

Minutes

Fall Business Meeting of the EFC Working Party 4 'Nuclear Corrosion'

September 23, 2021, 15:20 – 16:20

'Online'

Written by:

Laure Martinelli and Stefan Ritter

Diffusion:

Attendees and apologies
WP4 members & friends
Roman Bender (EFC Scientific Secretary)
Wolfram Fürbeth (EFC STAC Chairman)
Jörg Vogelsang (EFC President)

Attendees (17):

S. Ritter (PSI), D. Féron (CEA), A. Mackiewicz (PSI), A. Treichel (PSI), B.A. Baykal (PSI), B. Zajec (ZAG), B. Kursten (SCK CEN), C. Lilja (SKB), R. Rebak (GE-GRC), H.-P. Seifert (PSI), J. Stoulil (VSCHT), M. Vankeerberghen (SCK CEN), B. Normand (Univ. Lyon), W. Bogaerts (KU Leuven), R. Azihari (CEA), Z. Que (VTT), L. Martinelli (CEA)

Apologies for absence received from:

N. Diomidis (Nagra)

Agenda:

- 1) Opening of the meeting, apologies for absences, approval of the agenda
- 2) WP 4 awards ceremony
- 3) Approval of the minutes of the 2020 Fall Meeting (online)
- 4) EFC WP 4 internal matters
 - Members and “friends”
 - WP 4 prizes
 - Call for nominations for the 2022 Coriou Award and Jury selection
- 5) EFC WP 4 publications
 - Books & special issues published or under publication
 - Possible future publications
- 6) EFC WP 4 past events
- 7) EFC WP 4 future events (other than EUROCORRs)
 - LTC 2022
- 8) EUROCORR's
- 9) Introduction of the new EFC Hub
- 10) Discussion about other WP 4 activities
- 11) Any other business (website, next meeting, EU-projects, etc.)
- 12) Closure

Appendix:

Appendix 1) Meeting slides presented by S. Ritter*

Appendix 2) 8th LTC 2022 slides presented on behalf of N. Diomidis*

**) Document available only on the private space of the EFC WP 4 website, for members/friends only.*

1. Opening of the meeting, apologies for absences, approval of the agenda

S. Ritter opened the Fall Meeting and thanked the audience for joining in via Zoom. He underlined the particularity of this year marked by the Covid-19 virus that forced the WP 4 meeting to be virtual again. The agenda was presented and has been approved (see above).

2. EFC WP 4 awards ceremony

The ceremony began with some explanation of the special situation this year. Because no full papers were submitted, many young scientists (below 35 years) were eligible for the oral prize (15 candidates!). Stefan explained that the Jury had a very difficult job, because the ten best presentations were very close together. But finally Rachma Azihari (CEA, France) convinced the five-person Jury with her excellent talk “Experimental characterization and modelling of intergranular fracture of unirradiated and irradiated pre-oxidized austenitic stainless steels” and therefore received the prize. Thereafter Stefan announced that the three-person Jury decided to award the best poster prize to Adrianna Mackiewicz (PSI, Switzerland), who presented an excellent poster titled “Zinc injection in light water reactors to mitigate stress corrosion cracking of Alloy 182 and cold-worked 316L stainless steel”. Stefan emphasized that he was not member of the poster prize Jury!

Both prizes consisted of a diploma and a hardcopy of the new EFC Green Book No. 69 (“Nuclear corrosion: research, progress and challenges”). The sponsorship of Elsevier was gratefully acknowledged.

WP 4's honorary award, the Henri Coriou Medal, that is given every year to an expert, recognized in the nuclear corrosion field, has also been awarded this year. A Jury, composed of the Chairman, the Vice-Chairman of the EFC WP 4 and three members nominated during the Fall Meeting of the EFC WP 4 (the year before the honorary medal is awarded), was selecting the recipient from the nominees. In 2021, the Coriou award has been attributed to Grace Burke from University of Manchester (update: she recently moved over to ONRL, USA). Obviously, the prize could not be handed over face-to-face due to the pandemic, but Stefan promised to do his best organizing a "physical" award ceremony with Grace until end of next year at the latest. Beside the medal and a diploma also the green book "Stress corrosion cracking of Ni-based alloys in water cooled reactors – the Coriou effects" will be given. The sponsorship of the medal and book by CEA is highly appreciated!

