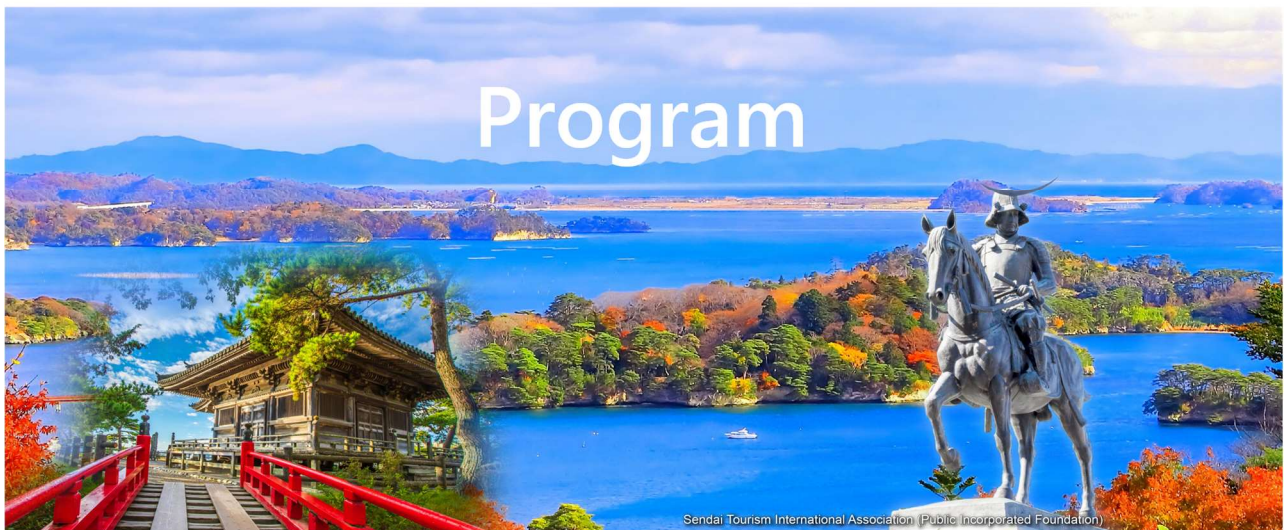




9th International Workshop on Long Term Prediction of Corrosion in Nuclear Waste Systems

November 3-7, 2025

Katahira Sakura Hall, Tohoku University, Sendai, Japan



Organized by: **JSCE** 公益社団法人 日本社会 腐食防食学会

in cooperation with:  東北大学  NUMO 原子力発電環境整備機構

supported by:  EFC  WP4  SenTIA

Overall program

November 3 Registration	November 4 Day 1	November 5 Day 2	November 6 Day 3	November 7 Site Tour
	8:00-8:40 Registration	8:30-9:00 Registration	8:30-9:00 Registration	"Site Tour"
	8:30-9:00 Opening session	9:00-9:05 Opening remarks	9:00-9:05 Opening remarks	
	9:00-10:20 Session 1 National programs (1)	9:05-10:45 Session 5 National programs (2)	9:05-10:20 Session 9 National programs (3)	
	10:20-10:45 Coffee break	10:45-11:10 Coffee break	10:20-10:45 Coffee break	
	10:45-12:00 Session 2 Long-term corrosion (1)	11:10-12:50 Session 6 Microbially influenced corrosion	10:45-12:25 Session 10 In-situ tests	
	12:00-13:00 Lunch	12:50-13:50 Lunch	12:25-13:25 Lunch	
15:00-17:00 LTC-ISC plenary meeting (Members only)	13:00-14:40 Session 3 Stress corrosion cracking	13:50-15:30 Session 7 Radiolysis, Modeling and prediction (1)	13:25-15:05 Session 11 Corrosion sensors, Hydrogen embrittlement	
	14:40-15:05 Coffee break	15:30-15:55 Coffee break	15:05-15:30 Coffee break	
17:00-19:00 Registration	15:05-17:10 Session 4 Corrosion in transition environments	15:55-17:10 Session 8 Modeling and prediction (2), Natural analogues	15:30-16:45 Session 12 Long-term corrosion (2)	
17:30-19:30 ICE BREAKER	17:30-19:30 Poster session	19:00-21:00 Banquet	17:00-18:00 Closing session	

