

AFCEN and INTERNATIONAL HARMONIZATION

C. LAUGIER - AFCEN Chairman

With contribution from JM. GRANDEMANGE & C. FAIDY

MDEP Conference September 10-11, 2009

- ✓ **First lessons learned from code comparisons**
- ✓ **The AFCEN point of view on code convergence**

- ✓ **ASME structure taken as reference**
 - **Exercise made on ASME Subsection NB scope for vessels**

- ✓ **Identification and classification of differences**
 - **Due to technical reasons**
 - **Industry responsibility**
 - **Due to regulatory context**
 - **Safety Authority responsibility**

- ✓ **Many other documents beyond the Codes ...**
 - **Codes refer to a large number of Standards**
 - **RCC-M integrates aspects which may be part of Owner specification according to ASME practice**
 - **Examples: Ageing and radiation protection considerations are included in RCC-M code / owner responsibility in ASME code**

- ✓ **Some provisions are different, but may be judged technically equivalent**
 - **Example: Qualification of processes and personnel**

Some examples of significant differences

✓ General

- No AFCEN accreditation system
- ASME referred to in US regulation. No mandatory status of codes in France

✓ Materials

- Part qualification where heterogeneity hazard is identified (M 140)
- Material selection procedures are different

✓ Design

- Fatigue and Rupture analysis are strongly different
- Pressure tests

✓ Fabrication / Examination

- All welding aspects grouped in one Section in RCC-M

- ✓ Code comparison table is a significant step

...to be continued on behalf of **MDEP**

- Exchanges between Safety Authorities on provisions resulting from national regulation
- Exchanges between SDOs on technical aspects

- ✓ Codes shall refer as far as possible to **existing international standards**

- Use of ISO standards where appropriate

- ✓ Examples of **harmonization** in RCC-M Add. by **AFCEN**

- 20MND5 integrated

- Pressure test conditions

} **Basic RCC-M requirement
now similar to ASME III**

Association Française pour les règles
de conception, de construction
et de surveillance en exploitation
des matériels des Chaudières Electro-Nucléaires

**THANK YOU FOR YOUR
ATTENTION**

AFCEN Standards

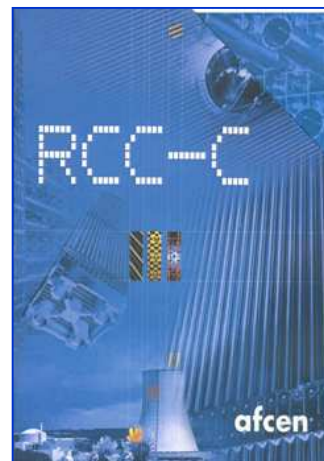
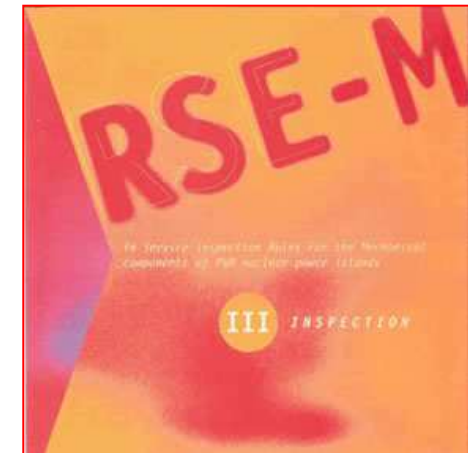
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French Society for design, construction and surveillance in operation Rules for Nuclear Island Components

