

SAM KANNAPPAN, P.E.
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ENGINEER
U.S. Citizen

EDUCATION

B.S. Mechanical Engineering, Annamalai University, India
M.S. Mechanical Engineering, University of Texas, Austin

PROFESSIONAL AFFILIATIONS

Board Member, Texas Board of Professional Engineers
Registered Professional Engineer, Texas No. 79135
ASME B31.3 code committee Member 1999-2001
ASME Gas Pipeline Safety Research Committee
Charter Member, Society of Piping Engineers, Houston

EXPERIENCE SUMMARY

Over **twenty-five years** experience in design, analysis, and software development for the petrochemical, refining, power plant and pipeline industries and **ten years** of supervisory experience. Mr. Kannappan authored a book on Stress Analysis, published by John Wiley and Sons, NY in 1985. He is also author of Pipe Stress Analysis software EZFLEX.

As Manager of Mechanical Engineering, responsibilities included design modification of a 3" relief valve from 5000 psi design pressure to 10000 psi to be used on mud pumps using ISO 9000 standards. Vessel design, repad calculations, skirt and support calculations. Specification for rotating equipment such as pumps, turbines. Specification for fixed equipment. Trouble shooting vibration problems in the gas production piping system on a platform offshore Nigeria. Worked as stress engineer performing water and steam hammer analysis, re-boiler piping, WRC 107 and WRC 297 local stress calculations, API 610 pump and 617 compressor piping. Designed high temperature large diameter piping with refractory, snubbers, springs and expansion joints, considering creep-rupture properties and cold temperature applications. Pipe support modifications to dampen vibrations using hold downs. Worked with pipe support vendors for the selection and modification of pipe supports. Supervised degreed engineers and designers.

Very proficient with static and dynamic analysis with **software CAESAR II, FEPIPE and NOZPRO FEA programs**. As chief engineer, supervised engineering personnel, electric power peak energy reduction, energy management of office buildings, bid evaluation and award of contracts. Performed naval architectural design, offshore piping design and marine pipe laying analysis.

EXPERIENCE:

12/2005- Present: Pipe Stress Engineering Manager, SNC Lavalin, Baytown, Texas
Pipe Stress Analysis for ExxonMobil Baytown Refinery Projects. Perform audit and in charge of Quality Improvement Process of Pipe Stress work done by SLEI, Mumbai, India. Estimates for stress tasks, budget and percent complete, develop staffing plans and training.

2/1995– 2/2003: Senior Stress Engineer, GDS Engineers (presently SNC Lavalin)
Pipe stress Analysis using CAESAR II. for the following projects:

Pipe Stress Analysis of reformer piping at Lyondell Chemical, Lake Charles, LA to withstand daily spike thermal transients from 1550F to 1620F and occasional quench flow failures which heat the portion of the system normally running at 400F to 1600F. Material properties for Incoloy 800 were input. Controlling B31.3 criterion is 67% of 100,000 hours creep rupture stress or allowable stress of 1500F. Recommendations include use of graphite slide bearing plates, hinged expansion joints and Y branch fittings. Other projects: Reciprocating compressor piping analysis for Marathon Ashland Petroleum Company, SQM North America, Dynegy, Lubrizol, BP Oil, BP Refinery, Lyondell Chemical Worldwide. CHEVRON PHILLIPS: Relief Valve Piping, High Pressure piping for reactors, K-Resin Spring evaluation.

2/94 to 2/95: Senior Pipe Stress Engineer, Jacobs Engineering, Baton Rouge
EXXON Refinery Hydrogen Supply Project (07-E900-54):. Saved \$24,000 by pipe wall thickness calculation . Reference: Doc Anselmo of Exxon, Gary Adams & Frank Stewart of Jacobs Engg. Received appreciation from Daryl Carpenter of JEG Employee Quality Committee

2/92 to 2/94: Manager of Mechanical Engineering, Zentech Inc, Houston
Pipe Stress Analysis of hydrogen sulfide piping for elf atochem at 1150F. Piping Vibration analysis in gas production on Offshore platform. Worked at S&B Engineers performing water hammer analysis, re boiler piping, WRC 107 local stress calculations, API610 and 617 Compressor piping. Taught Pipe Stress and support course, University of Houston, Downtown.

2/91 to 2/92 US Regulatory Commission, Washington DC
Performed advanced reactor reviews, fracture mechanics analysis, structural integrity analysis of high pressure components for license renewal, review of ASME code changes in piping design, USED NRC/PRAISE fracture mechanics analysis software.

2/89 to 2/91 Senior Engineer, General Electric Company, Princeton, NJ
Stress and structural analysis of space components using FEA software NASTRAN and PATRAN. Responsible for design and analyses of space shuttle integration hardware. Performed modal; analyses to find mode shapes and frequencies to calculate random loads. Used NASA/FLAGRO fracture mechanics analysis software.

7/70 to 2/89: Positions at various Companies, Allied Bendix, Tennessee Valley Authority, Blount Brothers, Parsons SIP.

Publications:

“Introduction to Pipe Stress Analysis” book published by John Wiley, NY1985

Developed stress analysis software EZFLEX and LIFEST

“Eliminate impact testing for some piping applications” for cold Temperature applications

“Structural integrity of integral pipe supports with increased corrosion allowance”

“Dynamic Analysis of Water Hammer Loads” for 36” piping.