

## **Appendix C – Panel Members**

## **Dr. Peter L. Andresen**

Dr. Andresen received his B.S. in Materials Engineering (Cum Laude) in 1972, his Ph.D. and M.S. in Materials Science in 1978 and 1974 from the same institution Rensselaer Polytechnic Institute.

Dr. Andresen's expertise is in the area of corrosion and environmental effects on mechanical properties and integrity of materials. His research has focused on corrosion and environmental fracture of iron- and nickel-base alloys under conditions of interest to the energy and plastics industries. He also studied corrosion fatigue of Cu-Al alloys and has published and consulted widely on pitting, general corrosion, erosion and polarization behavior in aqueous and organic media. In addition to numerous presentations of his research, Dr. Andresen has given many invited lectures at technical and educational symposia.

Prior to GE, Dr. Andresen worked as an independent consultant specializing in corrosion and metallurgical failure analysis. Dr. Andresen is the author of over 250 publications. He holds twenty-five patents, is a Fellow of the American Society for Metals and the National Association of Corrosion Engineers, on the Board of Directors of NACE, and is a member of the International Cooperative Groups on Irradiation Assisted Stress Corrosion Cracking and on Environmentally Assisted Cracking. He has served in many capacities in professional societies, including as Chairman of the Corrosion/93 Research-in-Progress Symposium; Board of Editors for Corrosion Journal; Chairman of the NACE Research Committee; NACE Awards Committee, Advisory Panel / Quick Response Team for Halden, Norway and MIT test reactor programs; Committee and Symposia Chairman of the NACE Group (T2) and Unit Committees on Corrosion in Nuclear Systems (T2A) and SCC / CF (T3E); Chairman of the Data Analysis and Round Robin Committees for the International Cooperative Group on Irradiation Assisted SCC; Executive Committee of the International Cooperative Group on Environmentally Assisted Cracking; and Chairman of the Eastern NY Chapter of ASM. He has served on several DOE Expert Review Panels for Fusion Energy and Radioactive Waste Disposal, as acting (5 months) technical administrator for the Inorganic Materials Laboratory, on RPI Trustees Committees for Faculty and Staff Compensation and Presidential Search, and on several thesis committees. He has received two Whitney Gallery of Achievers Awards and the Dushman Award from GE, the Speller Award from NACE, and was selected as one of "50 Stars to Watch" by Industry Week in 1996 and one of "2000 Outstanding Scientists of the 20<sup>th</sup> Century" by Int. Biographical Center of Cambridge, England.

## **Dr. Peter Ford**

Peter Ford received his bachelors and doctoral degrees from Cambridge University, UK and his master's degree from the Rensselaer Polytechnic Institute, USA. These degrees concentrated on metallurgy and corrosion science.

After finishing an apprenticeship with the turbine manufacturer, British Thomson Houston in the UK, he joined the staff of the Olin Mathieson Chemical Corporation in the US, developing and fabricating advanced corrosion-resistant aluminum–magnesium alloys. Following these early experiences he concentrated on mitigating corrosion problems in the power generation business, initially as a group leader at the Central Electricity Research Labs in the UK, and then for 25 years as a manager of the corrosion and coatings program at the General Electric Global Research Center (formally the GE Corporate Research and Development Center). During that latter time much of the efforts of the program were focused on developing prediction methodologies for environmental degradation of BWR materials (stress corrosion cracking, irradiation assisted SCC, corrosion fatigue, etc). Based on this fundamental understanding, the group was instrumental in the formulation, qualification and implementation of various mitigation strategies (noble metal coating and cladding processes, underwater weld repair, etc) as well as defining sound materials and water chemistry specifications.

He has been the recipient of various awards from GE and from technical societies, including the Whitney Award from the NACE International for “contributions to corrosion science and especially life prediction methodologies for light water reactors (LWRs)”. He has also been a member and chairman of various technical societies/cooperative organizations including the International Cooperative Group on Environmentally Assisted Cracking that covers the work of 86 organizations in 16 countries in the area of materials degradation in LWRs

Since retiring from General Electric he has been a member of the Advisory Committee on Reactor Safeguards to the USNRC.

