ARENS CONTROLS COMPANY, LLC

Automating the creation of controls assembly instructions with SolidWorks Composer

ARENS Controls uses SolidWorks Composer software to automate the development of instructions for assembling its industry-leading control systems.

Leading original equipment manufacturers (OEMs) in the heavy duty truck and off-highway construction and agriculture markets rely on ARENS Controls for by-wire control systems, power management technologies, and innovative operator interface solutions. Arens has extended its expertise in electromechanical controls to also become a leader in power management systems. This has enabled the company to play a major role in the fast-growing hybrid vehicles segment, providing advanced-power, electronic-drivetrain components and systems to hybrid vehicle manufacturers.

An important facet of Arens Controls product development is the creation of instructions for assembling its world-class controls and power management systems. Until recently, Arens Controls manufacturing engineers relied on digital photographs and word-processing tools to create instructions that document and support the assembly process. This approach had several drawbacks, according to Engineering Services Manager Joseph Stefinsky.

"Prior to using SolidWorks® Composer software, our manufacturing engineers used a manual process involving digital photographs manually integrated into a text document" Stefinsky explains. "This process was time-consuming and occurred at the end of the product development cycle. SolidWorks Composer software allows us to create the assembly instructions concurrent with product development. SolidWorks Composer has greatly decreased our time-to-market, a benefit for both Arens and our customers."

Manufacturing Engineer Rob Schwartz concurs. "Trying to develop assembly instructions using a camera and Microsoft® Word is not the most efficient approach. We build more than 2,500 products, and updating instructions using our previous process was very time-consuming. With SolidWorks Composer, we can generate changes from models prior to production parts being available. This allows for assembly training to be prepared concurrently with product development and validation. Once the production components are in-house, we can immediately begin hands-on training of the production staff."

Challenge:
Streamline the development of controls assembly work instructions to address photography scheduling and assembly delays, make the handling of engineering changes more efficient, and improve the quality of assembly instructions.

Solution:
Implement SolidWorks Composer software to support a more automated approach to the development of controls assembly work instructions directly from SolidWorks CAD models.

Results:
- Cut assembly instructions development time by 66 percent
- Pulled assembly documentation development earlier in the program by as much as a year
- Minimized reliance on digital photography
- Accelerated handling of design changes

▶ **Click here to view animated assembly instructions created with SolidWorks Composer.**

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The solution was to leverage the company's SolidWorks® design models to create high-quality 2D and 3D imagery and illustrations—including interactive animations of assembly processes—to support assembly instruction development. "We discovered SolidWorks Composer and believed it could improve efficiency and quality," Stefinsky says.

No need to wait for assembly

Arens Controls implemented SolidWorks Composer technical communications software to create assembly instructions for a new version of the T79XXX Shifter for mining trucks. Schwartz says that by using SolidWorks Composer to create assembly images and Microsoft PowerPoint® to create the instructions, he didn't have to wait for parts or assemblies and was able to work on the instructions immediately. He also was able to cut the time needed to complete the instructions by two-thirds.

"On the T79XXX, I had the instructions done before the first parts arrived on the dock," Schwartz stresses. "Not only was I freed from having to wait for parts or assemblies, I was able to put together better content in a fraction of the usual time and there was no need to wait for production components to arrive."

Replacing photos with CAD renderings and animations

Because SolidWorks Composer lets users focus more on high-quality CAD renderings and animations, and less on photos and lengthy word descriptions, the software gives Arens Controls greater flexibility to complete instructions ahead of assembly and handle engineering change orders more efficiently. Stefinsky uses SolidWorks Composer to create 3D interactive content from released SolidWorks models, and engineers like Schwartz use it to create supporting visual content for assembly instructions.

"SolidWorks Composer allows our engineers to capture assembly visuals from any angle they want, resulting in more clarity, better understanding, and less guesswork," Stefinsky notes. "With SolidWorks Composer, our engineers can develop better assembly documentation as soon as a design is released, and respond to engineering change orders promptly, before a single part is built."

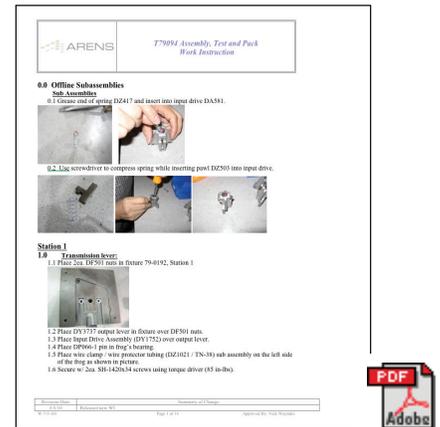### Supporting greater assembly automation

The success that Arens Controls experienced with the T79XXX instructions demonstrated the greater potential for SolidWorks Composer. "The response from everyone in production has been very positive," Schwartz points out. "Clearly, watching an animation is more effective than leafing through a stack of paper."

"With the PC terminals used in production, our assemblers can refer to the screen instead of a written document," Stefinsky says. "We are looking at extending SolidWorks Composer for use in other areas, such as documenting tooling, fixtures, and wiring designs, or to support maintenance and service in the field. After completing this project, we believe we're only scratching the surface of SolidWorks Composer's true power, which we hope to tap into, to realize additional benefits in the future."

Assembly instructions before SolidWorks Composer

Assembly instructions after SolidWorks Composer

Using SolidWorks Composer, ARENS Controls can more efficiently develop higher-quality assembly instructions. Older instructions (top) relied on photography that was difficult to schedule and arrange. Instructions created with SolidWorks Composer (bottom) are easier both to develop and understand.