Nuclear Energy Series

Document System Structure

December 2007

Version 6.0

1. The objective of this document

This document describes the rationale, elements and the structure of documents in the Nuclear Energy Series.

2. Background

There are many different types of documents regarding the application of nuclear technology that provide analysis for and advice, assistance and guidance to the Member States (MS). These documents represent developments and achievements in their subject areas within the nuclear industry and research community, based upon input from international experts.

Different MSs have different needs in support of their efforts in the use of nuclear technology. MSs without nuclear power programmes need information and guidance on the availability, benefits and costs of different technologies, but others with nuclear power programmes need information relevant to maintaining operational effectiveness and technological development in line with the best international experience.

The consistent structure of NES documents will help MSs in effective use of available information, enable more consistent documents to be produced in a more effective manner, recognise the significance of key documents, and have better alignment with other IAEA publications.

3. Objective for developing a new document system

The NES document system is intended to increase the consistency, effective use and recognition of selected nuclear energy documents. To support this objective and in accordance with the Article III.A. of the Statute of IAEA NE establishes a ***Nuclear Energy Series*** document system. This system will incorporate relevant existing documents, add structure and visibility and systematically fill important gaps, where necessary.

4. Rationale for development of NES documentation hierarchy

The rationale for the development of NES and its review process is to;

- give a visible and clear document structure;
- establish a structure of NE document;
- develop top level documents establishing the rational, objectives and goals for activities in specific areas;
- improve credibility, through structured external review, as necessary;
- provide continuity of documents through an established preparation and review process and renewal/revision period;
- provide standard approach to document preparation;

- improved recognition of NES documents; and,

- provide an underlying basis for supporting TC and Regular Budget activities.

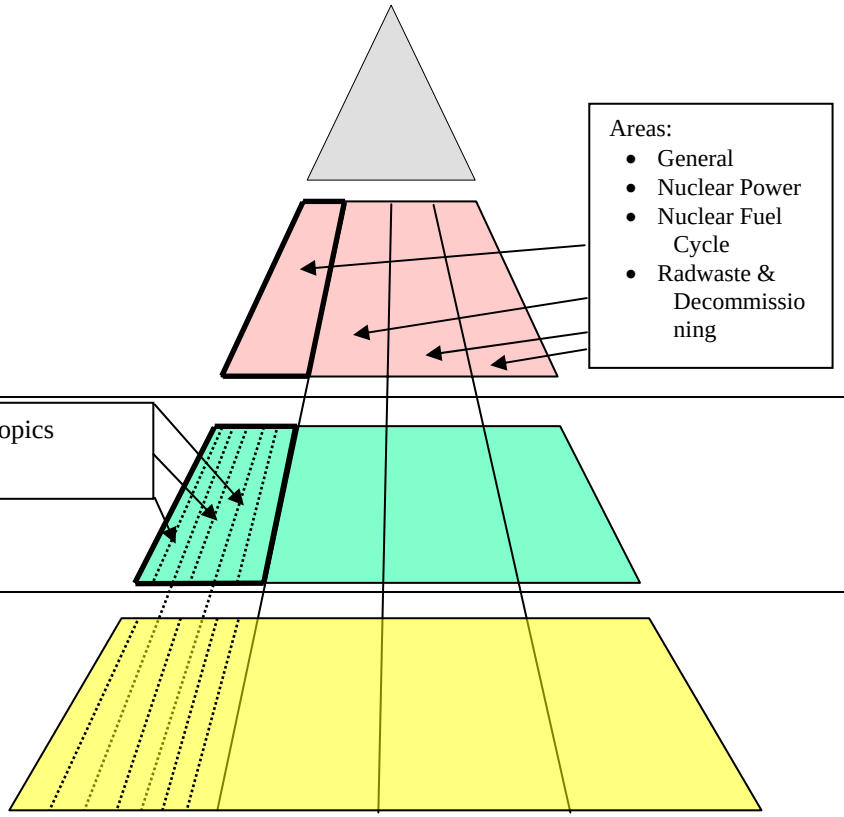
The new structure allows systematic analysis of existing documents and help to identify the gaps and areas not covered. Based on analysis, some of the existing documents (TECDOCs, TRSs, etc) will be revised/upgraded and will be integrated into the Nuclear Energy Series, as appropriate. The missing documents, if any, will be developed, so as to fit in the structure. This will not include documents that relate to a single Member State, or summarize one single meeting result or have a simple report nature, which will continue to be produced as documents and publications outside this system.

