



**US Army Corps
of Engineers®**

ENGINEERING AND CONSTRUCTION BULLETIN

No. 2018-10

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SUBJECT: HVAC Changes – HVAC Systems UFC, HVAC-HVAC Controls TCX and Thermal Insulation Specification

CATEGORY: For Information

1. References:

a. 10 USC 2867 – Energy Monitoring and Utility Control System Specification for Military Construction and Military Family Housing Activities

b. Unified Facilities Criteria (UFC) 3-410-02, Lonworks® Direct Digital Control for HVAC and other Local Building Systems, with Change 1

c. UFC 3-410-01, Heating, Ventilating and Air Conditioning Systems, with Change 4

d. UFC 1-200-02 High Performance and Sustainable Building Requirements

e. UFGS 23 09 00 Instrumentation and Control for HVAC

f. UFGS 23 09 23.01 Lonworks Direct Digital Control for HVAC and Other Building Control Systems

g. UFGS 23 09 23.02 BACNet Direct Digital Control for HVAC and Other Building Control Systems

2. Purpose. This ECB highlights HVAC changes that have been implemented for Tri-Service criteria direction and for awareness of Center of Expertise and thermal insulation spec changes.

3. Applicability. The following information applies to all MILCON Engineers and Planners in the Corps and others Corps-wide as general information.

4. Background. Basic background notes for the HVAC changes include the following. The changes to the HVAC Systems UFC in this ECB were discussed with the Tri-Service DWG and various Corps District personnel during FY17. Variable Refrigerant Flow (VRF) was discussed at great length due to the complexity of the systems and interface with industry. The combining of the two TCXs enabled the availability of good technical HVAC support from HNC to support HVAC Controls guidance. And finally the insulation change was prompted by new product line that now meets or exceeds fire protection concerns.

5. Changes to UFC 3-410-01. The following changes to the HVAC Systems UFC 3-410-01 were posted on 1 Nov 2017.

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a. Paragraph 3-5.16 on Variable Refrigerant Flow (VRF) Systems: The new wording reflects a Tri-Service view on VRF systems. VRF systems need to comply with the current HVAC controls criteria which were developed to meet 10 USC 2867. This code mandates an open Energy Monitoring and Utility Control System specification and open associated HVAC controls criteria. From paragraph 3-5.16.1.1: “All HVAC control systems, including VRF systems, must meet the requirements of UFGS 23 09 00 and either UFGS 23 09 23.01 or UFGS 23 09 23.02. The reason behind the change to the VRF paragraphs was to present a Tri-Service unified position on VRF systems. As of August 2018, none of the VRF system manufacturers met this requirement. Wording from ECB #2017-7 dated 22 Mar 2017 VRF has been recalled and is being revised and reissued to more accurately reflect the following issues:

(1) Concern of Refrigerant Concentration - The refrigerant lines are run inside buildings usually over office spaces. A typically sized VRF system contains enough refrigerant to asphyxiate occupants in the event of a refrigerant leak.

(2) Long refrigerant runs are common with VRF systems and many times the lines are branched out. A refrigerant leak would be difficult to locate and once found very difficult to repair as there is other piping and ductwork installed in dropped ceilings.

(3) VRF Systems have proprietary control systems. These closed systems are not permitted per UFC 3-410-02 Lonworks ® Direct Digital Control for HVAC and other Local Building Systems, with Change 1. This UFC states, “An Open DDC system is characterized by the ability for any qualified entity to readily modify, operate, upgrade, and perform retrofits on the DDC system.”

b. Paragraph 3-3 on Dedicated Outdoor Air Systems (DOAS): Wording was revised for the Army and the Navy/Air Force. The Army paragraph continues to state the requirement for a DOAS with zone sensible cooling systems and may be life cycle cost effective with a central system. Guidance is provided on performing a life cycle cost analysis in this paragraph. The designer will need to follow UFC 1-200-02 High Performance and Sustainable Building Requirements as well on life cycle cost analysis.

6. Technical Center of Expertise (TCX). The Heating, Ventilating and Air Conditioning Control Systems TCX has now been combined with the Heating, Ventilating, and Air Conditioning TCX. The new name will be Heating, Ventilating, and Air Conditioning - HVAC Controls TCX. HNC is the assigned lead of this TCX. The following link includes the HVAC-HVAC Controls TCX:

<http://www.hnc.usace.army.mil/Missions/Centers-of-Expertise/>

7. Changes to Unified Facility Guide Specifications. UFGS 23 07 00 Thermal Insulation for Mechanical Systems now permits polyisocyanurate insulation for both above ground cold pipeline (-34 to 16 deg C; -30 to 60 deg F) and above ground hot pipeline (above 16 deg. – 60 deg F) IF the insulation meets the flame spread index of 25 and the smoke developed index of 50 when tested in accordance with ASTM E84. In all cases the insulation must be provided with a

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vapor retarder/barrier that complies with this specification. This specification change was posted on 1 November 2017.

8. **Update.** All new requirements will be included in the next appropriate policy document update.

9. **Points of Contact.** HQUSACE points of contact for this ECB is Timothy Gordon, CECW-EC, (202) 761-4125.

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