**Bob Claborn**

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**Education; Bachelor of Science in Mechanical Engineering Design - East Tennessee State University (Dean’s List)**

**CERTIFICATE E.I.T.**

**AFFILIATION American Society of Mechanical Engineers (ASME)**

**SOFTWARE Microsoft Projects 2003, AutoCAD 14/2006, Word, Excel, Caesar II - Pipe Stress Analysis, and Compress & PV Elite for Pressure Vessels and E-Tank for API 620/650 Tanks**

**Training; AMERICAN SOCIETY OF MECHANICAL ENGINEERING (ASME) CODES: ANSI/ASME Y14.5 (Geometric Dimensioning and Tolerancing) and ASME Y14.100 (Engineering Drawing Practices),** **In-Service Inspection of Power Plants; • NRC/ASME 45.2.6 Inspection of Mechanical Systems; • ANSI-NB-23 – National Board Inspection Code • Section I - Power Boilers • Section VIII, Div.1 & 2 – Boiler and Pressure Vessel Code, API 510,570 & PED Requirements; ASME-** [**Failure, Failure Prevention and Repair of Pressure Vessels, Piping, Boilers, and Rotating Machinery,**](http://ww2.asme.org/pd/courseDetail.cfm?CO_ID=675) **Section Materials; • ASME Section II – Materials Evaluation and Section III – Nuclear Power Plant Components, Section XI - Rules for In-service Inspection of Nuclear Power Plant Components, ASME Piping Codes; • B31.1 – Power Piping • B31.3 - Process Piping • B31.5 – Refrigeration/Cryogenic Piping • B31.8 – Natural Gas Piping • ASME B 31.9 – Building Services Piping • NFPA 17 & 25 • OSHA Stds.; – 1910 Standards, Non-Destructive Examination (NDE) • ASME Section V - NDE; • Welding; Section IX – Welding and Brazing Qualifications, HVAC Stds; • ASHRAE Stds. Steel Construction Stds.; • AISC Stds., 40-Hr. HAZOPER and Project Management Training thru (Project Management Institute (PMI).**

**Work Experience**

More than 25 years of engineering experience on large capital projects. Proficient in completing the design of complex Process Systems; pump and piping systems, completing BOM's, P&ID's/PFD's, design/modification of boilers, heat exchangers and pressure vessels, completing hydraulic and pressure calculations, and addressing welding requirements. Completed in-service inspection of systems, established preventive and predictive maintenance procedures, addressed certification issues, and commissioned systems per operational requirements. I have detailed experience in completing engineering specifications and designs, procurement of materials/equipment, quality control, construction, integrity testing, and Project Management. Has an excellent track record for meeting project budgets and schedules.

Lead/Senior Mechanical or Facilities Project Engineer for the following companies: Suncor Energy, RWE Nukem Corp., Nissan North America, Denso Manufacturing Inc., NASA Langley, Oak Ridge National Laboratories, Foster-Wheeler Engineering, TVA's WB#2 Nuclear Project and Savannah River Site. etc.

**Consulting Mechanical/Project Engineer -**

**2011 to Present**

Completed EDCR’s packages ensuring the designs of Structure, Systems, and Components (SSC) met system design, material/grade, pressure/temperature, fabrication, and dimensional standards and completed system pressure and flow calculations for (2) 50,000 CFM HVAC Units at ORNL.

• Serves as Subject Matter Expert on mechanical/nuclear ventilation design, procurement, construction, installation, testing, and safety matters; qualifies as a Systems Engineer as assigned.

• Inspects and approves, or provides oversight for inspection and approval of systems, structures and components (SSCs) (including commercial or custom equipment, assemblies, or materials) within their area of expertise and develops familiarity with SSCs defined in the facility's Documented Safety Analysis (DSA) and Technical Safety Requirements (TSR), Configuration Items list, and non-DSA systems.

• Interprets and monitors compliance with applicable codes, standards, guides, and contractual requirements for nuclear ventilation systems (e.g. ASHRAE, ASME AG-1, ASME N509, ASME N510, DOE-HDBK-1169, DOE-G 420.1-1A, DOE-STD-3020,

etc.); approves designs and installation of commercial or custom equipment, assemblies, or materials.

Reviewed and updated procurement data sheets ensuring SSC’s met ANSI/ASME and other design code requirements for (2) 50,000 CFM HVAC Units at ORNL.

* Stops work without fear of reprisal for unsafe conditions potentially affecting personnel

safety or environmental risk.

• Completed the code calculations and specified the design requirements for Pressure Vessels, Heat Exchangers, and Feed Water Heaters following ASME B&PVC Section VIII requirements and used PVElite and Compress Design Packages for engineering evaluation of designs.

• Experienced in engineering and design programs (AutoCAD and Solid Works etc) to develop detailed layout and fabrication drawings and resolves customer function and application issues.

