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ENGINEERING CHANGE MANAGEMENT:

Three Challenges, Five Fixes

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WHITE PAPER

THE LIFEBLOOD FOR
PRODUCT DEVELOPMENT

The lifeblood for getting new products to market, or improving existing ones, is engineering change management. Engineering, quality, purchasing, manufacturing, and supply chain partners must be able to work together seamlessly to design, develop, test, build, and ship high-quality products to customers fast and effectively. For regulated companies, this includes adhering to a myriad of environmental, safety, ISO, FDA, ITAR, EAR, and other directives or standards.

Engineering change management allows dispersed teams to create, review, and approve new or existing designs. It provides a level of control, typically revision-based, to ensure that everyone is working around the right design and the right time.

Over the past few decades, engineering change management processes evolved from manual, paper-based systems to email-based sharing of electronic documents. Many newer point solutions—even those in the Cloud—are not fully connected to the entire product design record or other related requirements, quality, and project records. Without a single system, or single source of truth, internal teams and their partners have a harder time identifying the latest information and risk product launch delays and costly production errors.

THREE COMMON
ENGINEERING CHANGE CHALLENGES

Given the myriad of approaches in use, we want to cover three common challenges and provide five solutions or "fixes" to help you improve your engineering change management process and deliver innovative products to your customers on time and under budget.

CHALLENGE #1: You're Managing Change With a Paper-Based Process

A paper-based change management system locks your organization into communication habits that add time and hassle to the change process.

- **Paper is cumbersome.** A folder of printouts is not a secure and efficient means to communicate information. What if a page slips out or the folder gets lost? What if a reviewer has a question? And what would happen if the folder were to fall into the wrong hands?
- **Reconciling paper data sources is time-consuming and error-prone.** The potential for conflict between different sources is high, and the process of reconciling this conflicting information places a huge burden on resources.

CHALLENGE #2: Real-Time Visibility to Change Information Isn't a Top Priority

Real-time visibility that enables people throughout the organization to view change information at any point in the process saves time and money.

- **Don't assume that visibility equals vulnerability.** Letting people view information is not the same thing as letting people change information.
- **Visibility extends throughout the organization.** A change system needs to accommodate everyone involved in the product process, from engineers to managers to executives.

CHALLENGE #3: The Supply Chain Is Not Integrated Into the Change Process

Don't think of your four walls as the boundary of your business: including your suppliers and outsourced partners in the change process saves you time and money.

- **Supply chain mistakes are expensive.** Production delays, mistakes, and scrap and rework are costly and can hurt both customer satisfaction and partner relationships.
- **Don't waste supply chain partner expertise.** It's in the best interest of your suppliers to help you, so capitalize on this by involving them in your product development and change review and approval processes.

FIVE FIXES TO IMPROVE
ENGINEERING CHANGE MANAGEMENT

FIX #1: Go Electronic

Moving away from paper-based engineering change, product development, and documentation processes frees you from the limitations that paper imposes. Cloud-based product lifecycle management (PLM) and quality management system (QMS) software solutions are designed for electronic, real-time change management processes.

- **Create electronic engineering change orders (ECOs).** Stop shuffling paper and create automated routings and reviews for internal and external teams.

- **Capture complete change history with a traceable audit trail.** With electronic engineering change management, tracking review cycles and change history is easy. You don't have to wade through file cabinets, binders, or depend on disconnected silos that are not connected to your parts, assemblies, documents, policies, quality, or training records.

- **Manage role-based access policies. Set up user permissions that ensure the right people can view and approve ECOs and related product information.** When the administrative overhead of managing the engineering change process is handled electronically with PLM and QMS software, your resources are freed to focus on core competencies.

- **Group changes for multiple parts or assemblies in fewer ECOs.** Don't think part-by-part—think about the whole product being designed or changed. Your reviewers will thank you when they can see the big picture without having to wade through multiple ECOs.

- **Have changes to parts, assemblies, and documents automatically incorporated into the product record.** Don't rely on manual incorporation processes or reconciliation. You can set up your change and revision processes to ensure your affected product records are ready with updated information upon release.

