

Exponent®
Engineering & Scientific Consulting


# Bryan Templeton, Ph.D., P.E.

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## Professional Profile

Dr. Templeton is a Metallurgical / Materials Engineer that specializes in failure analysis and failure investigation of complex structures, equipment, components, and devices. He has specific expertise in fractographic examination, fracture mechanics, corrosion analysis and assessment, engineering analysis, as well as materials characterization, defect detection, and degradation mechanism identification for a large variety of materials.

Dr. Templeton excels at explaining complex scientific concepts and analysis methodologies to any level of academic understanding. He has extensive experience providing litigation support and testimony in complex legal matters. He has an advanced academic and theoretical background combined with practical metals production and quality control experience in manufacturing environments.

Dr. Templeton regularly acts as the lead investigator for large complex failures across a diversity of industries, equipment, and components. Highlight projects include multiple off-shore oil rig failures, a nitric acid plant explosion, the I-5 Skagit River bridge collapse, a hops extract plant explosion, multiple pipeline bursts and failures, a wind turbine failure and fire, and innumerable plumbing component failures. In addition, Dr. Templeton has extensive experience in materials analysis for construction defect claims involving a variety of building system components and large financial losses. He has been the lead testifying expert for structural materials failures that led to injury and loss of life. He has investigated many piping and pipeline leaks, ruptures, and explosions that led to significant property damages and financial impacts. Dr. Templeton also has specific experience in sprinkler pipe system failure investigations and corrosion assessments.

Academic achievements include investigation and characterization of aqueous corrosion processes and resultant corrosion oxide morphologies on steel bolt fracture surfaces, fundamental research into causality and mitigation techniques to prevent primary water stress corrosion cracking in alloy 600 components, and optimization of hard magnetic properties in Nd-Fe-B magnets through controlled chemistry annealing experiments on nano-crystalline amorphous alloys.

## Academic Credentials & Professional Honors

Ph.D., Metallurgical and Materials Engineering, Colorado School of Mines, 2010

M.S., Metallurgical and Materials Engineering, Colorado School of Mines, 1998

B.S., Metallurgical and Materials Engineering, Colorado School of Mines, 1996

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## Licenses and Certifications

Professional Engineer, Colorado, #PE.0038980

Professional Engineer Metallurgical, Idaho, #P-16566

Professional Engineer Metallurgical, Washington, #44080

## Academic Appointments

Adjunct Lecturer, Materials Science & Engineering Department, University of Washington, 2008

## Prior Experience

**Director, Metallurgical / Materials Engineering, Jensen Hughes, 2016 – 2020**

Principal Metallurgical and Materials Engineer providing technical and litigation support to insurance companies, general industry, and the legal profession. Lead for failure analysis and forensic engineering investigations to determine the root cause of a wide range of system failures from large scale structural failures involving tens of millions of dollars of property damage to small residential failures. Experienced in fractographic analysis, fracture mechanics, materials testing, mechanical analysis, materials characterization, corrosion analysis, and standards and code review. Specialized in piping failure investigations – both above ground and buried piping failures, joint failures, weld failures, bolt failures, corrosion failure investigations, metal component failures, and fundamental research. Experienced with product design, manufacturing processes, and assembly review.

**Principal, Metallurgical / Materials Engineer, CASE Forensics, 2007 – 2016**

Principal Metallurgical and Materials Engineer providing technical and litigation support to insurance companies, general industry, and the legal profession. Lead for failure analysis and forensic engineering investigations to determine the root cause of a wide range of system failures from large scale structural failures involving tens of millions of dollars of property damage to small residential failures. Experienced in fractographic analysis, fracture mechanics, materials testing, mechanical analysis, materials characterization, corrosion analysis, and standards and code review. Specialized in piping failure investigations – both above ground and buried piping failures, joint failures, weld failures, bolt failures, corrosion failure investigations, metal component failures, and fundamental research. Experienced with product design, manufacturing processes, and assembly review.

**Consultant, Structural Integrity Associates, Inc., 2002 – 2007**

Technical Lead and Project Manager for a variety of projects covering a wide range of engineering disciplines and industries including: failure analysis, litigation support, pipeline metallurgy, corrosion analysis, welding failures, probabilistic leak rate predictions for both buried and above ground piping systems, high temperature damage analysis of steelmaking components, fundamental research into mitigation techniques to prevent primary water stress corrosion cracking in alloy 600 components, pressure-temperature curve development for nuclear reactors, developing alternative cool-down curves for nuclear reactor vessel shutdown procedures, and fracture mechanics.

