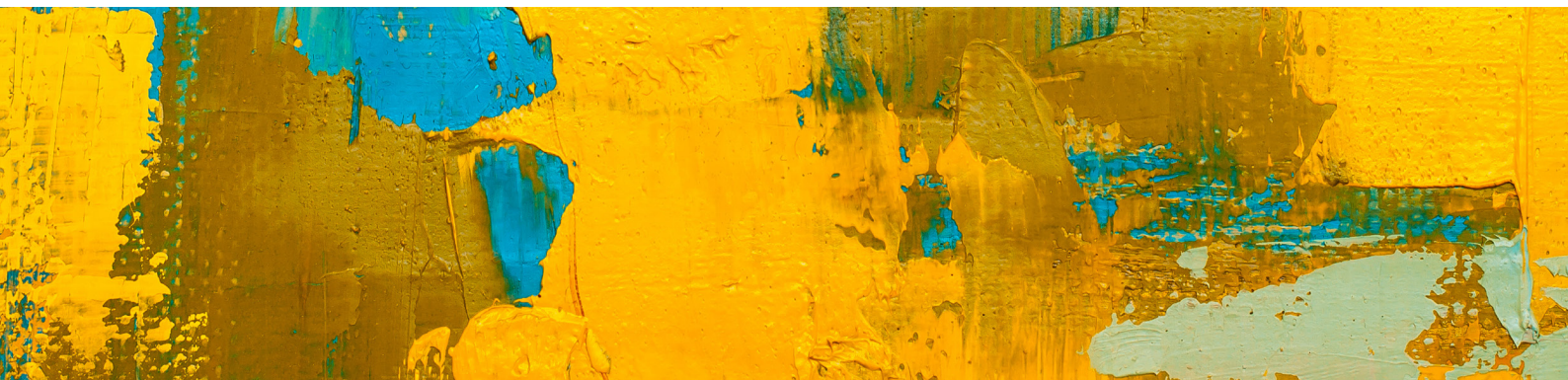
FONTEVRAUD 10

International Symposium on Contribution of Materials Investigations and Operating Experience to LWRs' Safety, Performance and Reliability

19 - 21 SEPT 2022 | Avignon, France

PROGRAM

Last update on September 20



MONDAY 19

8:30 ⏰ **Congress Center Opening**

9:30 **Welcome & Opening**
Keynote Speeches

11:00 **Technical Session**
T01.1

12:30 🍴 **Welcome cocktail**

2:00 **Technical sessions in //**
T03.1 | T02.1

4:00 ☕ **Break**

4:30 **Technical sessions in //**
T04.1 | T02.2

6:00 **End of day 1**

TUESDAY 20

8:00 ⏰ **Congress Center Opening**

8:30 **Technical sessions in //**
T01.2 | T05.1

10:15 ☕ **Break**

10:45 **Technical sessions in //**
T01.3 | T05.2 + T06.1

12:30 🍴 **Lunchtime cocktail**

2:00 **Panel discussion**

2:45 〰 **Transition**

3:00 **Technical sessions in //**
T02.3 | TB.1

4:00 ☕ **Break**

4:30 **Technical sessions in //**
T03.2 | TB.2 + TB.3 + TB.4

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7:00 🎆 **Conference reception**

WEDNESDAY 21

9:00 ⏰ **Congress Center Opening**

9:30 **Technical sessions in //**
T04.2 | T02.4

10:30 ☕ **Break**

11:00 **Technical sessions in //**
TA + T06.2 | T02.5

1:00 🍴 **Lunchtime cocktail**

2:00 **Technical sessions in //**
T03.3 | T01.4

3:20 〰 **Transition**

3:30 **Technical sessions in //**
T08 | T01.5

5:10 ⌛ **End of the Conference**

	19	20	21	P
PRESSURE VESSEL COMPONENTS	x	x	x	x
PRESSURE VESSEL INTERNALS	x	x	x	x
STAINLESS STEEL & NICKEL-BASED ALLOYS AREAS	x	x	x	
PIPING, PUMPS, VALVES	x		x	
STEAM GENERATOR		x		
STEAM WATER SYSTEMS		x	x	
TURBINE, ALTERNATOR				

	19	20	21	P
FUEL, CONTROL ROD ASSEMBLY			x	
CIVIL ENGINEERING				x
NON-METALLIC MATERIALS AND COATINGS			x	x
FAC FLOW ACCELERATED CORROSION		x		
Plenary	x			
Technical sessions in //	x	x	x	
Posters	x	x	x	

