

CURRICULUM VITAE

Tetsuo Shoji

<Present Position>

Vice President for Research

Director of Center for Mechanical Science Based on NanoTechnology

Tohoku University

<Academic Records>

March 1970 Graduate of Department of Mechanical Engineering,
Faculty of Engineering, Tohoku University(Bachelor of Engineering)

March 1972 Receive of Master Degree in Mechanical Engineering,
Faculty of Engineering, Tohoku University(Master of Engineering)

March 1975 Receive of Doctoral Degree in Mechanical Engineering,
Faculty of Engineering, Tohoku University(Doctor of Engineering)

<Research Experience>

1998 - 2003 Physics and Chemistry of Fracture and Failure Prevention under Combined Environments
(Center of Excellence Program • Research Leader, Ministry of Education, Culture, Sports, Science and
Technology
(MEXT))

October 2003 - March 2008 The Exploration of the Frontiers of Mechanical Science Based on
Nanotechnology

(21st Century Center of Excellence Program • Program Leader)

2005 - 2009 Mechanistic study of physico-chemical processes of stress corrosion cracking based on
mechano-chemical oxidation kinetics(Grants in Aid for Scientific Research, Category S • Research
Leader, Ministry of Education, Culture,
Sports, Science and Technology (MEXT))

<Work experience>

April 1975 Research Associate,

Department of Engineering Science, Faculty of Engineering, Tohoku University

May 1982 - August 1983 Visiting Scientist,

Department of Metallurgy and Materials Engineering, University of Newcastle Upon Tyne, U.K

Sept. 1983 Associate Professor,

Research Institute for Strength and Fracture of Materials, Faculty of Engineering, Tohoku Univ.

March 1988 Professor,

Dept of Mechanical Engineering II, Faculty of Engineering, Tohoku University,

May 1989 Professor,
Research Institute for Fracture Technology, Faculty of Engineering, Tohoku University,

April 1994 - September 1994 Visiting Professor,
Department of Nuclear Engineering, Massachusetts Institute of Technology, USA

February 1996 Director,
Research Institute for Fracture Technology, Faculty of Engineering, Tohoku University,

April 1998 Director
Research Institute for Fracture Technology, Faculty of Engineering, Tohoku University,

April 1999 Director
Fracture Research Institute, Graduate School of Engineering, Tohoku University

April 2000-2002 Councilor
Tohoku University

November 2002-2006 Acting member of the Nuclear and Industrial Safety Agency, METI
Ministry of Economy, Trade and Industry

1. Member of the sub-committee on Integrity Assessment of Nuclear Power Plants (2002-March2006)
2. Member of the Nuclear Reactor Safety Sub-committee on Evaluation of Codes and Standards WG (2002-March2006)
3. Member of the Inspection Technology Advancement WG. (May 2003-March2006)
4. Member of the Examination Committee on Ageing Management. (November 2004-2006)

April 2003 Special Advisor in Education
Tohoku University

June 2003-2005 Member of the Evaluation Committee
National Institution for Academic Degrees and University Evaluation

June 2004-2005 Vice Dean , School of Engineering,
Tohoku University

July 2004- Expert Panel Member of The US Nuclear Regulatory Commission,
Proactive Materials Degradation Assessment,

April 2005- Vice President for Research
Tohoku University

April 2005 - Scientific Advisory Committee Member
European Commission, PERFECT Project

<AWARDS>

A.B.Cambell Award for young authors National Association of Corrosion Engineers, USA , March 1977
JSME Award for young researchers Japan Society of Mechanical Engineers, Japan, Feb. 1983
JSME Award for best papers Japan Society of Mechanical Engineers, Japan, April 1990.
GRSJ Award for best papers The Geothermal Research Society of Japan, Japan, Oct. 1990.

JSME Tohoku Regional Award for Best Joint Research Japan Society of Mechanical Engineers, Tohoku Region, March 1995.

Honor member of Russian International Academy of Engineering Russian International Academy of Engineering, June 1995.