Scientific program: Day 1, November 4

No.	Time	Title	Authors
	08:00-08:30	Registration	
	08:30-08:40	Welcome address	Y. Watanabe
	08:40-08:50	Opening remarks	N. Diomidis
	9:00-10:20	Session 1: National programs (1)	Chair: C. Lilja Cochair: Y. Ogawa
11	09:00-09:30	Current Status of the HLW Disposal in Japan and Supporting Research and Development	M. Yamaguchi
12	09:30-09:55	Design and performance assessment of HLW disposal canisters for the General License Application	N. Diomidis , Y. J. Janin, M. Roy, R. Lunn, S. Holdsworth, F. King
13	09:55-10:20	Cigéo project : Overview of the French high - level long - lived radioactive waste disposal concept and corrosion research	V. Maillot , D. Crusset, G. Charrier
	10:20-10:45	Coffee break	
	10:45-12:00	Session 2: Long-term corrosion (1)	Chair: P. Keech Cochair: M. Yamamoto
21	10:45-11:10	Long-term corrosion of carbon-steel casing used in deep geological radioactive waste repository	M. S. Ahmed, A. Vernouillet, D. Neff , X. Bourbon, V. Maillot, D. Crusset, G. Charrier, P. Dillmann
22 ★	11:10-11:35	Characterization of Copper Corrosion after the Exposure to Gaseous Hydrogen Sulfide under Anoxic Conditions	B.D.C. Hackett , K. Daub, J. D. Giallonardo, M. Behazin, N. A Senior, S. Y. Persaud
23 ★	11:35-12:00	Long-term Oxidation Behavior of Borated Stainless Steel(Neutron Absorber Material) in Spent Fuel Pool Environment	D. Park , Y. Lee, J. H. Kim
	12:00-13:00	Lunch	
	13:00-14:40	Session 3: Stress corrosion cracking	Chair: V. Maillot Cochair: H. Abe
31	13:00-13:25	Mechanism of concrete structure failure induced by the corrosion acceleration test of embedded steel by the anodic polarization	K. Azumi , M. Sakairi, K. Fujiwara, M. Hironaga, Y. Yamamoto
32	13:25-13:50	Unveiling stress corrosion cracking (SCC) thresholds and mechanisms for OFE+P and HCP copper in ammonia and nitrate-containing groundwater	A. Trentin , J. Pakarinen, K. Sipilä, E. Fagnon
33	13:50-14:15	Origin of the oxide layer found at the copper-sulphide film interface after exposure to sulphide containing water	K. Arstila, E. Bergendal , A. Chonche, Q. Zaiqing, T. Ikäläinen, C. Lilja, T. Saario
34 ★	14:15-14:40	Influence of Oxidant Concentrations on the Stress Corrosion Cracking of Copper Under Anticipated Deep Geological Repository Conditions	Y. Emun , M. Edwards, K. Daub, J. D. Giallonardo, M. Behazin, S. Persaud
	14:40-15:05	Coffee break	
	15:05-17:10	Session 4: Corrosion in transition environments	Chair: K. Gao Cochair: N. Taniguchi
41	15:05-15:30	Sacrificial protection for the copper coated geological disposal canister with an aluminum overcoating: a feasibility study	H. Inoue , K. Ota
42	15:30-15:55	Impact of initial oxide layers on pitting of carbon steel in alkaline environments	L. S. Santos , N. C. Gascon, A. Hubin, T. Hauffman, R. Gaggiano
43	15:55-16:20	Effect of humidity on stress corrosion cracking of copper in humid bentonite simulating transient geologic disposal environment	S. Miyabe , S. Yoshijima, H. Tsuchiya, S. Fujimoto
44 ★	16:20-16:45	Early anaerobic corrosion of potential canister material in compacted bentonite	L. Panjiyar , N. Finck, C. Stephan-Scherb
45 ★	16:45-17:10	Conversion of copper oxide to copper sulfide under DGR-like conditions	E.S. Alaei , M. Guo, J. Chen, E. Bergendal, C. Lilja, M. Behazin, D. W. Shoesmith, J. J. Noel
	17:30-19:30	Poster session	Chair: P. Keech Cochair: S. Suzuki

