

***Dr. William M. Goble, P.E., C.F.S.E.***  
***Principal Partner, exida.com***

### **Fields of Competence**

Safety Instrumented System Design  
E/E/PS Safety Equipment Certification  
Reliability Engineering  
Failure Modes Effects and Diagnostics Analysis  
Electrical and Electronics Engineering  
E/E/PS Design Standards  
Design Engineering Training

### **Experience Summary**

**Dr. Goble** has over 30 years of professional experience. He is widely recognized as an expert in programmable electronic systems analysis, safety and high availability automation systems, automation systems new product development and market analysis. He developed many of the techniques used for probabilistic evaluation of safety and high availability automation systems. He was formerly Director, Critical Systems at a successful North American safety company. His principle work responsibilities included strategic planning, market analysis, promotion and business management. Dr. Goble previously held positions in research and development including computer design, software design and development and engineering project management. Dr. Goble also teaches reliability engineering at the University of Pennsylvania. He has written two widely used books on topics of safety and reliability modeling including "Control Systems Safety Evaluation and Reliability." He teaches many of the exida.com courses and ES35, an ISA professional course on safety and reliability. He is a fellow member of ISA. He has published many papers and magazine articles. Dr. Goble has a BSEE from Penn State, a MSEE from Villanova and a PhD from Eindhoven University of Technology in Eindhoven, Netherlands.

### **Credentials**

B.S., Electrical Engineering, Penn State University, 1971  
M.S., Electrical Engineering, Villanova University, 1988  
Ph.D. Department of Mechanical Reliability, Technical University of Eindhoven, Eindhoven, Netherlands 1998.

### **Key Assignments**

Advised a major equipment manufacturer on methods to effectively analyze and document field failure data and development process for purposes of safety certification per IEC 61508. The project has been certified by TUV.

Advised a major equipment manufacturer on market needs and analysis methods for a new safety system product line. Provided safety case construction tools and coaching the development team through the development process with successful certification and product launch.

Managed the development of several safety equipment lines including the QUALOG safety PLC, certified to VDE 0801 and to IEC61508, and the XTC safety pressure transmitter. This project included managing and participating in all aspects of the design process and analysis of the systems including failure modes effects and diagnostics analysis.

Managed a marketing effort for the critical systems for Moore Products. He was responsible for market planning, development, and support of the QUADLOG process control products focused on safety, high availability. The project included creating market communications, requirements definition, staffing, allocating resources, recommending process improvements, and coordination of sales, design and manufacturing.

Instructed at the University of Pennsylvania as an Adjunct Instructor. Taught SYS506 - Engineering Reliability to undergrad and MS/PhD grad students.

**Key Projects - Continued**

Directed the critical systems business unit of Moore Products Company. This assignment included responsibility for business planning, strategy, market planning, reliability certification and promotion of the critical systems products and services on a worldwide basis.

Developed and instructed courses for the International Society for Measurement and Control (ISA). This ongoing project includes development and primary instruction for the professional development course "ES35 - Control Systems Safety and Reliability", instruction for the course "T925 - Control System Auditing", and co-development of the course "EX-01 - Systematic Safety Integrity Level Analysis - Layer of Protection Analysis."

Managed the development team that developed the MYCRO Distributed Control System. The project included supervising a group of 6 - 14 engineers and technical staff. This system consisting of fault-tolerant control computers, communications networks, and graphic displays grew into one of the companies primary product lines. He personally developed a multiple microprocessor bus that allowed the company's products to utilize several microprocessors to outperform competitors using larger (and more expensive) minicomputers. Developed a substantial amount of the system software.

Managed an electronic systems development group. In this capacity he was responsible for a group of engineers/technical staff who performed development of system level products including the APACS line of distributed controller and the QUADLOG safety PLC. Specific duties involved: Suggest/approve new product plans. Staffing, Resource allocation, and scheduling. Evaluating field performance of products. Evaluating/recommending new engineering methods/development processes. Reviewing designs for reliability, diagnostic coverage, field usage.

Managed and participated in the design team that was responsible for instrumentation and control product developments including development of the Syncro 350, Moore Products Company's first electronic controller. The project included analog and digital design, development of MPCo.'s first electronic recorder, development of a unique stepper motor servo mechanism (patented) that remains the pen mover in electro-mechanical recorder product lines, and design and programming a uP based module tester.

**Affiliations**

Institute of Electrical and Electronics Engineers, Member

International Society for Measurement and Control (ISA), Fellow Member, Active member of SP84 standards committee for reliability of safety systems

**Awards and Honors**

Carl T. Humphrey Distinguish Graduate Award, College of Engineering, Villanova University - 2001  
ISA Fellow-1997

Best safety related paper of 1992 - ISA

Best Paper of 1994 Philadelphia- ISA Computech Division

Best presentation award - SAFECOMP'96

Best safety related paper of 1997 - ISA

Best paper of 1997 - ISA CHEMPID Division.

**Selected Publications****Books**

*Evaluating Control System Reliability- Techniques and Applications*, ISBN 1-55617-128-5, ISA, 1992.

*Control Systems Safety Evaluation and Reliability*, ISBN 1-55617-636-8, ISA, 1998.

*The Use and Development of Quantitative Reliability and Safety Analysis in New Product Design*, ISBN 90-386-0870-5, 1998

**Magazine Articles (over 20 published)**

*Using PLCs in safety applications*, Hydrocarbon Processing, June 1996.

*What does your control system really cost?*, Automation Magazine, Issue2, Vol. 1 1996.

*Software Reliability: Stress versus Strength*, Intech, October 1998.

*Getting Failure Rate Data*, Control, September 2002

**Technical Papers (over 90 published)**

*Safety Rated Smart Transmitters - Failure Modes and Diagnostic Analysis*, ISA TECH/EXPO Technology Update, ISA, October 1999. Presented again at Interkama, Dusseldorf, Germany.

*Software Safety and Reliability Using IEC61508 Techniques*, ISA TECH/EXPO Technology Update," ISA, October 1999. Co-Author: John Yozallinas

*Using a failure modes, effects and diagnostic analysis (FMEDA) to measure diagnostic coverage in programmable electronic systems*, Reliability Engineering & System Safety, Vol. 66, No. 2, November 1999, Co-Author: A.C.Brombacher.

