

**EUROPEAN FEDERATION OF CORROSION  
EUROPÄISCHE FÖDERATION KORROSION  
FÉDÉRATION EUROPÉENNE DE LA CORROSION**



From

Damien Féron, Chairman of the EFC WP4  
CEA/Saclay  
DEN/DANS/DPC/SCCME  
Bâtiment 458  
Point courrier n°50  
91191 GIF SUR YVETTE Cedex (France)

Thursday, June 01<sup>st</sup>, 2006

O/Ref. EFC/CEA/06-020/DF/MBe

Dear Colleagues,

Re **Minutes of the WP4 Spring Meeting (31/03/2006)**

Please, find hereafter the minutes of the WP4 Spring Meeting held in the Château de Cadarache (France) on March 31<sup>st</sup>, 2006.

Sincerely,

A handwritten signature in black ink, appearing to read 'D Féron', with a horizontal line underneath.

Damien Féron  
Chairman of the EFC WP4

A handwritten signature in black ink, appearing to read 'Mylène', with a horizontal line underneath.

Mylène Belgome  
Secretary of the EFC WP4

Enc. Minutes

Overheads presented by D. Féron and A. Roth

Overheads presented by D. Féron to the OECD/NEA meeting

**EFC WP4 "NUCLEAR CORROSION"**

|                      |                  |            |                                 |                              |
|----------------------|------------------|------------|---------------------------------|------------------------------|
| Chairman             | Damien Féron     | CEA/Saclay | DEN/DANS/DPC/SCCME Bâtiment 458 | F-91191 GIF SUR YVETTE Cedex |
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| Scientific Secretary | Odile de Bouvier | EDF        | DIN/CEIDRE<br>2 rue Ampère      | F-93206 SAINT DENIS Cedex 1  |



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**MINUTES**

**EFC WP4 "NUCLEAR CORROSION" SPRING MEETING**

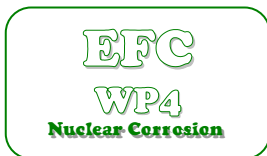
Château de Cadarache, France

Friday, March 31<sup>st</sup>, 2006



**EFC WP4 "NUCLEAR CORROSION"**

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**Attendance:**

|                  |  |
|------------------|--|
| Mylène Belgome   | CEA/Saclay (France)                      |
| Frank Druyts     | SCK-CEN (Belgium)                        |
| Damien Féron     | CEA/Saclay (France)                      |
| Alessandro Gessi | ENEA (Italy)                             |
| Bruno Kursten    | SCK-CEN (Belgium)                        |
| Radek Novotný    | JRC IE Petten (The Netherlands)          |
| Armin Roth       | AREVA NP (Germany)                       |
| Börje Wegemar    | Westinghouse Electric Sweden AB (Sweden) |

**Apologies for absence received from:**

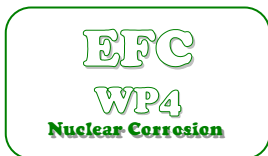
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|-----------------------|-------------------------------|
| Bengt Bentsson        | OKG Aktiebolag (Sweden)       |
| Pierre Combrade       | AREVA NP (France)             |
| Odile De Bouvier      | EDF (France)                  |
| Marc Foucault         | AREVA NP (France)             |
| Dolores Gómez-Briceño | CIEMAT (Spain)                |
| Catherine Guerre      | CEA (France)                  |
| Renate Kilian         | AREVA NP (Germany)            |
| Marc Le Calvar        | IRSN (France)                 |
| Valérie L'Hostis      | CEA (France)                  |
| Virginia Madina       | INASMET (Spain)               |
| Anders Molander       | Studsvik Nuclear AB (Sweden)  |
| Gabor Nagy            | KFKI (Hungary)                |
| Juha Piippo           | Cormet Oy (Finland)           |
| Antoine Pourbaix      | CEBELCOR (Belgium)            |
| Stefan Ritter         | PSI (Switzerland)             |
| Hans-Peter Seifert    | PSI (Switzerland)             |
| Bernhard Stellwag     | AREVA NP (Germany)            |
| David R. Tice         | Serco Assurance (UK)          |
| François Vaillant     | EDF (France)                  |
| Peter Wood            | United Kingdom Nirex Ltd (UK) |
| Ian S. Woolsey        | Nexia Solutions (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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**Summary:**

