Document Preparation Profile (DPP)

1. IDENTIFICATION

Document Category Safety Guide

Working ID:

Proposed Title: Commissioning for Nuclear Power Plants

Proposed Action: Revision of the Safety Guide No. NS-G-2.9 "Commissioning for Nuclear Power Plants" (2003)

Review Committee(s) or Group: NUSSC

Technical Officer(s): Martynenko, Yury (Operational Safety Section, Division of Nuclear Installation safety)

2. BACKGROUND/RATIONALE

The Safety Guide NS-G-2.9 "Commissioning for Nuclear Power Plants" was developed under the IAEA programme for safety standards for nuclear power plants and supplemented with information from Section 5 of "Safety of Nuclear Power Plants: Operation", (Safety Standard Series No. NS-R-2, Vienna, 2000) on the safety requirements for the commissioning of nuclear power plants. This Safety guide is a revision of the IAEA Safety Guide on commissioning that was initially issued in 1980 as Safety Series No. 50-SG-04. The Safety Series publication No.50-SG-04 was revised in 2003 retaining the technical content of the original document and updating where was necessary.

A consultancy meeting dedicated to the next revision of the Safety Guide was held with participants from France, England and the Russian Federation. The document was considered to be sufficiently comprehensive and of high quality. However, since the last revision a number of new approaches and new information has become available. In addition a number of advanced programmes and IAEA documents have been developed and implemented that considerably affect the current version of the Safety Guide. .

3. OBJECTIVE

The objective of the Safety Guide is to make recommendations for those involved in the nuclear power plants commissioning process based on recent good and proven practices to ensure the activities undertaken during this phase are conducted safely and with high quality, and that the plant is constructed and commissioned with the design intent and can be operated with a high degree of safety during the lifetime.

4. JUSTIFICATION

Although the current issue of NS-G-2.9 is an effective guide at a higher level, a number of issues were identified at a detailed level as shown below. A number of IAEA requirements documents and safety guides have been issued since the last revision of NS-G-2.9 and these have been identified for further review to determine if any gaps or weaknesses exist (see section 5).

It has been identified that there is insufficient consideration of environmental issues, including waste management and radioactive discharges, and although guidance will be limited, due to differing national legislation, some development of this topic should be considered.

The topic of safety culture has developed significantly since the issue of the guide, and it is considered that a specific section would be useful to identify the key issues relating to safety culture to replace the sporadic references in the current guide.

The guide currently does not include sufficient information on the control of documentation and records, and it is considered that this is an issue of particular significance during commissioning due to the additional demands on configuration control as the plant is modified, operating limits and parameters are amended and operating procedures are validated.

A recurrent issue within the current version of the guide is a need for a consistent approach to the responsibilities for the commissioning programme and the responsibility for safety through the construction and commissioning phases. This issue should be dealt with early in the document, perhaps by reference to a chart or matrix of activities and responsibilities, and should consider the effect of alternative contracting arrangements, including turnkey contracts, and those applicable to new nuclear states. The organization and management arrangements relate to the commissioning programme, its interface with construction phase, the stages of commissioning, and implementation and it would be advantageous if the safety management system aspects were moved to an earlier section in the guide. A feedback report to DPP "Commissioning to the Nuclear Power Plants" summarizes the justification for the review of the Safety Guide NS-G-2.9.

5. PLACE IN THE OVERALL STRUCTURE OF THE RELEVANT SERIES AND INTERFACES WITH EXISTING AND/OR PLANNED PUBLICATIONS

The guideline NS-G-2.9 "Commissioning for Nuclear Power Plants" is one of the set of IAEA Guidelines that supplement the Safety Requirements in NS-R-2 "Safety of Nuclear Power Plants: Commissioning and Operation". The IAEA Standards and parts of Standards listed below can potentially affect the structure and content of the NS-G-2.9 and will be taken into account during the revision process:

- NS-R-2 "Safety of Nuclear Power Plants: Commissioning and Operation" (2000) (being revised DS 413)
- GS-R-3 "The Management System for Facilities and Activities" (2006)
- GS-G-3.1 "Application of the Management System for Facilities and Activities" (2006)
- GS-G-3.5 "The Management System for Nuclear Installations" (2009)
- NS-G-1.1 "Software for Computer Based Systems Important to Safety in NPPs" (2000), Chapter 13 Installation and Commissioning
- NS-G-2.14 "Conduct of Operations at NPPs"(2008)
  - Can be applied to startup phase:
  - Structuring the operations department
  - Setting high standards of performance & making safety related decisions in an effective manner
  - Professional manner in conduct of operating personnel
  - Maintaining a NPP within OLC
- Technical Report Series NG-T-2.2 "Commissioning of NPPs: Training and Human Resource considerations" (2008)
  - Addresses training and human resource for:
  - All positions in the operating organization
  - All personnel in commissioning organization
  - Startup/test engineers
  - Test development engineers
  - Planners

Quality management
Personnel
Responsible managers/supervisors

- IAEA-TECDOC-1390 "Construction and commissioning experience of evolutionary water cooled nuclear power plants" (2004). This addresses some new construction and commissioning methodologies. For commissioning: Chapter 6 addresses some example measures to reduce commissioning period.

6. OVERVIEW

The structure of the document would be improved by re-ordering the major sections to move the description of Organization and Management (the safety management system) ahead of the sections on Commissioning Programmes, Stages of Commissioning and the Implementation of the Programme. Topics requiring amplification in the context of commissioning include environmental protection and management, safety culture, documentation and records. Clarification is required for the responsibilities of the groups and organizations involved in commissioning, under different contractual arrangements.

The preliminary Table of Contents as suggested during the Consultancy meeting is as follows:

CONTENTS

Power tests

5. IMPLEMENTATION OF THE COMMISSIONING PROGRAMME
Test procedures
Test results
Initial fuel loading
Achieving initial criticality
Deviations during commissioning

6. DOCUMENTATION
APPENDIX: FUEL LOADING
ANNEX: DETAILED LISTING OF COMMISSIONING TESTS
REFERENCES
GLOSSARY

7. PRODUCTION SCHEDULE: Provisional schedule for preparation of the document, outlining realistic expected dates for:

Approval of DPP by the Coordination Committee	April 2010
Approval of DPP by the Safety Standards Committees	July 2010
Approval of DPP by the CSS	October 2010
Approval of draft by the Coordination Committee	February 2011
Approval by the Safety Standards Committees for submission to Member States for comments	June/July 2011
Approval of the revised draft by the Coordination Committee	March 2012
Review in NS-SSCS	
Approval by the Safety Standards Committees for submission to the CSS	June/July 2012
Endorsement by the CSS	October 2012
Approval by the Publications Committee	November 2012
Approval by the Board of Governors, as appropriate	-
Target publication date	May 2013

8. RESOURCES

Staff: 52 staff weeks

Consultants: 16 consultants' weeks (two consultants meeting and one technical meeting)