The name in “Bold” is a presenter, ★Nominee of Young Researcher Award

Scientific program: Day 2, November 5

No.	Time	Title	Authors
	08:30-09:00	Registration	
	09:00-09:05	Opening remarks of Day 2	N. Taniguchi
	09:05-10:45	Session 5: National programs (2)	Chair: N. Diomidis Cochair: S. Nagata
51	09:05-09:30	An Update on the Status of Posiva's Operating Licence Application and of Activities at the Deep Geological Disposal Site in Olkiluoto, Finland	T. Prihti , T. Salonen, T. Glas, M. Niskanen, L. Koskinen, T. Sojakka, F. King, B. Pastina
52	09:30-09:55	Overview of the UK HLW Canister Development and Corrosion Programme	B. Reddy, J. Hesketh
53	09:55-10:20	Integrated Corrosion Assessment for Copper Canisters in a Crystalline Rock Island	C. Hung , F. King
54	10:20-10:45	Overview of the Belgian corrosion programme in the framework of the supercontainer design for the final disposal of vitrified high-level radioactive waste and spent fuel	R. Gaggiano
	10:45-11:10	Coffee break	
	11:10-12:50	Session 6: Microbially influenced corrosion	Chair: M. Behazin Cochair: Y. Miyano
61	11:10-11:35	Microbial Assessment of Carbon Steel and Copper Corrosion in Bentonite at Elevated Temperatures	S. Wakai , M. Ogawa, M. Tsukatani, J. Watanabe, H. Masukawa, H. Kashima, M. Yamamoto
62	11:35-12:00	The Influence of Bentonite Compaction Density on Copper Corrosion in a Deep Marine Environment	J. McDonald, C. S. Tully, M. Behazin, D. Zagidulin, W. J. Binns, J. D. Giallardo, P. G. Keech, J. J. Noel
63	12:00-12:25	Potential influence of microorganisms on the corrosion of the carbon steel in the French high level long-lived radioactive waste disposal context	E. Diler , V. Leblanc, H. Gueune, V. Maillot, Y. Linard, G. Charrier, D. Crusset
64 ★	12:25-12:50	Multimodal Spectroscopic and Microscopic Analyses of Biofilm–Metal Interactions on Stainless Steel in Simulated Repository Groundwater	Q. T. Nguyen , T. Ohligschläger, V. Ratia-Hanby
	12:50-13:50	Lunch	
	13:50-15:30	Session 7: Radiolysis, Modeling and prediction (1)	Chair: C. Lilja Cochair: H. Inoue
71 ★	13:50-14:15	Effect of Gamma Irradiation on the Corrosion of Carbon Steel and Copper Canister Materials for the Geological Disposal of HLW and SNF	C. J. Bevas , J. Hesketh, B. Pateman, O. Nalbant, B. Reddy, M. Behazin, P. G. Keech, N. Diomidis, F. King, C. Padovani
72	14:15-14:40	Effects of Radiation on Corrosive Environments for Overpack in Geological Disposal of Radioactive Waste	T. Sato , K. Hata, K. Otani, T. Igarashi, Y. Ogawa
73	14:40-15:05	Development of Radiation-induced Corrosion Model of Copper Used Fuel Containers Under Repository Conditions	M. Behazin , S. Briggs, F. King
74	14:40-15:30	Probabilistic Canister Breaching Model (PCBM) for Carbon Steel Canisters	F. King , G. Schneider, R. Lunn, N. Diomidis
	15:30-15:55	Coffee break	
	15:55-17:10	Session 8: Modeling and prediction (2), Natural analogues	Chair: J. Hesketh Cochair: S. Mitsui
81 ★	15:55-16:20	Numerical Model for Localized Corrosion of Copper Canister: HADESNU with Phase Field Model	P. Ju , K. Chae, N. Chae, S. Park, R. I. Foster, S. Choi
82	16:20-16:45	Development of carbon steel corrosion correlation model using Artificial Intelligence technology	D. Fujiwara
83	16:45-17:10	Effects of Burial Environments on the Long-Term Corrosion of Carbon Steel: Insights from Archaeological Analogues	A. Yanagida , S. Wakiya, K. Wada, Y. Ura
	19:00-21:00	Banquet	

