

# MINUTES EFC WP4 "Nuclear Corrosion" Fall MEETING MECC Congress Center, Maastricht (NL) Tuesday, September 26<sup>th</sup>, 2006





### Attendance:

Mylène Belgome CEA/Saclay (France)
Rick-Wouter Bosch SCK-CEN (Belgium)

Odile de Bouvier EDF (France)

Damien Féron CEA/Saclay (France)

Jan Macák Institute of Chemical Technology (Czech Republic)

Gabor Nagy KFKI (Hungary)

Radek Novotný JRC IE Petten (The Netherlands)

Juha Piippo Cormet (Finland)

Stefan Ritter Paul Scherrer Institute (Switzerland)
Kalmán Varga University of Veszprém (Hungary)

Peter Wood Nirex (UK)

# Apologies for absence received from:

Pierre Combrade
AREVA NC (France)
Frank Druyts
SCK-CEN (Belgium)
Dolores Gómez-Briceño
CIEMAT (Spain)
AREVA NP (Germany)
Bruno Kursten
SCK-CEN (Belgium)
Valérie L'Hostis
CEA/Saclay (France)

Kari Mäkelä Fortum Power and Heat Oy (Finland)
Anders Molander Studsvik Nuclear AB (Sweden)

Bo Rosborg KTH (Sweden)
Peter Scott AREVA NC (France)
David R. Tice Serco Assurance (UK)

### Diffusion:

Present and apologized participants

WP4 Members

P. MacIntyre (EFC Scientific Secretary)

J. Vogelsang (STAC Chairman)

Ph. Berge (EFC Secretariat in France)



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### EFC WP4 "NUCLEAR CORROSION"

Chairman Damien Féron CEA/Saclay DEN/SAC/DPC/SCCME Bâtiment 458 F-91191 GIF SUR YVETTE Cedex DEN/SAC/DPC/SCCME Bâtiment 458 F-91191 GIF SUR YVETTE Cedex DEN/SAC/DPC/SCCME Bâtiment 458 F-91191 GIF SUR YVETTE Cedex DIN/CEIDRE DIN/CEIDRE F-93206 SAINT DENIS Cedex 1



### 1. OPENING AND WELCOME

D. Féron opened the WP4 Spring meeting at 14.15, apologizing for the delay due to an organisation problem (no room available for the meeting).

He recalled the "pre-meeting" held during the Fontevraud 6 Conference, where the attendance was about 10 persons. Added to the present attendance, we reach the habitual attendance for the WP4 meetings.

He also introduced O. de Bouvier, reminding her nomination as Scientific Secretary of the WP4.

Then, he presented with M. Belgome the apologies for absence received.

# 2. APPROVAL OF THE AGENDA OF THE FALL MEETING

Presenting the agenda, D. Féron advised the attendance that there might be some modifications to the agenda sent to the WP4 members, since some orators were not able to come.

As no comment was made, the agenda is approved.

# 3. APPROVAL OF THE MINUTES OF THE CADARACHE MEETING

D. Féron recalled that, mostly due to the location, there were few participants to the Spring meeting, that is why few decisions were made.

The most important are (see the Spring meeting minutes for details):

- ✓ The 3<sup>rd</sup> International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems will be organized in the USA. There were two propositions for organizing this Workshop, from D.D. Macdonald (USA) and from SCK-CEN (Belgium), but as D.D. Macdonald helped for the organisation of the 1st and 2nd edition of the Workshop, it was decided to organize the 3<sup>rd</sup> one in the USA. It is already decided that the 4<sup>th</sup> one will take place in Belgium and organized by SCK-CEN.
- ✓ The creation of a new task force, "Corrosion issues in nuclear waste systems", has been decided, chaired by F. Druyts (SCK-CEN).

As no comment was made, neither received by mail before the meeting, the minutes of the WP4 Spring meeting held in Cadarache are approved.



