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International Atomic Energy Agency

# Management of Processes and Activities

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

Jakarta, Indonesia  
31 July-04 August 2023

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



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# Learning objectives

**This lecture is aiming at :**

- Create a better understanding of processes and the differences between processes
- Introduce typical processes for a regulatory body
- Introduction to process development

# Content

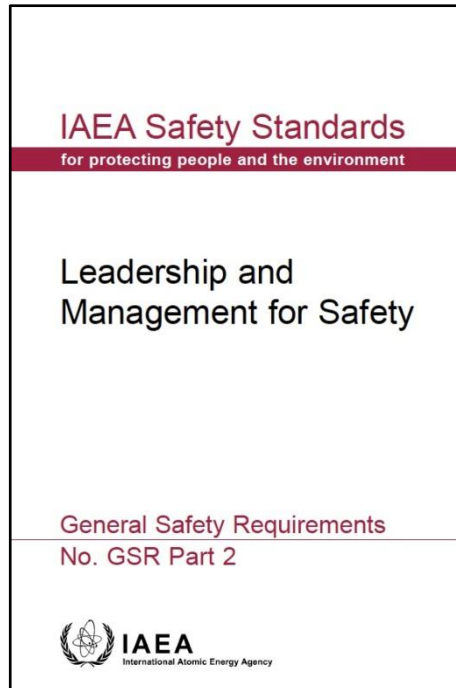
- Introduction
- GSR Part 2 Requirements
- What is process?
- How could a process look like?
- Development of processes
- Key messages



# Introduction

The following aspects will be addressed

- A process describes clearly who is responsible for doing what and crosses all the boundaries of the departments
- A flowchart is a very powerful tool to document processes
- The IAEA recognise 3 categories of processes
  - Management
  - Core
  - Support processes
- Every category is of equal importance
- An organization should select one representation model of a process which should be followed for the whole organization



## GSR Part 2 Requirements

# GSR Part 2: Requirements

Responsibility and Leadership for Safety  
Responsibility for Integration of Safety into the  
Management System  
Culture for Safety

R1: Achieving the  
fundamental safety  
objective

Responsibility  
for Safety

R2: Demonstration  
leadership for safety by  
managers

Leadership for  
Safety

R3: Responsibility of  
Senior Management  
for the Management  
System

Management  
for Safety

R4: Goals,  
strategies, plans and  
objectives

R5: Interaction with  
interested parties

R6: Integration of the  
Management System

R7: Application of  
the Graded  
Approach

R9: Provision of  
Resources

R10: Management  
of Processes and  
Activities

IAEA Safety Standards  
for protecting people and the environment

Leadership and  
Management for Safety

General Safety Requirements  
No. GSR Part 2



Culture for  
Safety

R12: Fostering a  
culture for safety

Measurement,  
Assessment  
and  
Improvement

R13: Measurement,  
assessment and  
improvement of the  
management system

R14: Measurement,  
assessment and  
improvement of the  
management  
system

The Management System  
Management of Resources  
Management of Processes  
and Activities  
Measurement, Assessment  
and Improvements

## GSR Part 2 Requirement 10: Management of processes and activities

- *Processes and activities shall be developed and shall be effectively managed to achieve the organization's goals without compromising safety.*
  - 4.28. Each process shall be developed and shall be managed to ensure that requirements are met without compromising safety. Processes shall be documented and the necessary supporting documentation shall be maintained. It shall be ensured that process documentation is consistent with any existing documents of the organization. Records to demonstrate that the results of the respective process have been achieved shall be specified in the process documentation.

# Requirements

- 4.29. The sequencing of a process and the interactions between processes shall be specified so that safety is not compromised. Effective interaction between interfacing processes shall be ensured. Particular consideration shall be given to interactions between processes within the organization, and to interactions between processes conducted by the organization and processes conducted by external service providers.
- 4.30. New processes or modifications to existing processes shall be designed, verified, approved and applied so that safety is not compromised. Processes, including any subsequent modifications to them, shall be aligned with the goals, strategies, plans and objectives of the organization.

# Requirements

- 4.31. Any activities for inspection, testing, and verification and validation, their acceptance criteria and the responsibilities for carrying out such activities shall be specified. It shall be specified when and at what stages independent inspection, testing, and verification and validation are required to be conducted.

# Requirements

- 4.32. Each process or activity that could have implications for safety shall be carried out under controlled conditions, by means of following readily understood, approved and current procedures, instructions and drawings. These procedures, instructions and drawings shall be validated before their first use and shall be periodically reviewed to ensure their adequacy and effectiveness. Individuals carrying out such activities shall be involved in the validation and the periodic review of such procedures, instructions and drawings.



**What is process ?**

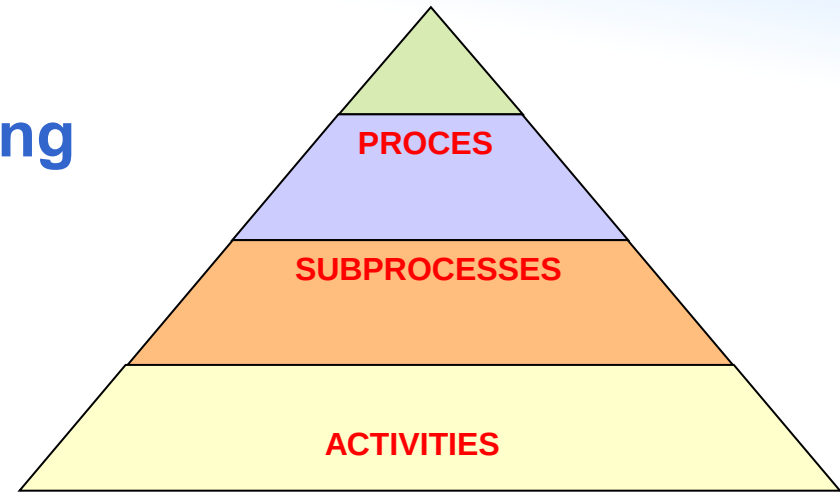
# Definition of the process

A “Process” is defined as a  
**“Set of interrelated or interacting activities, which transforms inputs into outputs”**