5. Elements of Nuclear Energy Series documents

This section describes the structure of documents, and the potential content of each level. It is envisaged that all Member States will use the Nuclear Energy Series (NES), but Member States of different status will use the Nuclear Energy Series in different ways. States without developed nuclear programmes can use the NES documents for the **establishment** of their entire programmes or identifying missing elements of infrastructure. Member States with a full infrastructure can use NES documents for **continuous improvement** of the efficiency of their nuclear power programmes. The structure of the Nuclear Energy Series documents shown in the diagram on the following page.

Nuclear Energy Series Structure

Level 1



Nuclear Energy Basic Principles
The Nuclear Energy Basic Principles manifests and describes the rationale, and vision for the peaceful use of nuclear energy.

Nuclear Energy Objectives
Nuclear Energy Objective describes what needs to be considered and to be achieved in various Areas at different stages of implementation.

Level 2

Nuclear Energy Guides
Nuclear Energy Guides describe how to achieve the objectives relating to various topics.

Level 3

Nuclear Energy Reports
Nuclear Energy Reports provide technical background in the various Areas and Topics.

5.1. Level 1: Nuclear Energy Basics Principles and Objectives

The Nuclear Energy Basic Principles manifests and describes the rationale, and vision for the peaceful use of nuclear energy.

Nuclear Energy Objectives describes what needs to be considered and to be achieved in various Areas at different stages of implementation. The objectives indicate ways and means for achieving effective use of the nuclear energy.

This level is structured by areas. The following areas will be covered in the NE Series:

1. General
2. Nuclear Power
3. Fuel Cycle and Materials
4. Waste Management and Decommissioning

5.2. Level 2: Nuclear Energy Guides

Nuclear Energy Guides describes how to achieve the objectives relating to various topics. Each area will contain several topics.

