DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
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9 May 2000

From: Commander, Naval Facilities Engineering Command, NAVFAC Criteria Office
To: Distribution

Subj: INTERIM TECHNICAL GUIDANCE (ITG) - FIRE APPARATUS VEHICLE EXHAUST REMOVAL SYSTEMS

Ref: (a) DOD Instruction 6055.6, dated 15 December 1994.
(b) National Fire Protection Association (NFPA) Standard 1500-97, Fire Department Occupational Safety and Health Program.
(c) American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Handbook, HVAC Applications, Chapter A-12.
(d) International Code Council, International Mechanical Code.
(e) NFGS-L-15802, Fire Apparatus Vehicle Exhaust Removal System, 31 March 2000, Regional Specification.

Encl: (1) DESIGN GUIDANCE FOR FIRE APPARATUS VEHICLE EXHAUST REMOVAL SYSTEMS, dated 09 May 2000.

1. Purpose. To provide interim technical guidance for design of new facilities and modification of existing facilities housing fire and rescue apparatus for shore stations and airfields. Increased awareness of the potential carcinogenic properties of diesel engine exhaust has resulted in the requirement for fire apparatus vehicle engine exhaust removal systems (FAVERS). Retain this guidance until it is incorporated into the criteria as noted in paragraph 4.

2. Background. Based upon field experience, fire apparatus may need to operate the engine for 15 to 120 seconds prior to exiting the apparatus bay, in order to attain sufficient air pressure in the air brake reservoir. Daily operational checkout during inclement weather conditions may require engine operation within the apparatus bay for as much as 10 minutes for each fire apparatus. Reference (a) applies to all Military Services, and in paragraph E2.1.1 of enclosure (2), requires that "The plans for all military construction projects, facility modernization, rehabilitation programs, or self-help projects shall be reviewed for concurrence with MIL-HDBK-1008B (reference (d)), by qualified personnel to ensure that they meet the life safety and fire prevention criteria promulgated by the DoD Components and the National Fire Codes, reference (e)." MIL-HDBK-1008B, FIRE PROTECTION is "reference (d)" in the previous sentence. Paragraph E2.3.1 states that "DoD fire protection standards consist of the relevant standards promulgated by ... the National Fire Protection Association (National Fire Codes), ..." Reference (b), Chapter 7-1.6 states "The fire department shall prevent exposure to fire fighters and contamination of living and sleeping areas to exhaust emissions." Reference (b), Appendix A, paragraph A-7-1.5 states, "As new stations are constructed or existing stations are renovated,

a separation between the apparatus floor and living quarters should be provided. The apparatus bay should be equipped with a designed exhaust ventilation system that meets local codes and applicable regulations. Exposure to diesel particulates can cause cancer, and elevated carbon monoxide levels are known to be toxic." Reference (c) provides detailed discussion of the requirements for handling diesel fumes, although particularly referring to those from buses. Reference (d) should be consulted for design and installation requirements for both the exhaust and makeup air systems. Reference (e) is a current regional specification, available for download at http://www.efdlant.navfac.navy.mil/, click MIDLANT, click FTP download, click 04 Design, select and click 15802.pdf or 15802.sec to obtain the Adobe Acrobat .pdf file or the SPECSINTACT .sec file.

3. Technical Guidance. Enclosure (1) is the new Design Guidance for Fire Apparatus Vehicle Exhaust Removal Systems, which is applicable for all fire and rescue stations ashore.

4. Action.

a. Design. Design all projects using this guidance. Revise all projects under design, but not yet design complete, to comply with this guidance, where funds and schedule permit.

b. Construction. Modify Navy projects currently under construction, and amend advertised construction projects, to conform to the enclosed guidance, where funds and schedules permit.

c. Criteria. The NAVFAC Criteria Office will fund the preparation of a Draft NFGS-15802, based upon reference (e) by Atlantic Division, after accumulating additional successful installation and operational experiences. The Criteria Office will also forward this ITG to the Tri-Service Unified Facility Criteria Working Group responsible for Fire Station design for possible adoption into a single Unified Facility Criteria document.

5. Coordination. This ITG has been coordinated internally within NAVFAC, and also with the Navy Environmental Health Center.

6. Points of Contact. For additional information concerning this ITG, please contact the following:

NAVFAC Criteria Office – Mr. Thomas J. Harris, P.E. at DSN 262-4206, commercial 757-322-4206, FAX 757-322-4416, or via the Internet at harristj@efdlant.navfac.navy.mil.

Engineering Field Division, Atlantic –

Design – Code 403, Mr. Roger Ashby at DSN 262-4241, commercial 757-322-4241, FAX 4238, or via the Internet at ashbyrl@efdlant.navfac.navy.mil.

Specifications – Code 406, Mr. Carl A. Throckmorton at DSN 262-4310, commercial 757-322-4310, FAX 4415, or via the Internet at throckmo@efdlant.navfac.navy.mil.

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/S/
R. D. CURFMAN
By direction

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09 MAY 2000

DESIGN GUIDANCE FOR FIRE APPARATUS VEHICLE EXHAUST REMOVAL SYSTEMS

1. NEW FACILITIES: Provide fire apparatus vehicle exhaust removal systems (FAVERS) in all new Aircraft Fire and Rescue Station, and Fire Station projects funded by Military Construction.

2. EXISTING FACILITIES UNDER MODIFICATION, REHABILITATION, OR SELF-HELP: Provide FAVERS in all modified, rehabilitated, or self-help Aircraft Fire and Rescue Station, and Fire Station projects.

3. OTHER EXISTING FACILITIES: Modify to provide FAVERS as soon as possible.

4. DESIGN REQUIREMENTS:

a. Each individual fire apparatus shall be directly exhausted to the outdoors by means of a mechanical exhaust system, and provided with sufficient makeup air for proper system operation.

b. Makeup air shall be distributed so as to minimize drafts. Makeup air should be introduced above apparatus level, since diesel exhaust is heavier than air, and the makeup air flow downward will assist in pushing the exhaust fumes out the storage bay doors when they are open.

c. Makeup air shall be tempered to maintain indoor design conditions in the fire apparatus storage bay, except in the following facilities:

1) Located in a tropical climate.

2) Heated by infrared heaters within the bay.

3) Heated by radiant panel heat, embedded hydronic coils or tubes in the floor slab.

d. Installations shall be in accordance with the International Code Council™, International Mechanical Code©.