## **Dr. Karen Eleanor Gott**

Dr. Gott studied metallurgy and materials science at Imperial College, London.

During the more than 20 years she has worked in Studsvik Dr. Gott studied many aspects of the environmental effects on structural materials in nuclear power plants, both through contract research projects and failure analysis. She has held a number of different types of position whilst at Studsvik including project manager, marketing manager and manager of the reactor chemistry group. She was also on periodic loan to a US subsidiary in Richland, WA, to help them establish laboratory support for their decontamination services.

The main areas of her research activities were

- Creep crack formation in stainless steels (mechanical testing, electron and light optical metallography)
- Fracture mechanics (corrosion fatigue, residual stress measurement, non-destructive testing)
- Reactor chemistry (PWR and BWR chemistry, activity build-up including field measurements, decontamination)
- Reactor materials (surveillance testing, failure analysis, metallography of Inconel 182)

In her current position at the Swedish Nuclear Power Inspectorate she has continued to work in the field of environmental degradation of nuclear power plant structural materials. The work covers both the regulatory and the research aspects. On the regulatory side she is involved in the development of regulations, inspection and safety evaluations that form the basis for decisions based on Swedish law and regulations. One of her responsibilities includes the management of the materials and chemistry research area for the Inspectorate. In addition she has built a database covering operationally induced failures and damage to mechanical components in the Swedish nuclear fleet and is responsible for its maintenance and the associated analysis of failure cases. In 2003 she was on a six-month job rotation to the Materials Engineering Branch of NRR working amongst other things on primary water stress corrosion cracking problems.

She is a member of the international conference committee, which arranges the regular water chemistry conferences in the nuclear field, and has also acted on the international committee for the Fontevraud conference in France. She serves as chairperson of the steering committees of two large international projects concerning irradiation assisted stress corrosion cracking and the establishment of a pipe failure database.

## **Dr. Robin L. Jones**

Dr. Jones received his B.A. (1962) and M.A. in Natural Sciences (1965), and Ph.D. in Metallurgy (1966) from the University of Cambridge, UK.

Dr. Jones is Technical Executive, Materials Science & Technology, at the Electric Power Research Institute (EPRI). He has more than 35 years of experience and achievement in materials-related contract research and R&D management, and is a recognized expert on corrosion-related materials integrity problems in nuclear power plants. Since joining EPRI in 1978, his assignments have included leadership of EPRI's materials R&D programs that address high-impact materials issues, industry-wide programs on BWR pipe cracking, PWR steam generator reliability, and BWR vessel and internals degradation, which have attracted worldwide participation by nuclear utilities. Dr. Jones has been responsible for managing the Nuclear Power Sector's Major Component Reliability, Fuel Reliability, Storage & Disposal, and Low-Level Waste, Chemistry & Radiation Control programs. He has made keynote presentations on materials performance and degradation at many international conferences and symposia, as well as invited lectures on these subjects.

Prior to joining EPRI, Dr. Jones was the Manager of the Metallurgy Program at SRI International, where he developed and directed contract R&D activities on materials and corrosion issues in fields ranging from aerospace to energy. Earlier, he was with Franklin Institute Research Laboratories, where he was principal investigator on several large R&D contracts on aerospace materials.

A member of ASME, TMS and NACE, Dr. Jones has made keynote presentations on materials performance and degradation at many international conferences and symposia and has presented invited lectures on these subjects at major universities such as MIT, Stanford and the University of California.

## **Dr. Peter Scott**

Peter Scott received his B.Sc. in chemistry from the University of Sheffield in England in 1965 and his Ph.D. in physical chemistry from the same university in 1968. He spent two years as a Post Doctoral Fellow in the Department of Applied Chemistry of the National Research Council of Canada before starting his career in the nuclear industry in the Materials Development Division at the Harwell Laboratory of the UKAEA. During 18 years at Harwell, he became a section head and a recognized expert in corrosion of metallic materials, particularly concentrating on the phenomena of corrosion fatigue and stress corrosion cracking in thermal and fast reactor systems. He entered the Framatome Group in 1989 and was named 'Expert Principal' (or Senior Corrosion Consultant) in 1993. In this capacity, he represents the company on several international working groups dealing with problems of stress corrosion cracking of materials in light water reactors. He is also a member of the editorial board of the NACE Corrosion Journal. He received the 2000 F. N. Speller Award from the NACE for outstanding contributions to the practice of corrosion engineering. He is the author or co-author of over 80 scientific publications.

