



European Utility Requirements
for LWR nuclear power plants

Revision C of the EUR volume 4

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**EUR seminar
2007**

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Status of the EUR works

- EUR works active since the early 90's
- Status as of 2007:
 - Volume 1 – Main policies and objectives
Revision “C” April 2001
 - Volume 2 – Generic “Nuclear Island” requirements
Revision “C” April 2001
 - Volume 3 – Application of EUR to specific design;
1999 to 2007, see specific presentations
 - **Volume 4 – Power Generation Plant requirements**
Revision “B” March 2000



Structure of the EUR volume 4

650 sections

VOLUME 4 : POWER GENERATION PLANT REQUIREMENTS

| | |
|--------------|---|
| Chapter 4.1 | Introduction to the volume 4 |
| Chapter 4.2 | Overall requirements |
| Chapter 4.3 | Layout |
| Chapter 4.4 | Design requirements |
| Chapter 4.5 | Main turbine generator systems |
| Chapter 4.6 | Steam, condensate and feedwater systems |
| Chapter 4.7 | Electric power systems |
| Chapter 4.8 | Circulating water systems |
| Chapter 4.9 | Auxiliary systems |
| Chapter 4.10 | Instrumentation and Control |
| Chapter 4.11 | Operation, maintenance and procedures |

Volume 4 is organised by chapters that deal with specific systems.



history of the EUR volume 4

- **Revision A** issued in November 1996, consistent with revision B of volume 2 (November 1995)
 - Result of the works by a specific EUR volume 4 coordination group
- **Revision B** issued in March 2000,
 - Feedback of the review of rev. A by the vendors & utilities
 - Result of the works by a specific EUR volume 4 coordination group
 - Published before revision C of volumes 1 & 2 was issued
- **Revision C** prepared since 2001
 - Main objective: to improve consistency with volumes 1 & 2
 - Specific EUR volume 3 coordination group
 - Detailed review by EUR Administration Group to ensure consistency
 - Works on volume 4 stopped in 2003



Why Energoatom contributed to revision C of the EUR volume 4

- February 2005: NNEGC «Energoatom» application for EUR membership.
- April 2005: NNEGC “Energoatom” admitted as associated member to the EUR organization.
 - A contribution (in kind) to the works already done within EUR use to be requested to the new EUR members.
 - Skills were available at Energoatom in conventional island design
 - ➔ Review and completion of Revision “C” of Volume 4 EUR by NNEGC “Energoatom” was agreed as a valuable contribution to the EUR works.



Preparation of the Revision «C» of Volume 4 by EA

- kick-off meeting on 19-20 January 2006 in Kiev.
- Discussion and agreement on:
 - How to review Volume 4,
 - The available inputs, the expected contribution by EA
 - The main steps of the programme
 - Review and acceptance process by the EUR organisation
- Presentation of the status of the revision C of volume 4 before EA works



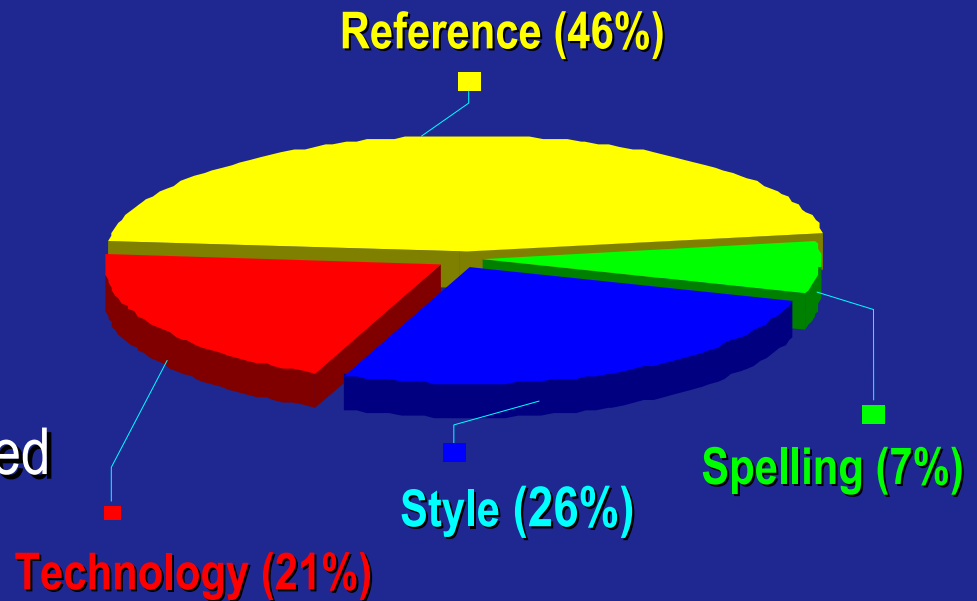
EA organisation for the revision of Volume 4

- A Temporary Expert Group (TEG) has been set up in Ukraine by EA for EUR volume 4
- TEG staff:
 - experts-technologists from NPPs shifts (turbine and electrical units departments);
 - experts-technologists from NPPs auxiliary departments;
 - experts-technologists from national designing institutes;
 - experts-technologists from NNEGC “Energoatom” scientific and technological services.



The Temporary Expert Group proposals

- 458 remarks on specific volume 4 requirements have been analysed by the experts of the TEG.
- Remark types:
 - Technological
 - Style
 - Reference
 - Spelling
- The proposals have been included in revised versions of the texts



Only a few significant technical changes

- **Section 4.2.4.11 Response to loss of main water pump**
- **Section 4.3.2.4.2.4 High radiation areas**
- **Section 4.4.9.4.3 Extraction, steam heaters, heater drains, condensate and feedwater system**
- **Section 4.5.3.1 Bearing**
- **Section 4.7.3.1 System definition**



A thorough review of the proposed changes by the EUR organisation

- More than 4 full days of review by the EUR organisation
- 5 EUR review meetings between October 2006 and April 2007:
 - Detailed review of the Chapters 4.5 to 4.11:
meeting 126 EUR Administration Group (9-10 October, Stockholm)
 - Detailed review of the Chapters 4.1 to 4.4:
meeting 127 EUR Administration Group (5-6 December, Zurich)
 - First round of volume 4 approval:
meeting 68 EUR Steering Committee (21 December 2006, Kiev)
 - Final consistency review:
meeting 127 EUR Administration Group (17-18 April, Brussels)
 - Final approval:
meeting 69 EUR Steering Committee (20 April 2007, Rome)



The remaining steps to publication

- The final texts of the revision C have been brought back to the EUR organisation in April 2007
- Final editing will take a couple of months from now
- Paper copies of the revision C should be available in September 2007
- The PDF version on CDROM will be made at the same time than the PDF versions of the last two subsets of volume 3. This may be available in September 2007
- The PDF version should be available for downloading from the EUR public web site later in 2007



Conclusions

- The participation of NNEGC “Energoatom” specialists, has allowed them to get acquainted, at detail level, with the European specifications for new NPP’s with light water reactors.
- This review confirms the international experience: the EUR document can be used as bases when the bid documentation will be prepared for building new NPP units in Ukraine.
- From an EUR standpoint, the quality of the volume 4 has been significantly improved and a revision C is to be published in 2007





European Utility Requirements for future LWR plants

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