



Indonesia

PROVEN TECHNOLOGY PERSPECTIVE FROM INDONESIA

Presented at INPRO Dialogue Forum, Vienna 1 -4 February 2010



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GOVERNMENT REGULATION 43/2006

- Entrusted by Act No. 10/1997 on Nuclear Energy, Article 17 paragraph (3)
- Signed on: 15 December 2006
- Scope:
 - GR 43/2006 regulates the licensing of construction, operation and decommissioning of nuclear reactor, excluding non-reactor nuclear installations and nuclear materials.
- Objective:
 - is to regulate the licensing of nuclear reactors, in order to ensure the safety and health of workers, public, as well as the protection of environment.



PART III : LICENSING

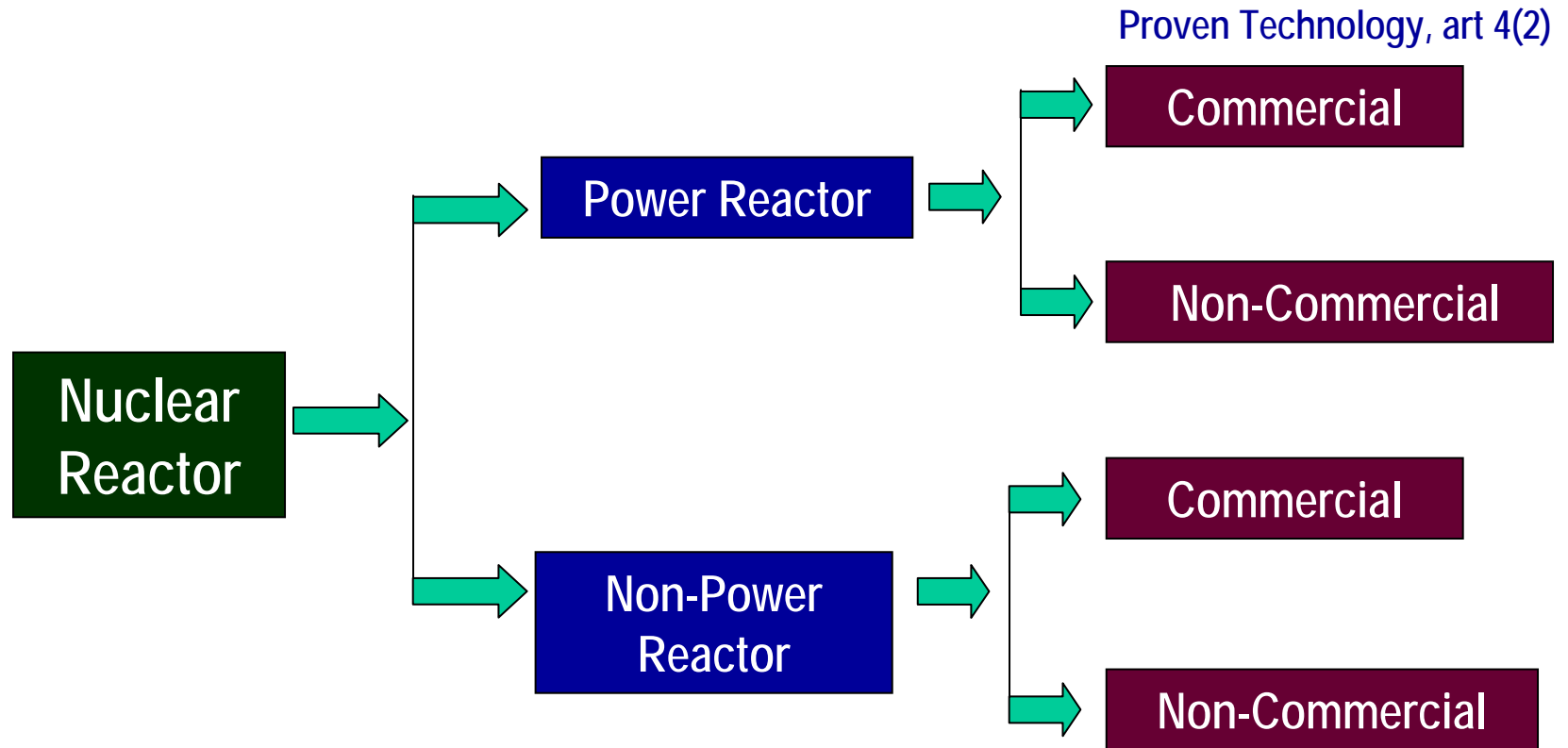
Section 1 : General

Article 4

- (1) Nuclear reactors to be licensed are :
 - a. Commercial and non-commercial power reactors; and
 - b. Commercial and non-commercial non-power reactors.

