

INSAG DEVELOPMENT OF A DOCUMENT
ON HIGH LEVEL SAFETY
RECOMMENDATIONS FOR NUCLEAR
POWER

Milestone Issues: Group C.
Nuclear Safety. A. Alonso (INSAG
Member)

INSAG ACTIVITIES IN SAFETY INFRASTRUCTURE

November 2005 INSAG meeting

Comments and concerns expressed at the Scientific Forum (General Conference 2005) were discussed. INSAG took the action to develop the ideas expressed and to discuss them at the next INSAG meeting.

INSAG ACTIVITIES IN SAFETY INFRASTRUCTURE

April 2005 INSAG meeting

- An INSAG document on the obligations for emerging nations was presented and discussed
- NE two drafts on the infrastructure subject were presented, considered and discussed.
- The Secretary of INSAG was requested to transmit comments to NE
- INSAG decided to continue the preparation of a separate high level recommendations document

INSAG ACTIVITIES IN SAFETY INFRASTRUCTURE

November 2006 INSAG meeting

- Documents presented at the INSAG Forum on Infrastructure (2006 General Conference), and the discussions there maintained were considered
- New draft on the high level recommendations. Decision was taken to emphasize safety culture, global safety regimen, the responsibilities of the vendor and consider countries willing to enlarge their nuclear programmes
- NE presented a draft of the Milestones document which was considered and discussed

INSAG ACTIVITIES IN SAFETY INFRASTRUCTURE

March 2007 INSAG meeting

- Secretariat made a presentation on the NE Milestones and on the December workshop. Comments were made by the INSAG Members
- INSAG Secretary was requested to relay the comments to the Group developing the paper
- New draft on the high level principles. Decision was taken to add sustainability.
- The Secretariat, assisted by INSAG Members, was asked to develop an outline and finally to draft a new document

INSAG ACTIVITIES IN SAFETY INFRASTRUCTURE

November 2007 INSAG meeting

The proposed Agenda (Nov. 13-15) includes:

1. A presentation on the Agency Approach New Build/New countries
2. A presentation on the Milestones document
3. A report on the November 5-9 Workshop
4. A discussion on the proposed document on the high level safety principles

THE BASIC STRUCTURE AND CONTENTS OF THE INSAG DOCUMENT

The matrix structure

PRINCIPLES	PHASES IN THE LIVE OF THE PLANT				
	Pre- decision	Decision	Implemen- tation	Operation	End of life
1.Responsibility	-	1	1	1	1
2.Government	1	2	2	2	1
3-Leadership		1	1	1	1
4.Justification	1	3	3	1	1
5.Optimization	-	-	-	1	1
6.Limitation	-	-	-	1	1
7-Future gener.	-	-	-	1	1
8.Prevention	-	-	1	2	3
9. Emergency	-	-	-	1	2
10.Exist. risks	-	-	-	-	1

The pre-decision phase

- **Safety activities:** Justify a nuclear plan. Enact basic legislation. Conduct a public consultation.
- **Needed safety structure:** Have the basic law. Create a regulatory body. Have a public consultation procedure. Accept the Global Safety Regime
- **Applicable principles:** Principle 2, Role of Government. Principle 4, Justification of facilities and activities
- **INSAG documents:** The need and ways to conduct a formal public consultation is presented in INSAG-17. The IAEA Global Nuclear Safety Regime is described in INSAG-21.

The decision phase

- **Safety activities:** Develop the nuclear plan. Select a technology, a site and a supplier.
- **Needed safety structure:** Develop the regulatory body. Establish a licensing methodology. Develop safety requirements for siting and design.
- **Applicable principles:** Principle 1, Responsibility for safety. Principle 3, Leadership and management for safety
- **INSAG documents:** The selection of the technology should adhere to proven engineering practices as recommended in INSAG-12.

The implementation phase. Siting

- **Safety activities:** Characterize the site. Formulate a site license.
- **Needed safety structure:** Regulatory competence on site safety.
- **Applicable principles:** Principle 1, **Responsibility for safety** should be clearly understood by all parties involved. Principle 3, **Leadership and management for safety** should start concurrent with site characterization
- **INSAG documents:** The characterization of the site may follow specific requirements for siting as recommended in INSAG-12.