Dr. Scott's work areas include stress corrosion cracking and corrosion fatigue of pressure vessel steels and piping of nuclear power stations and other non-nuclear structures, areas in which he directed research work on safety and reliability during his period with the UKAEA.

Stress corrosion cracking of steam generator components, reactor core internals and other components of both PWRs and BWRs are topics on which he has contributed in establishing, presenting and defending dossiers justifying the continued operation of nuclear power plants as well as directing research work on these topics. He assists the Fuel Division resolve corrosion problems in fuel assemblies.

Dr. Scott's network of contacts include EDF, CEA, ENS des Mines de Paris et St. Etienne, FTI, EPRI, NRC, Westinghouse, General Electric, PNNL, University of Michigan, AECL, AEA Technology, Rolls Royce, British Energy (Nuclear Electric), Laborelec, Tractebel, Vattenfall, SKI, Studsvik, Mitsubishi, Kansai Electric, Hitachi, Toshiba, TEPCO, NHI, JAERI, China Institute of Atom Energy, and the Shanghai Research Institute of Materials.

## **Dr. Tetsuo Shoji**

Dr. Shoji received his Bachelor's (1970), Master's (1972) and Doctoral degrees (1975) from school of Engineering, Tohoku University, Japan.

His current position at Tohoku University is Executive Director and Vice President since April 1, 2005. He also worked as Director of the Center for Mechanical Science Based on Nanotechnology. After receiving his doctoral degree from Tohoku University, he was appointed as a Research Associate in 1975, Associate Professor in 1983, and full Professor in 1989 of Tohoku University. During that time, he also served as a Visiting Scientist in the Department of Metallurgy and Materials Engineering at the University of Newcastle Upon Tyne, UK, from May 1982 to August 1983 and as a visiting professor in the Department of Nuclear Engineering at Massachusetts Institute of Technology, USA, from April to September, 1994.

He led the Center of Excellence Program on the Physics and Chemistry of Fracture and Failure Prevention under Combined Environments as a Program leader from 1998 to 2003. He is also serving as program leader of the 21st Century Center of Excellence Program on the Exploration of the Frontiers of Mechanical Science Based on Nanotechnology from October 2003 to March 2008. Since November of 2002, he has been serving as an acting committee member of the Nuclear and Industrial Safety Agency, METI, Ministry of Economy, Trade and Industry regarding the Integrity Assessment of Nuclear Power Plants, Evaluation of Codes and Standards Work Group, and the Inspection Technology Advancement Work Group.

His research area covers mechanistic study of environmentally assisted cracking in LWR environments with a combination of mechanics and mechanisms. Among the honors he has received are the A. B. Campbell Award for Young Authors from the National Association of Corrosion Engineers, USA (1977), Honorary member of the Russian International Academy of Engineering (1995), the W. R. Whitney Award, NACE International (1998), the ASTM Division Award for Annual Best Paper published in JTEV (Journal of Testing and Evaluation), ASTM International (2001), and the First Prime Award during the competition on fundamental investigations from the Institute of Theoretical and Applied Mechanics SB, Russian Academy of Science (2003).

## **Dr. Roger Washburne Staehle**

Dr. Staehle received his bachelor's and master's degrees from Ohio State University in 1957, attended Westinghouse Reactor Engineering School in 1959, and received his Ph.D. from Ohio State University in 1965.

Currently a resident of North Oaks, Minnesota, Dr. Staehle has served as a Naval Officer and Nuclear Engineer with the U.S. Navy and the U.S. Atomic Energy Commission (with Vice Admiral H.G. Rickover) Naval Nuclear Reactor Development, 1957-1961. From 1965 to 1970 he was an Associate Professor at Ohio State University, was Director and Founder of the Fontana Corrosion Center from 1975 to 1979, Dean of the University of Minnesota Institute of Technology from 1979-1983, and a Professor of that University's Chemical Engineering and Materials Science Department from 1983 to 1988. From 1984 to 1986, he was President and Chairman of Automated Transportation Systems, Inc. (now Taxi-2000).