**Cold Mill Metallurgist – Galvanizing Line, Nucor Steel Berkeley, 2000 – 2002**

Quality and technical expert for a 500,000 ton per year, appliance grade, hot-dip galvanizing line. Responsible for product development, product dispositioning, customer technical support, order setup, scheduling. In charge of product inspection, defect detection and elimination, process optimization, and ISO 9000 quality system procedure development and implementation. Managed a team of four inspectors

and testers.

**Quality Engineer – Hot Strip Mill, U.S. Steel Gary Works, 1999 – 2000**

Directed the quality department of the Gary Works Hot Strip Mill, a six million ton per year facility. Responsible for product dispositioning, process, optimization, defect detection and elimination, scheduling enhancement, and customer satisfaction. Supervised two union technicians and one metallurgical trainee.

**Staff Associate – Hot Strip Mill, U.S. Steel Gary Works, 1999**

Involved in hot strip mill defect detection, classification, analysis, and elimination. Highlight project: Identified roughing mill scale defect origin and initiated a program to radically improve diverted tons from approximately 2000 tons per month to less than 300 tons per month.

**Staff Associate – Steelmaking Projects, U.S. Steel Gary Works, 1998 – 1999**

Initiated several projects to improve process control of steelmaking and casting in the steelmaking facilities. Highlight project: Elimination of transverse face cracks in HSLA steel grades for line-pipe applications, affecting more than 50,000 tons of cast product monthly.

**Research Assistant – Masters' Thesis Project, Colorado School of Mines, 1996 – 1998**

Optimization of rare-earth magnetic powders for the bonded magnet market. Heat-treating of amorphous rare-earth powders produced by melt-spinning. Microstructural characterization of annealed alloy powders by X-ray diffraction and Mössbauer spectroscopy. Optimization of magnetic properties by refractory metal doping to maintain nanocrystalline microstructure. Research sponsored by Rhône-Poulenc Basic Chemicals.

**Teaching Assistant, Colorado School of Mines, 1996 – 1997**

Junior Level Thermodynamics, Dr. Hager, Fall 1996

Mineral Processing Lab, Dr. Yarar, Fall 1996

Senior Level Steels, Dr. Krauss, Spring 1997

Junior Level Chemical Processing of Materials, Dr. Hager, 1997

**Senior Thesis, Colorado School of Mines, 1995 – 1996**

Developed a technique to heat treat and characterize amorphous rare-earth magnetic powders. Research sponsored by Rhône-Poulenc Basic Chemicals.

Metallurgical Process Engineering Intern, Rhône-Poulenc Basic Chemicals, 1995

Designed equipment to discern liquidus points for rare-earth magnetic alloys. Analyzed rare-earth fluorides as part of a quality control study to improve alloy purity. Investigated methods to improve process times by varying alloy cooling atmospheres. Developed building and machinery schematics for expanding plant capacity.

Additional Skills and Experience

Materials Lab Experience: Fractography, SEM, TEM, EDS, AAS, XRD, Mössbauer spectroscopy, FTIR

Spectroscopy, DSC, TGA, Tensile Testing, Charpy and Izod Impact Testing, Hardness Testing, Microhardness Testing, SSRT, Combustion Infrared Absorption, and Metallographic Preparation.

## Professional Affiliations

ASM International, The Materials Information Society (ASM)

National Association of Corrosion Engineers (NACE)

## Publications

Templeton B. How to Prevent Corrosion in Fire Sprinkler Systems. Building Operation Management, 2017.

Templeton B. Investigation of Steel Bolt Fracture Surface Aqueous Corrosion Oxides Considering the Effects of Multiple Environmental Variables. PhD Thesis, Colorado School of Mines, 2010.

Lewis K, Templeton B, Challman T, Eigner B, Fordyce A. Electrical Arcing and the Law. Fire and Materials 11th International Conference and Exhibition, 2009.

Templeton B, Lewis K. Morphological Variation in Copper Arcs During Post-Arc Fire Heating. The International Symposium of Fire Investigation Science and Technology, University of Cincinnati, Cincinnati Ohio, 2008.