3. Approval of the minutes of the 2020 Fall Meeting (online)

No comments were received and no corrections have been asked for. Therefore, the 2020 minutes were approved by all.

4. EFC WP 4 internal matters

S. Ritter reminded that the list of members and friends is visible on the internal WP 4 website (accessible only with a password, which can be requested by members & friends on the website). Then he informed the participants of the objectives of the WP 4 and that the members of the WP include the delegates nominated by the member societies of the EFC and individuals nominated by the Chairman. Those who are interested in the activities of the WP but not member of an EFC member society are called 'Friends'. People who currently have no national EFC member society (like our colleagues in Finland) can create a local branch (information about it can be found via the website of the EFC).

S. Ritter then reminded on the objectives for the 2021-2023 period, which were approved during last year's fall meeting (they can be found on the WP 4 website).

Then S. Ritter asked if any changes to the WP 4 prize rules are needed, which was not the case.

He introduced the composition of the Juries of the prizes and Coriou award for this year (see slide 10 in Appendix 1) and proposed the Jury composition for next year's Coriou award: Chair, Vice-Chair, the 2021 winner (G. Burke), Ch. Lilja and one further member: because D. Féron would like to step back (due to his retirement) S. Ritter proposed R. Rebak to be part of next year's Jury. R. Rebak accepted his nomination. The meeting attendees silently approved the proposed persons. S. Ritter recalled that all members and friends can nominate candidates (persons or groups) for the 2022 Henri Coriou Award until February 28.

S. Ritter asked if two Coriou medals should be awarded, one normal Coriou award and one special prize at the occasion of the 2022 ICG-EAC meeting in Europe (Finland). This was originally decided in for 2020, but then the meeting was cancelled due to the pandemic. Some vivid discussion arose: H.-P. Seifert proposed to select someone under the age of 40. W. Bogaerts said that for the prestige of the award it is better to select well-known, senior scientists. L. Martinelli added that we already have the oral prize for scientists under the age of 35, so it would be redundant. Maybe middle carrier scientist could be more relevant. D. Féron proposed to create a new award specifically dedicated to younger people, but we would need to find financial support for such an award. C. Lilja commented that creation of another award risks diluting the prestige of the existing award. She added also that it

is good to propose younger persons to boost their carrier. W. Bogaerts proposed then to add a junior Coriou award. R. Rebak suggested to launch a poll with the question “Should we create an additional award? 1. Yes for young scientist. 2. Yes for middle carrier scientist. 3. No additional award”. No clear preference for another prize could be detected, therefore no decision was taken for now and the one Coriou award should be kept as is. But this question can be raised again next year if someone wishes. All are welcome to come up with a proposal (but including possible sponsors for such an extra prize).

5. EFC WP 4 publications

A special issue on LTC 2019 has been published in Materials & Corrosion in January 2021 and already in 2020 the EFC “green book no.69 “Nuclear Corrosion” was published.

D. Féron mentioned that a book on corrosion modelling by cellular automata has been written (but not yet published).

C. Lilja reminded that a special edition on “Corrosion and Materials Degradation under Irradiation: From Understanding to Mitigation...” has been edited for the Corrosion and Materials Degradation journal. B. Normand, who is the editor, informed that the special edition is currently under review.

Then S. Ritter explained on an extra slide (see appendix 1, slide 12) that a special issue of KOM – Corrosion and Materials Protection Journal – is dedicated to EUROCORR 2021 papers (not only for WP 4). Everyone is welcome to submit full papers until December 31, 2021.