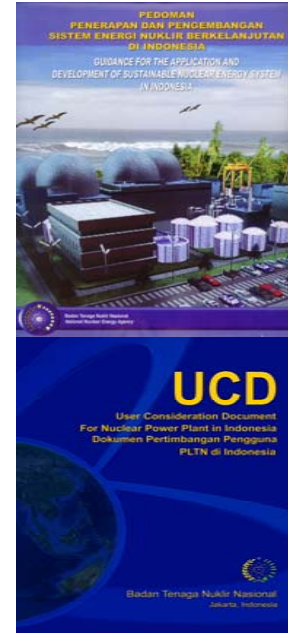
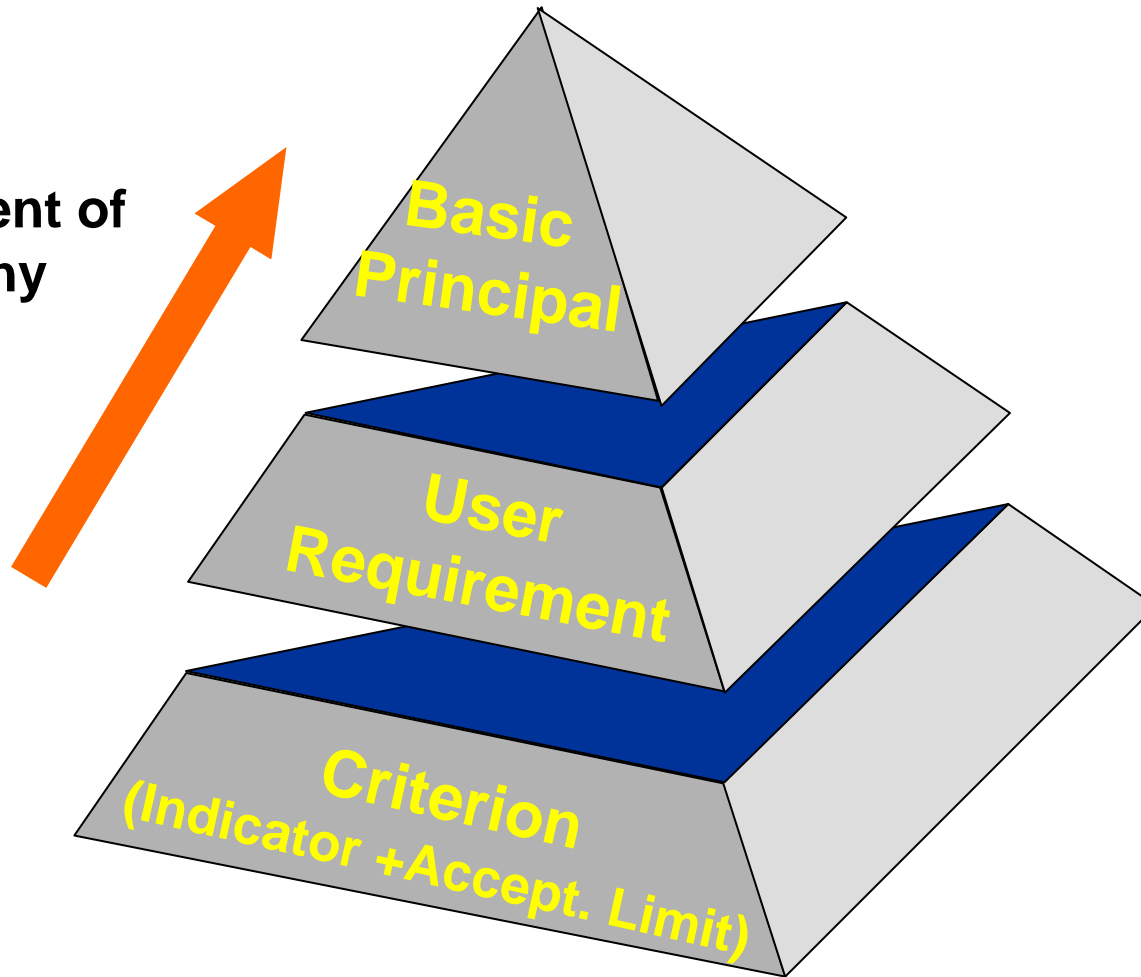
- (2) Commercial power reactors, as stipulated in paragraph (1) a, shall only be constructed based on proven technology.