JSME Northeast Branch Award for Technical Research [JSME Tohoku Branch] March 1995

W. R. Whitney Award [NACE International] March 1998

JSME Division Award for Outstanding Contribution in Mechanics and Materials, Division of Mechanics and Materials [JSME] November 1998

JSME Award for Fellow [JSME] March 2001

ASTM Division Award for Annual Best Paper published in JTEV [ASTM] March 2001

JSME Division Award for International Activity, Division of Mechanics and Materials [JSME] October 2002

Japan Thermal Spraying Society Award for best papers, Japan, June 2003

First Prime in the competition on fundamental investigations in the Institute of Theoretical and Applied Mechanics for 2003 [Institute of Theoretical and Applied Mechanics SB, Russian Academy of Science (2003)]

Japan Thermal Spraying Society Award for best papers, Japan, June 2004

Japan Thermal Spraying Society Award for outstanding performance, Japan, December 2004

<INVITED TALK ETC>

“Mechanistics and Mechanisms of EAC Formulation of Corrosion Deformation Interactions”
International Symposium on Corrosion -Deformation Interaction, 1996, Nice, France
INVITED, July, 1996

“Characteristics of the SCC Surface Crack Propagation in the Low K Region in Oxygenated High Temperature Water”, 8th International Symposium on Environmental Degradation of Materials in Nuclear Power Plants-Light Water Reactors, NACE, Florida, USA
INVITED, August, 1997

“Quantitative Evaluation of Gastric Emptying Behavior by Use of Magnetic Fluid and Perturbation Field Measurements”, International Conference on Advanced Technology in Experimental Mechanics 99, Ube, Yamaguchi, Japan, JSME
KEYSTONE SPEECH, July, 1999

“Theoretical Prediction on Environmentally Assisted Cracking of Structural Materials in LWR Systems- Threshold and Plateau Growth Behavior”, 9th International Symposium on Environmental Degradation of Materials in Nuclear Power Plants-Light Water Reactors, TMS, Newport Beach, CA, USA
INVITED, August, 1999

“Pressure Boundary Components in Nuclear and Fossil Power Plants”, The 20th Anniversary Annual Technical Meeting of KSNT, Nov. 2000, Seoul Korea
Memorial Lecture, July, 2000

“Progress in the mechanistic Understanding of BWR SCC and Its Implication to the Prediction of SCC Growth Behavior in Plants”, 11th International Conference on Environmental Degradation of Materials in Nuclear Power Systems-Water Reactors. August 10-14, 2003, Stevenson, Washington,
INVITED, August, 2003

“Development of a Fundamental Crack Tip Strain Rate Equation and its Application to Quantitative Prediction of Stress Corrosion Crack”, Corrosion 2005, George R Brown Convention

Center, Houston Texas
INVITED, April 3-7, 2005

“Center of excellence program on the exploration of the frontiers of mechanical science based on nanotechnology and international research collaboration”
ICMAT2005 (International Conference for Mechanical and Automotive Technologies), Chonbuk National University Jeonju, Jeonbuk, Korea
INVITED, June 1, 2005

“Femto Science and Aging of Nuclear Power Plant-Toward Proactive Aging Degradation Management”
The 54th General Meeting, The Industry Club of Japan, Tokyo Japan
Special Lecture, June24, 2005

“Frontier of Materials Engineering and Advanced Maintenance Technology for Nuclear Power Plant”
Special Committee on Human, Machine and System, Atomic Energy Society of Japan, at Sendai, Japan
Special lecture, July.23, 2005

“Research Promotion and Intellectual Property Management Policy for Industry-University-Government Cooperation”
International Symposium on Engineering Education and University-Industries-Government Cooperation at Deagu, Korea
INVITED, Oct.10, 2005

“Prospect of Advancement of Materials Engineering for Maintenance Technology for Nuclear Power Plant”
Symposium NISA · JNES 2005 at Tokyo Japan
SPECIAL LECTURE, Oct.28, 2005

“Modeling and Prediction of Environmentally Assisted Cracking of Austenitic Alloys”
International Conference on Corrosion (CORCORN2005) at Chennai Convention Centre, Chennai Trade Centre, India
INVITED, Nov.30, 2005

“Expectation for Creativity-Academic Freedom and Diversity Receptivity”
International Symposium on Academic Culture of Tohoku University, Tohoku University at Sendai, Japan
Special Lecture, Dec.9, 2005