For the future, probably a special issue with papers from the LTC 2022 workshop is planned and if anyone has ideas for any further special journal issues or books, the WP Chairman is happy to support such proposals and actions.

6. EFC WP 4 past events

Since the last EUROCORR, the second Nuclear Corrosion online seminar was conducted on April 23, 2021. An interesting lecture was given by B. Gwinner (CEA) titled “Journey to the heart of the corrosion processes involved in a spent nuclear fuel recycling plant”. Approximately 50 participants attended. Otherwise, no bigger events could take place due to the pandemic.

7. EFC WP 4 future events (other than EUROCORRs)

S. Ritter listed some future events that are co-organized by the WP 4:

- S. Ritter suggested to organize a third edition of the Nuclear Corrosion online seminar (e.g., around the Corrosion Awareness Day 2022) and asked for topics or contributions. Some positive feedback was received.
- In 2022 the next int. WS on “Long-Term Prediction of Corrosion Damage in Nuclear Waste Systems – LTC 2022” will be held on June 22 – 24, in Baden, Switzerland (see Appendix 2).
- It was suggested that the third edition of the Nuclear Corrosion Summer School – NuCoSS-23, should be organized in July 2023. It could be co-organized in the framework the European Horizon project POEAM if the submitted proposal would be accepted. B. Zajec mentioned that this time ZAG does not apply anymore to organize the school in Slovenia. Discussion about its organization is in progress with University Carlos 3 (Madrid, Spain), but no decisions are taken yet and all can propose to organize it, considering that approximately 30 to 40 students should be able to attend,

that registration fees should stay in a reasonable frame and that the location should be attractive. Around March 2022 the local host should be selected, to be able to start the preparation phase.

8. EUROCORRs

S. Ritter gave a summary of some facts of the virtual EUROCORR 2021. He underlined the reasonable number of nuclear corrosion session attendees (around 30 persons) and the very good level of presentations constituted of 25 oral presentations, 2 posters (+1 didn't show up) and 5 nuclear corrosion-related joint session orals (= 32 presentations). The total number of registered conference attendees was 613.

Then S. Ritter recalled the future EUROCORRs:

- EUROCORR 2022, August 28 – September 1, 2022, Berlin, Germany: Regular nuclear corrosion session and eventually a special session on corrosion issues during decommissioning (suggested by T. Yonezawa) and/or a repetition of the joint session on 'EAC initiation'? R. Rebak & L. Martinelli proposed to do the repetition of the joint session on 'EAC initiation' in 2023, which was accepted. D. Féron said that there is a program in Japan on decommissioning after the Fukushima accident. R. Rebak and F. Lequien (CEA) are involved, as well as EdF. R. Rebak, D. Féron and L. Martinelli will clarify if such a session would be feasible (*update: after some e-mail discussion, it was concluded not to organize a decommissioning special session in 2022*).

S. Ritter asked for other ideas for potential special sessions. W. Bogaerts proposed a topic on "Potential corrosion issues in thorium system in liquid molten salt". S. Ritter was doubtful if the necessary minimum of 5-6 talks could be gathered that a special session makes sense. But he is open for such a session if Bogaerts could come up with 5 potential lecturers on this topic during the next few weeks.

- EUROCORR 2023, August 27 – 31, 2023, Brussels, Belgium: Regular nuclear corrosion session; possibly a special session on EAC initiation (together with WP 5), proposals for further special sessions are welcome.
- EUROCORR 2024, Sep. 1 – 5, 2024, Paris, France: Regular nuclear corrosion session; proposals for special sessions are welcome.

9. Introduction of the new EFC Hub

S. Ritter presented the new tool for communication in the frame of the EFC: the EFC Hub. Via screen sharing he presented the Hub and how to use it. He underlined that the EFC Hub is free of charge (sponsored by the EFC) and a great tool facilitating cooperation among the nuclear and whole corrosion community. It can be accessed via any browser (<https://efc.solved.fi>) or downloaded as an app on a computer or smartphone (Android and OS).