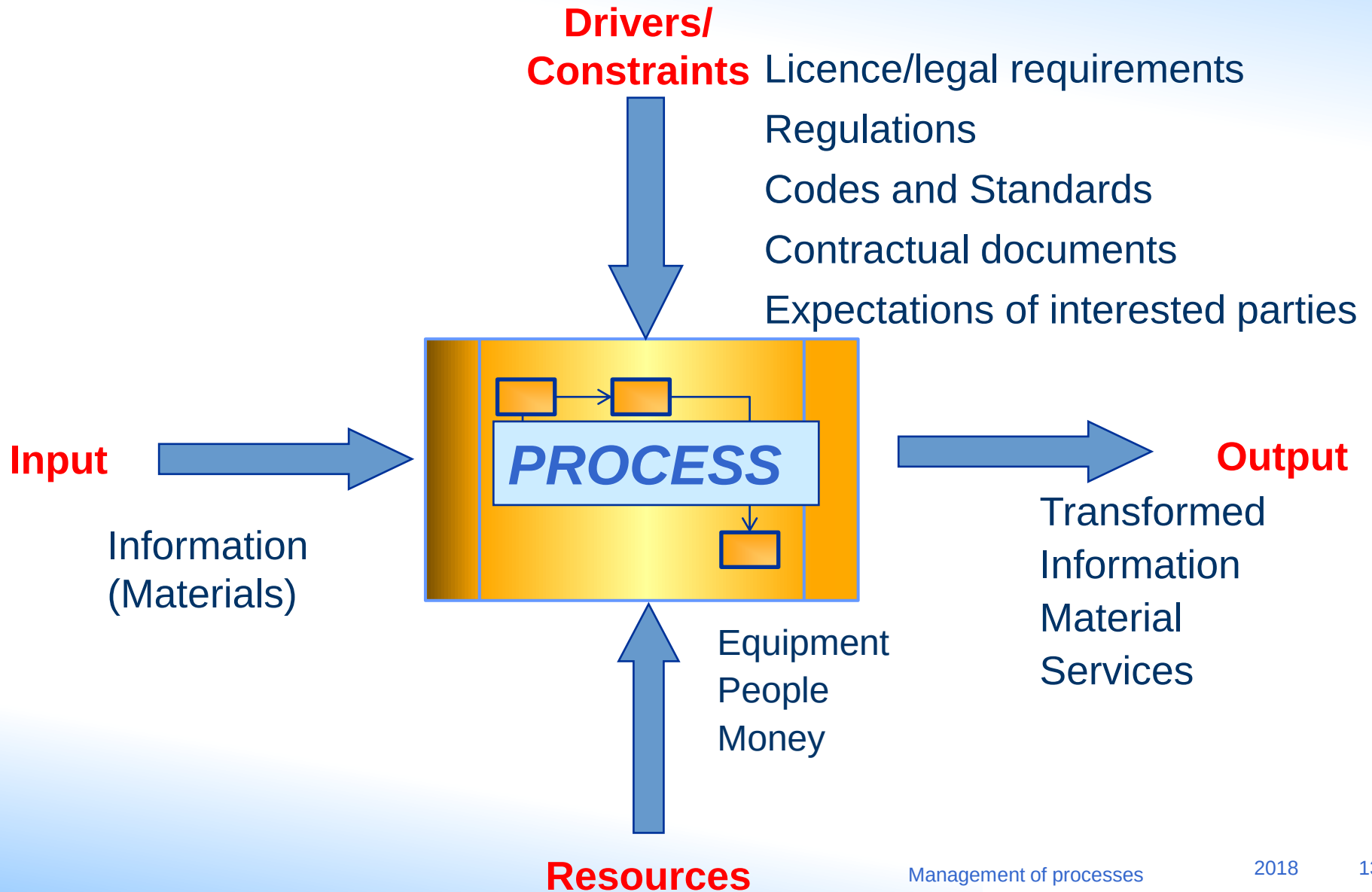
- A product is the result or output of a process

Source: IAEA Safety Glossary, 2018

GROUP OF PROCESSES



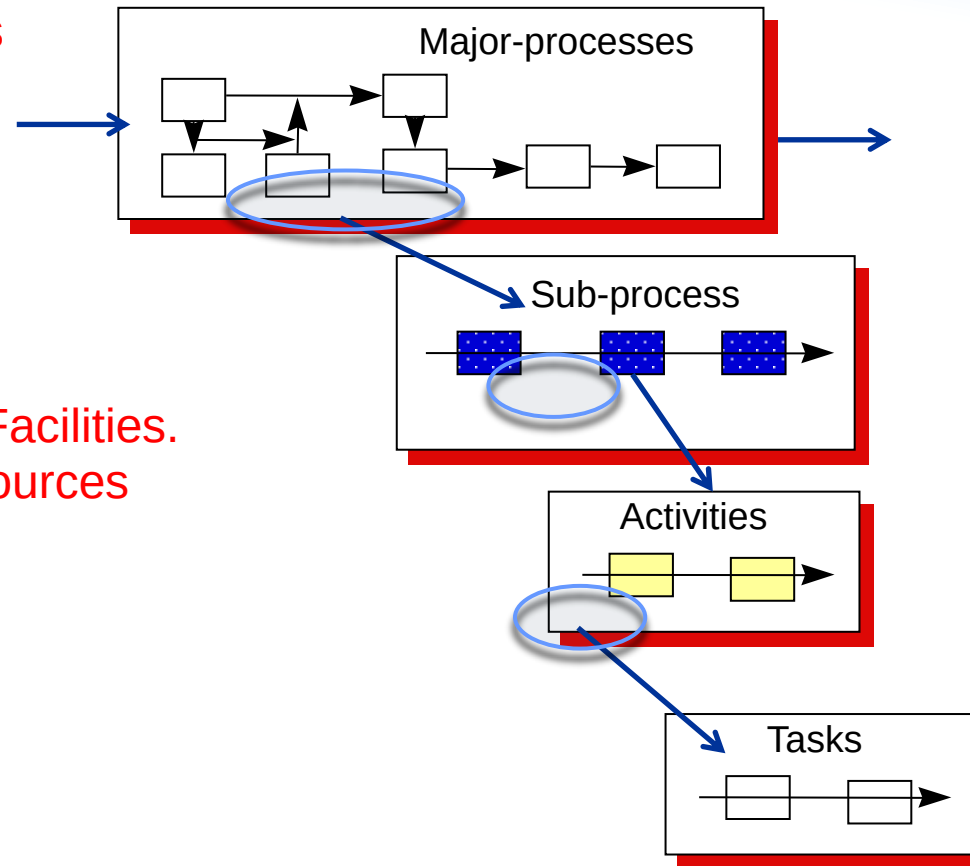
# Process Building Block



# Process Hierarchy

Process can be decomposed into smaller components that make up a hierarchy. An example of a hierarchy:

- Process  
Carrying out Inspection (The process should be described in procedure)
- Departmental Process  
Inspection department (leading)
- Sub-process  
Developing Annual Inspection Plan  
Developing Inspection Program  
Carrying out Inspections of Nuclear Facilities.  
Carrying out Inspection of Radiation Sources
- Activities  
Examination of Documentation  
Making Measurements  
Preparation of Inspection Report
- Tasks