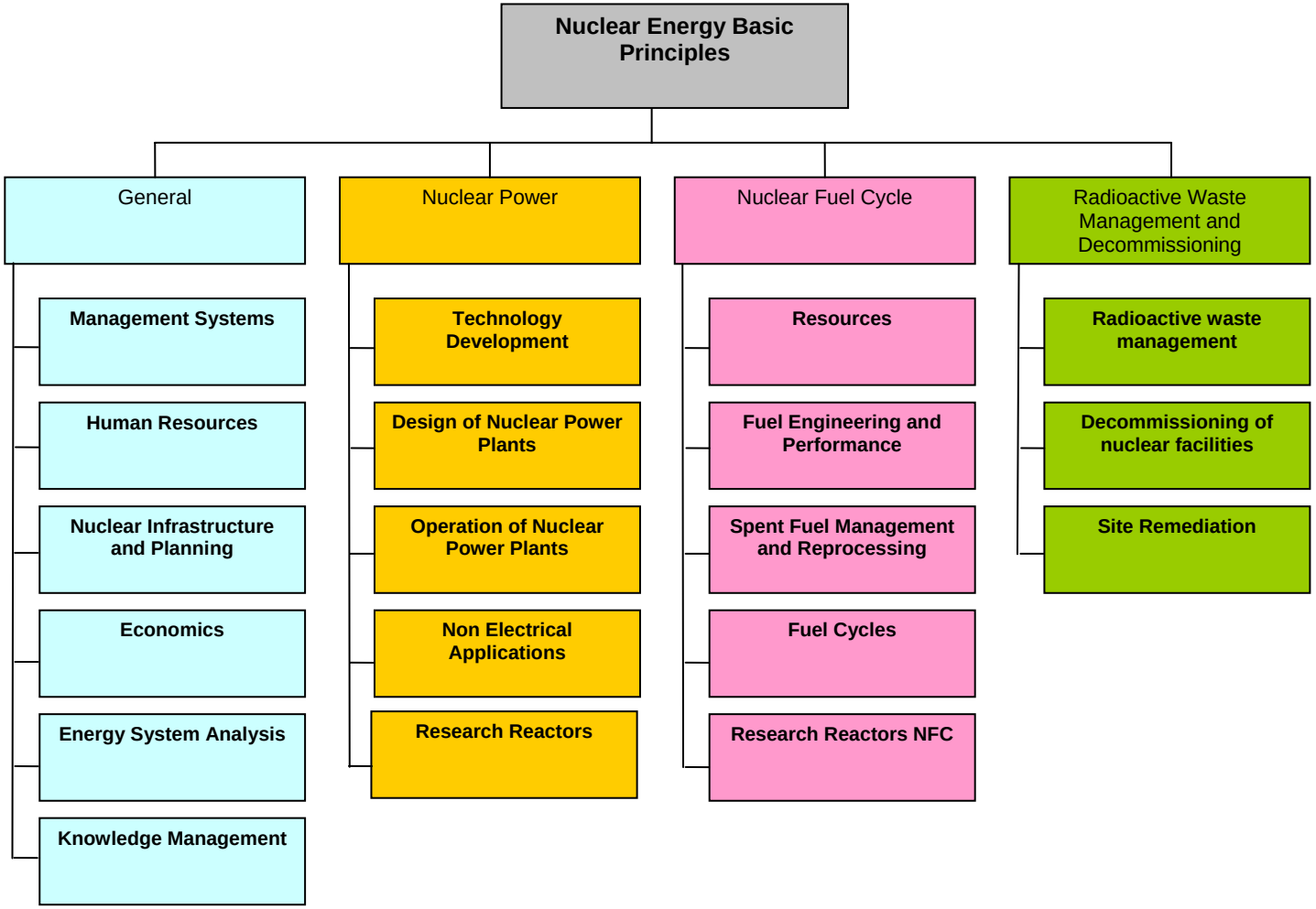
5.3. Level 3: Nuclear Energy Reports

Nuclear Energy Reports provides technical background in the various Areas and Topics. These documents would enable the Member States to understand the status of different developments in the specific topics worldwide.

6. The development process

The NES document preparation and review process is coordinated by the NE Document Committee (NE DCT). The process, the functions and the responsibilities are described in Appendix 1.

7. Detailed structure of the Nuclear Energy Series Level 1 and Level 2



8. Description of the Documents in NE Series

This section describes the content of each of the documents of Level 1 and Level 2.

8.1. Nuclear Energy Basic Principles and Objectives

8.1.1. Basic Principles

The Nuclear Energy Basic Principles manifests and describes the rationale, and vision for the peaceful use of nuclear energy. The document will identify the basic principles which nuclear energy systems must satisfy to fulfil nuclear energy's promise in meeting growing global energy needs - specifically:

- Efficient operation,
- A high level of safety,
- Economic competitiveness through continuing technological advances,
- Proliferation resistance,
- Efficient resource utilization,
- Low environmental impact,
- Sustainability and others.

8.1.2. Nuclear Energy Objectives

Nuclear Energy Objectives describe what needs to be considered and to be achieved in various Areas at different stages of implementation. The nuclear energy objectives documents identify the objectives which should be pursued in order to assure that the basic principles are satisfied.

In the various areas, the objectives will be briefly and concisely define the strategies and issues and topics that need to be addressed to satisfy the basic principles, and provide an overview of means for achieving the objectives, without describing the details.

