

PROJECTS LIST

WE ADVISE ON EVERY ASPECT OF PROCESS ENGINEERING FROM CONCEPT SELECT, FEED, DETAILED DESIGN THROUGH TO PROCUREMENT, CONSTRUCTION, MAINTENANCE AND OPERATIONS.

PROJECT MANAGEMENT

Tank Compliance with Major Hazard Regulations (Tank Terminal): Project Management for the renewal of over 40 hazardous tank compliance plans. Identified any areas of non-compliance with the new Health and Safety at Work Hazardous Substances Regulations 2017. Rimmer Engineering optioneered and prepared scopes of work for secondary containment bunds and tank firefighting upgrades and engaged with Worksafe and the Tank Certifier to achieve recertification of all tanks. We supplied a team of onsite and offsite resources and led the project.

Fire Main Upgrades and Process Control Modifications (Major Hazard Facility – 'MHF'): Review of the seawater firemain which had been experiencing high maintenance costs due to problems with the seawater pumps process control and surging pressures. Our team identified changes required including the core process control functionality. Project management of multi-discipline client site team for 50+ improvement items, including updates to the process control logic, installation of new isolation valves, a new jockey pump, recycle control valves and modifications to bermad anti-surge valves.

OPTIONS IDENTIFICATION / CONCEPT SELECT

Floating Roof Tank Safety Improvements (Tank Terminal): Rimmer Engineering was engaged to undertake an optioneering study for replacing the rim seal fire detection (a nitrogen fusible loop) with linear heat detection or infrared sensors. We also assessed options for installing roof drain auto shutoff valves.

Refrigeration System Selection (Dairy Plant):

Evaluated the best option for either repairing or replacing a warehouse refrigeration system. Rimmer Engineering assessed the options of utilising the existing ammonia/glycol refrigeration system, new standalone chillers using ammonia, R410A or CO2 and compared the relative merits against criteria of CAPEX, OPEX, safety and environmental aspects.

Mogas Booster Pump Evaluation (Pipeline Operator):

Rimmer Engineering was engaged to assess sparing of a canned style pump versus risk of failure and downtime of the pipeline.

Acid Dosing System (MHF): Rimmer Engineering was engaged to option assess and select acid addition for pH control in an effluent treatment plant. Our team designed the sulphuric acid injection system, including P&IDs, equipment specifications for a double skinned tank, pump, piping metallurgy and Class 5 cost estimate.

Emergency Response Pump (MHF): Rimmer Engineering completed the option assess and select of an emergency pump and power pack for recovering hydrocarbons in a hazardous zone. Multiple concepts were developed, comparatively assessed, and costed to form our class 5 estimate.

FEED

Flare System Debottlenecking (Petrochemical Complex): Hydraulic modelling (FlareSpace) of flare system to assess capacity and verify backpressures on relief valves. Rimmer Engineering assessed design cases for a new flare tip design and identified limiting MACH exit velocity with vendors.

Silo Expansion and A2 Milk Revamp (Dairy Plant): Our team was engaged to undertake a revamp of milk silos and increase of A2 milk pasteurisation capability. Rimmer Engineering assessed the optimum use of raw milk silos and completed the hydraulics, equipment datasheets, P&IDs, and created the project basis of design for contractor bids.

Hot Water System Revamp (Dairy Plant):

Debottlenecking of the hot water system, including energy balance, hydraulic modelling, heat exchanger analysis, P&IDs, technical specifications for new boilers and datasheets for new pumps and controls valves.

DETAILED DESIGN

Bund Emergency Recovery Pump (MHF): Detailed design including the technical specification and procurement of a rotary lobe pump, skid-mounted hydraulic power pack and piping, valued circa NZ\$400k.

Tank Venting Upgrades (MHF): Our team executed over 40 tank normal and emergency venting design calculations to API2000. Rimmer Engineering also produced datasheets, oversaw the procurement of the vents, and drafted the updates to P&IDs and nameplate drawings.

Depressuring line sizing (Petrochemical Complex): Sizing of outlet lines for new depressuring valves (ASPEN Flare System Analyser), creation of line list, and calculation of acoustic vibration sound power levels.

PROCESS SAFETY

Refrigeration Process Safety Reviews & Consequence Modelling (Dairy Plant): Applied “minimisation of inherent risk” techniques at the concept stage and led the HAZID review. In detailed engineering our team completed the HAZOP, risk assessment & SFAIRP demonstration and the consequence modelling of BLEVE and asphyxiation hazards (PHAST).