# 4. EFC/WP4 WEBSITE

- D. Féron and O. de Bouvier, who is the contact for the WP4 page on the EFC website (<a href="www.efcweb.org">www.efcweb.org</a>), presented the actual content of the WP4 page:
  - ✓ WP4 activities,
  - ✓ information on WP4 "mirror-groups" (ECG-COMON),
  - $\checkmark$  the minutes of the WP4 meetings, without the overheads presented,
  - ✓ WP4 events and workshops.

They proposed to add the announcements of WP4 future events and information on WP4 publications, either in EFC Series or other publications, for instance the "special papers" presented during the EUROCORRs and published in the Journal of Nuclear Materials.

As the website is just starting, O. de Bouvier encouraged the audience not to hesitate to contact her if they think about useful information to be added, or links to other existing pages (odile.debouvier@edf.fr).

- R.W. Bosch asked for adding links to other webpages. D. Féron said that this could be too many links on a single page, but links with the WP4 activities, "mirror-groups" and task-forces are encouraged.
- St. Ritter proposed to create a protected page to the WP4 page, where addresses of the WP4 members could be mentioned, reachable only by WP4 members. D. Féron agreed and precised that this idea has to be discussed with the webmaster, and if it is possible, maybe the overheads presented during WP4 meetings should also be added (action: O. de Bouvier).
- R.W. Bosch asked precision about the EFC website, since there were previously one website mastered by Dechema, and another mastered by EFC/UK. D. Féron answered that there is only one website, whose webmaster is Dechema, on which each WP has its own page.
- St. Ritter proposed to add few words about the WP4 activities, about the 50 years of nuclear corrosion (i.e. the presentation made by D. Féron during EUROCORR'2005), few words about the different "mirror-groups" existing in the WP4... D. Féron and O. de Bouvier agreed and proposed the attendance to contact O. de Bouvier for all these evolutions of the WP4 webpage.



# 5. EFC WP4 EVENTS

# 5.1. Event 284: NUCPERF 2006

D. Féron underlined that it was the first meeting co-sponsored by an International Agency (OECD/NEA) and a success with about 70 participants from many countries and equally coming from universities and research organisations.

He also insisted on the importance of the panel discussions held in the end of the workshop that lead to recommendations, which is the current organisation of OECD/NEA workshops (see overheads for details).

The proceedings were though to be published as an EFC Series book, but due to the actual delays of EFC publications, they will be edited as a special issue of the French Journal "Journal de Physique IV", in English, by December 2006.

### 5.2. Event 283: Fontevraud 6

D. Féron recalled that this event was organized by the SFEN and supported by EFC and WP4. It took place in Fontevraud on September  $18^{th}$ - $22^{nd}$ , 2006.

He said it was a good conference, gathering more than 300 participants. This event, previously mostly regarding PWRs, was this year also opened to BWRs.

He recalled that a WP4 special meeting was held during the conference on September 20th.

# 5.3. Event 301: 3<sup>rd</sup> International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems

- D. Féron informed the attendance that it is the first event organized out of Europe getting an EFC event number. It was difficult to get it, but that corresponds to the new EFC status, saying that members coming from out of Europe are allowed.
- D. Féron informed that the workshop will be organised by an International Advisory Committee composed by American and European (France and Belgium) members, and has already received the sponsorship of OECD/NEA. D. Féron precised that he tried to get the sponsorship of AIEA, but AIEA relationship is based on national and state contacts.

So, the  $3^{rd}$  Workshop will take place in the Campus of PennState University on May  $14^{th}$ - $18^{th}$ , 2007. The main deadlines are:

✓ March 1<sup>st</sup>, 2007 Deadline for abstracts

✓ March 23<sup>rd</sup>, 2007 Notification of abstracts acceptation

✓ April 14<sup>th</sup> to May 09<sup>th</sup>, 2007 Registration

Nota During the EFC STAC meeting, the attendance was informed of an agreement between EFC, the Chinese and Australian organisation, and NACE, to create a worldwide organisation based in New-York (USA), near the UNO, which objective is the creation of a world "Corrosion day". The creation of this organisation is now under decision, that will be given within 3 months.