(***Proven technology*** is a technology applied in a reactor design that has been proven through experiences of safe operation of the reactor at least for 3 (three) years with the minimum capacity factor of 75% average)

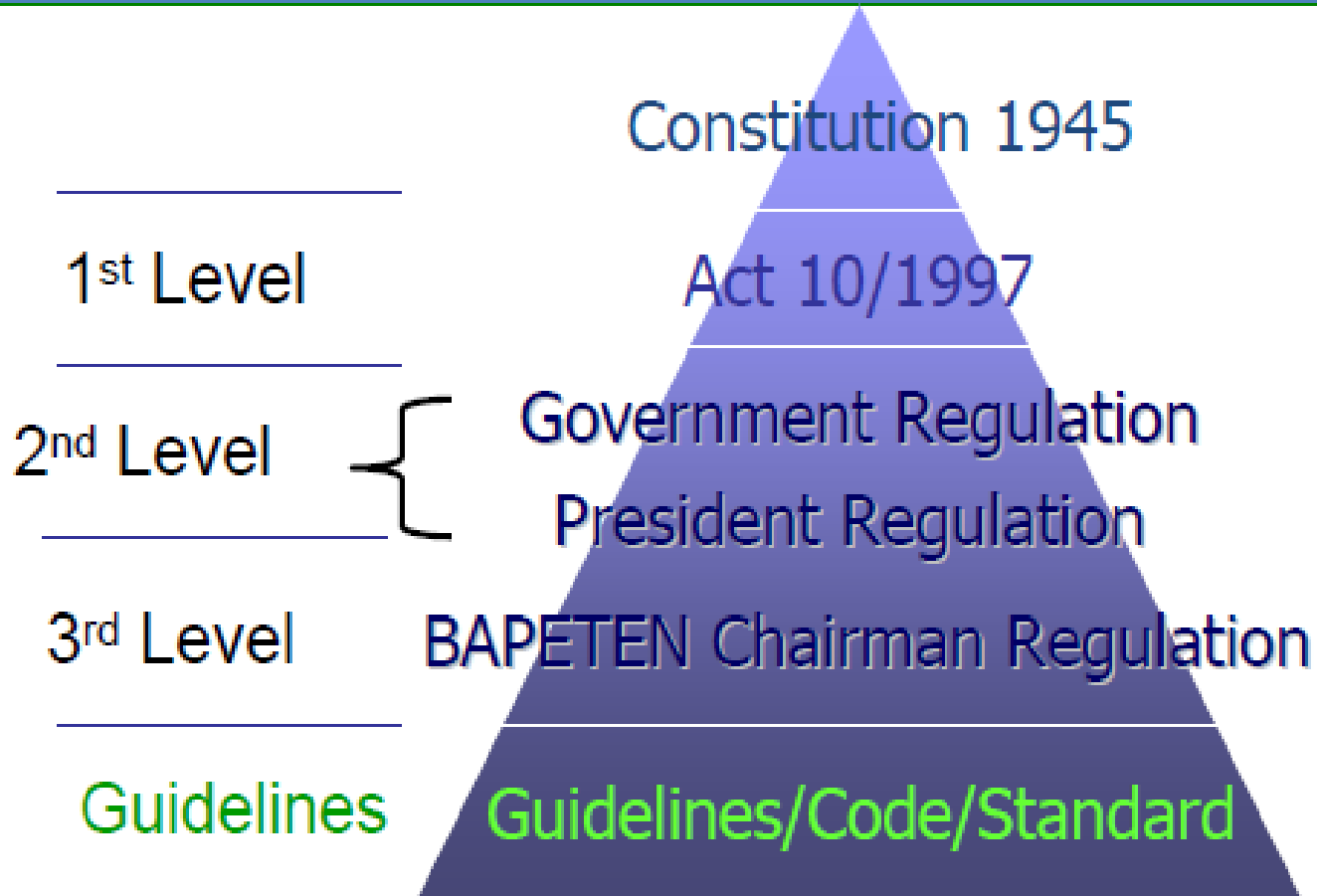


Hierarchy of demands on innovative designs In INPRO methodology

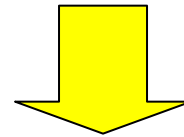
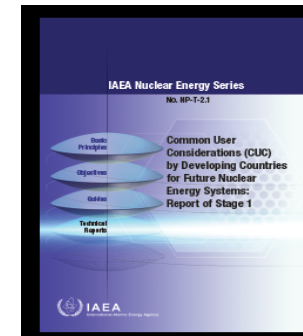
Fulfilment of
hierarchy



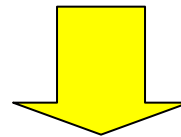
HIERARCHY OF LEGISLATION SYSTEM



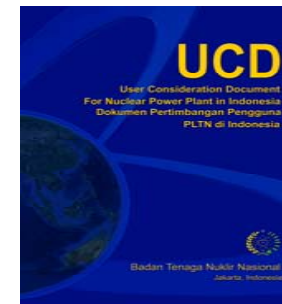
CUC



Country's Specific Requirement



UCD



SMR



LR

7 TECHNICAL CONSIDERATIONS

7.1 *Proven technology*

7.1.1 Proven technology should include overall nuclear power plant systems and elements. The elements should include components, plant structures, design and analysis techniques, maintainability and operability features and construction techniques.

