RAS M_187

NEC-JH_02

Curriculum Vitae for Dr. Joram (Joe) Hopenfeld

1724 Yale Pl., Rockville, MD 20850

Tel: 301 340 1625

A. Professional Expertise: **Nuclear Safety and Licensing** (design basis/severe accidents) **Thermal/Hydraulics, Materials/Environment Interaction** (corrosion, erosion, stress corrosion, fatigue) **Radioactivity Transport, Industrial Instrumentation and Environmental Monitoring.**

B. Current Position - CEO, Noverflo, Inc

C. Education - Engineering- University of California at Los Angeles: BS 1960, MS 1962, Ph.D 1967.

D. Summary of Work Experience

1. Nuclear Plant Related Experience

I have 45 years of experience in industry and government primarily in the areas of thermal hydraulics, materials, corrosion, radioactivity transport, instrumentation, PWR steam generator testing and accident analysis. I have managed major international programs on steam generator performance during accidents involving various thermal transients. Following a decade of studies and debates and Advisory Committee on Reactor Safety hearings, the Nuclear Regulatory Commission, ("NRC") adopted my position regarding the safety implication of steam generator tube degradation. In 2001 the NRC launched a five-year major program on the effects of steam generator tube aging on core melt. I have consulted to law firms and citizen groups regarding Steam Generators, Thermal Hydraulics, Corrosion , and Material Fatigue in connection with license renewals and a power upgrades.

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2. Non Nuclear Related Experience

I am the owner and the CEO of a small Maryland company, Noverflo, Noverflo is developing advanced fiber optic sensors for the oil & gas and the environmental monitoring industries. In 2004 Noverflo has completed a three year program which was sponsored by the U.S. Department of Energy. The program produced a new system for automatic tank gauging, which will be presented at the 2006 National Petrochemicals and Refiners Association Maintenance Conference.

In 1994-1996 Noverflo has developed and commercialized a shutoff valve for fuel tanks to comply with new EPA regulations.

E. Brief Employment History

A. *Recent Consulting*

1. Winston & Strawn , 1400 L St. Washington D.C

2001

Provided assistance in connection with the February 2000 steam generator event at Indian Point.

2. C-10 Research and Education Foundation, Inc. 44Merrimac St. Newburyport, MA

2002-2003

Provided assistance in the preparation of a 2.206 petition to the NRC and other matters in connection with steam generator problems at the Seabrook Station

3. California Earth Corps (Sabrina D. Venskus, Attorney at Law, Santa Monica, CA)
2005

Provided testimony to the Public Utility Commission of the State of California on behalf of California Earth Corps in connection with the San Onofre steam generator replacement project.

4. New England Coalition (Raymond Shadis, Edgecomb, Maine 04556)

2005-2006

Technical consultant and expert witness in connection with Vermont Yankee power uprate and life extension hearings before the **Atomics Safety and Licensing Board.** Prepare contentions and testify before the Board.

B. Industry and Government Employment

1962- 1971 –Corrosion testing of materials for the design and operation of liquid metal cooled nuclear reactors. Modeling Transient Boiling in water and sodium. Modeling Sodium Fires. Modeling destruction of SNAP fuel rods on reentry into the earth atmosphere. Atomics International, Canoga Park, Calif.

1971- 1973- Participated in the resolution of design issues as related to material behavior in the Breeder reactor environment. Atomic Energy Commission

1973 – 1978 Project Manager for the safety evaluation and testing of steam generators for liquid metal reactors. Managed the development of thermal –hydraulic computer codes such as COBRA. ERDA/Department of Energy. Responsible for testing material compatibility and cavitation damage in sodium. Development of acoustic leak detection systems for sodium/water reactions.

1978 – 1982 Project Manager for the development of materials and instrumentation for high temperature steam generators for fossil plants. Responsible for the resolution of issues relating to corrosion/erosion and NOx /SOx emissions, Department of Energy.

1982 – 2001 Program manager for the resolution of various, thermal hydraulics, material corrosion and safety issues primarily in relation to PWR steam generators. Nuclear Regulatory Commission.

Publications

In addition to numerous reports, I have published 15 papers in peer-reviewed technical journals in the areas of thermal-hydraulics, corrosion/ erosion, steam generator dose releases during accidents, steam explosions, sensors and ECM machining.