SEPTEMBER, MONDAY 19

8.30 **Registration • Congress Centre Main Entrance**

9.30 Conclave

Welcome & Opening

• Valérie Faudon, Executive Director (Sfen) & Emmanuel Herms, Fontevraud 10 Program Committee Chairman

Keynote Speeches

• Stress Corrosion Cracking: root causes, design changes, repairs
Etienne Dutheil, Director of Nuclear Production (EDF, FRA)

• Susceptibility to SCC of Cold Work Austenitic Stainless Steels in Non-polluted Primary PWR Environment
Thierry Couvant, Research-engineer (EDF R&D - Materials and Mechanics of Components Department, FRA)

11.00 Conclave

T01.1 • PRESSURE VESSEL COMPONENTS - Expertise of decomissionned plants

> Chairs : H.Hein (Framatome Gmbh, DEU), P.Joly (Framatome, FRA)

95 • Characterization of RPV Materials from Decommissioned Zion Nuclear Generation Station Unit 1	M. Sokolov (ORNL, USA)
50 • Microstructural characterization of RPV material harvested from a Japanese PWR plant	T. Oumaya (Institute of Nuclear Safety System, Incorporated, JPN)
57 • Comparison of Weld Microstructure and Brittle Fracture Initiation of Reactor Pressure Vessel Head Weld and Beltline Weld	N. Hytönen (VTT Technical Research Centre of Finland, FIN)
78 • Development of the technique of retrospective dosimetry applied to niobium present in stainless steel specimens irradiated in the osiris	D. Tisseur (CEA Cadarache, FRA)

12.30-2.00 **Welcome cocktail**

2.00 | Conclave | T03.1 • STAINLESS STEEL & NICKEL-BASED ALLOYS AREAS - Stainless steels

> Chairs: T. Couvant (EDF, FRA), T. Yonezawa (Tohoku Univ, JPN)

21 • Effect of surface treatment on environmentally-assisted crack initiation threshold of cold-worked type 316L in LWR environments	M. Zimina (University of Bristol, GBR)
135 • Discoloration and Uncleanliness @ Stainless Steels Surfaces - Tolerable Blemishes or Precursors to Degradation? A Critical View at Common Concepts	A. Roth (Framatome GmbH, DEU)
112 • The Underestimated Role of the Oxygen on RCS Components Failures	F. Cattant (Advanced Nuclear Technology International, FRA)
86 • Development of an analysis method for electrochemical corrosion potential in PWR primary coolant under irradiation	K. Hata (JAEA, JPN)
150 • Model For Stainless Steel Stress Corrosion Crack Growth In Deaerated Water	D. Morton (Naval Nuclear Laboratory, USA)

2.00 | Cellier Benoit XII | T02.1 • PRESSURE VESSEL INTERNALS - Compenent management & wear

> Chairs: P. Efsing (Vattenfall, SWE), J.L. Fayard (CEA, FRA)

45 • An Update for Aging Management of PWR Internals in U.S. Plants	K. Amberge (EPRI, USA)
69 • Design Improvement of Reactor Internals Replacement for Mihama Unit-3	Y. Mogami (Mitsubishi Heavy Industries, JPN)
97 • Hot Cell Testing of Type 304 Stainless Steel Core Barrel Thermal Shield Flexures Removed from U.S. PWRs	K. Amberge (EPRI, USA)
76 • Thermal Sleeves wear: from detection to mitigation	C. Falcand (Framatome, FRA)
104 • Visual and dimensional examinations on worn thermal sleeves and their associated CRDM nozzles coming from French PWR: insights on the wear mechanism	P. Cuvillier (EDF DI, FRA)
41 • Tihange 3 - Guide Tubes Wear investigation and mitigations	F. Somville (Tractebel Engie, BEL)

4.00-4.30 Coffee break

4.30 | Conclave | T04.1 • PIPING, PUMPS, VALVES - Piping

> Chairs: N. Huin (CNL, CAN), C. Pokor (EDF, FRA)

62 • Degradation and replacement strategy for neoprene in SEC piping	A. Bock (EDF, FRA)
36 • OPEX from the Historical Analysis of Graphitic Corrosion of Cast Iron Materials at Canadian Nuclear Laboratories	J. Turnbull (Canadian Nuclear Laboratories, CAN)
48 • Thermal Fatigue Cracking in the Doel 1&2 Upper Plenum Injection Lines	M. de Smet (Tractebel-ENGIE, BEL)
09 • Material Degradation Mitigation & New Degradation Scenarios: Lessons Learned from the Analysis of Operating Experience Data	B. Lydell (SIGMA-PHASE INC., FRA)

