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New Specs Allow Corps of Engineers to Procure Open Control Systems

CHAMPAIGN, Ill. – The U.S. Army Corps of Engineers has released two new specifications enabling designers to specify multi-vendor direct digital control (DDC) products that work together -- and with supervisory controls -- in heating, ventilating and air-conditioning (HVAC) systems.

Unified Facilities Guide Specification (UFGS) 13801, "Utility Monitoring and Control Systems," and UFGS-15951, "Direct Digital Controls for HVAC and Other Local Building Systems," aim to address longstanding problems with incompatible control equipment in HVAC systems.

The new specifications reflect the Corps' commitment to using open, non-proprietary building automation systems in its $9 billion annual construction program. Previous specifications, which have now been rescinded, usually resulted in non-integrated systems from multiple vendors due to the government's ban on using sole-source procurement for large contracts. Generally these systems either cannot interoperate with each other or can do so only after considerable effort and expense to modify. They are also a nightmare to maintain and repair.

"Our mission is to support the installations that we serve," said Donald Basham, Chief of Engineering and Construction at Corps Headquarters. "Development of multi-service criteria, including the adoption and use of industry open standards, is an important part of helping our installations implement useful technologies -- particularly in the case of building automation systems. They need to be integrated to improve the installations' operational efficiency."

UFGS-13801 and UFGS-15951 are based on LONWORKS® technology with the ANSI/EIA/CEA 709.1 open communications protocol serving as the cornerstone. ANSI 709.1 is sometimes referred to as LonTalk®, the name of the original protocol developed by Echelon Corporation. LONWORKS® includes use of ANSI 709.1, LonMark®-certified products and independent systems integrators. LonMark International is a nonprofit, volunteer membership organization created to promote efficient and effective integration of open, multi-vendor control systems using ANSI/EIA/CEA 709.1 and related standards. Currently over 560 products from more than 70 different vendors have been certified as compliant by LonMark International.

"I applaud the Corps for taking the initiative to create the two new open system specifications," said Barry Haaser, executive director of LonMark International. "By using LonMark® certified devices in building subsystems, the government will receive numerous benefits such as best of breed product selection, lower installation and maintenance costs, reduced energy costs, supplier independence and more competitive bids through multi-phase awards."

"The large number of systems and manufacturers supporting this protocol give our customers great flexibility in specifying their control systems," said David Schwenk, project leader at the U.S. Army Engineer Research and Development Center's Construction Engineering Research Laboratory (CERL). "It also fosters competition, which serves the spirit and intent of our federal procurement laws."

Schwenk led a multi-year, multi-agency collaborative effort to develop the new specifications for use in the Corps' military construction program. The goal was to replace proprietary control systems with open systems based on a standard communications protocol.

Besides Corps Headquarters and CERL, the developmental team involved numerous representatives from the controls industry, Air Force, Navy, Corps Districts, Army installations, the Corps Center of Expertise for UMCS (Huntsville), and the Corps Directory of Expertise for HVAC Controls (Savannah).

The two specifications are written to work together where ideally a utility monitoring and control system (UMCS), as the foundation for a base-wide system, will be included in the initial project along with one or more building-level DDC systems. The resulting LonWorks network database can later be expanded as new building DDC systems come online, and can also accommodate other monitoring and control applications, such as lighting control and energy monitoring.

As part of this development, CERL is updating related criteria documents and has revamped official training courses under the Corps' PROSPECT training program. In addition, the lab and its partners are looking at further possibilities for using open communication protocols, such as BACnet, SOAP, and XML as they become commercially available.

"LONWORKS® and BACnet® are the two main open systems technologies available for building controls, each with pro's and con's, and there is really no industry consensus for one or the other," said Schwenk. "While BACnet may provide more options, we decided to initially focus on LonWorks because we found it to be the more mature and ready to implement of the two technologies, and also believe it's easier to specify an open system using LonWorks."

The Corps and Navy are now co-developing BACnet-based open systems specifications, with completion projected for 2006. UFGS-13801 and UFGS-15951 along with the related Engineering Construction Bulletin, ECB 2004-11, are posted on the Corps' official technical information website, www.hnd.usace.army.mil/TECHINFO.

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