

Stress-Assisted Corrosion Damage V

Hernstein, Austria
15-20 July 2018

Editors:

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Monday, July 16, 2018

- 07:30 – 09:00 Breakfast
- 09:00 – 09:15 **Welcome and Announcements**
A.K. Vasudevan
Henry Holroyd
Ronald Latanision, ECI Technical Liaison
- Session I: Special Topics**
Session Chair: Henry Holroyd, USA
- 09:15 – 10:00 **Extraction of EAC crack growth rates and stress intensity factors from slow strain rate tests data for 5xxx and 7xxx series aluminum alloys.....1**
Henry Holroyd, Bolivar, USA
- 10:00 – 10:45 **Recommendations and rants regarding research on environmentally assisted cracking2**
Stanley Lynch, Monash University, Australia
- 10:45 – 11:15 Coffee/tea/refreshments break
- 11:15 – 12:00 **Unified approach to crack growth and fracture.....3**
Asuri Vasudevan, Office of Naval Research (retired), USA
- 12:15 – 13:30 Lunch
- 13:30 – 14:45 Tour/History of the historic Schloss Hernstein (accompanying persons invited)
Peter Glaser, Schloss Hernstein
- Session II: Special Topics (continued)**
Session Chair: James Burns, University of Virginia, USA
- 14:45 – 15:30 **Do corrosion pits eliminate the benefit of shot-peening?4**
Alan Turnbull, National Physical Laboratory, UK
- 15:30 – 16:15 **Initiation and growth of corrosion fatigue cracks from corrosion pits using elasto-plastic notch analysis5**
Asuri Vasudevan, Office of Naval Research (retired), USA
- 16:15 – 16:45 Coffee/tea/refreshments break
- 16:45 – 17:30 **When do small fatigue cracks propagate and when are they arrested?6**
Stefanie Tschegg, BOKU, Austria
- 17:30 – 18:15 **Short crack tolerance under EAC conditions7**
JTP Castro, PUC-Rio, Brazil
- 18:15 – 18:45 Discussion
- 19:30 – 20:30 Dinner
- 20:30 – 21:30 Social Hour

Tuesday, July 17, 2018

07:30 – 09:00 Breakfast

Session III: Models and Experiments

Session Chair: Michael Henthorne, USA

09:00 – 09:45 **Atomistic modeling of sustained FCG under realistic conditions.....33**
Derek Warner, Cornell University, USA

09:45 – 10:30 **Intergranular corrosion and grain dissolution with peridynamics.....34**
Florin Bobaru, University of Nebraska Lincoln, USA

10:30 – 11:00 Coffee/tea/refreshments break

11:00 – 11:45 **Building environmental history for naval aircraft35**
William Nickerson, Office of Naval Research, USA

12:00 Pick up boxed lunches and maps of Vienna at the hotel reception

12:15 Coaches depart promptly for excursion to Vienna
(Free sightseeing time in Vienna for hop-on/hop-off buses, museums, etc.)

17:30 Meet at designated area to board return coach to Schloss Hernstein

19:00 – 20:00 Dinner

20:00 – 21:00 Social Hour

Wednesday, July 18, 2018

- 07:30 – 09:00 Breakfast
- Session IV: Hydrogen**
Session Chair: Tim Burnett, University of Manchester, UK
- 09:00 – 09:45 **Hydrogen effects on mechanical performance of nodular cast iron36**
Hannu Hanninen, Aalto University, Finland
- 09:45 – 10:30 **Elucidating the mechanistic influence of strengthening precipitate morphology on hydrogen-assisted cracking in a Ni-Cr superalloy.....37**
James Burns, University of Virginia, USA
- 10:30 – 11:15 Coffee/tea/refreshments break
- 11:15 – 12:00 **Ductile-Brittle Transition Temperature shift controlled by grain boundary decohesion and thermally activated energy and hydrogen GB embrittlement38**
Jun Kameda, Retired, USA
- 12:00 – 12:45 **Effect of cyclic loading on hydrogen diffusion in low carbon steels39**
Diego Pesenti Bucella, University of Bergamo, Italy
- 12:45 – 14:00 Lunch
- Session V: Corrosion**
Session Chair: Fritz Friedersdorf, LUNA, USA
- 14:00 – 14:45 **Effect of mechanical loading on the galvanic corrosion behavior of Mg-steel joint56**
Kiran Solanki, Arizona State University, USA
- 14:45 – 15:30 **Role of microstructure and micromechanics in galvanic corrosion57**
Michael Sangid, Purdue University, USA
- 15:30 – 16:15 Coffee/tea/refreshments break
- 16:15 – 17:00 **Effect of confined electrolyte volumes on galvanic corrosion kinetics in statically loaded materials58**
Steven Policastro, US Naval Research Laboratory, USA
- 17:00 – 17:45 **Investigation of SCC of high strength aluminum alloys by means of slow strain rate test and cyclic anodic polarization in combination59**
Monica Trueba, Independent Scientist, Italy
- 17:45 Technical Discussion
- 19:00 – 20:00 Dinner
- 20:00 – 21:00 Social Hour

Thursday, July 19, 2018

07:30 – 09:00 Breakfast

Session VI: Aluminum Alloys

Session Chair: Sarah E. Galyon Dorman, SAFE, Inc., USA

09:00 – 09:45 **Initiation and final failure via environmentally assisted cracking in high strength aluminium74**

Tim Burnett, The University of Manchester, UK

09:45 – 10:30 **Multiscale correlative characterization of environmentally assisted crack initiation, propagation and failure in a high strength AA5083 H131 alloy75**

V. C. Gudla, The University of Manchester, UK

10:30 – 11:15 Coffee/tea/refreshments break

11:15 – 12:00 **Internal stress affecting environmental fatigue of 7075-T651 alloy76**

A.K. Vasudevan, TDA, Inc, USA

12:00 – 13:30 Lunch

Session VII: Fatigue

Session Chair: Stefanie Tschegg, BOKU, Austria

14:30 – 15:15 **Understanding corrosion features and alloy microstructural effects on fatigue initiation of corroded AA7050-T7451 using data science77**

James Burns, University of Virginia, USA

15:15 – 16:00 **Transition from small to large cracks in Ti-6Al-4V specimens78**

Emanuele Vincenzo Arcieri, University of Bergamo, Italy

16:00 – 16:45 Coffee/tea/refreshments break

16:45 – 17:30 **A continuum mechanics model for fatigue life prediction with pre-corrosion and sequential corrosion fatigue94**

Nagaraja Iyer, TDA, Inc, USA

19:00 – 21:00 Conference Banquet

21:00 – 22:00 Social Hour

Friday July 20, 2018

07:30 – 09:00

Breakfast

Session VIII: Applications

Session Chair: Ronald Latanision, MIT/Exponent, Inc., USA

09:00 – 09:45

4D microstructural and electrochemical characterization of dissimilar metal corrosion in naval structural Joints95

Sridhar Niverty, Arizona State University, USA

09:45 – 10:30

Electrochemical and environmental assisted behavior of AA0224-T3 and AA7075-T6 welded by means of FSW96

Marina Cabrini, University of Bergamo, Italy

10:30 – 11:00

Coffee/tea/refreshments break

11:00 – 11:45

Examination of Factors Influencing FCG in legacy aluminum alloys97

Sarah E. Galyon Dorman, SAFE, Inc., USA

11:45 – 12:30

The influence of dynamic atmospheric conditions on EAC and corrosion fatigue116

Fritz Friedersdorf, Luna Innovations, USA

12:30 – 13:00

Feedback and Comments by Ron Latanision

13:00

Lunch and departures