Dr. Staehle currently serves as an Adjunct Professor at the University of Minnesota (since 1988) and as an Industrial Consultant (since 1986). Among the honors he has received are as a Le Hsun Lecturer, Institute of Metals Research, Shenyang, China, October 2004, as a Plenary Lecturer, Corrosion 2004 in New Orleans, the Electrochemical Society (ECS) Fellow Award, 2000, the TMS Meeting, "Chemistry and Electrochemistry of Corrosion and Stress Corrosion," held in his honor, New Orleans, February 2001, the NACE Fellow Award (first group of fellows), 1993, the NACE T.J. Hull Award, Corrosion'92, Nashville, TN, the Distinguished Alumnus, The Ohio State University, College of Engineering, April, 1989, the Willis Rodney Whitney Award from NACE for Outstanding Contributions to Corrosion Research, 1980, the Research in Progress meeting of NACE special award (1979) for organizing the first conference. He was elected to the National Academy of Engineering in 1978, was named International Nickel Professor of Corrosion Science and Engineering, 1971-1976, was named ASM Fellow (first group of fellows), 1975, received three awards for achievement (1966, 1969 and 1970) from the College of Engineering, received the Ohio ASEE Award for Innovative Teaching, 1975, and has given Plenary Lectures at International Congresses (quadrennial) on Metallic Corrosion in Amsterdam (1968), in Sidney (1972) and in Tokyo (1976).

He has published numerous edited volumes, major review articles and technical reports, served as Editor of *Corrosion Journal* 1971-1979, and as Editor of *Advances in Corrosion Science and Technology*. He has served on the Board of Directors of such organizations as Data Card Corporation, Donaldson Company, Inc, Teltech, Inc., Great Northern Iron Ore Properties, and Taxi 2000.

## **Dr. Robert L. Tapping**

Dr. Tapping received a B.Sc. (Hons) in Chemistry, and a PhD in Physical Chemistry, from the University of British Columbia, in Vancouver, Canada, in 1968 and 1972, respectively. Dr. Tapping's specialty was in the areas of magnetic resonance spectroscopy and in electron spectroscopy of surfaces and surface reactions, and he pursued this line of research whilst doing two post-doctoral fellowships.

In 1976 Dr. Tapping joined Alcan Research in Kingston, Ontario, Canada, where he specialized in applications of electron spectroscopy to aluminum corrosion, and provided inputs into corrosion consulting and new alloy developments for aluminum alloys. In 1979 Dr. Tapping joined Atomic Energy of Canada's Chalk River Laboratories as a corrosion specialist, focusing on aluminum alloy corrosion in research reactors, and also on heat exchanger materials corrosion, including condenser degradation issues. Over the next 10 years Dr. Tapping took over the R&D programs related to steam generator materials degradation, and later, on zirconium alloy corrosion in-reactor. He was also involved in applications of plastics and elastomers in reactor systems, and in maintaining awareness of new materials applications, and ensuring that AECL's corrosion-related R&D programs were complementary to those elsewhere. Part of this focus was to ensure that electrochemical and surface science capabilities and applications to corrosion R&D at AECL were "state-of-the-art". More recently Dr. Tapping has focused on carbon steel corrosion, particularly flow-accelerated corrosion and cracking of carbon steels under CANDU reactor conditions. Currently Dr. Tapping is Acting Director of the Components and Systems Division within AECL, responsible for a wide range of chemistry, materials and engineering applications of relevance to CANDU reactor technology. Dr. Tapping acts as a corrosion consultant for AECL on a wide variety of materials and chemistry issues.

Dr. Tapping has published more than 250 papers and reports on corrosion and surface science, and has made many presentations to external groups. He represents AECL on many national and international committees, and has won a number of awards for his work, most notably election as a Fellow of the Chemical Institute of Canada. He is also a member of ASTM and NACE. Dr. Tapping currently focuses on plant life management and health monitoring technologies, attempting to integrate AECL's many years of chemistry and materials R&D knowledge into practical guidelines and technologies for plant applications.