4.30 | Cellier Benoit XII | T02.2 • PRESSURE VESSEL INTERNALS - Mechanical analysis

> Chairs: K. Amberge (EPRI, USA), R. Bonzom (EDF, FRA)

52 • Baffle Former Bolt Stress Analysis Method Simulating Stress Redistribution due to Bolt Failure	Y. Mogami (Mitsubishi Heavy Industries, JPN)
93 • Development of constitutive equations for Baffle to Former bolts assessment based on in-reactor stress relaxation in bending of CW 316 stainless steels	G. Zumpicchiat (Université Paris-Saclay, CEA, FRA)
91 • Effect of low dose neutron irradiation on the tensile and fracture properties of 316L stainless steel	R. Chaouadi (SCK CEN, BEL)
71 • A ductile fracture initiation criterion for austenitic stainless steel irradiated in LWR conditions	J. Hure (CEA, FRA)

6.00 End of day 1

SEPTEMBER, TUESDAY 20

8.00 Registration • Congress Center Main Entrance

8.30 | Conclave | T01.2 • PRESSURE VESSEL COMPONENTS - Manufacturing issues

> Chairs: P. Joly (Framatome, FRA), A. Parrot (EDF R&D, FRA)

29 • Comparison of Through-thickness Distribution of Master Curve Fracture Toughness and Charpy Impact Energy of a Reactor Pressure Vessel Steel SQV2A	M. Yamamoto (Central Research Institute of Electric Power Industry, JPN)
73 • Effect of cooling rate after austenitization on the ductile-to-brittle transition of a quenched and tempered nuclear component Pressure Vessel Steel	J.-B. Delattre (Université Paris-Saclay, CEA, FRA)
28 • Numerical approach to predict the sealing performance of TEXEAL® texturized metallic seals	F. Ledrappier (Technetics Group, FRA)
139 • Metallographic characterization by variographic analysis and geostatistical simulation of local segregation microstructure in a heavy thickness forged part in SA508Gr3Cl2 type steel	E. Deneuvilliers (Framatome, FRA), P. Masoudi (Géovariances, FRA)
23 • Causal Investigation of a Crack Detected Below a Thick Weld Build-up on a Forged Low Alloy Steel Shell Barrel	L. Venudo (Westinghouse, ITA)

8.30 | Cellier Benoit XII | T05.1 • STEAM GENERATOR - SG tube bundle

> Chairs: O. De Bouvier (EDF, FRA), C. Guerre (CEA, FRA)

113 • Operational Experience with Siemens/KWU SG Tubing Alloy 800 mod	R. Killian (Framatome GmbH, DEU)
110 • Results and analysis of the Non-Destructive Testing performed on the Sherlock project removed Steam Generator	S. Hollner (EDF DI, FRA)
111 • Recent Findings during Steam Generator Tubing Non-Destrctive Examination	R. Killian (Framatome GmbH, DEU)
109 • Estimating Steam Generator Tube Wear Depths from Foreign Objects	J. Benson (EPRI, USA)
51 • Assessment of the SG materials from decommissioned V1 NPP to LTO support on VVER type units	J. Petzova (VUJE, SVK)

10.15-10.45 Coffee break

10.45 | Conclave

T01.3 • PRESSURE VESSEL COMPONENTS - Monitoring of irradiation effects

> Chairs: R. Chaouadi (SCK-CEN, BEL), P. Todeschini (EDF R&D, FRA)

99 • Use of Unirradiated Yield Strength as a Variable in Embrittlement Trend Forecasting to Better Inform ΔT41J Predictions	M. Erickson (Phoenix Engineering Associates, USA)
54 • Evaluation of General Prediction Capability of Japanese Embrittlement Trend Curve by Bagging Method	M. Kirk (Central Researcy Institute of Electric Power Industry, JPN)
89 • Monitoring irradiation effects on DBTT with Charpy impact in comparison to precracked Charpy specimens	I. Uytdenhouwen (SCK CEN, BEL)
85 • Evaluations of the Impact of Potential Changes in Embrittlement Trend Correlations with FAVOR v16.1	P. Raynaud (U.S. Nuclear Regulatory Commission, USA)
80 • An Embrittlement Trend Curve Useful for Scaling Test Reactor T41J Data to Power Reactor Conditions	M. Kirk (Phoenix Engineering Associates, USA)