•Develops, evaluates, improves and documents internal and external product designs to assure high quality of parts and full compliance with customer and regulatory specifications and codes.

•Continually analyzes prospect and customer design and manufacturing process flows and implements documented changes which support continuous improvement in the areas of product design, performance, durability, cost, and quality.
• Wrote the Pressure Equipment Directive (PED)/ASME Quality Control Manual, WABTEC Corporation, for ISO 9001 certification.
• Involved the conception design development and final design review of environmental, remediation, deactivation and decommissioning projects.
• Completed design modification packages for the replacement of piping system, valving, pumps and motors, and installation of inspection ports on ASME Section VIII Pressure Vessels.
• Reviews nuclear plant safety designs and reaction forces from Safety Relief valves and completes code reinforcement calculations and specifies requirements for modification to systems.
• Evaluated nuclear systems and identified critical ASME Section III components and specified ASME, ANSI, ASTM, and manufacturing standards for benchmarking component requirements.

• Completed procurement packages per the requirements of 10CFR 50 and Appendix B Quality Assurance Program and 10CFR50.59 Safety Evaluation Program.
• Developed the Pilot Program for system modifications incorporating Design Change Notices (DCN'S) into an Engineering Design Change Record (EDCR's) ensuing Nuclear Regulatory Commission (NRC) requirements are addressed.
• Completed EDCR's packages ensuring the designs of Structure, Systems, and Components (SSC) met system design, material/grade, pressure/temperature, fabrication, and dimensional standards and completed system pressure and flow calculations.
• Reviewed and updated procurement data sheets ensuring SSC's met ANSI/ASME and other design code requirements.

• Completed pressure vessel drawings, calculations, and specifications ensuring ASME Section III, VIII and the ASME B31.1 Power Piping codes for Nuclear Steam Supply System (NSSS) addressed Quality, Safety, and Nuclear requirements.
• Completed the P&ID & PFD for the Breathing/Instrument Air Systems for the Waste Solidification Building (WSB) and developed line, valve data sheets, and equipment lists addressing material, fabrication, flow, pressure, temperature and dimensional requirements. Modification of design resulted in a cost savings of over 400k.
• Completed engineering analysis, and design development for various types of pressure vessels ensuring ASME III and VIII code requirements are addressed for the MOX and WSB Projects.
• Completed the design of a ASME Section VIII Reactor Vessel determining the pressure boundary requirements for the pressure reducing chambers, internal cyclones, and supports using the Compress Design Package.
• Redesigned a $ 250K heater bundle addressing oxidation, thermal cycling, and high temperature issues per ASME Section I and B31.1Power Piping requirements with an estimated cost savings of over 1MM.
• Project Manager of process designs, specifications, resolved construction and operational solutions for site utilities. Experienced in the installation and operational requirements for HVAC, Fire Protection, mechanical, conveyance, power boilers, pressure vessels, and piping systems for 300M Liquid Carbonics/Praxair Methane Processing Plant.
• Project Manager - Developed scopes of work and technical specifications and managed dozens of projects ranging in cost from several thousand dollars to multi-million dollars projects for Denso Manufacturing.
• Estimated project costs, developed task strategy, reviewed and approved vendor proposals, calculations, evaluated/tabulated proposals, selected equipment vendors, awarded contracts and supervised construction.
• Project Manager - Supervised contractors and approved system modifications, developed task strategy and managed daily project tasks, verified adherence to specifications, design dwgs. and code requirements for Conveyance, HVAC, Natural Gas, Fire Protection, Rail Line Installation, and Cryogenic Systems and completed system integrity testing , interfaced with clients and reported progress to Nissan Management.
• Developed designs, developed specifications and code requirements for system modifications, interfaced with clients/vendors, and reported project status to management for the Hanford Nuclear Waste Cleanup Project.
• Developed the site Mechanical Integrity (MI) program for the Inspection of Pressure Vessels, Control Valves/ Pressure Relief Valves and Piping Maintenance Programs (PMP) for Suncor Energy.

**Sr. Mechanical Engineer Alstom Power Inc Chattanooga, TN -**

**2010 to 2011**

• Primary contributor for the development of the Quality Control Manual for ISO 9001 certification.
• Completed engineering calculations and designs for heat exchangers, pressure vessels, and Feed Water Heaters using PVElite.

• Provided technical direction for Quality/Manufacturing and contributed to the evaluation/qualification of products and suppliers.
• Interfaced with internal/external Global customers regarding technical matters.
• Coordinated project design between office in the U.S. and Paris, France and provided technical support to Sales/Procurement for preliminary equipment design.

