

R&D projects relating to SCC conducted by Aging and Material Reliability Evaluation Group of JNES



- To establish the precise integrity evaluation method of RPV pressure boundaries and internals.
- To prepare the SCC evaluation guides for the regulatory side and to make technical evaluation of the non-governmental rules etc..

Title	Abbrevia- -tion	Project Period (FY)	Contents	Components
Evaluation Technology of Irradiation Assisted Stress Corrosion Cracking	IASCC	2000-2008	<u>BWR</u> -Evaluation of a fluence of IASCC susceptibility initiation in L-grade SSs. -IASCC crack growth data base in neutron irradiated L-grade SSs. -Development of CGR disposition curves for BWR NWC and HWC (IASCC Evaluation Guide) <u>PWR</u> -SCC initiation data for baffle former bolts, BFB(<70dpa) and IASCC crack initiation diagram of BFB in primary PWR water -Development of a lifetime evaluation method for BFB (IASCC Evaluation Guide)	Core internals (stainless steel)
Evaluation Technology of Stress Corrosion Crack Growth of Nickel Based Alloy	NiSCC NSC	(Phase I) 2000-2005 (Phase II) 2005-2009	<u>BWR & PWR</u> -SCC crack growth data base in Ni-based alloy and its weld. -Development of CGR disposition curves for BWR NWC and HWC and PWR -Improvement of integrity evaluation method considering the effects of residual stress distribution, welding conditions, weld hardening etc. on CGRs. -Large scale mock-up test to verify the applicability of the SCC growth diagram to the actual plants.	Pressure boundaries, Shroud support (Ni-base alloy)
Evaluation of Intergranular Stress Corrosion Cracking of Nuclear Grade Stainless Steel	IGSCC ELC	(Phase i) 2003-2007 (Phase ii) 2008-2010	<u>BWR</u> -SCC crack growth data base in weld hardened region of L-grade stainless steels -Development of CGR disposition curves for BWR NWC and HWC -Expanding of CGR disposition curves to low K range below $15 \text{ MPa}\sqrt{\text{m}}$ -Large scale mock-up test to verify the applicability of the SCC growth diagram to the actual plants.	PLR piping Core shroud (stainless steel)
Evaluation of Neutron Irradiation Effect on SCC Crack Growth Behavior of Austenitic Stainless Steel	ENI	2007-2013	<u>BWR</u> -Evaluation of the acceleration effect of low neutron irradiation (fluence/flux) on SCC crack propagation, especially a synergy effect of neutron irradiation and weld hardening -Improvement of SCC evaluation method in terms of neutron irradiation	Core shroud Top guide etc. (stainless steel)
Integrity Evaluation of IASCC	I I A	2009-2016	<u>BWR</u> Verification of applicability of Laboratory data to actual core internals. -Evaluation of irradiation environment -Evaluation of specimen size effect -Enhancement of the IASCC Evaluation Guide	Core Internals (Stainless Steel)

(Supported by METI)