UFC 3-401-01
28 July 2025

UNIFIED FACILITIES CRITERIA (UFC)

MECHANICAL ENGINEERING

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Indicate the Military Department Preparing Activity responsible for the document.

U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND (Preparing Activity)

AIR FORCE CIVIL ENGINEER CENTER

Record of Changes (changes are indicated by **1**\ ... /**1**/)

Change No.	Date	Location

This UFC supersedes UFC 3-401-01, dated 01 July 2013.

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FOREWORD

The Unified Facilities Criteria (UFC) system is prescribed by MIL-STD 3007 and provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with USD (AT&L) Memorandum dated 29 May 2002. UFC will be used for all DoD projects and work for other customers where appropriate. All construction outside of the United States, its territories, and possessions is also governed by Status of Forces Agreements (SOFA), Host Nation Funded Construction Agreements (HNFA), and in some instances, Bilateral Infrastructure Agreements (BIA). Therefore, the acquisition team must ensure compliance with the most stringent of the UFC, the SOFA, the HNFA, and the BIA, as applicable.

UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Military Department's responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Systems Command (NAVFAC), and Air Force Civil Engineer Center (AFCEC) are responsible for administration of the UFC system. Technical content of UFC is the responsibility of the cognizant DoD working group. Defense Agencies should contact the respective DoD Working Group for document interpretation and improvements. Recommended changes with supporting rationale may be sent to the respective DoD working group by submitting a Criteria Change Request (CCR) via the Internet site listed below.

UFC are effective upon issuance and are distributed only in electronic media from the following source:

- Whole Building Design Guide website https://www.wbdg.org/dod.

Refer to UFC 1-200-01, *DoD Building Code*, for implementation of new issuances on projects.

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CHAPTER 1 INTRODUCTION

1-1 REISSUES AND CANCELS.

This UFC reissues and cancels UFC 3-401-01, *Mechanical Engineering*, 01 July 2013, and all subsequent changes.

1-2 PURPOSE AND SCOPE.

This UFC provides requirements and guidance for mechanical systems designed and constructed for the Department of Defense (DoD). Figure 1-1 shows the relationship of this UFC to other related mechanical UFCs.

1-3 APPLICABILITY.

This UFC follows the same applicability as UFC 1-200-01, paragraph 1-3, with no exceptions.

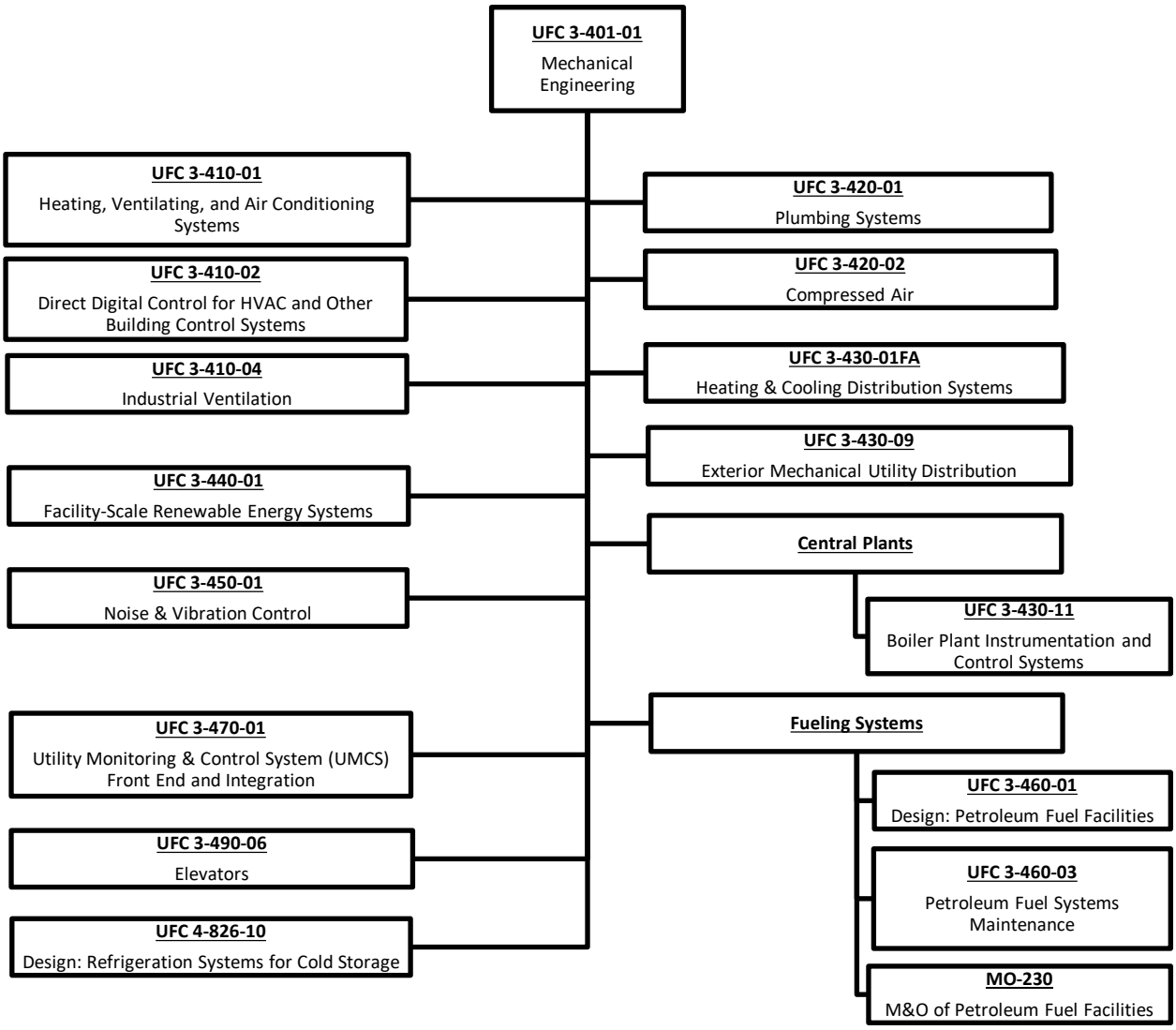
1-4 GENERAL BUILDING REQUIREMENTS.

