

Industrial / Process Manufacturing Case Studies

Case Study #1 (Scope Development, Project Execution, Cost Savings)

The Client refinery site is one of the larger facilities in the US and sought operational improvements to reduce its costs. Utilizing Black Belt and Six Sigma techniques, TAS defined the scope of operational changes and established alignment with site-based project sponsors and change agents to ensure organizational buy-in and forward sustainability. The project roll-out was successfully implemented, and the resulting savings exceeded \$9MM. Client leadership asked TAS to expand the program to other business units.

Case Study #2 (Cooling Tower Efficiency, Process Reliability, Performance Improvement)

Client facility was having significant operational issues associated with the fouling of a 24,000 gpm cooling tower that was beginning to impact production. The TAS team engaged with both the vendor and operations to identify the root cause for the issues and an appropriate remedy. We identified a number of items that were substantially different from the design as well as additional streams that were causing the problems. TAS identified and implemented short and long term engineering solutions, allowing the unit to return to full rate in the near term and to continue at full rate on an ongoing basis.

Case Study #3 (Scope Development, Project Management, Process Safeguards)

The Client manufactured an industrial chemical that was highly reactive and had the potential for sensitization of the local workforce. A solution was needed to reduce the potential for worker exposure and OSHA recordable incidents. TAS completed Scope Development and Project Management for a project which was implemented to successfully resolve this (\$15MM TIC), with the project team also being awarded an internal company award.

Case Study #4 (Relief Valve Study and Installation, Project Management)

Client facility had a full shut down scheduled and had identified over 700 relief valves to be checked for proper sizing and/or due for recertification. A HAZOP had identified additional scenarios that needed to be checked with some of those resulting in new relief valve installations. TAS oversaw the completion of the asset study and onsite installation project (738 relief valves being either installed as new or removed, recalibrated and reinstalled), safely, on time and on budget.

Case Study #5 (Process Improvement, Installation Planning and Oversight, Project Management)

Client's facility required a significant increase in dust collection capacity and efficiency with the installation to be completed during an upcoming scheduled turnaround. TAS's deliverable objective was to design and install 2 dust collectors that would provide ~4x the capacity of the previous units. This required substantial technical and executional effort as the units and structural supports were to be located on top of twin 165' tall production silos, within a 1-day installation window. The TAS team identified various items to eliminate potential problems, and the installation was seamlessly completed within the window with no safety issues and on budget. The project was later cited as an example of good project management with excellent alignment between operations and engineering.

Case Study #6 (Due Diligence, Scope Development and Cost Savings)

The client facility had significant operating costs that it wanted to reduce. In performing a due diligence review, TAS identified a 3 MW power demand and significant waste heat stream as a source of potential value creation. TAS developed a scope for the installation of a steam turbine generator and associated boiler upgrades to allow the site to produce its own power at a substantial savings. The project resulted in a 1.25-year payback on a \$5MM project investment.

Case Study #7 (Technical and Operational Due Diligence, Process Performance Analysis)

The client was interested in acquiring a process manufacturing production facility and needed a technical and operations assessment as part of their due diligence. TAS was retained to evaluate the facility's performance capabilities (equipment capacity, process design and control, asset reliability). TAS completed an onsite review of physical assets and documentation (production records, maintenance log), interviewed key operating personnel, and prepared a due diligence report, highlighting areas of strength and potential issues to be addressed. Based on TAS's findings, client revised their valuation analysis and offer price. Client then re-engaged TAS to perform due diligence and evaluate additional investment prospects.

Case Study #8 (Operability Review, Technical Due Diligence, Performance Improvement)

Client site was not reaching production targets due to frequent operability problems. TAS performed a technical review to identify root cause in fermentation section and remedy. Due diligence included operations interviews and external expert reviews which identified root cause. TAS developed a project scope and execution plan for a \$2MM project to modify the Clean-In-Place unit (piping, systems and procedural modifications). TAS oversaw onsite completion, including management of engineering and construction contractors. Post re-start, the facility run rates increased to design capacity.

Case Study #9 (Due Diligence - Repurposing Assets, Technology Licensing, Market Assessment)

Client engaged TAS to perform technical, operational and commercial due diligence in support of strategically repurposing production facilities to better position themselves for evolving market conditions. TAS performed detailed site reviews, process technology assessments, and market analysis to identify and validate a preferred operational configuration platform. TAS developed work scope plans and cost forecasts to implement, prepared investment justifications for approvals by client's Board, and supported client's executive team in subsequent technical and commercial negotiations with 3rd parties.