<Publication list>

- (1) T. Shoji, "Crack-Tip Blunting and Crack-Opening Displacement under Large-Scale Yielding". [Metal Science, Vol. 10, No. 5, (1976), 165-169]
- (2) M. Suzuki, H. Takahashi, T. Shoji, T. Kondo and H. Nakajima, "The Environment Enhanced Crack Growth Effects in Structural Steels for Water Cooled Nuclear Reactors". [The Influence of Environment on Fatigue, Institution of Mechanical Engineers, London, (1977), 161-169]
- (3) S. Aiyama, T. Shoji, H. Takahashi and M. Suzuki, "Stress Corrosion Cracking and Corrosion Fatigue in Cr-Mo Low Alloy Steel". [Corrosion, Vol. 34, No. 10, (1978), 325-331]
- (4) T. Shoji, S. Aiyama, H. Takahashi and M. Suzuki, "Effect of Stress Intensity Rate K and Stress Ratio R on Corrosion Fatigue Crack Growth Enhancement Below KISCC ". [Corrosion, Vol. 34, No. 8, (1978), 276-282]
- (5) T. Shoji, T. Ise, H. Takahashi and M. Suzuki, "Intergranular Corrosion Fatigue Crack Growth of

Sensitized Type 304 Stainless Steel in Oxygenated Pure Water at 85°C". [Corrosion, Vol. 34, No. 10, (1978), 366-367]

(6) T. Shoji, H. Takahashi and M. Suzuki, "Corrosion Fatigue Aspects in BWR Pipe Cracking". [Predictive Methods for Assessing Corrosion Damage to BWR Piping and PWR Steam Generators, NACE, (1978), 58-72]

(7) T. Shoji, H. Takahashi and M. Suzuki, "Significance of Crack Opening Displacement and Crack Tip Plastic Strain Energy in Fracture Initiation". [Metal Science, Vol. 12, (1978), 579-586]

(8) T. Shoji, K. Date, H. Takahashi, M. Suzuki, "Evaluation of Intense Strain Region at Crack Tip in Fracture Toughness Testing". [Journal of Non-destructive Inspection, Vol. 27, No. 8, (1978), 499-505]

(9) H. Takahashi, K. Saito, T. Shoji, K. Date and M. Suzuki, "Reactor Surveillance Test and Fracture Mechanics Evaluation of Irradiation Embrittlement in Reactor Pressure Vessel Steels". [Journal of Engineering Materials and Technology, Vol. 102, No. 10, (1980), 317-326]

(10) T. Shoji, M. A. Khan, H. Takahashi and M. Suzuki, "Triaxiality Effects on Ductile Fracture and Acoustic Emission Characteristics". [Res Mechanica, Vol. 2, (1981), 21-38]

(11) M. Saka, T. Shoji, H. Takahashi and H. Abe, "Virtual Initiation Analysis of a Ductile Crack in Plane Strain Large-Scale Yielding". [Res Mechanica Letters, Vol. 1, (1981), 35-38]

(12) M. Saka, T. Shoji, H. Takahashi and H. Abe, "Finite Deformation Analysis of Cracked Specimen in Large Scale Yielding". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 47, No. 414, (1981), 148-157]

(13) T. Shoji, Y. Otani, H. Takahashi and M. Suzuki, "Corrosion Fatigue Crack Growth of Low Alloys Steel in Oxygenated Pure Water at 85°C". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 47, No. 416, (1981), 391-399]

(14) M. A. Khan, T. Shoji and H. Takahashi, "Significance of the Acoustic Emission Technique in Monitoring Cleavage Controlled Instability". [Res Mechanica Letters, Vol. 1, No. 3, (1981), 133-138]

(15) T. Shoji, "Determination of Crack Tip Energy Dissipation and Elastic-Plastic Fracture Toughness Parameter with Ductile Crack Extension". [Journal of Testing and Evaluation, Vol. 9, No. 6, (1981), 324-334]

(16) M. Saka, T. Shoji, H. Takahashi and H. Abe, "A Nondimensional Tearing Parameter Related to the Intense Strain Region near the Propagating Ductile Crack Tip". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 47, No. 424, (1981), 1301-1308]

(17) T. Shoji, H. Takahashi, M. Suzuki and T. Kondo, "A New Parameter for Characterizing Corrosion Fatigue Crack Growth". [Journal of Engineering Materials and Technology, Vol. 103, (1981), 298-304]

(18) M. A. Khan, T. Shoji, H. Takahashi and M. Suzuki, "Evaluation of Radiation Damage in Reactor Pressure Vessel Steel by Elastic-Plastic Fracture Mechanics". [Trans. of the ASME, Journal of Engineering Materials and Technology, Vol. 103, No. 3, (1981), 276-281]

