Example of application of EN 13480 and revision of the Guide on “Background to the rules Part 3: Design”

OPEN CALL FOR PROJECT TEAM EXPERTS

Under an EC/EFTA funding, the project aims to address the development of 1 example of application of EN 13480 and the revision of the Guide on “Background to the rules EN 13445-Part 3: Design”. It includes also the participation to a dissemination event organized at CEN premises for industry and other stakeholders, where the deliverables will be presented.

Through this call for Project Team experts, CEN invites applications (download the application form, word format) from experts who would like to work on:

- Example of application of EN 13480, referred to as Package 1 and,

The funding is available via the specific Grant Agreement 2014-12 between CEN and the European Commission. The official starting date of the Grand Agreement is 2015-01-01.

The two examples, referred to as Package 1 and Package 2, may be drafted by the same applicant or 2 different applicants, within the global budget of about 75 man/days.

The Terms of Reference (ToR) of the Project Team are attached in Annex. The selection and appointment of the Project Team experts will be made by a selection panel whose composition is:

- Alexandre Butaye, EN 13445/MHD Secretary
- Phil Bygate, CEN/TC 54 Chairman
- David Krupka, CEN/PE/AN Secretary
- Laurent Legin, CEN/PE/AN Convenor

The selection panel will select 1 expert for each package. Applicants should specify for which package they apply and their planned budget. Please refer to Clause 5 for a description of the expertise needed for this project.

Payments to Project Team experts are dependent on CEN having received the corresponding payments by the European Commission. The financial steps are defined in the Specific grant agreement.

Interested candidate experts are kindly requested to send their nominations by 2016-07-01, to David KRUPKA (david.krupka@afnor.org), CEN/PE/AN Secretary. Preferred method is by email, including a short and concise Curriculum Vitae focused on the experience, publications, achievements and skills relevant to the project. The estimated number of man-days they will need to perform the task and the man-day rate based on real costs need also to be provided.

We look forward to receiving your applications.

Yours sincerely,

David KRUPKA
Terms of Reference for a Project Team

1. **Scope**

This document is designed to enable the selection of 1 or 2 project teams in the frame of “Helpdesk pressure equipment directive” This is the Terms of References for the following specific tasks:

- Example of application of EN 13480, referred to as Package 1 and,

2. **Background**

Harmonized standards under Pressure Equipment Directives (97/23/EC and 2014/68/EU) have been adopted over the past few years on the basis of mandate M 071. These standards give appropriate solutions for designing and building safe pressure equipment complying with the pressure equipment directives.

Although the main standards for the major product groups are now available, further action is needed to ensure a take-up by industry of these standards.

The Pressure equipment migration help desk, EN 13480/MHD, was created in August 2002 to give to the standard users a central point where raising questions and obtaining authorized answers. From the questions it received, the help desk has identified the publication of examples of application as a key issue and has developed rules of procedure for their publication as CEN deliverables.

Examples of application is an efficient way to help the standard user to correctly understand and apply the requirements of the standard and to be aware of the permissible deviations, possible alternatives, use of normative reference documents, etc. It can also assist training organization and software developers. The revision of the Guide on “Background to rules EN 13445-Part 3: Design” will be also very useful for the Pressure equipment sector.

The project, in its efforts to broaden the application of the European standards harmonized for PED, will support the actions of the European Commission in the field of safety of pressure equipment.

3. **Description of scope, work plan**

3.1 **Scope**

The project will address the development of Example of application of EN 13480, the revision of the Guide on “Background to rules EN 13445-Part 3: Design”, and the participation to a dissemination event organized at CEN premises for industry and other stakeholders.

3.2 **Work plan**

The two deliverables to be developed are detailed in Annex and referred to as Package 1 and Package 2.

The drafting of the application shall explain the philosophy of EN 13480, and identify the basic alternatives used and revision of the Guide on “Background to the rules EN 13445-Part 3: Design”.

For the dissemination event, slides shall be prepared.
3.3 Timescale

<table>
<thead>
<tr>
<th>Activities</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>End of call for Project team</td>
<td>T 0</td>
</tr>
<tr>
<td>Selection Meeting</td>
<td>T0 + 1.5 months</td>
</tr>
<tr>
<td>Signature of the contract</td>
<td>T0 + 2.5 months</td>
</tr>
<tr>
<td>Redaction and restitution</td>
<td>T0 + 2 months</td>
</tr>
<tr>
<td>Review</td>
<td>T0 + 17 months</td>
</tr>
<tr>
<td>Restitution meeting</td>
<td>T0 + 19 months</td>
</tr>
</tbody>
</table>

4. Resources

The Applicant(s) will be appointed for the period (T0 + 2.5 months) to (T0 + 19 Months) for a total of maximum 75 man/days (including participation to the dissemination event).

5. Applicant - criteria for eligibility and working conditions

5.1 Skills

The applicant should have an engineering background and expertise in pressure equipment. He/she should have an excellent knowledge of the relevant Directives (PED: 97/23/EC and 2014/68/EU) and related CEN Standards (EN 13480, EN 13445 and referenced standards). He/she should be able to speak, read and write English fluently; knowledge of other European languages would be an advantage.

He/she needs to have an experience and good understanding of the standardization environment (CEN and ISO), including in particular the specific issues related to "Pressure Equipment Directive". He/she needs to have an experience and good understanding of the CEN tools in particular STD.

