

 	<h1>EPERC Newsletter</h1> <h2>European Pressure Equipment Research Council</h2>	<p>Number: 4</p> <p>February 12, 2019</p>
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Welcome from the Chairman

The Board of Directors (BOD) in operation since April 2017 wish you Happy New Year 2019!

The new organization of the Association is now active to support Innovation and Competitiveness of the European Pressure Equipment Industry and launch different technical activities. 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** in Standards associated to "Renewable", "Innovation" and "Security" in Design, Manufacture and Operation of Pressure Equipment?

- **What** are the new Operating Conditions considered in term of Pressure, Temperature and New Materials that need to be included in existing or specific Standards?

- **How** to include all the new technologies in Design, Manufacture, Surveillance and Operation of these Pressure Equipment?

- **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 and European Standards Technical Committees around these new needs?

- and finally, **how** to develop R&D on Pressure Equipment to actively support this important Industry in Europe on all these new questions?

The major orientation is to work with the key actors at the European level in one hand, with Industry that used Pressure Equipment, and in the other hand and with International Cooperation (USA, Russia, Japan, Korea, China, India, and Middle East countries...).

EU "European Union" key actors in this domain include JRC "Joint Research Centre", EIT "European Institute of Innovation & Technology", CEN "European Committee for Standardisation" including all the Pressure Equipment Technical Committees.

All Companies concerned by Pressure Equipment interesting by innovation, to share knowledge and to manage R&D projects, are Welcome in EPERC! Improvements of European Codes & Standards will be considered with European Pressure Equipment Standards Technical Committees to develop R&D for the different Standards and to guarantee knowledge transfer, to develop training of users, on different innovation.

If you have any needs, any initiative, any ideas or any suggestions on "Codes & Standards" or "R&D topics" around Pressure Equipment (PE), please join our

1st EPERC International Conference on "Pressure Equipment Innovation and Safety" in Roma, Italy from April 1 to 3, 2019.

EPERC Chairman - Claude Faigy

EPERC 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:

- R**esearch in relation with the international context and European institutions,
- E**xchange of industry experience in design, materials, fabrication, surveillance, use, inspection, monitoring, safe life assessment ...
- I**mprovement of the Codes and Standards by providing industry and research information, data and competitive rules
- I**nternational **C**ooperation with similar organisations around the world.

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 to assure safety and competitiveness through recognition of standards and recommended practices with associated background; promote and encourage co-operation through research and exchange of industry experience among the EPERC Stakeholders (Members).

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 needs identification; support the implementation of the joint projects, collaborative programs and activities; disseminate research results and industry experience, through different medium as 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 the European level.

EPERC strategy

- Consider all the Pressure Equipment actors: end users, designers, manufacturers, material organization, maintenance organization, professional institutes, R&D organization and Universities
- Be in touch with all the EU organization involved in any particular aspect of Pressure Equipment
- Remain closely in touch 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

The major work will be attached to:

- **Thematic Task Groups** with a dedicated technical program (charter), form by a group of voluntary active members to express needs and to propose Technical Reports and R&D management
- **Regular Thematic Technical Seminars**, 1 to 3 days, open to members and visitors, minimum one every 6 months, to make a status on Gaps, Needs and recent program Results on a dedicated technical topic
- **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 promote European Pressure Equipment Industry, to compare existing international Codes & Standards
- **Training courses, master classes, summer school** proposals on different aspects of Pressure Equipment
- **Communication:** major exchanges will be done through EPERC website (a new version is 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

- Reports and Documentation:

All the historical and new EPERC Reports will be downloaded on the website very soon; all other free reports from any member could be also downloaded on the website, after BOD agreement.

