

CASE STUDY: MANUFACTURING (TRANSFORMATION)



Working with Caterpillar's largest manufacturer of *exhaust systems* in the world, the JKA team was engaged to help *transform* the flagship operation from a traditional manufacturer of exhaust systems (30+ day lead times, high WIP inventory, high overhead costs, etc.) to a *lean* (flow based) operation. The *business case* was as follows: *On Time Delivery, Productivity* and *Cost*. The timeframe for the transformation was 5 months. Results:

- *OTD* from 84% to 96+%
- *WIP inventory* -48% (\$1.6mm)
- *Productivity* +26%
- *Operating income* +16%

OPERATIONAL EXCELLENCE

Overview: John Kim and Associates was brought in to assist Nelson Global Products in creating a new model for manufacturing at the largest manufacturing facility (600+ employees, 500,000+sf). The challenges facing the NGP team were extreme price pressures from customers, increased pressure on OTD, and ever increasing quality performance (product and service). At stake was NGP's global position as Caterpillar's single largest supplier of exhaust systems around the world. The manufacturing *concepts* piloted/demonstrated will be deployed across 7+ additional NGP facilities.

Baseline: The manufacturing philosophy at NGP had been one centered on *constraint* management and as a result had invoked many philosophies following a *Theory of Constraints* model. The vision proposed by JKA was counter to what had been viewed for 20+ years as a *world class* approach for manufacturing *exhaust systems* (and *hand rail* systems). The model was one focused on using *flow, velocity and speed* (through operations) as the pathway to the *elimination* of indirect labor, material handlers, warehousing staff, warehouse transactions, inventory, etc. Instead of 30+ days of *work in process inventory* (WIP) on the shop floor (WIP used to create *optimal* lot sizes and perceived *economies* of scale), the strategy would be to use *economies of flow* to create floor space, labor productivity, cash (inventory) and create capacity (i.e. growth and absorption)

Approach: The JKA team used their mobilization model to guide the leadership team through phases I, II and III of their transformation focusing on *measurable results, speed to value* and a *'pay as you go'* model for improvement.

- **Phase I:** Create the *physical* flow (i.e. layout) of manufactured 'piece parts' to allow for movement from 'raw' to 'ready for ship' without having to be moved, received, put away, etc. into a warehouse (and subsequently pulled, kitted and issued back to the floor for final welding, assembly paint and pack)
- **Phase II:** Re-alignment and configuration of the *Enterprise software system* to support a new strategy for manufacturing, shop control, master scheduling, materials and supply chain management. Including the *unwinding* of massive amount of custom 'code' that had been written to support the management of 30+ days of WIP.
- **Phase III:** Re-design of key front end (i.e. EDI, customer service and sales) processes to enable integration of *support departments* to be able to support (and subsequently *sell*) the new capabilities of the operation

Key Points:

- Creating the *physical* flow (i.e. layout) was the most *noticeable*, however in the end was the easiest component of change.
- Integrating *Lean tools* into a system for *managing* flow was key. Developing front line leaders to be able to use *Lean tools* to be able to both *manage* and *improve* performance was breakthrough.
- Moving from 30+ days of WIP to <5 days, resulted in 40+% of the floor space being freed up. (note: this space is actively being 'sold' using the new *capabilities* of operations (OTD, lead time, cost) to 'double' the volume (revenue) through the facility)
- Re-configuring of the *Enterprise System* and associated support departments to align with the new model for manufacturing was paramount. Delay days, order multiples, min order qtls, office *rules* (2 days to enter an order, 24 hrs to ship an order) had to stop

Results:

- Reduce plant throughput from 30+ days to < 5 days: Foundation for OTD (84% → 96+%)
- Reduced Floor Space 40% (ROA): Incremental business to increase Revenue/Capacity by 2x
- WIP reduced to <5 days (ROA): Generated \$1.6+mm in *cash* to self fund transformation
- Productivity increase 26+% (EBIT): Initial improvements included elimination of 40+ temps, reassignment of 18+ indirect staff to direct positions