

CASE STUDY

Learn How This Energy Company Saved \$1.75 Million YoY by Optimizing Maintenance Productivity

A conservative maintenance setup includes unnecessary maintenance checks, too high mean-time-to-repair and uncontrolled peaks of workload. This adds up and affects your bottom line greatly. The resulting high backlog jeopardizes asset integrity, asset performance and possibly safety. How do you reduce man hours and increase your maintenance efficiency and subsequently your production output? Learn how one of Australia's leading energy companies saves \$1.75 million YoY by fixing the basics and leveling the workload.

When the LNG plant was initially built, there was limited experience with LNG plants available as the typical local trades are shipping and mining. This resulted in a very conservative maintenance setup, generating too many and often unnecessary work orders to maintain the equipment. The workload and the costs were consequently too high.

WHERE TO AIM

By performing a scan or mapping of the current asset performance situation, you can pinpoint problems, identify and calculate potential for improvement and prioritize actions. As the problem was clear, for this LNG plant the situational map focused on their asset performance strategies, way of working, maintenance setup and data.

The Asset Improvement Mapping showed that the plant's highest improvement potential lay in optimizing maintenance productivity. The underlying key to success was, as always, to gain a deep understanding of the client's systems and work processes. In this case that included the required knowledge of the Safety Critical Elements and their necessary performance (performance standards) and the design of an asset build or functional location structure in the CMMS representing the actual situation on site.

SUMMARY

Challenge: due to a conservative maintenance setup, the maintenance productivity needed to be optimized.

Approach

Stage 1: mapping of current situation and improvement plan
Stage 2: partial deployment to prove effectiveness
Stage 3: plant-wide deployment

Improvements

- Optimization and standardization of the PM routines
- Workload leveling
- Enrichment of work instructions

Results

- **\$1.75 million YoY, of which \$600.000 YoY on manhours**
- 7000 PMs load leveled
- From 6.000 to 1.000 PM job plans

MANAGEABLE DEPLOYMENT

The first stage focused on fixing the basics and a partial deployment. The low-hanging fruit that was picked up first included creating and revising job plans and building missing preventive maintenance plans as derived from a library. Most first fixes were based on the review of the asset register, the safety-critical elements (SCEs), and a first benchmark of the preventive maintenance (PM) routines.

The partial deployment of the proposed improvement plan concentrated on two interlocking elements:

- Planning and scheduling
- Workload leveling

Deploying on a smaller manageable scale at first proved the success of the improvements while achieving high adoption rates by the workforce as everyone was able to get used to the changes due to a staged introduction process. This adoption is a highly underestimated element of maintenance engineering and a performance killer of many improvement initiatives in the market. In this case the time spent on the testing and feedback loop of the workforce made the implementation a big success.

IMPROVED PLANNING AND SCHEDULING

In a world-class maintenance department the work is completely planned and scheduled. This reduces downtime and improves maintenance workflow and productivity. In this plant a Preventive Maintenance strategy was in place but was only partially implemented. In workshops with the maintenance workforce, gaps were uncovered in the PM setup in the CMMS system. Some PMs were missing, which meant that those had to be created and added in the system. This first stage of improved planning and scheduled also focused on reducing the number and frequency of PM tasks and enriching PMs with the correct data. All of these measures helped with better forecasting and resource planning.

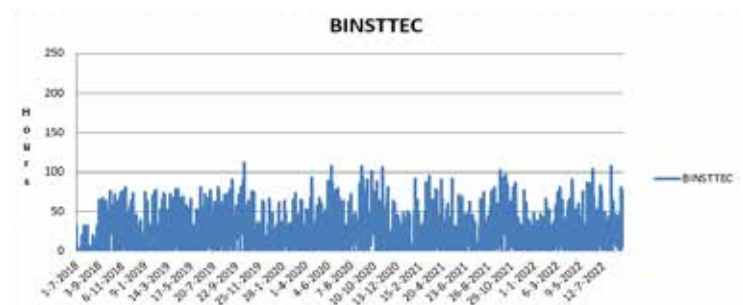
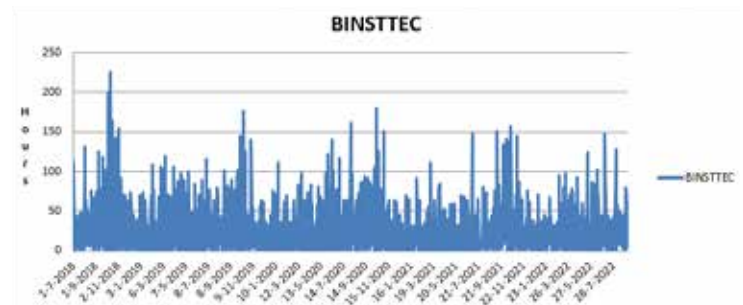
Regarding implementing the maintenance strategies, the biggest task concerned the enrichment of the strategy with the required information for execution. This resulted in maintenance plans, tasks (operations) and work instructions. At the end of the day a technician should have a workable workorder with the right instruction to be able to execute and report back the work to be done.

Much attention, therefore, goes to calculating preparation and execution hours, assigning the tasks to the right crafts, describing the tasks to be done in the right order and defining the asset condition criteria.

WORKLOAD LEVELING

Another important measure was the introduction of workload leveling on some units. With load leveling the maintenance activities are spread out to match work requirements with the available workforce. This decreases the peaks in workload ensuring that there is no need to hire extra contractors. The maintenance tasks are also clustered so that work efficiency increases as less (isolated) work needs to be done. At this plant another result of starting with load leveling was the decrease of the PM backlog as the team was in control of all maintenance activities. The long-term planning that was created, ensured that there were no surprises anymore causing potential unscheduled downtime.

This graph shows the total workload for the discipline Instrumentation at the LNG plant, before (top) and after (bottom) the project was completed.



OPTIMIZATION AND FULL DEPLOYMENT

After having successfully laid down the foundation and having executed the first deployment, the LNG plant was ready for a scale up. The APM improvement project concluded with the Asset Improvement Rollout for the entire plant. This included:

- Optimization of PMs: By further optimizing PMs the plant established standardized PM routines per equipment subgroup in the CMMS system.
- Workload leveling: this was deployed for the complete plant. 7000 PMs were load leveled.
- Enriching work instructions: the work instructions were improved with detailed instructions. This improved work execution.
- PM alignment & optimization: the updated maintenance strategies and performance standards were aligned in the CMMS. With the PMs in line with these approved and implemented strategies, maintenance is allocated to equipment where needed (and vice versa).
- Standardization: rationalizing the PM specific Job Plans into Generic Job Plans. The number of Job Plans to maintain dropped from over 6,000 to about 1,000.

RESULTS: SIGNIFICANT SAVINGS YOY

The first stage, which fixed basics and partially deployed the suggested improvements, resulted in savings of \$600,000 YoY. This number only covered the man hours and excluded savings on spare parts, replaced equipment and so on. Combining this outcome with the results of the optimization and full-deployment rollout means annual savings of \$1.75 million.

\$1,750,000

in annual savings

\$600,000

in yearly manhours savings

7000

PMs load leveled

ABOUT MAXGRIP

MaxGrip consultants enable organizations in asset-intensive industries to achieve continuous improvements on their asset performance, also using the power of Digital Transformation. MaxGrip embraces APM 4.0 with a maintenance track record of over twenty years in industries like Oil & Gas, Food & Beverages and Utilities & Infrastructure. We operate on all continents and have a global presence with our main offices in the Netherlands (HQ), USA, Malaysia, and, Australia.

WOULD YOU LIKE TO KNOW MORE?



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