EUROPEAN COMMITTEE
FOR STANDARDIZATION

Business Plan proposal for a CEN Workshop

CEN/WS 64 – Phase 2
Design and Construction Codes for Gen II to IV nuclear facilities
(pilot case for process for evolution of AFCEN codes)

(as revised at the kick-off meeting on 2014-06-06)

CONTENTS

Status of this Business Plan

Accepted by CEN Members.

EUROPEAN COMMITTEE
FOR STANDARDIZATION

1. Background to the CEN Workshop

1.1 The Market environment

In the nuclear industry, specific design and construction Codes provide a set of essential engineering tools for the design, construction, and integration of nuclear high safety class components and systems. These Codes are the common reference between all actors involved in the design and construction of power plants and other nuclear facilities, starting from the main supplier of the technology, the architect engineer, the operator, manufacturers and suppliers of components, contractors, but also inspectors and safety authorities. These Codes are a reliable basis to ensure the quality level of components and systems, necessary to meet high nuclear safety levels.

Codes permanently integrate the lessons learnt from industrial practice of the different stakeholders (both in terms of failures and in terms of best practices) and the safety requirement evolutions. They are mostly based on scientific results or, failing that, on experience-proof postulates.
Codes are contractual bases for the projects, in the first place between contracting authorities and their providers of specific key equipment. In addition, they can be used as a basis in the arguments between licensees and safety authorities, in particular at the time of reactors licensing or periodical safety assessment.

1.2 Motivation for the creation of "CEN/WS 64 phase 2"

In the EU, for historical reasons and depending on the country, the nuclear reactors in operation today were designed and built using either the US ASME Code, equivalent "European national" codes (AFCEN for France, KTA for Germany), or Russian codes (NIKIET), or even a mixture of codes adapted at national level. This led to a European nuclear reactors fleet that has been built within a "patchwork" of reference codes, leading in some cases to over costs, delays in the implementation and a more complex follow-up of activities. The need for harmonization has been recognized at diverse occasion and some initiatives are already trying to improve the situation, for example, as Multinational Design Evaluation Programme (MDEP), the CORDEL group of the WNA, NUGENIA.

These codes are one of the major contributors for driving cost for new nuclear power plants. Harmonization of these codes is a way of reducing their impact. Another way is a simplification of the codes.

In the perspective of the implementation of Generation IV systems, an experiment was carried out in the European area to federate stakeholders in a common code elaboration process derived from the current AFCEN[1] process.

- Tentative Europeanization process to an AFCEN code relating to Generation IV systems

This initiative was the set up in 2011 of the CEN Workshop on "Design and construction codes for mechanical equipment of innovative nuclear installations" (CEN/WS 64) proposed by the European Sustainable Nuclear Industrial Initiative (ESNII) and AFCEN.
This Workshop, financially supported by the European Commission (DG ENER) and in which participated a wide range of organizations among nuclear development stakeholders, aimed at investigating the Europeanization potential of an existing code (AFCEN RCCM-Rx: design and

[1] **Afcen**: *Association Française pour les règles de Conception, de construction et de surveillance en exploitation des matériels des Chaudières Electro Nucléaires*
French Association for the rules governing the Design, Construction and Operating Supervision of the Equipment Items for Electro Nuclear Boilers.

construction rules for mechanical equipments of research and fast neutron reactors) for innovative nuclear facilities (mainly Generation IV systems).

As a main result of the CEN/WS 64, it appeared that the modifications of the Code required by partners involved in short term concrete design and/or construction projects (referred to as short term modifications in the CEN/WS 64) should preferably take place in the existing dedicated AFCEN subcommittees. But for stakeholders with potential medium or long term projects or desiring to learn more about the Codes and their evolution process, in order to introduce appropriately their requirements into the Codes and to identify the associated pre-normative research needs, the Workshop experience should be the base for a veritable European process for future developments of the AFCEN Codes.