### **EFC WP4 "NUCLEAR CORROSION"**

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# 5.4. "Topical day: 10 years of stress corrosion cracking in SCK-CEN"

R.W. Bosch explained that there is now 10 years (in 2006) that a group of SCK-CEN is working on corrosion. Since some important personalities in this field of interest were coming in Europe, it has been decided to point out this 10-years of corrosion expertise by organising a "topical day".

The conference will take place on January 22<sup>nd</sup>, 2007, in the auditorium of the SCK-CEN Club-house in Mol (Belgium).

As there are 04 groups working in corrosion in SCK-CEN, the conference will be organised in 04 sessions including a keynote lecture by an authority in the field followed by presentations of the related work performed by SCK-CEN.

This is a open meeting, but the number of participants will be limited by the capacity of the auditorium, so registration should be made soon.

- D. Féron congratulated R.W. Bosch for this initiative. He asked for sending the announcement to WP4 members and proposed to put a link on the WP4 webpage. R.W. Bosch agreed and said he will give the announcement leaflet to D. Féron and the meeting website address to O. de Bouvier.
- D. Féron took this occasion to encourage some other laboratories to have similar initiatives, for instance there could be a celebration of the 50 years of the "Corriou effect"... and maybe the WP4 members could organise one anniversary per year!
- O. de Bouvier proposed to R.W. Bosch to contact the WP5 Chairman that could be interested in this SCK-CEN celebration.



# 6. EUROCORRS

### 6.1. EUROCORR'2006

- D. Féron recalled the topic of this EUROCORR taking place in Maastricht (NL), which is "Reliability management of Technical Systems".
- D. Féron recalled that 02 sessions were originally planned:
  - ✓ a workshop on "Corrosion Issues in Reprocessing Plants"

    D. Féron first received the agreement of BNFL and JNFL but, as he did not receive any return from the organisers (D. Féron complained to the STAC for this problem), there was no announcement made and BNFL cancelled its participation. The workshop was then cancelled.
  - ✓ a Nuclear Corrosion session
    D. Féron maintained this session and included papers related to corrosion issues in reprocessing plants. There were 14 oral presentations and 3 posters. D. Féron regretted the "small" number of participants, probably mainly due to the fact that the Fontevraud Conference was held the week before EUROCORR.
- D. Féron informed that a selection of papers (oral and posters) will be published in the Journal of Nuclear Materials, recalling that, to be selected, the papers must concern achieved researches, not published before. The person in charge of the management of the whole task (selection of papers, contact with authors and reviewers, contact with JNM, etc.) is O. de Bouvier.

# 6.2. EUROCORR'2007

D. Féron recalled that it will take place in Freiburg (Germany) on September 09<sup>th</sup>-13<sup>th</sup>, 2007 and that the topic is "Industrial corrosion management focussing on the chemical and automotive industries and civil engineering", which is quite far from nuclear corrosion!

During the WP4 special meeting, it was decided to propose 03 sessions:

- √ a nuclear corrosion general session,
- ✓ a workshop on "Corrosion monitoring in nuclear systems", organised by the ECG-COMON group (A. Molander and St. Ritter) and the WP4 (see overheads presented).
  - St. Ritter presented the scope of the workshop: research on corrosion monitoring techniques and their applications for all types of fission reactors and nuclear waste disposal systems.
  - O. de Bouvier asked if non-destructive methods are included. D. Féron recalled that there are two objectives of non-destructive methods: find defects, which is not in the scope of the workshop, and follow the evolution of the defects, which is in the scope of the workshop; this point has to be controlled before the acceptation of papers.

