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SERVICE BULLETIN

TFA10-26-0010

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Revision IR

Record of Revisions

Revision	Description	Date	Approval
IR	Initial Release	03-25-10	W.A. Enk Sr.

SUBJECT:

Cargo Smoke Detection and Fire Suppression System

MODEL:

DC-9-10 Series, DC-9-21, DC-9-30 Series, DC-9-41, DC-9-51, DC-9-81, DC-9-82, DC-9-83, DC-9-87, MD-88, MD-90-30

APPLICABILITY:

Aircraft with AAE Supplemental Type Certificate (STC) ST01455AT/ST01138WI Installed

COMPLIANCE:

Recommended

APPROVAL:

The data referenced by the written AAE Installation Instructions for accomplishment of this SB, and the new AFMS, are FAA approved

DEFINITIONS:

The following definitions apply to terms used in this service bulletin.

Volumetric Averaging: Minimum 3% average concentration level of Halon (1301) to be maintained in the cargo compartment for the required duration.

Point to Point: Minimum 3% by volume concentration level of Halon (1301) to be maintained for the required duration at each point (everywhere) in the cargo compartment where cargo will be carried, including side to side, end to end and top to bottom.

BACKGROUND:

AAE's Cargo Fire Protection System (FPS) designs and their configurations are installed in the lower cargo compartments of transport category aircraft, including those models listed above.

AAE's designs include configurations that are approved by the FAA per the above STC's and provide 60 minutes or 120 minutes of protection. They include standard suppression systems that were certified using a "volumetric averaging" technique to determine the concentration of Halon (1301) that's needed for the required duration of protection.

AAE's designs also include configurations that are approved by the FAA and EASA and provide 78 minutes of protection. The higher performance suppression systems in these configurations were certified using a "point to point" technique to determine the concentration of Halon (1301) that's needed for the required duration of protection (including the time to land, park, and evacuate the aircraft).

PURPOSE:

This SB recommends upgrading those configurations that use the standard suppression system (volumetric averaging) to configurations that use the higher performance suppression system (point to point).

This SB also provides information to the operator to assist them in determining what configuration is currently installed on the aircraft and to identify which upgrade kit part number is applicable (See Table 1).

DISCUSSION:

Traditionally, cargo FPS designs have been certified by demonstrating a five percent initial Halon "Knockdown" concentration followed by a sustained concentration of three percent for the duration of protection. The industry practice has been, and continues to be, to use the technique of "volumetric averaging" to establish the minimum Halon concentrations.

In 1997, through fire suppression tests, the FAA recognized the technique of "volumetric averaging" may allow a concentration of Halon insufficient (below 3%) to suppress a fire at certain locations in the compartment. However, after considering Industry objections, the FAA decided that requiring more stringent techniques to determine minimum concentrations levels, such as "point to point", was considered new policy for Class D to C conversions; and therefore, they would continue to allow manufacturers to use the technique of "volumetric averaging" to establish the minimum concentration of Halon for fire suppression.

Additional guidance in Europe by the Joint Aviation Authority (JAA), and later adopted by EASA, require the cargo FPS designs to be certified using a technique that demonstrates a concentration of 3% by volume or higher everywhere "point to point" in the cargo compartment. Ongoing attempts to harmonize the U.S. and EASA certification standards continue.

In the meantime, the risk with using the technique of "Volumetric Averaging" is that although the "average" concentration throughout the compartment is 3% or above, some points have concentrations that are higher; and some points have concentrations that are lower. It's at those locations where the concentration of extinguishing agent falls below 3% that a fire can reignite and the ability to suppress the fire is compromised, thus the fire is likely uncontrollable. This is a hazard that should be mitigated.

Therefore, implementation of this Service Bulletin is highly recommended.

RECOMMENDED OWNER/OPERATOR ACTION:

Using the Table 1 below, determine which FPS 'Volumetric Averaging' Kit Configuration is installed on your aircraft. Contact AAE for confirmation of the applicable FPS 'Point to Point' Upgrade Kit Part Number; And for pricing and lead time details.

The upgrade kit(s) will include the following items:

1. New 5-minute "Auto-Fire" Cargo FPS Control Panel
2. New BTL No. 2 for Sustaining Discharge [applicable for 60 minute configuration(s)]
3. New Metering Device [applicable for 120 minute Extended Range Configuration(s)]
4. Mounting Plate, Hardware, Sheet Metal, Suppression Tubes, and Harnesses [when applicable].
5. New Airplane Flight Manual Supplement
6. New 3 Year Warranty
7. Applicable Installation Instructions and its FAA Approved Drawings
8. Continued Airworthiness Data Package

Note: All core units removed and returned to AAE, LTD.

TIME OF COMPLIANCE:

Recommended at next scheduled maintenance check for the cargo fire protection system.

