



**US Army Corps
of Engineers®**

ENGINEERING AND CONSTRUCTION BULLETIN

No. 2004-11 Issuing Office: CECW-CE-D Issued: 17 Sep 2004

Subject: Utility Monitoring & Control Systems (UMCS) and Direct Digital Control (DDC) Criteria Update

Applicability: Guidance

1. Introduction: UFGS-13801 (Utility Monitoring and Control Systems) and UFGS-15951 (Direct Digital Controls for HVAC and other Local Building Systems) have been released, replacing UFGS-13801A and UFGS-15951A.
2. Background: Direct digital control (DDC) systems are routinely designed and procured on a building-by-building or subsystem-by-subsystem basis. Inconsistencies and incompatibilities between new and existing DDC systems result in inefficient, complex and non-functioning systems. This is due to the inability of different vendors' DDC systems to interoperate with each other, particularly in basewide UMCS applications. This inability to interoperate is a result of closed systems due to vendor-specific proprietary elements.
3. Purpose: The new specifications are based on ANSI/EIA 709.1 communications protocol including the use of LONWORKS[®] technology consisting of various tools and devices available from a wide variety of manufacturers. The specifications should be used together where UFGS-15951 is for building-level control systems and UFGS-13801 is for integration of the building level systems with a basewide UMCS. While the focus of UFGS-15951 is on HVAC control systems, the specifications contain the foundation for other monitoring and control applications, such as lighting control and power monitoring.
4. Implementation: With the release of UFGS-15951 and UFGS-13801, the following specifications are being rescinded:
 - Heating Ventilating and Air-Conditioning Control Systems (UFGS-15950A)
 - Utility Monitoring and Control Systems (UFGS-13801A)
 - Direct Digital Control for HVAC (UFGS-15951A)
 - Building Preparation for EMCS (UFGS-13814A)
 - a. Use of the new guidance is encouraged, but where proprietary procurement is deemed necessary the Navy's UFGS-15910N (Direct Digital Control Systems) is one alternative for single-building DDC systems. With a commitment to open systems and providing our customers options, a new specification based on the BACnet[®] ANSI/ASHRAE 135.1 protocol will be developed by the Navy, with Corps assistance. Development is scheduled to begin in FY 2005 with final criteria available in late FY 2006.

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b. Details for use of UFGS-13801 and UFGS-15951 will be described in UFC 3-401-01 and UFC 3-401-02, respectively, which are projected for release in September 2004. Use of each UFGS requires project-specific drawings. A draft version of the UFCs and drawings can be obtained from the ERDC-CERL POC listed below. The final UFCs and drawings will be posted to the TECHINFO website.

c. The specifications were written to work together. The recommended approach for implementing the new specifications is to include a UMCS (as specified in UFGS-13801) in the initial project, which may include one or more building-level DDC systems (as specified in UFGS-15951). The initial UMCS will result in one or more front-end workstations and will establish the LONWORKS network database, which can be expanded for future projects. Subsequent building-level DDC systems can then be specified to interface with the UMCS using the ANSI/EIA 709.1 communications protocol and ANSI/EIA 852 protocol (*ANSI/EIA 709.1 over IP*). This technology precludes the need for a building prep specification for UMCS. It is important to note that the front-end software will likely have proprietary elements, but any building-level system from any vendor, when supplied as specified, will be able to interface with it. Due to the underlying LONWORKS network database standard specified in UFGS-13801 and 15951, a new vendor can replace the front-end without replacing the database.

d. When a building or system will be truly 'stand-alone' the designer can use the new criteria or UFGS-15910N. When using the new criteria in a stand-alone application, the designer must either add requirements to UFGS-15951 (from the UFGS-13801 UMCS spec) or use an edited version of the UMCS spec to obtain a building-level operator interface (necessary for day-to-day O&M) and a network configuration software tool (necessary for periodic O&M). Note: that this operator interface and network configuration tool can readily become the foundation for a future basewide UMCS.

e. Existing DDC systems can be interfaced to the new UMCS using a gateway. The decision to perform this integration should be made on a project-by-project basis.

f. Designers and construction quality verification personnel are cautioned that simply specifying LONWORKS and use of the ANSI 709.1 protocol are not sufficient requirements to obtain an open and non-proprietary system. Some vendors may provide proprietary systems that use both LONWORKS and ANSI 709.1. UFGS-15951 and 13801 each contain an appendix consisting of quality control checklists intended to help ensure that non-proprietary systems are supplied.

g. PROSPECT courses in support of the new guidance are available. These include: UMCS LONWORKS (Course 094), HVAC Control Systems Design (Course 340), and HVAC Control Systems Quality Verification (Course 382). Course descriptions and availability can be found at the USACE Professional Development Support Center website: <http://pdsc.usace.army.mil>

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5. Technical support: Assistance with the implementation of the specifications is available from:

- The Utility Monitoring and Control Systems Mandatory Center of Expertise. Chuck Holland, 256-895-1749.

- The Heating, Ventilating and Air Conditioning (HVAC) Control Systems Directory of Expertise. Lucie Hughes, 912-652-5645.

- Engineer Research and Development Center Construction Engineering Research Laboratory (ERDC-CERL). Dave Schwenk (x7241) or Joe Bush (x7616) at 1-800-USA-CERL. For draft UFC and drawings: Joseph.Bush@erdc.cecer.army.mil.

The website URL for the Centers of Expertise is:

<http://www.usace.army.mil/inet/functions/cw/cecwe/coexpert/index.htm>

The Center of Expertise is also listed on the TEN site, the website URL for TEN is:

<https://ten.usace.army.mil/TechExNet.aspx>

6. Point of contact for this bulletin is Gary Bauer, CECW-CE-D, 202-761-0505.



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