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Jacobs Vehicle Systems™

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FAST FACTS

Company:
Jacobs Vehicle Systems is recognized as the industry leader in developing and manufacturing commercial vehicle retarding systems.

Industry:
Manufacturing

Geography:
United States

Challenges:
- Establish centralized control of digital project assets and activities
- Efficiently specify, validate and communicate change requests
- Improve efficiency and eliminate rework

Solution:
Change Management

Products:
Borland® StarTeam®

Results:
- Improved quality and productivity through centralized control of project assets
- Improved visibility and communication of change requests
- Three times faster builds due to improved efficiency and reduced rework

COMPANY

As the maker of world famous Jake Brake® engine retarders, Jacobs Vehicle Systems is recognized as the industry leader in developing and manufacturing commercial vehicle retarding systems. With more than 40 years experience in the business, Jacobs is known for its innovative business practices, modern manufacturing methods and a level of research and development investment rivaled only by the aerospace industry. The Jacobs Engine Brake® and Jacobs Exhaust Brake® are available worldwide. No matter where the road may lead, Jacobs Vehicle Systems is engineered for the road ahead.

CHALLENGES

Jacobs has taken its core competency of designing precision valve actuation to new heights. Jacobs is working to take advantage of opportunities created by shifts in the commercial vehicle retarding systems market by delivering advanced technologies in the area of Variable Valve Actuation. Variable Valve Actuation (VVA) is one of an engineer's most powerful and cost-effective tools for accomplishing vehicle system performance goals: meeting tightening emissions standards while maintaining fuel economy. VVA precisely tunes the engine across its operating range, which can control exhaust gas temperature, increase low-end torque, reduce emissions, boost transient response and optimize fuel consumption.

With Jacob's focus on VVA, the need to formalize process and consistency around software development lifecycle management has become a critical requirement for success. Unlike Jacob's traditional engine products, VVA leverages software to accept inputs generated from an engine to allow real-time adjustments for valve opening and closing, to maintain precise control of valve motion. Having traditionally focused on hardware development, Jacobs created a new team called the Advanced Systems Group to focus on creating electronics, which include both hardware and software components, for the VVA technology.

The Advanced Systems Group is responsible for managing source code and change requests for products such as the Jacobs Valve Control Unit (VCU). The group maintains a base software code line for the product, as well as modified software code branches for each customer specific implementation. In order to offer the best service to their customers as well as maintain efficiency and optimize resources within their team, the Advanced Systems Group looked to automate their software change and configuration management (SCCM) process.

Establish centralized control of digital project assets and activities

The Advanced Systems Group includes a lean group of software engineers. Because the team is responsible for maintaining more than one software code branch and has multiple people working on source code in parallel at any given time, the team needed a system that would provide them with centralized control while increasing project visibility across stakeholder roles. This would give the engineers the ability to concurrently make changes to the code without reintroducing previously fixed defects while maintaining separate source code versions for their various customers. Additionally, members of the Advanced System Group spend time working offsite at customer locations and supplement software engineering staff with contract employees on a regular basis. This meant that they needed a way to support geographically distributed development with good support for access from remote locations.

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Efficiently specify, validate and communicate change requests

The Advanced System Group is responsible for developing and managing the core software code line for VVA products, including the Jacobs Valve Control Unit (VCU). They are also responsible for managing customer change requests (CRs), including prioritizing CRs, addressing CRs by making changes to customer or core software source code and managing a backlog of CRs. The team manages this responsibility by regularly holding a change control board meeting every two weeks. At the change control board meeting, a team of stakeholders would review manually generated CR Reports and make decisions on prioritizing which CRs to address. While the team had an existing software configuration management tool, WinCVS, it didn't offer integrated change management capabilities, so the team was left to cross reference change requests with source code manually. Without a way to quickly determine the status of a CR, it's impact and relationship to existing source code, the process was tedious and time consuming, as well as inconsistent and prone to error.

