



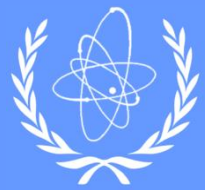
L03.- Safety Assessment GSR Part 4 (I)

International Atomic Energy Agency



OBJECTIVE

- ✓ **Basis for requiring a safety assessment, derived from the Fundamental Safety Principles**
- ✓ **Graded approach**
- ✓ **Assessment of the features relevant to safety**
- ✓ **Defence in depth**
- ✓ **Safety Analysis**
- ✓ **Documentation and Independent verification**
- ✓ **Management, use and maintenance of the safety assessment**



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Introduction

Safety assessments are:

- To be undertaken as a means of evaluating compliance with safety requirements (and thereby the application of the fundamental safety principles);
- Applicable to all facilities and activities;
- To determine the measures that need to be taken to ensure safety;



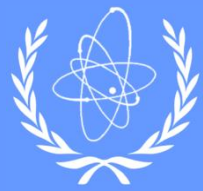


Introduction

Safety assessments are to be:

- Carried out and documented by the organization responsible for operating the facility or conducting the activity;
- Independently verified;
- Submitted to the regulatory body as part of the licensing or authorization process.





Introduction

Safety assessment,

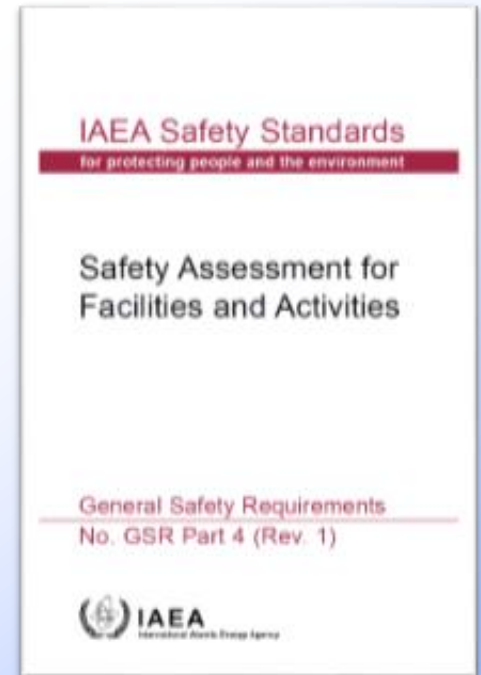
- ✓ It is a systematic assessment of the risks of radiation exposure;
- ✓ Quantification of radiation dose and the risks that may arise from the facilities or activities for comparison with the established safety criteria,
- ✓ It provides an understanding of the performance of the facility or activity under normal conditions, anticipated operational occurrences and in accident conditions.

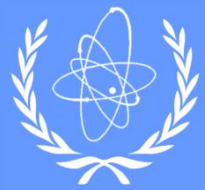


IAEA General Safety Requirements

Objective:

- ✓ To establish the generally applicable requirements to be fulfilled in safety assessment for facilities and activities, with special attention paid to:
 - *defence in depth,*
 - *quantitative analyses; and*
 - *the application of a graded approach*
- ✓ To establish the independent verification of the safety assessment,

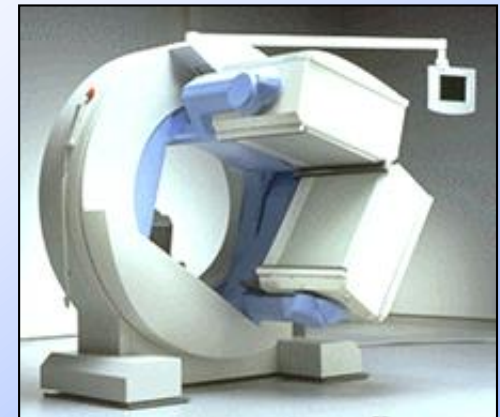




Scope

These requirements apply to the facilities:

- ✓ *Irradiation installations for industrial, research and medical purposes, and places where radiation generators are installed;*
- ✓ *Facilities where radioactive materials are produced, processed, used, handled or stored;*
- ✓ *Facilities for radioactive waste;*
- ✓ *NPPs and other reactors;*
- ✓ *Facilities related to nuclear fuel*
- ✓ *Facilities where the mining and processing of radioactive ores are carried out*





Scope

These requirements apply to the activities:

- ✓ *Production, use, import and export of radiation sources for industrial, research and medical purposes;*
- ✓ *Transport of radioactive material;*
- ✓ *Decommissioning and dismantling of facilities;*
- ✓ *Radioactive waste management activities such as the discharge of effluents;*
- ✓ *Remediation of sites affected by residues from past activities;*
- ✓ *Close-out of facilities where mining and processing of radioactive ore was carried out.*

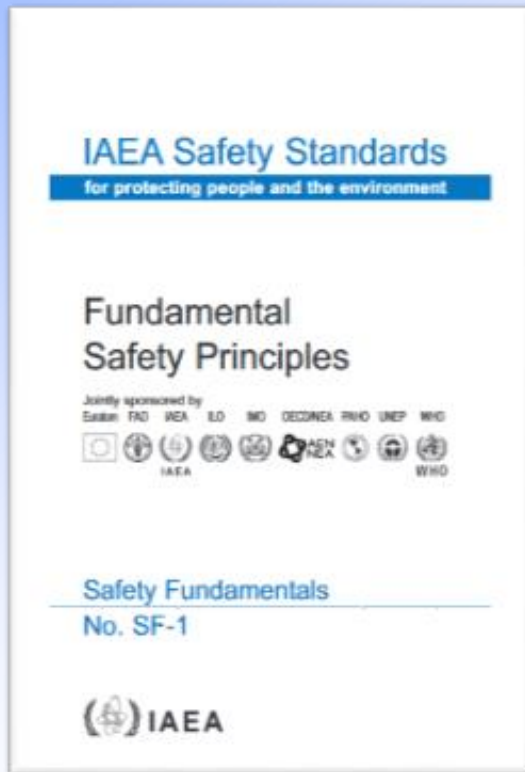




Basis for requiring a safety assessment

SF-1 Principle 3 on Leadership and management for safety establishes:

- ✓ Safety has to be assessed for all facilities and activities, consistent with a graded approach.
- ✓ Safety assessment involves the systematic analysis of normal operation and its effects, of the ways in which failures might occur and of the consequences of such failures.
- ✓ Safety assessments cover the safety measures necessary to control the hazard, and the design and engineered safety features are assessed to demonstrate that they fulfil the safety functions required of them.

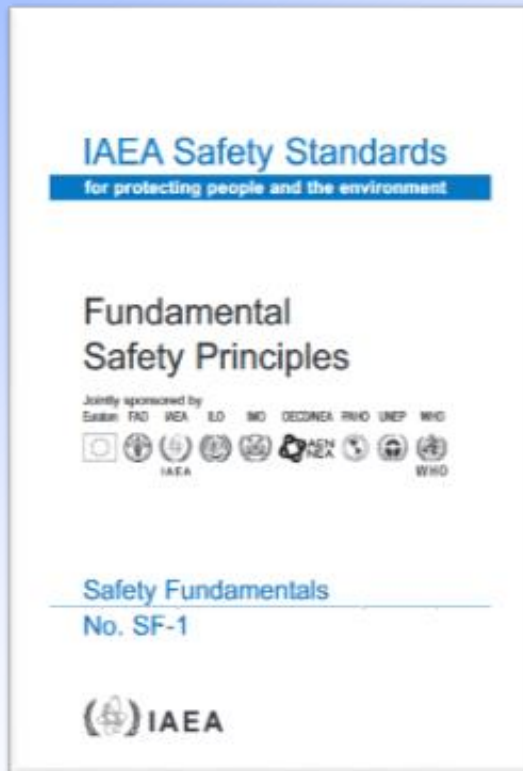




Basis for requiring a safety assessment

SF-1 Principle 3 on Leadership and management for safety establishes:

- ✓ Where control measures or operator actions are called on to maintain safety, an initial safety assessment has to be carried out to demonstrate that the arrangements made are robust and that they can be relied on.