(19) T. Shoji, H. Takahashi, H. Nakajima and T. Kondo, "Role of Loading Variables in Environment Enhanced Crack Growth for Water Cooled Nuclear Reactor Pressure Vessel Steels". [Proc. of the International Atomic Energy Agency Specialists' Meeting on Subcritical Crack Growth, NUREG/CP-0044, Ed., W. H. Cullen, Vol. 2, (1981), 143-171]

(20) T. Kondo, H. Nakajima, T. Shoji and H. Takahashi, "Fatigue Crack Growth Through Typical Weld HAZ Microstructures of SA533B Gr. B Steel in BWR Environment". [Proc. of the International Atomic Energy Agency Specialists' Meeting on Subcritical Crack Growth, NUREG/CP-0044, Ed., W. H. Cullen, (1981), 147-159]

(21) T. Shoji, Y. Saito, H. Takahashi and M. Suzuki, "Prediction of Service Life of Boiler Superheater Tubes under Hot Corrosion and Creep Environment". [Boshoku Gijutsu, Vol. 31, No. 3, (1981), 196-201]

(22) H. Nakajima, T. Shoji, M. Kikuchi, H. Niitsuma and M. Shindo, "Detecting Acoustic Emission

during Cyclic Crack Growth in Simulated BWR Environment". [Proc. of Symposium on Fatigue Crack Growth Measurement and Data Analysis, ASTM STP 738, Eds., S. J. Hudak, Jr., and R. J. Bucci, American Society for Testing and Materials, (1981), 139-160]

(23) M. A. Khan, T. Shoji and H. Takahashi, "Characterization of the Crack Toughness Behavior of Structural Steels by the Tearing Modulus Parameter and Acoustic Emission". [Journal of Testing and Evaluation, Vol. 10, No. 1, (1982), 3-11]

(24) M. A. Khan, T. Shoji and H. Takahashi, "Acoustic Emission from Cleavage Microcracking in Alloy Steels". [Metal Science, Vol. 16, No. 2, (1982), 118-126]

(25) M. A. Khan, T. Shoji, H. Niitsuma and H. Takahashi, "Acoustic Emission Rating Parameter for Prediction of Tearing Instability in Structural Materials". [Engineering Fracture Mechanics, Vol. 16, No. 5, (1982), 645-658]

(26) T. Hashida, M. Saka, H. Anzai, T. Shoji and H. Takahashi, "Evaluation of Resistances to the Elastic-Plastic Plane Strain Crack Initiation and Growth Using Small Fracture Toughness Specimen". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 48, No. 433, (1982), 1111-1119]

(27) Y. Saito and T. Shoji, "High Temperature Corrosion Test Method in Simulated Oil Fired Boiler Environment for Service Life Evaluation of Boiler S/H Tubes". [Boshoku Gijyutsu, Vol. 31, No. 3, (1982), 232-238]

(28) M. Saka, T. Shoji, H. Takahashi and H. Abe, "Finite Deformation Analysis of COD, J-Integral and Crack Tip Intense Strain Region in Plane Strain Large-Scale Yielding". [Journal Mechanics and Physics of Solids, Vol. 30, No. 4, (1982), 209-224]

(29) M. A. Khan, T. Shoji and H. Takahashi, "Evaluation of Structural Integrity by Acoustic Emission and Fracture Mechanics Techniques". [Proc. 6th International Acoustic Emission Symposium, the Japanese Society for Non Destructive Inspection, (1982), 531-541]

(30) T. Shoji, H. Nakajima, T. Kondo and H. Takahashi, "Role of Mechanical Factors in Environmentally Enhanced Crack Growth under Cyclic Loading". [Journal of the Society of Materials Science Japan, Vol. 31, No. 346, (1982), 703-709]

(31) H. Nakajima, T. Shoji, H. Tsuji, H. Takahashi and T. Kondo, "Effect of High Temperature Water Environment of Cyclic Crack Growth through Typical Weld HAZ Microstructures of SA 533 gr. B Steel". [Journal of the Society of Materials Science Japan, Vol. 31, No. 346, (1982), 710-716]

