EPERC Newsletter

European Pressure Equipment Research Council

Number: 2

November 24, 2017

Welcome from the Chairman

A new Board of Directors is in operation since last April 2017. The EPERC Association "renaissance" is now active in order to support needs, innovation and competitiveness of the European Pressure Equipment Industry. The major objectives of EPERC is to manage and support R&D to answer different questions, as:

- what are the gaps and needs in Pressure Equipment Industries? In particular the new needs associated to "renewable" and "innovation"?
- what are the differences with other international similar Codes or Practices? What's the background and justification of these differences? What's the situation of Pressure Equipment EN Standards versus new needs?
- how to support European Pressure Equipment Industry? How to develop R&D on Pressure Equipment for this important Industry in Europe?

The major orientation is to work with the key actors, like EU, including JRC, like EIT, like CEN including all the Pressure Equipment Technical Committees, with European Companies concerned by Pressure Equipment, to develop, to share and to manage R&D projects, in order to propose improvements of European Codes & Standards to guarantee knowledge transfer, innovation and competitiveness. All interesting parties from any EU country, concerned with Pressure Equipment, are welcome to contribute, to shear experience, to ask questions or to make suggestions for areas that need development.

In addition to this basic activities, EPERC will be in touched with similar organizations in the world like USA, Japan, Korea, India, China… to promote the EU Pressure Equipment Industry.

If you have any needs, ideas or R&D topics suggestion around Pressure Equipment (PE), please be free to send an email to EPERC through attached email address.

EPERC Chairman
Claude Faidy

EPERC Mission, Aims and Objectives

Mission: Co-ordinate, develop and promote the common technical interests and strategies of European industry with regard to pressure equipment industry innovation and competitiveness through:

a) research in relation with the international context and European institutions,
b) exchange of industry experience in design, materials, fabrication, use, inspection, monitoring, safe life assessment …
c) influencing the Codes and Standards by providing industry and research information, data and rules.

Aims: Safeguard and represent the technical and economic interests of industries in Europe that rely on pressure equipment; facilitate the free trade of pressure equipment and common in-service requirements across borders at international and European level through harmonization of standards and legislation, acceptance tests and recommended practices; promote and encourage collaboration and co-operation through research and exchange of industry experience among the EPERC Stakeholders (Members) with an interest in the design-manufacture and operation of pressure equipment for innovation and competitiveness improvement projects.

Objectives: Identify the needs for research and innovation and make pressure vessel industry safer, innovative and competitive through the exchange of industry experience and dedicated Technical Task Groups; establish priorities, timescales, scope and funding requirements; launch joint research and collaborative programs and activities based on identified needs; support the implementation of the joint projects, collaborative programs and activities; disseminate research results and industry experience, including through the medium of e-learning, and facilitate the transfer of technology into practice; assist and advise authorities involved with legislation, standards and other issues concerning pressure equipment at a European level.

EPERC strategy

- increase the to-day number and diversity of members: end users, designers, manufacturers, material organization, maintenance, professional institutes, R&D organization and Universities
- increase number of EU countries involved
- remain closely in touched with EU organization: EC, EIT, JRC, CEN and all Pressure Equipment Technical Committees
- increase number of topics to be considered for R&D programs and European Codes & Standards improvements
- basic work is attached to Thematic Task Groups with a dedicated technical program (charter), results and reports release
- regular thematic Technical Seminars, 1 to 3 days, open to members and visitors, minimum every 6 months
- EPERC International Conference, minimum every 2 years, 3 to 5 days, to exchange at the International level on State of the Art in Pressure Equipment Technology, to confirm gaps and needs, to promote European Pressure Equipment Industry, to compare existing international Codes & Standards
- EPERC is will propose training courses, master classes, summer school proposals on different aspects of Pressure Equipment
- Communication an Documentation: major exchanges will be done through EPERC website (new version in preparation):
  www.eperc-aisbl.eu
- the number of face to face meetings will be limited using in priority phone call conference or web-seminars as alternatives
- all the historical and new EPERC Reports will be downloaded on the website very soon; all other free reports from any member could be downloaded on the website too, after BOD agreement.

