

**Minutes of EFC WP 15  
Corrosion in the Refinery and Petrochemical  
Industry**

**Brussels during Eurocorr 2023 and Virtual**

**29 August 2023**

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# 1 WELCOME

Francois Ropital opened the hybrid face to face and virtual meeting. The meeting took place in Brussels during the Eurocorr 2023 congress.

57 persons (40 face to face + 17 remote) attended the meeting. The list of participants is enclosed in Appendix 1.

## 2 EFC WP 15 ACTIVITIES

### 2.1 EFC WP 15 activities And Minutes of Meetings

Information on the activities of EFC WP 15, was presented by Francois Ropital. This information can also be found on the EFC web site where the minutes of previous WP15 meetings can be consulted and downloaded. More information is enclosed in Appendix 2.

<https://efcweb.org/WP15.html>

EFC hub platform:

EFC launches a web platform to share information and collaborative works. The web link is <https://efc.solved.fi/activities/wp/list>. The WP15 members are welcome to join the platform and all the information to do that has been emailed.

In this platform news on the activities of WP15 and collaborative works (such as publication of EFC green books) will be shared.

### 2.2 EFC WP15 organisation

New chairpersons are sought to take charge of WP15 from 2024: a new Chairperson, a new Vice Chairperson and if possible, a Secretary and a Young Corrosion Delegate. WP15 has around 350 members. Currently its main activities are:

- Organising annual Eurocorr sessions, joint sessions with other WPs and Task Forces, workshops on corrosion in refining and petrochemistry industries and the related new energy transition topics.
- Organizing WP meetings: one during Eurocorr and as agreed by WP15 members a one-day spring meeting (face to face or hybrid) with between 40 and 60 participants. A great part of the meetings is dedicated to informal exchanges on technical and scientific issues.
- Publication of EFC guidelines.
- Participation to the annual STAC meeting (Sunday morning just before the start of Eurocorr) and EFC general assembly (remote).
- Dissemination of WP 15 activities: within EFC and on the EFC Web, EFC Hub platform, ...

Candidacies are expected and a remote election will take place for 3 years mandates.

### 2.3 Publications from WP15

#### **Advancement on a new guideline on corrosion in sea water cooling systems:**

This new EFC guideline takes place in the frame of a joint WP9 (marine corrosion) WP15. A finalized version of the document will be sent to the editor (Elsevier) by the end of September 2023. Valerie Bour-Beucler and Antoine Surbled are doing an important work to finalize the guideline and we express all our special thanks for their great contributions.

#### **Continuation of the activities on Corrosion Under Insulation (CUI) guideline:**

A next 2025 revision of EFC guideline 55 is planned and more information are given in paragraph 5 of these minutes.

## 2.4 EUROCORR 2023

This annual working party meeting was held during the Eurocorr 2023 conference. The session dealing with refinery and petrochemistry corrosion took place on 28<sup>th</sup> August. Attendance of this session was around 40 persons, figure that reflects the attendance of the Eurocorr 2023 face to face conference with about 1020 participants and 570 oral presentations.

On 31<sup>st</sup> August a joint session WP15 & TF “Corrosion in low carbon and green energies” on corrosion in biorefineries took place with around 40-50 participants.

## 2.5 EUROCORR 2024

Eurocorr 2024 “A step forward in societal awareness of materials degradation issues” will take place in Paris, France from 1 to 5 September.

**A session dealing on corrosion in the refinery and petrochemistry will take place.**

**A joint session on “Corrosion during the manufacture, transformation, storage, and use of biofuels and bioproducts” is planned with the Task Force (that will be WP26 in 2024) “Corrosion in low carbon and green energy technologies”.**

The call of abstract will be issued on 15 October with the **deadline to submit an abstract is 15 January 2024.**

More information is available via the web link: <https://www.eurocorr2024.org/>

## 2.6 Next 2023 WP15 spring meeting

During the meeting, a full day hybrid mode face to face with possibility to join virtually the meeting was decided. Proposals from companies or laboratories to host this meeting are welcome. Then a Doodle enquiry will be sent to all the WP15 members in order to fix a date in March or April and to avoid overlap with the AMPP Corrosion Congress that will take place in New Orleans from 3 to 7 March 2024.