# Procedures, Instructions

- A procedure is defined as „**a series of specified actions conducted in a certain order or manner.**

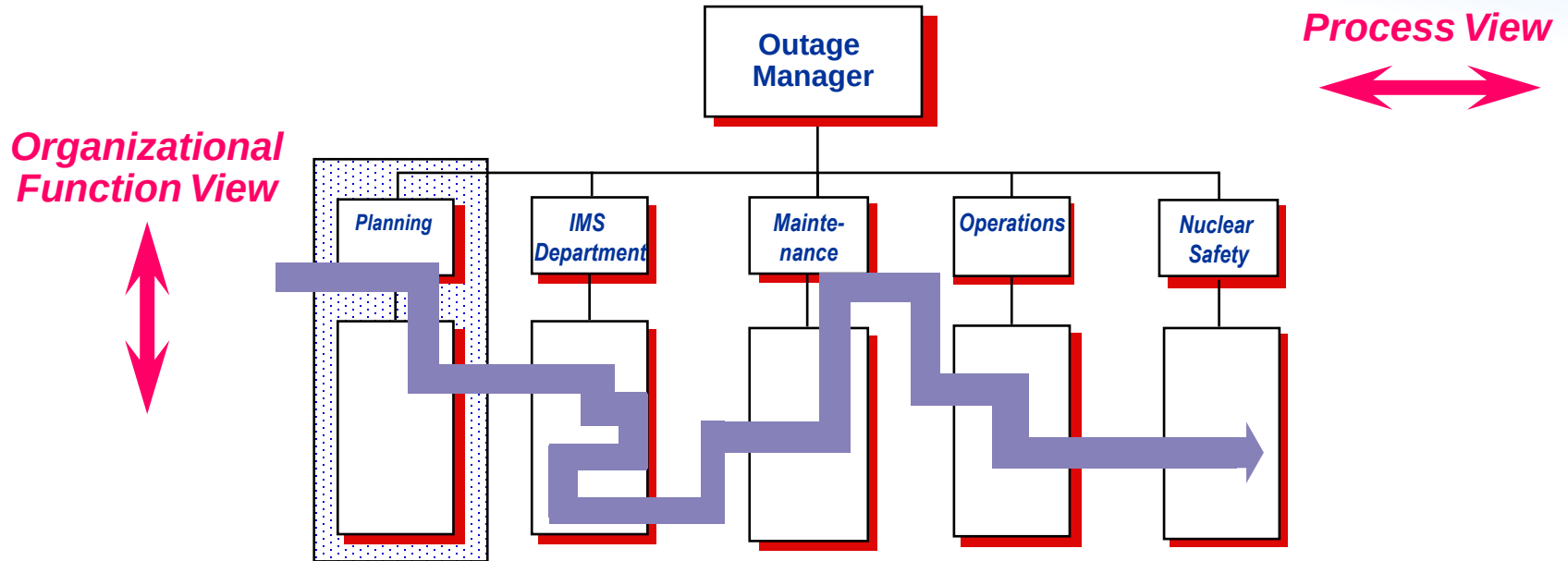
Source: IAEA Safety Glossary, 2018

- A **procedure** defines, e.g.:
  - The responsibilities of an activity
  - What should be done
  - What are the results

# Procedures, Instructions

- The set of actions to be taken to conduct an *activity* or to perform a *process* is typically specified in a set of **instructions**. Source: IAEA Safety Glossary, 2018
- **Instruction** describes in detail, e.g.:
  - the tasks which should be performed
  - Checklists to be filled in
  - Information to be checked
- Instructions are usually used to ensure a process has been performed precisely in compliance with regulations and safety guides, e.g., to conduct licensing process

# Process versus Functional View



*Processes cross organizational boundaries.  
Processes enhance horizontal organizational intelligence*