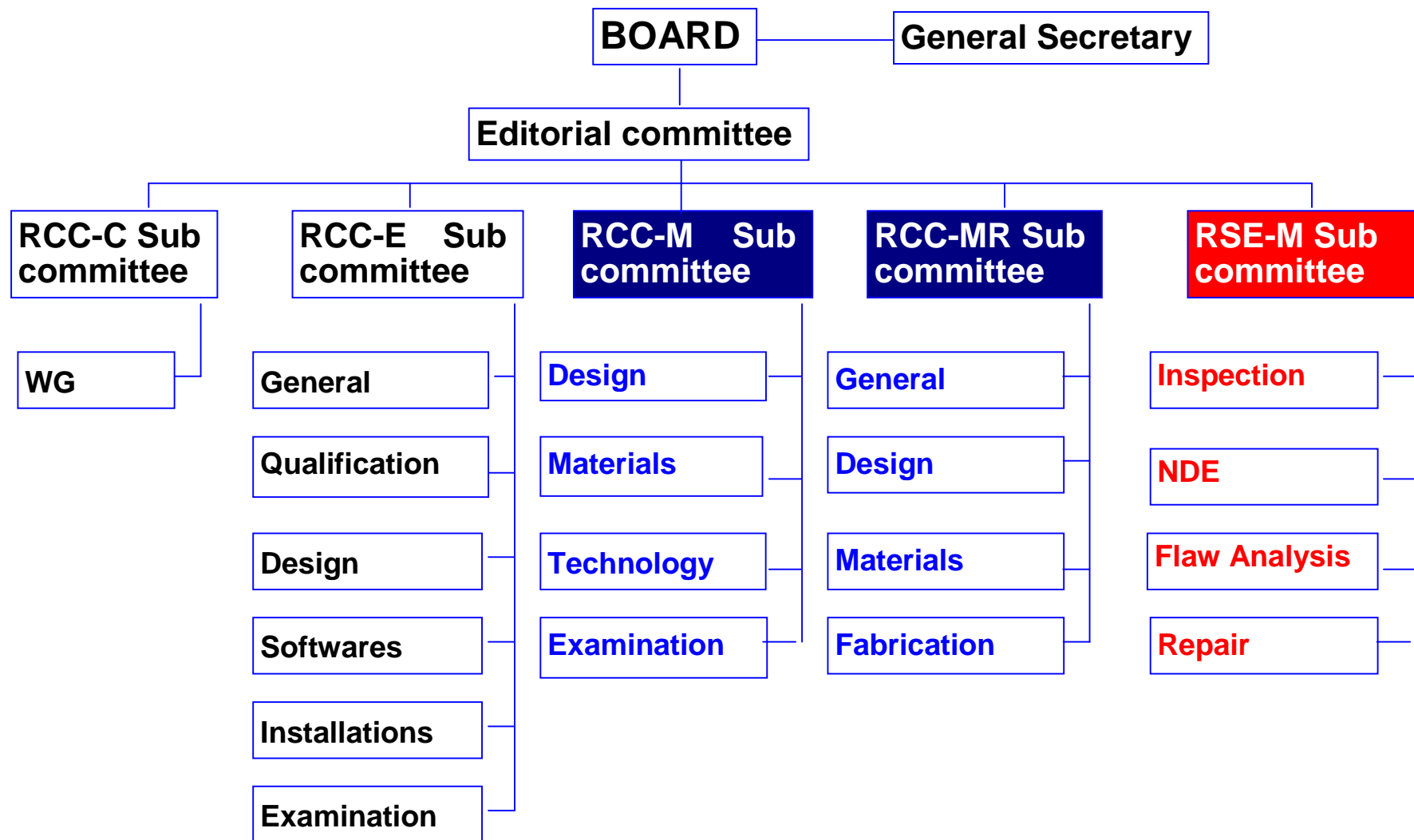


RCC-M

AFCEN codes edited in French and English (combined Paper and CD-Rom versions)
Other translations with Afcen agreements (Russian, Chinese)



Structure of Afcen



✓ RCC prepared by AFCEN

- **RCC-C Nuclear Fuel**
- **RCC-E Electrical Equipment**
- **RCC-M Mechanical components of LWR reactors**
- **RCC-MR Mechanical components of FBR reactors**
- **RCC-G Civil Works**
- **RSE-M In-service surveillance of mechanical components**

✓ Other RCC

- **RCC-I Fire protection**
- **RCC-MX Mechanical components of experimental reactors**
(to be merged with RCC-MR in the future and be edited by Afcen)

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Code comparison: Structure

afcen

RCC-M Code

ASME Code



- | | |
|------------------|----------------------------------|
| Section 1 | Nuclear Island Components |
| A | General requirements |
| B | Class 1 components |
| C | Class 2 components |
| D | Class 3 components |
| E | Small components |
| G | Core support structures |
| H | Supports |
| J | Storage tanks |
| P | Containment penetrations |
| Z | Technical appendices |

- | | |
|------------------|----------------------------|
| Section 2 | Materials |
| Section 3 | Examination methods |
| Section 4 | Welding |
| Section 5 | Fabrication |

- | |
|--------------------|
| Section III |
| NCA |
| NB |
| NC |
| ND |
| None |
| NG |
| NF |
| NC/ND 3800-3900 |
| NE |
| Appendices |

- | |
|---|
| Section II |
| Section V |
| Section IX
(qualifications) |
| Various parts of
Section III |

- ✓ **Adaptation to other Regulatory contexts depending on project needs**
 - Through additional non-mandatory appendices
- ✓ **Consideration of new editions of standards**
 - Updating of QA provisions in A.5000 referring to ISO and IAEA standards
- ✓ **Improve convergence between codes**
 - Safety margins 4 on UTS to be replaced by 3.5 for class 2/3 equipment
 - Updating of stress indices and equations
- ✓ **Integration of developments**
 - Consideration of environment effects in fatigue evaluation
 - Non-mandatory appendix Z.L based on existing code design fatigue curves and reserve factors under evaluation
 - Need for in-depth discussions between Code Committees

