

4th International Workshop on Long-Term Prediction of Corrosion Damage in Nuclear Waste Systems

Conference Centre 'Oud Sint-Jan, Bruges, Belgium, June 28 – July 2, 2010

FINAL PROGRAMME

Monday June 28, 2010

17:30 Registration
18:30 Welcome reception

Tuesday June 29, 2010

07:45 Registration and coffee
08:00 Opening words

- Philippe Lalieux (Long Term Management Director, ONDRAF/NIRAS, Belgium)
- Eric Van walle (General Manager, SCK•CEN, Belgium)
- Damien Féron (Chairman EFC Working Party 4 – Nuclear Corrosion, CEA-Saclay, France)

SESSION I - Overview of the national programmes

Chairman : Ph. Lalieux (ONDRAF/NIRAS, Belgium)

Co-chairman : G. Volckaert (SCK•CEN, Belgium)

08:30 Risk-informed performance-based application of container/canister corrosion in nuclear waste management
(LongTermCorr2010-01)
T. Ahn, C. Markley, H. Jung, K. Compton

09:00 Overview of Canada's adaptive phased management approach for managing used nuclear fuel in a deep geological repository – container and monitoring developments
(LongTermCorr2010-02)
G. Kwong

09:30 Review of the performance of selected metals as canister materials for UK spent fuel and/or HLW
(LongTermCorr2010-03)
F. King and C. Padovani

10:00 The Ondraf/Niras safety strategy and the strategic choices in the Belgian Supercontainer design
(LongTermCorr2010-04)
M. Van Geet and R. Gens

10:30 Coffee break

SESSION IIa - Experimentation

Chairman : D. Féron (CEA, France)

Co-chairman : F. Druyts (SCK•CEN, Belgium)

- 11:00 Review of the corrosion studies of the metallic barrier in geological disposal conditions with respect to the Belgian Supercontainer design
(LongTermCorr2010-05)
B. Kursten, F. Druyts, D.D. Macdonald, N.R. Smart and R. Gens
- 11:30 Some important issues in the electrochemistry of carbon steel in simulated concrete pore water
(LongTermCorr2010-06)
D.D. Macdonald, A. Saleh and O. Rosas-Camacho
- 12:00 Further studies on the effect of irradiation on the corrosion of carbon steel in alkaline media
(LongTermCorr2010-07)
N.R. Smart, A.P. Rance, R.J. Winsley, P.A.H. Fennell, B. Reddy, D. Scott, B. Kursten
- 12:30 Lunch
- 14:00 Propagation behavior of general and localized corrosion of carbon steel in simulated groundwater environment under aerobic condition
(LongTermCorr2010-08)
N. Taniguchi, H. Suzuki, M. Kawasaki, M. Naito, M. Kobayashi, R. Takahashi, H. Asano
- 14:30 An experimental approach to study the effect of chloride deposition on the stress corrosion behaviour of 316L stainless steel used for intermediate level radioactive waste containers
(LongTermCorr2010-10)
O.E. Albores-Silva, E.A. Charles, C. Padovani
- 15:00 Application of X-ray tomography for characterisation of localised corrosion and stress corrosion cracking in waste container materials
(LongTermCorr2010-09)
D.L. Engelberg, N.P.C. Stevens, S.B. Lyon, A.B. Cook, P.J. Withers, T.J. Marrow
- 15:30 Coffee break

SESSION IIb - Experimentation

Chairman : B. Kursten (SCK•CEN, Belgium)

Co-chairman : H. Asano (RWMC, Japan)

- 16:00 Field corrosion experiments in clay in anoxic conditions at high temperature
(*LongTermCorr2010-11*)
S. Dewonck, C. Bataillon, F. Foct, M.L. Schlegel, Y. Linard, D. Crusset, B. Scwyn, N. Nakayama and G. Kwong
- 16:30 Crevice corrosion testing methods for measuring the repassivation potential of alloy 22
(*LongTermCorr2010-12*)
C.M. Giordano, M.A. Rodriguez, R.M. Carranza and R. Rebak
- 17:00 Sulphide induced stress corrosion cracking of CuOFP in groundwater
(*LongTermCorr2010-13*)
E. Arilahti, T. Lehtikuusi, T. Saario, P. Varis
- 17:30 The rate controlling reactions for copper corrosion in anaerobic aqueous sulphide solutions
(*LongTermCorr2010-14*)
J. Chen, Z. Qin, D.W. Shoesmith
- 18:00 Closure of day 1