In parallel, the CEN-CENELEC investigated the situation of nuclear standards in Europe and the potential need to create a European technical structure dedicated to this area under its umbrella.

- Investigation on European needs related to nuclear energy standards by a Focus Group

In 2011 CEN-CENELEC created a dedicated Focus Group on nuclear energy. In 2012, this Focus Group issued a report with an overview on suitable standards already publicly available (from ISO, IEC, CEN and CENELEC or other sources) or in preparation, to meet specific needs for products and services in the nuclear sector. A set of recommendations was proposed to both the CEN and CENELEC Technical Boards and endorsed by these Boards (CEN BT C145/2012, CENELEC BT D144/C002-C005). One of the recommendations encourages the follow up of the CEN/WS 64 to enlarge the Europeanization process to other AFCEN Codes using CEN Workshops.

Based on the results of the CEN Workshop 64 and the recommendations of the CEN-CENELEC Focus Group, in April 2013, the European Commission in the framework of ENEF (European Nuclear Energy Forum) decided to support a CEN/WS 64 phase 2 with the target to enlarge the scope to the codes for mechanical equipment and civil engineering of GEN II to GEN IV nuclear installations. Indeed, seeing the perspective of the Long Term Operation for GEN II NPPs and the potential new NPPs of GEN III, the aim would be to offer an opportunity to a wide range of stakeholders to gain a deep understanding of the AFCEN codes and their evolution process, to allow them to define their long term requirements for the codes modification and the adaptation to their needs. It would also lead to the definition of pre-normative research priorities. At the end this would help initiating the harmonization process of codes at EU level.

1.3 Existing standards and standard related activities and documents

According to another recommendation of the Focus Group, CEN/TC 430 was set up in September 2013 in view of implementing ISO/TC 85 & SCs' existing and forthcoming standards at the CEN level.
Civil engineering, fuel technology, electrical equipments and mechanical standards for nuclear facilities are not addressed in ISO/TC 85. ISO/TC 85 has currently 3 subcommittees respectively dedicated to radiation protection (SC 2), nuclear fuel cycle (SC 5) and reactor technology (SC 6).
None of them is dealing with topics covered by AFCEN codes.
Electrical equipment standards for the nuclear sector are addressed in IEC/TC45 (Nuclear instrumentation), IEC/SC45A (Instrumentation, control and electrical systems for nuclear facilities) at international level and in CLC/TC45AX (Instrumentation, control and electrical systems for nuclear facilities) and CLC/TC45B (Radiation protection instrumentation) at European level. Some of the standards developed at international level or endorsed as EN at European level by those Committees are dealing with topics covered by AFCEN code RCC-E.

EUROPEAN COMMITTEE
FOR STANDARDIZATION

2. Workshop Proposers and Workshop Participants

The present CEN Workshop is proposed by Afcen and Afcen members.

In addition, ENEF[2], SNETP[3] (and in particular NUGENIA) and Foratom called for participation at the kick-off meeting.

3. Workshop objectives

The proposal consists into a voluntary mechanism for a broad set of partners involved with design and construction of nuclear facilities in Europe. It will allow partners not yet using AFCEN codes to learn about these codes. It will also give the opportunity to all participants to express their specific requirements for the long term modifications of the Codes including identification of pre-normative research where necessary."

During this process, other solutions in existing codes shall be considered. In ideal case, the result should be a combination of solutions from others codes, sometimes also allowing alternate approaches.

The prospective work to be done would be applicable to GEN III and IV NPPs and long-term operation/lifetime extension for GEN II NPPs.