|   |           |
|---|-----------|
| <b>1. Opening and welcome</b>   | <b>5</b>  |
| <b>2. Approval of the agenda of the Spring meeting</b>  | <b>5</b>  |
| <b>3. Approval of the minutes of the Lisbon meeting</b>   | <b>5</b>  |
| <b>4. EFC WP4 publications</b>  | <b>6</b>  |
| 4.1. WP4 publication already published  | 6         |
| 4.2. WP4 publications to be edited as EFC Series books  | 6         |
| 4.3. WP4 future publications  | 7         |
| <b>5. EFC/WP4 website</b>   | <b>9</b>  |
| <b>6. EFC WP4 Events</b>  | <b>10</b> |
| 6.1. European MIC Workshop - by A. Roth   | 10        |
| 6.2. NUCPERF 2006   | 10        |
| 6.3. Fontevraud 6   | 11        |
| 6.4. 3 <sup>rd</sup> International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems | 11        |
| <b>7. EFC Groups</b>  | <b>12</b> |
| 7.1. ECG-COMON  | 12        |
| 7.2. EEG-CILWR - by R. Novotný  | 12        |
| 7.3. Revised stability diagrams   | 12        |
| 7.4. EEG-CNWS (Corrosion in Nuclear Waste Systems)  | 12        |
| <b>8. EUROCORRs</b>   | <b>13</b> |
| 8.1. EUROCORR'2006  | 13        |
| 8.2. EUROCORR'2007  | 13        |
| <b>9. EFC WP4 Specific matters: Up-dating of WP4 Members' list</b>  | <b>14</b> |
| <b>10. Missing items: WP4 3-years plan</b>  | <b>15</b> |
| <b>11. Closure</b>  | <b>16</b> |
| <b>12. In addition</b>  | <b>16</b> |

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**1. OPENING AND WELCOME**

D. Féron opened the WP4 Spring meeting at 09.00 and presented the apologies for absence received.

He apologized for the location of the meeting, as the place of Cadarache is not easy to reach, and sincerely thanked the attendance for coming.

**2. APPROVAL OF THE AGENDA OF THE SPRING MEETING**

D. Féron presented the agenda of the meeting and informed the audience that, due to some absences, it would be slightly modified.

As no comment was made, the agenda is approved.

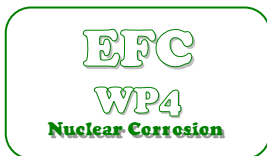
**3. APPROVAL OF THE MINUTES OF THE LISBON MEETING**

D. Féron asked the audience for comments about the Lisbon minutes.

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

**EFC WP4 "NUCLEAR CORROSION"**

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#### 4. EFC WP4 PUBLICATIONS

##### 4.1. WP4 publication already published

D. Féron first presented the book published by ANDRA (French agency for nuclear waste management) in the "ANDRA Science and Technology Series": the Proceedings of the 2nd International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems.

While passing on an exemplar of the book through to the audience, he recalled that this book is available free of charge and informed the audience that each author has received an exemplar while 200 exemplars have been diffused on 1000 exemplars printed.

B. Wegemar asked about the contact for getting this publication, and for EFC Series books. D. Féron answered that the contact for this particular "ANDRA Science and Technology Series" is M. Belgome and also advised to go and see the ANDRA website. For EFC Series books, he encouraged EFC members to see the EFC website, where they can get these books with a 20% discount.

Finally, D. Féron recalled that the proceedings of the 1<sup>st</sup> International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems have been published as an EFC Series book (#36), sold for about 180€.

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

###### 4.2.1. EFC Series #48: "Corrosion of metallic heritage artefacts"

D. Féron recalled that 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.

###### 4.2.2. EFC Series #49: "Electrochemistry in Light Water Reactors: Focus on Reference Electrodes, Measurements, Corrosion and Tribocorrosion Issues"

D. Féron recalled that this book contains 11 papers presented during the LIRES Seminar "High temperature electrochemistry in Light Water Reactors" held in Leuven on November 30<sup>th</sup>, 2004 and from the WP18 ("Tribocorrosion") session during EUROCORR'2005.

The manuscript was sent to the EFC by mid-October 2005.

