



■ Larry Parker, ControlWorx project coordinator, reviews one of the hundreds of screens available in the REMVue-500/A panel.

ADAPTIVE CONTROL FOR LARGE HIGH-SPEED ENGINES

First Application for ControlWorx REMVue® on Waukesha 12VATGL

By Howard Malm

Customer reaction to a new engine control system is rarely both immediate and ecstatic. Pleased beyond expectations was the response of operators and supervisors of two facilities in Louisiana after installing a **REMVue®** engine/compressor control system and watching the performance of their Waukesha ATGL™ engines improve significantly. “(Before REMVue) these engines were the last to be used due to starting and reliability issues. Now, these two AT’s with the new REMVue control system have moved from last to first place in our line up,” one supervisor enthused.

Duke Energy Egan Hub is a gas storage and distribution facility with two Waukesha 12VATGL engines and five

Cat 3600 engines powering compressors that both store and remove gas from the dome. The three Waukesha AT engines employed at the Atlanta Gas and Light (“AGL”) facility at Jefferson Island are used for the same purpose. Operations at both facilities had difficulty starting these units and keeping them running as load requirements changed. The units also responded poorly to ambient temperature or fuel gas BTU changes without direct operator intervention. The nuisance drops and constant tweaking compounded personnel frustrations. At the Egan Hub facility in Lafayette, the AT engines were used only when necessary.

Early in 2004 after hearing of the problems experienced by the Duke operations, ControlWorx (a division of John H. Carter, Co. and representative of REM Technology Inc., the supplier of the REMVue control system) approached Larry Fondon, the Egan Hub supervisor, and Egan Hub’s Mechanical Technical Specialist John Norris about

the possibility of replacing the existing engine control system with a REMVue. The REMVue-500 could be configured for compressor control and shutdown, diagnostics, air-fuel control, or any combination of the three. After consultations, ControlWorx proposed the Egan Hub facility replace its existing engine control system on the AT’s with a REMVue-500/A which is adaptive air-fuel control only.

The REMVue is certified for Class I, Division 2 operations and is comprised of a touch screen panel, a central controller and I/O modules. Its panel can be under local or remote control. Its touch screen provides user-friendly means for operator control, descriptive alarm and shutdown messages as well as live trend graphs that can aid in tuning and trouble-shooting. Designed for both new and retrofit applications, the REMVue software is a standardized package which allows site specific configuration thus avoiding the expense and programming variation of custom engineered solutions.

Howard Malm is chief technical officer at REM Technology Inc. Malm is a specialist in the field of electronic instrumentation. His accomplishments include the development and commercial launching of the CARMA performance analyzer and the REMVue online system.



■ **AGL Operator Danny Hebert stands beside one of the Jefferson Island's REMVue-500/A panels and checks off everything that is now right.**

While the REMVue system had been fitted to hundreds of other engines over the previous eight years, none to-date had been fitted to an AT engine. Waukesha AT engines were introduced in the 1980's and come available in 8L, 12V and 16V sizes with rated loads ranging from 1,670 to 4,500 BHP. Engines are turbocharged and fitted with pre-combustion chambers ("PCC") to meet stringent NOx, CO and VOC emission limits.

ControlWorx REMVue specialist Carl Bourque recommended modification of the turbocharger control strategy in addition to the replacement of the control system. A magnetic flywheel pick-up replaced the existing hydraulic governor; a Fisher fuel control valve replaced the carburetor fuel control function and the unique REMVue pre-combustion fuel control strategy replaced the existing PCC regulator. REMVue's proprietary control algorithms for fuel and turbocharger capacity control are the heart of this adaptive control system and the root of REMVue's success.

The success of the REMVue control

system at Egan Hub has dramatically changed how the gas storage facility is managed. Before the conversion, Larry Fondon had to assign a person full-time to attend to the two AT units in order to get and keep them running. Now, according to Fondon, "we simply hit the Start, load the units and don't pay any more attention to them. What a difference!"

"Not only have my overtime costs dropped," Fondon added, "but I have a happier Operations group."

AGL's Jefferson Island supervisor has seen similar changes at his facility with the installation of their REMVue-500/A. "Before REMVue, we were constantly trying to keep these engines going — replacing components and constantly tweaking to deal with changes," Joe Donowho said. "Now we can spend time on other plant issues. The savings to us have been immense."

Operators and supervisors of these installations have concrete results that justify their praise. After installing the REMVue-500/A on their combined five AT engines, engines at both facili-

ties can now deliver loads from 30-to-105% with no adjustment. Emission limits at semi-annual tests have always been met, and the life of spark plugs and PCC valves typically has doubled. At the Egan Hub facility, the two AT engines are the first to be used instead of last. Both installations also saw the time personnel spent dealing with engine problems drop to less-than a quarter of what it had been prior to the REMVue install.

"The overall responsiveness of these engines has also improved," Carl Bourque of ControlWorx said. "During one shift, there was a 50 degree swing in temperature and the operators did not have to readjust the engines."

With the successful conversion on these AT engines in Louisiana, other facilities have opted to have a REMVue engine/compressor control system installed on their own AT's. Another five REMVue-500 systems were recently installed on AT engines at a West Texas gas processing plant — with the same outstanding results.

ControlWorx's General Manager is strongly supportive of the initiative to apply the REMVue technology to the AT engines. "We realize that replacing an engine/compressor control system is a challenging task, requiring knowledge and skill on both our part and the customer's," said Todd Gilbertson. "We are proud to have the experience and skill to make it happen, and are excited to help our customers improve performance and save money."

Referring to the exceptional outcome seen by the Texas gas processing plant after REMVue was installed, Gilbertson added, "we now have more than 70,000 installed hours on AT's and recently started up five more units in West Texas. The customer was so pleased he ordered four more, bringing his total to nine REMVue-500 systems on AT engines."

With all these successes, Gilbertson is confident the REMVue solution can provide more opportunities for larger high-horsepower engines such as the AT engine models to excel. ■

Source article submitted to *Compressor-Tech*[™]. Published in the August-September 2006 issue.