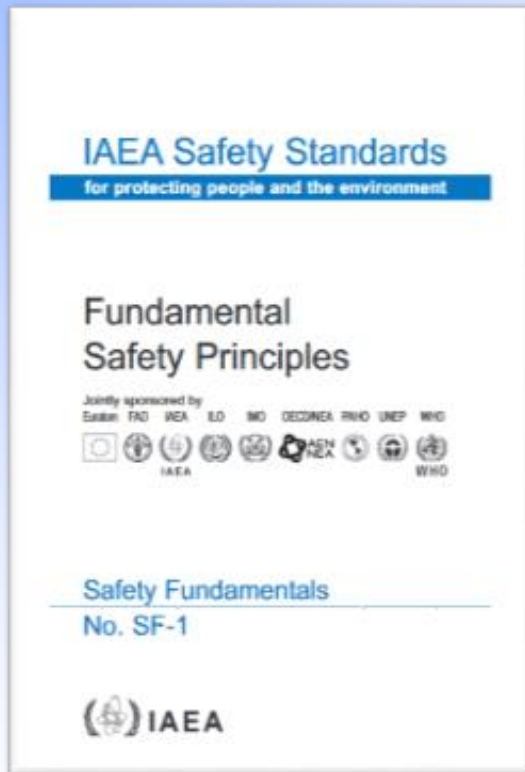




Basis for requiring a safety assessment

SF-1 Principle 3 on Leadership and management for safety establishes:

- ✓ A facility may only be constructed and commissioned or an activity may only be commenced once it has been demonstrated to the satisfaction of the regulatory body that the proposed safety measures are adequate.

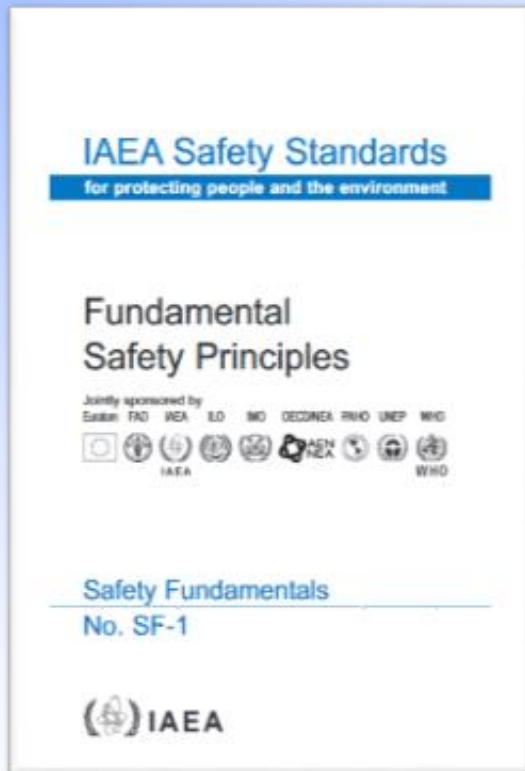




Basis for requiring a safety assessment

SF-1 Principle 3 on Leadership and management for safety establishes:

- ✓ For operations that continue over long periods of time, assessments are reviewed and repeated as necessary.
- ✓ Continuation of such operations is subject to these reassessments demonstrating to the satisfaction of the regulatory body that the safety measures remain adequate.

