

**ENGINEER: MECHANICAL,  
MATERIALS**

**GLENN M. ARMSTRONG, P.E.**  
Engineering Design & Testing Corp.  
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**EDUCATION:**

1968 B.S., Mechanical Engineering, Texas A&M University

1974 M.S., Mechanical Engineering, Purdue University

1984 Additional graduate work, University of Houston

**EXPERIENCE:**

1989 to Present **Engineering Design & Testing Corp., Houston, Texas.**  
Engineering Manager. Senior Consultant performing specialized consulting in the areas of: Analysis of operational, mechanical, and metallurgical failures. Functional testing of mechanical equipment and testing of engineering materials to determine mechanical and physical properties. Mechanical design, materials application, inspection, and testing. Analysis and evaluation of property and equipment damage. Investigation of industrial, construction and agricultural accidents.

Experience areas include petroleum refining, petrochemicals, heavy chemicals, fertilizer, fine chemicals, independent power, electrical utilities, pipeline, industrial gas, water utilities, plastic processing, building materials, pulp & paper, wood products, oil & gas exploration and production, construction, agricultural operations and commercial/industrial mechanical systems.

Equipment familiarity includes pressure vessels, piping, turbomachinery (steam, gas, hydro & hydraulic turbines, axial & centrifugal compressors, turboexpanders), reciprocating machinery (engines, compressors, pumps), electrical generators (thermal & hydro), furnaces (boiler, reformer, superheat, process heaters), pumps (centrifugal, displacement, eductor), oil & gas drilling and production (hoisting, drill stem, mud handling, well control, OCTG, completion, wellheads, separation, processing), off-road equipment (tractors, combines, pickers, mobile cranes, bulldozers, scrapers) and materials handling (conveyors, packaging, crushing/grinding).

1983 to 1989 **T H Hill Associates, Houston, Texas.**  
Engineering Manager and Vice President-Engineering. Provided technical assistance for qualification and inspection of oilfield equipment manufactured from carbon and low alloy steels, 12-13 Cr steels, duplex and austenitic stainless steels, austenitic alloys, nickel base alloys, and titanium alloys. Wrote quality assurance standards for Oil Country Tubular Goods (OCTG), line pipe, drilling equipment and associated

equipment. Investigated operational, mechanical, and metallurgical failures of OCTG, line pipe, drilling equipment, and associated equipment. Performed quality audits of manufacturing facilities. Managed project sized quality assurance programs for critical service equipment applications. Provided expert witness testimony.

- 1981 to 1983      **P A Inc. - Plastic Applicators, Houston, Texas.**  
Design and Development Manager and Project Manager. Managed design and drafting of internal coating process equipment. Designed flexible lance system and metering pump system. Redesigned, assembled and tested prototype metering pump system. Investigated new and existing processes for application and improvement of production. Developed work control and memorandum accounting procedures.
- 1979 to 1981      **Staff, Commander Naval Construction Battalions.**  
U.S. Atlantic Fleet, Norfolk, Virginia. Program Manager. Developed and implemented multi-year program of 150 overseas construction projects. Managed and/or coordinated design, estimating, funding, procurement, and resource identification. Quantified, analyzed, and corrected deficiencies in program execution.
- 1976 to 1979      **Atlantic Division, Naval Facilities Engineering Command.**  
Norfolk, Virginia. Contract Administrator. Managed construction contracts. Monitored and evaluated contractor progress. Coordinated inspections, quality control, design changes, and fiscal control. Analyzed, negotiated, and prepared contract changes.
- 1974 to 1976      **U.S. Naval Station, Midway Islands.**  
Assistant Director - Public Works. Managed daily operations of 100-employee department that provided public works, public utilities, public housing and transportation services. Programmed and executed maintenance and utilities operations for all island facilities.
- 1973 to 1974      **Purdue University, West Lafayette, Indiana**  
Graduate studies in mechanical engineering.
- 1971 to 1973      **Naval Facility Centerville Beach, Ferndale, California.**  
Public Works Director and Contract Administrator. Managed daily operations of 20-employee department providing public works, public utilities, public housing and transportation services. Prepared and managed construction contracts. Monitored and evaluated contractor progress. Coordinated inspections, quality control, design changes, and fiscal control. Analyzed, negotiated, and prepared contract changes.
- 1969 to 1971      **U.S. Naval Mobile Construction Battalion SIXTY-TWO.**  
Gulfport, Mississippi. Embarkation Officer and Material Liaison Officer. Managed movement (air, sea and land) of 562-man combat engineering battalion to and from Vietnam and Puerto Rico. Ordered, received, stored and issued construction materials for all types of vertical and horizontal construction projects.