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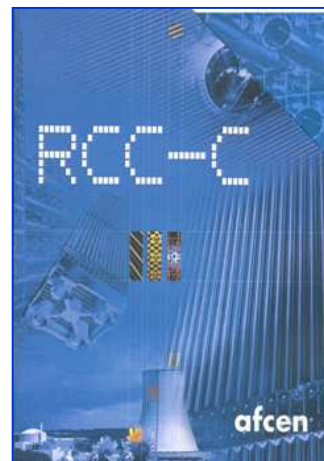
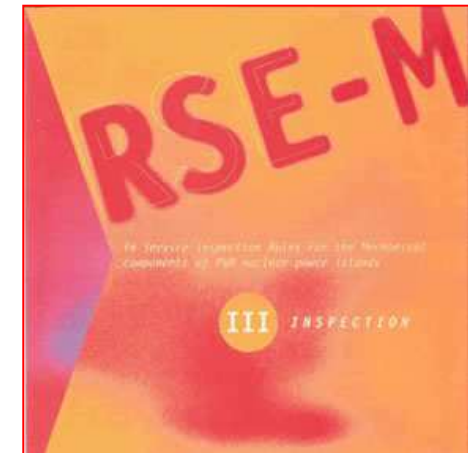
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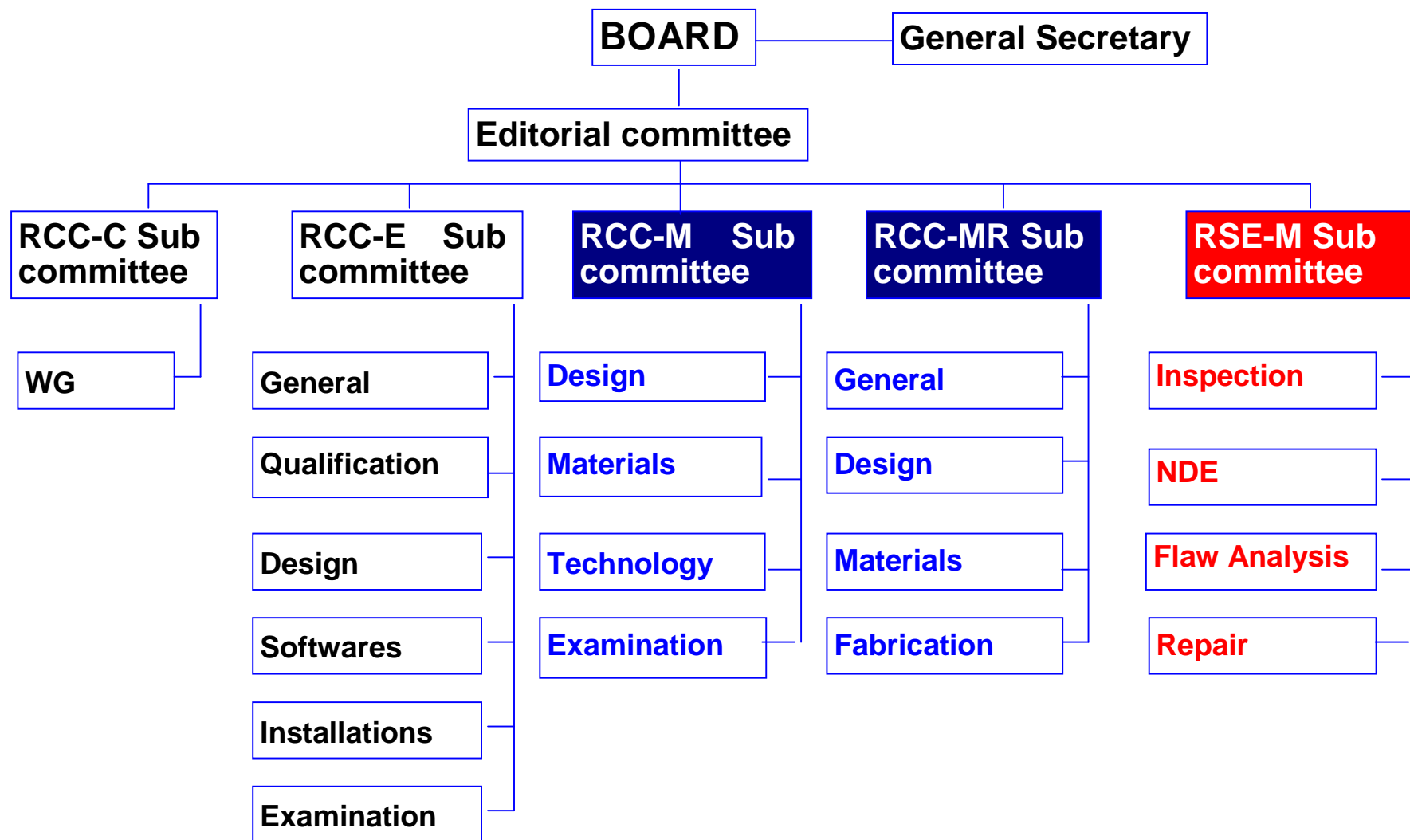


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