

EUROPEAN FEDERATION OF CORROSION

Working Party 13 - Corrosion In Oil & Gas

MOM of the Istambul Business Meeting

Thursday 13th September 2012

10:00 – 13:00,

Istambul

Michel Bonis and Jean Kittel, Chairman and vice-chairman of WP13 opened the meeting at 10:00 and welcomed the members of WP13 attending the meeting.

Michel Bonis expressed particular thanks to all speakers of the successive sessions led by WP13 and to Bob Badrak and Mohsen Achour as NACE representatives and co-chairmen of the 2 joined NACE – EFC sessions.

1. General Information

Next EFC WP13 Chairmanship

Michel Bonis reminded that until now WP13 has been chaired by a representative of a given corrosion society and country for a period of 5 years. The chairmanship of Michel Bonis, following Thierry Chevrot from Total should thus end in 2013, after Eurocorr/ 2013.

The election of a new chairman shall be proposed to the next meeting at Eurocorr/2013.

It has been suggested that a representative of The Netherlands from the Shell company might take the position. Steve Patterson has indicated his agreement to be a candidate.

This position is opened to any member of WP13 who is also a member of a Corrosion Society of EFC. Candidates are welcomed to declare their interest before the next business meeting in Estoril.

Eurocorr 2012 (preliminary conclusions)

About 800 participants to Eurocorr/2012.

Wide and constant attendance of WP 13 sessions, 40 to 80 people in general, 100+ as a maximum. Topics on materials are the most attended in average.

Only 4 no-show with no given advice + one advised long before. Although low when compared to many other sessions, this number of four is too high. Advice should necessarily be given to chairmen one or two days before the session, in order to allow back-up presentations.

M. Bonis reminds that I had wished organizing a joined forum with WP 10 on Microbial Influenced Corrosion, dealing with future alternate solutions to biocides. The number of proposed papers has been so low (2 only) that this forum was abandoned. Quite surprisingly this subject does not yet look to be considered as a major challenge by operators nor by suppliers. There is no plan for trying organizing it once more in 2013. May be in 2014 if interest is growing.

Eurocorr 2013

Eurocorr 2013 conference will be held 2nd to 5th September, 2013 in Estoril, Portugal. Joint sessions with NACE on Sour service and Corrosion/ inhibition and monitoring will continue being organized. :

A training session on the ISO 15156/ NACE MR 0175 standard document is planned to be organized (tentatively on the 1st of September) by D. Milliams and Ch. Fowler, as already done in Stockholm in 2011.

NACE 2013 – Orlando

Corrosion 2013 will be held in Orlando 11th to 15th March 2013. Two exchange forum between NACE and EFC will be organized, on Materials in Oil & Gas (Richard Thompson) and on corrosion and inhibition (Mohsen Achour).

Miscellaneous

Updating the list of WP 13 members:

The list will be up-dated with new members declared during the business meeting. All members included in this list shall be contacted to confirm or cancel their membership.

It has been a decision taken long time ago to include members from all countries, without any limitation to members of EFC funding societies. We do not see any reason to change this opened philosophy, which takes benefit of all potential active members around the world.

It is however reminded that, if at any time a formal vote had to be organized for any decision, the EFC rules should apply, i.e. only members of funding professional societies of EFC might vote, with a limitation to two persons per society.

Possible new activities:

Michel Bonis reviewed new potential activities for WP13, as long as a wide interest is formulated. Tentative topics:

- **Corrosion monitoring:**
 - The management side (organisation, data management, reporting, alarms and KPIs, decision processes...)
 - Moving from intrusive to non-intrusive monitoring.

M. Bonis indicated that a detailed & practical document on corrosion monitoring is under preparation at CEFRAFOR (France), which might be communicated in 2013. The part dedicated to the management side might be used as a basis. What's done at NACE has also to be documented (action M. Bonis, Orlando 2013).

- **Testing methodologies:**
 - The topic on “testing methodologies of oil soluble corrosion inhibitors” has not shown a significant interest → Abandoned
 - “SSC/ SCC testing of super-martensitic SS”: A topic of potential interest, from comments made during the Business meeting.
- **Practical guidelines on corrosion mechanisms or on corrosion control solutions:**

- The idea is to issue short documents (3 – 4 pages), for others than the sole corrosion community (designers, suppliers, operators...) in a “corrosion awareness” approach
- Few topics considered: Corrosion monitoring, CO2 corrosion, TLC, welding of duplex SS (see here after
- Should be inspired by documents issued by the Energy Association in UK.
- Should provide reference to relevant standards.

WP 13 members are invited to think about these possible topics and revert to chairmen to give opinions, background and hopefully to volunteer taking actions to make them running.