(Nuclear) General (NG)

- Management systems
- Human resources
- Nuclear Infrastructure and planning
- Economics
- Energy System Analysis

- Knowledge Management

Nuclear Power (NP)

- Technology development and innovation for future nuclear plants
- Design of nuclear power plants
- Construction, commissioning and operation of nuclear power plants
- Non-electrical application
- Research Reactors

Nuclear Fuel Cycle (NF)

- Natural Uranium and Thorium resources
- Fuel engineering and performance
- Spent fuel management
- Advanced and innovative fuel cycles
- Research reactor fuel cycle

Radioactive Waste Management and Decommissioning (NW)

- Radioactive waste management
- Decommissioning of nuclear facilities
- Site remediation

8.2. Guidance Under General Topic

Management Systems

Guidance documents on Management Systems will complement the Safety Requirement GS-R-3 and will address (in more depth) the issues that are not part of the Safety Series:

- Establishment of an integrated management system
- Organizational culture and leadership
- Ethics and professionalism
- Managing change

Human Resources

Guidance documents on Human Resources will address the following issues:

- Management of human resources for nuclear facilities
- Management of nuclear facility personnel training
- Improving human performance for nuclear facilities

Nuclear Infrastructure and Planning

Guidance documents on Infrastructure and Planning will address the following issues:

- Nuclear Power Project management
- Nuclear Power programme planning
- Choosing the nuclear option
- Financing arrangements for nuclear power projects
- Basic infrastructure for a nuclear power project
- Potential for sharing nuclear power infrastructure
- Milestones in implementing nuclear infrastructure

Economics

Guidance documents on Economics will address the following issues:

- Capital investment costs and financing of NPPs
- Economic analysis of nuclear power and optimization of nuclear power generation costs
- Nuclear fuel cycle costs
- Infrastructure development costs
- Effects of nuclear power upon national/regional economy\ies

Energy System Analysis

Guidance documents under the 'energy system analysis' topic might include guides on:

- Primer on energy system analysis at different levels (global, regional, national, sub-national)
- A document on analytic tools (ours and others')
- A document on nuclear power and sustainable development

At lower levels they could include descriptions of the Agency's analytic tools (models, databases, indicators, country profiles) and some specific applications.

Knowledge Management

Guidance documents on Knowledge Management will address the following issues:

- Risk management of knowledge loss in nuclear industry organizations
- Capture of knowledge within the organization
- Retain knowledge within the organization
- Transfer of knowledge among of personal

8.3. Guidance Under Nuclear Power Topic

Technology development

Guidance documents on Technology Development will provide guidance on:

- Desired features of advanced nuclear power plants
- Application of advanced technologies for operation and maintenance in nuclear power plant
- Application of advanced technologies for instrumentation and control system in nuclear power plants

Design of Nuclear Power Plants

Guidance documents on Design of Nuclear Power Plants will provide guidance on:

- Elements to be considered in the design
- Method of assessment and verification of design in nuclear power plant
- Elements of construction in nuclear power plant

Operation of Nuclear Power Plants

Guidance documents on Operation of Nuclear Power Plants will provide guidance on:

- Elements to be considered in the safe, reliable and efficient operation of NPP
- Commissioning for system function verification in nuclear power plant
- Monitoring and assessment of performance
- Improving plant performance through process modernization and modification in nuclear power plant.

- Outage management optimization in nuclear power plant
- Maintenance optimization programmes to enhance equipment reliabilities i nuclear power plant.
- Plant life management programme for long term operation in nuclear power plant

Non Electrical applications

Guidance documents on Non-electric applications address the following issues:

- Economic evaluation
- Elements to be considered in the coupling with nuclear system
- Desalination of seawater
- District heating
- Steam for industrial applications
- Nuclear hydrogen production

Research Reactors

- Operation
- Utilization
- Networking and sharing of research reactors
- Ageing
- Refurbishment and Modernisation
- New research reactors

8.4. Guidance Under Nuclear Fuel Cycle Topic

Resources

- U and Th. Deposits
- Demand and Supply
- Exploration
- Mining and Production of uranium and thorium concentrates