The proposed CEN WS 64 phase 2 will enable members to:

a) recommend medium-long term orientations of evolution of those codes ;
Some rules presently considered cannot directly be included in the codes either because of an insufficient robustness of their demonstration or because there is no suitable way to deal with them in the current status of the code. When the integration of new rules of comparable nature or related to the same field seems feasible in a medium-long term period, an evolution of the code structure could be recommended to allow this integration

b) identify the R&D needs associated to these recommendations ;
Inventory of the R&D needs for the codification shall be established with a corresponding list of priority actions.
Some R&D needs for setting design rules for some equipments or, more frequently, to dispose of basic data for some materials and in particular for irradiated materials were already identified (e.g. materials not currently used in the nuclear industry , proton irradiation effects on materials).

c) look for explicit or implicit references to national standards in the codes and propose their substitution by international standards or, failing that, to advocate the elaboration of such standards ;

d) interact with the Multinational Design Evaluation Programme (MDEP) in view of:

[2] European Nuclear Energy Forum
[3] Sustainable Nuclear Energy Technology Platform

- on the one hand, promoting convergence actions in particular via MDEP SDO Board and asserting European practices at the international level,
- on the other hand, converting MDEP recommendations in codes evolution proposals.

4. Workshop programme

WS 64 – phase 2 will take place for a 3-year period, ending by 2017.

In order to meet its objectives, "WS 64 – phase 2" plans to prepare the following deliverables:

- **Yearly statements of the proposed evolutions**

These statements will consist in a formal activity report of the prospective groups and will contain a list of proposed evolutions for one or several codes, including possible substitution of standards taken as reference. For each evolution, depending on the stage of discussions' progress in the prospective groups, the following information will be given:

- the description of the evolution, i.e. its technical content, its scope of application and the associated deadlines;
- the required R&D to support the evolution, i.e. its technical content and expected results, the resources needed and their availability, its specificity to a project or for the community, and in this case, recommendations regarding to its funding and the associated intellectual property;
- the procedure to integrate the evolution in the code(s), i.e. the description of the modifications to perform, the expected deadline for implementation as well as the position of the code editor for the proposed modification.

These statements will be published in the form of a CEN Workshop Agreement (CWA); yearly revisions of the CWA will be issued (in 2017) to reflect the findings reached during the previous year.

- **A triennial statement of the medium-long term orientations stated in the CWA**

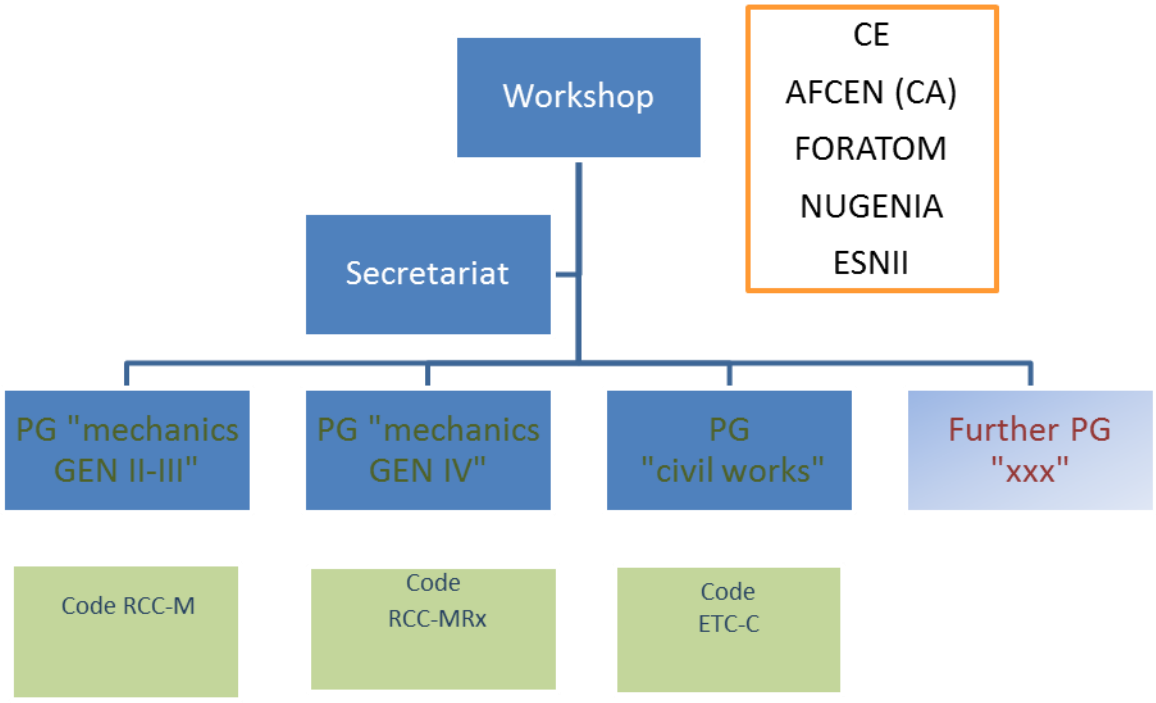
  This statement would allow the stakeholders to evaluate the workshop and its working group's efficiency for the code "Europeanization" process. It will also allow the AFCEN (and other possible code editing bodies) to take advantage of the associated European evolution of its codes and the rules included in them. This triennial statement will be documented in the version of the CWA at the end of Workshop 64 phase 2.