The duration of the workshop will depend on the number of papers received, probably one day. The main information about this workshop are:

- \* deadline for abstracts submission: January 15<sup>th</sup>, 2007
- \* deadline for papers submission: June 15<sup>th</sup>, 2007
- \* proceedings: publication in the EUROCORR'2007 (CD-ROM), and as an EFC Series book or JNM special publication

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- ✓ a workshop on "Initiation of stress corrosion cracking in NPPs", in collaboration with WP5 It was first planned to have a workshop on SCC, but after discussions and to get the agreement of the German organisers, it was decided to focus on initiation. R. Novotý, who is in charge of the organisation of the workshop, explained that it is now the proposal phase, trying to get the agreement of AMALIA (R. Kilian, who is also the German correspondent nominated by Dechema for EUROCORR'2007) and PERFECT (St. Van Dyck) groups.
- D. Féron said that the decision should be made by the end of October, and mentioned that NACE could be interested in these workshops that could become common events EFC/NACE.

### 6.3. Next EUROCORRs

- D. Féron informed the attendance about next EUROCORRs:
  - ✓ EUROCORR'2008: planned on September 07<sup>th</sup>-11<sup>th</sup>, 2008 in Edinburg, Scotland
  - ✓ EUROCORR'2009: planned on September 06<sup>th</sup>-10<sup>th</sup>, 2009 in Nice, France on the topic "Corrosion: from nanoscale to the plant"
  - ✓ EUROCORR'2010: the decision is not made yet, maybe in Poland
- O. de Bouvier underlined that, in 2010, there will be again a risk of conflict with the dates of the Fontevraud conference (held every 04 years).
- R.W. Bosch asked why the Fontevraud dates are not changed. D. Féron answered that they changed in 2006, but, as for the EUROCORRs, it is a "tradition" that Fontevraud occurs in September, and a problem of practical organisation too as the "Abbaye de Fontevraud" is at disposal for the congress only in September, after the summer tourist season.



# European Federation of Corrosion Europäische Föderation Korrosion Fédération Européenne de la Corrosion

# 7. EFC WP4 PUBLICATIONS

# 7.1. WP4 publications to be edited as EFC Series books

- D. Féron recalled the books to be published as EFC Series:
  - ✓ EFC Series #48: "Corrosion of metallic heritage artefacts: investigations, conservation and prediction for long term behaviour"
    - This book contains 20 papers from a common session between "Heritage Artefacts" and "Nuclear Corrosion" WPs held in Nice during EUROCORR'2004. The manuscript was sent to the EFC by mid-June 2005.
  - ✓ EFC Series #49: "Electrochemistry in Light Wator Reactors: Focus on Reference Electrodes, Measurements, Corrosion and Tribocorrosion Issues"
    - This book contains 11 papers presented during the LIRES Seminar "High temperature electrochemistry in Light Water Reactors" held in Leuven on November  $30^{th}$ , 2004 and from the WP18 ("Tribocorrosion") session during EUROCORR'2005. The manuscript was sent to the EFC by mid-October 2005.
  - ✓ EFC Series #51: "Corrosion issues in Light Water Reactors: Focus on Stress Corrosion Cracking propagation and Practical Experience"
    - This book is a collection of 26 papers presented during EUROCORR'2003 and 2004 in WP4/WP5/WP18 sessions related to LWRs. The manuscript was sent to the EFC in November 2005.
- D. Féron informed the audience about the current status of EFC Series books:
  - ✓ Woodhead Publishing is now in charge of the EFC Series book publication;
  - ✓ WP4 books are among the 12 books "waiting" for publication, while some earlier proposed books are now under publication (NB: EFC Series #48 pre-prints have been received);
  - $\checkmark$  All the books are planned to be published by mid-2007.

# 7.2. WP4 future publications

- D. Féron presented the WP4 future publications:
  - ✓ Proceedings of the Lisbon Workshop "Corrosion Issues in Future Nuclear Reactors" The collection and reviewing of the papers are postponed, waiting for the things get better with EFC Series publications. Then the authors will be contacted for replacing/rewriting the papers of EUROCORR'2005.
  - ✓ Papers presented during NUCPERF'2006 They will be published in the "Journal de Physique IV", by December 2006.

