An Arena Solutions whitepaper

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Three Essential Tips for BOM Control

whitepaper

The key to any successful strategy for controlling your engineering and manufacturing processes and avoiding scrap, cost overruns, missed deadlines, and other manufacturing disasters must begin with your product data. But your data is not a single entity. It is a collection of information from design, engineering, manufacturing, and even supply chain partners. The trick is to consolidate each department's unique data sets in a tightly secured, yet readily available environment that enforces clean, standardized part and approved vendor information, maintains strict document control, and communicates engineering and manufacturing changes to all affected stakeholders automatically.

This whitepaper tells the story of a small manufacturer that learned too late that the informal processes that served their purposes when they first started out were now no match for the complexities of their growing business. This paper also describes how a collaborative bill of materials (BOM) and change management system like Arena could have prevented this disaster from happening.

4 COMMON PROBLEMS THAT LED TO DISASTER

Ellerby Manufacturing, a small manufacturer of high-tech electronics testing equipment, had ten days to get the pilot line for its new Short Spotter up and running so that it could ship product off to TUV for certification when its lead manufacturing engineer reported to executives that they were going to miss their deadline. A lot was riding on the Short Spotter, a hand-held thermal imaging scanner that can detect electrical hot spots in difficult to access locations. It has a full-color LCD display, image capture and diagnosis software, as well as three USB ports for transferring and storing data and images. The Short Spotter was going to be a price and performance breakthrough, and Ellerby had placed all their chips on its success.

Ellerby got onto TUV's testing schedule months earlier, confident that the production line would be up and running with plenty of time to spare. But, as usual, time slipped away, and now everyone was working as quickly as they could to make the final tweaks to build a shippable product. Everything from design to prototype build and internal performance testing had gone right with the Short Spotter. So, when manufacturing reported that it could not start the pilot, the entire organization was stunned. When they learned that the PCB assembly was missing chips, parts had nowhere to go, cables were too long, screws too short, and nothing fit together, they were devastated. No one knew how they had made such a mess of things.

Ellerby Manufacturing missed its TUV certification testing date, which had to be moved to the next available slot on the TUV schedule several months later. Ellerby incurred great costs shipping back unneeded parts and reordering the correct parts. New product development was suspended as every employee and department was re-focused on getting the Short Spotter launched. In all, about six months were lost investigating what went wrong with the product and discovering what was wrong with their process that caused the Short Spotter roll-out to be such a disaster.

The ensuing internal investigation of what went wrong revealed that the primary problem Ellerby encountered was that the company had no control over its master BOM. The entire process relied on informal, ad hoc processes that did not support an organization that had grown yet still required the nimbleness of a start-up. Ellerby's heads of operations, engineering, manufacturing, and purchasing identified four major ways that their BOM and engineering change order (ECO) management process had broken down:

1. Frequent design changes and different data formats for each department left the consolidated master BOM riddled with errors

2. Frequently changed BOMs were often inaccurate and the inaccuracies were not caught because Ellerby did not have a formal review methodology in place

3. Changes in the master BOM were too easy to make and the changes were neither highlighted nor communicated to stakeholders

4. Overlooked and improperly reviewed changes, as well as inaccurate data in the master BOM, resulted in purchasing ordering the wrong parts and the wrong quantities or not ordering parts with long lead times in time to meet production schedules

The conclusions surprised Ellerby's management and development teams. They had always considered themselves a tight-knit group that excelled at collaboration. They dutifully informed their colleagues about changes they had made, or were considering making, to their part of the project using e-mail, voice mail, or passing hallway conversations to ensure that everyone remained in the loop.

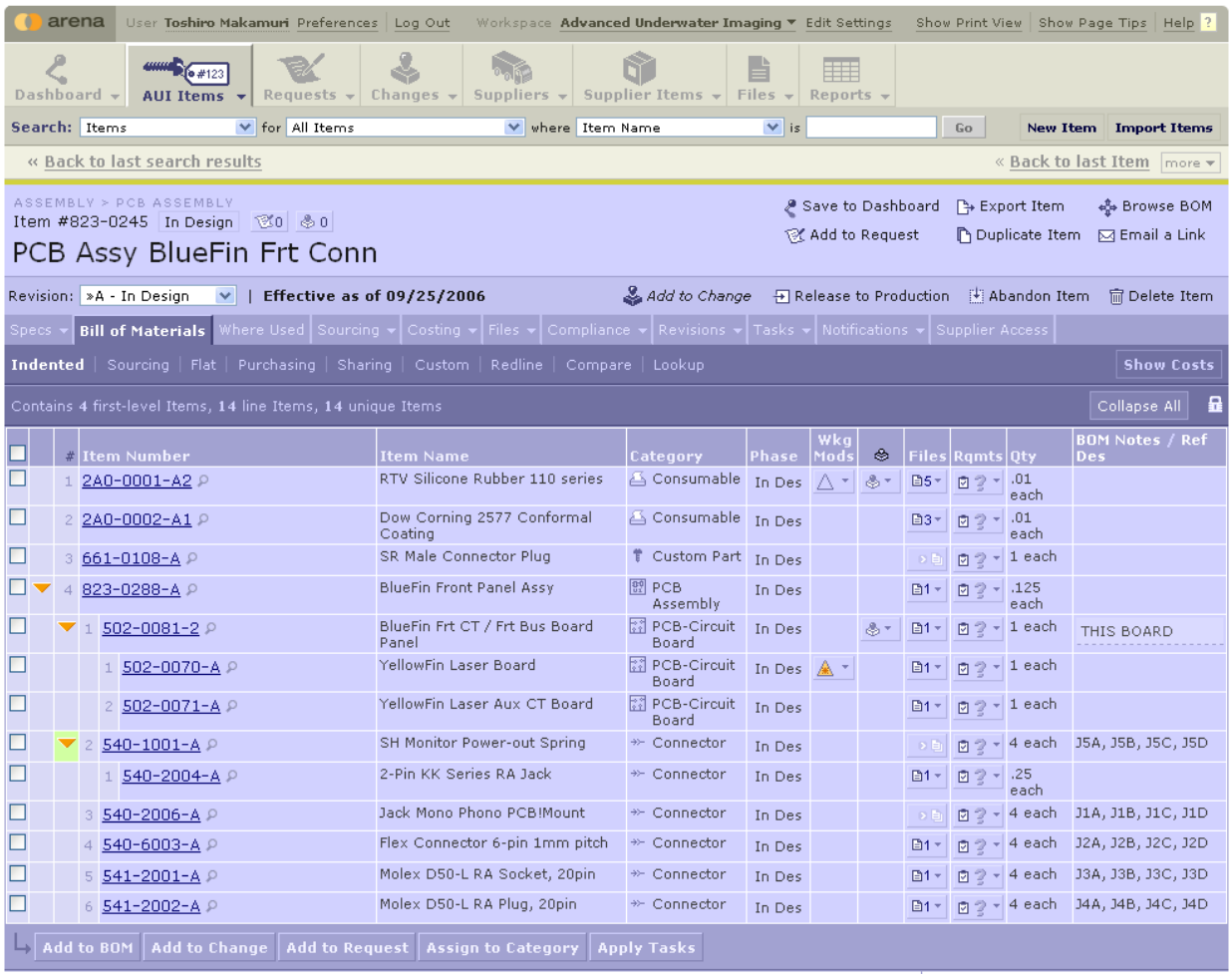
Each department also used Excel spreadsheets for their BOMs. Throughout product development Ellerby's mechanical, electrical, manufacturing, and purchasing teams continuously entered new information into their BOMs. They delivered a copy of their updated BOM to the person in charge of the master BOM, which, at Ellerby, was the purchasing department. Because Excel does not highlight changes, this left Ellerby vulnerable to missed changes when reconciling newly updated BOMs with the master.

With every department making changes to its BOM and communicating changes through ad hoc channels, it became impossible to enforce changes and control the master BOM. The entire process had left Ellerby to deal with missed, forgotten, or garbled engineering changes that cost the company a lot of time and money when the problem was discovered too late to keep the Short Spotter on schedule.

HOW ARENA HELPS YOU CONSOLIDATE YOUR BOM

Companies like Ellerby learn the value of having control over their BOMs the hard way… You don't have to. Arena eliminates this vulnerability by providing a single, unified system that, in real time, automatically combines and synchronizes changes into a single master BOM accessible by all departments. Furthermore, Arena highlights changes in a redline view so that they are easy to find, and then automatically notifies affected stakeholders of the changes. This visibility allows teams to assess the change's impact on their project immediately. For example, operations always has access to the latest engineering data for purchasing or manufacturing planning and mechanical engineering knows when the electrical team has changed the outline of a circuit board.

A single, unified BOM does not mean that Arena imposes its structure on your organization. Individual users and departments can configure their view of the BOM. This gives your process the advantage of having departments working only with the data they need while maintaining the data's relationship to the entire product record. In practice, this means that purchasing sees only the part information they need for costing and that data crucial to electrical engineers, such as reference designators, does not clutter their view into the BOM. On the other hand, electrical engineers see their designators, but don't need to see if the parts come on a reel or in a tube.



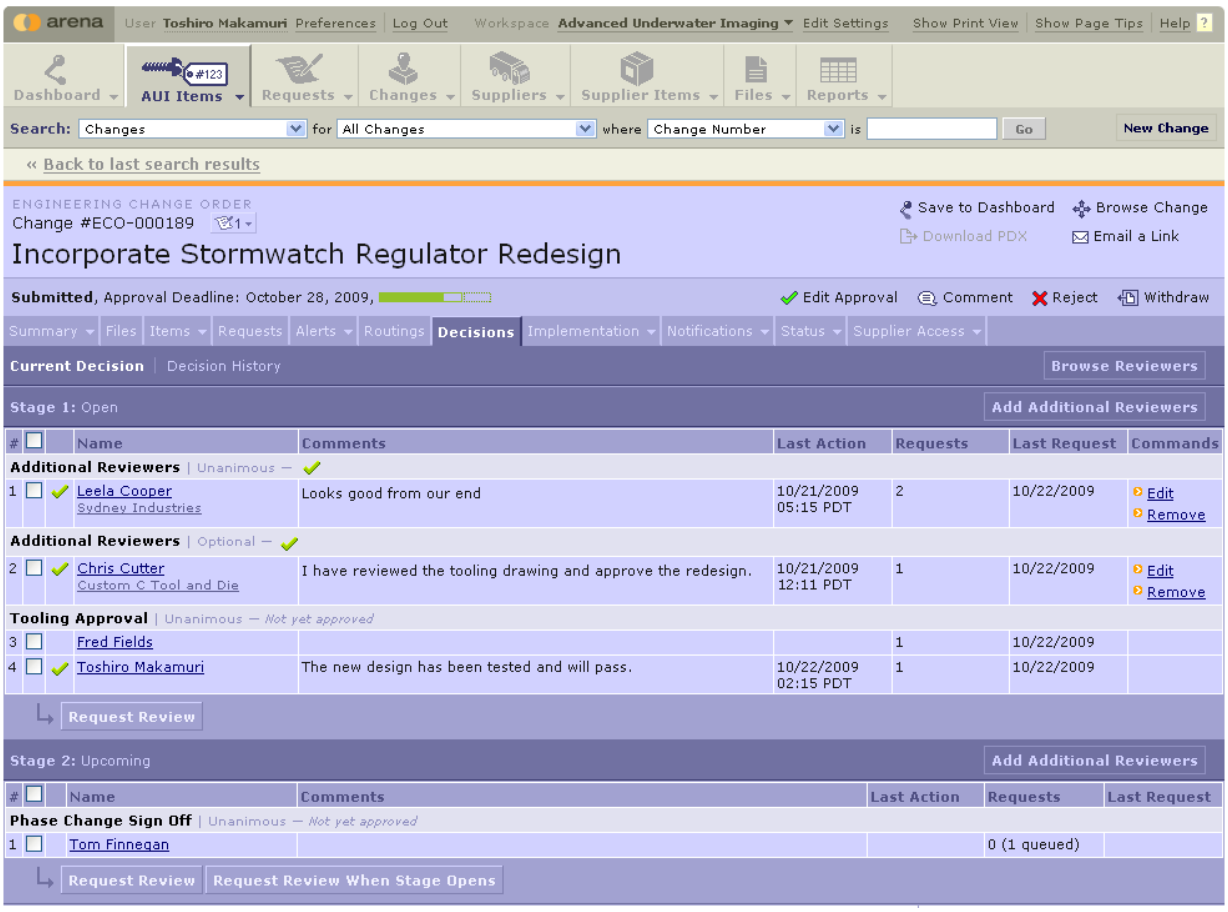
Arena Indented BOM View

HOW ARENA HELPS YOU CONTROL CHANGES

An informal, ad hoc system for managing changes to the BOM cost Ellerby dearly. Your staff cannot be expected to remember every e-mail or discussion they have had with colleagues in other departments. Arena eliminates this vulnerability by enabling you to standardize and automate your ECO and approval process. This ensures that changes cannot be entered into your production master BOM without leaving behind an auditable record of approvals that include digital sign-offs.

Arena's ECO methodology is fully configurable to your process needs. For example, you can tailor Arena to accommodate the differences between each phase of your product's lifecycle. This means that you can set looser routings and sign-off levels or none at all for revision changes during the design phase then establish stricter controls including ECOs for changes during the production phase. Arena also automates ECO routing, ensuring that the right people review and sign off on changes before anything is implemented.

Not only does Arena control your change process, but it dramatically accelerates ECO turnaround times. Users typically report that Arena has cut their change cycle times by 50% and in some cases the newly automated process reduced their cycle times from months to just days.

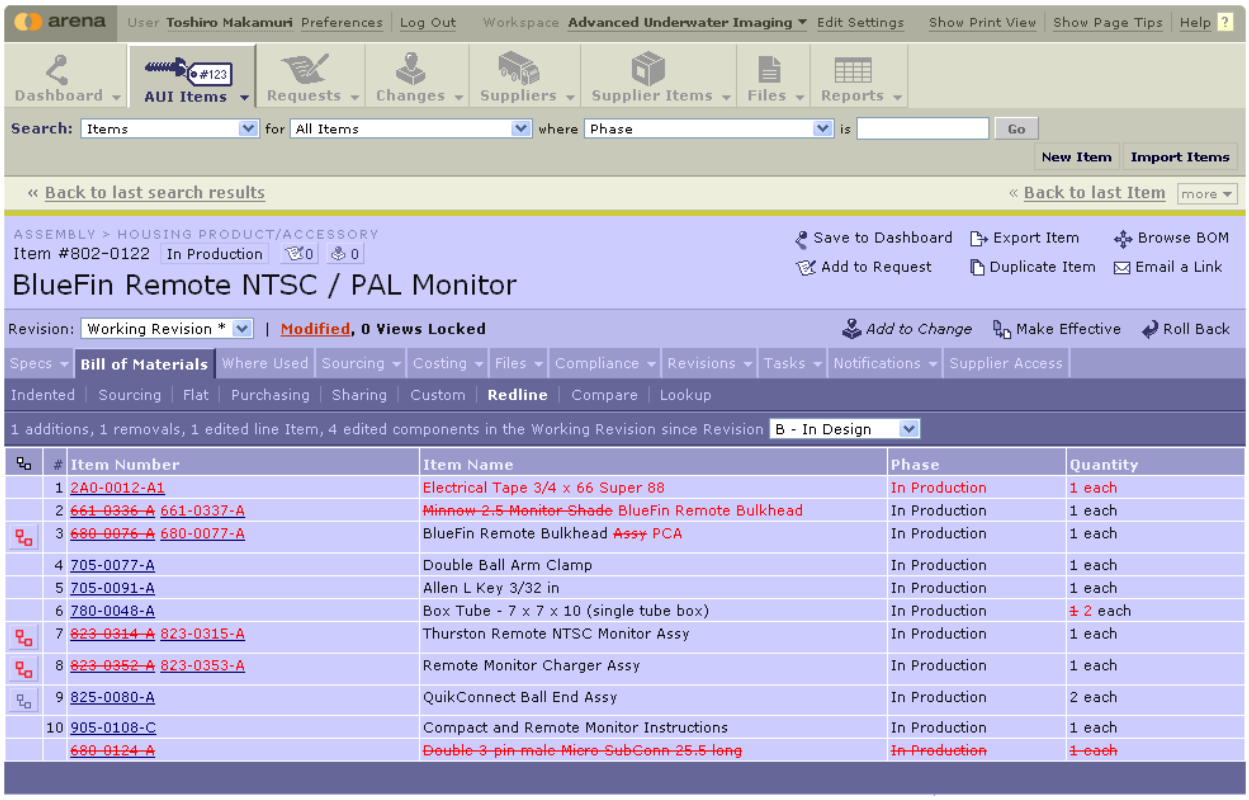


View of ECO sign-off in Arena

HOW ARENA HELPS YOU MAKE DECISIONS

It's clear that Ellerby could have avoided this disaster by having a formal ECO methodology with automatic routing and enforceable approvals with digital sign-offs. If Arena had been managing Ellerby's ECO process, it would have helped focus their attention on what decisions needed to be made.

Through Arena's redline functionality, you cannot miss a change and order the wrong part. A single modification to a 1000-line BOM is readily apparent, almost popping off the page. You can easily compare two revisions of a BOM and see how they differ. Redlining gives you visibility into when files or specifications have been modified, or if parts and quantities have changed. This will allow you to order the right parts, in the right quantities in time to meet your production deadlines.



Redline BOM View in Arena

GET CONTROL OF YOUR DATA NOW

The goal of all manufacturers is to build a product correctly the first go around, ship it on time, and stay within budget. Establishing and maintaining control over your data and bill of materials is essential to achieving this goal. This used to require a staggering investment in time and money, but Arena makes it easy and affordable for the small to mid-size company.

Arena's flexible user-based pricing and on-demand delivery make the time and money hurdle a thing of the past. Arena provides the software without requiring additional IT infrastructure and allows you and your team to focus on what you do best … design and build good products.

If your success depends on staying within budget and getting to market before your competitor, you cannot afford to let your data get out of your control. Arena reduces scrap, rework, missed deadlines, and cost overruns. Arena makes it easy to avoid disaster, control your bill of materials, and stay on top of engineering changes.

Learn more about how Arena can help you get your data under control by visiting www.arenasolutions.com/bomcontrol.

This whitepaper is brought to you by Arena Solutions, which enables small to mid-sized global manufacturers to deliver their products to market on time, within budget and at high quality. Arena provides a collaborative environment for centralizing, controlling and analyzing complex and constantly changing product information, including bills of materials (BOMs), part specifications and engineering change orders (ECOs).

The repository for the product record, Arena sits at the epicenter of the broader product lifecycle management (PLM) landscape, connecting with systems like CAD, EDA, PDM and ERP and linking organizations with their supply chains. With its on-demand, software-as-a-service (SaaS) approach, Arena is a low-risk, rapid-return proposition that makes enterprise-class functionality available to companies that would otherwise have to contend with manual, time-consuming and error-prone product data management processes.

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