Wednesday June 30, 2010

SESSION IIc - Experimentation

Chairman : D.D. Macdonald (Pennsylvania state University, USA)

Co-chairman : T. Ahn (NRC, USA)

- 08:30 Further studies of in situ corrosion testing of miniature copper-cast iron nuclear waste canisters
(*LongTermCorr2010-15*)
N.R. Smart, A.P. Rance, B. Reddy, S. Eriksson, K. Pedersen, C. Lilja
- 09:00 The corrosion rate of pure copper in an oxic bentonite/saline groundwater environment
(*LongTermCorr2010-16*)
B. Rosborg, A. Kranjc, V. Kuhar, A. Legat
- 09:30 The scientific basis for the corrosion of copper in water and the implications for canister lifetimes
(*LongTermCorr2010-17*)
F. King, C. Lilja
- 10:00 Long-term integrity against corrosion of titanium used for TRU waste container
(*LongTermCorr2010-18*)
G. Nakayama, Y. Sakakibara, S. Kawakami

- 10:30 Coffee break
- 11:00 Effect of material strength on the hydrogen-absorption characteristic of carbon steel weldments
(*LongTermCorr2010-19*)
H. Inoue, Y. Itoda
- 11:30 Long-term integrity of overpack closure weld for HLW geological disposal – II. Corrosion property under anaerobic condition
(*LongTermCorr2010-20*)
M. Kobayashi, Y. Yokoyama, R. Takahashi, H. Asano, N. Taniguchi and M. Naito
- 12:00 Corrosion issues related to disposal of 316SS-zirconium metal waste forms under simulated repository conditions
(*LongTermCorr2010-21*)
L.R. Bairi, S. Ningshen, U.K. Mudali and B. Raj
- 12:30 Lunch
- 14:00 Social event
- 18:30 Workshop diner

Thursday July 1, 2010

Session III – Corrosion behaviour of steel reinforcements in concrete

Chairman : R. Gens (ONDRAF/NIRAS, Belgium)

Co-chairman : T. Saario (VTT, Finland)

- 08:00 Passive corrosion of steel in concrete in the context of nuclear waste disposal
(*LongTermCorr2010-22*)
V. L'Hostis, E. Amblard
- 08:30 Long-term corrosion behaviour of centrifuged reinforced concrete elements in the electric transformer stations
(*LongTermCorr2010-23*)
I. Pepenar
- 09:00 Apparent activation energy of electrical resistivity in concrete
(*LongTermCorr2010-24*)
C. Andrade, P. Zuloaga, I. Martinez, A. Castillo, S. Briz
- 09:30 Microorganisms induced degradation of containers for radioactive waste disposal
(*LongTermCorr2010-25*)
B. Zlobenko, V. Kadoshnikov, R. Belevtzev, I. Kozlova

- 10:00 Electrochemical treatment to condition contaminated electric arc furnace dusts (EAFD) as an addition to the immobilization mortar in low and medium activity repositories
(*LongTermCorr2010-26*)
M. Castellote, C. Andrade, P. Zuloaga, M. Navarro, M. Ordóñez
- 10:30 Coffee break
- 11:00 Effect of dissolved oxygen on corrosion properties of reinforcement steel
(*LongTermCorr2010-27*)
H. Jung, K.-J. Kwon and E. Lee
- 11:30 Corrosion inhibition of steel in ageing nuclear structures
(*LongTermCorr2010-28*)
M. Balonis and F.P. Glasser
- 12:00 Effect of temperature on the corrosion parameters and concrete strains in a pilot container in El Cabril repository
(*LongTermCorr2010-44*)
C. Andrade, P. Zuloaga, I. Martinez, A. Castillo and S. Briz
- 12:30 Long term corrosion of iron in concrete and in atmospheric conditions: From the experience to the modelling
(*LongTermCorr2010-45*)
E. Burger, A. Millard, S. Perrin, V. L'Hostis, D. Neff, P. Dillmann
- 13:00 Lunch