MAN-HOURS:

Time to accomplish 'UG1' Upgrade Kit is approximately 14 man/hours

Time to accomplish 'UG2' Upgrade Kit is approximately 8 man/hours

Time to accomplish 'UG3' Upgrade Kit is approximately 12 man/hours

Time to accomplish 'UG4' Upgrade Kit is approximately 6 man/hours

The times shown above are estimated, actual times may vary.

TABLE 1

Aircraft Model	FPS 'Volumetric Averaging' AFMS	FPS 'Volumetric Averaging' Kit Configuration	FPS 'Point to Point' AFMS	FPS 'Point to Point' Kit Configuration	FPS 'Point to Point' Upgrade Kit P/N
DC-9-10 Series & DC-9-21	TFA09-0042, TFA09-0069	-900	TFA09-0080	-1500	TFK DC-9-10-1500 UG1 OR TFK DC-9-21-1500 UG1
DC-9-10 Series & DC-9-21	TFA09-0049, TFA09-0072	-900	TFA09-0080	-1500	TFK DC-9-10-1500 UG2 OR TFK DC-9-21-1500 UG2
DC-9-30	TFA09-0042, TFA09-0069,	-700	TFA09-0080	-1600	TFK DC-9-30-1600 UG1
DC-9-30	TFA09-0049, TFA09-0072	-700	TFA09-0080	-1600	TFK DC-9-30-1600 UG2
DC-9-30	TFA09-0057, TFA09-0075	-1400	TFA09-0080	-1600	TFK DC-9-30-1600 UG3
DC-9-41	TFA09-0042, TFA09-0069	-1100	TFA09-0080	-1700	TFK DC-9-41-1700 UG1
DC-9-41	TFA09-0049, TFA09-0072	-1100	TFA09-0080	-1700	TFK DC-9-41-1700 UG2
DC-9-51	TFA09-0042, TFA09-0069	-1300	TFA09-0080	-1800	TFK DC-9-51-1800 UG1
DC-9-51	TFA09-0049, TFA09-0072	-1300	TFA09-0080	-1800	TFK DC-9-51-1800 UG2
DC-9-81, -82, -83 & MD-88	TFA09-0039, TFA09-0052, TFA09-0068, TFA09-0074	-400	TFA09-0082, TFA09-0084	-1900	TFK DC-9-81-1900 UG1, TFK DC-9-82-1900 UG1, TFK DC-9-83-1900 UG1, OR TFK MD-88-1900 UG1
DC-9-81, -82, -83 & MD-88	TFA09-0048, TFA09-0051, TFA09-0071, TFA09-0073	-400	TFA09-0082, TFA09-0084	-1900	TFK DC-9-81-1900 UG2, TFK DC-9-82-1900 UG2, TFK DC-9-83-1900 UG2, OR TFK MD-88-1900 UG2
DC-9-81, -82, -83 & MD-88	TFA09-0046, TFA09-0061, TFA09-0070, TFA09-0078	-600	TFA09-0082, TFA09-0084	-1900	TFK DC-9-81-1900 UG3, TFK DC-9-82-1900 UG3, TFK DC-9-83-1900 UG3, OR TFK MD-88-1900 UG3
DC-9-81, -82, -83 & MD-88	TFA09-0059, TFA09-0060, TFA09-0076, TFA09-0077	-600	TFA09-0082, TFA09-0084	-1900	TFK DC-9-81-1900 UG4, TFK DC-9-82-1900 UG4, TFK DC-9-83-1900 UG4, OR TFK MD-88-1900 UG4
DC-9-87	TFA09-0039, TFA09-0052, TFA09-0068, TFA09-0074	-1000	TFA09-0082, TFA09-0084	-2000	TFK DC-9-87-2000 UG1
DC-9-87	TFA09-0048, TFA09-0051, TFA09-0071, TFA09-0073	-1000	TFA09-0082, TFA09-0084	-2000	TFK DC-9-87-2000 UG2
DC-9-87	TFA09-0046, TFA09-0061, TFA09-0070, TFA09-0078	-1200	TFA09-0082, TFA09-0084	-2000	TFK DC-9-87-2000 UG3

DC-9-87	TFA09-0059, TFA09-0060, TFA09-0076, TFA09-0077	-1200	TFA09-0082, TFA09-0084	-2000	TFK DC-9-87-2000 UG4
MD-90-30	TFA09-0039, TFA09-0052, TFA09-0068, TFA09-0074	-800	TFA09-0082, TFA09-0084	-2100	TFK MD-90-30-2100 UG1
MD-90-30	TFA09-0048, TFA09-0051, TFA09-0071, TFA09-0073	-800	TFA09-0082, TFA09-0084	-2100	TFK MD-90-30-2100 UG2