# Example: Process maps

## Management Processes

Strategic  
Planning

Continuous  
Improvement

IMS  
Administra-  
tion

Culture  
enhancement  
and  
improvement

Organization  
Mngt

## Core Processes

Development  
of  
Regulations  
Guides

Notification  
and  
authorization

Review &  
Assessment  
of Facilities  
and Activities

Inspection &  
Enforcement

Communic &  
Consultation  
with  
Interested  
Parties

Emergency  
Predared.  
&  
Response

## Support Processes

Human  
Resourc  
e Mngt

Procure-  
ment

IT  
Mngt

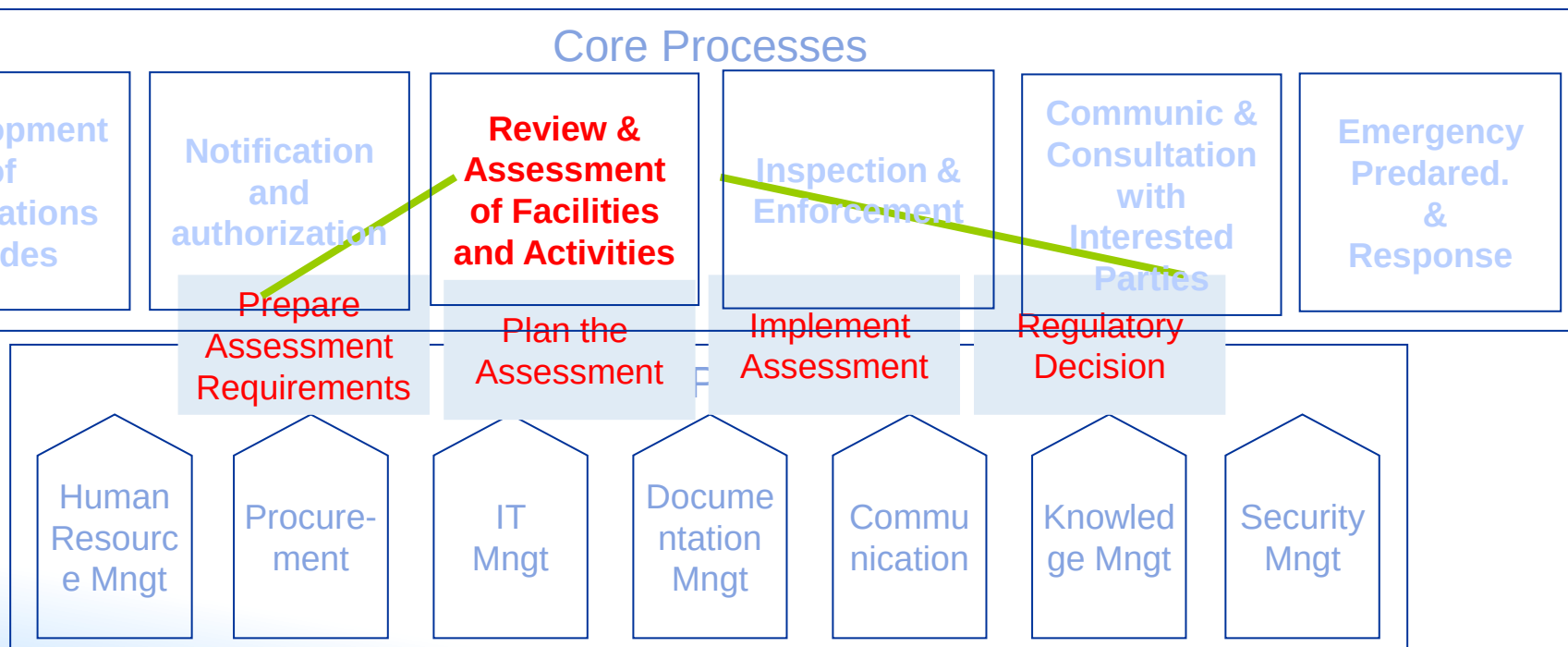
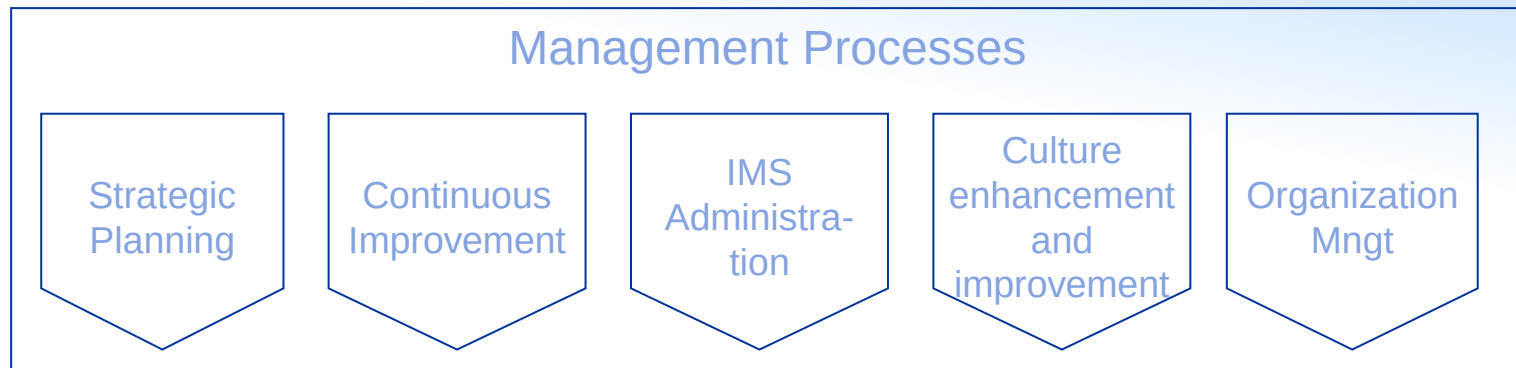
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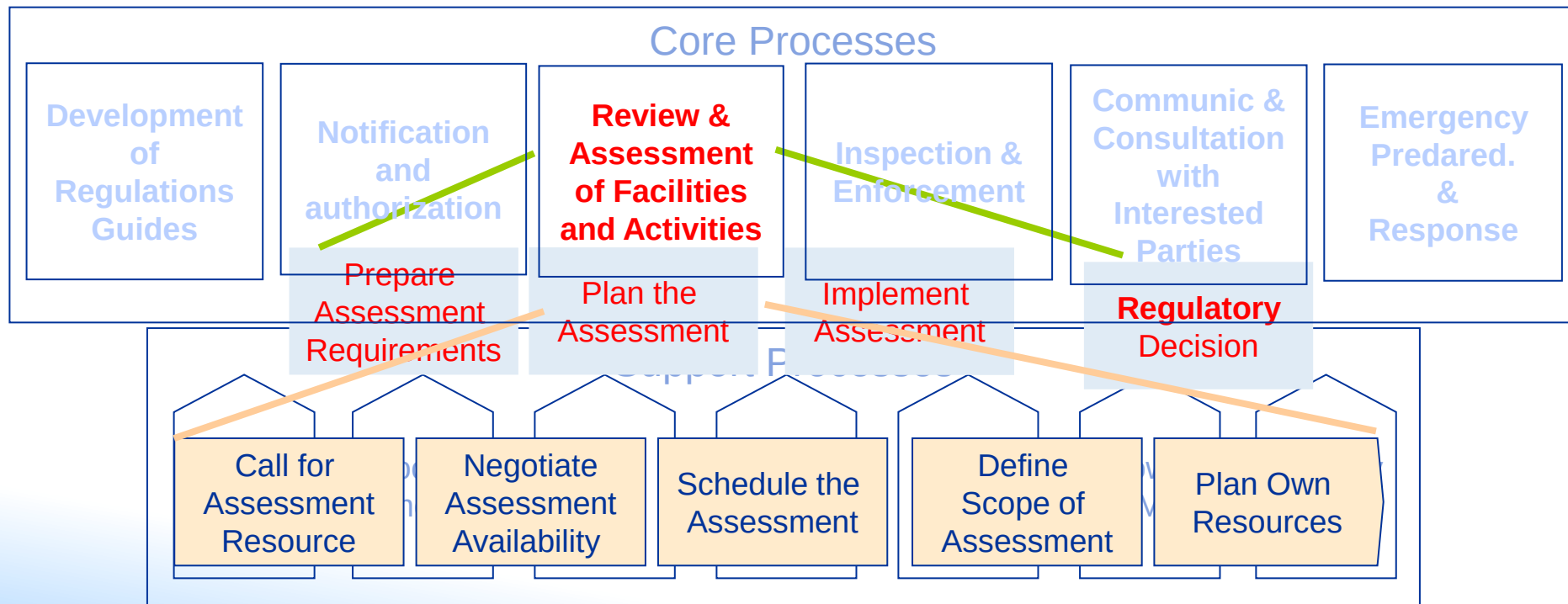
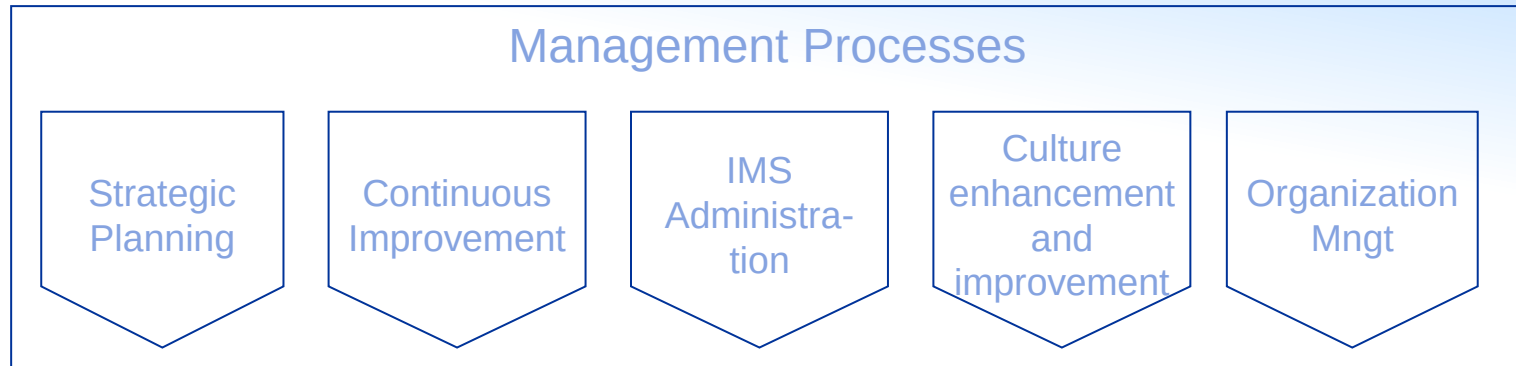
Knowled  
ge Mngt

