

NUCLEAR SAFETY and LICENSING

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- Licensing Process

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Nuclear Safety

In accordance with IAEA Safety Glossary, 2018 Edition:

«The achievement of proper operating conditions, prevention of accidents and mitigation of accident consequences, resulting in protection of workers, the public and the environment from undue radiation risks.»

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Nuclear Safety

IAEA Fundamental Safety Principles (SF-1) defines nuclear safety fundamental and objectives:

- The fundamental safety objective is to protect people and the environment from harmful effects of ionizing radiation.

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Nuclear Safety

- From this fundamental safety objective, 10 principles were derived.
- This fundamental safety objective should be fulfilled without unduly limiting the operation of facility or activity.
- This fundamental safety objective applies through entire lifetime of all facilities from planning to decommissioning phase.

Nuclear Safety

- To ensure that the highest standards of safety are achieved , measures have to be taken:
 - To control the radiation exposure of people and the release of radioactive material to the environment,
 - To restrict the likelihood of events that might lead to a loss of control over a nuclear reactor core, nuclear chain reaction, radioactive source or any other source of radiation,
 - To mitigate the consequences of such events if they were to occur.

Nuclear Safety-Safety Principles

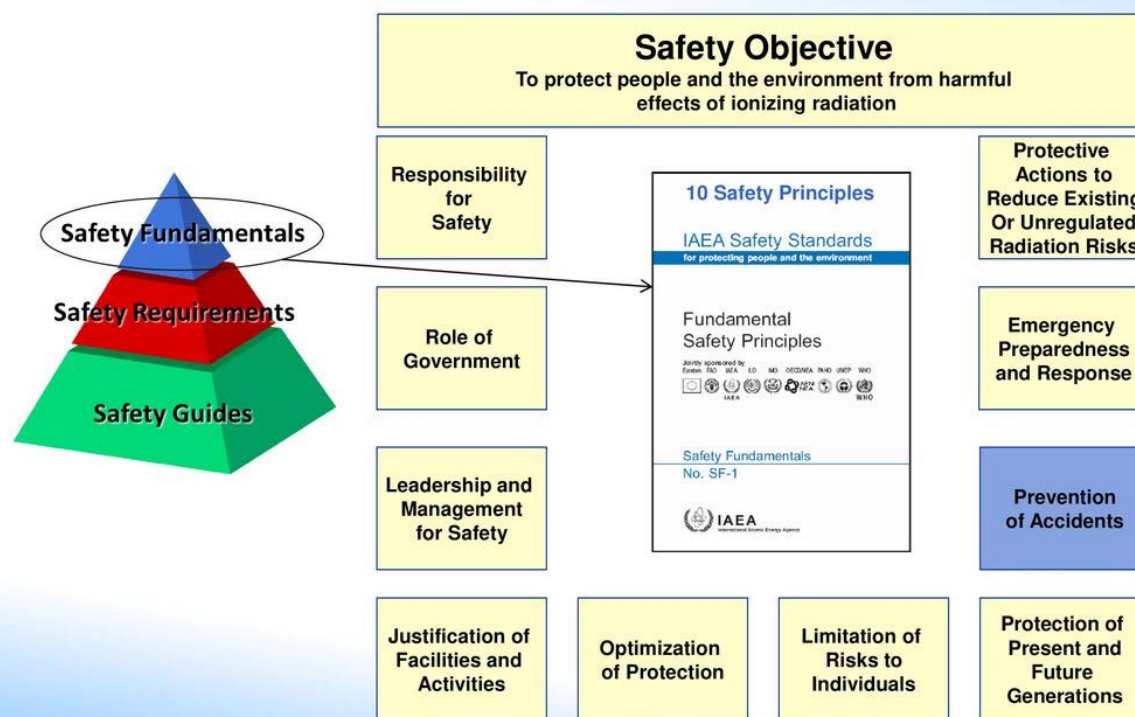
1. Responsibility for Safety
2. Role of Government
3. Leadership and Management for Safety
4. Justification of Facilities and Activities
5. Optimization of Protection
6. Limitation of Risks to Individuals
7. Protection of Present and Future Generations
8. Prevention of Accidents
9. Emergency Preparedness and Reponse
10. Protective Actions to Reduce Existing or Unregulated Radiation Risks

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Fundamental Safety Principles



