

EXPERIENCE

BRG MACHINERY CONSULTING, LLC. Charlottesville, VA
Machinery Consultant, February 2016 – Present

Work with a team of highly qualified machinery specialists in providing a full range of rotating machinery management services. Actively involved in providing machinery expertise in the following areas:

- Maintenance and reliability engineering organizations performance assessments
- Root cause failure analysis and redesign
- Shop and field testing
- Repairs inspection and overhauls
- Monitoring and inspecting the manufacture of new major rotating equipment
- Turnaround planning and execution
- Training of operations and maintenance personnel
- LNG plant rotating equipment selection, optimization commissioning and start up
- Capital Project Pre-FEED, FEED and EPC phase consulting on machinery specification and procurement for the petroleum, chemical and utility industries.

EXXONMOBIL DEVELOPMENT COMPANY. Spring, TX
Senior Machinery Engineer, November 2009 – September 2015

Provided machinery expertise to capital project engineering organization, EPC contractor supervision and troubleshooting/root cause analysis support to affiliates. Key activities and accomplishments:

- Assigned to Papua New Guinea LNG Project. Led and provided oversight for the plant compression equipment design, dynamic simulations, construction, commissioning and start up. Equipment included 10 centrifugal horizontal and vertical split compressors driven by GE LM2500+G4 gas turbine mechanical drivers (6 turbines included waste heat recovery units for plant oil heating), a JSW reciprocating compressor and 7 Solar Titan 130 generator sets. Led validation and testing of the compressors gas turbines driver's combustion control system to process fuel gas with heavy hydrocarbon components. Project earned worldwide recognition for its safety record, and being the only LNG industry grassroots project finished ahead of schedule and on budget.
- Assigned to the Imperial Oil/ExxonMobil Kearn Tar Sands expansion project as Machinery Commissioning Manager. Machinery commissioned included a Siemens 150 MW Cogeneration Steam Turbine and Slurry handling equipment.
- Seconded to the BG Group Tanzania LNG plant Project Pre FEED as Machinery and Fixed Equipment Lead. Provided consulting to develop engineering concepts, cost estimates, and contractor technical resources specification, planning and execution for a 30 MTA LNG plant. Led the concept selection for the refrigeration compressor and drivers including electric drives, mega frame, aero derivatives turbines and inlet air chilling.
- Appointed as Machinery Section Lead. Responsible for Asia Pacific and Africa regions and Subsea machinery technology qualification and project technical support. Lead effort to reduce a project FEED study step outs risks on subsea multiphase pump and driver applications

EXXONMOBIL RESEARCH AND ENGINEERING. Baytown TX
Distinguished Engineering Associate, July 2006- October 2009

Regional Engineering Office Machinery Engineering Group Leader responsible for technical work of 5 machinery specialists with responsibility for central engineering support for all ExxonMobil refining facilities in United States and Central/ South America. Provided machinery expertise to all affiliates operating plants in all aspects of machinery troubleshooting, application and procurement from design specifications and bid evaluations to testing, commissioning and installation. Responsible for all machinery, including compressors, pumps, steam turbines, hot gas expanders, gearboxes, and reciprocating compressors. Led key high impact investigation and improvement programs working with refineries technical departments, including:

- Operators based Machinery care programs for all large refinery critical machinery trains. The programs

comprised five primary components: Ownership, Operator Care, Management Walkabouts, Stewardship, and Company Reliability Systems Implementation

- FCC Main Air Blower Train over speed event
- Fluid Catalytic Cracker Hot Flue gas expander failures

EXXONMOBIL RESEARCH AND ENGINEERING. Paulsboro, NJ and Fairfax, VA
Senior Engineering Associate, November 1999 – June 2006

Assigned to the plant equipment division providing machinery engineering consulting for Downstream, Upstream, and Chemicals business and manufacturing units on all types of rotating equipment to capital project engineering organization, EPC contractor supervision and troubleshooting/root cause analysis support to affiliates. Key activities and accomplishments included:

- Led Machinery Engineer for the ExxonMobil Qatar Gas to Liquids Project Pre –FEED.
- Led a “Bad Actor Program” and machinery staff organizational changes for the France PJG Integrated Refining Complex. Recommendations implemented resulted in an increase in pumps MTBR from 40 months to over 100 months.
- Led a Chinese critical machinery supplier’s capabilities evaluation for the Fujian Refining and Ethylene Project. Obtained selected Chinese machinery suppliers engineering and management organization commitment to participate in the EMRE design audit process.
- Led the Baytown Complex Global Energy Management Systems(GEMS) roll out in the machinery discipline. GEMs is an energy efficiency audit and improvement tool that targets facilities critical turbomachinery. Realized the highest savings with minor capital investment of any of the large world scale refineries roll outs (Baton Rouge, Baytown, Beaumont) with savings in excess \$1. 6MM /year.

MOBIL TECHNOLOGY COMPANY. Paulsboro, NJ
Machinery Senior Associate, November 1996 -June 1994-November 30th 1999

Provided Mobil affiliates machinery engineering consulting for capital project engineering groups, refining, marketing and chemicals operating units. Scope included machinery management, performance and reliability improvements, troubleshooting and failure analysis. Responsibilities included compressors, pumps, steam turbines, hot flue gas expanders, gas turbines, gearboxes, and reciprocating compressors, from design and specification to installation, commissioning and turnaround technical support.

