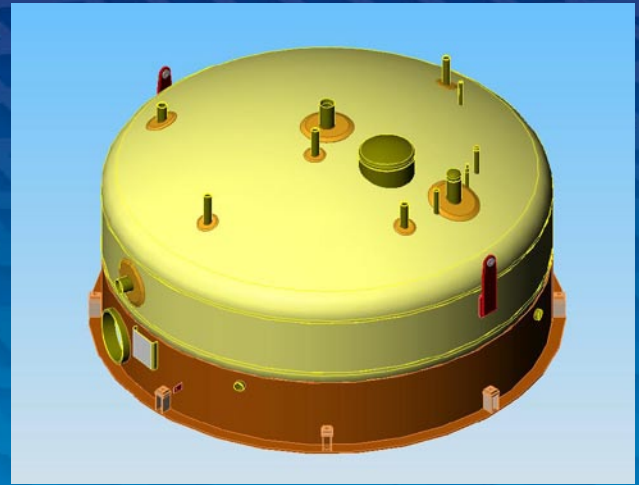


*"I would have to say that I prefer RISA-3D for structural and thin plate applications due to its ease of use, speed of development, and evaluation of results. RISA-3D has become a great tool for me in the structural and thin shell design work that I do."*



### Project

Pressure vessel designed to ASME Section VIII, Division 1 specifications.

### Challenges

- Additional seismic and structural design requirements beyond typical ASME Section VIII, Division 1 design criteria
- Substantial number of nozzles on top head of vessel, each requiring localized loading in all six degrees of freedom
- All localized and general structural loading as well as internal and external pressure loading had to be evaluated and tested collectively

### Solutions

Jeff Choules, Senior Engineer at Premier Technology (Pocatello, Idaho), has many software tools at his disposal. But when he was called upon to design a specialized pressure vessel for a nuclear-industry client, he immediately reached for RISA-3D.

The complexity of the design and the client's timeframe made it the only logical choice. RISA-3D's strong

graphic tools and importing capabilities enabled Choules to overcome the many challenges during the design and analysis of the vessel.

RISA-3D's capability to turn off or hide areas not being worked on proved an invaluable feature. The vessel design called for the creation of 20 nozzles, each with localized loading in all six degrees of freedom. The intricacy of

## QUICK FACTS

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### **Contractor**

Premier Technology, Inc.,  
Pocatello, Idaho

### **Design Engineer**

Jeff Choules, P.E.

### **Size**

Overall height: 111"  
Overall diameter: 204"  
Weight: 27,000 lbs (est.)

### **Software**

RISA-3D

***“If I’ve got a project to do and I want a straightforward, readily available answer, I’ll run it in RISA.”***

**Jeff Choules, Premier Technology, Inc.**

each model and the overall detail of the structure would have made it difficult for Choules to zoom in on any particular area of the model if not for RISA-3D’s multiple view options.

Choules was able to select any part of the model to work on, even if the section was at the rear of the model in isometric view. Other engineering analysis software packages Choules uses do not have this feature.

“For a lot of projects, I don’t know how you would do that otherwise,” Choules says. “Without that capability, this task would have been impossible.”

Another benefit to using RISA versus other FEA programs is RISA’s frame member design and code checking features. For this project, there were additional calculations and stringent

requirements in place beyond the normal threshold for an ASME analysis. The ability to perform a unity check in all failure modes without having to reference an AISC guide was a time-saver, Choules says.

The design process began by importing .dxf files from AutoCAD into RISA-3D. Choules used AutoCAD to develop the Flanged and Dished (F&D) style top and bottom heads of the vessel and needed to be able to bring the high-level geometry generated directly into RISA-3D.

The library of materials in RISA-3D enabled Choules to quickly put together the model without having to build all the detail in many member sections.

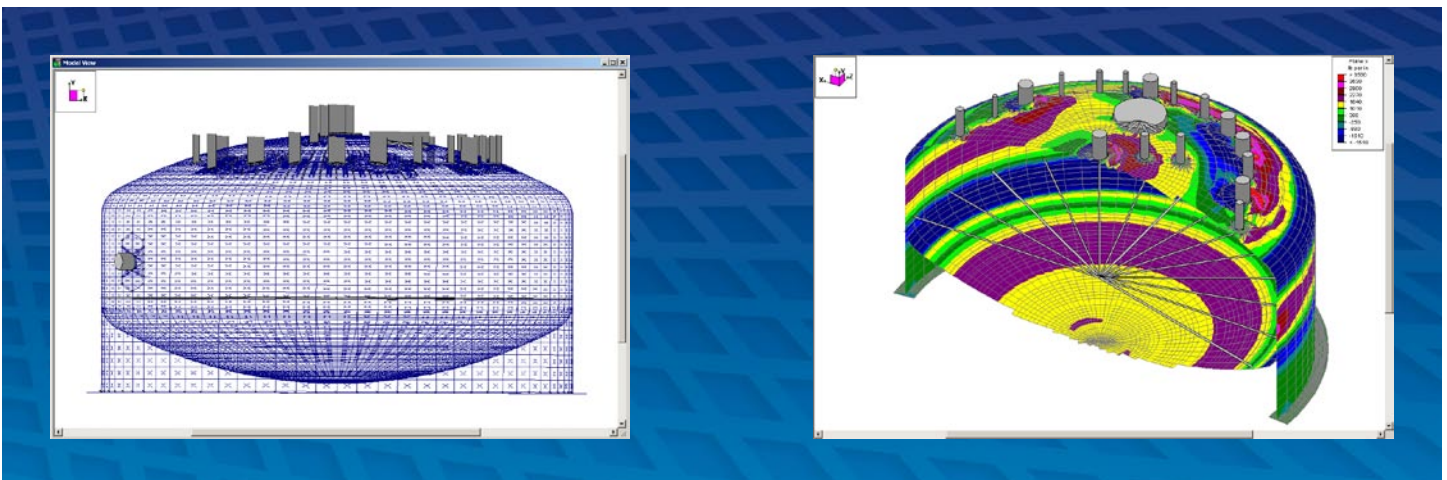
When it came time to have the design verified and validated through the

NQA-1 program, Choules relied on the problem sets included in RISA-3D to guide him through the process.

“The example problems provide a great resource for accomplishing this task,” Choules says.

Choules completed the pressure vessel design with a sense of accomplishment that he reached the guidelines set by the client and produced a model that passed an NQA-1 audit. But after more than five years of using RISA software on a weekly basis, Choules knows he can count on getting accurate results quickly.

“If I’ve got a project to do and I want a straightforward, readily available answer,” Choules says, “I’ll run it in RISA.”



RISA Technologies has been an established leader in structural analysis and design software since 1987. RISA Technologies’ top-rated software tools help structural engineers improve productivity and work more efficiently.

From general building and manufacturing firms to petroleum and power companies, RISA’s use across multiple design categories is testimony to the versatility of our products.

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