EPERC Organization & Activities

Chairman & Board of Directors (BOD)	Communication, Documentation and website
Members	
Thematic **Task Group** (TG) 1 to 10… with a TG Chairman, a group of members, a charter and a list of potential R&D projects	
Periodic EPERC **Seminars** : - around each existing active TG - or around New Potential Topics - and Intermediate TG meetings between Seminars at the TG Chairman Initiative	
International EPERC Conference on present and future EPERC Pressure Equipment Technical Activities to support: **Innovation and Renewable Industries**	

EPERC Task groups running

Fatigue: in connection with EN13445 for Vessel first, and after with EN13480 for Piping systems; what's the detail background of existing rules, how to compare them with other Codes (non-nuclear and nuclear), how to consider different environments in fatigue analyses, what's the level of margins and conservatisms attached to different rules, what kind of complementary R&D is needed…

Non Destructive Test as alternative to hydro proof tests: after analyses of a large questionnaire reviewing different practices at the EU level, some practical proposals will be done for operating plants

In series produced pressure equipment: many specific aspects to the "series" aspects will be analyzed for practical proposals

Bolted Flange: starting by an example of innovative bolted flange (lightweight, leak tightness assure by metallic seal, large case by case experience..), and will move to leak tightness criteria and design rules for EN 13445, 13480, 1591… in accordance with corresponding CEN TC 74

The corresponding deliverables will be: different Code comparisons, background of existing rules and proposal to improve these rules with CEN TC's, gaps and needs identification associated to R&D programs

EPERC Potential R&D Task Groups

- **EN13445 Background**: Updated version for Vessel design rules in connection with TC 54
- **Piping design rules** in connection with TC 267 in order to enlarge the scope for innovation and renewable energy applications; for example piping system design rules under high level dynamic loads and strain criteria
- **Hydrogen PE** and specific aspects of interaction of the pressure boundary with hydrogen
- **High pressure PE**: pressure greater than 500 bar (50 MPa) and consequences on design, construction or operation of these PE
- **High temperature PE**: temperature greater than 450°C and consequences on design, construction or operation of these PE due to creep and interaction with other damages as fatigue or buckling
- **Cryogenic PE**: temperature less than 0 °C and consequences on design, material and construction or operation of these PE

- **Non-metallic PE**: started by High Density Polyethylene Pipe to develop a dedicated appendix to EN 13480 for design, material, fabrication and installation, tests and operation guidelines attached to EN13480 through dedicated Appendix
- **Non-steel PE**: aluminum, copper, titanium… to be defined with end users, and material and manufacturer companies of corresponding PE
- **Non-linear design rules of PE**: development of limit load and elastic-plastic analyses rules for plastic collapse, instability, local failure, fatigue, ratchetting and plastic shakedown for vessels and piping systems to improve EN 13445 and 13480 standards
- **Fitness for Service and Risk Based** Decision making: toward an European Procedure consistent with existing Procedures
- **Defect evaluation rules:** cracks, thinning areas, leaks…
- **New materials** for new innovative PE application
- **New welding techniques,** heat treatment and Repair technology for PE in operation
- **New NDE** Techniques
- **Specific needs for high safety application** as Nuclear, Aeronautic, Space or Rail industries…

Any actors or interesting EU parties are welcome for any exchanges with EPERC Association, or any topic to consider: **please express your needs, comments and contact us through email addresses attached**

Upcoming Events

- **next Seminar 3:**
  - **Title:** "Fitness for Service and Risk Based Inspection"
  - **Lead organizer**: Guy BAYLAC
  - **Location:** Paris, France
  - **Date**: February 27-28, 2017
  - **Save the date** and connect to EPERC website for detailed program and call for presentation
- **next Seminar 4:**
  - Attached to the EPERC annual General Assembly
  - **Title**: "Bolted Flange and Leak tightness"
  - **Lead Organizer**: Claude FAIDY
  - **Location**: Lyon, France
  - **Date**: April 09-10, 2018
    Save the date and connect to EPERC website for detailed program and call for presentation
- **1st EPERC International Conference**
  - **Title**: "Innovation and Safety of Pressure Equipment"
  - **General topics**: Innovation – Competitiveness-Renewable and Design, Construction and Operation of Pressure Equipment
  - **Lead organizer**: Andrea Tonti with all the BOD and TG Chairmen support
  - **Location**: Roma, Italy
  - **Date**: November 12-16, 2018
  - **Save the date** and connect to EPERC website for detailed program and call for presentation