Security  
Mngt

# Example: Process maps (2)



# Example: Process maps (3)



# Categories of processes

- The operation of an organization is based on several different processes
- All activities of an organization should be covered by identified processes
- An integrated management system is based on the process approach and includes all activities performed within regulatory body

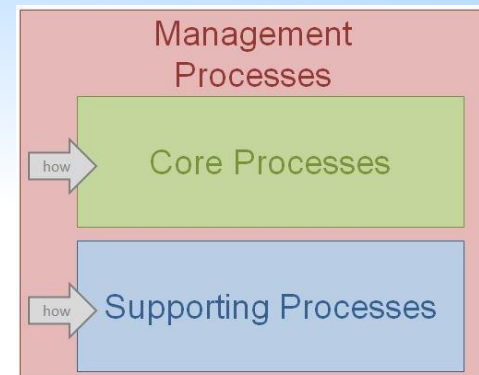
# Categories of processes

- Processes are defining the responsibilities for activities along the organization
- It is essential to use a structured approach to developing the processes to achieve integrated management
- IAEA recognises 3 categories of processes
  - Core processes (sometimes called *key* or *business processes*)
  - Management processes
  - Support processes

# Categories of processes



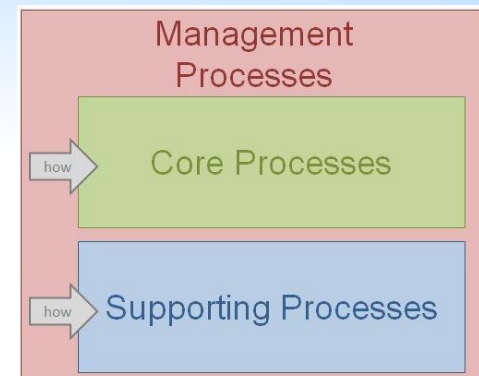
- There are several **core functions** that the regulatory body should fulfil in order to meet its regulatory responsibilities
- There are several **supporting functions** necessary to enable fulfilment of core functions
- **Management function** are necessary to enable the regulatory body to sustain an efficient and effective organization



Source: IAEA Safety Standard DS 472

# Categories of processes

- All these functions (management, core and supporting) should be organized in their associated processes and should be represented in the regulatory body integrated management system
- Processes necessary for the regulatory body to discharge its responsibilities should be:
  - Identified and defined
  - Documented



# Process model: Core processes

- The core processes help the regulatory body to perform its core functions (GSG 12)
- The following considerations could facilitate to identify core processes.
  - Do they provide critical outputs of the organization
  - Do they have the greatest impact on performance (safety, quality, cost, speed, innovation)
  - Do they reflect the unique competencies
  - Do they are **value-creating** activities
  - Do they have the greatest **impact on safety**
  - **Are (normally) not been outsourced**

# Process model: Core processes

- The description of **core processes** is given in detail in IAEA GSG-13 “Functions and processes of the Regulatory Body” namely:
  - The development of regulations and guides;
  - Notification and Authorization;
  - The review and assessment of facilities and activities;
  - The inspection of facilities and activities;
  - The enforcement of regulatory requirements;
  - Communication and Consultation with Interested Parties
  - Emergency Preparedness and Response

# Core processes of a RB

## Management Processes

Strategic  
Planning

Continuous  
Improvement

IMS  
Administra-  
tion

Organization  
Mngt

## Core Processes

**Development  
of  
Regulations  
Guides**

**Notification  
and  
authorization**

**Review &  
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of Facilities  
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**Inspection &  
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**Communic &  
Consultation  
with  
Interested  
Parties**

**Emergency  
Predared.  
&  
Response**

## Support Processes

Human  
Resource  
Mngt

Procure-  
ment

IT  
Mngt

Docume  
ntation  
Mngt

Commun  
ication

Knowled  
ge Mngt

Security  
Mngt

# Process model: Management processes



- Management processes are processes used primarily by Senior Management to describe how it sets and communicates expectations and how it exercises control
- Management processes are concerned with the governance and management of the regulatory body, strategic planning, the provision of resources, competence management, and evaluation and audit (Source GSG 12)

# Process model: Management processes



- These processes provide direction and structure for an organisation. They are generally implemented by senior management and include:
  - set organisational goals
  - direct and manage the organisation
  - manage external relationships and interfaces
  - manage and improve the processes
  - assess and improve performance of work

# Typical management processes of a RB

## Management Processes

**Strategic  
Planning**

**Continuous  
Improvement**

**IMS  
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**Culture  
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## Core Processes

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# Process model: Supporting processes

- Support processes are all processes whose sole purpose is to ensure the functioning of core processes and management processes (<https://managementmania.com/en/support-processes>)
- Support processes Support the functioning of the regulatory body, such as human resource management, financial management, purchasing, information technology and document control. (Source :GSG 12)
- Support processes do not directly create products or services but are necessary to facilitate or assist the execution of core or management processes

(<http://www.ittoday.info/ITPerformanceImprovement/Articles/2012-04Lehmann.html>)