Peer Reviewed

1 "New Fiber Optic Based Technology for Automatic Tank Gauging", **Sensors** ,December 2006

2. "Distributed Fiber Optic Sensors for Leak Detection In Landfills", Proceeding of SPIE Vol 3541 (1998)

3. "Continuous Automatic Detection of Pipe Wall Thinning", ASME Proceedings of the 9th, International Conference on Offshore Mechanics and Arctic Engineering. Feb. 1990

4 "Iodine Speciation and Partitioning in PWR Steam Generators", Nuclear Technology, March 1990

5. Comments on "Assessment of Steam Explosion Induced Containment Failures" Letter to the Editor, Nuclear Science and Engineering, Vol. 103, Sept. 1989

6. "Experience and Modeling of Radioactivity Transport Following Steam Generator Tube Rupture", Nuclear Safety, 26,286, 1985

7. "Simplified Correlations for the Predictions of Nox Emissions from Power Plants". AIAA Journal of Energy, Nov.-Dec., 1979

8. "Grain Boundary Grooving of Type 304 Stainless Steel in Armco Iron Due to Liquid Sodium Corrosion", Corrosion, 27, No.11, 428, 1971

9. "Corrosion of Type 316 Stainless Steel with Surface Heat Flux in 1200 Flowing Sodium", Nuclear Engineering and Design, 12; 167-169, 1970

10. "Prediction of the One Dimensional Cutting Gap in Electrochemical Machining", ASME Transaction, J. of Engineering for Industry, p100 (1969)

11. "Electrochemical Machining- Prediction and Correlation of Process Variables", ASME Transactions, J. of Engineering for Industry, 88:455-461, (1966)

12. "Laminar Two-Phase Boundary Layers in Subcooled Liquids", J. of Applied Mathematics and Physics (ZAMP), 15, 388-399 (1964)

13. "Onset of Stable Film Boiling and the Foam Limit", International j. of Heat Transfer and Mass Transfer, 6; 987-989 (1963)) (co-author)

14 "Operating Conditions of Bubble Chamber Liquids", The Review of Scientific Instruments, 34, 308-309. (1963); co-author

15. "Similar Solutions of the Turbulent Free Convention Boundary Layer for an Electrically Conducting Fluid in the Presence of a Magnetic Field," AIAA J. 1:718-719 (1965)

Not Peer Reviewed (Very Recent Publications Only)

New Fiber Optic Based Technology for Automatic Tank Gauging (ATG), NPRA – 2006 Reliability and Maintenance Conference

Automatic Tank Gauging: A New Level of Accuracy; A New Device Promises Greater Accuracy for Custody Transfer by Combining Fiber- Optic Sensing with a Pressure. Sensors Magazine, 12/01/06

PlasticOptical Fibers Sensors for Industrial Process Controls and Environmental Monitoring

List of Patents

1. Automatic Shut-Off Valve for Liquid Storage Tanks, 5,522,415
2. Method and Apparatus for Detecting the Presence of Fluids, 5,200,615
3. Sensors For Detecting Leaks, 5,187,366
4. Method for Monitoring Thinning of Walls and Piping Components 4,922,74
5. Method for Monitoring Thinning of Pipe Walls, 4,779,453
6. Looped Fiber Optic Sensor for the Detection of Substances (5,828,798)
7. Coated Fiber Optic Sensor for The Detection of Substances (5,982,959)
8. Method and Apparatus for Analyzing Information of Sensors Provided Over Multiple Waveguides (6,870,607)

Honors

1. Engineer of Distinction – Published by Engineers Joint Council
2. American men and Women in Science
3. The Blackwall Award for Machine Tools
4. Member Sigma-Xi

Professional Activities

1. Reviewed papers for the ASME Journal and the Journal of Sensors and Actuators
2. Taught a class on Diesel Engines at Montgomery College, Rockville, MD.
3. Served as a member of a Railroad Committee that development a standard for locomotive Fueling
4. Funded and sponsored research and development work at the Engineering Department of the University of Virginia. The research produced a novel method of measuring pipe wall thinning from erosion/corrosion