



Other Engineering

Mechanical Engineering

Mechanical engineers apply engineering principles in the employment of energy, machinery, equipment and materials. They design machines and mechanical installations and evaluate installed machinery, processes and products. Mechanical engineers in the minerals and energy industry may undertake the design and construction of resource development projects (eg gas platforms, mining facilities etc), design new machines, equipment or systems taking into account costs, material suitability and life, carry out research in areas such as use and application of different fuels and energy, materials, heating, handling, storage and pumping of liquids. Mechanical Engineers use CAD (Computer Aided Design) to design plants. They supervise and manage the working of production plants (eg coal handling, power stations) and set up work control systems.

Electrical Engineering

Electrical engineers apply scientific and engineering principles in the research, design, manufacture, operation and maintenance of electrical and electronic equipment, machine systems and components. Electrical engineers in the minerals and energy industry may plan and supervise generating equipment; supervise construction plans and specifications; and supervise operating and maintenance staff. They use CAD to assist in the design and drawing of complex electrical systems; decide on the type and arrangement of circuits, transformers etc; make or improve electrical products such as motors, equipment etc; and they write, interpret specifications and regulations about electric power equipment and its use.

Software Engineering

Software engineers develop specialised programs for all aspects of the industry processes. Software engineers in the minerals and energy industry develop software specifications for a proposed

process, compile programs from approved specifications which a computer can understand. Software Engineers maintain and upgrade technology to keep abreast of change, develop software solutions and investigate and develop tool and ideas to support the production of software programs.

Surveying/Geomatic Engineering

Surveyors assemble and assess land and geographic information which is used for planning and regulation of the land, the sea and related structures. Mine Surveyors measure underground and open-cut mine workings in full detail. Their measurements enable new mine works to avoid older and possibly flooded ones, and allow connections to be made between different underground passages. Mine surveyors also establish the boundaries of mining claims in some states and territories. Surveyors may spend a lot of time working outdoors. They also work in offices, analysing data and preparing plans and reports.

Civil Engineering

Civil engineers plan, design and supervise the construction, operation and maintenance of roads, bridges, dams, ports, docks, building structures and other facilities required by the minerals and energy industry. Civil engineers in the minerals and energy industry may investigate sites to determine suitable foundations, research and advise of best engineering solutions on site; and produce detailed designs and documentation for construction of a project. They may also organise delivery of materials, plant and equipment to site; establish detailed programs for the coordination of site activities; prepare engineering calculations required for project design; and supervise the testing and commissioning of completed works. Civil Engineers analyse and interpret reports on loadings, materials etc; analyse risks associated with natural phenomena (eg earthquake, flood etc); and arrange for geological and geophysical investigations.

BRIAN N'DRELAN

BEng (Mechanical) MSc (Industrial Management) MAusIMM, MIEPNG Senior Mill Mechanical Engineer – OTML Production Maintenance Department

What formal qualifications do you have?

I completed a 1st degree in BEng Mechanical at PNG University of Technology 1978, 2nd degree in BEng Mechanical & Manufacturing at QUT 1989, and 3rd degree a Master of Science in Industrial Management at the Institute of Technology Bandung – Indonesia 1997.

Why did you choose your particular career(s)?

Bougainville Copper Limited (BCL) sponsored me at the PNG University of Technology to study Mechanical Engineering. BCL was the second largest copper mine at that time, so naturally I went to work at Bougainville after graduation in 1978. I was impressed with the

hugeness of the mining equipment and what they were capable of doing. I started working as a Graduate Engineer at the Pit Maintenance Department, which maintained various mining equipment including blast-hole drills, electric rope shovels, haul trucks, dewatering pumps. I also spend eight months with Zinc Corporation Ltd, in Broken Hill NSW. There I had exposure to underground mining equipment such as Skips, Cage, Load-Haul-Dump equipment, winders, milling & flotation plant, trains & rail lines. My interest in mining process has kept me more or less working in one mine or another. The other mines where I had spent time with include Hamersley Iron Pty Ltd in Western Australia, Porgera Joint Venture in PNG, PT Timah- a tin company in Indonesia. I was an academic at the PNG University of Technology, before I joined Ok Tedi Mining Ltd in March 1999.

What have you done?

Some roles I have played include being supervisor on maintenance teams, Major shutdown planning coordinator, senior engineer in engineering sections, carry out condition monitoring on equipment, and also being an academic for six years at PNG University of Technology. Reading has helped me a lot to broaden my engineering base.

What have you enjoyed most about your profession(s)?

The involvement on major projects with other professionals and trades people has brought much joy. People express how much your contribution has meant to the outcome of the project. The wide range of skills employed including man management, maintenance planning, imparting information, research for information, analysing data, and sourcing of resources. I enjoyed helping others improve their knowledge base.