

## NuTech Energy Alliance uses two leading solutions to create advanced 3D geological models



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## Case Study

### Business Benefits

Seamless workflow between two industry-leading geological solutions, IHS PETRA and Roxar RMS from Emerson Process Management, lets geologists and petroleum engineers quickly develop complex 3D geological models for clients all over the world. PETRA database gives customers the ability to manage vast amounts of project information, while the reservoir modeling tool Roxar RMS enables the creation of field-wide accurate 3D representations of the reservoir.

NuTech also uses PETRA to import and view the composite stratigraphic image maps (CSIM) created in Roxar RMS, allowing clients who don't have 3D modeling software to view the distributed property maps in PETRA or other applications and manipulate the color spectrums as desired.

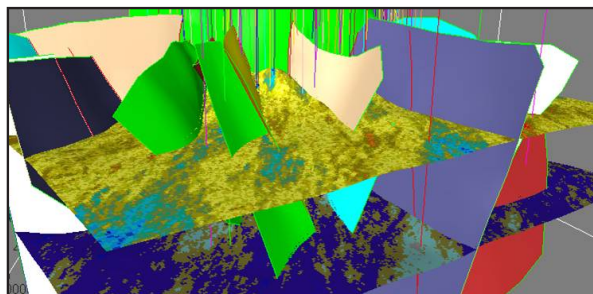
### Customer Profile

NuTech Energy Alliance was founded in 1998 by former Schlumberger and Numar/Halliburton executives who pioneered Nuclear Magnetic Resonance research and development. The company provides advanced petrophysical, geological and engineering solutions to oil and gas companies, helping clients identify, quantify and produce their hydrocarbon reserves with more confidence. To date, NuTech has analyzed over 45,000 wells in more than 80 countries.

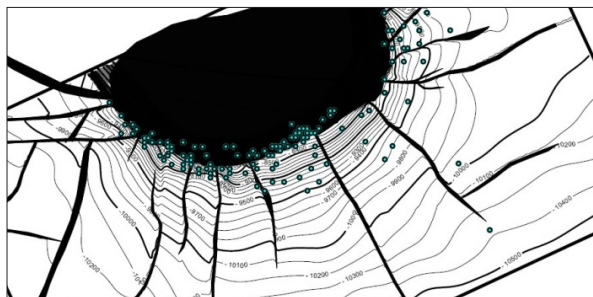
### Business Challenge

Several years ago, NuTech began offering a 3D geological modeling service, NuView™. The service uses inputs such as petrophysical analysis, seismic, engineering and geological data to provide clients with field-wide 3D models of structures, reservoir facies, petrophysical properties and associated stratigraphic variances. Original as well as remaining in-place volumes are also calculated.

In order to create the 3D models more efficiently, NuTech needed two tools: one to help its geologists manage and analyze the vast amounts of data inputs from diverse data formats and one for building the detailed 3D models. After evaluating several 3D modeling tools, the NuView team chose Roxar RMS, a leading reservoir modeling solution from Emerson Process Management. With integrated mapping, modeling, planning and workflow management tools among its 13 software modules, Roxar RMS was the ideal 3D modeling solution for NuTech.



A 3D geologic model built in Roxar's RMS.



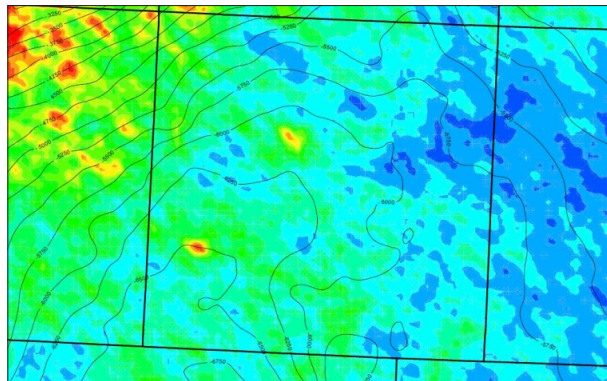
A PETRA 2D geologic map created from the Roxar RMS 3D model

But before building a 3D model, the NuView geologists and petroleum engineers needed a robust and versatile tool that would allow them to more easily import, manage and manipulate geological and engineering data in preparation for entry into the Roxar RMS 3D modeling software. The team chose the PETRA solution, an integrated application from IHS with a common database and interface for project and data management, mapping, cross-sections and production analysis.