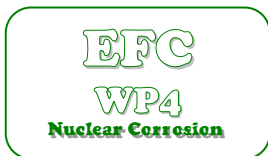
###### 4.2.3. EFC Series #51: "Corrosion issues in Light Water Reactors: Focus on Stress Corrosion Cracking propagation and Practical Experience"

D. Féron recalled that 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.

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**4.2.4. Status of EFC Series books**

D. Féron informed the audience about the current status of EFC Series books:

- ✓ EFC changed from Maney to Woodhead Publishing after having encountered some problems ;
- ✓ WP4 books (#48, 49 and 51) are among the 12 books "waiting" for publication, while some earlier proposed books are now under publication ;
- ✓ no delay has been given for the effective publication of the WP4 books; D. Féron is hoping for the end of 2006.

D. Féron recalled that, after the book is sent to the EFC, there are still about 6 months of delay to review the English: the paper reviewed by the EFC (for English) is sent to the author for agreement and only after sent for publication.

Regarding the situation of EFC Series book publication, D. Féron proposed to write a letter to the President of the EFC, saying that the delay for publication has to be shortened and asking to put this particular point to the agenda for the next EFC BoA and/or STAC meeting.

**4.3. 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.
- ✓ Papers presented during NUCPERF' 2006  
It was previously planned to publish them as an EFC Series book, but due to the situation, contacts were taken with different publishers; it is now decided that NUCPERF papers will be published in the "Revue de Physique".  
B. Wegemar asked for the delay of publication.  
D. Féron answered that the reviewing should be carried out under the authority of NUCPERF Chairperson (V. L'Hostis) in May 2006 and the Revue published, hopefully, for the next EUROCORR. The book will be given free of charge to the contributors and against money for anyone else.

D. Féron informed that the Editors of the Journal of Nuclear Materials (JNM) agreed, during their last meeting, to publish the "best" papers presented during WP4 sessions in EUROCORRs, including EUROCORR'2005. The "best" papers meaning papers presenting researches achieved, in which no further results are expected.

For EUROCORR'2005 papers, the authors have been contacted, papers are expected by the end of March, reviewing in April and publication expected for EUROCORR'2006.

D. Féron also informed that JNM agreed to publish the papers from WP4 workshops as an "extra" edition, WP4 becoming "temporarily Editor", but following the JNM standards.

A discussion is engaged about Copyright. D. Féron recalled that there is no Copyright for EFC events, like EUROCORRs.

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B. Wegemar asked about NUCPERF. D. Féron answered that every participant will be given a CD-ROM gathering all the presentations made and papers without reviewing, as well as the recommandations made during panel discussions.

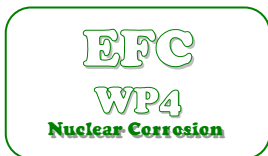
A. Roth asked if there will only be a CD-ROM, since it seems important that the NUCPERF presentations could be referenced. D. Féron proposed to register the CD-ROM with an ISBN/ISSN number, so that it can be referenced, and recalled that a book of proceedings will be published (see above).

In conclusion, D. Féron recalled that WP4 has several possibilities to publish the papers presented during its sessions and workshops, waiting for things get better with EFC Series publications.

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**5. EFC/WP4 WEBSITE**

D. Féron recaled the EFC website address: [www.efcweb.org](http://www.efcweb.org) and informed that the WP4 has now its own page for which the contact is O. De Bouvier, Scientific Secretary of the WP4.

The WP4 page contains:

- ✓ WP4 activities,
- ✓ the minutes of the WP4 meetings, without the overheads presented,
- ✓ Announcements of WP4 events and workshops.

D. Féron informed that the minutes of WP4 groups/mirror-groups should be added. He asked the audience not to hesitate to contact O. De Bouvier if they think about useful information to be added.

D. Féron also informed that it is possible to create a "private" part to the WP4 page, only for WP4 members. This private part could be used for exchanging papers during the construction of books to be published by the WP4, for instance.

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## 6. EFC WP4 EVENTS

### 6.1. European MIC Workshop - by A. Roth

D. Féron introduced the presentation by saying that this Workshop was a very interesting meeting.

A. Roth first informed that FRAMATOME-ANP is now named AREVA-NP.

The Workshop took place in Erlangen (Germany) in January 30-31, 2006.