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Safety Approach

- Multistep Licensing
 - Under revision based on lessons learned from the Akkuyu NPP licensing
- Determination of Licensing Basis
 - List of regulations, guides, codes and standards to be used during the authorization process
 - Hierarchy defined by a Directive
 - Turkish legislative and regulatory documents
 - IAEA Safety Fundamentals and Requirements
 - Legislative and regulatory documents proposed by applicant
 - Vendor country documents
 - Laws and regulations on issues insufficiently addressed above
 - Codes and standards used in design
 - Third party documents
 - Same hierarchy for the guides, codes and standards

Safety Approach

- Multistep Licensing

Licensing Basis

- List of regulations, guides, codes and standards to be used during the authorization process
- Hierarchy defined by a Directive
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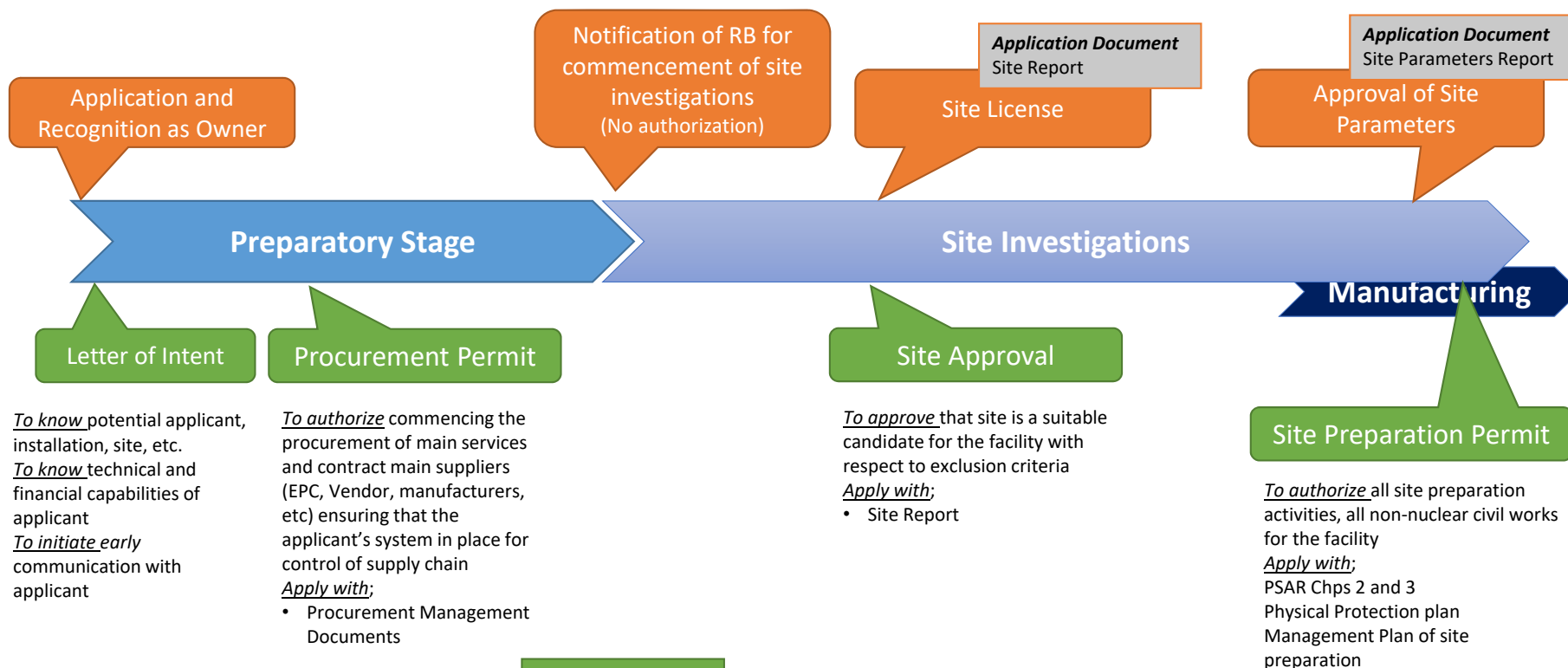
Safety Approach-Reference Plant

- Definition
 - An NPP of similar design, currently operating, or
 - An NPP of similar design, authorized for construction by a competent RB and under construction
- Approval mechanism
 - Submission of a report
 - Rationale of selection, details of reference plant, authorizations received, and comparison with proposed design