(32) T. Shoji and H. Takahashi, "Characterization of Ductile Crack Growth Behavior Based on Energy Dissipation within Intense Strain Region at Crack Tip". [Proc. of a CSNI Workshop on Ductile Fracture Test Methods, Dec. 1-3, 1982, Paris, Committee on the Safety of Nuclear Installations, Nuclear Energy Agency, OECD, (1983), 428-449]

(33) K. Shimomura, T. Shoji and H. Takahashi, "Detection of Intergranular Pop-in Cracking during Elastic-Plastic Fracture Toughness Test of Cr-Mo-V Steel by Frequency Analysis of Acoustic Emission". [Journal of the Iron and Steel Institute of Japan, Vol. 69, No. 16, (1983), 118-125]

(34) M. Saka, T. Shoji, H. Takahashi and H. Abe, "Tearing Modulus T_w and Its Evaluation Based on Stress-Strain Fields Near a Growing Crack Tip". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 49, No. 438, (1983), 166-171]

(35) M. Saka, H. Anzai, T. Shoji, H. Takahashi and H. Abe, "Experimental Verification of Tearing Moduli T_j , T_σ and T_w as the Material Resistance against Ductile Crack Growth". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 49, No. 443, (1983), 829-837]

(36) M. Saka, T. Shoji, H. Takahashi and H. Abe, "A Criterion Based on Crack-Tip Energy Dissipation in Plane Strain Crack Growth under Large-Scale Yielding". [ASTM STP 803, Vol. 1, Eds., C. F. Shih and J. P. Gudas, American Society for Testing and Materials, (1984), I-130-I-158]

(37) T. Shoji, H. Nakajima, H. Tsuji, H. Takahashi and T. Kondo, "Effect of Microstructure and Strength of Low-Alloy Steels on Cyclic Crack Growth in High-Temperature Water". [ASTM STP 801, Eds., T. W. Crooker and B. N. Leis, American Society for Testing and Materials, (1984), 256-286]

(38) K. Shimomura, T. Shoji, H. Takahashi and K. Saito, "Determination of Intergranular-Cleavage Mode Fracture Toughness of Retired Steam Turbine Rotor Steel (CrMoV) by Means of Acoustic

Emission Technique". [Progress in Acoustic Emission II, The 7th International Symposium, JSNDI, (1984), 89-96]

(39) T. Shoji, K. Tamakawa, H. Takahashi and T. Wakabayashi, "Application of Acoustic Emission to Fracture Toughness Test of Rocks under the Simulated Geothermal Reservoir Conditions". [Progress in Acoustic Emission II, The 7th International Symposium, JSNDI, (1984), 616-623]

(40) M. A. Khan, T. Shoji, H. Takahashi and H. Niitsuma, "Combined Elastic-Plastic and Acoustic Emission Methods for the Evaluation of Tearing and Cleavage Crack Extension". [ASTM STP 803, Vol. II, Eds., C. F. Shih and J.P. Gudas, American Society for Testing and Materials, (1984), II-508-II-530]

(41) H. Takahashi, T. Shoji, M. Suzuki, M. Muramastu, K. Kimura, K. Saito and M. Suzuki, "蒸気タービン・発電機部材の新しい非破壊的経年劣化診断技術". [電気現場技術, Vol. 23, No. 261, (1984), 1-7]

(42) J. Congleton, T. Shoji and R. N. Parkins, "The Stress Corrosion Cracking of Reactor Pressure Vessel Steel in High Temperature Water". [Corrosion Science, Vol. 25, No. 8/9, (1985), 633-650]

(43) J. Congleton, H. C. Shih, T. Shoji and R. N. Parkins, "The Stress Corrosion Cracking of Type 316 Stainless Steel in Oxygenated and Chlorinated High Temperature Water". [Corrosion Science, Vol. 25, No. 8/9, (1985), 769-788]

(44) H. Anzai, T. Shoji, H. Takahashi, H. Nakajima and T. Kondo, "Slow Strain Rate Fracture Toughness Test of Nuclear Pressure Vessel Steel (A553B-1) in Hydrogen and Simulated Boiling-Water reactor Environment". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 51, No. 463, (1985), 714-722]

(45) M. Takeuchi, T. Shoji, H. Takahashi and T. Anayama, "Evaluation of Elastic-Plastic Fracture Toughness and Crack Growth Resistance of Structural Steels for Fusion reactor Superconducting Magnet at Liquid Helium Temperature". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 51, No. 470, (1985), 2256-2264]