10.45 | Cellier Benoit XII

T05.2 • STEAM GENERATOR - Protection from corrosion

> Chairs: O. De Bouvier (EDF, FRA), U. Ramminger (Framatome GmbH, DEU)

118 • Study of the behavior of copper species in presence of pollutants in steam generator flow-restricted areas	T. Vital (CEA Saclay, FRA)
42 • Effect of Film-Forming Amine Application on Hideout Return	J. Ulaganathan (Canadian Nuclear Laboratories, CAN)
59 • ENERGIE Test Loop, a Unique Research Platform dedicated to SG Fouling Problem Studies under Two-Phase Flow Conditions	Y. Lou (EDF, FRA)

T06.1 • STEAM WATER SYSTEMS - Protection from corrosion

> Chairs: O. De Bouvier (EDF, FRA), U. Ramminger (Framatome GmbH, DEU)

121 • Film Forming Amines Application at Blayais EDF NPP: Operating experience and laboratory-scale experiments on FFA protection evaluation in lay-up conditions	C. Dupont (EDF, Industrial Division, FRA)
77 • Framatome experience with nuclear film forming amine applications	U. Ramminger (Framatome GmbH, DEU)

12.30-2.00 Lunchtime cocktail

2.00 | Conclave

Panel discussions | Reactivation of NPPs expected for permanent shutdown: what specific challenges?

> Moderator: P.Jolly (Framatome, FRA)

F. Somville (Tractebel-Engie, BEL), U. Jendrich (GRS gGmbH, DEU), M. Kirk (Phoenix Engineering Ass., USA)

2.45-3.00 Transition

3.00 | Conclave

T02.3 • PRESSURE VESSEL INTERNALS - Microstructure

> Chairs: F. Somvile (Tractebel Engie, FRA), D. Brimbal (Framatome, FRA)

124 • Analytical TEM of Type 304 SS following three different neutron irradiations, including Zorita PWR to 41 dpa and Bor-60 to 42 dpa	W. Karlsen (VTT Technical Research Centre of Finland, FIN)
105 • Radiation induced segregation in neutron irradiated 316 stainless steel by atom probe tomography	B. Radiguet (University of Rouen, FRA)
68 • Modeling the evolution of microstructure under irradiation and swelling in internal structures of reactors	G. Adjanor (EDF Lab Renardières, FRA)

3.00 | Cellier Benoit XII

TB.1 • FAC FLOW ACCELERATED CORROSION - Leakage analysis, detection & prediction

> Chairs: D. Delacoux (EDF, FRA), M. Krondak (UJV Rez, CZE)

60 • Optimization of the Remote Field Eddy Current testing method used for high pressure feedwater	N. Jeanne (EDF DI, FRA)
75 • Leakage on the header of steam extraction n°5 due to Flow Accelerated Corrosion	R. Chegraoui (Tractebel, BEL)
39 • Influence of Flexible Operation on the Flow Accelerated Corrosion Behavior	A. Zander (Framatome GmbH, DEU)

4.00-4.30 Coffee break

4.30 | Conclave

T03.2 • STAINLESS STEEL & NICKEL-BASED ALLOYS AREAS - Nickel based alloy 600 & its weld metal

> Chairs: Y. Vidalenc (Framatome, FRA), D. Morton (NNL, USA)

149 • The Temperature Functionality of Sensitized Stainless Steel SCC Growth in Deaerated Water	D. Morton (Naval Nuclear Laboratory, USA)
125 • Metallurgical and microstructural investigations of a central drain of a steam generator revealing a sweating	C. Panait (EDF CNPE Chinon, FRA)
79 • Simulating the susceptibility to IGSCC of Bottom Mounted Instrumentation nozzles	T. Couvant (EDF R&D, FRA)
87 • Zinc injection to mitigate stress corrosion cracking initiation of Alloy 182 in LWR primary water	K. Chen (Paul Scherrer Institut, CHE)
129 • Kinetic and thermodynamic modeling of mass transfer in the coupled system Ni/ NiO/ Water in physico-chemical conditions of PWR circuit	T. Saidi (CEA Saclay, FRA)
058 • Residual Stresses Measurements in Bottom Mounted Instrumentation Mock-ups Tubes Welds (Alloy 182/82) using different techniques, X-ray, deep hole drilling and test in sodium autoclaves	M. Yescas (Framatome, FRA)