Regulations defining the authorization process

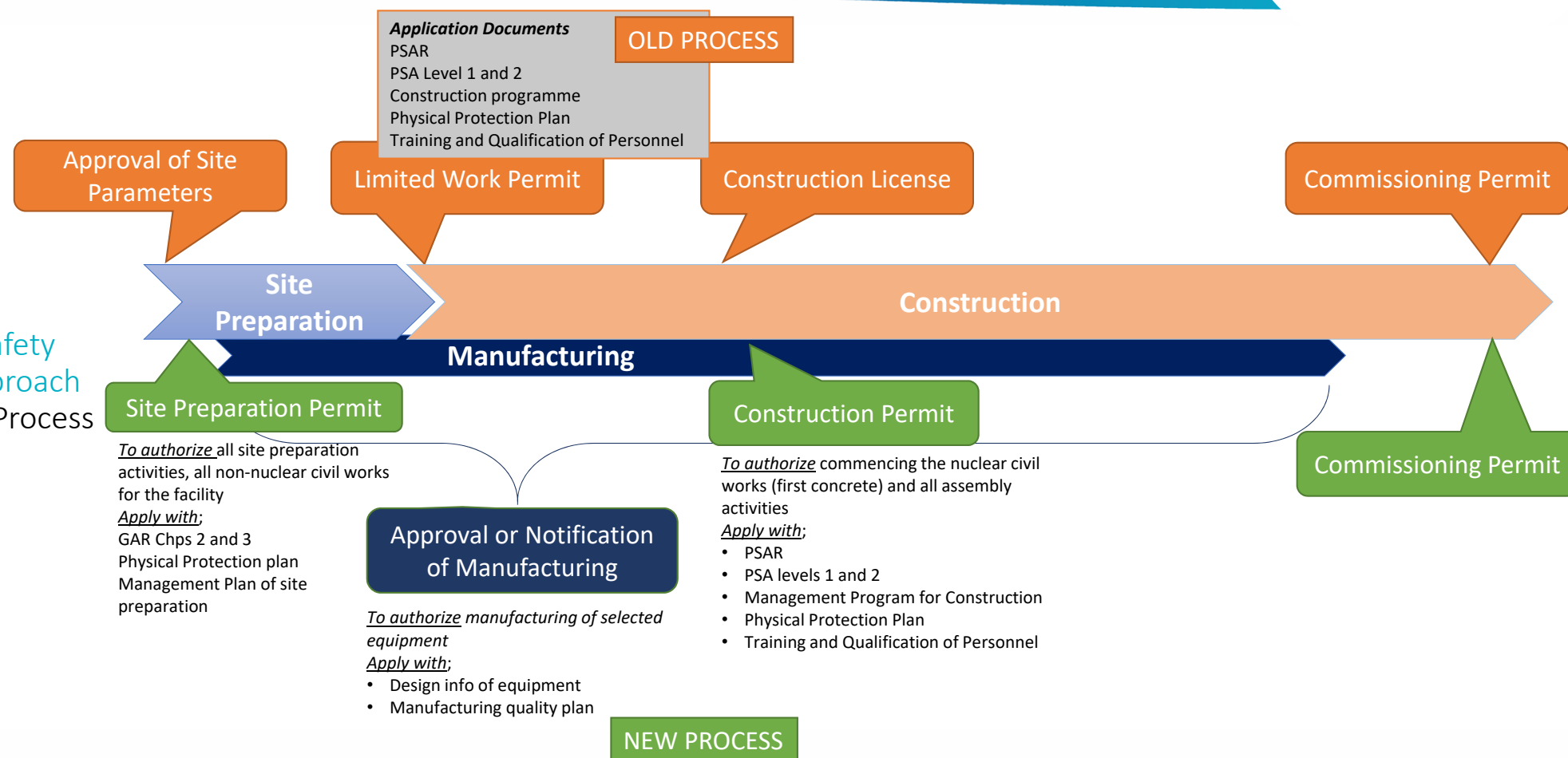
- Decree on Licensing of Nuclear Installations
 - Who will apply
 - Documents for application
 - Authorizing body of TAEK
 - Authorization conditions
 - Main authorizations in stages (licenses), sub-stages (permits) and notifications/recognitions
- Regulation on Equipment Procurement Process and Approval of Manufacturers for Nuclear Installations
 - Procurement permit
 - Approval of manufacturing of long lead items and manufacturers
- Regulation on Clearance and Release of Site from Regulatory Control in Nuclear Installations
 - Decommissioning and Release from Regulatory Control