(46) K. Onisawa, T. Shoji, H. Takahashi and K. Ando, "Evaluation of Tearing Instability by Means of Recrystallization-Etch Technique (Comparison of Fracture Toughness Between Through Crack Specimens and Part-Through Crack Specimens)". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 51, No. 462, (1985), 514-517]

(47) T. Shoji, K. Hayashi, T. Kojima, T. Ito, H. Takahashi and H. Abe, "Growth Behavior of Hydraulically Created Crack and its Size Evaluation Using Well Logging Data - Crustal Rock Fracture Mechanics Approach -". [Geothermal Resources Council, Transactions, Vol. 9, Part II, August, (1985), 579-584]

(48) K. Hayashi, T. Shoji, H. Niitsuma, T. Ito and H. Abe, "A New In-Situ Tectonic Stress Measurements and its Application to a Geothermal Model Field". [Geothermal Resources Council, Transactions, Vol. 9, Part II, August, (1985), 99-104]

(49) T. Shoji, "Quantitative Prediction of Environmentally Assisted Cracking Based on Crack Tip Strain Rate". [Proc. of Predictive Capabilities in Environmentally Assisted Cracking-PVP-Vol.99, (1985), 127-142]

(50) K. Ohnishi, T. Shoji and H. Takahashi, "Evaluation of Micro-Fracture Mechanisms and Fracture Toughness of Cryogenic Structural Steels and Weldment". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 52, No. 473, (1986), 170-173]

(51) K. Shimomura, T. Shoji, H. Takahashi and K. Saito, "Effect of Specimen Size on Intergranular Mode Fracture Toughness of Cr-Mo-V Steel in the Transition Temperature Region". [Journal of the Iron and Steel Institute of Japan, Vol. 72, No. 11, (1986), 1744-1750]

(52) R. L. Tobler, T. Shoji, H. Takahashi and K. Ohnishi, "Fracture, Acoustic Emission and Adiabatic Heating of Austenitic Stainless Steels at Liquid Helium Temperature". [Progress in Acoustic Emission III, The 8th International Acoustic Emission Symposium, Eds., K. Yamaguchi, K. Aoki, and T. Kishi, The Japanese Society of NDI, (1986), 453-461]

(53) S. Jang, T. Shoji, H. Takahashi and Y. Watanabe, "Corrosion Fatigue of High Strength Steel in Sea Flowing Water". [Boshoku Gijutsu, Vol. 35, No. 9, (1986), 503-508]