Fuel Engineering and Performance

- Fuel Design
- Manufacturing
- Failure Analysis
- Radiation Damage, Fuel Properties and In-core Behaviour Modelling
- Water Chemistry
- Post Irradiation Examination and Poolside Inspection
- Development of Advanced fuels and Structural Materials for Fuel Assemblies

Spent Fuel Management and Reprocessing

- Storage (burn-up credit, behaviour of fuels and materials, maintenance, inventories, selection criteria, regional approaches)
- Treatment (reprocessing, conditioning)

Fuel Cycles

- NFC Options
- Nuclear Material Management
- Proliferation Resistance
- Basic Science

Research Reactors NFC

- Research reactor fuel design, manufacturing and performance
- Research reactor spent fuel issues
- Research reactor components
- Non-Proliferation issues
- Economic aspects

8.5. Guidance Under Radioactive Waste Management and Decommissioning Topic

Radioactive Waste Management

Guidance documents will be developed in the following fields:

- Predisposal radioactive waste management

- Disposal of radioactive waste
- Management of disused sealed radiation sources

Decommissioning of nuclear facilities

Guidance level documents will be developed in the following fields:

- Decommissioning activities
- Decommissioning of specific types of facilities

Site remediation

Lower level documents are developed in the following fields:

- Site remediation activities
- Site remediation for specific types of environmental contamination

Appendix 1.

NE Document Coordination Team

Terms of Reference

Responsibilities

The NE Document Coordination Team (DCT) has the task of ensuring the quality and consistency of documents in the Nuclear Energy Series through developing and implementing a process for the coordination, planning, preparation and revision of Nuclear Energy Series documents. The DCT task is also to improve the consistency of all NE published documents through review of the proposals (DPPs) for other publications[1].

The DCT will establish, maintain and improve the Nuclear Energy Series document structure.

The DCT does not supersede the responsibilities of the Departments, Sections and Divisions for the preparation and quality of documents.

Functions

The DCT shall:

- establish, maintain and improve the Nuclear Energy Series (NES) document structure;
- review Document Preparation Proposals (DPPs) for documents before their preparation;
- approve of the categorisation of a document as proposed in its DPP, either as an NE Series document or other publication;
- implement a process for the planning, preparation, and revision of NE Series documents;
- ensure the development and revision of NE Series documents in accordance with the approved structure;
- ensure peer review, if necessary, of NES documents in the second phase of their preparation
- prepare and maintain a roster of potential reviewers;
- provide an interface in NE Series document preparation with other IAEA departments and the Publication Committee.

Approach

The DCT will function as a standing group and will receive guidance from and report to the DDGM. DCT activities will, in accordance with the attached flowchart, include the following:

[1] Other publications: Journal articles, brochures, conference proceedings, book chapters, special reports co-authored with other institutions, and documents that relate to a single Member State, that summarize the results of a single meeting, or that have a simple report nature and may be published as separate TECDOCs or TRSs.

1. The DCT will review DPPs on a timely schedule and will recommend whether the document should be prepared as an NE Series document and endorse the category of the document in the NES structure. The subsequent review process of the DCT will not cover other publications.

2. The DCT will review and comment on the submitted draft documents and, if deemed necessary, request an external review. The objectives or such reviews will include ensuring consistency with other IAEA documents, such as other Nuclear Energy Series and Safety Standard documents, and checking areas that may cut across the Agency. The DCT will determine the scope of the review and the reviewers. The DCT may comment on the quality of the draft document and will have the right to recommend to Section Head, Division Director or DDG not to proceed further with the document. .

3. The final draft of the document will be reviewed by the DCT. If the DCT recommendations are addressed without conceptual change the Division Director may decide to submit the final draft to the Publication Committee with following reporting to the DCT.

Membership and Chairmanship

The DDG NE, DIR/NENP, DIR/NEFW and one representative of each of the NE sections will compose the DCT. It is desirable that one of the two NE Members of the Publication Committee also attends the meetings.