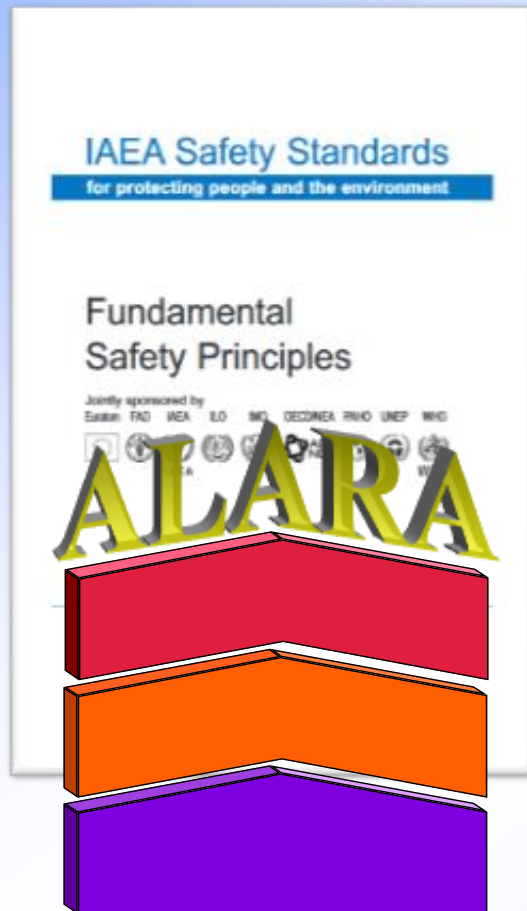




Basis for requiring a safety assessment

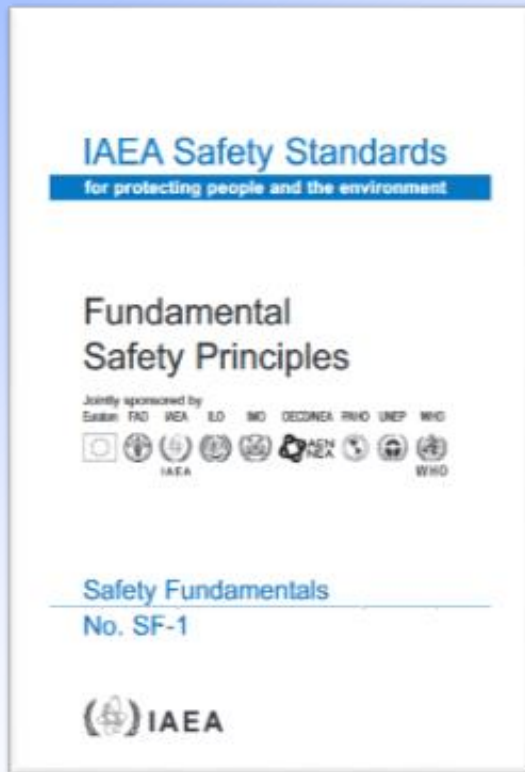
SF-1 Principle 5 on The optimization of protection recognizes the need for a differentiated approach so:

- ✓ The resources devoted to safety by the licensee, and the scope and stringency of regulations and their application, have to be commensurate with the magnitude of the radiation risks and their amenability to control.
- ✓ Regulatory control may not be needed where this is not warranted by the magnitude of the radiation risks.





Basis for requiring a safety assessment



The other fundamental principles are also related to the safety assessment

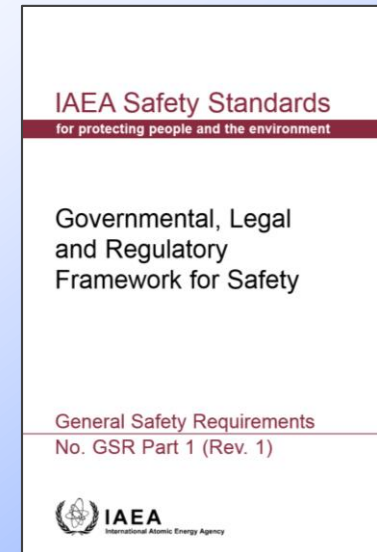
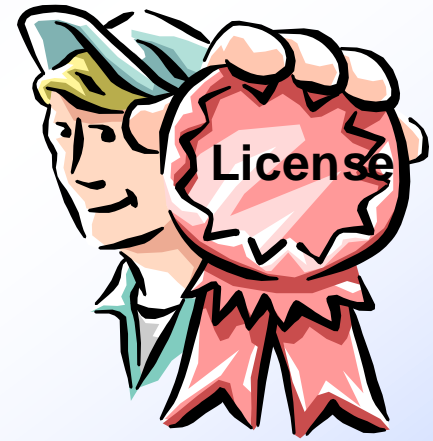


Basis for requiring a safety assessment

GSR-Part 1 Requirement 24: Demonstration of safety for the authorization of facilities and activities.