### 7.3. Journal of Nuclear Materials

D. Féron recalled that the JNM board of editors agreed, during their last meeting, to publish the "best" papers presented during WP4 sessions in EUROCORRs, including EUROCORR'2005: 03 papers from the WP4 Lisbon session have already been sent to JNM by the beginning of September.

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D. Féron also informed that JNM agreed to publish the papers from WP4 workshops as an "extra" edition, WP4 chairman becoming "guest Editor", but following the JNM standards. It is planned to publish a special edition per year.

# 7.4. Reviewing problems

- D. Féron focussed on the problem of the difficulties encountered for the reviewing of the 03 papers and insisted on the point that each member of the WP4 has to feel concerned.
- R.W. Bosch asked why authors/participants to the workshops could not review each others papers. D. Féron answered that the reviewers have to be found outside the authors of the selected papers or outside the authors of the special issues.



# 8. EFC WP4 SPECIFIC MATTERS: NEW 3-YEARS PLAN

D. Féron recalled the past 3-years plan (2004-2006) approved in Budapest.

# The objectives were:

- ✓ Providing links between European teams involved in the nuclear corrosion field and EU funded programs.
- ✓ Initiating/encouraging exchanges on scientific and technical subjects related to nuclear corrosion.
- ✓ Promoting corrosion science and technical developments.

The actions engaged to reach these objectives were:

- ✓ Having 02 meetings per year: Spring meeting and Fall meeting during the EUROCORRs.
- ✓ Organising/supporting specific seminars and workshops: during the EUROCORRs and in conjunction with EU programs.
- ✓ Creating/supporting active task forces (groups) on specific subjects.
- ✓ Publishing at least a book per year in EFC Series.
- ✓ Proposing a co-ordinated action.

All the actions were carried out except the co-ordinated action which was not accepted, but it is to note that now, ageing and corrosion are mentioned in the EU FP7, and that the NULIFE project, involving people proposed in the WP4 CA, was accepted.

Then, D. Féron presented his proposal for the new 3-years plan (2008-2010):

- ✓ The objectives are the same than in the previous 3-years plan.
- ✓ The actions are also the same, except for the CA but contacts have been taken with EU and FP7.
- ✓ The publications in EFC Series and international journals will be maintained.
- ✓ The links created with OECD/NEA and AIEA will be encouraged.
- ✓ The creation of a "Summer school" on nuclear corrosion is proposed, of a duration of a week
  and to be organised maybe in conjunction with European programs, knowing that there will be no
  problem to get money from Europe.
  - D. Féron explained that the objective is to have one Summer school per year, in a different country. D. Féron proposed to create a new task force in this aim, by mid or end 2007, gathering people from universities and from former East and West Europe, for a first Summer school in 2009.
  - R.W. Bosch is very interested and will speak about this proposal to SCK-CEN.



# 9. CLOSURE

- D. Féron recalled the forthcoming meetings:
  - ✓ "Topical day: 10 years of stress corrosion cracking in SCK-CEN" on January 22<sup>nd</sup>, 2007 in Mol (Belgium)
  - √ 3<sup>rd</sup> International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems on May 14<sup>th</sup>-18<sup>th</sup>, 2007 in PennState University (USA)
  - ✓ ECG-COMON meeting (for members) on June 18<sup>th</sup>-19<sup>th</sup>, 2007
  - ✓ EUROCORR'2007 on September 09<sup>th</sup>-13<sup>th</sup>, 2007 in Freiburg (Germany) with a nuclear corrosion general session, two workshops and the WP4 Fall meeting
- D. Féron asked the attendance about the place where to hold the WP4 Spring meeting. R.W. Bosch and St. Ritter proposed to hold it in conjunction with the NULIFE or MTR meeting. St. Ritter also proposed to hold it in conjunction with the ECG-COMON meeting. The decision will be made soon.
- D. Féron thanked the audience for coming and recalled that there is the poster session at the end of the afternoon, while St. Ritter recalled the ECG-COMON meeting will follow.

The Fall meeting is closed.