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 Due to Covid-19 health trouble, the meeting that should have taken place in Budapest had been replaced by a virtual one.

67 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/WP15.html

New 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 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 September 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 takes place in the frame of a joint WP13-15 task force. The book is now available.
https://www.elsevier.com/books/corrosion-in-amine-treating-units/van-roij/978-0-323-91549-6

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 final version is expected by November 2021 to be sent to the publisher.

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

In order to update and exchange information on CUI for the next 2024 revision of EFC guideline 55, a project has been created on the new EFC hub platform. https://efc.solved.fi/activities/wp/list.
Persons who would like to contribute to the new revision should contact Gino de Landtsheer.

2.3 EUROCORR 2021

This annual working party meeting was held during the Eurocorr 2021 virtual conference.

The session dealing with refinery corrosion took place on 21th and 22th September
Attendance of this session was around 30 persons, figure that reflects the attendance of the Eurocorr 2021 virtual conference with about 620 participants and 400 oral presentations.

2.4 EUROCORR 2022

Eurocorr 2022 “Corrosion in a Changing World – Energy, Mobility, Digitalization” will take place in Berlin, Germany from 28 August - 1 September 2022.
A session dealing on corrosion in the refinery and petrochemistry will take place.
The **deadline to submit an abstract is 14th January 2022**.
More information are available via the web link:
https://dechema.de/EUROCORR2022.html

2.5 Next 2022 WP15 spring meeting

During the meeting, a Wooclap enquiry was available to know what type of WP15 spring meeting should be organized in 2022. An hybrid mode face to face with possibility to join virtually the meeting made consensus. WP15 chairpersons are organizing this meeting and a Doodle enquiry will be sent to all the WP15 members in order to fix a date and to avoid overlap with the AMPP-Nace Corrosion Congress that will take place from 6 to 10 March 2022.

3 CORROSION UNDER INSULATION

Corrosion under insulation in asset management perspectives
G.H. Wijnants presented the roadmap of World Class for sustainable control of CUI. Next steps include the development of decision tool based on inspection costs, building a database with CUI related incidents, establishing a coating monitoring program, development of a cost-effective moisture monitoring program. More information is given in Appendix 3.

Minimising CUI using insulation coatings: advantages and disadvantages over conventional insulation including the use of a novel NDT technique for detecting CUI
To reduce CUI risk, S. Daly gave information on replacing insulation materials by seamless, non-porous materials**.** Sub-TeraHertz technology can be effective at detecting CUI beneath insulation coatings. More information is given in Appendix 4.

New generation 2K heat resistant hybrid siloxane coating for CUI

B. Martens presented a new heat resistant (up to 480°C) hybrid (barrier + galvanic protection) siloxane coating and its impact on installation efficiency. More information is given in Appendix 5.

Experience with Eddify PEC for CUI and Flow Accelerated Corrosion detection
After a presentation of the Pulsed Eddy Current (PEC) technology, A. Vanacore gave feedbacks on on-site applications. More information is given in Appendix 6.

Online Risk Monitoring of CUI for Cold Insulation Pressure Vessels and Pipelines
P. Sharma gave information on the Electro-Magnetic Guided Radar (EMGR) technique as corrosion and moisture sensors for a predictive cui management. Refinery plant case studies were also discussed. More information is given in Appendix 7.

Influence of Painting & Insulation Quality on CUI Behavior
P. van Dooren discussed experiences on how to bring Quality Assurance and especially Quality Control programs in practice and expectations on coating lifetime. Experiences with 'contact-free insulation' were also debated. More information is given in Appendix 8.

4 COOLING WATER SYSTEMS

How lower toxicity new yellow metal corrosion inhibitor with high stability improves corrosion performance in recirculating cooling water systems
V. Bour-Beucler presented an innovative yellow metal corrosion inhibitor with improved halogen stability, lower consumption rates, and reduced aquatic toxicity compared to triazole compounds. Site case studies have also been discussed. More information can be found in Appendix 9.

5 COATINGS

Utilization of thermal spray cladding systems to locally address preferential corrosion in existing cladding systems - Preferential corrosion of weld seams or HAZ in higher nobility CRA cladding systems
C. Bateman gave an example of the revamping of a delayed coker fractionator column using the high velocity thermal spray (HVTS) technology for applying on-site Inco 625 coatings. The technology does not create HAZ and does not require PWHT. More information can be found in Appendix 10.

New laser cladding materials developments for the Petrochemistry Industry. New corrosion resistant Monel based HVOF material developments for the Petrochemistry Industry.
A. Castells, V. Eronen gave a presentation of newly developed Fe and Ni based conventional laser clad and high-speed laser cladding (EHLA) materials developed utilizing Oerlikon Metco's patented Rapid Alloy Development (RAD) computational metallurgy platform. New materials have been designed for corrosion resistance, cavitation resistance and hard chrome plating replacement (Metco 1020A, Metco 1020B, Metco 1720A, Metco 1720B, Metco 1040[a])

The Oerlikon Rapid Alloy Development (RAD) platform.

J. Cheney gave a talk on the RAD platform for potential use in designing advanced materials to address current and future industry challenges. The RAD technology design new alloys and materials using a combination of materials science principles and big data algorithms. The fundamentals of how the technology works have been discussed along with some examples to illustrate the capabilities as the design of Metco 8453 in partnership with Chevron to protect amine and other refinery vessels against high temperature corrosion and other advanced materials to protect against aggressive metal dusting attack. More information can be found in Appendix 11.

6 MONITORING

Online Spray Visualization for Corrosion Prevention
After a presentation on the complexity of sprays, R. Makhoul gave information on the application of on-line spray visualization to monitor the efficiency of the injection of corrosion inhibitors. More information can be found in Appendix 12.

7 CORROSION MODELING

Prediction of high temperature sulfidation and naphthenic acid corrosion in transfer lines and furnace' tubes – model development
S. Kus presented the progress in development of crude corrosivity model with the goals and tasks from Phase I and Phase II Joint Industry Research Programs leaded by Honeywell. New features like calculation of H_2S partial pressure from sulfur speciation and impact of high wall shear stress parameters (up to 1000Pa) were also showed. More information can be found in Appendix 13.

8 OTHER POINTS FROM THE AUDIENCE

The corrosion in biorefining process was proposed as another topic for the next Working Party meetings.

9 NEXT MEETINGS

2022 Spring WP15 Meeting
An hybrid mode (face to face with possibility to join virtually the meeting made consensus. WP15 chairpersons are organizing this meeting and a Doodle enquiry will be sent to all the WP15 members in order to fix a date.

2022 Autumn Full WP 15 Meeting:
This meeting should take place in Berlin, Germany, from 28 August - 1 September 2022.