**Project Manager/Engineer Global Engineers Inc Bailey Island, ME -**

**1996 to 2009**

• Sized and installed HVAC and Industrial Air/Ventilation systems addressing requirements for air changes, pressure drops, Humidity Control, control of Contaminants and flow rates requirements.
• Saved $45K by designing and installing a closed-loop heat exchanger system and $32K for refurbishment of (6) 2000°F Retort test cylinders for Denso Manufacturing.

• Prepared engineering specifications, completed system calculations, received bids for materials/equipment for Centrate Ammonia Recovery Systems (CARS) project in New York.
• Reviewed specifications, drawings, and code calculations of API 620, API 650, and ASME Section VIII pressure vessels for the Synair Natural Gas Construction Project.
• Designed fire protection system for the Synair Natural Gas Project using NFPA 13 guidelines.
• Project Manager for Operable Unit 4 (OU4) at DOE's Fernald Environmental Management Project (FEMP) including the Northwest Rail Yard, Locomotive Maintenance Facility, 8 Plex-Project Management Facility, Site Drainage and Reservoir Project, and the Waste Management Facilities.
• Supervised field engineering and construction of $400MM methane, methanol gas process plant for Liquid Carbonics.
• Used PV Elite for the design and fabrication of ASME Section VIII pressure vessels
• Performed engineering calculations, completed designs and ordered materials for pressure vessels.
• Interfaced with customers to address design requirements, evaluated and addressed requirements for modifying pressure vessels.

**Project Manager/Mechanical Engineer III SSI Services, Inc Tullahoma, TN -**

**1987 to 1996**

•Completed & certified the integrity of pressure vessels, piping systems, instrumentation, and valves following ASME/ANSI code requirements and ASME-45.2.6 Inspection requirements for 50M Pressure and Hazardous Materials Systems (PHMS) Project. Certification is a multi-step process including field verification, engineering analysis, deficiency correction monitoring, nondestructive examination, in-service inspection, repair of systems, pressure testing of systems, and updating as-built dwgs.

• Permits alternate methods where it is assured that equivalent objectives can be achieved by establishing and maintaining effective safety equal to or exceeding established codes, regulations, and standards.

• Prepares Facility Modifications, Field Change Notices, Engineering Change Responses, drawings, and sketches as required.

• Performs or participates in Design Reviews, Equivalency Evaluations, and Commercial Grade/Legacy Item Dedications as assigned.

• Consults with cognizant experts in other areas before a decision is reached on items outside their expertise, such as fire, nuclear safety, ES&H, etc.

• Prepares designs, documents, and procedures; ensures that the complexity is appropriate for the application; maintains knowledge and configuration management of as-built SSCs.

• Assists other organizations as directed by the Engineering Manager.

• Supports the execution of Integrated Safety Management System guiding principles

and core functions and the Safety Culture.

• Performed pipe stress analysis on systems using Caesar II Software.
• Initiated cost savings of $180K to refurbish and bench test 6,000-psi large-diameter cryogenic flow control valves.

• Project Engineer/Manager for the following projects; Installation of Pressure-Reducing Station for Loading Transfer Trucks, Certification if 2,000 psi GN2 Tube Trailers, Installation of Natural Gas and Steam Flow Meters, Installation of Chlorinators at the Primary Pumping Station, Reparation/Relocation of East Side Nitrogen System, and Repair/Upgrade Steam Tracer Project.
• Project Manager - Saved $215K by designing and installing a Central Gaseous Nitrogen (GN2) Storage and Distribution System thus eliminating the certification costs and usage of 2,000 psig high-pressure tube trailers.
• Evaluated existing systems and completed repairs, upgrades, and maintenance of systems per ASHRAE Standards for HVAC and NFPA Standards for Fire Protection y of Life Project.

**Design Engineer Kaydon Corporation Greeneville, TN - -**

**1986 to 1987**

• Evaluated equipment specifications and performance requirements to determine product designs that can be produced by manufacturing methods and completed design per customer requirements.
• Designed and directed the manufacturing of prototype filtration systems and turbine oil conditioners (TOC's) including completing hydraulic calculations for pipe line sizing, selecting pumps and motors, and completed control panels wiring diagrams for Turbine Oil Conditioners (TOC).

**Quality Control Engineer Fluor-Daniel Corp** Greenville, SC -

1981 to 1986

• Inspected mechanical systems using ASME-45.2.6, N.B.I.C., and the In-service Inspection Code for Tennessee Eastman Co-generation Coal Gasification Facility, Kingsport, TN. and the Sharon-Harris Nuclear Project in New Hill, N.C.
• Reported non-conformances and issued stop work orders when construction methods and quality requirements were issues.
• Supervised and verified the installation of four 9017-Hp DeLaval diesel generators & diesel fuel support systems, pumps/motor alignments, fabrication of piping systems and installation of HVAC systems following code, manufacturer, and project requirements.
• Recorded and reported project status to management.

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