The chairman of the DCT is the DDG NE Mr Y.A. Sokolov. Mr. P. Vincze NENP/NPES will act as the secretary of the DCT. The members are DIR/NENP Mr A. Omoto, DIR/NEFW Mr H Forsström and a representative form each of the NE Sections: L. Nachmilner NEFW/WTS; J. Cleveland, NENP/NPTDS; Y. Yanev, INIS/NKMS; V. Inozemtsev, NEFW/NFCMS; D. Ah Win, Library; A. McDonald PESS. Alternates may be appointed to represent each Section.

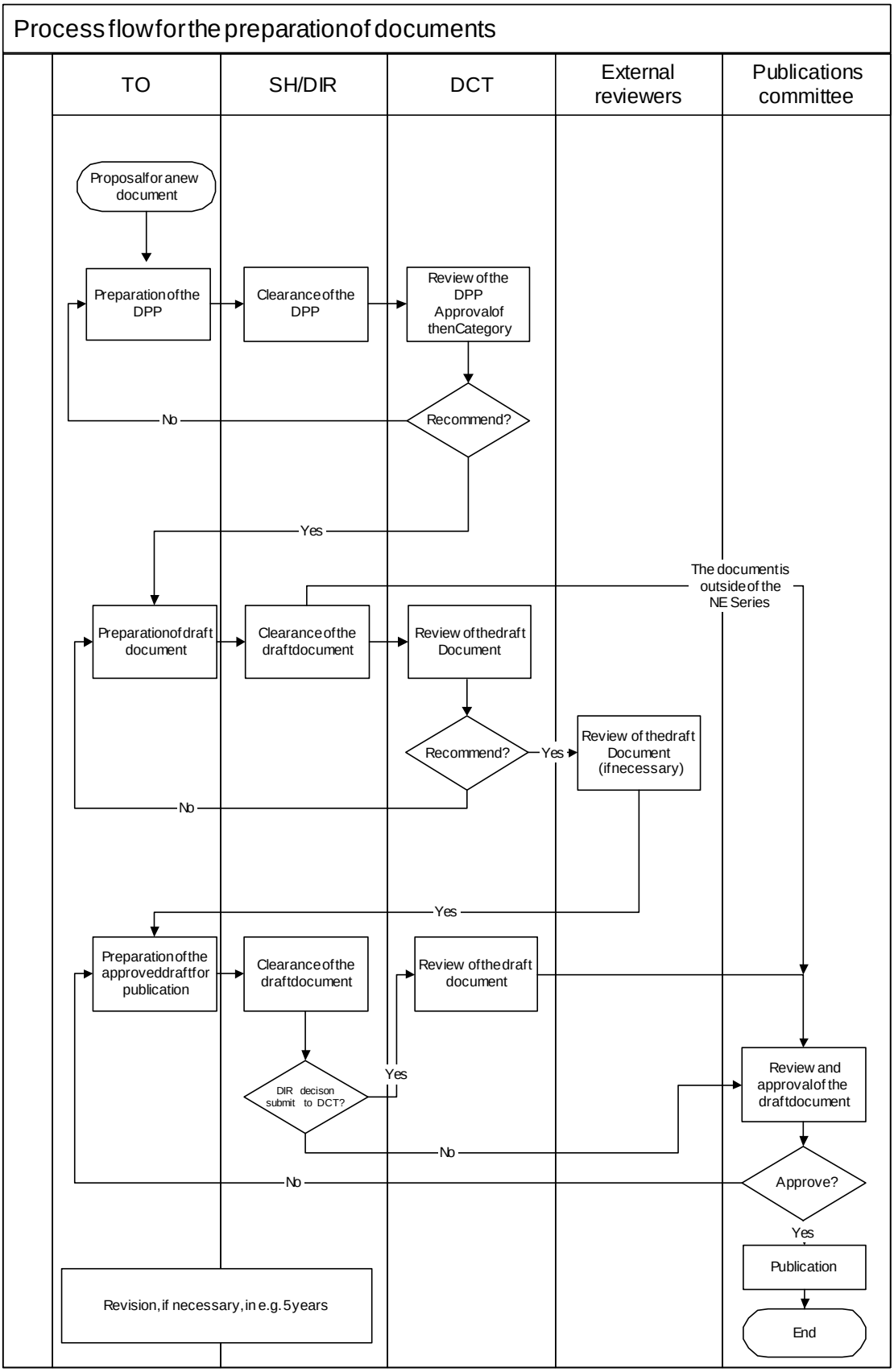
Representatives of other IAEA departments may also be members of the DCT.