Improve efficiency and eliminate rework

Without an integrated software configuration and change management system, the Advanced System Group lacked an efficient build and release process. The team relied on manual processes to pull project components together for any given software build. This slowed down the speed and frequency of software releases. Additionally, the need to maintain separate code branches for individual customer releases resulted in a large amount of rework, as there was no easy way to isolate changes, reuse existing components or easily merge code updates from the baseline product to the individual customer code branches as changes were made. Finally, while their existing WinCVS system provided a basic set of capabilities for source code management, it wasn't very scaleable or entirely reliable.

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SOLUTION

After evaluating solutions from several other vendors, including Microsoft Visual Source Safe, WinCVS and Serena PVCS, Jacobs Vehicle Systems chose Borland® StarTeam® for software change and configuration management. Borland® StarTeam® is part of the Borland® Change Management solution, which allows development organizations to control, communicate and respond more effectively to rapidly changing business demands.

"We chose Borland StarTeam because it offered integrated change management and configuration management capabilities," said Gosselin. "Borland StarTeam was also the most reliable solution we looked at, and provided the ease-of-use and flexibility we were looking for in an SCCM solution."

Ease-of-use and low maintenance overhead was also key criteria for the Advanced Systems Group in selecting a SCCM solution. A robust platform for coordinating and managing the entire software delivery process, Borland StarTeam promotes communication and collaboration through centralized control of project activities and digital assets. Jacobs now has integrated change and configuration management, project and task management, defect tracking, file versioning and threaded discussions. This speeds the build and release process and allows Jacobs to optimize the resources of its team to meet customer requirements.

The team is also using Borland StarTeam to centrally manage their electronics design documents, which includes design specifications for hardware components of their control units.

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RESULTS

Improved quality and productivity through centralized control of project assets

By providing a central, collaborative repository, Borland StarTeam keeps all of the project's assets up-to-date and available, dramatically improving team communication and productivity. The Advanced System Group reports higher confidence in their code quality while optimizing their productivity. Using the system, the team can link CRs to source code changes, which gives the team direct visibility into all changes that go into a build. Prior to implementing Borland StarTeam, CR status was reported to customers through manually created version description documents. While these documents were accurate, they were static and aged as soon as they were created. With Borland, the team can communicate real-time CR status to customers, which has improved customer care and loyalty.

"Borland StarTeam gives us a living version description document. It is our time machine to go back in time and look at the code. Since change requirements can be linked to the source code, when our customers have questions about when or why a change was made, we can easily see all the revision details," adds Gosselin

Improved visibility and communication of change requests

Before using Borland StarTeam, change control board meetings tended to be unstructured and subjective. Without a way to accurately report on the status of, and prioritize, CRs, decisions were made based on the loudest voice, not on factual data or actual severity. With Borland StarTeam, the team can run a report that reveals CR status instantly, which helps drive better decision making and makes meetings much more productive. With Borland StarTeam's integrated change request component, it has never been easier for the Advanced Systems Group to make decisions or report on status with confidence.

THREE TIMES FASTER BUILDS DUE TO IMPROVED EFFICIENCY AND REDUCED REWORK

With a centralized location for build components, the Advanced System Group can create builds three to five times faster than with the previous system, which has greatly improved the team's efficiency. Additionally, the team is using Borland StarTeam's branching and merging capabilities to visually compare and merge branches of files. This allows the team to maintain baseline source code (parent) and maintain modified code branches (children) for each customer separately. Changes in the baseline code can be automatically propagated into the customer code line, but changes in the customer code branches are isolated from the baseline source so that they do not show up in the baseline code until its ready to be merged and integrated. This enables the team to be more productive by reusing existing code while appropriately isolating customer code.

Borland StarTeam has also proven to be an extremely reliable tool for the team, with no unplanned outages or lost code. Additionally, when it was time to upgrade to the latest release of Borland StarTeam, the process was effortless.

"Our build and release cycle is significantly faster with Borland StarTeam. It has also been effortless to manage, which is a huge relief in an environment where staff resources are tight," notes Gosselin.

Borland is the leading vendor of Open Application Lifecycle Management (ALM) solutions - open to customers' processes, tools and platforms - providing the flexibility to manage, measure and improve the software delivery process.