4.30 | Cellier Benoit XII | TB.2-3-4 • FAC: FLOW ACCELERATED CORROSION -

> Chairs: C. Guerre (CEA, FRA), D. Delacoux (EDF, FRA), S. Frappart (Naval Groupe, FRA),

11 • Flow-Accelerated Corrosion Ageing Management Program at VVER NPPs	M. Krondak (UJV Rez, CZE)
33 • Advantages of the use of the 3D scanner on Flow Accelerated Corrosion expertises	J. Chavat (EDF DI, FRA)
38 • FAC & CFD – Evolution of mass transfer due to degradation geometry	D. Delacoux (EDF DTG, FRA)
37 • FAC – Influence of flexible operations on FAC	D. Delacoux (EDF DTG, FRA)
53 • Flow Accelerated corrosion with BRT-CICERO : advanced simula-tion of the phenomenon with the version 4.3	C. Thaury (EDF, FRA)

7.00 Conference Reception

SEPTEMBER, WEDNESDAY 21

9.00 Registration • Congress Center Main Entrance

09.30 | Conclave | T04.2 • PIPING, PUMPS, VALVES - Equipment

> Chairs: A. Bock (EDF, FRA), C. Pokor (EDF, FRA)

63 • Long term thermal ageing of austenitic stainless-steel welds and Dissimilar Metal Welds of French PWR plants	M. Yescas (Framatome, FRA)
90 • Intergranular Stress Corrosion Cracking in SS316 Globe Valves	J. Wielant (Engie Laborelec, BEL)
49 • Investigations of failed temperature probes	C. Panait (EDF DI, FRA)

09.30 | Cellier Benoit XII | T02.4 • PRESSURE VESSEL INTERNALS - IASCC

> Chairs: Y. Mogami (MHI, JPN), B. Tanguy (CEA, FRA)

44 • IASCC crack initiation testing of thimble tube material under PWR conditions: effect of oxide layer, stress and load form	F. Somville (Tractebel - ENGIE, BEL)
88 • SMILE Project - Studies on Irradiation Embrittlement and Irradia-tion-Assisted Stress Corrosion Cracking of Core Support Struc-tures and Internals	A. Jenssen (Studsvik Nuclear AB, SWE)
96 • Hot Cell Failure Analysis of Thermal Shield Support Block Bolts and Baffle-former Bolts from a US 4-loop PWR	J. Smith (EPRI, USA)

10.30-11.00 Coffee break

11.00 | Conclave | TA • NON-METALLIC MATERIALS AND COATINGS

> Chair: K.L. Naït Ali (EDF, FRA)

141 • ASG pit: use of HDPE materials and investigation of its influence towards water during agin	T. Hildebrandt (EDF DI TEGG, FRA)
115 • Innovative technique for improving the compatibility of radioactive waste with the blocking matrix	P. Chantereau (NUVIA Protection, FRA)

T06.2 • STEAM WATER SYSTEMS - Equipment degradations

> Chairs: A. Marion (EDF, FRA), J.-F. Coste (EDF, FRA)

64 • Corrosion of Low Alloy Steel Boiler Tube Material under Boiling Service using the Heat Flux Flow Loop	G. Quirk (Jacobs, GBR)
74 • Optimization of Inspection Program of Cooling Water System at NPP Cofrentes	M. Weiss (Framatome GmbH, DEU)
14 • Main condenser tube degradations	J.-F. Coste (EDF, FRA)
67 • Study of damage on titanium tubes of Gravelines 3 main condenseur	A. Mazenc (EDF New Nuclear Projects and Engineering Divisiony, FRA)

11.00 | Cellier Benoit XII | T02.5 • PRESSURE VESSEL INTERNALS - IASCC Mechanistics

> Chairs: J. Smith (EPRI, USA), A. Roth (Framatome GmbH, DEU)

35 • Metallurgical and microstructural investigations of a cracked baffle-former bolt coming from a French PWR and irradiated up to 37 dpa	P. Cuvillier (EDF DI, FRA)
43 • TEM investigation of IASCC crack tips from tested thimble tube O-ring specimens	F. Somville (Tractebel - ENGIE, BEL)
66 • Fracture behavior of grain boundaries of neutron-irradiated stainless steels oxidized in simulated PWR primary water	T. Miura (Institute of Nuclear Safety System, JPN)

1.00-2.00 Lunchtime cocktail

2.00 | Conclave | T03.3 • STAINLESS STEEL & NICKEL-BASED ALLOYS AREAS - Nickel based alloy 690 & its weld metal