7.1.2 The provenness of overall nuclear power plant systems should be demonstrated through several years of operation of similar nuclear power plants as a commercial plant with a good operational record.

7.1.3 The provenness of the elements as defined in 7.1.1 should be demonstrated through one or more of the following:
Several years of operation in existing nuclear power plant;
Full or part scale testing facilities;
Several years of operation in other applicable industries such as fossil power and process industries.

7.1.4 The supplier should review existing databases of operating experience to identify both positive experience as well as causes of significant events and unplanned outages, and incorporate appropriate features in the nuclear power plant design.

7.1.5 The reactor system should have been licensed or should be licensable in the country of system origin and the licensing information should be made available.

The access to existing databases could enable the user to perform an informed assessment of the nuclear power plant performance.

Reactor system is defined as a nuclear steam supply system with a similar reactor and general system configuration. There are several ways the supplier can demonstrate licensability of the reactor system, such as design certification, or statement by the country of system origin's regulatory body that there is no significant potential issue with the licensing of the reactor system in the country.



USER CONSIDERATION DOCUMENT (UCD – INDONESIA)

Number		Requirement	Rationale/Explanation
7.2		<i>NPP Provenness</i>	
	7.2.1	The Supplier should ensure the provenness of the proposed NPP covering overall system and elements	The element includes components, plant structures, design and analysis techniques, maintainability and operability features and construction Techniques
	7.2.2	The overall proven NPP system should be concluded from minimum three years of operation of reference NPP as a commercial plant with a good operational record.	According to government regulation No. 43, 2006 the reference plant has 3 years operation as a commercial plant with minimum average capacity factor of 75%.



USER CONSIDERATION DOCUMENT (UCD – INDONESIA)

	7.2.3	<p>Provenness of the elements as defined in 7.2.1 should be demonstrated through one or more of the following;</p> <ul style="list-style-type: none">– Minimum three years of operation in existing NPP,– full or part scale testing facilities,– Minimum three years of operation in other applicable industries such as fossil power and process industries.	
	7.2.4	<p>The Supplier should review existing databases of operating experience to identify both positive experience as well as causes of significant events and unplanned outages, and incorporate appropriate features in the NPP design.</p>	<p>The access to existing databases could enable the User to perform an assessment of the NPP performance.</p>
	7.2.5	<p>The reactor system should have been licensed in the country of system origin or any other country and should be licensable in Indonesia.</p>	



BID INVITATION SPECIFICATION

Vol. IV. 1 General technical specification for the entire Plant (GTS)

1.2. Main Design Criteria

1.2.1. General Design Principles

1.2.1.1. Proven Design

1.2.1.2. Redundancy and Diversity

1.2.1.3. Design and Space Margin

1.2.1.4. Physical Separation

1.2.1.5. Testability

1.2.1.6. Maintainability

1.2.1.7. Standardization

1.2.1.8. Low Radiation Exposure

1.2.1.9. Waste Minimization



BID INVITATION SPECIFICATION

1.2.1.1. Proven Design

- 1. The Plant shall be designed and constructed using components and systems already proven in other nuclear power plants with a low failure rate ensuring the highest possible degree of safety and availability.**
- 2. Components and systems of a recent design are only acceptable if it can be demonstrated that they have operated satisfactorily under comparable conditions to the proposed plant.**
- 3. Only safety systems and components already approved by the safety authorities of the Contractor's home country and/or the country of the plant located shall be used in the Plant.**



BID INVITATION SPECIFICATION

Technical Specification

- **Technical specification covers proven technology used, standardization, modularization, construction method/ prefabrication, reactor type, as well as its output.**
- **The minimum level of proven technology for the first unit should be the same level as of the current plants. It is required that the selected design must have already been proven through a minimum three year operation with 75% capacity factor of an existing plant using the same design.**

SUMMARY

- The availability of proven technology for the system is one of the most imperative considerations
- Since the suppliers have more extensive nuclear power plant experience than the users, they should take more responsibility than the user in proving the merit of the nuclear power plant technology they are supplying.
- The user would simply prefer proven, robust and efficient technology to ensure good availability and to avoid the risk of potential accidents, incidents and technical problems associated with immature technologies.

SUMMARY

- The degree of required technical maturity varies among the countries, but the common bottom line is that the nuclear power plant should at least have been licensed in the country of origin.
- The majority of the countries require a very high level of technology maturity: “the same type of nuclear power plant design should have been built and operated commercially elsewhere with a good record during several years”.
- The minimum level of proven technology should be the same level as of the current plants. It is required that the selected design must have already been proven through a minimum three year operation with 75% capacity factor of an existing plant using the same design.

THANK YOU

