



RESULTS AT A GLANCE

40%

Reduction in craftsmen

2.3

Work orders per craftsmen
per day

50%

Reduction in Priority 1 work
orders

Integrating Lean Thinking into Maintenance for a Petrochemical Company



In its ongoing efforts to increase overall competitiveness, one of the largest independent refining and petrochemical companies in the U.S. (300,000 barrel-per-day capacity) zeroed in on maintenance processes as an area ripe for improvement. The company had a significant backlog of maintenance work orders while suffering from high costs in multiple areas such as base contractors, materials and rentals.

THE SITUATION

The challenge was to identify sources of excessive cost by engaging with all the craft groups in waste identification / elimination discussions — using visual management and problem-solving methods — then implement rapid improvements organization wide.

In terms of backlog, the operations was dealing with cycle times to complete work orders that were much higher than benchmarks (over 100 days to complete a P2 work order). In terms of productivity, crafts were completing on average less than 0.5 work orders per resource per day

The client sought out Argo to take a leading-edge approach by implementing best practices and Lean Thinking tools taken from traditional manufacturing improvement methodologies from multiple industries.

Argo has a track record for doing just that — adapting successful Lean Thinking tools and techniques for industries that are less familiar with those concepts, such as petrochemical manufacturing and refining.

In this case, Argo conducted a deep analysis including daily front-line observations with the different crafts of all maintenance processes and operations over four weeks. Doing so confirmed both the challenges and the size of the opportunity. Among our findings:

- Multiple barriers were preventing craftsmen from fixing equipment in a timely manner. Just to start work, they would wait on work assignment, materials, tools, and equipment. Up to 2 to 3 hours before mechanics / electricians could start turning wrenches.
- Shops were disorganized and without visual indication of tool and equipment status causing wasted time locating and managing them
- Front-line supervisors needed training and systems to instill greater accountability and improve discipline among the craftsmen.
- Work order quality needed improvement at every step: scoping, planning, scheduling, and execution.
- Maintenance coordination among departments was lacking, impeding handoff between warehouses, contractor shops, and operations.

ARGO'S ACTIONS

Acting as a player-coach, Argo worked with the refinery to achieve new levels of productivity and on-time-delivery thanks to several value-creating initiatives:

CRAFT PRODUCTIVITY optimization

Argo organized structured problem-solving events to enable the craftsmen to eliminate non-value-added activities: better coordination for permitting, materials available when needed, clearing barriers to fixing equipment. Solutions included start of shift performance dialogue with the right KPI's, then comprehensive check-lists to get their assignment, tools, and parts, and arrive at their repair location within 30 minutes of on-duty time. The shops were organized, so that everything is close to the point of use. Also, part retrieval was streamlined. Rather than waste time walking to a warehouse to get parts, a craftsman arrives at his shop to find everything he needs has been kitted and delivered so that work can commence.

Work sequence was mapped to understand and eliminate causes for low wrench time (originally under 30%). Wrench time was improved to almost 50% for rotating equipment and electrical crafts.

LEADERS LEADING

Argo worked with leaders at all levels to increase the amount of time they spend actually leading. We implemented Leader Standard Work, which includes tactics for instilling accountability. To further those efforts, highly visual boards clearly communicate what a craftsman needs to do once on duty. As a result, front line supervisors now are spending twice as much time out in the field.

IMPROVED MAINTENANCE COORDINATION

Argo and the client designed a visual management system to improve communication and coordination between operations and maintenance, so that one group is always ready to hand off to another.

RESULTS

- The client is getting more done with less. The number of craftsmen has been reduced by 40 percent, while increasing productivity to 2.3 work orders per craftsman per day.
- Risk has been greatly reduced thanks to better prioritization of work orders — pulling priorities forward to get them fixed. Priority 1 work orders were reduced by 50% while P2 work orders cycle time was reduced to 1 week.
- There is tremendous buy-in on the front lines. A new performance management system keeps motivation high, and a passion to be competitive is providing the most competitive edge of all.

Argo takes pride in partnering with clients to increase their competitive advantage in their respective industries. In this case, by using Lean Thinking, the client is rapidly gaining ground in their industry.



Argo is an operations improvement consulting firm that breaks through the traditional barriers of the consultant-client relationship. We are hands-on consultants who deliver real results and no excuses.