> Chairs: E. West (NNL, USA), A. Roth (Framatome GmbH, DEU)

83 • Materials harvesting and SMILE´s materials library	M. Bjurman (Studsvik Nuclear AB, SWE)
103 • Reliability of PWSCC Resistance and Possible SCCGR for TT Alloy 690 and Associated Welds to the End of PWR Plant Life Time	T. Yonezawa (Retired Tohoku University, JPN)
56 • Fusion Boundary Microstructure and Fracture Behavior of a narrow-gap Alloy 52 Dissimilar Metal Weld and an Alloy 52 Dissimilar Metal Weld with Buttering	N. Hytönen (VTT Technical Research Centre of Finland, FIN)

2.00 | Cellier Benoit XII | T01.4 • PRESSURE VESSEL COMPONENTS - Fracture thoughness

> Chairs: M. Yamamoto (CIREPI, JPN), A. Parrot (EDF R&D, FRA)

34 • Application of miniature-C(T) for determination of the master curve and DBTT of a highly neutron-irradiated RPV steel	T. Petit (CEA Saclay, FRA)
46 • Summary of main results of the CAMERA project regarding application of an optimized fracture mechanics approach for the RPV	H. Hein (Framatome GmbH, DEU)
47 • Proposal of stiff fixture for better fatigue-pre-cracking of Mini-C(T) fracture toughness specimens	S. Sakuraya (Nippon Nuclear Fuel Development Co, JPN)
10 • Simple empirical equation to estimate quasi-static fracture toughness from the Charpy impact energy	R. Chaouadi (SCK CEN, BEL)

3.20-3.30 Transition

3.30 | Conclave | T08 • FUEL, CONTROL ROD ASSEMBLY

> Chairs: F. Bourlier (Framatome, FRA), P. Bossis (CEA, FRA)

25 • Characterising The Effect Of Li On Zircaloy Corrosion	S. Ortner (National Nuclear Laboratory, GBR)
30 • Microstructural examination of thermo-mechanically treated and neutron irradiated Alloy 718	W. Karlsen (VTT Technical Research Centre of Finland, FIN)
27 • Hydrogen Trapping in Zirconium Alloys	H. Swan (National Nuclear Laboratory, GRE)
31 • Effects of pre-irradiation thermo-mechanical treatments of Alloy 718 SCC susceptibility	A. Toivonen (VTT Technical Research Centre of Finland, FIN)
142 • Transmission Electron Microscopy Examination (TEM) and Atom Probe Tomography (APT) Analysis of Ion irradiated Alloy 718	S. Doriot (CEA, FRA)

3.30 | Cellier Benoit XII | T01.5 • PRESSURE VESSEL COMPONENTS - Irradiation & thermal ageing effects

> Chairs: M. Kirk (Phoenix Engineering Associates, USA), D. Brimbal (Framatome, FRA)

136 • Effect of microstructure on reversible temper embrittlement of 16MND5 low alloy steel	P. Todeschini (EDF, FRA)
133 • Microstructural characterization of PWR RPV model steels with vary-ing Ni and Mn contents and correlation to mechanical properties	V. Marques Pereira (NRG, NLD)
106 • Thermal Ageing Characterization of the Fusion Boundary and Carbon Depleted Heat Affected Zone of Alloy 52 Dissimilar Metal Welds for Nuclear Plants	P. Joly (Framatome, FRA)
146 • Fatigue properties of thermally aged Low Alloy Steel – Base and Welding materials	R. Magnusson (Ringhals - Vattenfall, SWE)

5.10 End of the conference

Displayed in Paneterie from Monday to Wednesday

**Posters

84 • From FAVOR to FAVPRO: Modernizing the U.S. NRC's Probabilistic Fracture Mechanics Vessel Integrity Assessment Tool	P. Raynaud (U.S. Nuclear Regulatory Commission, USA)
18 • Integrity assessment of baffle-former bolts of PWR reactor	P. J. Baas (Nuclear Research & consultancy Group, NLD)
107 • Ageing management of civil structures supported by software	U. Wildner (Framatome GmbH, DEU)
140 • Basic creep of VERCORS concrete: a multi-scale and multi-age experimental campaign	S. Huang (EDF lab, FRA)
131 • The effect of thermal-oxidative ageing on the chemical structure and mechanical properties of EVA	M. Ji (Xi'an Jiaotong University, CHN)