Curriculum Vitae
Fred H. Hua

EDUCATION

Ph.D:	Nov. 1998	Department of Materials Sci. & Eng., McMaster University, Hamilton, Ontario, Canada
	Major:	Materials/Corrosion Science & Engineering
M.Eng. Study:	Sept. 1991 - Jan. 1993	Faculty of Engineering, Memorial University of Newfoundland, St. John's, Newfoundland, Canada
	Major:	Corrosion Fatigue and Hydrogen Embrittlement
B.Eng:	Dec. 1981	Department of Chemical Engineering, Hunan University, Changsha, Hunan, P. R. China
	Major:	Electrochemistry and Corrosion

EMPLOYMENT

August 1998 – Present:	**Senior Research Engineer** Research and Development Division, McDermott Technology, Inc. (MTI), Alliance, OH, **USA**
Sept.1993-July 1998:	**Teaching and Research Assistant** Department of Materials Science & Engineering, McMaster University, Hamilton, Ontario, **Canada**
Jan. 1992-Jan.1993:	**Teaching and Research Assistant** Department of Mechanical Engineering, Memorial University of Newfoundland, St. John's, Newfoundland, **Canada**
Jan.1988-Sept.1991:	**Research Engineer** Shanghai Research Institute of Materials (SRIM), Shanghai, **P. R. China**
July 1987-Jan.1988:	**Visiting Researcher** Department of Metallurgical, Mechanical and Manufacturing Engineering, University of Newcastle-upon-Tyne, Newcastle-upon-Tyne, **England**

Feb.1982-July1987: **Assistant Research Engineer**
Shanghai Research Institute of Materials (SRIM), Shanghai, **P. R. China**

RELEVANT SKILLS AND ACCOMPLISHMENTS

Applied Research

- Studied hydrogen embrittlement of Ti Grade 7 in nuclear waste repository environments (Yucca Mountain Project, DOE, USA).
- Studied flow assisted corrosion (FAC) for nuclear and fossil power plant materials (B&W, Canada).
- Studied the effect of reducible metal oxides on OTSG (once-through steam generator) SCC
- Studied the low NO_x corrosion of water-wall coating & materials (Chromized, Chromeplex® and DiffuseAlloy®) (B&W, USA).
- Worked on corrosion fatigue of boiler tube materials in AVT environment (EPRI, USA).
- Studied corrosion problems of carbon steel 3000 meters below the sea level in CO_2 sequestration application (4,400 psi, 0~2°C, liquid CO_2, Clathrate and seawater mixture, in-situ monitored pH) (CO_2 Management, DOE, USA).
- Studied corrosion of high-level nuclear waste disposal package materials (stainless steels, titanium alloys, nickel alloys) (Yucca Mountain Project, DOE, USA)
- Studied lead (Pb) assisted/induced SCC in nuclear steam generator environments (nickel alloys) (B&W, Canada).
- Studied silicon (Si) induced SCC in nuclear steam generator environment (nickel alloys) (B&W, Canada).
- Reviewed the corrosion failure of interconnects materials in fuel cell applications (Intergran)
- Reviewed the corrosion failure of nuclear valve materials (Intergran, Canada).
- Studied low-pH SCC of pipeline steels by rising-load methods (GRI, USA).
- Developed static and dynamic high temperature aqueous electrochemistry and Slow-Strain-Rate-Test combination system and applied to nuclear materials testing (MTS/Instron type) (SRIM, China).
- Experimented SCC of sensitized/welded Type 316 and Type304 stainless steels in high temperature water and suggested an alternative crack initiation mechanism (University of Newcastle-upon-Tyne, UK).
- Studied corrosion and cracking behavior of weldment of carbon steels and low alloy steels used in petrochemical, oilfield and refinery industries (SRIM, China).
- Developed a straining hydrogen permeation technique for corrosion fatigue study of offshore structural steels under cathodic protection (Memorial University of Newfoundland, Canada).

- Studied H_2S stress corrosion cracking in petrochemical and oilfield industry environments (SRIM, China).
- Developed quantitative surface sensitive analysis techniques (XPS, SEM and AES) and used the techniques to study the effect of alloying elements Cr, Ni and Mo on properties of ferritic stainless steels (SRIM, China).

Project Management

- Managed projects with annual funding from $3,000 (RMB) to $1,500,000 (US) with up to 11 engineers and technicians from all levels.
- Principal researcher of the project "The Techniques for Testing and Characterization of Environmental Sensitive Cracking for Engineering Materials in High Temperature and High Pressure Water Environment in Nuclear Industry", leading to a 2nd Class “Advancement in Science and Technology Award” in 1992/1993 (Chinese National Committee of Science & Technology).

Laboratory Skills

Failure Analysis Corrosion Environmental Sensitive Cracking Joining Metallurgy High Temperature Corrosion and Creep Materials Selection and Characterization Corrosion and Mechanical Laboratories Metallurgy and Metallography High Temperature Aqueous Electrochemistry in Autoclave and Pressure Vessels Surface Sensitive Analysis (XPS, AES, RBS, SIMS, SEM, EDS, XRD, etc) Electrochemical Techniques (DC, AC, Polarization Resistance, EIS, Micro-Electrode Techniques and Voltammetry) Materials worked on include Carbon and Low Alloy Steels, Stainless Steels, Nickel Alloys, Aluminum Alloys, Zirconium and Zircaloy, Titanium Alloys and Cobalt Alloys.

Language:

Fluent in English and Chinese; Reading level of Japanese.

Training

- Trained in ISO9001, SPM (Standard Practice Manual), STOP (Safety), NQA (Nuclear Quality Assurance), OCRWM (Office of Civilian Radioactive Waste Management) Quality Program, MTI Ethics, Compliance and Self-Governance programs.

Professional Affiliation:

Member of National Association of Corrosion Engineers (NACE International), Houston, Texas.