Redman, UK
Evolution to Management Systems

Time

Safety & Performance

Quality Control

Quality Assurance

Quality Management

Integrated Management Systems

50-C-QA 1985-88

50-C-Q 1996

GS-R-3 2006

GS-R-3 2011
New Approach

Integrated Management System

- Coordinated activities to direct and control an organization
- Set of interrelated or interacting elements
Integrates all management elements of nuclear facilities and activities to ensure that inter-related economic, health, security, quality, environmental, and economical matters are considered jointly with safety matters.
Management system model

- Member state statutory requirements
- IAEA safety standards requirements

Management system

- Safety culture
- Management responsibility
- Resource management
- Process implementation
- Measure, assess, and improve

Requirements from stakeholders
Requirements from other standards

A product that satisfies all requirements
Safety - Health - Environment - Security - Quality - Economic - Others
Lack of a sense of urgency about fixing defective equipment

Don’t follow procedures

Don’t report minor problems or unusual observations

Make non-conservative decisions

“The plant is robust, it has some margin”
Themes "Warning Flags" - INPO List

- Overconfidence
- Isolationism
- Managing relationships
- Production priorities
- Nuclear Leaders
- Operations and Engineering
- Plant events
- Self-critical
- Managing change
NOTES

- Different types of technical failures
- Different types of reactors
- Different types of production
- Different types of national culture

**BUT**

Similar types of organizational failures

- All events apparently rooted in the organizational culture
- The root causes appear to have been established many years before the event, yet went undetected
Reasons for revision

- IAEA/FORATOM Workshops and feedback highlighted the need to change
- New challenges to the industry
- Harmonization of terminology with ISO 9001:2000
- Examples of ineffective management
Principle 3: Leadership and management for safety
The IAEA Safety Standards for Management Systems represent an integrated approach that recognizes:

- that safety emerges from the entire system of work that the organization performs - it cannot be separated out

- that all of the safety barriers are designed, constructed and applied by people and that people’s basic beliefs, attitudes and behaviours (culture) are fundamental to safety, and emerge from the entire organizational and management system.

- that leadership is essential for the development of a strong safety culture and the successful implementation of the management system
Management System Requirements and Guides

- GS-R-3: The Management Systems for Facilities and Activities (Safety Requirement - 2006)
- GS-G-3.1: Application of Management System for Facilities and Activities (Generic Safety Guide)
- GS-G-3.5: Management System for Nuclear Installations (Specific Safety Guide)
Management System Guides

- GS G 3.3: Management Systems for the Treatment, Handling and Storage of Rad. Waste
- GS G 3.2: The Management System for Technical Services in Radiation Safety
- GS G 3.4: Management Systems for the Disposal of Radioactive Waste
- T S G 1.4: Management Systems for the Safe Transport of Radioactive Material
- T S G 1.5: Compliance Assurance for the Safe Transport of Radioactive Material
Fundamental differences between GS-R-3 and ISO9001:2000

**GS-R-3**
- Safety standard
- Nuclear industry specific
- Integrated management system approach
- All requirements are mandatory

**ISO9001:2000**
- Non safety standard
- General application
- Quality management
- Exclusion of requirements allowed
Requirements not in ISO9001:2000

- Safety
- Safety culture/leadership
- The role of Regulatory bodies (only for product quality at the end of processes)
- Knowledge management
- Self-assessment
- Managing organizational change and continuous improvement
General Aims of GS-R-3

- To focus the performance of the organisation on achieving and improving safety in normal, transient and emergency situations.

- To foster and support a strong safety culture through the development and reinforcement of good safety attitudes, values and behaviour in individuals, teams and the organisation so as to allow them to carry out their tasks safely.
Management system requirements GS-R-3

**Objective:**
to ensure that safety is not compromised by considering the implications of all actions with regard to safety as a whole and not in separate Management Systems.
Scope of GS-R-3

Establishment, implementation, assessment and continue 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.

It covers the lifetime of facilities and the entire duration of activities.
Users of GS-R-3

OPERATORS
- basis for their Management Systems to discharge their prime responsibility for safety
- basis for the interaction with the other parties

REGULATORS
- basis for licensing requirements for Operators
- basis for their own Management Systems

SUPPLIERS
- basis for additional safety requirements in contracts
- basis for introduction of additional requirements into their management systems
Section 1: Introduction

Section 2: Management System general requirements including safety culture, grading, documentation and records.

Section 3: Requirements for and responsibilities of senior management for the development and implementation of the management system

Section 4: Requirements for resource management including human resources, infrastructure and work environment.

Section 5: Requirements for the processes of the organisation – their specification, development and management including generic processes.

Section 6: Requirements for measuring, assessing and improving the management system
Management System

- A management system shall be established, implemented, assessed and continuously improved.
- Safety shall be paramount overriding all other demands.
- The management system shall promote and support a strong safety culture.
- The application shall be graded to the products and activities of each process.
Management System

The documentation shall include:

- Description of the management system
- Description of the organization structure
- Functional responsibilities, accountabilities, levels of authority and interactions among those managing, performing and assessing work
- Processes and supporting information that explain how the work is prepared, reviewed, carried out, recorded, assessed and improved
Management responsibility

Senior management shall:

- consider satisfaction of expectations of all interested parties
- develop organizational policies
- develop planning
- retain responsibility and authority for the management system

Management commitment at all levels
Planning

Senior Management shall:

- Establish goals and strategies, plans and objectives consistent with policies of the organization
- Develop them in an integrated manner to ensure that collective impact is understood and managed
- Ensure measurable objectives for implementation through processes at all levels
- Ensure regular review and correction of deviations
Resource Management

Senior Management shall:

- Determine and provide resources
- Determine human competencies needed and provide training
- Determine, provide, maintain and re-evaluate infrastructure and working environment
Process implementation

- Development of processes and interactions
  - flows, inputs, outputs, communication and responsibilities

- Process management
  - control of documents, products, records, purchasing, managing organizational changes
Measurement, assessment and improvement

- Monitoring and measurement of effectiveness
- Self assessment at senior management and all levels
- Independent assessment on behalf of SM
- Management system review at planned intervals
- Non conformance, identified, corrective and preventive actions taken
- Improvement opportunities identified and used