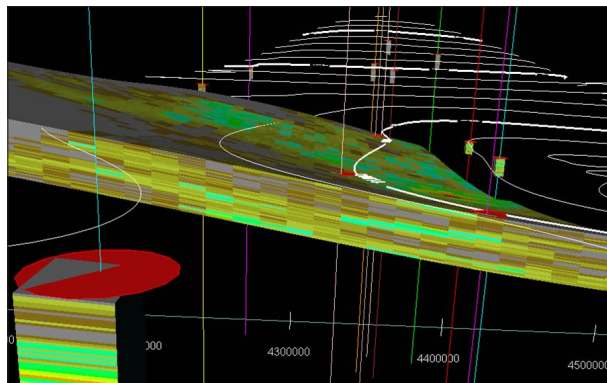
“The main driving force for choosing PETRA was its ability to communicate with Emerson’s Roxar RMS,” said William “Spud” Basham, vice president of the NuView business unit. “PETRA works very smoothly with Roxar RMS as well as many other applications with varying data formats.”

### Establishing the Workflow

When it launched the NuView service, the team initially created a one-way workflow in which data would be loaded into PETRA, manipulated in the application and then sent to Roxar RMS for modeling. “We realized that not everyone has 3D modeling software on their desktops,” said Scott Dodson, a geologist who works on the NuView team. “However, PETRA is widely used throughout the industry.”



A 2D attribute map generated in PETRA



A 3D attribute model created in Roxar's RMS

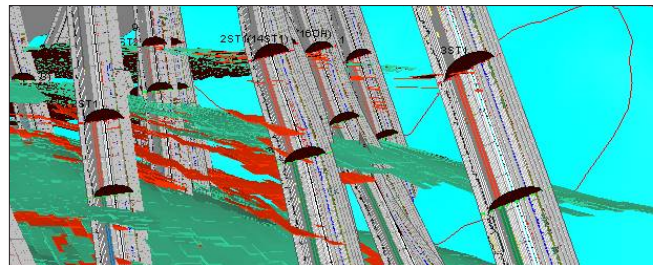
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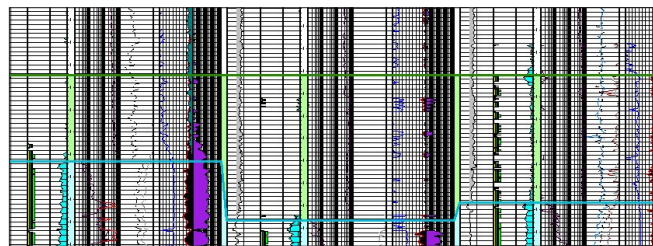
That’s when the team decided to extend the workflow, so that after the 3D model was created in Roxar RMS, the resulting maps would be exported back into PETRA. The team could then create 2D scaled plots and export them in a format that would allow them to be easily viewed and manipulated not only in PETRA but also in most formats compatible with PETRA.

### Moving Quickly and Seamlessly Between Applications

Today, the NuView team uses a three-part workflow that starts with PETRA, moves to Roxar RMS, then back to PETRA. To create a field study, the team begins by loading data into PETRA. Data items that can contribute to a field study include petrophysical information, well locations, logs, surveys, surfaces, fault traces and perforation and production data. PETRA acts as a common database for all data related to a study, making it easy for the NuView team members to manage, analyze and quality control the data.



