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A Working Party Report on

Corrosion Resistant Alloys for Oil and Gas Production: Guidance on General Requirements and Test Methods for H₂S Service

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Preface to the First Edition

This Working Party Report is the companion to EFC 16 Guidelines on Materials Requirements for Carbon and Low Alloy Steels for H₂S-Containing Environments in Oil and Gas Production. These reports have been produced by Work Groups in the Working Party on Corrosion in Oil and Gas Production since it was formed in 1992.

The driving force for the preparation of this report has been the long standing, unsatisfactory inconsistency in testing and qualifying corrosion resistant alloys (CRAs) for H₂S service. The primary problem was considered to be that there was no standard methodology for establishing the environmental cracking resistance of CRAs in H₂S service. Improving this situation became the CRA Work Group’s initial aim.

The report therefore proposes test methods for assessing the environmental cracking resistance of CRAs. In order to document the basis for these proposals, extensive background information has been included along with further information related to the use of CRAs in oil and gas production.

However, to produce the report in a reasonable time it has been necessary to limit its scope. Thus, it has not been possible to include detailed test methods for pitting and crevice corrosion or develop guidance on the service limits of individual CRAs. These important tasks, among others, remain for consideration in future revisions or reports.

The CRA Work Group has been well supported by all sections of the industry that have an interest in the use of CRAs. As chairmen of the EFC Working Party and Work Group that have produced this report, we wish to thank all who have supported the work. This includes sponsorship of Work Group members by employers, provision of meeting facilities by host organisations and contributions from individuals. Unfortunately, the contributors are too numerous to name individually, though NDI’s essential organisational and secretarial sponsorship warrants particular mention. Working with the group, whose membership has been drawn from Europe and beyond, has been very rewarding for us. We hope readers find value in the product of this labour.

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European Federation of Corrosion  
Working Party on Corrosion in Oil and Gas Production

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Ed Wade  
Past Chairman (1992-1996)  
Corrosion Resistant Alloys Work Group of the Working Party
Preface to the Second Edition

The work group consider this revision of EFC 17 necessary to incorporate developments, in the testing of CRAs, made since publication of the first edition in 1995. In particular:

1. Experience with weldable super-martensitic stainless steels has identified that artificially buffered test solutions used for SSC testing require modification for these steels
2. More general improvements in the definition of test solutions have been made in co-operation with ISO/TC 67/WG 7 during the preparation of ISO 15156.

The above have been incorporated as changes to Section 8 and Appendix 4. Elsewhere, minor changes have been made to update and correct editorial errors and omissions in the original text.

In addition to the changes now made to this document, the reader's attention is drawn to:

2. Extensive proposed changes to the CRA content of NACE MR0175 and the intended carry-over of these changes into ISO 15156.
3. Incorporation of SCC testing requirements in the 1996 revision of NACE TM0177 and changes to test solutions now in preparation for the next edition. The latter are expected to be largely consistent with this document.

We wish to acknowledge the essential contributions of Work Group members to this revision and the following who have assisted with the editorial preparation of the revision: J.-L. Crolet, E. Wade, B. Kermani.

As foreseen in the first edition, developments in the testing of CRAs continue. Readers are encouraged to monitor these to ensure their use of best practice.

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_EFC Oil and Gas Chairman_  

Chris Fowler  
_Working Party Chairman_  

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