# Process model: Supporting processes

- There are several supporting functions that are necessary to ensure that the core functions can be performed efficiently and effectively. According to the GSG 13 these include:
  - Administrative support, including human resources, finance, management of relevant documents and records, equipment purchasing and control
  - Legal assistance
  - Research and development processes
  - Arrangements for contracting external expert support, where needed
  - Establishment of advisory committees
  - Organization of international links and cooperation

# Typical support processes of a RB

## Management Processes

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## Support Processes

Human  
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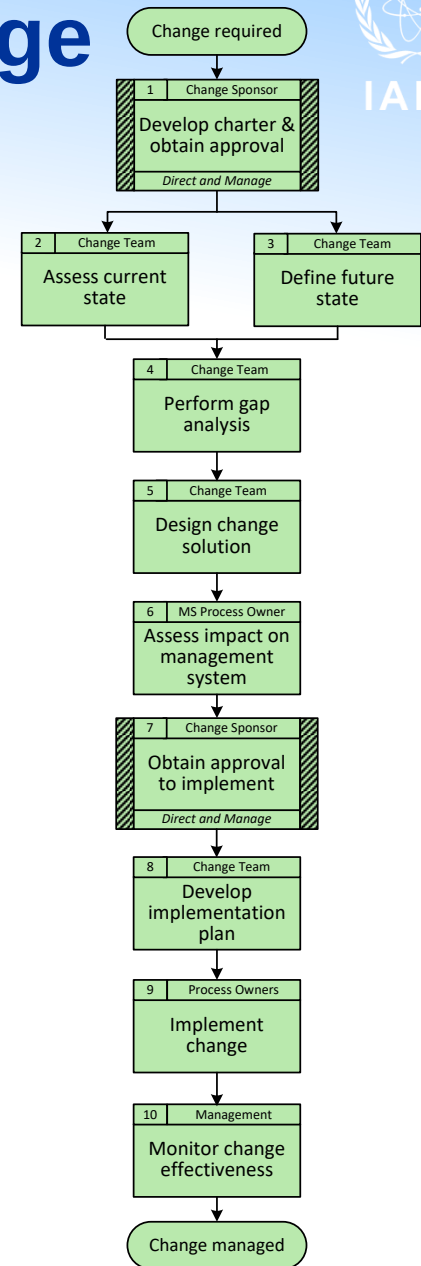
# Challenge



**HOW could a process look like?**

# Basic Flowchart Managing Change

- Symbol for other process to avoid duplication



# Managing Organizational Changes

## 1. Responsible Manager

- identifies necessary organizational changes
- draws up initial proposal

## 2. Division Manager

- assesses proposal
- appoints, in case of safety related subject, authorizers and internal reviewers

## 3. Authoriser

- draws up draft implementation plan
- proposes classification
- processes comments

## Reviewers

- execute initial assessment

## 4. Division Manager

- approves proposal
- starts, if necessary, an RSC\* assessment
- requests advice, if necessary, from Manager Human Resources, Management System Representative and Radiation Protection Supervisor

## 5. RSC\*

- executes assessment and issues advice

## Manager Human Resources

- requests Management Team and Labour Council, if necessary, for assessment
- issues advice

## Radiation Protection Supervisor

- issues advice

## Management System Representative

- issues advice

## 6. Division Manager

- assesses advices
- adjusts, if necessary, the implementation plan
- approves implementation plan

## 7. Head of operating organization

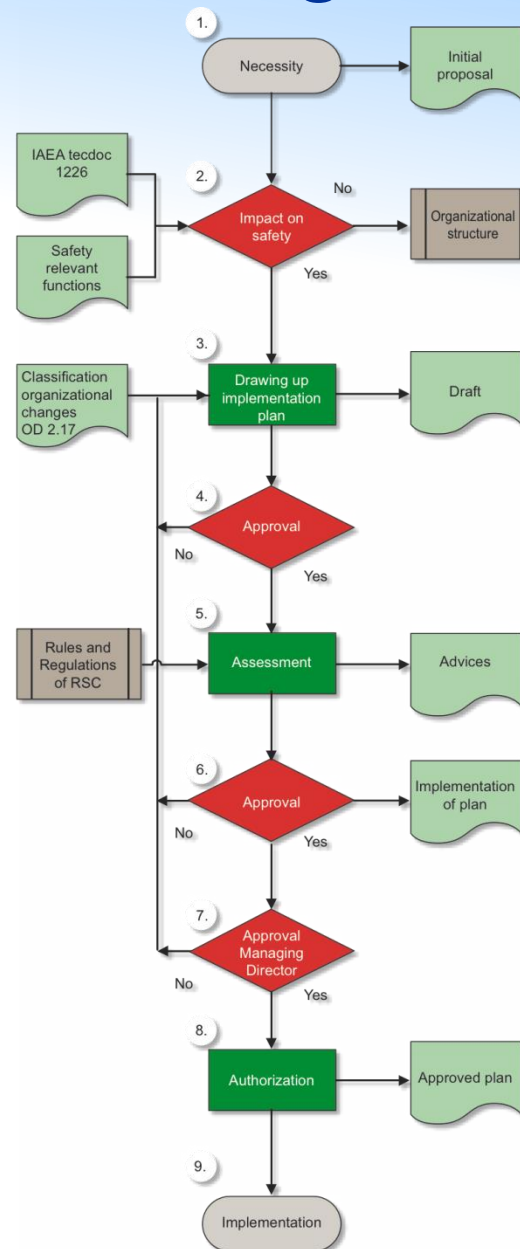
- requests, if necessary, the approval of the Regulatory Body