Templeton B, Microstructural Characterization of Rapidly Quenched and Annealed Nd-Fe-B Hard Magnetic Alloys Using Mössbauer Spectroscopy and X-Ray Diffraction. Master's Degree Thesis, Colorado School of Mines, 1998.

**Selected Presentations**

Templeton B, Ramey S, Farnam K. Canary in a Billion-Dollar Coal Mine Pursuing Subrogation in Plastic Plumbing Failures, NASP Annual Conference, Colorado Springs, 2023.

Templeton B. Plastic Pipe Failures in Domestic Water Systems. NAREIM Architecture & Engineering Conference, Chicago, 2023.

Templeton B, Slavik J, Farnam K. Cracking of Plumbing Components & Subrogation of Cracked Plumbing Components. Cozen O'Connor Subrogation & Recovery Department Webinar, 2021.

Templeton B, Gramann P. Plastic Parts that are Flooding our Homes and Businesses – Case Studies. NASP Webinar, 2020.

Templeton B, Skaf L. I Fall to Pieces: Investigating Microbiologically Influenced Corrosion. NASP 2020 Virtual Spring Conference, 2020.

Templeton B, Smith W, Sheaffer R. Product Claims in Construction Defect Litigation - Predicted Failure Claims, a panel discussion. Claims and Litigation Management Alliance Washington State Chapter, Made in the Northwest Continuing Education Workshop, Seattle, WA, 2015.

Templeton B, Clark R, Lieber HL. Yellow Brass - What is it? How does it Fail? Incompatibility Issues and Class Actions. Washington Defense Trial Lawyers Association, Construction Law Seminar, Seattle, WA, 2014.

Templeton B, Lewis K, Liebman M. Applying Advanced Engineering Technologies and Methods to Far-Reaching Facilities Issues. Department of Defense, Pentagon, Washington D. C., 2013.

Templeton B. Steel Metallurgy Described by Case Study. Technical Presentation to BergerABAM, Federal Way, WA, 2010.

Templeton B. Failure Analysis and Forensic Engineering. Seattle Chapter of the Society for the Advancement of Materials & Process Engineering, Seattle, WA, 2008.

Templeton B. Analyzing Anodic Protection as a Method to Prevent PWSCC in Alloy 600 CRDM Tubes in PWR Reactors. Puget Sound Chapter of ASM International, Seattle, WA, 2008.

Templeton B. Failure Analysis Overview. Greater Seattle Insurance Professionals Education Symposium, Seattle, WA, 2007.

Templeton B, Chandler S. Arkansas Nuclear One Buried Service Water Piping Condition Assessment. 2005 INPO-EPRI Chemistry Managers Workshop, Marietta, GA, 2005.

Templeton B. Degradation of Buried Piping. Structural Integrity Associates Plant Assessment & Reliability Improvement Summer Workshop, Annapolis, MD, 2005.

Templeton B. Anodic Protection of Alloy 600. EPRI 2005 PWSCC of Alloy 600 International Conference Santa Ana Pueblo, NM, 2005.

Templeton B. Challenges of Assessing the Buried Piping of Nuclear Stations. Structural Integrity Associates Second Annual FatiguePRO Users Group Meeting, Santa Clara, CA, 2005.

Templeton B. ½-Day Course on Buried Piping Degradation, Inspection, and Mitigation. The Institute of Nuclear Power Operations (INPO), INPO Headquarters in Marietta, GA, 2005.

Templeton B, Jarrett B, Leffler S. Development of a Probabilistic Model for Predicting the Number of Leaks in Oconee's Low-Pressure Service Water System. EPRI-SWSRI Montreal Conference, 2004.

Templeton B. Anodic Protection of Alloy 600. EPRI MRP Alloy 600 ITG Meeting, Minneapolis, MN, 2004..

## Additional Education & Training

Level 4 - O2 Analyze In-House, WHA International, Inc., 2016

Plastics Fracture Analysis, Society of Plastics Engineers, 2007

Plastics Failure Analysis/ Prevention & Testing, Society of Plastics Engineers, 2007

Galvanizing Technology, American Iron and Steel Instituted (AISI), 2000

Steelmaking, Casting and Hot Rolling, U.S. Steel Research, 1998