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Scientific program: Day 3, November 6

No.	Time	Title	Authors
	08:30-09:00	Registration	
	09:00-09:05	Opening remarks of Day 3	N. Taniguchi
	9:05-10:20	Session 9: National programs (3)	Chair: V. Maillot Cochair: T. Igarashi
91	09:05-09:30	Czech national DGR programme and canister corrosion challenges	J. Stouilil , L. Baborová, J. Šembera, M. Hokr, M. Hasal, J. Novák, E. Bedrníková, R. Bureš, K. Černá, V. Hlaváčková, S. Mukhtar, D. Dobrev, D. Trpkošová
92	09:05-09:55	An Overview of the Canadian Nuclear Waste Corrosion Program	P. G. Keech , M. Behazin, J. Giallonardo, S. Briggs
93	09:55-10:20	An overview of collaborative disposal canister material R&D in Europe	N. Diomidis , A. Debelle
	10:20-10:45	Coffee break	
	10:45-12:25	Session 10: In-situ tests	Chair: R. Gaggiano Cochair: K. Fujiwara
101 ★	10:45-11:10	The Impact of Trapped Oxygen on Corrosion of Steel and Microbial Landscape in Bentonite Clay Environment	P. V. Kulkarni , N. Jakus, D. Grolimund, S. Mischler, R. Bernier-Latmani, N. Diomidis
102	11:10-11:35	In-situ testing the corrosion performance of candidate HLW/SF canister materials in contact with bentonite in a crystalline rock environment	A. J. Martin , N. Diomidis, M. Behazin, P. G. Keech, B. Reddy, S. Suzuki, S. Nagata, Y. Ogawa, N. Finck, T. Philipp
103	11:35-12:00	Experiences from 25 years of in-situ corrosion experiments in the Äspö Hard Rock Laboratory	C. Lilja , M. Karlsson, E. Bergendal, J. Johansson
104	12:00-12:25	URL Construction and Corrosion online monitoring system in China	K. Gao , S. Xing, H. Cui
	12:25-13:25	Lunch	
	13:25-15:05	Session 11: Corrosion sensors, Hydrogen embrittlement	Chair: P. Keech Cochair: M. Yamamoto
111	13:25-13:50	Development of Advanced Corrosion Sensors for High-Level Waste Disposal Cells in Geological Repositories	J. Bertrand , J. Becker, E. Diler, M. Robineau, P. Refai, M. Jeannin, S. Betelu, I. Ignatadis, M. Valay, G. Charrier, V. Maillot, D. Crusset, Y. C. Sano Moyeme
112	13:50-14:15	Corrosion behavior monitoring of carbon steel in bentonite by using direct current potential drop method	H. Abe , H. Kakizaki, K. Yara, Y. Watanabe
113	14:15-14:40	The Use of Low-Cost Commercial Hydrogen Sensors for Research	N. A. Senior , T. Martino, N. Diomidis, J. Giallonardo, P. G. Keech, R. Gaggiano, C. Lilja
114	14:40-15:05	Corrosion Behavior of Cu-coated Carbon Steel Nuclear Waste Container	N. Liu , X. Liu, J. Chen, J. Noël, D. Shoesmith, B. Hou
	15:05-15:30	Coffee break	
	15:30-16:45	Session 12 Long-term corrosion (2)	Chair: J. Hesketh Cochair: K. Azumi
121	15:30-15:55	The initiation, progression, and stifling of micro-galvanic corrosion of copper in anoxic aqueous bisulfide solutions	J. Chen , E. Bergendal, C. Lilja, M. Behazin, P. G. Keech, D. W. Shoesmith, J. J. Noel
122	15:55-16:20	Effect of cement composition used between the tunnel and the host rock on the corrosion of a X65 casing steel in the French radioactive waste deep geological disposal facility (CIGEO)	N. Bulidon , C. Mendibide, V. Maillot, G. Charrier, D. Crusset
123	16:20-16:45	Study of the corrosion regime of a low-alloy steel in contact with a cementitious material	C. Poulain , B. Vuillemin, D. Neff, V. Maillot, D. Crusset, G. Charrier, P. Combrade
	17:00-18:00	Closing session	Chair: N. Diomidis Cochair: Y. Watanabe