2. Progress of active Working Groups

“Recommended Practice for Pipeline Corrosion Management in Oil and Gas production and Transportation”, T. Chevrot, TOTAL

Action closed, as the document has been issued as a Green Book in Feb. 2012. Great thanks to Thierry Chevrot and Bijan Kermani and to all participants for their quick progress

Working Group on 4 point bend testing – Status, S. Bond, TWI

Common Working group to NACE and EFC (EFC 16 – 17 and NACE TM0177). List of members in the presentation given by Stuart (appendix 1)

Draft document available for comments: ask to S. Bond or M. Bonis. Document will be presented and discussed during next NACE conf. in Orlando.

Stuart also suggests to add this document as an appendix in EFC 16 and 17.

Discussion on the oxygen level (C. Condat – P. Dent): decision to add value was discussed in Salt Lake City. It was stated that the lowest level (10ppb) is mandatory for CRA and HSLA. 50ppb could be acceptable for low alloy steels with medium mechanical properties.

Discussion (S. Olsen): critical point = how to stress welded specimens.

Laboratory testing of materials to qualify clear brine fluids for use in wells, P. Nice, Statoil

As an introduction Perry gave a presentation (joined in appendix 2) on a corrosion case of alloy 825 by a scale inhibitor showing a pH as low as 1!

Perry agreed that the present document is not to be published (too thin). He proposes a document on testing methodologies for brines and also for chemicals pumped to surface facilities, pipelines and wells. The document should include high level guidelines and specific protocols & test methods.

The question was asked whether this document should extend to elastomers.

S. Paterson (Shell), Th Cassagne (Total), J. Martin (BP), V. Smith (BP), G. Hobbs (Strategic Chemistry) and X. Han (Technip) volunteered to join the group.

3. Technical presentations

“HISC (or HSC): Not yet ended with it?” - Stein Olsen & Thierry Cassagne

Stein Olsen presented a case of failure of a big subsea flange in Duplex SS (not included to this document).

The lack of established methodology for fitness for purpose evaluation in the DnV document is pointed out. There is also no sharp crack configuration in the HISC methodology from DnV.

Thierry Cassagne presented a case of cracking of a sea water lifting column (appendix 3) close to welds. Brittle cracking propagated in the ferrite phase and along ferrite/ austenite interfaces.

The vicinity of anodes and the lack of coatings have induced dissolved hydrogen content > 50 ppm. Residual stresses from welding/ fabrication have contributed to cracking, in addition to normal stresses.

As far as possible future R&D needs are concerned, the following are highlighted:

4. Long term hydrogen charging profiles?
5. Effect of temperature and relaxation time at temperature?

The interest for simple design and construction guidelines, for people out of the corrosion/ materials community (eng. Companies, manufacturers...) has been discussed (ref. § 1)

Development of a high OCTG grade for shale applications in mild sour environments - Th Perez, Tenaris

See Th Perez presentation in appendix 4.

The specificity of shale applications is that casing of high grade (110 ksi) are needed for the frac. operation, even though a moderate grade is sufficient for the current operational phase, as well as for production tubing → potential H₂S cracking issues.

A restricted yield 110 grade casing has been developed (110- 125 ksi), as a compromise between cost, yield, toughness and H₂S resistance (region 1 of ISO 15156 severity areas).

See presentation for the technical details.

The product works in area 1 at pH 3.5. Might possibly pass at least partly in area 2 at higher pHs.

“Quality issues with Alloy 625 – Relevance of impact testing of these alloys” - Steve Paterson, Shell

Presentation not included.

Alloy 625 selected for a subsea application instead of Duplex 25% Cr because of low temperature resistance needed down to -70°C.

Steve Patterson presented testing results of Alloy 625 samples according to ASTM G48 from 3 distinct suppliers.

Very variable results obtained, including severe corrosion related to serious micro-structural defects/ numerous precipitates on some delivered alloys while a very good resistance and performance is obtained with another specimen.

This experience highlights the importance of micro-structural requirements and of a strong QC process, and not only of specifications on composition and mechanical behaviour. “Do not only account on 625 only because it is 625!”.

A question was asked on the acceptable corrosion level for alloy 625 subjected to G48 test.

6. AOB & Close of Meeting

No other business was brought by the attendees.

Before closing the meeting, Michel Bonis thanked again all members of Working Party 13 and more particularly Perry, Stuart, Stein, Thierry, Thereza and Steve for their very interesting presentations.

Appendix 1

WP13 4-point Bend Update

Appendix 2

Test Protocol Guideline for Brines and Chemicals

Appendix 3

Fire pump pipestack failure analysis

Appendix 4

**Development of a high OCTG grade
for shale applications in mild sour
environments**