## 8. Head of operating organization

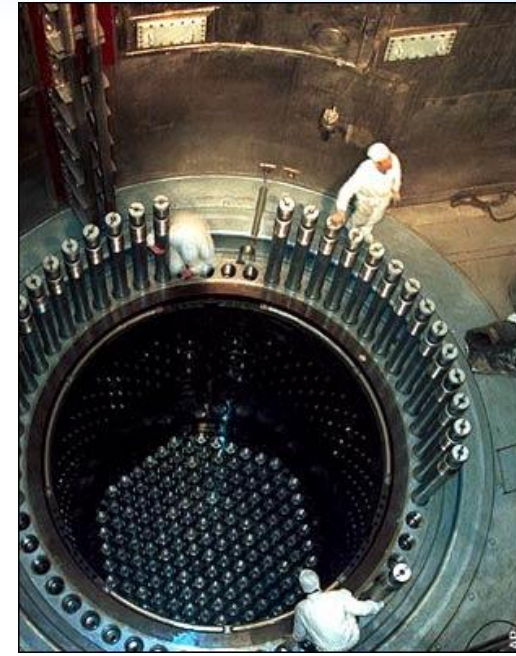
- authorizes implementation plan

## 9. Division Manager

- is responsible for implementation



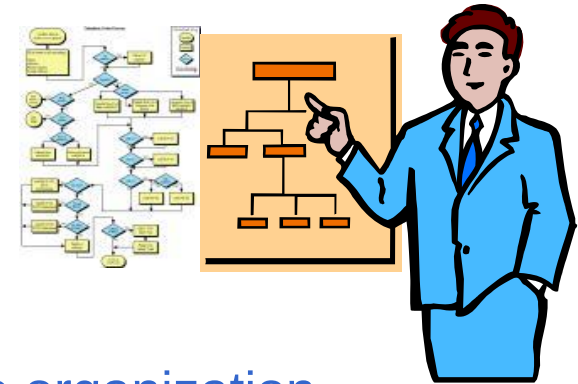
\*RSC: Reactor Safety Committee



# Development of processes

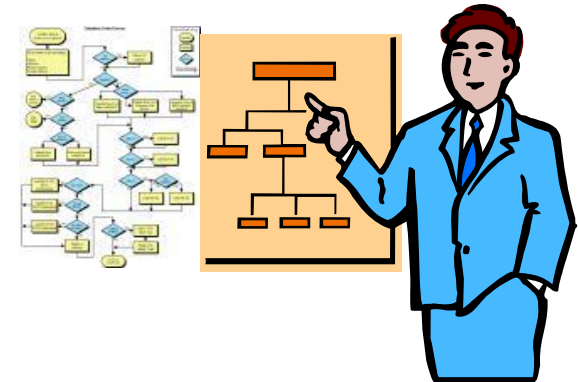
# An approach to Process Mapping

- Describing the sequence of actions necessary to accomplish the work may take the form of **a flow chart or process map**
- The process map help to understand how the work is to be conducted
- The related text to the process map should be simple and direct
- For the process mapping the following should be selected in advance:
  - A generic process mapping style for the whole organization
  - Unique tools for process mapping (SmartDraw, Visio, ARIS, etc.)
  - Experienced representatives of each department



# An approach to Process Mapping

- The process mapping should be done on identification off all processes, subprocesses and activities of organization
- It is recommended that at first only few processes are mapped and later on the mapping is extended for the whole organization.

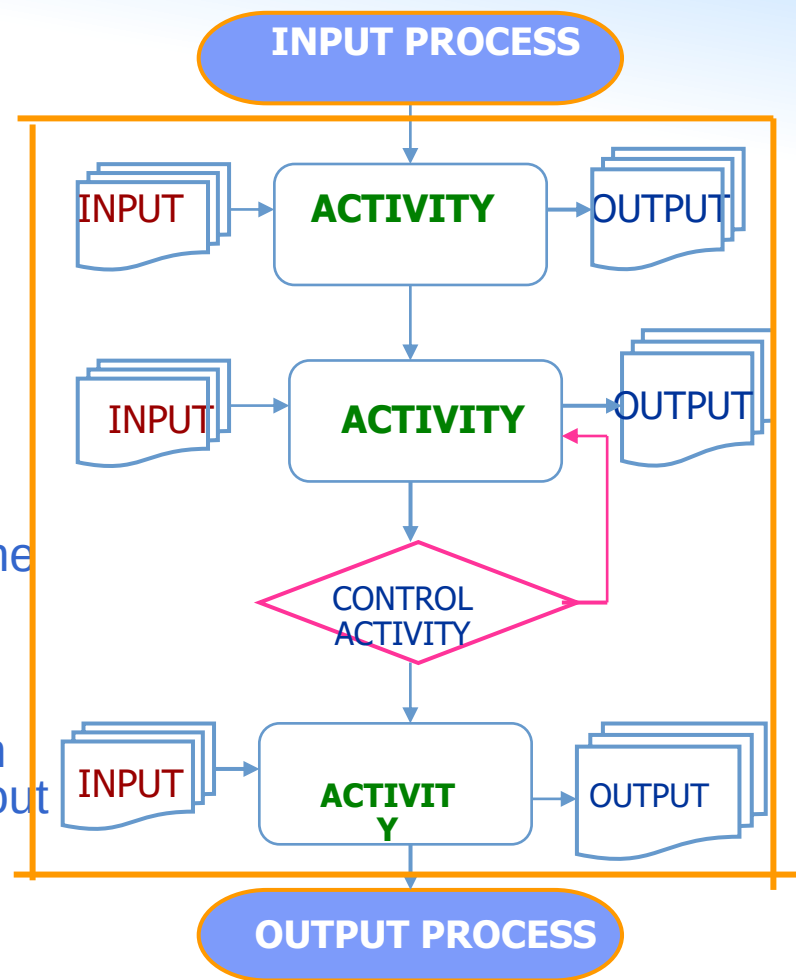


# An approach to Process Mapping

Process must be documented,.  
Description must define at least:

- Purpose and objective of the process
- Responsibilities
- Interaction with other processes and/or subprocesses
- Inputs into the process including applicable regulatory, statutory and legal requirements
- Outputs from the process
- All resources needed for the performance of the process
- Sequence of activities
- Phase approach of process implementation in case work, services or processes are carried out in a wrong way
- Records as written proofs on performed activities or achieved results
- Indicators measuring effectiveness /efficiency

- All resources needed for the performance of the process;
- Information and other inputs which are the basis for the start of a process or individual activities in the process;
- Limits of the process;
- Sequence of activities;



# Development of the processes

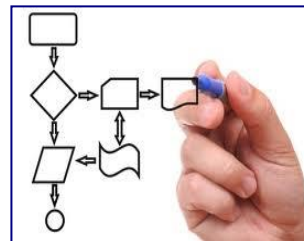
- Identify and clarify the constraints or requirements that affect how a process operates
- Assign a process owner
- Select a process team; the team leader, normally the process owner, representatives from different departments, facilitator
- Define the objectives of a process
- Define the different activities in a process
- Assign responsible persons and the related actions
- Create a logical hierarchy of the activities/sub processes

# Development of the processes

- Define the major inputs and outputs (results of activities) and interested parties
- Identify risks and define preventive measures
- Determine how the process interacts with other processes to enable the achievement of the organization's objectives
- Identify indicators to measure effectiveness
- Prepare detailed instructions when required
- Verify inputs, outputs, resources needed, interfaces between processes, results against goals