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Poster session (1/2)

No.	Title	Authors
9901	Long-term Aerobic Corrosion Experiment on SiC-Dispersed HCCU Cold-Spray Coating Copper	M.S. Lee , J.S. Kim, N.K. Chae
9902	Electrochemical Corrosion Behavior of Copper Alloys in Aerobic and Anaerobic Korean Groundwater Conditions for DGR	S. Kim , G. Kim, G. Park, J. M. Kim, S.-W. Song
9903 ★	The Corrosion Behaviour of Copper Exposed to Simulated and Natural Groundwater Solutions Under Anoxic Conditions	K. V. Albrechtas , D. Zagidulin, J. Henderson, M. Behazin, J. J. Noel
9904	Long-Term Sulfide Corrosion Assessment of Copper Canisters Using Hydrogeological Data from Taiwan's Crystalline Rock Reference Case	C. Hung , F. King
9905	Corrosion behavior of magnesium alloys in alkaline solutions simulating a low-level radioactive waste repository	K. Fujiwara , M. Hironaga, H. Tsubokura, N. Sato, R. Moriichi, M. Habano
9906	Initial corrosion behavior of irons in compressed bentonite	H. Katayama , Y. Sakaeda, K. Tanabe, H. Watanabe, I. Shitanda, M. Itagaki
9907	Changes in corrosion behavior of carbon steel in bentonite due to reduced oxygen concentration	R. Nakasuga , M. Uyama, H. Saito
9908 ★	Corrosion of potential canister materials in different bentonite media at elevated temperatures: A comparative analysis	L. Panjiyar , C. Stephan-Scherb
9909	Mechanistic aspects of transitional middle-term corrosion of graphite cast iron in fully hydrated Wyoming bentonite: electrochemical and surface chemistry studies	A. G. Muñoz , D. Schild
9910 ★	Electrochemical behavior of carbon steel in unsaturated compacted Kunigel V1 bentonite	S. Nagata , H. Abe
9911 ★	The effect of chloride transience on the corrosion of iron covered with siderite scale	M. N. S. Lumongsod-Thompson , A. N. I. Muñoz, S. Mischler
9912	Corrosion characteristics of candidate canister materials at elevated temperatures	C. Stephan-Scherb , L. Panjiyar
9913 ★	Evaluation of physical properties of bentonite by electrochemical impedance spectroscopy	H. Niimi , Y. Hoshi
9914 ★	Measurement of the Corrosion Rate of Copper in Unsaturated Compacted Bentonite with the Electrochemical Noise Technique	T. Sakamoto , H. Inoue
9915 ★	Quantitative Characterization of Steel Corrosion Products and Bentonite Alteration in a 21-Year Experiment	T. Ishiwata , R. Kikuchi, R. Kawakita, S. Anraku, S. Mitsui
9916	From archaeological systems to deep storage multibarriers, how to understand on-site complex corrosion processes?	D. Neff , M. S. Ahmed, A. Vernouillet, C. Poulain, X. Bourbon, V. Maillot, D. Crusset, G. Charrier, P. Dillmann
9917	Potentiometric study of chloride diffusion in a cementitious grout	C. Poulain , B. Vuillemin, D. Neff, V. Maillot, D. Crusset, G. Charrier, P. Combrade
9918	Corrosion rate and stress corrosion cracking susceptibility of copper in the presence of sulfides	S. Watari , A. Kitayama, S. Mitsui, N. Taniguchi, W. Kimura, H. Kajiya, H. Suzuki
9919 ★	Study of Accelerated Corrosion Experiments in a Spent Fuel Pool Environment to Evaluate the Long-Term Integrity of Al Alloy-Based Neutron Absorbers from Casting Processes	D. Park , J.H. Kim