EPERC Organization

Board of Directors (BOD)	Communication, Documentation and website
Members	
Thematic Task Group (TG) 1 to 10... with a TG Chairman in charge of TG management, a group of members, a charter and a list of potential R&D projects	
Periodic Thematic Seminars : - around existing active TG or New Topics, to develop State of the Art achievement and discuss potential needs for new programs	
International EPERC Conference on present and future Pressure Equipment Technical Activities status and associated needs to support: Safe, Competitive and Innovative Pressure Equipment and Renewable Industries	

EPERC Task groups running

Fatigue: in connection with EN13445 for Vessel first, and later 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 conservatism attached to different rules, what kind of complementary R&D is needed, as all type of weld joint fatigue reduction factors or how to consider plasticity and cyclic nonlinear rules...

Non Destructive Testing as alternative to hydro proof tests: after analyses of a large questionnaire reviewing the different practices at the EU level, some practical proposals will be done for operating plants alternatives
In series produced pressure equipment: many specific aspects to the "series" aspects will be analyzed for practical proposals

Bolted Flange: (new task group will start soon) starting by an example of innovative bolted flange (lightweight, leak tightness assure by metallic seal, large case by case experience in many different industry..), and move to leak tightness criteria, gasket properties and design rules for EN 13445, EN13480, EN1591... in accordance with corresponding CEN TC 74, 54 & 267

Nonlinear Design Rules: (new task group will start soon) development of limit load and elastic-plastic analyses rules for plastic collapse, fatigue, plastic shakedown, rupture analysis and fatigue

The corresponding deliverables of each Task Group will be: different International Code comparisons, review background of existing rules and proposal to improve these rules with CEN TC's, gaps and needs identification for new innovative use, recommended practices associated to R&D programs and Standards Code Cases proposals in accordance with EN PE Technical Committee.

EPERC Potential Task Groups

(generally in connection with corresponding CEN Pressure Equipment Technical Committee)

- **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, plastic shakedown or buckling
- **Cryogenic PE:** temperature less than 0 °C and consequences on design, material and construction or operation of these PE
- **Fitness for service rules and Risk based Inspection,** including rules to define remaining life of PE in front of all the potential degradation material
- **New NDE Techniques** and associated requirements in accordance with to-day State of the Art, including potential use of drone and robot to perform ISI
- **New fabrication process** and associated requirements in accordance with to-day State of the Art, including Additive Manufacturing
- **Non-metallic PE:** started by High Density Polyethylene Pipe to develop a dedicated appendix to EN 13480 (in connection with TC 267 & 155) for design, material, fabrication, installation, tests and operation guidelines
- **Non-steel PE:** aluminum, copper, titanium... to be defined with end users, and material and manufacturer companies of corresponding PE

- **Fitness for Service and Risk Based Decision making:** toward a European Procedure consistent with existing Procedures, like RIMAP, API, ENIQ, ASME-RIM... including **Defect evaluation rules**, as cracks, thinning areas, leak before break...
- **New materials** for new innovative PE application, as high pressure, high temperature, non-metallic materials...
- **New welding techniques:** Heat Treatment and Repair technology for PE in operation, for Construction and Repair Technology as Excavation or different Repair constraints, in accordance with to-day State of the Art
- **Specific needs for high safety application** on design, manufacturing and operation of PE, as Nuclear, Aeronautic, Space, Car, Petro-chemistry, Rail, Medical or other specific industries, as Leak Before Break or Incredibility Of Failure or Reliability approach of Pressure Systems for Design, Manufacture and Operation...

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

Upcoming Events

1st EPERC International Conference

- o **Title:** "Innovation and Safety of PE"
- o **General topics:** Innovation – Competitiveness- Renewable- Design, Construction, Protection, Operation and Maintenance of Pressure Equipment
- o **Conference Chairman:** Andrea Tonti – INAIL
- o **Location:** **INAIL, Roma, Italy**
- o **Date:** **April 1-3, 2019**

All of you are Welcome and connect to EPERC website for detailed program, registration and regular updated information

To-day status: around 50 papers will be presented during the 3-days with a large place for Panel Discussion to prepare our future cooperation...

How to contact us?

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