Working Methods

- The DCT will have meetings as needed to implement the document planning, preparation and revision process, but not fewer then 6 meetings in a year;

- Minutes of the DCT meetings will be prepared by the DCT secretary and distributed to all members and placed upon a dedicated DCT Livelink record.

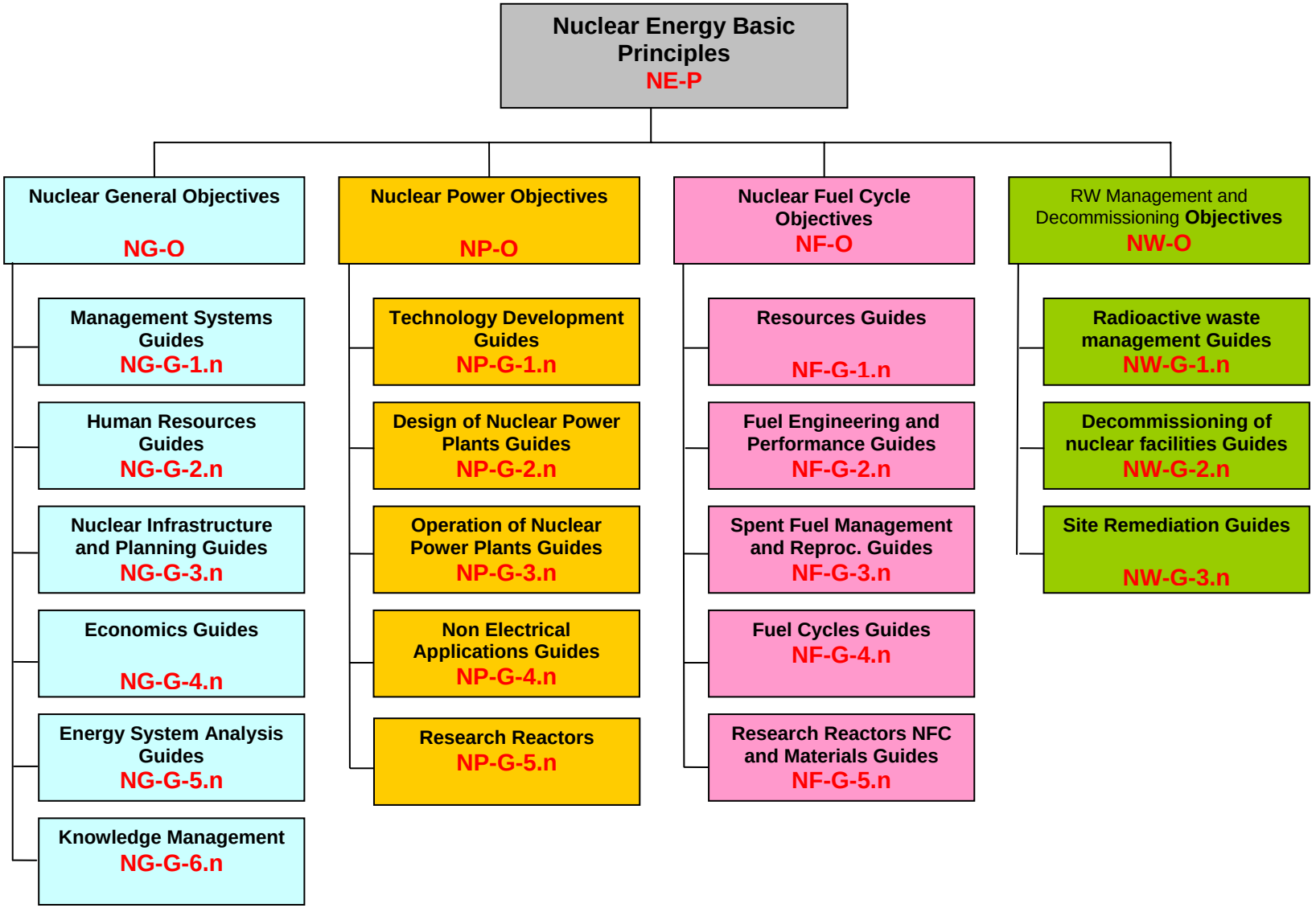
The DCT will review and evaluate its TOR after six months from the date of its first meeting and may recommend a refocus of DCT activities or a revision of its TOR as it deems appropriate.