Comply with UFC 1-200-01. UFC 1-200-01 provides applicability of model building codes and government unique criteria for typical design disciplines and building systems, as well as for accessibility, antiterrorism, security, high performance and sustainability requirements, and safety. Use this UFC in addition to UFC 1-200-01 and the UFCs and government criteria referenced therein.

1-5 CYBERSECURITY.

All control systems (including systems separate from a utility monitoring and control system) must be planned, designed, acquired, executed, and maintained in accordance with UFC 4-010-06 and as required by individual Service Implementation Policy.

Figure 1-1 Associated Mechanical Systems Criteria



CHAPTER 2 TECHNICAL REQUIREMENTS

2-1 DOCUMENTATION REQUIREMENTS

Comply with the design analysis and drawing requirements in the UFC 3-401-01 Supplement.

2-2 SUSTAINABILITY AND LIFE CYCLE.

Comply with UFC 1-200-02 which provides requirements that influence the selection and design of mechanical systems and fuel sources.

2-3 MAINTAINABILITY.

Mechanical equipment not required to be located outside must be located in an equipment room. Provide system designs with the features necessary for easy access for maintenance and for successful testing, adjusting, balancing, and system commissioning. Provide protection for equipment materials located in corrosive environments. When mechanical appliances and equipment are installed at heights in excess of 12 feet (3.6 m), provide special maintenance accommodations such as a service platform, railings, catwalk with railings, and a permanent ladder or stairs for access of maintenance, repair, and replacement. Special maintenance accommodations must be approved by the real property owner. Include documentation of real property owner acceptance for record in the project files.

2-4 MECHANICAL ROOMS.

“Mechanical rooms” refer to appliance, boiler, furnace, equipment, and machinery rooms as outlined in the International Mechanical Code (IMC). “Equipment” refers to appliances, equipment, or machinery.

Size the mechanical room to accommodate the space required to house all equipment and piping including all associated maintenance and access clearances. All mechanical rooms must have exterior access sized to accommodate all maintenance and equipment replacement throughout the life of the building. Incorporate provisions for future equipment removal and replacement including a replacement route and adequate door dimensions. Provide fall protection as required. Handrails must be removable. For supplemental mechanical spaces with equipment weighing 125 lbs (56.7 kg) or less, provide exterior access as required by the real property owner.

2-4.1 Mechanical Rooms on Grade.

Mechanical rooms on grade must be provided with door(s) on the building exterior. At the sole discretion of the real property owner, interior access, adequate for all maintenance throughout the life of the equipment in the space, may be provided in lieu of direct exterior access for equipment rooms on grade. Such access must include a route through interior doors and corridors that allows replacement of any equipment

within the equipment space. Include documentation of the real property owner's decision in the project documentation for record.

2-4.2 Mechanical Rooms Above Grade.

Mechanical rooms above grade must be provided with exterior access that will allow crane or mobile lift access to equipment. Coordinate with the Architect on this requirement to address historical preservation requirements.

2-5 REFRIGERANTS.

2-5.1 EPA Refrigerant Regulations.

Provide only refrigerant systems that comply with the requirements of the Environmental Protection Agency (EPA) Technology Transitions Program and other relevant EPA regulations such as the Significant New Alternatives Policy (SNAP) Program. Coordinate with equipment manufacturers for options for compliant equipment.

Refer to the US EPA Technology Transitions webpage or latest EPA requirements for further information: https://www.epa.gov/climate-hfcs-reduction/technology-transitions. Refer to the US EPA SNAP Program webpage for further information regarding SNAP: https://www.epa.gov/snap.

2-6 WEATHER DATA.

Obtain engineering weather data needed for design calculations and analyses from the 14th Weather Squadron (https://climate.af.mil/) unless otherwise indicated in associated Mechanical Systems UFCs. Refer to UFS 3-410-01 for access instructions. Refer to technical guide, Design: Engineering Weather Data, located in related materials on the UFC 3-410-01 webpage, for information regarding 14th Weather Squadron data and usage.

2-7 CONFLICTS IN CRITERIA.

Where there is a conflict between a general requirement and a specific requirement, the specific requirement is applicable. Where, in a specific case, different sections of the any mechanical UFC specify different materials, methods of construction or other requirements, the most restrictive govern unless determined otherwise by the Authority Having Jurisdiction.