In addition to the above statements, the workshop will regularly report on the evolution of the work and results achieved by the prospective groups to the EC/ENEF working groups dealing with nuclear installation safety and competitiveness and MDEP if possibility is given to.

	2014				2015				2016				2017	
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Kick-off meeting														
Code recommendations by PGs														
Notification to AFCEN														
AFCEN's report to the WS														
WS's assessment of AFCEN editorial programme														
Statement of the medium-long term orientations														
R&D recommendations by PGs														
Prioritization by WS														
Information of EC DG R&D, SNE-TP														
Drafting of the CWA														

5. Workshop structure

5.1 General organisation



- **Workshop plenary meetings**
  The Workshop endorses the recommendations from the prospective groups dealing with the proposed code evolution, with R&D, and with references to international standards. The Workshop notifies to the codes editors the recommendations dealing with the code contents.. Additionally, it will assess how the recommendations are taken into account by the codes editors and give its feedback to them.

  It may intervene in case of serious trouble in the workshop functioning or if some decision concerning its work has to be taken.

- **Prospective groups**
  There is no a priori limitation for the number of groups or for the topics to be considered. On the practical point of view, it is proposed in a first phase to create prospective groups corresponding to the codes dealing with mechanical equipments for GEN II-III reactors, with mechanical equipments for GEN IV installations and with the civil work for reactors.

  - To recommend medium-long term orientations concerning the evolutions of the codes
  - To identify the related R&D actions
  - To see to the « denationalisation » of references

To this end AFCEN will provide, free of charge, participant organizations with one copy of the relevant AFCEN Code(s) for the prospective groups.
To support the identification of R&D needs and the recommendation of medium-long term orientations, it may be useful to get access to some research and background information that constitutes the basis for what is in the AFCEN Codes of today. When needed, the Prospective Groups will ask AFCEN for such information. AFCEN will supply it to the Prospective Groups to such an extent possible due to proprietary aspects.

5.2 Workshop Chairman and Vice-Chairman

The responsibilities of the Workshop Chairman are:
- to chair WS plenary meetings;
- to ensure that the WS delivers in line with its BP;
- to manage the consensus building process;
- to interface with the CCMC regarding strategic directions, problems arising, external relationships;
- to work with the Workshop secretariat and prospective groups convenors on general management issues.

Vice-chairperson

The responsibilities of the Vice-chairperson are to assist the chairperson in its function and to replace him in case of absence/unavailability.