A. Roth recalled the background of this workshop:

- ✓ motivation: many companies see an increase of the number of the failures caused by MIC, mostly in (North) German NPPs, and the idea came to see what happens in other European NPPs
- ✓ the initiative went from R. Kilian for organizing a European workshop, on invitation, to exchange on operating experience and discuss about potential preventive measures and remedies

There were 44 participants, from Europe and one from South Africa, coming from industries (utilities and vendors, NPP, chemical industries, ...), research organizations and governmental organizations. Everyone showed a huge interest for the Workshop.

A. Roth presented the programme and the list of presentations, then summarized the main issues:

- ✓ industry is aware to be affected by MIC,
- ✓ appearance of MIC failures,
- ✓ MIC is not a completely new problem,
- ✓ MIC is a biofilm issue.

In conclusion, A. Roth presented the feedback got from the participants: very interesting meeting, the success is achieved and it is proposed to have a MIC Workshop every 2 years.

D. Féron congratulated again A. Roth and said it was a very interesting meeting gathering different people and, as it was a private meeting, discussions were more open between people from plants with MIC problems and other without problem. It was a very good initiative and there will be other workshops, hopefully with EDF which is also concerned. A. Roth also encouraged the participation of EDF. D. Féron and A. Roth agreed to say that there should be other MIC workshops on invitation to guarantee really open discussion.

As A. Roth asked for support and suggestions for the organization, D. Féron said WP4 encourages this event, even without EFC event number.

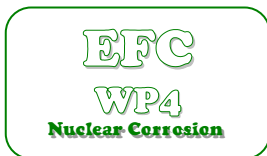
### 6.2. NUCPERF 2006

D. Féron informed that V. L'Hostis will make a report next meeting, but underlined that it was the first meeting co-sponsored by an International Agency (OECD/NEA) and a success with about 70 participants.

A. Roth agreed, adding it was a very interesting meeting where key experts on different fields have met and discussed. D. Féron said that it is important to carry this kind of discussion at an international level.

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**6.3. Fontevraud 6**

D. Féron recalled that this EFC event (#283), organized by the SFEN, will take place in Fontevraud on September 18<sup>th</sup>-22<sup>nd</sup>, 2006 (for information, see: [www.sfen.fr/fontevraud6](http://www.sfen.fr/fontevraud6)).

He underlined that Fontevraud conferences were previously mostly regarding PWRs, but this year, it will be also opened to BWRs.

He informed that papers from plants will be presented during oral sessions and papers from laboratories during poster sessions.

**6.4. 3<sup>rd</sup> International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems**

D. Féron recalled that the 1<sup>st</sup> workshop occurred in Cadarache in 2001, gathering only people from the corrosion field, the 2<sup>nd</sup> one occurred in Nice in 2004.

During the last EFC WP4 meeting, it was decided to hold the future workshops in Europe and it was evoked the possibility of an "open event" during EUROCORR or a "close meeting" in Cadarache or elsewhere in Europe.

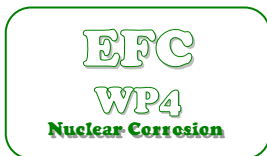
D. Féron received two proposals after the Autumn meeting, from SCK-CEN (Belgium) and from PennState University (USA). As D. D. Macdonald was co-organizer of the 1<sup>st</sup> meeting and of the 2<sup>nd</sup>, previously planned to occur in the USA, D. Féron decided to accept the US proposal. He thanked SCK-CEN and said they are already retained for the organization of the 4<sup>th</sup> Workshop.

The 3<sup>rd</sup> Workshop will take place in the Campus of PennState University during the 3<sup>rd</sup> week of May 2007, on 3 days. The announcement should be made by May 2006. The organization will be carried out by an International Advisory Committee, now under constitution, in which SCK-CEN will be represented.

D. Féron will ask EFC to get an EFC event number, as half part of the Advisory Committee will be European, and as the two previous events were held in Europe. Getting this EFC event number would be a recognition of WP4 activity up to now and also valuable for EFC.

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## **7. EFC GROUPS**

### **7.1. ECG-COMON**

As there were no representative, D. Féron informed that next meeting of this group will take place in Studsvik in June 12<sup>th</sup>, 2006.

### **7.2. EEG-CILWR - by R. Novotný**

R. Novotný recalled that he replaces F. Sevini who left by the end of 2005, and that S. Van Dyck has been elected as chairman of the AMALIA European Expert Group.

He also reminded the members of the AMALIA group, its background and objectives.