Case Study #10 (Pilot Plant Design, Code Review, Cost and Schedule Development)

The Client wanted to design a new pilot plant in conjunction with ongoing efforts to develop process conditions, manage technical constraints, and optimize reactor configurations. TAS provided 3D piping and equipment CAD models to allow an interactive and iterative layout process. TAS developed cost and schedule projections and completed NFPA code review. Final package included all equipment and structures, constructability analysis, and modular construction to minimize risk of business interruption.

Case Study #11 (Process Improvement, Scope Development, Project Execution)

Client needed to improve water quality for steam production as well as analytics used to determine and control the water quality at a coal fired generating station. TAS developed scope and project execution plans for a \$3MM water quality improvement and monitoring project and validated design with site engineers and subject matter experts (water, instrumentation). TAS oversaw execution per defined scope, with project completed on time and on budget.

Case Study #12 (Process Commercialization Study, Root Cause Analysis, Operability & Optimization)

Client was experiencing ongoing operability issues with commercializing a new process at a production scale facility, which created delays and cost overruns vs. previously committed targets. TAS was engaged by client's CEO to assist the company's technical and operations leadership groups with pinpointing and resolving causative factors. TAS conducted an onsite review of the facility, evaluated process flow (design, capacity, rates) and integrated capabilities of the respective process manufacturing units, used best practice process design frameworks to identify and prioritize operability risks and concerns (contamination, clogging, fouling), highlighted scalability concerns (achieving prior pilot and demo scale results at production scale site) and developed recommendations for addressing these issues.

Case Study #13 (Pump Reliability Study, Value Engineering, Risk Mitigation)

TAS completed a facility-wide assessment of 50+ pumps to validate asset condition, review suitability of pump configuration and performance parameters to operational requirements, and develop tiered and prioritized recommendations on replacement timeframes and preventative maintenance cycles for client. TAS's report provided client with a cost effective approach to continued use of the facility and improved assurance to prevent unscheduled downtime.

Case Study #14 (Pump Redesign Study, Improved Operational Performance)

Client facility had operational concerns and suspected pump design/performance was a key factor. TAS completed an onsite review of the system layout and design and operational utilization. TAS performed a hydraulic review and confirmed the pumps were suboptimal to requirements. TAS developed redesigned pump and piping configurations, including 3D modeling to validate viability of design.

Case Study #15 (Technical and Operational Due Diligence, Capacity Utilization)

Client retained TAS to complete a technical and operational due diligence review for a prospective investment in the battery recycling sector. TAS reviewed investment prospectus materials, developed detailed validation checklists, assessed performance characteristics and operating history at production facilities, and interviewed operating company leadership. TAS's due diligence report provided prospective private investors with assurance on production capacity, operational reliability, technology processes, organizational capabilities, and performance track record and highlighted key risks associated with achieving future operating projections and target investment thresholds. This enabled client to refine its valuation, risk weight a revised offer, and position itself for final round negotiations.

Case Study #16 (Technical and Operational Due Diligence, Commercial Readiness Assessment)

Client was considering an investment in an early-stage process manufacturing company focused on converting greenhouse gases to bio-based materials and plastics. TAS was engaged to complete a technical analysis of the process technology (feasibility, operability, scalability, risks), assess key organizational strengths and capabilities (leadership team, functional bandwidth, customer relationship proof points), and evaluate commercial readiness for pursuing a first production facility. TAS reviewed pilot and demonstration scale campaign data, interviewed senior leadership, and evaluated process design parameters (mass balance / flow, equipment, catalyst, stability, maintainability). TAS provided the investors with conclusions on viability / readiness / scalability, an assessment on cost to build and produce, and a perspective on technical and operational risks to better inform the investment decision.

Case Study #17 (Due Diligence – Technical Assessment, Operability, Validating Production Economics)

Client retained TAS to conduct due diligence and provide investment transaction support for a proposed investment in a company commercializing a new process technology for producing industrial chemicals in an environmentally-friendly manner. TAS analyzed pilot and demonstration scale production run data, evaluated performance curves (yield, on-spec consistency, run time, reliability), and assessed robustness of process design (process flows, technical constraints, operating control limits, production unit flexibility, causes of downtime). TAS reviewed cost to build and cost to operate forecasts, analyzed performance benchmarks (gas usage, electricity consumption, target efficiency improvements), and interviewed operating company leadership to validate modeling assumptions. TAS provided the private equity investors with conclusions on key technical, operational, and economic factors as drivers for valuation, input on primary risks to be mitigated and recommendations for follow-up onsite validation. TAS's findings helped client determine that the prospect company did not fit with its risk/return profile.