The implementation phase. Design and construction

- **Safety activities:** Application for the construction permit. Construct the plant in accordance with safety requirements.
- **Needed safety structure:** Design criteria available. Regulatory competence on safety analysis, inspection and quality assurance.
- **Applicable principles: Principle 3, Leadership and management for safety** should be perfected for construction. Principle 8, **Prevention of accidents** must be clearly present in the design of the plant.
- **INSAG documents:**.. Prevention of accidents is best implemented through the **defence-in-depth** concept as described in INSAG-10.

The operation phase. Commissioning

- **Safety activities:** Verify compliance with requirements. Perform nuclear tests. Transfer responsibility to the operator.
- **Needed safety structure:** Availability of trained personnel. Initiate radiation protection and develop emergency plan. Create a safety culture for operation
- **Applicable principles:** Principle 5, **Optimization of protection**, and Principle 6, **Limitation of risks to individuals** should be in place. Principle 9: **Emergency preparedness and response**, should be initiated during the commissioning phase.⁰
- **INSAG documents:** **Safety** culture has been defined in INSAG-4; how it could be implemented in a nuclear power plant is explained in INSAG-15

The operation phase. Commercial operation

- **Safety activities:** Operate within safety requirements. Evaluate malfunctions. Conduct emergency drills.
- **Needed safety structure:** Increase competence in safety culture. Be part of nets for safe operation and share operating experience.
- **Applicable principles: Principle 3, Leadership and management,** should cover the maintenance of the safety levels, the analysis of operating experience and the control of aging.
- **INSAG documents: Maintaining** the design integrity is recommended in INSAG-19. INSAG-16 stresses knowledge, training and infrastructure for research and development and the conduct of independent peer reviews

The end of life phase.

- **Safety activities:** Dismantling. Radioactive waste management. Long term management of spent fuel
- **Needed safety structure:** Safety requirements for decommissioning. Compliance with regulations for the long term management of radioactive waste and spent fuel.
- **Applicable principles:** **Principle 7: Protection of present and future generations** should continue. Principle 10, **Protective actions to reduce existing radiation risks**, should be implemented
- **INSAG documents:** INSAG-12 covers safety during decommission.

HIGH LEVEL RECOMMENDATIONS ON SAFETY
INFRASTRUCTURE

Reliance on the IAEA Fundamental Safety Principles

The implementation of an effective safety infrastructure and its subsequent maintenance for the life cycle of the nuclear programme should be started early and be based on a clear understanding of the IAEA Fundamental Safety Principles.

HIGH LEVEL RECOMMENDATIONS ON SAFETY
INFRASTRUCTURE

Financial capability

Measures to periodically evaluate the long term maintainability of the financial capability of the plant owner and that of the regulatory body are integral to the achievement of safety.

HIGH LEVEL RECOMMENDATIONS ON SAFETY
INFRASTRUCTURE

Adherence to the Global Nuclear Safety Regime

Continuous, dedicated efforts for safety improvement are dependent upon meaningful involvement of all stakeholders and on active participation in the Global Nuclear Safety Regime.

HIGH LEVEL RECOMMENDATIONS ON SAFETY
INFRASTRUCTURE

National participation

The level of national participation should include an active human resource programme to establish a competent work force in the country.

HIGH LEVEL RECOMMENDATIONS ON SAFETY
INFRASTRUCTURE

Legal framework and regulatory body

The safety infrastructure should be developed within a legal framework that establishes a competent, independent regulatory body with appropriate authority and funding to ensure safety

HIGH LEVEL RECOMMENDATIONS ON SAFETY
INFRASTRUCTURE

Responsibility of the operator

To fully assume its prime responsibility for safety, the operator should implement a management system and create a safety culture to develop, maintain and strengthen the appropriate skills, attitudes, experience and technical competence for safety during the life cycle of the plant.

HIGH LEVEL RECOMMENDATIONS ON SAFETY
INFRASTRUCTURE

Emergency preparedness

Emergency preparedness and response programmes should rely on physical infrastructure, exercises, cooperation with neighbouring countries and international organizations.

HIGH LEVEL RECOMMENDATIONS ON SAFETY
INFRASTRUCTURE

Infrastructure for existing programmes

Countries with existing nuclear programmes need to be vigilant in reviewing and upgrading their current safety infrastructures against international safety standards and good practices.

THE END

THANK YOU