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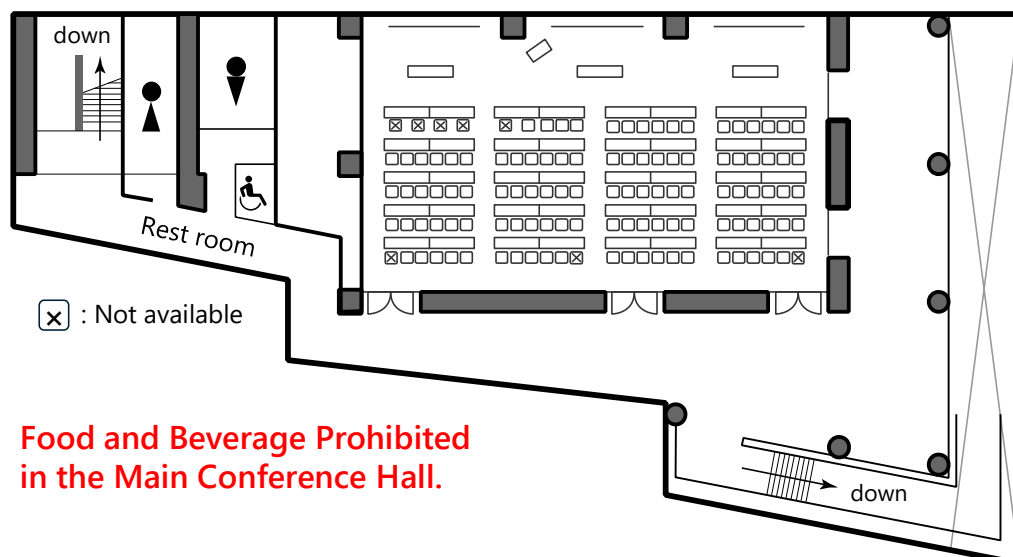
Poster session (2/2)

No.	Title	Authors
9920 ★	Growth Behavior of Mechanically-Induced Pits on Copper in Chloride Environments Relevant to Deep Geological Repository (DGR)	K. Chae , P. Ju, S. Choi
9921	Development of an Electrochemical Methodology for Corrosion Monitoring of Carbon Steel Coated with Cement–Bentonite Grout in the Cigeo Deep Geological Disposal Project	Y.C. Sano Moyeme , S. Betelu, J. Bertrand, I. Ignatiadis
9922	Round Robin Evaluation of an Immersion Test Method for Carbon Steel in Compacted Clay Materials: Comparison of Corrosion Products	R. Saito , S. Nagata, S. Suzuki, T. Sakamoto, M. Okihara
9923 ★	Long-term microbially influenced corrosion behaviour of irradiated reactor pressure vessel steels in artificial and natural repository groundwaters	A. Bordbar-Khiabani , P. Rajala, L. Carpén, E. Isotahdon, S. Salo, J. Lydman, T. Lavonen, M. Nuppenen-Puputti, V. Ratia-Hanby
9924 ★	The Long-Term Corrosion Behaviours of Metals in Simulated Cementitious Environments	T. Martino , N. A. Senior, N. Diomidis, J. Giallonardo, P.G. Keech, R. Gaggiano
9925	Simultaneous 4D Imaging of Metal Surfaces and Microbial Biofilms for Corrosion Risk Assessment in Buffer Material Environments	N. Obana, Y. Manabe , Y. Miyano, N. Nomura
9926	U-bend stress corrosion cracking test of copper specimens in KURT using 3-D printed corrosion cells	N. Chae , M. Lee, J. Kim
9927 ★	Susceptibility to near-neutral pH stress corrosion cracking of carbon steel in a simulated geological disposal environment	T. Takita , H. Abe, Y. Watanabe, Y. Ishijima, Y. Ogawa
9928 ★	Fundamental study on the application of Al-5%Mg alloy to the overcoating material for the sacrificial protection of the copper-coated overpacks in high-chloride groundwater environments	K. Nose , H. Inoue
9929	Sulfide Transport Through MX-80 Bentonite Under Various Geochemical Conditions	M. M. Krol , F. Chowdhury, S. Papry, M. A. Asad, P. Mondal, T. Rashwan, I. Molnar, M. Behazin, P.G. Keech
9930	Simulation of Corrosion Behavior of Micro Pits: In Crevices vs. on Exposed Surfaces	A. Nagaoka , K. Amaya
9931 ★	Corrosion aspects of repository design optimisation	S. Nagata , T. Ichimura, S. Suzuki, H. Umeki, I. McKinley
9932	Development and Validation of a Mixed-potential Model for the Corrosion of Copper Used Fuel Containers in Chloride Environments	F. King , S. Briggs, M. Behazin
9933	Enhancing the Accountability of Longevity Assessments for HLW Overpacks and TRU Waste Containers under Geological Disposal Conditions in Japan	S. Suzuki , Y. Ogawa, S. Nagata, A. Nishikata
9934 ★	Design of Corrosion Allowance of Overpack for the Advanced Prefabricated Engineered Barrier System Module (PEM)	Y. Ogawa , S. Suzuki

