ETL 91- 5
18 JUNE 1991

ENGINEERING TECHNICAL LETTER

FIRE PROTECTION ENGINEERING CRITERIA
EMERGENCY LIGHTING AND MARKING OF EXITS

OFFICE of THE CIVIL ENGINEER
DIRECTORATE of MILITARY CONSTRUCTION
ENGINEERING DIVISION

Fire Protection Engineering Criteria and Technical Guidance for Emergency Lighting and Marking of Exits

1. REFERENCED PUBLICATIONS

a. AFR 8-7, Air Force Engineering Technical Letters, January 1987

b. AFR 88-15, Criteria and Standards for Air Force Construction (15 December 1985 draft)

c. MIL-HDBK 1008A, Fire Protection for Facilities Engineering, Design, and Construction, 31 March 1988

d. National Fire Protection Association Standard 101 (NFPA 101), The Life Safety Code

e. NISTIR 4399, Evaluation of Exit Signs in Clear and Smoke Conditions, August 1990

f. HQ AFOMS/SGPR, Use of Radioluminescent Signs and Markers, 16 December 1985

g. HQ USAF/LEEE, Use of Radioluminescent Signs and Markers, 11 May 1986

2. CRITERIA/TECHNICAL GUIDANCE

a. Emergency lighting must be provided IAW NFPA 101, Chapter 5, Section 5-9. Normally emergency lighting is required only for designated stairs, aisles, corridors, ramps, escalators, and passageways leading to an exit. Interior rooms and windowless rooms generally do not require emergency lighting unless they meet the definition of a "Windowless Structure" in NFPA 101, Chapter 30, Section 30-1.3.5. Mechanical rooms, telephone equipment rooms, and similar utility spaces generally do not require emergency lighting.

(1) Emergency lighting in facilities provided with a stand-by electric generator should be powered by the generator. Such generators must be installed, tested, and maintained in accordance with NFPA 110, Emergency and Standby Power Systems.

(2) Emergency lighting in other facilities will be powered by batteries incorporated in the lighting fixtures.

(3) Fixtures with wall mounted battery packs will not be used. Fixtures with remote battery packs are permitted. Existing fixtures with wall mounted battery packs meeting minimum NFPA 101 standards will not be replaced simply to eliminate wall mounted battery packs. Existing fixtures with wall mounted battery packs located where not required by NFPA 101 should be removed.

b. Marking of means of egress must be provided IAW NFPA 101, Chapter 5, Section 5-10.

(1) Externally illuminated signs must have letters displayed on a white opaque background.

(2) Internally illuminated signs must have illuminated letters displayed on an opaque background. Internally illuminated signs include surface illuminated fixtures such as light emitting diode type.

(3). The lettering on all exit signs must be a single uniform color for the entire installation. Each base will establish their standard lettering as either red or green. Bases in or near jurisdictions with established exit signs lettering colors should adopt similar red or green standards.

(4) Existing exit signs meeting minimum NFPA 101 standards should not be replaced simply to standardize sign colors.

(5) All internally illuminated signs must use low maintenance low energy consuming lighting. Light emitting diodes are recommended for all applications; however, other low maintenance, low energy consuming, lighting such as fluorescent fixtures or neon fixtures are permitted.

(6) Incandescent fixtures are not permitted. Existing incandescent fixtures meeting NFPA 101 standards may remain in service.

(7) In overseas locations, different colors, pictorials, and/or bilingual lettering may be required to remain consistent with local national standards. Exit marking must always be located as required by NFPA 101 and additional marking is permitted to remain consistent with local national standards. The overseas theatre MAJCOM fire protection engineer must publish a formal standardized policy to implement variations from NFPA 101 and this ETL.

(8) Self-luminous, electroluminous or radioluminous signs are not permitted. These types of signs contain radioactive materials that are nuclear reactor by-products and controlled by the Nuclear Regulatory Commission. The Air Force Office of the Surgeon General, USAF Radioisotope Committee, has prohibited the use of these signs (reference f). Special handling is required for their disposal.

(a) Existing signs, installed before the 14 May 1986 prohibition (reference g) on new installations, may remain in service until replaced at the end of the ten year service life. All signs must have been replaced not later than 1 June 1996.

(b) IAW NRC requirements, records of the exact location, manufacturer, and date of installation of each sign must be maintained by the facility owner (base real estate office), base fire department, and local environmental health office.

(c) Broken or damaged signs must be treated as a radiological hazardous materials incident similar to a "Broken Arrow" incident. Incidents must be reported through radiological health channels to the NRC.

(d) Removed undamaged or unbroken signs must be returned to the manufacturer for disposal. If the manufacturer is no longer in business or has lost NRC license to handle radioactive material, the base is responsible for arranging for disposal at the approved site in Barnwell, SC.

ENGINEERING TECHNICAL LETTERS (ETL)

SECTION A - CURRENT ETLs

ETL Number	Title	Date Issued
82-2	Energy Efficient Equipment	10 Nov 82
83-1	Design of Control Systems for HVAC	16 Feb 83
	Change No. 1 to ETL 83-1, U.S. Air Force Stndardized Heating, Ventilating & Air Conditioning (HVAC) Control Systems	22 Jul 87
83-3	Interior Wiring Systems, AFM 88-15 Para 7-3	2 Mar 83
83-4	EMCS Data Transmission Media (DTM) Considerations	3 Apr 83
83-7	Plumbing, AFM 88-8, Chapter 4	30 Aug 83
83-8	Use of Air-to-Air Unitary Heat Pumps	15 Sep 83
83-9	Insulation	14 Nov 83
84-2	Computer Energy Analysis	27 Mar 84
	Change 1 Ref: HQ USAF/LEEEU Msg 031600Z MAY 84 1 Jun 84	
84-7	MCP Energy Conservation Investment Program (ECIP)	13 Jun 84
84-10	Air Force Building Construction and the Use of Termiticides	1 Aug 84
86-2	Energy Management and Control Systems (EMCS)	5 Feb 86
86-4	Paints and Protective Coatings	12 May 86
86-5	Fuels Use Criteria for Air Force Construction	22 May 86
86-8	Aqueous Film Forming Foam Waste Discharge Retention and Disposal	4 Jun 86
86-9	Lodging Facility Design Guide	4 Jun 86
86-10	Antiterrorism Planning and Design Guidance	13 Jun 86
86-14	Solar Applications	15 Oct 86
86-16	Direct Digital Control Heating Ventilation and Air Conditioning Systems	9 Dec 86
87-1	Lead Ban Requirements of Drinking Water	15 Jan 87
87-2	Volatile Organic Compounds	4 Mar 87
87-4	Energy Budget Figures (EBFs) for Facilities in the Military Construction Program	13 Mar 87
87-5	Utility Meters in New and Renovated Facilities	13 Jul 87
87-9	Prewiring	21 Oct 87