The applicant shall be required to submit an adequate demonstration of safety in support of an application for the authorization of a facility or an activity.

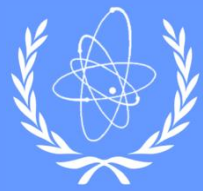
Prior to the granting of an authorization, the applicant shall be required to submit a safety assessment, which shall be reviewed and assessed by the regulatory body in accordance with clearly specified procedures.





OBJECTIVE

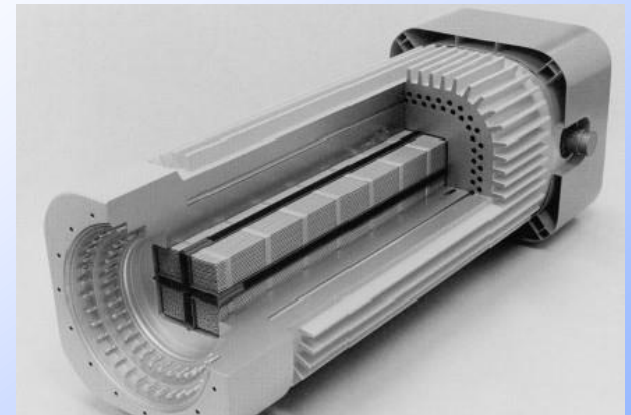
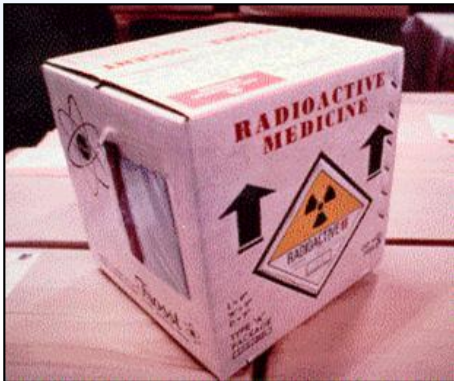
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Graded approach for the safety assessment

Requirement 1: Graded approach.

A graded approach shall be used in determining the scope and level of detail of the safety assessment carried out in a particular State for any particular facility or activity, consistent with the magnitude of the possible radiation risks arising from the facility or activity.





Graded approach for the safety assessment

- The main factor when applying a graded approach is that the safety assessment has to be consistent with the magnitude of the possible radiation risks arising from the facility or activity;
- The graded approach also takes into account:
 - *Any releases of radioactive material in normal operation;*
 - *The potential consequences of anticipated operational occurrences and possible accidents;*
 - *The possibility of the occurrence of very low probability events with potentially high consequences.*





Graded approach for the safety assessment



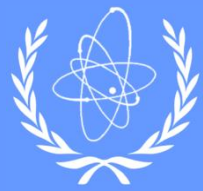
- Other relevant factors are the maturity or complexity of the facility or activity:
 - *Maturity: the use of proven practices and procedures, proven designs, data on operational performance of similar facilities or activities, uncertainties in the performance of the facility or activity*
 - *Complexity: the extent and difficulty of the effort required to construct a facility or to implement an activity, the number of related processes for which control is necessary, the extent to which radioactive material has to be handled, the longevity of the radioactive material, the reliability and complexity of systems and components.*



Graded approach for the safety assessment

- ✓ Before starting the safety assessment, a judgement has to be made as to the scope and level of detail;
- ✓ This has to be agreed with the regulatory body;
- ✓ The application of the graded approach needs to be reassessed as the safety assessment progresses and a better understanding is obtained of the radiation risks arising from the facility or activity;





Graded approach for the safety assessment

Examples of practices:

- ✓ Dental x-ray facility
- ✓ Level control industrial sources
- ✓ Transport of radioisotopes
- ✓ Transport of radioactive sources
- ✓ Radiotherapy facility
- ✓ Industrial gammagraphy



Thank you!