# Task Group – Fitness for Service & Risk Based Inspection

Claude Faidy EPERC TG7 Chairman info@eperc-aisbl.com

Agenda of the second Teams® meeting of TG7

**Thursday March 3, 2022** 14:00 – 18:00 CET

## 1 Welcome of the participants

## 2 Remarks on previous meeting minutes

## 3 Remember EPERC Strategic Plan

- Comparison of International Codes & Standards
- Identification of Gaps & Needs with Code Organization and Industry
- Developments of complementary R&D programs associated to dedicated Road Map developed by topics at the TG level
- Development of Recommended Practices with all the rules validation (methods and material properties)
- Performance of Benchmarks on practical cases
- Code Case Proposal
- Knowledge transfer through: Regular Thematic Technical Seminars, International Conference, Training courses, Master Classes, Summer School, Reports and Documentation Communication and Registration to different EPERC Activities through: **www.eperc-aisbl.eu**

## 4 Overview of the EPERC TG7 Road Map

### 4.1 WP1 : International Codes comparison

### 4.2 WP2 : Major Degradation Mechanisms to consider

WP3-1 : List of Degradation Mechanisms

WP3-2 : Preliminary Recommended Practices

### 4.3 WP3 : Complementary Research Program

WP3-1 : Cracks analyses

WP3-2 : Residual Stresses analyses

WP3-3 : Leak Before Break Procedure

WP3-4 : Thinning – Pitting Analyses

WP3-5 : Loss of Material Properties

WP3-6 : Overload and buckling

### 4.4 WP4 : Local Approach of Rupture

### 4.5 WP5 : Complementary Risk Based Inspection Research program

### 4.6 WP6 : Benchmarks

### 4.7 WP7 : Final Recommended Practices Report

### 4.8 WP8 : Synthesis and Code Cases Proposals

### 4.9 WP9 : Knowledge Transfer

# 5 EPERC TG7 Detailed Road map

## 5.1 WP1: International Codes comparison

5.1.1 **FFS**: ASME BPVC Sect XI, ASME BPVC Section XI Appendices-Code Cases, RSEM/RCC-MRx, R5-R6, BS 7910, FITNET, API-ASME FFS, VERLIFE, JSME, KEPIC

5.1.2 **RBI:** ASME BPVC Sect XI Code Cases/Division 2 RIM, API 581, RIMAP, ENIQ, TWI, JSME, EN16991

## 5.2 WP2: Degradation mechanism to consider

5.2.1 Cracks (from fabrication/welding/fatigue/corrosions/creep…)

5.2.2 Thinning- Pitting

5.2.3 Overloads and buckling

5.2.4 Loss of material properties: thermal ageing, strain ageing…

**For each of them a dedicated report with:**

- Definition and Scope
- Existing Analysis methods and criteria
- Other particular approaches and criteria
- Associated Material Properties needed
- Methods and Material data validations: theoretical, experimental, standards…

5.2.5 FFS Preliminary Recommended Practice for all degradation mechanisms considered

## 5.3 WP3: Complementary FFS R&D program

WP3-1 : Cracks analyses

- K, J, C* handbook
- Defects interaction
- Fatigue crack growth: da/dN = $\Delta K_{eff}$ – R ratio correction and negative R ratio – crack closure - threshold - mode I, II, III combination – transient combination – $\Delta K$ or $\Delta J$ – primary/secondary stresses – environmental effects
- Corrosion crack growth: da/dt - $K_{max}$
- Creep crack growth: da/dt – C*
- Critical crack size: brittle / transition / ductile, mode I, II, III combination, primary/secondary stresses…
- All material data required and data/methods validation: theoretical, experimental, standards…

WP3-2 : Residual Stresses analyses

- Analysis methods through elastic-plastic analysis
- Base metal and weld residual stresses
- Consequences on crack analyses
- All material data required to perform analyses with validation

WP3-3 : Leak Before Break Procedure

- Initial crack
- Crack growth up to through wall crack
- Crack opening area
- Leak flow rate
- Through wall crack critical size
- Criteria
- All material data required and data/methods validation: theoretical, experimental, standards…

WP3-4 : Thinning – Pitting Analyses

- Analysis methods
- Degradation rate
- Thinning defects interaction
- Allowable thinning
- Pitting analyses
- All material data required

WP3-5 : Loss of Material Properties

- All material data required for base metal and welds

WP3-6 : Overload and buckling

- Typical Examples and analyses

## 5.4 WP4 : Local Approach of Rupture

- To be defined in accordance with TG4 Nonlinear Design Rules for Fracture

## 5.5 WP5 : Complementary Risk Based Inspection Research program

- To be defined soon

## 5.6 WP6 : Benchmarks

- Definition of a list of Benchmarks and Sample Examples
- To be released largely to a lot of actors

## 5.7 WP7 : Final Recommended Practices Report

- Preliminary Report + R&D results + Benchmark results analysis

## 5.8 WP8 : Synthesis and Code Cases Proposals

- A set of proposals to be largely released to Code Development Organizations

## 5.9 WP9 : Knowledge Transfer

- Management of the different type of events:
  - Reports
  - Workshops and Seminars
  - Conferences
  - Summer School and Training Courses
  - Specific meetings with any user group

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## 5.10 Closing Remarks

The meeting will be held as a web conference using Microsoft Teams®. All members and experts wishing to participate are kindly requested to register themselves on the EPERC web site, under "Seminars, Conferences and Meetings" in order to receive the link for the connection.

**Objectives of this 2nd TG7 meeting**:

- fill up, with Technical detailed Program, the Road Map with a list of Contributors and Reviewers of Test Programs or Reports
- Potential CE budget support will be discussed during the meeting

**Claude Faidy TG4 Chairman** info@eper-aisbl.eu **Phone: +33 6 1410 11 19**

**NOTE:**

Participation is free for all EPERC individual and company members**. As an exception to the actual EPERC Statute**, in order to promote participation to the research work of EPERC, **the Board of Directors has decided to admit free of charge at this first meeting of TG4 also qualified experts having an experience on Non-linear analysis**, in order that they can evaluate the possibility of joining EPERC as members in order to participate also in the future meetings of this fundamental Task Group.

I wish to remind that **one of the main objectives of EPERC is to promote research projects** organized by a suitable group of individual members or member companies **financially supported by the Commission**, and this is very well possible considering the program of work presented in this agenda. Instructions and fees for joining EPERC (for individuals and/or companies) can be found under "Join us > membership".

**Fernando Lidonnici**
**EPERC Chairman**
Tel.: +32 2 616 13 04
info@eperc-aisbl.eu

EPERC web site: **www.eperc-aisbl.eu**