- (54) Y. Saito, T. Shoji and H. Takahashi, "The Material Degradation of SUS316 HTB Used for Boiler Superheater during Service Operation". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 52, No. 473, (1986), 165-169]
- (55) T. Hashida, T. Shoji and M. Muramatsu, "Simulation of the Extension Behavior of a Hydraulically Induced Crack by Use of Brittle Epoxy Specimens". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 52, No. 480, (1986), 1906-1912]
- (56) H. Takahashi and T. Shoji, "In-Service Degradation of Fracture Properties of High Temperature Structural Components and Related NDE in Fossil Electric Power Plants". [The Thermal and Nuclear Power, Vol. 37, No. 8, (1986), 858-871]
- (57) Y. Saito, T. Shoji and H. Takahashi, "Materials Degradation and its Relevance to Life Assessment of Superheater Tubes of Fossil Boilers". [Proc. Conference on Life Extension and Assessment of Fossil Plants, EPRI, EEL, ASME and ASM, June 1986, Washington, (1986), 3-8]
- (58) T. Shoji and H. Takahashi, "Non-destructive Evaluation of Materials Degradation during Service Operation by Means of Electro-Chemical Method". [Proc. Conference on Life Extension and Assessment of Fossil Plants, EPRI, EEL, ASME and ASM, June 1986, Washington, (1986), 4-8]
- (59) C. Wada and T. Shoji, "Fracture Toughness and its Relation to Initial Tangent Modulus of Granitic Rock". [Journal of the Society of Materials Science Japan, Vol. 35, No. 389, (1986), 145-151]
- (60) C. Wada, T. Shoji and H. Takahashi, "Fracture Toughness Evaluation of Granite in a High Temperature Pressurized Water Environment". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 52, No. 476, (1986), 1082-1088]
- (61) T. Shoji, "Sub-Critical Crack Growth and Structural Integrity of Light Water Reactor". [Transactions of the Japan Society of Mechanical Engineers, Vol. 89, No. 807, (1986), 37-43]
- (62) T. Shoji, K. Komai, S. Abe and H. Nakajima, "Mechanistic Understanding of Environmentally Assisted Cracking of RPV Steels in LWR Primary Coolants". [Proc. of the 2nd International Atomic Energy Agency Specialists' Meeting on Subcritical Crack Growth, Ed., W. H. Cullen, NUREG/CP-0067, Vol. 2, (1986), 99-118]
- (63) K. Saito, K. Kimura, M. Muramatsu, H. Kashiwaya, Y. S. Lu, T. Shoji and H. Takahashi, "Electrochemical Polarization Technique to Detect In-Service Degradation of Material Toughness". [Proc. Fossil Plant Inspection Workshop, EPRI and ASME, September 1986, San Antonio, (1986), 4-9]
- (64) X. Mao, T. Shoji and H. Takahashi, "Characterization of Fracture Behavior in Small Punch Test by Combined Recrystallization-Etch Method and Rigid Plastic Analysis". [Journal of Testing and Evaluation, Vol.15, No.1, (1987), 30-37]
- (65) Y. Lu, T. Shoji and H. Takahashi, "A New Evaluation Procedure for Detecting the Material Degradation of a CrMoV Turbine Rotor Steel". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 53, No. 492, (1987), 1550-1557]
- (66) Y. Lu, T. Shoji, H. Takahashi and Y. Saito, "Material Characterization Procedure of Degradation of Austenitic Stainless Steels by Use of Small Punch Test and Electrochemical Potentiokinetic Reactivation (EPR) Method". [Journal of the Society of Materials Science Japan, Vol. 36, No. 402, (1987), 296-302]
- (67) K. Shimomura, T. Shoji and H. Takahashi, "Probabilistic Evaluation of Cleavage Mode Fracture Toughness in a Regime of Elastic-Plastic Fracture Mechanics". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 53, No. 495, (1987), 2121-2127]
- (68) K. Shimomura, T. Shoji and H. Takahashi, "Evaluation of Intergranular Fracture Initiation in Transition Region of Retired Steam Turbine Rotor Steel Using Small Specimens and the Acoustic Emission Technique". [Journal of Testing and Evaluation, Vol. 15, No.5, (1987), 257-264]
- (69) H. Murata, T. Hashida, T. Shoji and H. Takahashi, "Effect of Anisotropy on Mixed Mode Crack Extension Behavior in Granite". [Transactions of the Japan Society of Mechanical Engineers (A), Vol. 53, No. 489, (1987), 894-898]
- (70) H. Takahashi, T. Shoji, T. Kondo, N. Nakajima and J. Kuniya, "Time Domain Analysis for

Quantitative Evaluation of EAC and its Relevance to Life Evaluation Procedure of RPV". [Trans. of the 9th International Conference on Structural Mechanics in Reactor Technology, Ed., F. H. Wittmann, Vol. F, (1987), 233-238]

(71) H. Takahashi, T. Shoji and H. Abe, "Recent Progress and Future of Γ Project at Tohoku University". [Geothermics, Vol. 16, No. 4, (1987), 409-418]

(72) T. Shoji and H. Takahashi, "Critical Cracking Potential for Stress Corrosion Cracking of Nuclear Pressure Vessel Steels in Pressurized High Temperature Waters". [Trans. of the 9th International Conference on Structural Mechanics in Reactor Technology, Ed., F. H. Wittmann, Vol. A, (1987), 119-124]

(73) J. Congleton and T. Shoji, "Slow Strain Rate Testing of RPV Steels in High Temperature Water". [Trans. of the 9th International Conference on Structural Mechanics in Reactor Technology, Ed., F. H. Wittmann, Vol. H, (1987), 265-270]

(74) F. Nogata, K. Seo, H. Takahashi, T. Shoji, Y. Lu, K. Kawano, S. H. Chung and Y. B. Xian, "Detection of Material Degradation on CrMo Steel during Service Operation by a Chemical Etching Test". [Proc. of the Fifth International Conference on Mechanical Behavior of Materials-V, ICM-5, Eds., M. G. Yan, S. H. Zhang and Z. M. Zheng, (1987), 1109-1114]

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