FIX #2: Make It Easy to Digest and Understand the Proposed Changes

The more time product teams and individual reviewers spend trying to understand an ECO, the longer the process takes.

- **Include only the information that is changing in the ECO.** If you are asking for approval on a simple sourcing change, there's no need to put the entire product specification in the ECO. Extraneous unchanging information just slows down the review process.

- **Attach relevant documentation to the ECO.** Consider what information will help the team understand the nature and reason for the change. Do you have customer input? CAPA-driven resolutions? You can share information to give the reviewers the reason and impact for your changes.

- **Include redlined BOMs.** Specifically, a redlined BOM that clearly indicates modified quantities, part numbers, reference designators, and makes it easy to see exactly what is changing. See an example below.

FIX #3: Route Electronic ECOs to All Internal Team Members and Partners

Once your engineering changes are managed online, it's easier to track, review, and release changes to drive immediate product updates, especially with dispersed teams.

- **Notify reviewers automatically.** You can configure changes to automatically notify your change control board (CCB) or external reviewers via email with links to the related changes.

- **Don't limit visibility to the CCB.** The change control board is not necessarily the only group that needs to know about pending ECOs. Let other people view and subscribe to product lines and related changes so that they are notified whenever ECOs have been submitted, modified, rejected, or approved.

- **Create electronic approval traceability.** Enable reviewers to approve or reject ECOs immediately, and let others see their decisions.

- **Add additional reviewers on the fly.** Your change boards likely comprise the same departments and players in most cases. However, you need the flexibility to add other reviewers or participants that may have additional responsibility or insights regarding certain product lines, types of changes, or unique situations. Your change management software should allow for adding ad hoc or additional reviewers as needed.

FIX #4: Route Your Changes to the Right People at Specific Stages Throughout the Product Lifecycle

New product development (NPD) and new product introduction (NPI) is continually evolving. Your company's business processes change to meet new customer demands, technological advances, and specific innovations to your products. Having a dynamic and flexible change process that allows you to get changes to the affected teams and partners will ensure you can grow and scale as needed.

- **Adjust the level of change control for each stage of development.** Set up simpler revision controls for prototype parts and products. Introduce more controls with ECOs and change boards during limited production or volume production to ensure you can plan, build, and deliver high-quality products on time.
- **Route different kinds of changes to specific people.** Consider using different change board teams for various types of parts or product lines. This will ensure that those who know the most about any given product are the ones making the approval decisions.

FIX #5: Get Real-Time Access Online to Any ECO

Your ECOs contain critical information about your products and your process, so make it easy to access, review, and approve anytime and anywhere.

- **Manage your ECOs in a single system or "source of truth."** This ensures everyone is always looking at the latest information.
- **Send reminders to reviewers.** Your teams are always busy, so send email reminders with a link to the ECO when they need to take action.
- **Track ECOs from creation to release.** Your ECO history will help your teams trace decisions and product changes. If issues arise (and they will) in the field or with customers, you can use your change history to identify why decisions were made, by whom, and drive faster resolution.
- **Track all reviewers and status.** When it's easy to monitor who has reviewed ECOs, it's easier to follow up when approval delays hit.

READY TO AUTOMATE?

Arena has been helping companies speed product development and launch processes for years. Our electronic change management solution can improve efficiency, control, and accountability. Consider how Arena PLM and QMS can streamline your change management, NPD, and NPI processes. Arena helps internal teams and supply chain partners design, develop, and produce high-quality, innovative products fast.

Arena's cloud-based software solutions create a solid product development foundation with electronic changes (ECOs) linked to affected parts, bills of materials (BOMs), quality issues, training records, project plans, and more. More importantly, they give everyone in your organization the ability to see what is happening and what has happened over time. With reporting and analytics, your executive teams are empowered with key insights to speed product development and get products into your customers' hands quickly and under budget.

For more on Arena and information about Cloud PLM and QMS solutions, visit ArenaSolutions.com.