

# PROE

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## 3D CAD models move into the future: A web forecast

**VIRTUAL PROCEDURE** ENSER Corp  
28-Sep-2001

**Step 5: INSPECTION & ASSEMBLY OF FLEX SUPPORT**  
Inspect and/or repair Flex Support for assembly per FSP-700-01 Section 7.4. (Ref Sections 7.4.1 thru 7.4.5) Assemble and verify transition support lugs per FSP-700-01 Section 7.4.6.

**Step 6: REMOVE MANWAY COVER**  
Remove manway cover and prepare to enter turbine without removing turbine cover.

**Step 7: INSPECT RADIAL CLEARANCE**  
Inspect radial clearance between row 1 vane and the row 1 blade ring. Reference FSP-700-01 Section 7.5.2.2.

**Step 8: ADD DUMMY STUD**  
Add fully threaded dummy stud per FSP-700-01 Section 7.6.1 Without flex support installed.

**Step 9: MOUNT FLEX SUPPORT**  
Mount flex support to turbine using (2) weld

**Properties**

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## 3D CAD models move into the future: A web forecast

*This web-based engineering and manufacturing procedure is set to become a standard in the engineering arena*

By Marco Arnone

Many companies in today's engineering industry do not fully utilize the 3D CAD models that are created for their designs. Enser Corporation, a 54-year-old, New Jersey-based engineering services company, has found a way to stretch the boundaries of CAD data for many of its clients. Enser uses a software package that ties manufacturing, training, maintenance, marketing and sales back to the engineering department. This software package, called IPA (Interactive Product Animator) comes from Immersive Design, a product communication software firm in Massachusetts.

IPA Professional is an animation and web-publishing solution that allows communication of 3D product information for downstream applications including interactive assembly, maintenance and repair documentation, product catalogs and product presentations. There is minimal preparation involved, other than simply determining how to utilize the specific product or procedure. Once this has been established, two outputs can be created: a web page (HTML) or a Windows-based movie (AVI) file, which can be published to a location of choice. When someone views the HTML file for the first time, an IPA web viewer plug-in automatically downloads to his or her computer, making the 3D model available for interactive viewing.

The AVI file, the initial output, is the starting point for obtaining the HTML output. After the AVI is complete, an HTML page can be developed to show (or not show) the assembly's parts tree, bill of materials (BOMs), instructions, images, videos, links, or part attributes (weight, density, etc.). Once this HTML page is complete, the end-user can zoom, pan and scroll the model while viewing animations, assembly instructions and other pertinent information without needing a CAD system.

Enser is discovering that once its clients realize what the company can do for them, the possibilities are endless. Currently, Enser uses IPA in various ways:

- To convey design intent to other members of the design team
- To communicate product information to non-technical people and departments

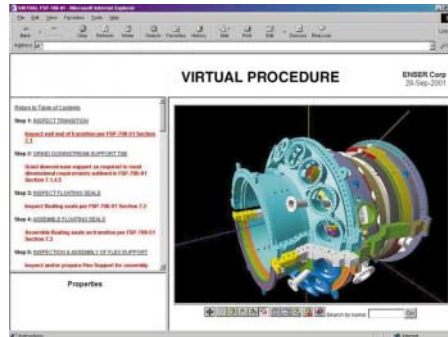


Figure 1

- As a training aid to facilitate product assembly, disassembly and service

One of Enser's main clients—a major original equipment manufacturer (OEM) in the power generation industry—has started using this new service in several areas, but specifically as a training aid to explain combustion engine servicing to its field technicians.

As a senior service product manager for the OEM explained, "We are implementing the procedure to train our technicians before they go out and service an engine. When you are dealing with substantial penalties for every extra day an engine is down, this quickly becomes a critical issue." The goal is to decrease the amount of time it takes to make engine repairs.

The process is simple, once all of the necessary parts are modeled in Pro/E or another compatible CAD software package. In the OEM project, the engine model did not exist in Pro/E and the entire section was designed around the area that would require servicing. The models were created in Pro/ENGINEER Release 2000i (the IPA software is also compatible with Pro/E Releases 19 through 2000i<sup>2</sup>). The models were then imported into IPA so that the manipulation process could begin.

Next, IPA systematically documented a maintenance procedure with disassembly instructions to show the necessary steps for performing the repairs. An animation was generated by "grabbing" a part with the cursor, identifying a start point, then moving the part (with rotations or linear movement) and entering the motion's end point. The timing was set

for the sequence in a scheduling window that described the sequences as instructional steps. Additional options include modifying part color, fading parts in and out, descriptive text, lighting and linkage motion.

As seen in Figure 1, the resulting HTML file, which contains optional notes and hyperlinks to supplement written instructions, is robust and informative, giving the technician an opportunity to learn the process at his or her own pace. The HTML page allows the technician to step through each instruction, showing all the information necessary to perform that operation, including highly detailed, linked standards and specifications. The capability to "Fly Thru" the entire model also gives the technician dynamic control in visualizing what he or she will be working with. This "Fly Thru" ability allows the technician to pan and zoom through the models as if working with the actual parts.

Enser regards this service as a powerful and cost-effective tool. An animation can be developed in the same amount of time that it takes to create an exploded-view drawing containing numerous cross-sections. As many experts in the engineering community can attest, an exploded-view drawing might not always convey the same information to everyone who examines it. The animation AVI and HTML files communicate design intent precisely, with limited room for interpretation. This allows companies to save many hours of work because they no longer need to repeatedly explain (throughout the entire corporate enterprise) just how something operates. Since animations are language-independent, this merely scratches the surface as to how companies can utilize this service. Enser sees this as standard design management practice within the engineering industry in the coming years.

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