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

Virtual

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Content

1 WELCOME

Francois Ropital opened the virtual meeting. Due to Covid-19 health trouble, the meeting is a virtual one.

53 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

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 available since August 2020 : https://www.elsevier.com/books/corrosion-under-insulation-cui-guidelines/de-landtsheer/978-0-12-823332-0.

Revision of the EFC Guideline 46 “Amine units corrosion in refineries”. This revision took place in the frame of a joint WP13-15 task force. The final version of the guideline was sent to the publisher Elsevier and its issue expected for September 2021.

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 full version is expected by May 2021.

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

The creation of a web platform to exchange information on CUI is in progress. 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,… and also to prepare the 4th revision of EFC n°55 guide line. A group of moderators in charge of these different topics will be sought.

2.3 EUROCORR 2021

Eurocorr 2021 “Materials science and advanced technologies for better corrosion protection” should had taking place in Budapest, Hungary from 19-23 September 2021, but due to the Covid pandemic will be virtual the same week 20-24 September.

All updated information (sessions, registration) are available on the web site is: https://eurocorr.org/2021.html

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

2.4 EUROCORR 2022

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

2.5 Next 2021 WP15 full meeting

The annual WP15 full meeting will take place during the Eurocorr 2021 week 20-24 September. As soon as this week program will be established, the WP15 members will be informed of the date of the meeting.

3 CORROSION UNDER INSULATION

Simon Daly (Hempel) gave a presentation on the development of a coating degradation sensor and its implication for CUI monitoring in the laboratory and on on-site facilities. Electrochemical measurements are a proven way to measure the coating performance and the technique has been modified for use with CUI application by the implementation of strong signal acquisition using latest electronics. More information is given in Appendix 3.

Vincent Gregoire presented Equinor running R&D program in order to improve CUI management. Equinor is moving from inspection to water monitoring, thanks to the monitoring technologies development. Preliminary tests showed that water under insulation can be detected and located by measuring relative humidity and that inspection programs can be optimized. More information is given in Appendix 4.

Vitaly Geraskin presented IGS Online TSA Solution, a specialized system providing the ability to do maintenance in an online (live plant) environment. IGS has a dedicated team which has the know-how to safely apply high-quality TSA by maintaining temperature, humidity, and safe environment surrounding the abrasive blasting and TSA process. More information is given in Appendix 5.

4 CORROSION IN METHANOL

Carlo Farina reported on stress corrosion cracking of carbon and low alloy Cr Ni Mo steels in methanol environment that can occur in the range of industrial grade solvent. The cracking can be influenced by various impurities (chlorides, acids, …), dissolved oxygen and can be inhibited by small quantities of water which ensure a certain degree of protection. More information can be found in Appendix 6.

5 HIGH TEMPERATURE HYDROGEN ATTACK

Hadi Zakeri (PetroIneos) presented an approach to review all equipment that operated or had design conditions above the CSB threshold recommendation threshold published after the catastrophic fire at the Tesoro refinery in USA in April 2010. Recommendations are proposed for the inspection and steels characterizations. More information can be found in Appendix 7.

Casper Wassink (Eddyi Technologies) gave a review on optimized ultrasonic techniques for HTHA inspection such as phase array probes and Time of Flight UT FMC/TFM. More information can be found in Appendix 8.

6 FAILURE CASES

Yousef Ahmed Al-Dossary (Saudi Aramco) gave an overview of Monel caustic injection failure in Crude Distillation Unit. The corrosion mechanism was investigated and critical locations identified. A technical alert for hot locations was issued.

Swen Koller (Holborn Refinery) reported on leakages of hydrogen in a steam reformer piping system. The cracks located near weld seams could be due to a carbonic acid stress corrosion cracking phenomena. More information can be found in Appendix 9.

Corrosivity of Stripped Sour Water: what are the most relevant corrosion related contaminants? M. De Marco (Istituto Italiano della Saldatura) presented several failures cases investigations in order to identified some contaminants (cyanides? chlorides? phenols ? thiosulphates? formates?) in high caustic water and proposed some remedies (including metallurgical selection). More information can be found in Appendix 10.

7 CORROSION RESISTANT ALLOYS

Jonas Höwing presented the corrosion and mechanical performances of Sanicro® 35, a new grade for demanding applications within the process industry. This new grade of stainless steel can have applications for heat exchangers (REAC's), hydraulic & instrumentation systems, process piping. Seamless tubes for HX and H&I are available and plates and pipes are coming soon. More information can be found in Appendix 11.

8 STEAM GENERATION

Valerie Bour-Beucler presented e^{ROI} Nalco Environmental Return On Investment for water, energy, CO_2 emission savings. Examples of applications in petrochemical plants were discussed. More information can be found in Appendix 12.

9 INSPECTION

The development of ISO standards for use of Eddy Current Arrays in lieu of magnetic particle testing was presented by Casper Wassink (Eddyi Technologies). The probabilities of detection (POD) of conventional ECT, ACFM, MT and PT were compared with modern ECA/ACFM implementations. A working group program is proposed to do a survey, analyse advantages and limits, and prepare three draft standards. More information can be found in Appendix 13.

10 OTHER POINTS FROM THE AUDIENCE

Marco De Marco (Istitutot Italiano della Saldaturar) proposed a discussion on: effects of mercury in crude feed in refinery plants. Is it possible to set a target limit?. More information can be found in Appendix 14.

11 NEXT MEETINGS

2021 Autumn Full WP 15 Meeting:
This meeting will take place virtually during the Eurocorr 2021 week 20-24 September 2021

2022 Spring WP15 Meeting :
The form of this meeting will discuss during the 2021 Autumn Full WP 15 Meeting