Qualification profile in details:

1) Familiar with CEN rules and tools
2) Familiar with Pressure Equipment Directive 97/23/EC and 2014/68/EU
3) Experienced of EN 13480 and/or EN 13445
   • Materials
   • Design
   • Manufacture
   • Inspection and Testing
4) Previous experience in contributing to a standardization initiative

5.2 Availability

The applicant(s) shall guarantee electronic availability during the contract period and physical participation to the dissemination meeting, to be held in Brussels.
5.3 Financial conditions

Travels are reimbursable, subject to prior agreement from AFNOR. The contracts will be between the Applicant and AFNOR and will follow standard CEN rules.

5.4 Selection grid

- Price aspects 20%
- Technical Skills 30%
- Language (English) skills 10%
- Knowledge of the rules and practices governing CEN-CENELEC technical work 10%
- Knowledge of the European and practices governing framework related to the tasks to be assigned (EN 13480, EN 13445 etc…) 30%

5.5 Other

Both individuals acting in their own right and those acting on behalf of their employers may apply. However, contractual arrangements will only be made with legally registered companies.

The two examples, referred to as Package 1 and Package 2, may be drafted by the same applicant or 2 different applicants, within the global budget stated in 4.

5.6 Selection of the candidate(s)

A call will be launched in accordance with the CEN rules. A Selection Panel (see composition below) will select the candidate(s).

Panel composition:

- Alexandre Butaye, CEN/PE/AN Secretary
- Phil Bygate, CEN/TC 54 Chairman
- David Krupka, CEN/PE/AN Secretary
- Laurent Legin, CEN/PE/AN Convenor

The foreseen date for the start of work is 1st of September 2016.

Annex:

- Technical requirements.
Annex A - Technical requirements

Example of application of EN 13480 and the revision of the Guide on “Background to the rules of EN 13445 Part 3: Design”.

Package 1

Scope: Show the application of EN 13480-1 to 5 to the case described below.

This application shall deal with the following issues:

- choice of materials and prevention of brittle fracture,
- design and calculation (DBF),
- manufacture
- testing and inspection.

The drafting of the application shall explain the philosophy of EN 13480, and identify the basic alternatives used.

The details of calculation, manufacturing conditions, amount of test and NDT, proof test shall be provided in the report, with reference to the appropriate subclause, equation number, figure, etc. of EN 13480 with specific commentaries on following issues:

- permissible deviations in design indicating which clauses of EN 13480 are relevant, e.g. material thickness, flange type, nozzle spacing, fluid type;
- alternative materials to those specified in European standards, which need a PMA;
- supplementary aspects to be considered in case of alternative welding qualifications to those in EN 13480;
- supplementary aspects to be considered in case of alternative welder and NDT operator qualifications to those in EN 13480.

The example will show which of the normative reference documents are necessary, with an indication of which clauses in them are essential to consult.

To ensure an easy reading, the document has to include abstracts of the EN 13480 where it is relevant. The same structure and presentation as CEN/TR 13445-101 shall be used.

Case: The case has to be proposed by the document writer. The example shall be chosen to highlight the specific cases that the EN 13480 users may meet while using them. The following aspects have to be covered:

- joints between headers et branch connections and also from pipe to pipe
- joints between different types of materials;
- welds performed by welders with different qualification types;
- joints between pipes with different diameters (DN).
Package 2

Scope: Revision of the Guide on “Background to rules EN 13445-Part 3: Design”.

In 2004 a document named “EN 13445 "Unfired pressure vessels" Background to the rules in Part 3 Design” has been issued.

The objective of this book was to explain the background of the EN 13445 design rules, to help industry to apply them in the most effective way. It was initiated by EPERC, the European Pressure Equipment Research Council, and was awarded a contract of CEN, the European Standardization Committee, with support of the European Commission.

Since the EN 13445 part 3 has seen several evolutions in the last 12 years, this document needs to be updated accordingly. The presentation system shall remain the same (organized according to the same clause numbering than the standard). As a consequence, each explanatory clause has to address the following topics:

- Background and references to the rules (with, where relevant a bibliography included in each clause)
- Detailed description of the method and comparison to other methods
- Future developments

Moreover, main technical changes in EN 13445 design rules shall be highlighted. For instance, the evolutions in fatigue and creep fields have to be clearly identified.

Existing scope of the guide:

“Part 3 of EN 13445 gives the rules to be used for design and calculation under internal and/or external pressure (as applicable) of pressure bearing components of Pressure Vessels, such as shells of various shapes, flat walls, flanges, heat exchanger tubesheets, including the calculation of reinforcement of openings. Rules are also given for components subject to local loads and to actions other than pressure. For all these components the DBF (Design by Formulae) method is generally followed, i.e. appropriate formulae are given in order to find stresses which have to be limited to safe values. These formulae are generally intended for predominantly non-cyclic loads, which means for a number of full pressure cycles not exceeding 500. However general prescriptions are also given for DBA (Design by Analysis) which can be used either to evaluate component designs or loading situations for which a DBF method is not provided, or, more generally, as an alternative to DBF. Methods are also given where a fatigue evaluation is required, due to a number of load cycles being greater than 500. There are two alternative methods: a simplified method based on DBF (valid mainly in case of pressure variations) and a more sophisticated method based on a detailed determination of total stresses using, for example, FEM or experimental methods. This can be used also in the case of variable loads other than pressure. For certain components (such as flanges and tube sheets) also an alternative DBF method (based on limit analysis) has been provided; the choice of which method has to be used in each particular case is left to the Designer. For the time being, the scope of Part 3 is limited to steel components working at temperatures lower than the creep range of the specific material concerned”

Complete document is available here: