Reduce Production Delays in the Fiberglass Manufacturing Department

by
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and
Baylor University Waco, TX.
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Project Overview

- **Purpose:**
  - Evaluate through a root cause systematic approach, then to identifying and eliminating Work Order delays.

- **Scope:**
  - Reduce the number of Work Orders that are consistently put on hold as soon as they are put into work.
  - Improve communication between functional groups.

- **Importance:**
  - This project will positively impact the Fiberglass Department by reducing production delays created from discrepancies on material quantities, identifying the right material and material shortages. Ultimately improving On-Time delivery to our customer.
Project Overview

- **Financials/Deliverables:**
  - This project will result in a greater than 25% reduction in production delays and improve material control.

- **Goals & Objectives:**
  - Reduce Work Order Delays.
  - Improve Communication between functional groups.
  - Improve on that correct Material Quantities are being loaded to the Work Order.
  - Improve on that the correct Materials have been identified and are being loaded to the Work Order.
  - Improve on material inventories in an effort to reduce material shortages.
Project Overview

• Measures:
  • Reduce the number of defects causing Work-order delays by ~25% or better.
  • Determine what value-added steps are needed and to include them into the flow.
Project Overview

•Resources:
  Champions
  Thad Barker – Director of Operations
  David Riel – Lean & Manufacturing Mgr.
  
  Customer:
  Reginald Little – Supervisor of Fiber Glass Dept.
  
  Team Members:
  Cassie Dean – Baylor
  Ricky Hasoon – Baylor
  Grant Lerette - Baylor
  Monica Martinez – Baylor
  Chad Smith - Baylor
  
  Lean Operations:
  Edward Ordonez – Sr. Lean Operations Engineer
According to the supervisor this WO is to fab honeycomb panels. The prepreg and core are loaded but no film adhesive is called out on the WO. Also the panel requires production test panels to be made while the panels are processed. The core material for those are not on the WO as well and was also never purchased.

Key take away – The Work-Order example above is clearly missing parts needed to produce the honeycomb panels. These missing parts will ultimately cause process delays and have a financial impact to the shop. This could happen at least 2 to 3 times a week according to the supervisor.
Key take away – We have twenty defects over about a two month period. Material not on or loaded to the Work Order combined totaled 50% of the contribution. Followed by SLA coming in at 2\textsuperscript{nd} with 20%.
**Fiber Glass Pareto Chart of WO vs. Average Delay Days**

- All are SMNM Category (SLA and mold not made)
- **Key take away** – The WO with the SLA category have the highest number of average delay days
### Matrix Sorted by Delay Days

<table>
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<th>DATE</th>
<th>DELAY DAYS</th>
<th>WORK ORDER</th>
<th>MNOWO</th>
<th>MNLWO</th>
<th>MQLI</th>
<th>MWONI</th>
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**Key take away** – The high delay days correlate and fall out to the SLA category. The other categories are randomly distributed in the 7 to 0.04 delay day ranges.
Key take away – On average we have 40 delay days for the SMNM category, followed by 11 average days in the MLBNIS and 5 average delay days on MWONI.
Fiberglass Manufacturing Process Improvement Team

Action Items:

• Create a separate SLA Work-Order. This would help to be an in-line flag that would signal when a model is needed to be created.

• Create a SLA Process Flow/Check list so that the model and all the associated paper work is correct before the Fiberglass Shop starts work. Process Flow Below:
  1. SLA Model (electronically)
     a) Review for tooling Model/Check for revisions.
     b) Metaphase Release
  2. Build Part/SLS
     a) Validation of the model to the prints.
     b) Fiberglass shop to send the need for Part Drawing.
     c) Fiberglass shop needs Deformation Requirements.
  3. Fiberglass – In Work
     a) ID – Tag

• Dedicate a Fiberglass Planner, to oversee that the correct parts are listed and that material is ordered and or available on each Work-Order.

• Create a group that would oversee the bulk, common and as-required material or BCARM Group. The advantage would be an open line of communication between functional groups, an open forum to discuss material issues and to discuss pre-stage material requirements. Being proactive rather than reactive.

(All Action Items have assigned owners and completion dates)
Implementation Planning Phase

✔ **Action Items** – Who will be assigned to them and when will they be completed?
✔ **Sustainability Phase** – What measures do we have in place that are necessary to sustain the improvements? What do we have in place to make sure the new process will be used now and in the future?
✔ **Accountability Phase** – Who will be responsible for the new improvements?
✔ **Control Phase** – What matrix, specifications, work-instructions etc. will we need to sustain the improvements?
✔ **Transition Phase** – When will we Implement the new process and how?
✔ **Training Phase** – What training will be required to properly use the new process? Who will do the training and when?
✔ **Follow-up Phase** – How often do we check on the new process to see how it is performing and if any revisions are needed?
✔ **Status Report Phase** – Have a weekly Status reviews for updates on all key action items.

**Key take away** – MAKE IT A STANDARD WAY OF DOING BUSINESS
Conclusion:

Due to the semester coming to an end this project is more than half way completed. However the team did uncover many root causes and also discovered the lack of communication between functional groups. Based on many of the findings from our analysis we are definitely headed in the right direction with this project. The L3 leadership group will continue with the investigation to uncover all issues dealing with the Work-order related delays and ending the project with the Implementation phase.