- **Task Group (TG) meetings:**
  In parallel to these Seminars or attached to Seminars, many existing or new TG meetings will be organized in accordance with the TG chairman or BOD agreement: connect to EPERC website for more information on TG's and contact us.

Some Links

- https://ec.europa.eu/programmes/horizon2020
- https://eit.europa.eu
- https://standards.cen.eu
- https://www.afnor.org
- https://www.bsigroup.com
- https://www.din.de
- https://www.austrian-standards.at
- http://www.uni.com
- https://www.nbn.be
- http://www.afiap.org
- http://www.snct.org
- http://www.cetim.fr
- http://www.isgroupe.com
- http://www.afim.asso.fr
- http://www.fim.net
- https://www.airliquide.com

How to contact us?

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For Information

(to be periodically updated)

Pressure Equipment EN Standards

MATERIALS

EN 10028 - Flat products made of steels for pressure purposes
EN 10216 - Seamless steel tube for pressure purposes
EN 10217 - Welded steel tube for pressure purposes
EN 10222 - Steel forgings for pressure purposes

PERMANENT JOINING

EN ISO 9606 - Approval testing of welders – Fusion welding
EN ISO 15614 - Specification and qualification of welding procedures for metallic materials

PRODUCTS

EN 286 - Simple pressure vessels
EN 378 - Refrigerating systems and heat pumps – Safety and environmental requirements
EN ISO 4126 - Safety devices for protection against excessive pressure
EN 12516 - Industrial valves – shell design strength
EN 12952 - Water tube boilers
EN 12953 - Shell boilers
EN 13445 - Unfired pressure vessels
EN 13480 - Industrial piping
EN 14276 - Pressure equipment for refrigerating systems and heat pumps
EN 13458 - Cryogenic vessels – Static vacuum insulated vessels

CEN Pressure Equipment Technical Committees

CEN/TC 23 - Transportable gas cylinders
CEN/TC 47 - Atomizing oil burners and their components - Function - Safety - testing
CEN/TC 54 - Unfired pressure vessels
CEN/TC 57 - Central heating boilers
CEN/TC 58 - Safety and control devices for gas burners and gas-burning appliances
CEN/TC 69 - Industrial valves
CEN/TC 70 - Manual means of fire fighting equipment
CEN/TC 74 - Flanges and their joints
CEN/TC 79 - Respiratory protective devices
CEN/TC 121 - Welding
CEN/TC 131 - Gas burners using fans
CEN/TC 132 - Aluminium and aluminium alloys
CEN/TC 133 - Copper and copper alloys
CEN/TC 138 - Non-destructive testing
CEN/TC 155 - Plastics piping systems and ducting systems
CEN/TC 182 - Refrigerating systems, safety and environmental requirements
CEN/TC 185 - Fasteners
CEN/TC 190 - Foundry technology
CEN/TC 194 - Utensils in contact with food
CEN/TC 210 - GRP tanks and vessels
CEN/TC 234 - Gas infrastructure
CEN/TC 235 - Gas pressure regulators and associated safety devices for use in gas transmission and distribution
CEN/TC 237 - Gas meters
CEN/TC 267 - Industrial piping and pipelines
CEN/TC 268 - Cryogenic vessels
CEN/TC 269 - Shell and water-tube boilers
CEN/TC 286 - Liquefied petroleum gas equipment and accessories
CEN/TC 326 - Gas supply for Natural Gas Vehicles (NVG)
CEN/TC 342 - Metal hoses, hose assemblies, bellows and expansion joints