FOWLER INC.

METALLURGICAL ANALYSIS
FAILURE ANALYSIS &
EXPERIMENTAL TESTING

13707 Cimarron Avenue
Gardena, CA 90249
(310) 329-8300
FAX (310) 329-0043
Email: Fowlerinc@ aol.com

CURRICULUM VITAE

MICHAEL NEFF, Science Masters (SM)
METALLURGICAL ENGINEER

Michael Neff has over twenty-seven years of experience in metallurgy and materials analysis and failure analysis. Mr. Neff received his Bachelor's of Science (SB) in Metallurgy and Materials Science and Masters of Science (SM) degree in Materials Engineering from the Massachusetts Institute of Technology (MIT) in 1977. His Master's thesis addressed fundamental addressed fundamental aspects of directional solidification and plane front eutectic growth in ternary alloys. Mr. Neff was the supervisor of the Metal Crystal Growth Facility and passed the doctoral qualifying exams in materials engineering before leaving MIT in 1980. Mr. Neff developed process metallurgy for advanced welding materials for corrosion and wear resistance at Stoody Company. Since 1983, Mr. Neff has analyzed thousands of components and mechanical systems for metallurgical structure and properties, fracture mode, corrosion, and environmental attack. During this time, Mr. Neff has developed expertise in many analytical and microanalytical techniques, commonly used in failure analysis, and has taught university and professional classes in the use of these techniques. In the last ten years, Mr. Neff has developed specialized expertise in failure analysis of concrete and soils. He operates a specialized laboratory, Chemistry of Concrete, to perform most of the ASTM chemical methods used to evaluate concrete deterioration and other construction materials.

SPECIALIZED PROFESSIONAL COMPETENCE:

Materials Engineering and Failure Analysis; Corrosion and Failure of Metals, Ceramics, and Concrete; Fracture Surface analysis (fractography)

EXPERIENCE:

MICHAEL NEFF ASSOCIATES – Culver City, CA
President, 2000 to Present
MNA was formed in 2000 to provide Materials Engineering consulting and specialized testing for the industrial, commercial, and legal professions. Excellence in SEM and X-ray Spectroscopy.

CHEMISTRY OF CONCRETE – Goleta, CA
Partner, 2000 to Present
C of C is a fully equipped laboratory for the chemical analysis of mineral, cementitious, and soil materials. Our staff is experienced in forensics supporting the construction and legal professions and our laboratory is well equipped for analysis of cement, concrete, stucco, gypsum and lime products.

SEAL LABORATORIES - El Segundo, CA
Senior Member Technical Staff, Materials Science, 1984-2000
SEAL Laboratories is an internationally recognized failure analysis laboratory, consulting to Industrial, Scientific, and Legal clients. As a senior scientist, served as a primary consultant in Failure Analysis,

with direct technical and budget responsibilities. Duties included metallurgical, ceramic/cementitious, electronic, and polymeric failure analysis, materials characterization, and contamination/corrosion studies. Testified frequently as an expert witness in product liability and patent cases.

STOODY COMPANY - Los Angeles, CA
Consultant, Solidification Science and Metallurgy 1980-83
Responsible for data acquisition and process modeling on a high temperature continuous casting process. Also provided metallurgical expertise and supported manufacturing efforts.

UNIVERSITY OF SOUTHERN CALIFORNIA - Los Angeles, CA
Instructor, Mechanical Engineering & Materials Science 1980-1985
Courses Taught:
Undergraduate Level: Introduction to Materials, Fluid Mechanics
Graduate Level: Solidification Processing

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - Cambridge, MA
Research Associate & Metal Crystal Growth Laboratory Manager, 1977-80
Managed research labs and assisted in experimental design for graduate students in solidification science. Independent research funded by NASA. Awarded certificate of merit by NASA for innovation in the development of a high gradient crystal growth process. Developed γ/ γ'- δ Nickel Based Superalloys.

EDUCATION:

Science Masters (SM) 1977	Materials Engineering, Specializing in Solidification Science: MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA
Science Bachelors (SB) 1977	Materials Science & Engineering: MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

PROFESSIONAL SOCIETIES - AFFILIATIONS:

International Metallographic Society (IMS): Member (1989-Present)
ASM International (formerly American Society for Metals): Member (1989-Present); Los Angeles Chapter Advisory Committee (1989-91); National Chapter Operations Committee (1989-91); Los Angeles Chapter Chairman (1988-89).
ASTM, Voting Member of Committee C09-65, Petrography
American Concrete Institute (ACI): Member (1998-Present)
Microprobe Analysis Society (MAS): Member

SEMINARS/COURSES:

Electron Microscopy in Failure Analysis: Instructor from 1984 to 1998. This one-week intensive course has been conducted bi-annually since 1984. Attendees come from across the U.S.

Principles of Failure Analysis: Instructor for the Materials Engineering Institute. This course has been taught yearly since 1998 to employees of NASA Kennedy Space Center and at Materials Park, OH.

PUBLICATIONS:

“A New Furnace for High Gradient Directional Growth", in **Proceedings of The Metals Research Society**, Boston, 1978.

"The Growth and Morphology of Directionally Solidified Nickel-Based γ/γ'-δ Superalloys", in **Metallurgical Transactions B**, September, 1978.

"In-Situ" Multi filamentary Superconducting Wires Fabricated Using a Controlled High Temperature Gradient", in **Applied Physics Letters**, 35 (9), November 1979.

"The Role of Electrical Insulation in Electrochemical Degradation of Terrestrial Photovoltaic Modules", in **The Insulation Journal of the IEEE**, December, 1985.

"Fiber-Matrix Interface Characteristics of CVD Processed Silicon Carbide Matrix Composites", in **Proceedings of the 10th Annual Conference on Composites and Advanced Ceramics Materials**, Engineering Ceramics Division (closed session), American Ceramics Society, Coca Beach, Florida, January, 1986.

"The Advantages of Microgravity in the Production of Semiconductor Materials", in **Proceedings of the American Chemical Society Conference, Emerging Technologies Symposium**, September 1986.

"Quantitative Analysis of Thin Layers Using Microanalytical Techniques", in **ISTFA 1986**, October 1986.

"Localized Hydrogen Attack in Welded Commercially Pure Titanium", in **ISTFA 1986**, October 1986.

"Testing and Analysis of Photovoltaic Modules for Electrochemical Corrosion", in **ISTFA 1986**, October 1986.

"The Use of Microanalytical Techniques for Failure Analysis and Problem Solving", in **Failure Analysis and Prevention**, Volume 11 of the 9th Edition of **Metals Handbook**, November 1986.

"Mode III Fatigue Crack Growth Following the Curvature of the Heat Affected Zone of a Type 321 Stainless Steel Spot Weld", in **Handbook of Case Histories in Failure Analysis**, Volume 1, December 1992.

"Failure of Stainless Steel Springs Used in an Oil Ring Lip Seal", in **Handbook of Case Histories in Failure Analysis**, Volume 1, December 1992.

“Dezincification Influenced by Stray Currents”, in **Microstructural Science, Vol. 25, The Role of Characterization in Understanding Environmental Degradation of Materials**, IMS Conference Proceedings, 20-23 July, 1997.

“Failure Analysis of Small Gap Brazing of a Stainless Steel Heat Exchanger”, in **Microscopy and Microanalysis 2002 Conference Proceedings**, 4-8 August, 2002.