# Process owner

- All processes should have clearly defined process owner
- Process owner is a designated individual who has the authority and responsibility for single process
- Process owner should have a good understanding of her/his process
- According to the size of RB, its organization and complexity the process owner can be:
  - Designated individual (larger organizations)
  - Leaders or managers, head of departments (smaller organizations)



Sources:

- GS-G-3.1

- <http://www-ns.iaea.org/training/ni/train-on-ss3.asp> E & T on IAEA Safety Standards

**SST-01 Training Course on Management Systems based on GS-R-3 Modul 5, Vienna 2007**

- PICTURE: <http://www.google.com/search?q=process+owner+photo&rlz=com.microsoft.sl:IE- SearchBox&tbm=isch&tbo=u&source=univ&sa=X&ei=J97vUblVoc3Usgaa2IHAAQ&ved=0CCgQsAQ&biw=983&bih=548>

# Process owner

## Process owner:

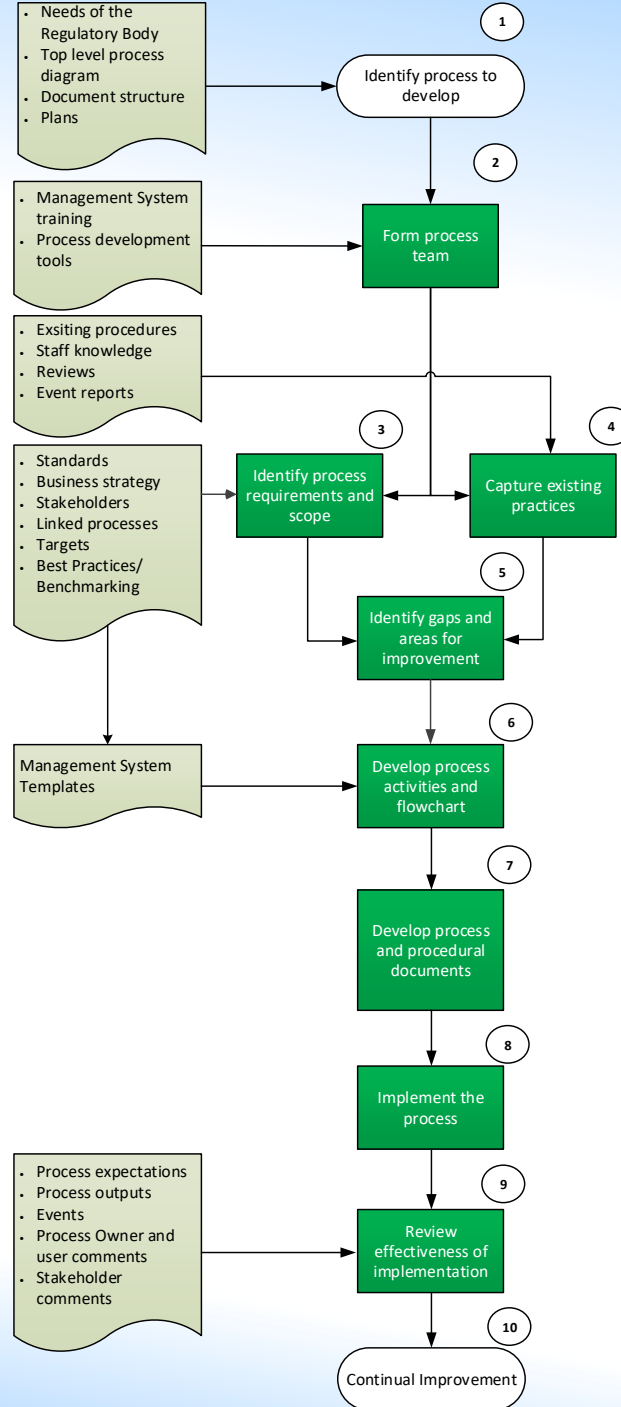
- Should have the authority to:
  - Assess impact of the process on safety, organisational plan and objectives
  - To cooperate with the process owners of interfacing processes;
  - To ensure that staff involved in the process is trained and familiar with the process and process documentation
  - Documenting the process and identify supporting documentation (procedures, working practices, record formats etc.)
  - Ensuring that management system documentation reflects the actual situation
  - To identify the inputs, outputs, resources and constraints for each process
  - To ensure process documentation incorporates all relevant legal requirements
  - To ensure that the records requirements are specified within the process documentation

# Process owner

## Process owner:

- Should have the authority to:
  - To ensure that records are kept and are stored in a suitable place
  - Monitor the effectiveness of the process
  - Monitor and control the major resources used in the process
  - Should identify, use and monitor indicators of performance
  - Propose and initiate changes in the process
  - Introduce changes into procedures, instructions, templates
  - To prepare periodic reports on the process

# Process development



## Step 1.

- Process chosen will depend on interactions with other processes
- The first process that may be required is usually connected with management system specification

## Step 2.

- Size and skills of team depends on type of process and experience of Process Owner
- If necessary Process Owner arranges for team to be trained in process development

## Step 3.

- Collate process requirements by analysis of relevant standards, specifications
- Produce common set of requirements

## Step 4.

- In consultation with stakeholders identify and capture details of the existing process and techniques
- Produce flowcharts describing existing practices

## Step 5.

- Requirements must be specified for the process and Improvement Opportunities identified

## Step 6.

- Different techniques may be used to define the process steps
- Involve the team, other staff, and stakeholders

## Step 7.

- Supporting procedures may include sub-processes, procedures, computer systems, etc.
- Output requirements
- Risk Assessment may be required before proceeding to process implementation

## Step 8.

- Communicate and train staff
- Provide resources
- Provide support
- Monitor and report progress

## Step 9.

- Carry out assessments of process effectiveness against requirements
- Obtain stakeholder feedback

## Step 10.

- Review processes at regular intervals to ensure they still comply with business and external requirements, and implement improvement opportunities

# Advantages of a Process Approach

- Desirable results can be achieved more effectively if activities and resources related to them are managed as a process
- Efficient resource management focussing on safety aspects
- Clear responsibilities
- Elimination of duplication
- Clarify process interactions with other processes
- Identify activity/sub process to be done/decision to be made and who is responsible
- Create a logical hierarchy of the activities/sub processes
- Clarify the constraints or requirements that affect how a process operates
- Identify the result of an activity

# Key messages

- A process based management system based on GSR Part2 will enhance the effectiveness and efficiency of the organization and ensure at the same time that safety is not compromised
- Flowchart will introduce a better definition of the responsibilities, better aligned processes and better integration of all requirements in order not to jeopardize safety
- Although the IAEA recognise 3 categories of processes they are all of the same importance
- An organization should select one representation model of a process which should be followed for the whole organization



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*Thank you!*