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SECTION A - CURRENT ETLs

ETL Number	Title	Date Issued
88-2	Photovoltaic Applications	21 Jan 88
88-3	Design Standards for Critical Facilities	15 Jun 88
88-4	Reliability & Maintainability (R&M) Design Checklist	24 Jun 88
88-5	Cathodic Protection	2 Aug 88
88-6	Heat Distribution Systems Outside of Buildings	1 Aug 88
88-8	Cholorfluorocarbon (CFC) Limitation in Heating, Ventilating and Air-Conditioning (HVAC) Systems	4 Oct 88
88-9	Radon Reduction in New Facility Construction	7 Oct 88
88-10	Prewired Workstations Guide Specification	29 Dec 88
89-2	Standard Guidelines for Submission of Facility Operating and Maintenance Manuals	23 May 89
89-3	Facility Fire Protection Criteria for Electronic Equipment Installations	9 Jun 89
89-4	Systems Furniture Guide Specification	6 Jul 89
89-6	Power Conditioning and Continuation Interfacing Equipment (PCCIE) in the Military Construction Program (MCP)	7 Sep 89
89-7	Design of Air Force Courtrooms	29 Sep 89
90-1	Built-Up Roof (BUR) Repair/Replacement Guide Specification	23 Jan 90
90-2	General Policy for Prewired Workstations and Systems Furniture	26 Jan 90
90-3	TEMPEST Protection for Facilities Change 1 Ref: HQ USAF/LEEDE Ltr dated 20 April 90, Same Subject	20 Apr 90
90-4	1990 Energy Prices and Discount Factors for Life-Cycle Cost Analysis	24 May 90
90-5	Fuel and Lube Oil Bulk Storage Capacity for Emergency Generators	26 Jul 90
90-6	Electrical System Grounding, Static Grounding and Lightning Protection	3 Oct 90
90-7	Air Force Interior Design Policy	12 Oct 90
90-8	Guide Specifications for Ethylene Propylene Diene Monomer (EPDM) Roofing	17 Oct 90
90-9	Fire Protection Engineering Criteria for Aircraft Maintenance, Servicing, and Storage Facilities	2 Nov 90
90-10	Commissioning of Heating, Ventilating, and Air Conditioning (HVAC) Systems Guide Specification	17 Oct 90

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SECTION A - CURRENT ETLs

ETL Number	Title	Date Issued
91-1	Fire Protection Engineering Criteria Testing Halon Fire Suppression Systems	2 Jan 91
91-2	High Altitude Electromagnetic Pulse (HEMP) Hardening in Facilities	4 Mar 91
91-3	Water Supply for Fire Protection	14 Jun 91
91-4	Site Selection Criteria for Fire Protection Training Areas	14 Jun 91
91-5	Fire Protection Engineering Criteria - Emergency Lighting and Marking of Exits	18 Jun 91

SECTION B - OBSOLETE ETLs

No.	Date	Status
82-1	10 Nov 82	Superseded by ETL 83-10, 86-1, 87-4
82-3	10 Nov 82	Superseded by ETL 83-5, 84-2
82-4	10 Nov 82	Superseded by ETL 84-7
82-5	10 Nov 82	Superseded by ETL 84-1, 86-13, 86-14
82-6	30 Dec 82	Cancelled
82-7	30 Nov 82	Cancelled
83-2	16 Feb 83	Superseded by ETL 84-3
83-6	24 May 83	Cancelled
84-3	21 Mar 84	Cancelled
84-4	10 Apr 84	Superseded by ETL 86-7, 86-15, 87-5
84-5	7 May 84	Superseded by ETL 84-8, 86-11, 86-18, 88-6
84-6	Not Issued	Cancelled/Not Used
84-9	5 Jul 84	Superseded by ETL 88-7
86-3	21 Feb 86	Superseded by ETL 86-4
86-6	3 Jun 86	Superseded by ETL 86-11, 86-18, 88-6
86-7	3 Jun 86	Superseded by ETL 86-15
86-12	3 Jul 86	Superseded by ETL 90-2
86-13	18 Aug 86	Superseded by ETL 86-14
86-15	13 Nov 86	Superseded by ETL 87-5
86-17	17 Dec 86	Superseded by ETL 89-6
86-18	18 Dec 86	Superseded by ETL 88-6
87-3	12 Mar 87	Superseded by ETL 87-6, ETL 88-5
87-6	21 Aug 87	Superseded by ETL-88-5
87-7	14 Oct 87	Superseded by ETL 89-1
Chg 1	30 Dec 87	Superseded by ETL 90-1
88-1	5 Jan 88	Superseded by ETL 89-2
88-7	24 Aug 88	Superseded by ETL 90-3, ETL 91-2
89-1	6 Feb 89	Superseded by ETL 90-4
89-5		Issued as ETL 90-7