10. Discussion about possible activities

S. Ritter reminded that there is a possibility of requesting some money from the EFC (up to approx. 2000 €) to support WP 4 activities (e.g., WP 'extra' meetings, grants, support of young colleagues/students, etc.). E.g., a grant has been attributed to three students to attend the summer school. This money, given by EFC, can also support the price of small activities or publications but not the invitation of special guests to the EUROCORRs. Any ideas are very welcome and for 2022 they should be submitted to the Chairman very soon!

11. Any other business

S. Ritter reminded that the WP 4 website is always up-to-date and contains useful information. Another source is the new Hub.

He also mentioned the current European projects related or connected to WP 4: MEACTOS, INCEFA-SCALE and, if accepted, POEAM (EAC initiation in additive manufactured metals).

The next WP 4 meeting will take place during the EUROCRR 2022 (hopefully!) in person, in Berlin.

12. Closure

As no other point was raised, the meeting was closed. S. Ritter thanked the participants for attending the meeting even in those difficult 'virtual' times and for their support of the WP 4 activities. As always, he emphasised that an active participation in the activities of the WP 4 is essential to be able to fulfil its objectives and that any wishes, suggestions or ideas are always welcome.

R. Rebak, and then the whole assembly, thanked Stefan Ritter for the organization and its implication within the WP 4.

APPENDIX 1



Fall Business Meeting of the EFC Working Party 4 'Nuclear Corrosion'

September 23, 2020, 15:20 – 16:20

Online



Agenda

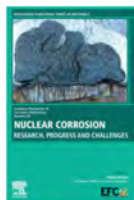
- 1) Opening of the meeting, apologies for absences, approval of the agenda
- 2) WP4 awards ceremony
- 3) Approval of the minutes of the 2020 Fall Meeting (online)
- 4) EFC WP4 internal matters
 - Members and “friends”
 - WP4 prizes
 - Call for nominations for the 2022 Coriou Award and Jury selection
- 5) EFC WP4 publications
 - Books & special issues published or under publication
 - Possible future publications
- 6) EFC WP4 past events
- 7) EFC WP4 future events (other than EUROCORRs)
 - LTC 2022
- 8) EUROCORR's
- 9) Introduction of the new EFC Hub
- 10) Discussion about other WP4 activities
- 11) Any other business (website, next meeting, EU-projects, etc.)
- 12) Closure

1) Opening

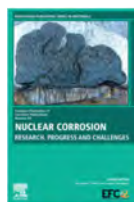
- Welcome
- Appologies received from... (N. Diomidis (NAGRA, CH))
- Approval of the meeting agenda

2) WP4 awards ceremony

- Best oral presentation award 2021 of a young presenter in the nuclear corrosion session:



- Best nuclear corrosion-related poster presentation award 2021:



***The sponsoring of the prizes by Elsevier
is gratefully acknowledged!***

2) Oral prize winner 2021

...and the winner of the best oral presentation award 2021 is:

Rachma Azihari

“Experimental characterization and modelling of intergranular fracture of unirradiated and irradiated pre-oxidized austenitic stainless steels”

CEA, France

23 September 2021

EFC-WP4 Fall Meeting 2021

5

2) Poster prize winner 2021

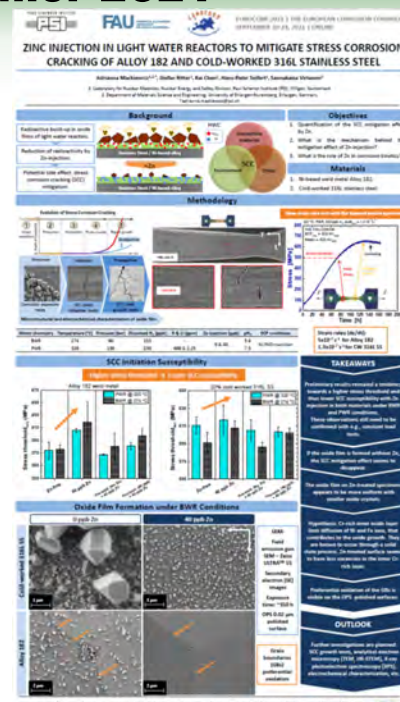
...and the winner of the best poster presentation award 2021 is:

Adrianna Mackiewicz

“Zinc injection in light water reactors to mitigate stress corrosion cracking of alloy 182 and cold-worked 316L stainless steel”

Co-authors: Stefan Ritter, Kai Chen, Hans-Peter Seifert, Sannakaisa Virtanen

Paul Scherer Institut & Friedrich-Alexander Universität Erlangen-Nürnberg



23 September 2021

EFC-WP4 Fall Meeting 2021

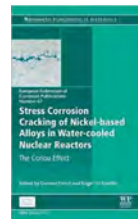
6

2) 2021 Henri Coriou Award

- The Jury has selected **M. Grace Burke (University of Manchester – MPC, UK)** in recognition of the outstanding contributions to corrosion science and engineering in the nuclear field.



The sponsoring of the medal & book by CEA is gratefully acknowledged!



23 September 2021

EFC-WP4 Fall Meeting 2021

7

3) Approval of the minutes of the 2020 Fall Meeting (online)

- Approval?*

23 September 2021

EFC-WP4 Fall Meeting 2021

8

4) EFC WP4 internal matters

- Members and “friends”

Please check your name/address on the internal area of the [WP4 website](#)!

- WP4 objectives 2021 – 2023 :

- To provide links between European teams and EU-funded programs in the nuclear corrosion field, with an opening on to the world.
- To initiate and stimulate opportunities of exchange of scientific and technical subjects related to nuclear corrosion, particularly on today's main nuclear research areas (waste systems, water reactors, generation IV and fusion reactors).
- To promote corrosion science and technical developments through events such as seminars, workshops, publications, etc.

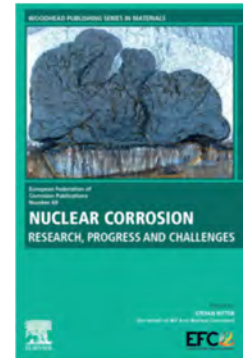
4) EFC WP4 internal matters (cont'd)

- WP4 awards:

- Adjustment of the prize rules?
 - → [Oral](#): no change?
 - → [Poster](#): no change?
 - → [Coriou](#): no change?
- Jury for the 2021 Coriou Award: Chair, Vice-Chair, Christina Lilja, Damien Féron, Ulla Ehrnstén
- Jury for the 2021 oral prize: Chair, Vice-Chair, Ingrid Proriot Serre, Bernard Normand, (Kai Chen)
- Jury for the 2021 poster prize: Vice-Chair, Eriko Irisawa, Milan Kouril, Young EFC (Andressa Trentin)
- Jury for the **2022 Coriou Award**: Chair, Vice-Chair, 2021 winner (Grace Burke), Christina Lilja, ??? (update: Raul Rebak)
- **Please nominate candidates (persons or groups) for the 2022 Henri Coriou Award until February 28, 2022!** (Should we give two prizes, one normal, one ICG-EAC ‘special’ prize?)

5) EFC WP4 publications

- Books & special issues published or under publication:
 - Special issue on LTC 2019 in Materials & Corrosion: Volume 72, Issue 1-2, January 2021, <https://onlinelibrary.wiley.com/toc/15214176/2021/72/1-2>
 - EFC Green Book No. 69 based on the 50 years WP4 anniversary WS has been published: Woodhead Publishing, August 2020, 497 pages, ISBN: 978-0-12-823719-9
- Future publications:
 - Special issue from LTC 2022?
 - Special issue on EAC initiation (joint session)?
 - *Any other suggestions, ideas?*
 - Special issue “EUROCORR” in KOM – Corrosion and Materials Protection Journal (*not officially co-organized by WP4*) (<https://www.sciendo.com/journal/KOM>)



Call for papers

You are welcome to submit a full paper to the KOM journal!