5.3 The Workshop Secretariat

The Workshop Secretariat is in charge of:

- organizing Workshop meetings (Coordination Committee and Prospective Groups), both as physical and electronic meetings;
- assembling the CWA and yearly statements;
- producing and distributing Workshop meeting reports and action lists;
- constituting the administrative contact point for the Workshop;
- managing Workshop membership lists;
- managing Workshop document registers;
- ensuring the follow-up of action lists;
- assisting the chairman in monitoring and follow-up of electronic discussions.

5.4 Prospective Groups Convenors

The Prospective Group Conveners were appointed during the Workshop kick-off meeting by the participants.

They are in charge of:

- planning the Prospective Group meetings so that it delivers in line with the Workshop Business Plan,
- convening the Prospective Group meetings and chairing them,
- managing the consensus building process,
- interfacing with the Workshop Chairperson regarding strategic directions, problems arising, external relationships, etc.

Prospective Group experts shall comprise representatives of the Workshop registered participants. However, experts coming from other organizations may be invited to join a Prospective Group meeting on invitation of the Convenor, and with the agreement of the Prospective Group experts.

6. Resource requirements

The registration and participation at this CEN Workshop is free of charge for every member of the Workshop, but each participant will bear his/her own costs for travel and subsistence.

The administrative costs of the Workshop Secretariat and other logistical support, for instance the online conference tool, will be shared between the CEN Workshop members.

7. Distribution of CWA

The copyright of the final agreement will be with CEN, though all proposers will get a free copy of the CEN Workshop Agreement for their own use.

8. Related activities, liaisons, etc.

The proposed CEN/WS 64 phase 2 will cooperate with:

- AFCEN
- MDEP
- if necessary, CEN/TC 430 “Nuclear energy, nuclear technologies, and radiological protection”, ISO/TC 85 “Nuclear energy, nuclear technologies, and radiological protection”, CLC/TC 45AX “Instrumentation and control of nuclear facilities”, CLC/TC 45B “Radiation protection instrumentation”, IEC/TC 45 “Nuclear instrumentation”.

- **Coordination with AFCEN**

  In order to promote their recommendations, CEN/WS 64 – phase 2 should have strong and continuous relationships with the AFCEN in order to allow code evolution but as well to make sure that the recommendations elaborated by the prospective groups are relevant in a rule-making process.

  To achieve this, senior representative of each involved AFCEN subcommittee should make the link with the corresponding prospective group and participate in its work.

  Furthermore, the President of AFCEN Editing Committee will report yearly to the workshop on the taking into account of its recommendations in the editorial programme.

- **Coordination with MDEP**

  Topics in relation with the codes are dealt with in MDEP through its Mechanical Codes and Standards working group in which participate the main Standard Development Organisations (SDO) in the area (ASME, AFCEN, CSA, JSME, KEA and NIKIET).

  The coordination will take place with the AFCEN representatives as AFCEN is the only European SDO involved in the programme and, as it is a proposer, will participate to the workshop.

9. Contact points

Chairman
Didier Lelièvre
Company: AFCEN
10, rue Juliette Récamier
F - 69456 Lyon Cedex 06
France
Tel.: + 33 1 69 08 63 95
e-mail: didier.lelievre@afcen.com
Web: www.afcen.com

Secretariat
Sylvie Picherit
CEN Member: AFNOR
11, Rue Francis de Pressensé
F - 93571 La Plaine Saint-Denis Cedex
France
e-mail: sylvie.picherit@afnor.org
Web: www.afnor.org

CEN-CENELEC Management Centre
Alexandre della Faille de Leverghem
Programme Manager
Avenue Marnix, 17
B-1000 Brussels
Belgium
Tel.: + 32 2 550 09 31
e-mail: adellafaille@cencenelec.eu
Web: www.cen.eu

Vice-Chairman
Dr. Martin Widera
RWE Power AG
Sparte Kernkraftwerke / Nuclear Power Plants
Anlagentechnik / Sicherheit
Huyssenallee 2
D-45128 Essen, Germany
Tel. +49 (201) 12-24638
E-Mail martin.widera@rwe.com