Session IV – Archaeological artefacts

Chairman : V. L'Hostis (CEA, France)

Co-chairman : C. Padovani (NDA, UK)

- 14:30 Natural analogues and archaeological artefacts for long term prediction in nuclear waste disposal
(*LongTermCorr2010-29*)
D. Féron
- 15:00 Studying the mechanisms of long-term atmospheric corrosion of steel: new strategies to understand the role of non-stable phases constitutive of the rust layer
(*LongTermCorr2010-30*)
E. Burger, H. Faiz, D. Neff, E. Rocca, F. Mirambet, P. Dillmann
- 15:30 Fluctuation of redox conditions in a waste disposal cell: influence on the corrosion behavior of carbon steel components
(*LongTermCorr2010-31*)
M. Saheb, D. Neff, P. Dillmann, F. Marsal, D. Pellegrini
- 16:00 Coffee break

- 16:30 Applicability of iron and copper artefacts excavated at a ruin as a natural analog study for long-term corrosion
(*LongTermCorr2010-32*)
H. Yoshikawa
- 17:00 Micro-mechanical characterization of properties of corrosion layer
(*LongTermCorr2010-33*)
A. Dehoux, F. Bouchelaghem, Y. Berthaud
- 17:30 Long term alteration of archaeological slags: an analogue for nuclear waste glasses
(*LongTermCorr2010-34*)
A. Michelin, D. Neff, S. Gin, P. Dillmann

Friday July 2, 2010

Session Va – Modelling

Chairman : F. King (Integrity Corrosion Consulting Ltd, Canada)

Co-chairman : B. Rosborg (Royal Institute of Technology, Sweden)

- 08:00 Computer simulation of local attacks on carbon steel
(*LongTermCorr2010-35*)
S. Tricoit, B. Vuillemin, R. Oltra, D. Crusset
- 08:30 Pitting corrosion of stainless steel: measuring and modelling pit propagation in support of damage prediction on radioactive waste containers
(*LongTermCorr2010-37*)
M. Gahari, A.J. Davenport, T. Rayment, N. Laycock, D. Krouse, C. Padovani, T. Suter, R. Mokso, M. Stampanoni
- 09:00 Development of a spinel-structure point defect model for the magnetite film on iron
(*LongTermCorr2010-38*)
M. Vankeerberghen
- 09:30 Long-term integrity of overpack closure weld for HLW geological disposal – I. Prediction and evaluation method for structural integrity of the weld joint
(*LongTermCorr2010-36*)
H. Asano, A. Nakamura, M. Kobayashi
- 10:00 Using experimental data from atmospheric corrosion experiments to parameterise models of localised corrosion and stress corrosion cracking
(*LongTermCorr2010-39*)
A.B. Cook, N.P.C. Stevens, S.B. Lyon
- 10:30 Coffee break

Session Vb – Modelling

Chairman : C. Andrade (Institute of Construction Science, IETcc, CSIC, Spain)

Co-chairman : N.R. Smart (Serco Assurance, UK)

- 11:00 Prediction of long term corrosion damage to the carbon steel overpack in Belgium's Boom Clay repository
(LongTermCorr2010-40)
D.D. Macdonald, A. Saleh and O. Rosas-Camacho
- 11:30 Modelling the long-term corrosion behaviour of copper canisters due to sulphide
(LongTermCorr2010-41)
F. King, M. Kolar, M. Vähänen, C. Lilja
- 12:00 Corrosion of copper in the safety assessment SR-Site
(LongTermCorr2010-42)
C. Lilja
- 12:30 Modelling the metal interface evolutions: applications to the localised corrosion
(LongTermCorr2010-43)
D. Di Caprio, C. Vautrin-UL, J. Stafiej, J. Saunier, A. Chaussé, D. Féron and J.P. Badiali