**KOM – Corrosion and Materials
Protection Journal**



ASSOCIATION
OF CZECH AND SLOVAK
CORROSION ENGINEERS

- EUROCORR 2021 Special Issue
- Papers of oral and poster presentations
- Open Access (*publication fee covered by AKI*)
- **Deadline: 31.12.2021**
- *Follow the standard submission procedure on website*
- <https://www.sciendo.com/journal/KOM>

Scopus
indexed

6) EFC WP4 past events

- **Nuclear Corrosion Web-Seminar**, April 23, 2021: Journey to the heart of the corrosion processes involved in a spent nuclear fuel recycling plant by Benoit Gwinner (CEA), good attendance (approx. 50 registered attendees)

The poster is for an online seminar titled "Journey to the heart of the corrosion processes involved in a spent nuclear fuel recycling plant" by Benoit Gwinner. It is part of the EFC WP4 Nuclear Corrosion series. The seminar is held on Friday, April 23, 2021, from 9:00 to 10:15 CEST (16:00 to 17:15 JST). It is online via Zoom, free of charge, and registration is required to receive the link. The abstract discusses the durability and safe operation of the spent nuclear fuel recycling plant in La Hague, focusing on the assessment of corrosion of structural materials (mainly stainless steel and zirconium) in contact with oxidizing dissolution medium (hot and concentrated nitric acid with impurities). The goal is achieved by a continuous and precise control of the evolution of the wall thickness of the plant equipment and by a detailed investigation of the corrosion processes involved. The aim of this talk is to give an insight on both, cathodic and anodic processes occurring in such systems, including oxide film characterization and modelling results. A diagram at the bottom shows the process flow from spent nuclear fuel to the recycling plant, highlighting the corrosion challenges.

On the occasion of the CORROSION AWARENESS DAY 2021 the EFC Working Party 4 will hold its 2nd online seminar on Nuclear Corrosion:

Journey to the heart of the corrosion processes involved in a spent nuclear fuel recycling plant

Benoit Gwinner
Université Paris-Saclay, CEA, Service de la Corrosion et du Comportement des Matériaux dans leur Environnement, Gif-sur-Yvette, France

Friday, April 23, 2021, 9:00 to 10:15 CEST (16:00 to 17:15 JST)

Online via Zoom, please register (free of charge) to receive the link to the virtual meeting room: www.efcweb.org

Abstract

The durability and safe operation of the spent nuclear fuel recycling plant in La Hague are major industrial challenges. Among other criteria, a key point is the assessment of corrosion of the structural materials (mainly stainless steel and zirconium) in contact with the oxidizing dissolution medium (hot and concentrated nitric acid with impurities). This goal is achieved both by a continuous and precise control of the evolution of the wall thickness of the plant equipment and by a detailed investigation of the corrosion processes involved. The aim of this talk is to give an insight on both, cathodic and anodic processes occurring in such systems, including oxide film characterization and modelling results.

For more activities of the WP 4, please visit www.efcweb.org/wp4.html !

7) EFC WP 4 future events (other than EUROCORRs)