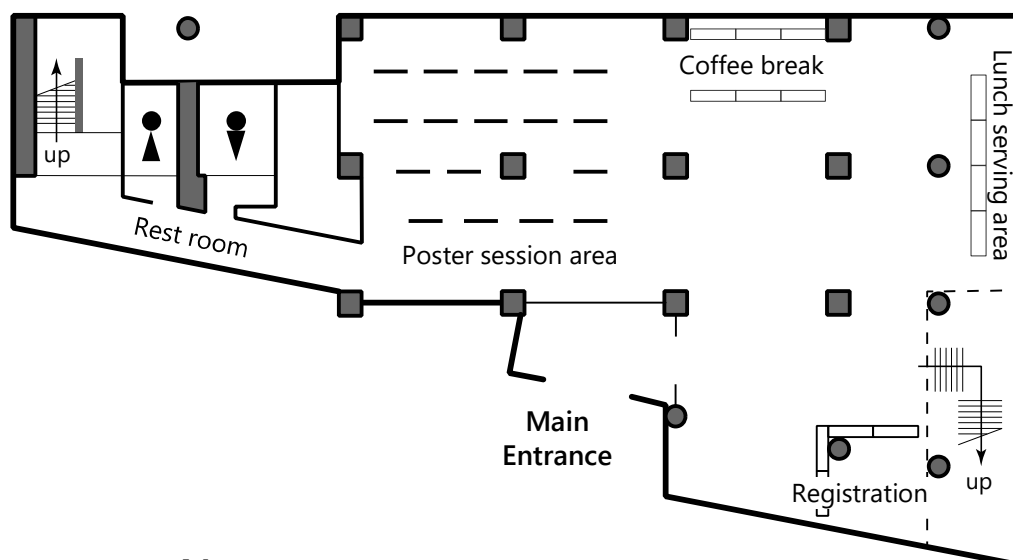
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Floor Guide Katahira-Sakura Hall

2F: Main Conference Hall



1F: Registration, Poster session, Coffee break, Lunch



Important Notes

- **Smoking is Strictly Prohibited on the Katahira Campus.**
Please Refrain from Smoking on the Streets Near the University.
- Tohoku University Promotes "**Plastic Smart**" Initiatives.
Disposal of Waste on Campus Is Not Permitted.
Please Take Your Trash With You.

