

# NAUTEL LTD. ADVANCING RADIO BROADCAST TRANSMITTER DEVELOPMENT WITH INTEGRATED SOLIDWORKS SOLUTIONS

Case Study



Nautel relies on SOLIDWORKS mechanical design, electronic (PCB) design, simulation, product data management (PDM), visualization, and technical communication solutions to slash its development cycles and expand its product line, including its largest installation to date: the 2 MW AM medium wave transmitter for Antenna Hungária's facility near Solt, Hungary, shown here.

### Challenge:

Advance the development of radio broadcast transmitters, navigational radio beacons, eLoran transmitters, weather transmitters, and sonar systems by improving design performance, reducing product weight and volume, and shortening development cycles to accelerate time to market.

### Solution:

Implement integrated SOLIDWORKS® mechanical design, electronic (PCB) design, simulation, product data management (PDM), visualization, and technical communication software solutions.

### Results:

- Shortened development cycles from 18 months to one year
- Cut transmitter weight in half via simulation
- Dramatically expanded product line
- Designed largest circuit board in company history with SOLIDWORKS PCB

With facilities in Nova Scotia and Maine, Nautel Ltd. is one of the world's largest manufacturers of AM and FM radio broadcast transmitters. Since 1969, the company has deployed more than 16,000 transmitters in 177 countries, and brought the first commercially available, fully solid state broadcast transmitter to market. With more than 50 years' experience in creating highly innovative products, Nautel has built a reputation as a worldwide leader in the design, manufacture, and support of high power, solid state radio frequency (RF) products for radio broadcast, navigation, sonar, and industrial applications. Adhering to stringent quality standards at its ISO-certified manufacturing facilities, the company has expanded its product offerings to include navigational radio beacons, eLoran transmitters, weather transmitters, and sonar systems.

Until 2003, Nautel designers and engineers utilized AutoCAD® 2D design tools to develop the company's products. However, increasing competition and market demand for more innovative products prompted management to move to a 3D development platform, according to Drafting Manager Joey Panczyk. "We were starting to fall behind in terms of product development back when we worked in 2D," Panczyk recalls. "Roughly 95 percent of a transmitter is sheet metal, and while we were initially attracted to 3D to improve sheet metal design, we've since realized the value of designing in 3D so that we can leverage additional integrated solutions, such as simulation, PCB design, communication, and rendering tools."

Panczyk and his team evaluated the Autodesk® Inventor®, Solid Edge®, and SOLIDWORKS 3D design systems before deciding to standardize on SOLIDWORKS. Nautel chose

SOLIDWORKS because it is easy to use, provides access to a host of valuable integrated solutions, and is backed by the quality support provided by SOLIDWORKS value-added reseller Javelin Technologies. "We needed software that we could expand on and grow with, plus a solid provider and partner," Panczyk recounts. "I knew that SOLIDWORKS would represent our products in the best possible way as well as help to shorten our time to market."



**"When we first implemented SOLIDWORKS, we immediately realized productivity gains in sheet metal design because you can pretty much generate a flat pattern at the push of a button with SOLIDWORKS. Yet the additional integrated solutions that we have added... have had even larger roles in contributing to our improved efficiency, shorter design cycles, improved quality, and accelerated time to market."**

— Joey Panczyk, Drafting Manager

Since its initial implementation of SOLIDWORKS 3D CAD software in 2003, Nautel has added valuable integrated applications, including simulation, flow simulation, visualization, product data management (PDM), technical communications, and printed circuit board (PCB) design solutions.

### SLASHING DEVELOPMENT TIME, EXPANDING PRODUCT LINE

The move to the SOLIDWORKS product development platform has enabled Nautel to reduce its development cycles from 18 months to a year while simultaneously expanding its product line to move into new markets. "When we first implemented SOLIDWORKS, we immediately realized productivity gains in sheet metal design because you can pretty much generate a flat pattern at the push of a button with SOLIDWORKS," Panczyk explains.

"Yet the additional integrated solutions that we have added—dynamic simulation of shock and vibration, flow simulation of air flow in electronics cooling systems, photorealistic rendering, PDM, and technical communications to drive assembly with SOLIDWORKS Composer™—have had even larger roles in contributing to our improved efficiency, shorter design cycles, and accelerated time to market."

## IMPROVING PERFORMANCE, CUTTING WEIGHT AND VOLUME WITH SIMULATION

With the dynamic analysis capabilities of SOLIDWORKS Simulation Premium and the computational fluid dynamics (CFD) capabilities of SOLIDWORKS Flow Simulation, Nautel can more quickly and cost-effectively prototype designs in software, reducing the volume of physical prototyping required while simultaneously improving design performance. For example, when Nautel began developing sonar systems for the Canadian Navy, the ability to run shock and vibration analyses—to ensure that the vibration of the ship's engine and the movement of the ocean do not interfere with system performance—was not only helpful but also mandatory.

Similarly, Nautel uses SOLIDWORKS Flow Simulation to validate and optimize electronics cooling systems as the company responds to market demands for smaller, lighter products. "When it comes to circuit boards and electronic systems, size does matter," Panczyk stresses. "The lighter a product is and the less space it takes up, the better. However, when you're tasked with putting the same power levels into smaller packaging—such as cutting the weight of our 70-pound VS 2½ kW FM transmitter in half—it becomes more critical to optimize the electronics cooling system by simulating the effects of fins, fans, and heat sinks, for which we use SOLIDWORKS Flow Simulation software."

## DESIGNING LARGEST CIRCUIT BOARD IN COMPANY HISTORY

In 2017, Nautel completed its largest installation to date—a 2 MW AM medium wave transmitter for Antenna Hungária's facility near Solt, Hungary. The company used SOLIDWORKS PCB Powered by Altium electronics design software to create the largest circuit board in the company's history. The 12-by-8-inch board contains eight layers and more than 2,000 components. "With SOLIDWORKS PCB software, our mechanical and electrical engineers can collaborate much better in a single, common design environment.

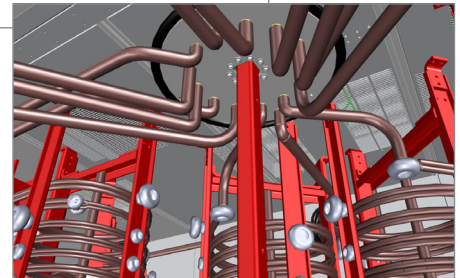
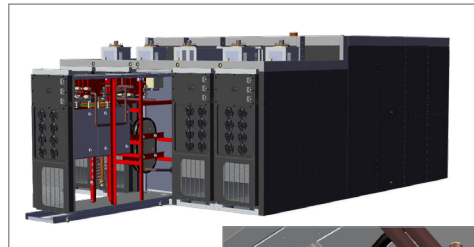
"SOLIDWORKS PCB software allows them to work on a single board design that is more realistic and representative of the actual PCB," Panczyk continues. "The result is that the software helps our designers improve the quality of the PCB design while also saving time during development."

### Focus on Nautel Ltd.

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Using integrated SOLIDWORKS mechanical design, PCB design, and simulation tools, Nautel has been able to reduce its development cycles by 33 percent, cut transmitter weight in half, and design the largest circuit board (12-by-8-inch board containing eight layers and more than 2,000 components) in company history.

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