# 3 CORROSION IN BIOREFINERIES

## Biorefinery – Materials selection challenges

Johan van Malsen (McDermott company) proposed some discussion on the applicability of API RP 571 chapter dedicated to naphthenic acid corrosion, to biorefinery with fatty acids with high TAN numbers (almost 200). Corrosion limitation by inhibitors injection and the effect of hydrogen were also discussed. More information can be found in Appendix 3.

## European funding for a network on corrosion in biorefineries

European Union proposes COST funding to establish networks on interdisciplinary topics that are not covered by collaborative calls of Horizon Europe. Francois Ropital presented some information on COST program that funds the only networking activities. This possibility has to be kept in mind to facilitate exchanges on biorefineries corrosion issues. The slides are in Appendix 4.

## 4 BIG DATA & MACHINE LEARNING

### **Prediction of materials degradation**

Philipp Schempp presented approaches to develop machine learning (ML) for corrosion prediction as corrosion under insulation (CUI). ML can be embedded into CUI inspection plan development as recommended by EFC Guideline n° 55. TH Köln University proposes collaborative projects to implement this methodology. More information can be found in Appendix 5.

## 5 CORROSION UNDER INSULATION

### **Recent developments on “control on CUI” as per WCM initiative**

Geert Henk Wijnants presented the latest developments on WCM practices guideline: development of the digital COI platform, optimization of the developed tooling. More information can be found in Appendix 6.

### **Zerust ZIF tape application**

Dale Matthews gave some information on Zerust® Inhibitor Fusion (ZIF) tape: it is a corrosion inhibiting tape based on silicon elastomer, to protect flanges, valves, and instruments at temperature up to 200°C. Examples of application against CUI, atmospheric and marine corrosion were presented. More information can be found in Appendix 7 that contains a video link.

### **Corrosion Under Insulation Partner for the process**

Peter Bosmans detailed some services provided by Sitech to detect CUI corrosion and optimize inspection. More information can be found in Appendix 8.

### **Revision of the third edition of EFC CUI n°55 guideline**

Gino de Landtsheer confirmed that the edition of a revised version of EFC CUI n°55 guideline is planned for 2025 and that the dedicated Task Force contributes to this revision.

## 6 HIGH TEMPERATURE HYDROGEN ATTACK

### **Joint Industry Program on HTHA both modelling and NDE/Inspection**

The objectives of the project presented by Gerrit Buchheim are to create data and augment the existing Becht HTHA model to calculate the remaining lives for critical equipment components in high temperature hydrogen. More information on the models and JIP can be found in Appendix 9.

## 7 INSPECTION

### **RBI plan for steam generation boilers and corrosion**

Askar Soltani emphasized that RBI implementation without the field knowledge of the probable damage mechanisms in the steam generation boilers is useless and that probability of failures (POF) calculation are necessary. An example was presented dealing with the leakage and failure in a component that has never been in the inspection plan: this reveals that without having field experience and without defining the probable potential damage mechanisms the RBI calculations for steam generation boilers would be useless. More information can be found in Appendix 10.

### **Advanced NDE techniques have turned up much HIC damage and leading to condemnation of equipment**

Gerrit Buchheim gave a brief history on some rules to evaluate wet H<sub>2</sub>S corrosion cracking sensibilities of carbon steels. Some of them may be too conservative concerning the loss of steels' strength. More information can be found in Appendix 11.

### **A case study a persistent corrosion problem located near a complex arrangement of pressure relief valves**

Sale Eide reported experiences on the use of permanent Permasense UT sensors for safe operation of an overhead system in a crude distillation tower. UT sensors were installed in typical material loss positions (after one of the chemical injection quills in a new overhead system), avoiding unexpected shutdowns and allowing an effective preventative maintenance strategy. More information can be found in Appendix 12.

## **8 COOLING WATER TREATMENT**

### **How to treat a recirculating cooling system feed with very low mineralized water make up**

Due to water restrictions and new regulation, Valerie Bour-Beucler presented some challenges for cooling water systems strategy (treatments without P and metals). Water losses and cycle control will be a real target for cooling water management. More information can be found in Appendix 13.

## **9 NEXT MEETINGS**

Election meeting (remote) for the new chairpersons of WP15.

2024 Spring WP15 Meeting:

A full day hybrid mode (face to face with possibility to join virtually the meeting) made consensus. Proposals from companies or laboratories to host this meeting are welcome. Then a Doodle enquiry will be sent to all the WP15 members in order to fix a date.

2024 Autumn Full WP 15 Meeting:

This meeting should take in Paris, France from 1 to 5 September during the Eurocorr congress.