1968 to 1969     **Mason & Hanger - Silas Mason Co., Inc., Amarillo, Texas.**  
Design Engineer. Designed assembly tooling and mass parameter measurement equipment.

**CONTINUING EDUCATION:**

ASME PROFESSIONAL DEVELOPMENT

- ASME Boiler and Pressure Vessel Code, Section IX
- Surface Pollution Prevention Equipment
- Project Management

INTERNATIONAL GAS TURBINE INSTITUTE

- Basic Gas Turbine Engine Technology

MATERIALS ENGINEERING INSTITUTE

- Titanium and Its Alloys
- Arc Welding

NACE INTERNATIONAL

- Gulf Coast Corrosion Control Seminar: Process and Refining Corrosion
- Corrosion in the Oil Refining Industry

TURBOMACHINERY LABORATORIES

- Practical Engineering and Trouble Shooting of Turbomachinery
- An Introduction to Turbine Steam Path Engineering (Design, Damage, and Refurbishment)

**PROFESSIONAL ORGANIZATIONS:**

ASME International

American Society for Nondestructive Testing

NACE International

NACE Specific Technology Group on Chemical and Mechanical Cleaning (STG-06)

NACE Specific Technology Group on Oil and Gas Production - Metallurgy (STG-32)

NACE Specific Technology Group on Petroleum Refining and Gas Processing (STG-34)

NACE Specific Technology Group on Process Industry – Chemicals (STG-36)

NACE Specific Technology Group on Process Industry – High Temperature (STG-37)

NACE Specific Technology Group on Process Industry – Materials Applications (STG-39)

ASM International

Society of Petroleum Engineers

American Petroleum Institute, Exploration & Production Department, Subcommittee on Tubular Goods (SC5), Drill Stem Equipment (V07)  
American Petroleum Institute, Exploration & Production Department, Subcommittee on Drilling Structures & Equipment (SC8), Drilling & Well Servicing Structures (V04F); Chains & Sprockets (V07F), Drilling Equipment (V07K), Hoisting Equipment (V08A), Wire Rope (V09A)  
American Welding Society

**PUBLICATIONS:**

"Sensitivity and Application of the Normal Beam Ultrasonic Technique for Detection of Fatigue Cracks in Rotary-Shouldered Connections", SPE/IADC Paper No. 13430, SPE/IADC 1985 Drilling Conference, New Orleans, Louisiana, March 6-8, 1985, with J.A. Woods and H.A. Sanders.

"Risk Reduction Through Quality Management of Critical Service Well Equipment", SPE Paper No. 14992, Deep Drilling and Production Symposium, Amarillo, Texas, April 6-8, 1986, with D.H. Brown, Jr. and W.W. Reynolds.

"Failure Prevention by Selection and Analysis of Drill Stem Connections", SPE/IADC Paper No. 16075, SPE/IADC 1987 Drilling Conference, New Orleans, Louisiana, March 15-18, 1987, with T.M. Wadsworth.

"Standardizing Drill Stem Inspections", Summary Paper, ASNT International Petroleum Industry Inspection Technology II Topical Conference, Houston, Texas, June 25-27, 1991.

"Nondestructive Evaluation in Failure Analysis", Summary Paper, ASNT International Chemical and Petroleum Industry Inspection Technology III Topical Conference, Houston, Texas, June 14-17, 1993.

"NDE in Major Incident Recovery", Summary Paper, ASME NDE Engineering Division Topical Conference - NDE's Role in Evaluating Engineering Structures and Materials (for continued service), San Antonio, Texas, April 18 - 21, 1994.

"NDT Decisions in the CPI and HPI", Summary Paper, ASNT International Chemical and Petroleum Industry Inspection Technology IV Topical Conference, Houston, Texas, June 19-22, 1995.

"The Mystery of the BLEVE", Feature Article, ASM International Journal of Failure Analysis and Prevention, Volume 4, Issue 1, February 2004.

"Dust Explosions: The Potent Power of Powder", Feature Article, ASM International Journal of Failure Analysis and Prevention, Volume 4, Issue 6, December 2004.

**REGISTRATION:**

Registered Professional Engineer in Texas (#45137)