Flare system consequence modelling (Petrochemical Complex): Rimmer Engineering was engaged to analyse a capacity increase for a flare column. Our team performed radiation and dispersion modelling (FlareSim) to assess the impact on personnel and equipment resulting from radiated heat, flash fire and toxicity.

Gas Safety Workshop (Dairy Client): Rimmer Engineering provided a technical expert (SME) for a gas process safety review for an industrial natural gas system.

Hazardous Area Classification (Manufacturing Plant): Review of explosion hazards to AS/NZS 60079.10.1 for dust and chemical storage including creation of hazardous area drawings.

Tank Failure (Tank Terminal): Risk assessment of tank bund failure and tertiary containment using LOPA techniques.

Process Safeguarding Manual Updates (MHF): Review and updates of relief cases and instrument protection functions for a hydrotreating unit.

OPERATIONAL TROUBLESHOOTING

Foaming in Milk Filler (Diary Plant): The client’s bottle filler was experiencing foaming. Our team was engaged to provide onsite operational troubleshooting. We reviewed the milk properties and the process variables that could contribute to foaming and recommended over 20 improvement items, from simple operational changes, to detailed process control modifications. Rimmer Engineering assisted the site team in implementing these to achieve a noticeable reduction in foaming.

Pipeline Valve Replacement (Pipeline Operator): Rimmer Engineering was engaged to assess the failure modes for a critical jet pipeline dual seal isolation valve and the procurement of a new valve.

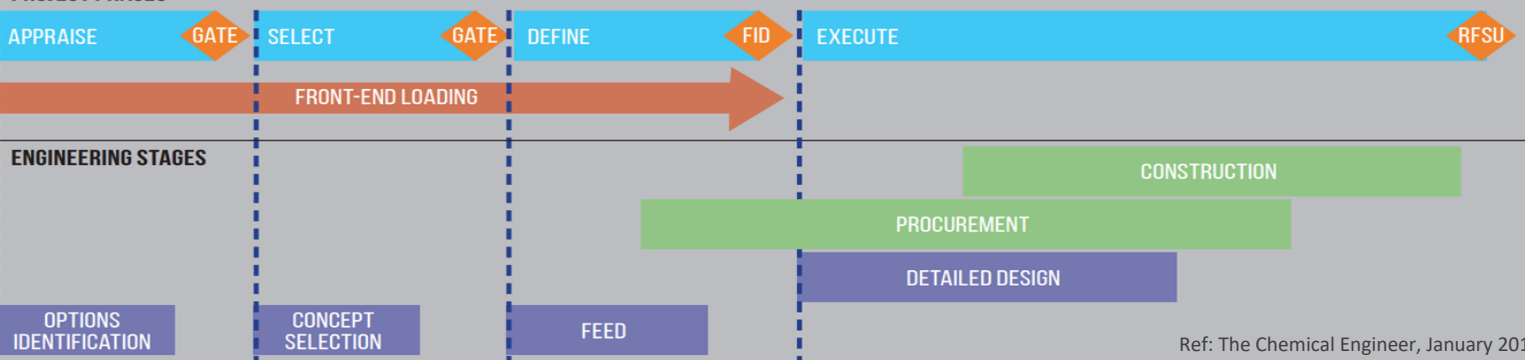
Relief Valve Damage (MHF): Investigation into the cause of a chattering relief valve on pump startup. Rimmer Engineering analysed the reactor circuit design philosophy and validated the pump start-up sequencing to identify the root cause.

PROCESS OPERATIONAL SUPPORT

Hydrodesulphuriser Offgas Debottlenecking (MHF): Rimmer Engineering conducted the testrun and pressure survey for a new control valve. We used a hydraulic modelling tool to replicate results, revealing the limitation was in fact the upstream heat exchangers and replacing control valve would yield no improvement.

Modelling of Fluegas Duct Temperature: Our team was engaged to create a heat transfer model to assess the temperature drop in an uninsulated duct and compared with the SO3 dew point temperature.

PROJECT PHASES



Ref: The Chemical Engineer, January 2019

For further information on our projects please contact:



Vaughan Rimmer – Principal Consultant
M: +64 22 088 3841 E: vaughan@rimmerengineering.co.nz