

## **DAVE M. VAN DYKE, P.E., MS**

### ***Mechanical / Metallurgical Engineering***

Mr. Van Dyke is the engineering manager at VGO. In addition to the technical component of his work, his tasks include oversight and management of many projects within the firm. He has consulted in numerous legal cases and frequently speaks at technical classes and society presentations. His work includes: metallurgical analysis, forensic investigations, design and implementation of testing and experimentation programs in mechanics, and design of mechanical systems.

### **BACKGROUND**

Mr. Van Dyke came to VGO after managing an engineering testing and failure analysis group at another local forensics and testing firm. His background includes extensive experience in forensics, testing, and design of structural and mechanical components.

While working in forensic analysis, Mr. Van Dyke gained experience in metallurgy and metallurgical investigative tools including: scanning electron microscopy, fractography, optical microscopy, and chemical analysis. His failure investigations encompassed materials varying from nickel based super-alloys to carbon steels to polymers and composites. He has researched failure modes including stress corrosion cracking (SCC), ductile overload, hydrogen embrittlement, high/low cycle fatigue, corrosion, liquid metal embrittlement, fretting, cavitation, and many others. He rigorously applied scientific principles and deductive reasoning in determining cause of failure and determining corrective actions.

Mr. Van Dyke's work in physical testing includes a wide variety of non-standard tests on structures from medical devices to interstate bridges. His unique background and experience allows him to determine the requirements for test output, and design an experimental program that will concisely answer the question at hand. Based on the application and desired output, Dave has used instrumentation and high-speed digital data acquisition systems to record system parameters. Additionally, he has overseen proof loading and proof of concept studies.

Prior to his work in forensics and testing, Mr. Van Dyke managed custom design and manufacturing projects for an industrial design and prototyping company. This experience gave him a unique understanding of machining, welding, industrial design, and project management. This hands-on approach to engineering set the stage for his future career, and gave him an understanding of heavy machinery design and fabrication techniques.

### **PRIMARY SKILL AREAS**

- Physical Metallurgy
- Forensics/Failure Analysis
- Machine Design/Analysis
- Design of Experiments
- Finite Element Analysis (FEA)
- Instrumentation (Strain gage, accelerometer, thermocouple, RTD, LVDT, etc.)
- Weld Engineering
- Non-destructive testing and inspection

## **EDUCATION**

**Masters of Science, Mechanical Engineering (MSME),**  
Portland State University, Portland, Oregon  
Awarded: "PSU CECS Award for Outstanding TA / RA"

- Advanced Finite Element Analysis
- Advanced Stress Analysis

**Bachelor of Science, Mechanical Engineering (BSME),**  
Portland State University, Portland, Oregon

## **CERTIFICATIONS**

Licensed Professional Engineer (PE), State of Oregon #65637PE  
Certified EMCF Engineering Manager by Engineering Management Certification International (EMCI)  
Licensed Certified Welding Inspector (CWI) # 05030131  
Licensed ASNT ACCP Level II Visual Testing (VT) Inspector Cert#156371  
NDT Industrial Level II: PT, MT, UT and VT, per ASNT TC-1A

## **PROFESSIONAL ASSOCIATIONS**

Elected 2008-2009 Chairman, American Society of Mechanical Engineers (ASME) Oregon  
2006-2008 Vice-Chair, American Society of Mechanical Engineers (ASME) Oregon  
2006 Company Representative Society of Automotive Engineers (SAE) Oregon  
American Society of Mechanical Engineers (ASME) Member  
American Welding Society (AWS) Member  
American Society of Metals (ASM) Member  
Association for Iron & Steel Technology (AIST) Member  
Active with Society of Tribologists and Lubrication Engineers (STLE)  
Active on National Pipe Inspector's Association (NPIA) Board of Directors

## **RECENT SEMINARS/PUBLICATIONS**

"Failure Analysis Investigation Short Course", April 2006, for OSAE at Freightliner Corporate Headquarters  
Co-Author of Welding Failures chapter in American Welding Society (AWS) Handbook [to be published 2008]  
"Load and resistance Factor Rating (LRFR)", March 2006, Bruce Johnson, P.E. and Bala Sivakumar, P.E. ODOT Bridge Section.  
"Engineering Analysis with Emphasis on the Finite Element Method", March 2006, Dr. Lemmy Meekisho with guest lecture by Dave Van Dyke, P.E.  
"American Welding Society (AWS) Weld Inspection Seminar", February 2005  
"Society of Tribologists and Lubrication Engineers (STLE) Lubrication Training Seminar", March 2003

## **OTHER ACTIVITIES**

PADI Licensed Open Water SCUBA-Diver  
FAA Licensed Private Pilot