

A client wanted an independent evaluation of a new onshore processing plant to optimize the life-cycle costs while the project was in the conceptual design phase.

The investor wanted a full economic evaluation of all the design options down to equipment level, to optimize capex & opex and asset availability (including capacity).

The existing facility was benchmarked to create a starting reference for the integrated RAM study.



### BENEFITS

- ▲ A reduction of \$17M USD in Capex was achieved by optimizing the design in terms of plant configuration & equipment redundancy without comprising asset availability.
- ▲ It was proved that the best plant configuration was 2 x 100% for the condensate plant and 2 x 50% for the water treatment plant.

### METHODOLOGY

Using RAM-int from ProAIM, an integrated RAM model of the existing plant was built to benchmark the existing facility and compare the reliability of the equipment against industry standard failure data to quantify the reliability against the operational performance of the plant.

A full Reliability, Availability and Maintenance (RAM) model was built from the conceptual design, incorporating process equipment, economic and performance data to quantify the availability of the proposed design. Using the redundancy optimization module within RAM-int, the design configuration was optimized based on equipment redundancy and plant configuration. The RAM model included the costs of the equipment, costs of the maintenance, failure modes, start-up shut downs, manning levels, time slices over the life of the asset to reach the optimum design to minimize the LC or TCO.

Key to the optimization model is the ability to model the costs of maintenance. A simple example is one pump is cheaper to maintain than two pumps, but two pumps increase availability and improve reliability, but increase the Capex of a project, but it also depends on how the second pump is maintained as this will directly affect the reliability of the system.

### ABOUT PROAIM

A reliability-engineering consultancy company based in the UK, with operations across the globe.

Providing specialist bespoke consultancy with integrated RAM technology and training solutions in the area of reliability and maintenance engineering.

We enable our clients in asset-centric process industries to achieve the safety, production output and costs targets for their business.

ProAIM is one of the leading companies able to quantify the true life-cycle costs from design to decommissioning by combining RAM and Process Synthesis with ProAIM's patented RAM-int.