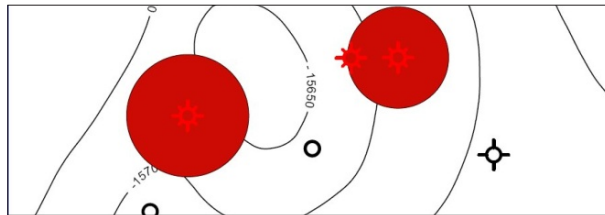
A Roxar RMS 3D geologic model with well control



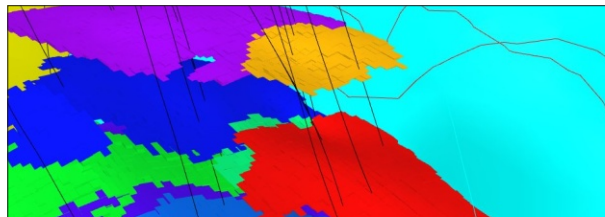
Well log and top correlation in PETRA

From there, the data is moved from PETRA to Roxar RMS. In Roxar RMS, the NuView team members can perform all the necessary modeling operations, including structural modeling, 3D gridding, well blocking, depositional facies modeling, petrophysical property modeling, volumetric analyses, stream line simulations and cross-section displays for planning. These 3D models are designed to help NuTech clients determine the extent and potential of bypassed pay zones and better understand inter-well permeability connections and hydrocarbon volumes. With this information, clients can high grade drilling locations, plan wells and make better economic decisions with better targeted field development strategies.

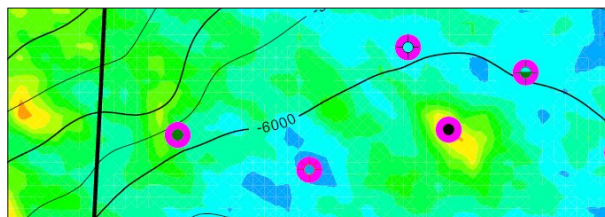
For those few clients who have 3D modeling software, NuTech provides them with the 3D models it has created. But for most projects, the NuView team exports the 3D models back into PETRA to create detailed 2D maps. Using PETRA, the team can include a number of data elements on the maps, such as text boxes, license boundaries and other culture information, and production bubbles.



A gas production bubble map created in PETRA



A 3D model depicting potential reserve accumulations created in Roxar RMS



A 2D attribute map depicting proposed well location created in PETRA

Even though PETRA and Roxar RMS are provided by two different vendors, NuTech has easily integrated the two applications, allowing for a seamless workflow. Even data

updates are handled with ease, so that models are updated and results generated quickly, saving NuTech clients time and money.

“We use PETRA and Roxar RMS seamlessly in such a way that it works like one piece of software,” said Basham.

Also, the PETRA and Roxar RMS solutions have proven to be very flexible, which is important to NuTech, since it performs work for clients that need to have many different types of geological environments analyzed, such as channels, salt domes, carbonates and shale plays. The NuView team knows it can always rely on PETRA and Roxar RMS to support these various needs.

The latest version Roxar RMS 2011, for example, comes with more new features than any previous version, providing enhancements to the seismic architecture, new tools to model complex geologies, such as salt, and the ability to realistically represent the target field — no matter how geologically complex it is.

“The IHS/Roxar workflow works with all different types of geological scenarios.” Dodson said.

### Looking Forward to Future Innovation

While members of the NuView team use nearly all of the modules in the Roxar RMS solution, Dodson said that they only use a fraction of the functionality offered by PETRA. But they’re working on incorporating more of PETRA’s functionality into the workflow. Currently, the team is investigating more of the available options in PETRA for presenting maps and mapping data. It is also interested in leveraging the PETRA 3D Visualization Module, which is designed to provide a 3D view of PETRA projects to where it can visualize 3D grid systems like those created in RMS.

“It’s a continually moving target, always trying to be innovative,” Basham said. “PETRA will do a lot more than what we’re using it for and we’d like to do more with it.”



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