- Led a corporate science and technology initiative to improve FCC hot flue gas expander fleet reliability doubling its run length by advancing equipment technology upgrades and retrofits.
- Developed and implemented corporate FCC hot flue gas expander trains operation, maintenance and engineering best practices.
- Evaluated Venezuela’s PDVSA El Tablazo Chemical Complex operations, maintenance and engineering capabilities to support Mobil’s corporate evaluation effort for a joint venture /partnership to build a large world scale Petrochemical Complex in Venezuela. Became the Lead Machinery Engineer for the complex joint venture Project FEED. The Complex included an ethylene cracker, ethylene glycols, low pressure high density and a high pressure polyethylene unit.
- Developed Mobil’s first integrated equipment health monitoring system specification for rotating, fixed, electrical and control equipment for a grass root facility. Commissioned and started up the Sabic/ Mobil Joint venture Yanpet 2 Chemical plant polyethylene and polypropylene units.

SUN OIL COMPANY. Yabucoa Refinery, Yabucoa, Puerto Rico
Machinery Engineering and Reliability Superintendent, July 1994-November 1996

Created and led a Machinery Engineering/Reliability Group including five machinery and mechanical engineers. Responsible for the reliability improvement of an 80 thousand barrels per day lubes refinery. Scope included refinery instrumentation rotating and electrical equipment. Group provided technical support to capital projects, operating organization, leading root cause analysis, preventive/predictive programs and reliability improvement projects. Key achievements;

- Led effort to achieve ISO 9000 certification of the maintenance organization.
- Led a “Total People Involvement” Refinery Management Team to reconfigure the refinery conventional staffing into a competitive Lubes business model.
- Developed and installed a first of its kind online transient and steady state vibration analysis and automatic recording system in all unit’s critical compression machinery trains.

MOBIL OIL CO. Joliet Refinery, Joliet, IL

Staff Rotating Equipment Engineer, November 1991 -June 1994

Provided machinery engineering support for operations, maintenance, project commissioning and corporate third party special projects. Key activities included:

- Developed, justified and implemented an industry first of its kind wet/dry tandem seal conversion project for the refinery hydrofluoric acid alkalization unit acid pumps.
- Joined a corporate team to lead a Maintenance, Reliability and Engineering Organization assessment for the Argentina Yacimientos Petroliferos Fiscales (YPF) La Plata refinery. Reorganization and restructuring recommendations were implemented allowing for an initial public offering in the New York Stock Exchange.

SUN OIL COMPANY, Philadelphia, NJ and Yabucoa Refinery, Yabucoa, Puerto Rico.

Rotating Equipment Specialist, November 1987 – October 1991

Responsible for machinery troubleshooting, reliability improvements and projects support of an 80 thousand barrels per day lubes refinery. Provided machinery expertise to operating units in all aspects of machinery management including performance and reliability improvements, as well as troubleshooting and failure analysis. Scope included all rotating equipment including a 3000 PSIG hydro treater, and a solvent dewaxing unit. Machinery lead for commissioning and startup of new reformer unit.

Promoted to company headquarters project and engineering support group. Provided machinery expertise to all USA refineries and chemical plants. Held leadership role in the Atlantic Richfield Refinery Sulfuric Acid Unit Expansion Project, Sun Olin Plant Machinery Reliability Improvement project and the Yabucoa Refinery 1991 Turnaround Technical Support.

INSECO INDUSTRIAL SYSTEMS AND EQUIPMENT CO. San Juan, Puerto Rico

General Manager / Lead Mechanical Engineer, July 1982-October 1987

Managed 4 Sales engineers and a Repair Center supervisor for a Manufacturer Representative and Repair Company. Represented 20 manufacturing industry leaders in filtering, pumping, mechanical sealing, and chemicals process equipment. Island-wide recognized authority in centrifugal pumps, mechanical seals application and troubleshooting. Provided process equipment selection and application consulting to major engineering firms.

UNION CARBIDE CHEMICAL AND PLASTICS CORPORATION, Ponce Plant, Ponce, Puerto Rico

Rotating Equipment Reliability Engineer, June 1976 – June 1982

Responsible for troubleshooting and reliability improvements on multiple machinery trains of a 680 Million tons per year ethylene plant. Led the machinery specialist group. Responsibilities included preventive/predictive maintenance program coordination, execution and vibration analysis. Work scope included electric motors, Frame gas turbine driven process compression, high pressure steam turbine driven compression and chemical process pumps. Responsibility included Ethylene Oxide, Glycols, Bisphenol-A /Cumene, Oxygen, Alcohols and Butanol and Acetylene Black units.

EDUCATION AND PROFESSIONAL ACTIVITIES

COLLEGE OF AGRICULTURAL AND MECHANICAL ARTS, UNIVERSITY OF PUERTO RICO, Mayaguez, Puerto Rico.

Bachelor of Science, Mechanical Engineering, June 1976

Member, American Society of Mechanical Engineers

Registered Professional Engineer in the Commonwealth of Puerto Rico, License No. 9675