

Project Engineering



e3k offers expert project engineering in a wide variety of contexts. Whether it's design auditing, quality assurance, experimental performance testing, or coordination and management of maintenance and repair, e3k has the skills and know how to ensure your project is completed on time while meeting all requirements.

e3k's project management services are supported by advanced technical expertise in the broad fields of Mechanical Engineering including creative machine design, dynamic analysis, computer aided design (CAD) and simulation, power systems and transmission, hydraulics, aerodynamics, thermodynamics, microprocessor control and diagnostic systems, transducers, instrumentation and experimentation, and data analysis. Examples of projects e3k have completed include:

Total Plant Shutdown Critical Path Repair – S.E. Asia

A stainless steel lined concrete tank was leaking acidic solution and required repair during a 5 day total plant shutdown. The repair of the tank was the most significant task to be undertaken during the shutdown and represented the critical path on the shutdown timeline. e3k were engaged to be lead contractors and perform the project engineering for the repair as well as the engineering design. e3k inspected the tank and started planning months prior to the shutdown. A complete shut plan was implemented including acid transfer, cleaning, NDT and tank welding. e3k organised all the subcontractors and provided detailed scopes of work to each one. e3k also assessed the structural integrity of the tank with FE analysis and designed repair methods and reinforcing structures for the tank. During the Shutdown, e3k project engineers were onsite 24 hours a day to manage the operation and trouble shoot any issues that arose during the repair.



Award Winning Marine Power Generator – Sydney, Australia

e3k performed project engineering for the performance testing of a prototype SeaUrchin marine power generator on the Georges River in Sydney, Australia. e3k produced a detailed report of the performance testing including comparisons to the Computational Fluid Dynamic (CFD) computer simulations, already performed by e3k. At Engineers Australia's National Awards night held at Parliament House in Canberra on 20th November 2012, e3k won a coveted Australian Engineering Excellence Award from the original pool of several hundred entries, for their contributions to this SeaUrchin Marine Power Generator. e3k's contribution to the development of this new generation of Marine Turbines included initially performing an engineering review of the turbine technology and providing valuable ideas for improvements. e3k also produced new and improved designs of turbines using advanced Computational Fluid Dynamics (CFD) in the design process to optimise innovative flow enhancement technology and produce highly efficient turbines.



Provisions Modelling For Large Mining Fleet Maintenance - Australasia

One of Australia's largest operators of mining fleet vehicles, including haul trucks, excavators, graders, and tractor crawlers, engaged e3k to perform an analysis of the projected maintenance costs over the life time of the fleet to help determine how much cash needed to be set aside at any time to ensure sufficient funds were available to maintain their fleet. e3k analysed the current methods used and developed a computer program to automate the calculation process and reduce the volume of maintenance records needed to be processed.



CAPEX Reporting for Gold Mine – Papua New Guinea

A Copper and Gold mine in Papua New Guinea was undergoing a Mine Life Extension program and engaged e3k to review plant and equipment. e3k conducted on site reviews of cranes, mobile fleet, planetary gears, VSDs, pumps and new workshops. Extensive costings and reporting on over USD \$8million of capital expenditure was performed.



Crusher Feeder Lift and Repair – Papua New Guinea

A crusher Feeder had slid off its bearings and the ore flow was consequently creating uneven wear on the crusher's wear plates. e3k were engaged to design hydraulic ram support columns to lift the 300 tonne feeder up approximately 25mm and reposition it on the bearings. An onsite survey was conducted on the feeder's support structure to determine which parts were strong enough to support the columns. The design, fabrication and installation of the columns were project managed by e3k. The lift successfully repositioned the feeder on the bearings and columns remained in place for any future lift requirements.



SAG Mill Life Cycle Analysis – Papua New Guinea

A 34ft diameter SAG mill developed cracks in a corner weld near the end of its service life. e3k inspected the SAG mill on site during the repair process to document the condition of the SAG mill. e3k then conducted FE analysis on the mill design prior to and after repair to determine the reduction in stress intensity at the repaired site and provided recommendations for operational practices during continuing use of the SAG mill. e3k also provided information on the potential remaining life of the SAG mill to enable a decision to be made concerning a time frame for replacement of the SAG mill.



Mine SAG Mill Design Review and Quality Assurance – USA, Turkey, China

e3k performed a design review of a new replacement SAG Mill for a Copper and Gold mine in Papua New Guinea. The review included independent FEA analysis and meetings with the design team in York, Pennsylvania, USA. e3k then provided independent onsite quality assurance during the manufacture of the new Mill components in Turkey and China and arranged material tests in a NATA certified lab in Australia.