Process flow for the preparation of documents
TO
SH/DIR
DCT
External reviewers
Publications committee
Proposal for a new document
Preparation of the DPP
Clearance of the DPP
Review of the DPP Approval of then Category
Recommend?
No
Yes
The document is outside of the NE Series
Preparation of draft document
Clearance of the draft document
Review of the draft Document
Recommend?
Yes
Review of the draft Document (if necessary)
No
Yes
Preparation of the approved draft for publication
Clearance of the draft document
Review of the draft document
DIR decison submit to DCT?
Yes
Review and approval of the draft document
No
Approve?
No
Yes
Publication
Revision, if necessary, in e.g. 5 years
End

Appendix 2: Document Cover Arrangement

IAEA	
NUCLEAR ENERGY SERIES	
	Title **Objectives**
Reference Number	**NP-O-1**
IAEA, Vienna	

The cover page will be colour coded and will have pictures.


Nuclear Energy Basic Principles
NE-P
Nuclear General Objectives
NG-O
Management Systems Guides
NG-G-1.n
Human Resources Guides
NG-G-2.n
Nuclear Infrastructure and Planning Guides
NG-G-3.n
Economics Guides
NG-G-4.n
Energy System Analysis Guides
NG-G-5.n
Knowledge Management
NG-G-6.n
Nuclear Power Objectives
NP-O
Technology Development Guides
NP-G-1.n
Design of Nuclear Power Plants Guides
NP-G-2.n
Operation of Nuclear Power Plants Guides
NP-G-3.n
Non Electrical Applications Guides
NP-G-4.n
Research Reactors
NP-G-5.n
Nuclear Fuel Cycle Objectives
NF-O
Resources Guides
NF-G-1.n
Fuel Engineering and Performance Guides
NF-G-2.n
Spent Fuel Management and Reproc. Guides
NF-G-3.n
Fuel Cycles Guides
NF-G-4.n
Research Reactors NFC and Materials Guides
NF-G-5.n
RW Management and Decommissioning Objectives
NW-O
Radioactive waste management Guides
NW-G-1.n
Decommissioning of nuclear facilities Guides
NW-G-2.n
Site Remediation Guides
NW-G-3.n

Identification of Reports

The same principle will be used, i.e. the area, level (Report) number of the topic within the area and a sequential number will be reflected in the identification.

E.g. Reports under Nuclear Power Objectives will be numbered as NP-T-1.n, where NP is the area, 1 is the number of the topic (Technology Development) in the area, n is a serial number.

The working ID of the NES documents in preparation

The working ID should reflect that the document is a draft (D), the respective area (e.g. NG, NW) and the number (e.g. 1) of the topic (Radioactive Waste Management), and a sequential number.

Exaples: D-NF-1.n (Draft document for NF area, topic 1 Resources)