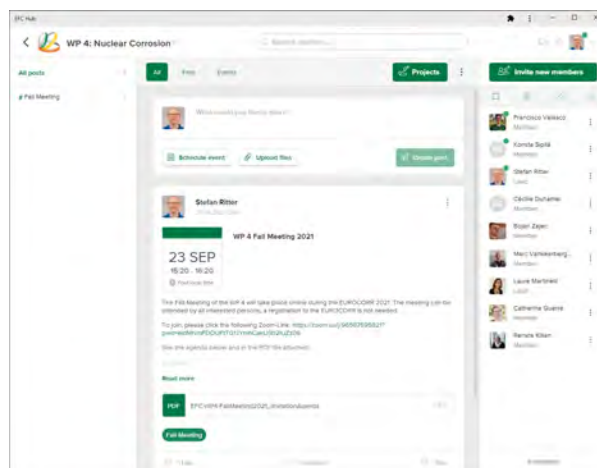
- How about another nuclear corrosion web-seminar (e.g., around the Corrosion Awareness Day 2022, April 24)?
- WS on Long-Term Prediction of Corrosion Damage in Nuclear Waste Systems – [LTC 2022](#), in Switzerland
- Nuclear Corrosion Summer School – NuCoSS-23, in July 2023 (*to be confirmed*), possibly in co-operation with POEAM EU-project (*if accepted*)
- Other events?

8) EUROCORRs

- EUROCORR 2021 ('virtual')
 - Nuclear Corrosion session: 25 oral presentations + 3 posters + 5 nucl. JS orals = 33 pres. (originally: 32 orals + 5 posters + 5 nucl. JS orals = 42 pres.)
 - Sessions were running ok (except Wed. morning) and were well attended (26 – 34 persons)
 - Total number of registered EUROCORR attendees: 613
- EUROCORR 2022, Aug. 28 – Sep. 1, 2022, Berlin, Germany
 - Regular nuclear corrosion session
 - Repetition of 'EAC initiation' joint session (with WP 5 & 22)?
 - 'Corrosion issues during decommissioning' ??? (suggestion by T. Yonezawa)
- EUROCORR 2023, Aug. 27 – 31, 2023, Brussels, Belgium
 - Regular nuclear corrosion session + ?
- EUROCORR 2024, Sep. 1 – 5, 2024, Paris, France
 - Regular nuclear corrosion session + ?

9) Introduction of the new EFC Hub

- A new web tool for facilitating communication and co-operation among the (European) corrosion community.
- <https://efc.solved.fi>
- [Registration guide](#)
(available on the EFC website)
- Works via browser or app
(also on Android or iOS)



10) Discussion about possible activities

- We may apply for a small financial support (up to approx. 2000.- €) from the EFC for WP4 activities!
 - Suggestion: Student grant for attendance to LTC 2022 (covering the registration fee)?
 - Suggestion for 2023: 2 student grants for attendance to NuCoSS-23?
- Other suggestions for any WP4 activities (with or without financial support)?

11) Any other business

- WP4 website → www.efcweb.org/WP4
- EFC Hub → www.efc.solved.fi
- Related EU-projects:
 - MEACTOS (www.meactos.eu)
 - INCEFA-SCALE (www.incefascade.unican.es)
 - POEAM (*proposal!*)
- Next WP4 meeting:
 - Fall Meeting during EUROCORR 2022 in Berlin
- Anything else?



12) Closure

Thank you for attending and for your support!

**Any ideas, suggestions or contributions are
very welcome! Please contact
Stefan (stefan.ritter@psi.ch) or
Laure (laure.martinelli@cea.fr).**

Hope to see you in Berlin next year!

APPENDIX 2



EFC Event No. 480

LTC2022

- LTC is the main event of the radwaste corrosion community. Takes place every 3 years.
- Nagra is the Swiss National Cooperative for the Disposal of Radioactive Waste.
- Conference: **22-24 June 2022 in Baden, Switzerland**
- Technical visit to the Grimsel Test Site (underground lab): 21 June 2022
- Abstract submission deadline: **end of January 2022**
- Some subjects of interest:
 - Corrosion mechanisms in deep geological repositories
 - Design, materials and fabrication of disposal containers
 - Performance assessment of containers and engineered barriers
 - Development of models valid over millennia
 - Specification of corrosion evolutionary paths
 - Geochemical factors
 - Archaeological and natural analogues

More info:
www.ltc2022.ch