R. Novotný informed that the main tasks are to:

- ✓ prepare a programme for NULIFE NoE,
- ✓ prepare a workshop on SCC in JRC Petten in 2007.

D. Féron said that, if WP4 supports the workshop to be organized by the AMALIA group, there will not be a WP4 workshop during EUROCORR'2007, since the subject is similar. He added that this point should be discussed again in Fontevraud 6, to reach the people that could be involved in the organization. He also added that people acting in the PERFECT programme should be contacted to organize only one workshop at the European level.

R. Novotný agreed, as PERFECT should continue in the European FP7.

A. Roth recalled that ECG-EAC meetings and "environmental degradation" symposiums in US are the major events in the "SCC world" and questioned about the opportunity to have such event in Europe.

D. Féron mentioned that it is really important to get support from PERFECT since, at the end of the programme, they will have to organize a meeting to spread the knowledge acquired, as usual for European programmes.

### **7.3. Revised stability diagrams**

D. Féron informed that A. Pourbaix presented a proposal called PREPHED to get support from EC to carry out this task.

He recalled that data already exist but are not gathered, which is needed to revise the E-pH diagrams and extrapolate to high temperatures.

Some news will be given during next WP4 meeting, but it seems quite sure that the PREPHED proposal will not be accepted by EC.

### **7.4. EEG-CNWS (Corrosion in Nuclear Waste Systems)**

D. Féron proposed to gather European people from the International Advisory Committee of the 3<sup>rd</sup> Workshop on Long Term Corrosion Behaviour in NWS to create a new European Expert Group on this subject, and proposed SCK-CEN (F. Druyts) to chair this group.

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

|                      |                  |            |                   |              |                              |
|----------------------|------------------|------------|-------------------|--------------|------------------------------|
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**EUROPEAN FEDERATION OF CORROSION  
EUROPÄISCHE FÖDERATION KORROSION  
FÉDÉRATION EUROPÉENNE DE LA CORROSION**

## 8. EUROCORRs

### 8.1. EUROCORR'2006

D. Féron recalled that EUROCORR'2006 will take place in Maastricht (NL) on September 25-28<sup>th</sup>, 2006. The general topic is "Reliability management of Technical Systems".

D. Féron informed that 2 sessions were originally planned:

- ✓ a workshop on "Corrosion Issues in Reprocessing Plants"  
D. Féron first received the agreement of BNFL and JNFL but as they cancelled their participation, the workshop is also cancelled, even if AREVA still agrees to present something.
- ✓ a Nuclear Corrosion session  
D. Féron informed that this session is maintained and will include papers related to corrosion issues in reprocessing plants, among which papers from AREVA.

D. Féron proposed the creation of a task force working for the organization of a workshop on corrosion issues in reprocessing plants, since getting BNFL and JNFL should be difficult.

D. Féron mentioned some problems with EUROCORR'2006 organizers (no answer to different requests and mails, etc.), before presenting the list of papers accepted for the WP4 session.

B. Wegemar asked for the duration of the WP4 session. D. Féron answered that it is planned to last one day or one and 1/2 day + WP4 Fall meeting.

B. Wegemar asked about the usual attendance to WP4 sessions during EUROCORRs and the quality of presentations. D. Féron answered that efforts have been made to improve the number and quality of presentations, mentioned that the "support" of JNM for the publication of the proceedings is a kind of guarantee, as well as an increasing number of papers from universities. All that explains an increasing attendance to WP4 events.

### 8.2. EUROCORR'2007

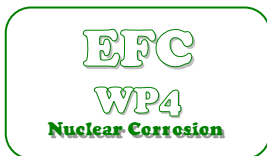
D. Féron recalled that it will take place in Freiburg (Germany) on September 09<sup>th</sup>-13<sup>th</sup>, 2007 on the following topic "Industrial corrosion management focussing on the chemical and automotive industries and civil engineering".

Two sessions are proposed:

- ✓ a nuclear corrosion general session,
- ✓ a workshop on "Stress Corrosion Cracking in PWR and BWR conditions", in collaboration with WP5, for which the sponsor of OECD/NEA has been solicited. This workshop depends on the occurrence (or not) of a workshop organized by the AMALIA Group in the beginning of 2007. D. Féron proposed the creation of a Scientific Committee gathering people from EEG-CILWR, ECG-COMON and other European programmes dealing with (IA)SCC. D. Féron also asked for other proposals for the workshop. The decision should be made before next WP4 meeting.

