From Our Experience

MERCURY PLM Services

Product Data Management for Aerospace Parts Suppliers

For companies supplying parts or assemblies to aerospace OEMs, managing product configuration is a daily challenge. This challenge is magnified if the parts supplier has more than one location providing components or assemblies to an OEM because each plant is often treated like an independent supplier. Now consider the potential for being audited for process and security controls by the OEM, FAA, AS9100 and third-party quality compliance companies, then product data management becomes a daunting endeavor.

For example, a daily challenge encountered by parts suppliers is making sure those suppliers have the most current product configuration data from the OEM. Typically, this means someone from each plant that ships components to the OEM must visit the engineering content portal daily to check for changes and download the new configuration data.

Once the data is downloaded, the real work begins. How is it secured? Who needs to review the content and analyze it for relevance? If the content initiates a change, what are the impacts to production? How much will the change cost? When do the changes take effect?

Add a significant volume of unique parts to the mix and more than one OEM with data to manage, and these parts suppliers are often quickly overburdened. Especially when every download package typically includes CAD models, drawings, OEM specifications, industry specifications, PO documents describing the changes, and more.

To further complicate matters, every OEM typically runs its own portal, which has a unique authentication process, site navigation, and document retrieval process, so trying to create an automated script to retrieve the new content is virtually impossible, if not illegal in many cases.

Further, many of the part changes only impact the manufacturing configuration, not the component design. For example, instead of drilling 12 holes into an aluminum flap, maybe only six holes are fully drilled, and the other six are only pilot drilled. Or another typical change is for the part surface quality, like on a wing leading edge where the specification tolerance for smoothness or shine may have become more stringent.

So how should the parts supplier handle this challenge? For most, the solution is very manual and labor intensive with plenty of opportunities for errors.

However, there are many potential solutions when using a PLM system. To help with managing the content from an OEM portal for example, a commonly accessible SharePoint site by all the plants could be created to store the downloaded content waiting for review. Attributes could be associated with the downloaded files such as customer, project, download date, etc. to maintain data segregation controls.

To help review the downloaded content for relevancy, a change board or product specialist can be appointed by project or the OEM to review the information in SharePoint and determine the level of impact.

Once the change has been initially reviewed and found applicable to one or more locations, the data should be imported into the PDM system and locked down from possible alteration.

After the data is imported into the PDM system, a cross-plant and cross-functional change board can further discuss the requested changes to understand the impact across the organization, along with potential cost and timing considerations.

The change board can be a paper-based system, or ideally, it would reside within a change workflow inside a PDM system. This way, the design data (CAD), manufacturing planning, quality enforcement, tooling, OEM change instructions, and specifications can be linked against each other and the change authority to provide the full impact of the change.

Relevant content such as spreadsheets for cost and timing

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analysis, vendor quotes, and other related information can also be attached to the change authority to provide the change board with everything required to make an informed decision.

Once the change board has reviewed the change and discussed any impacts to cost and timing with the OEM customer, the requested change can be approved for implementation by the cross-functional teams across all affected plants based on the agreed upon part effectivity plan.

By using linked content in the PDM system, the teams can work in a more coordinated manner. For example, the manufacturing planner can update routes and processes within the context of impacts to work instructions, NC programs, tools, inspection fixtures, etc. The quality engineer can participate in the manufacturing process review to ensure the quality inspection changes are captured and properly updated. Tooling designers correctly adjust jigs, fixtures, and gauges, while machine programmers revise the correct program version and know the latest version is delivered to the machine.

The final step in the change process within the PDM system is a verification step where all the "do tasks" are validated as complete and a production status is applied to the parts and change. This final validation step is often performed by a document controller or impartial internal auditor.

Since part and document traceability is critical in aerospace, if an electronic sign-off is not practical on the shop floor, the next best option is to collect the manual signatures from each production or quality step into a package and store it as a scanned PDF in SharePoint under a job identification number. Other relevant attributes could include date, customer OEM, project, plant, etc.

Following some of these suggestions may help reduce some of the noise and fire-fighting associated with supporting the parts manufacturing for a large aerospace OEM.

Content for this article was based on our experience working with aerospace component manufacturers. For more information, please visit www.mercuryplm.com.

Mercury PLM Services Unique Perspective

Mercury's differing approach concentrates on understanding your process as a must for success. A process-centric approach requires businesses to review and question existing work streams to understand "why," "what," and "how" work should be done to establish efficient cross-functional work flows that are consistent, repeatable and scalable for growth.

Mercury also offers a unique perspective for helping organizations that are considering a Product Lifecycle Management implementation because Mercury lives and breathes PLM from a manufacturing business user's vantage point.

Because Mercury works in a dynamic, global product-development environment that supports a worldwide manufacturing footprint, Mercury has a user's perspective that helps drive results and realize improvements. Several of Mercury's experts also have been deeply involved with our ISO 9000 certification effort, as well as configuration management, and engineering document-management practices. ■

PLM Offerings

Business Process
- Product Data Process Evaluation
- PLM Visioning & Roadmap
- Business Process Facilitation
- Process Impact Communication

Data Management
- CAD Configuration & PDM Integration
- Large Assembly Management
- Product Data Mgmt.
- Change Management
- Visualization

Prod. Data Planning
- Portfolio / Project Management
- Part Attribute Mgmt.
- Product Cost Eng.
- Requirements Mgmt.
- Collaboration

Back Office Support
- Environment Planning
- System Assessment
- System Admin Mentoring
- Upgrade/Patch Install

Manufacturing
- CAM and Tool Data Mgmt

Knowledge Sharing
- Hosted Events
- PLM Mentoring
- SharePoint Best Practices

Implementation
- PLM Implementation
- Training Facilitation
- ERP Integration