

Minutes of Meeting of

EFC WP 13 – Working Party Business Meeting

Eurocorr 2015 – September 8th, Graz (Austria)

Chair: Steve Paterson

Co-chair: Marc Wilms

After opening the meeting the purpose of the business meeting was explained. Presentations are informal and presentations will not be shared. The proposed agenda was explained, which includes a joint topic with WP15 (refinery corrosion) on amine units. There were no additional agenda items from the floor.

Items from 2014 meeting in Pisa

After minor comments the minutes of meeting from Pisa were approved. The wish to issue an EFC document on ‘compatibility of materials to well stimulation acids has not yet led to action. There is nevertheless interest in this topic. Volunteers to work on this are requested to contact Lee Smit of BP.

Items from EFC meetings (STAC) –Steve Paterson

The Chair informed the meeting of some of the items discussed at the EFC Science and Technology Advisory Committee (STAC), specifically:

A Task Force, moderated by a senior EFC representative, has been proposed to form a small core group of young corrosionists from the EFC community who will recommend a strategic action plan for stimulation and activation of the young corrosion community in terms of EFC actions required to promote international networking, collaboration, education, communication, exchange, recognition, etc of young corrosionists across the EFC community.

An up-to-date Calendar of Events for all EFC-endorsed and non-endorsed corrosion events taking place throughout the world can be found on the EFC website under the “Events” section as well as in EFC Newsletter No. 22.

The WP13 Folder in the EFC website has been updated with all WP13 Business Meeting minutes since 2003.

Flattening of material before SSC testing - Stuart Bond

In a number of sour service test programs, questions were asked on whether or not material can be flattened prior to specimen preparation, to make specimen preparation easier. However, cold work will affect the mechanical properties, therefore the material will not be fully representative anymore after flattening. Nevertheless DNV OS F-101 states that ‘specimens may be flattened’.

In the discussions it was suggested that it is especially important to test the original surface (representative hardness). Further it was suggested that flattening leads to a more conservative test and is therefore acceptable. It was also suggested that flattening and machining have a similar free end effect. The recommendation from Stuart Bond was to not flatten test material of specimens.

Update NACE TG494 on Four Point Bend Test – Stuart Bond

The test method for the Four Point Bend Test (FPBT) will be issued separately, it will not be part of TM0177. The FPBT method has gone through the first ballot. Second ballot will be via consensus approach. The expectation is that the test method is available end 2015 or early 2016.

There is no direct relation to the EFC16 / 17 documents. Nevertheless, after finalization there is a wish to align both where possible. Acceptance criteria will not be part of the test method.

Quality of S13Cr bar stock material – Lee Smith

Quality issues experienced with S13Cr bar stock material were presented as an early warning. More details on this topic will be presented at the NACE Conference 2016.

S13Cr bar stock material (applied for components) is thicker than S13Cr tubulars and has a different production route. Nevertheless, a similar quality / properties should be achievable. The quality checks applied for tubulars are not applicable to bar stock. In a comparison carried out between bar stock and tubular material it was identified that tubulars have a cleaner, more homogeneous microstructure. Bar stock was found to underperform in sour service as compared to tubular material.

It was suggested to treat S13Cr bar stock as proprietary alloys and that extra effort should be paid to improve the quality of the material in production, since a similar performance as tubular material is needed in the field and can technically be achieved.

Revision of the EFC 17 document – Marc Wilms

The revision of EFC 17 has been prepared and agreed in the Pisa meeting. However, to align with the draft NACE Test Method for the Four Point Bend Test (NACE TG 494), two additional changes are suggested:

- Apply uniaxial tensile data (instead of instrumented bend bars or C-rings) to determine the mechanical properties for loading the FPBT specimens or C-rings.
- Carry out high temperature tensile tests at the actual corrosion test temperature to determine the mechanical properties for loading bend beam specimens or C-rings to be tested at high temperature.

There was a general agreement to include these adaptations in the EFC 17 revision. It was suggested to include a general statement to allow what is included in TM494. Ensuring fast issuing of the revised document.

The following was agreed: 1) Any further comments by WP members should be sent to the WP13 chair no later than 1st of November 2015. 2) M. Wilms and G. Hinds to implement agreed changes. 3) Subsequent final review by C. Fowler. 4) S. Paterson to issue for printing.

Revision of EFC 46 on corrosion in amine units – Johan van Roij

A revision of EFC 46 – Corrosion in Amine Units is suggested. It was suggested to take an approach based on Integrity Operating Windows. Background information and current operator's experience was explained. It was suggested for WP13 and WP15 to jointly work on a revision of WP15. This initiative was embraced. Volunteers to support and work on this can approach J. van Roij (johan.vanroij@shell.com).

Use of non-metallic piping in HCl service – Steve Paterson

A failure case where GRVE (Glass Reinforced Vinyl Ester) piping lined with UPVC (unplasticized Poly Vinyl Chloride) is applied in HCl service was presented. Because a higher HCl concentration was applied than designed for, leaks occurred after three years of service. Lessons learned from subsequent failure analysis is there is little experience with non-metallic piping materials in HCl service. Qualification of non-metallics for this service is not straight forward, with many challenges. The knowledge of manufacturers seems to be rather limited.

Pigging of 316L clad pipelines – James Hesketh

An investigation was performed on the effect that routine pigging or cleaning pigging can have on the sour resistance of 316L clad lines. Pigging can lead to an abrasive effect, change the stress distribution at the surface, cause roughness and affect the passive film. Four point bend testing was applied with point

loads and with scratches in longitudinal and transfers direction. The outcome was that the 316L cladding becomes more susceptible to cracking due to pitting.

It was suggested to also test girth welds. The effect of cold work on the microstructure was investigated, but no deformation martensite was found.

JIP on HSC of precipitation hardenable nickel base alloys – Claud Duret

A general overview of the purpose of the JIP was provided. Qualification testing by SSRTs was successfully applied for HSC on Alloy 718. Building on this experience, the aim is to define test conditions and acceptance criteria for different PH nickel base alloys. Detailed examination of microstructures will be part of the work.

In the case of questions or a request participation in the ongoing JIP C. Duret (claude.duret@institut-corrosion.fr) or D. Thierry (dominique.thierry@institut-corrosion.fr) can be approached.

Corrosion modelling at IFE – Rolf Nyborg

An overview of resent test work, JIPs and corrosion modelling at IFE in Norway was provided.

Stopac - Dinko Cudic

An overview of the application of Stopaq which is a viscoelastic coating and sealant solution was given. The ability for the material to “flow” means that it can self-heal defects. Some examples of application were given. The wrapping band version has been qualified up to 95C.

AOB

- The EFC website will be updated to improve communication within the working party. A variety of information will be stored there. Everyone is encouraged to visit and make more use of the website.
- The 10th edition of the Antikor prize for the best young presenter in the Oil & Gas session was awarded by Prof. Alexander Muradov to M. Monnot of Ugitach SA, for his presentation “SSC study of a super martensitic stainless steel: role of H₂S on metallic sulfur formation and hydrogen embrittlement”.