#### EFC WP4 "NUCLEAR CORROSION"

|                      |                  |            |                   |              |                              |
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FÉDÉRATION EUROPÉENNE DE LA CORROSION**

**9. EFC WP4 SPECIFIC MATTERS: UP-DATING OF WP4 MEMBERS' LIST**

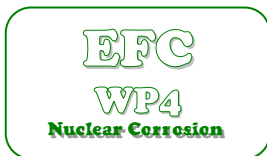
M. Belgome said that the up-dating has been done, except for the Scientific Committee members, as the process is a bit different.

D. Féron recalled that within the WP4, there are Personal members and Scientific Committee members who are designed by the Scientific Societies members for the EFC in each country. That is why WP4 Chairman has to ask these Societies to cancel or change the name of any SC member.

In conclusion, he encouraged the attendance to get new members for the WP4.

**EFC WP4 "NUCLEAR CORROSION"**

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**EUROPEAN FEDERATION OF CORROSION  
EUROPÄISCHE FÖDERATION KORROSION  
FÉDÉRATION EUROPÉENNE DE LA CORROSION**

**10. MISSING ITEMS: WP4 3-YEARS PLAN**

D. Féron first recalled the present 3-years plan (2004-2006):

- ✓ 2 sessions during the EUROCORRs, a workshop and a Nuclear Corrosion general session, gathering more attendance  
⇒ point achieved
- ✓ specific seminars and workshops  
⇒ point achieved with EFC events #279 and 284 for instance  
WP4 will try to support more specific seminars for "concluding" European programmes coming to their end, as one of the points of these programmes are to spread the knowledge acquired
- ✓ publications  
⇒ point achieved or to be achieved by the proceedings published by ANDRA and the EFC Series book #48, 49 and 50 sent to the EFC
- ✓ proposal of a Co-ordinated Action  
⇒ proposal made but rejected, but in the new FP the word "corrosion" now appears, which is a progress

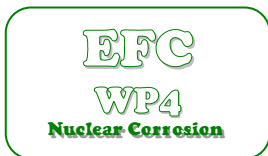
Then D. Féron exposed his proposal for the next 3-years plan (2007-2009):

- ✓ maintain 2 sessions during EUROCORRs, a workshop and a general session
- ✓ specific seminars and workshops  
3<sup>rd</sup> International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems, next NUCPERF Workshop, open meetings of groups related to WP4, etc.
- ✓ publications  
EFC Series and publications with international organizations (as JNM)
- ✓ increasing links with nuclear international organizations, as OECD/NEA, AIEA, etc.  
following the success of the 1<sup>st</sup> attempt of collaboration with NUCPERF'2006, there will be a 2<sup>nd</sup> trial with the organization of the 3<sup>rd</sup> International Workshop on Prediction of Long Term Corrosion Behaviour in Nuclear Waste Systems

In conclusion, D. Féron asked for proposals to add to this new plan, which will be discussed during the next WP4 meeting.

**EFC WP4 "NUCLEAR CORROSION"**

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FÉDÉRATION EUROPÉENNE DE LA CORROSION**

## 11. CLOSURE

D. Féron recalled the forthcoming meetings:

- ✓ ECG-COMON (for members) on June 12<sup>th</sup>, 2006 in Studsvik
- ✓ Fontevraud 6 on September 18<sup>th</sup>-22<sup>th</sup>, 2006 in Fontevraud
- ✓ EUROCORR' 2006 on September 25<sup>th</sup>-28<sup>th</sup>, 2006 in Maastricht with a Nuclear Corrosion general session and the WP4 Fall meeting

D. Féron proposed a WP4 pre-meeting during Fontevraud 6. As the attendance to this event is mainly composed of people dealing with materials behaviour in NPPs, it could be a good way to present WP4 activity. It could also permit to make the decision about the occurrence of the SCC workshop either during EUROCORR' 2007 or before.

As no other point is evoked, D. Féron thanked the audience for coming and apologized again for the location. Then he closed the meeting.

## 12. IN ADDITION

The presentation of the WP4 activities to OECD/NEA made by D. Féron is enclosed and will also be available on the EFC website.

### EFC WP4 "NUCLEAR CORROSION"

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