



Converteam

Breaking the Ice

Results

- Ability to store more data in less hardware space
- Quick data retrieval on massive amounts of data allowing the ability to respond faster to issues on the ship
- Increased system reliability - new system never loses data
- More accurate historical data
- Easy system maintenance
- Ease of use greatly reduces time for new crew to learn system
- Built-in audit log automatically reports on system events
- Open solution with superior connectivity allowed for 1.6 billion data points to be migrated from old system without losing data integrity and connectivity to existing control hardware

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Jim Christenson,
System Engineer for Healy Project, Converteam

Converteam Outfits Coast Guard Vessel With Modern Historian from GE

The United States Coast Guard Cutter Healy (WAGB - 20) is designed to conduct a wide range of research activities, providing more than 4,200 square feet of scientific laboratory space, numerous electronic sensor systems, oceanographic winches, and accommodations for up to 50 scientists. The state-of-the-art ship is able to break 4½ feet of ice continuously at three knots and can operate in temperatures as low as -50 degrees Fahrenheit.

In the design of the Healy, the science community provided invaluable input on lab layouts and science capabilities during design and construction of the ship. At a time when scientific interest in the Arctic Ocean basin is intensifying, Healy substantially enhances the United States Arctic research capability.

Due to its sophisticated equipment, the Healy is working on a Polar Region Support project to map the sea floor to help determine the legitimacy of claims by countries claiming rights to the natural resources of the ocean.

An integral part of the Coast Guard fleet in the region, the Healy is also a model for the future of this kind of vessel. As a Coast Guard cutter, Healy is a capable platform for supporting other potential missions in the polar regions, including logistics, search and rescue, ship escort, environmental protection, and enforcement of laws and treaties. But in order to embark on these state-of-the-art missions, the Healy also needed to run like a state-of-the-art ship.



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In order to do this, the Coast Guard brought in Converteam, a worldwide specialist in power conversion. The company provides integrated propulsion system solutions that convert electrical energy through application in drives, controls, motors and generators. The company also supports and upgrades the technology on the Healy, including the control system, data acquisition, etc.

Keeping Up With Evolution

The system that Converteam assembled for the Healy is called a Continuous Test and Evaluation System (CTES), which provides two systems - one resides on board the ship, and its sister system resides in the Converteam office. The two systems "speak" over satellite as the ship system interfaces with the ship's automation.

"It effectively provides us with a window into the on-board system," said Jim Christenson, Converteam's System Engineer for the Healy project. "We can troubleshoot what happens on the ship since we provide 24 hour-a-day, seven day-per-week support for the Healy."

The Healy is sent out to sea for nine months or more on long research activities. New crews are rotated annually (in part) with durations of two to three years.

Both Converteam and the Coast Guard determined that the original system was not robust enough to keep up with evolution of the vessel, particularly when it came to the performance of recording and analyzing data. The trends were slow to display and the team on board and at Converteam were running into limitations on the amount and frequency of data points being logged.

However, while Converteam needed to provide the Coast Guard with an updated system, they also needed to keep the data from the old system for historical purposes. That way, they could do upgrades and maintenance based by comparing past performance with current performance.

They decided that they needed to migrate a legacy historian and operator interface application to a more advanced application set. Performance enhancements were required to collect and archive critical data points at once per second or less. Data integrity was key because of the importance of the data used for research and maintaining the ship in the polar caps.

Running "A Small City"

"We originally put the CTES in the Healy when the ship was first commissioned," said Jason Jasinski, Naval Systems Manager for Converteam. "When we upgraded the system, we evaluated new products from five different suppliers including GE."

GE Intelligent Platforms' Proficy Historian was selected because it is an easily configurable Historian, offering fast retrieval and data acquisition performance, as well as the ability to retrieve

massive amounts of data for viewing. Proficy Historian also has the flexibility to migrate existing data from the ship's legacy historian.

GE provides a unique foundation of agile, advanced and ultra-reliable technology that customers can trust to ensure their long-term success

"GE was able to emulate our existing system," said Jim Christenson. "That made the transition to Proficy Historian very easy. And, at the time, many of the competing products were in beta and GE had a solid product."

"The Proficy Historian product solution proved to be the best choice," said Jasinski. "It didn't provide us with 100 percent of what we needed, but we worked with the GE application engineering team to enhance the functionality of the solution and give the customer what they needed."

In addition, Proficy HMI/SCADA iFIX provides comprehensive monitoring, analysis, control and distribution of real-time data. The solution's client/server architecture delivers unparalleled scalability. For Converteam, iFIX communicates to the ship's control system providing a state-of-the-art HMI interface.

The CTES has access to all information regarding the running of the automation systems on the ship including machinery status, diesel generators, breakers, etc. It is a troubleshooting tool as well, automatically generating logs that used to be done by hand.

"It's like a small city," said Christenson. "But because of the ship's automation, it can be operated by four people. The vessel was designed to cut its crew size in half from the number of people required to operate similar vessels built in the 1970s.

Converteam is involved in a six-year program upgrade and service contract with the Coast Guard to provide maintenance and engineering upgrades to the Healy's Integrated Power Plant.

It's All About The Data

Data acquisition for the Healy results in a massive amount of data to be stored, and the vessel management demanded fast retrieval of the data for viewing. Therefore, the vessel crew required an easy-to-use configurable historian and SCADA with unprecedented reliability and performance. The kinds of data being collected include voltage and amperage of the propulsion system drives. In fact, there are approximately 6,000 digital and 1,500 analog data points.

The logging of machinery data is a key component of this new system. The crew had previously used an Excel add-in for logs or had done all logging by hand. The log is now electronic and done in Microsoft Word. The Coast Guard created a menu and common phrases that are used to increase consistency.

“Overall reliability is much better than the old system,” said Jasinski. “Proficy Historian’s redundant collectors are very important so the ship is never in danger of losing data.”

“When the ship is running without incident,” said Jasinski, “the system is collecting data that gives us a base knowledge of how it runs normally. When a problem occurs, we can use that base knowledge to analyze data and provide troubleshooting guidance to get the ship out of harm’s way and underway again.”

GE Intelligent Platforms Contact Information

Americas: **1 800 433 2682** or **1 434 978 5100**

Global regional phone numbers are listed by location on our web site at www.ge-ip.com/contact

www.ge-ip.com

