

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

**Virtual**

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## **1 WELCOME**

Francois Ropital opened the virtual meeting. Due to Covid-19 health trouble, the meeting that should have taken place in Brussels had been replaced by a virtual one.

42 persons 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/Scientific+Groups/WP15\\_+Corrosion+in+the+Refinery+and+Petrochemistry+Industry-p-38.html](https://efcweb.org/Scientific+Groups/WP15_+Corrosion+in+the+Refinery+and+Petrochemistry+Industry-p-38.html)

### **2.2 Publications from WP15**

Advancement of revision of publications:

The third revision of the EFC Guideline 55 “Corrosion under insulation” is achieved and the book is now available

<https://www.elsevier.com/books/corrosion-under-insulation-cui-guidelines/de-landtsheer/978-0-12-823332-0>.

A flyer on this guideline is also attached at the end of appendix 2. EFC WP15 would like to express all their thanks to Gino de Landtsheer and to the contributors for this important revision.

Revision of the EFC Guideline 46 “Amine units corrosion in refineries”. This revision takes place in the frame of a joint WP13-15 task force. The final version of the guideline has been completed and is going to be sent to the publisher Elsevier.

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

This task force takes place in the frame of a joint WP9 (marine corrosion) WP15 and in collaboration with French Cefracor “corrosion of heat exchangers” group. The writing of the document is in progress and a first version is expected by November 2020.

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

The possibility to exchange information on a web forum platform hosted in the EFC website is considered. NACE Europe, CINI, World Class Maintenance will be associated. The aim of this forum platform will be to exchange information on mitigation of CUI, best practices, practices to be

avoided, experiences,... A group of moderators in charge of these different topics will be sought.

### **2.3 Downloading Previous Eurocorr Conference Papers**

Papers from the previous Eurocorr conferences (from Eurocorr 2004 to 2019) can be downloaded via the member's pages of each of the national member societies of EFC. The list of EFC member societies is available on the web page:

<https://efcweb.org/About+us/Membership.html>

Please contact your member society for more information on access to these papers.

### **2.4 EUROCORR 2020**

This annual working party meeting was held during the Eurocorr 2020 virtual conference.

The session dealing with refinery corrosion took place on 9<sup>th</sup> September afternoon with less papers than initially proposed for the Brussels on site conference. Attendance of this session was around 35 persons, figure that reflects the attendance of the Eurocorr 2020 virtual conference with about 640 participants and 400 oral presentations.

### **2.5 EUROCORR 2021**

Eurocorr 2021 "Materials science and advanced technologies for better corrosion protection" will take place in Budapest, Hungary from 19-23 September 2021.

The web site is: <https://eurocorr2021.org/>

A session dealing with corrosion in refineries and petrochemistry plants will take place.

The deadline to submit abstract is 19<sup>th</sup> January 2021.

### **2.6 EUROCORR 2022**

Eurocorr 2022 will take place in Berlin, Germany from 28 August - 1 September 2022.

### **2.7 Next 2021 WP15 spring meeting**

The participants agreed to continue to have 2 working party meetings per year: one in spring and one during the annual Eurocorr conference.

At the present time we cannot know if the spring meeting will be face to face or virtual. Nevertheless a Doodle enquiry has been sent to all the WP15 members in order to fix a date and to avoid overlap with the NACE Corrosion Congress. The date that has been selected is **Tuesday 23 March 2021**.

### **3 CORROSION UNDER INSULATION**

Geert Wijnants (World Class Maintenance) gave a presentation on cost effective proactive CUI management and on a project to develop a decision model (best practice) for cost-effective control of the risk of corrosion under insulation. More information is given in Appendix 3.

### **4 MONITORING**

#### **Digitalisation with corrosion monitoring: uses cases for CUI, coatings, RBI**

Prafull Sharma (Corrosion Radar) presented the “Inspection 4.0” approach with automated analytics and predictive systems. More information can be found in Appendix 4.

#### **Asset Integrity Management: Digital solutions from PPG**

The asset integrated management (AIM) system developed by PPG (coating specialist and provider) was presented by Chris Magel and Michael Kuhn. Information was given on how the corrosion management system was implemented. More details can be found in Appendix 5.

#### **Non-intrusive corrosion-erosion monitoring solutions to enhance operational profitability in the alkylation units**

Peter Fischbacher (Emerson Permasense) presented two on site applications of Permasense monitoring systems for corrosion control of HF alkylation units and their effects on the OPEX reduction, operations optimization. More information can be found in Appendix 6.

### **5 HIGH TEMPERATURE HYDROGEN ATTACK**

Philipp Schempp (Shell) presented a high temperature hydrogen attack (HTHA) of an hydrocracker unit (HCU). Ultrasonic time-of-flight diffraction (TOFD) measurements were performed in relation with a fit for service (FFS) and risk based inspection (RBI) approach.

### **6 CORROSION RESISTANT ALLOYS**

The applications of enhanced heat transfer tubings and finned tubes in overhead condensers, methanol vaporizers were developed by Mathieu Lheureux (Neotis). The advantages such as a better heat control, a limitation of space, a debottlenecking, were discussed. More information can be found in Appendix 7.

### **7 HYDROGEN PRODUCTION**

#### **Fitness for purpose evaluation of hydrogen production Unit centrifugally cast tubes; post exposure metallographic and mechanical test**

Marco De Marco (Istituto Italiano della Saldatura) presented some work (metallographic, creep tests, NDT analysis) on aged and damaged centrifugally cast tubes of steam reforming units in order to propose remaining life assessments. More information can be found in Appendix 8.

## **8 CASE STUDIES OF CORROSION AT OIL REFINERIES AND PETROCHEMICAL PLANTS AND MITIGATION ACTIONS**

Roman Vinogradov (KBR) provided an overview of the current status of corrosion situation observed at sites in former Soviet Union and Europe. Some failures cases in overhead condensers, ammonia production loop and the associated remedy mitigation actions, were presented. More information can be found in Appendix 9.

## **9 CORROSION INHIBITION**

### **Reliable level of corrosion inhibitor's residual concentration in wet gas-condensate pipelines**

Organic corrosion inhibitors applied to mitigate corrosion in pipelines which transport multi-phase gas-condensate flow requires a minimum allowable residual concentration of corrosion inhibitors. Askar Soltani (South Pars Gas Complex) reported that the lack of recommended standard for the measurement of the maximum level of residual inhibitor concentration may result in operational issues in downstream equipment. More information can be found in Appendix 10.

## **10 OTHER POINTS FROM THE AUDIENCE**

The following topics have been discussed:

- Coke formation in CDU ovens
- Application of electrochemical method for corrosion monitoring
- 

## **11 NEXT MEETINGS**

2021 Spring WP15 Meeting

At the present time we cannot know if this meeting will be face to face or virtual. Nevertheless a Doodle enquiry has been sent to all the WP15 members in order to fix a date. The date that has been selected is **Tuesday 23 March 2021**.

2021 Autumn Full WP 15 Meeting:

This meeting should take place in Budapest, Hungary from 19-23 September 2021.