Site tour schedule

Itinerary Group 1

Sendai station East Exit (meeting at 7:35, departure at 7:45)



(A short break at Minami-Soma Kashima S.A)

TEPCO Decommission Archive Center (arrival at 9:45)

9:45-10:45

Facility tour (with attendant Including theatre screening)

Fukushima Daiichi Nuclear Power Station (arrival at 11:10)

11:10-11:50

Identity verification, Overview & Entry procedures explanation

11:50-13:55

Site inspection (including access procedures)

13:55-14:05

Q&A session, Completing a survey



TEPCO Decommission Archive Center (arrival at 14:30)

Hotel Tomioka (arrival at 14:35)

14:35-15:35

Lunch (buffet-style)



Sendai Station (arrival at 17:40*)

Itinerary Group 2

Sendai station East Exit (meeting at 8:50, departure at 9:00)



(A short break at Minami-Soma Kashima S.A)

TEPCO Decommission Archive Center (arrival at 11:00)

11:00-12:15

Lunch (lunch-box style)

12:15-13:15

Facility tour (with attendant Including theatre screening)

13:15-13:55

Identity verification, Overview & Entry procedures explanation

Fukushima Daiichi Nuclear Power Station (arrival at 14:15)

14:15-16:10

Site inspection (including access procedures)



TEPCO Decommission Archive Center (arrival at 16:30)

16:30-16:40

Q&A session, Completing a survey



Sendai Station (arrival at 18:40*)

* NOTICE: The return time may vary due to road congestion or other factors.



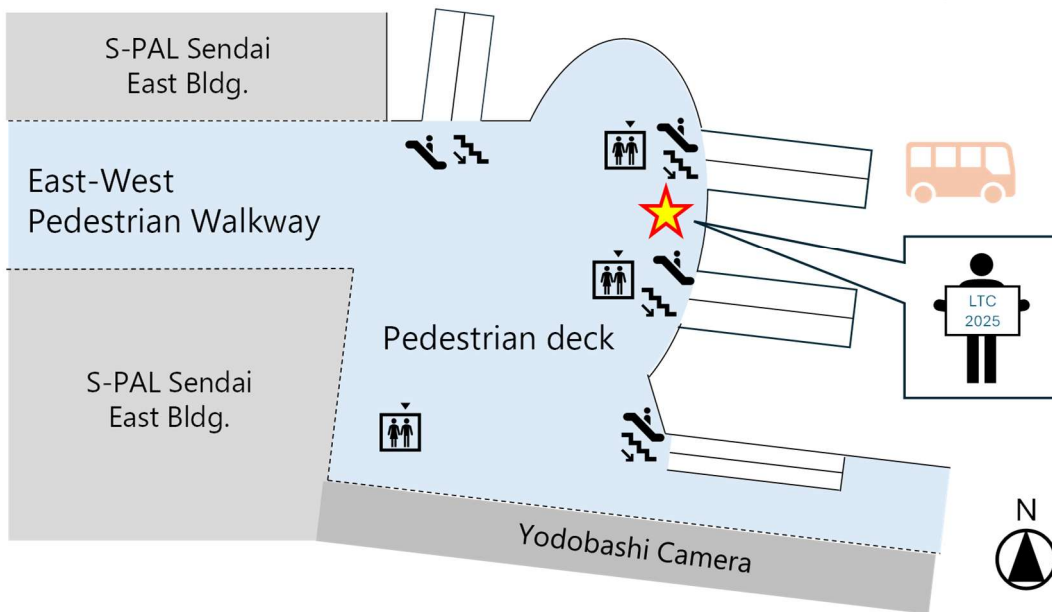
Facility Brochure Download
TEPCO Decommission Archive Center

Meeting Point & Departure Time

- Sendai Station, East Exit
- Gr. 1: **meeting at 7:35**, **departure at 7:45**
- Gr. 2: **meeting at 8:50**, **departure at 9:00**



Google map



Remarks

- **Late Arrivals May Not Be Able to Join the Site Tour.**
- **Participation in Other Groups' Tours Is Not Permitted.**
- **Identification Submitted at Application Required to Board the Bus.**
- **This tour ends only at Sendai Station.**
- After leaving Sendai Station, we will stop at a Minamisoma-Kashima service area for a short break.
- Large luggage such as suitcases can be loaded into the bus trunk. Please make sure to keep your valuables with you.