OLD PROCESS



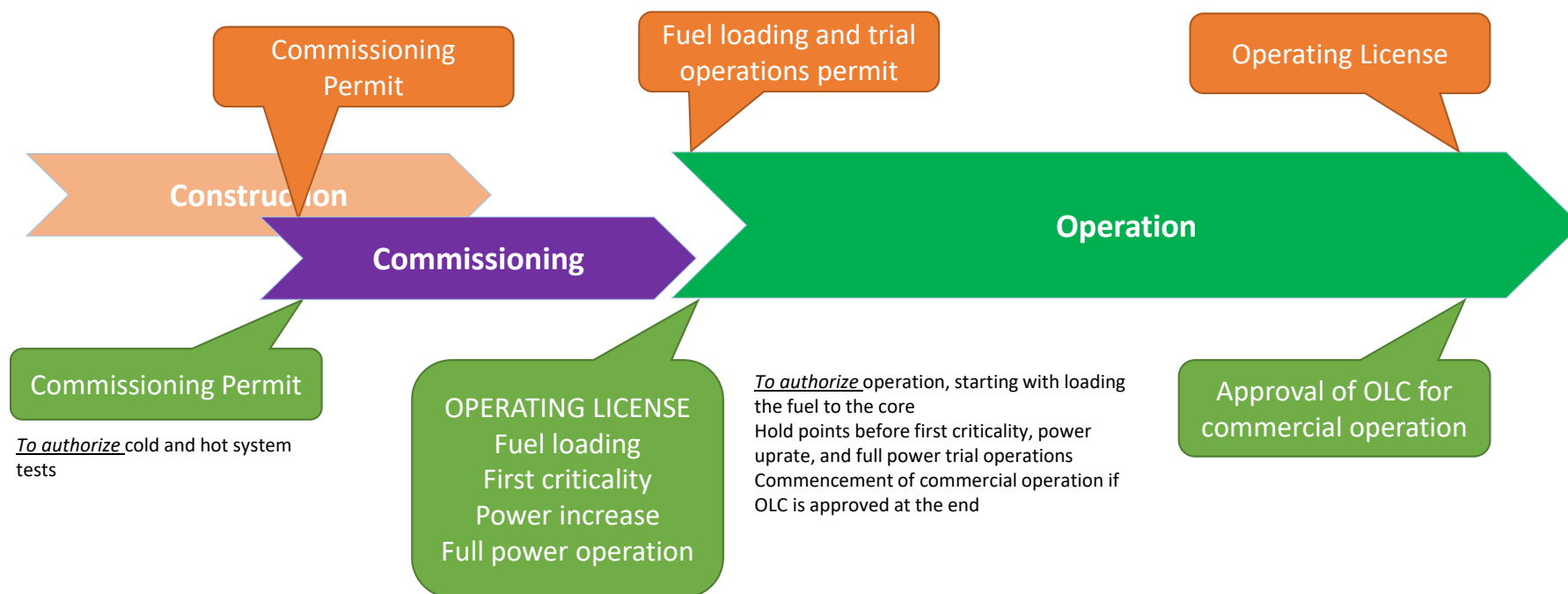
NEW PROCESS

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OLD PROCESS



NEW PROCESS

OLD PROCESS

Modification permits

Decommissioning Permit

Release from regulatory control

..... Operation

Decommissioning

Permit for returning to operation

Modifications permit

Decommissioning permit

Release from regulatory control

To authorize start-up after long term shutdown or after an automatic shutdown because of exceeding OLC

To authorize safety significant modifications to design, OLC or operation procedures or any approved document or activity

To authorize safe decommissioning of the facility and/or unit

NEW PROCESS

Application Documents for Construction

- PSAR
- PSA Level 1 (and level 2)
- Construction Program
- QMS for Construction
- Physical Protection Plan
- Conf. MS documents
- Environmental Monitoring Program
- Personnel Training and Qualification Program
- Differences from reference plant and their impact on safety
- Independent safety evaluation

Application Documents for Commissioning

- Commissioning program
- Commissioning organization and personnel
- Final design and QA of systems and components
- Results of preoperational tests
- Preliminary operational limits and conditions
- Operation manuals of systems and components
- QMS for commissioning

Application Documents 2 (Programs)

- Maintenance
- Fuel and Core Management
- Waste Management
- Ageing Management
- Equipment Qualification
- Fire Protection
- Chemical Control
- Nuclear Material Accounting and Control
- Physical Protection Plan
- Independent tests and inspection reports

Application Documents for Operation

- FSAR
- Fuel loading, criticality and test operations program
- Results of commissioning
- QMS for stage
- Operating manuals of the installation
- Emergency Response Plans
- Operating organization and personnel
- Results of tests performed
- Final version of Operating Limits and Conditions
- Operating procedures

Application Documents 2 (Programs)

- Radiation Protection Program
- Operational Experience Program
- Safety Performance Monitoring Program
- Human Factors Program
- Surveillance and In-Service Inspection Program
- All revised procedures, plans and programs

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THE END...

Thank you for your attention.