UNITED STATES ARMY AVIATION BOARD
Fort Rucker, Alabama

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ATBG-DT Proj Nr AVN 5060

SUBJECT: [redacted] "Abbreviated Service Test of the Helicopter-Mounted Irritant-Gas Disperser, E-16R1"

(14) ATBG-DT-AVN-5060

TO: Commanding General
United States Continental Army Command
ATTN: ATDEV-6
Fort Monroe, Virginia

1. References:

a. Disposition Form, MD, Headquarters, USCONARC, 16 April 1960, subject: "Helicopter Mounted Irritant Gas Disperser (U)," with Comment Nr 2.

b. Message, ATDEV-6 785516, Headquarters, USCONARC, 23 June 1960.

c. Message, ATDEV-6 790879, Headquarters, USCONARC, 30 August 1960.

2. In compliance with reference 1b, a helicopter-mounted irritant-gas disperser, E-16R1, was installed and operated in flight in H-21, H-34, and HU-1A helicopters and was installed, but not operated, in an H-19 helicopter. The gas disperser consists essentially of a sealed hopper which holds powdered agent, a pressure tank assembly which contains air under pressure, and a hose assembly from which the agent is disseminated. Cargo tiedown straps are used to secure the disperser to the helicopter. The disperser is 4 feet high and 2½ feet wide and weighs 280 pounds with agent. Powdered talc was provided as an agent for test purposes. It was determined that:

a. The weight and required location of the disperser (near the door of the cargo compartment) are acceptable for Army utility and cargo helicopters.

b. Three or more men could install a loaded disperser in any of the helicopters in approximately five minutes using four Type MC-1 cargo straps and friction tape, or like items.

c. The agent-control valve of the disperser was provided with a positive safety to prevent inadvertent release of the agent. The valve was "safetied" by inserting a threaded bolt through a hole in the valve handle and screwing it into a mounting bracket. A modification to afford the pilot a mechanical or electrical means of opening and closing the

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agent-control valve is desirable but not mandatory. Use of the helicopter intercommunication system for communication between the pilot and operator of the disperser provided adequate control over dispersal of the agent.

d. The disperser is designed for the use of compressed air; however, the charger valve is compatible with oxygen recharging equipment currently in use by the military. Any attempt to use oxygen in the disperser system would be extremely hazardous and likely to result in an explosion. For safety purposes, the pressure tank should be appropriately placarded to preclude the use of oxygen in this system.

e. At altitudes out of ground effect, the agent could be dispersed safely from the helicopters when hovering and in forward flight within the speed r nge of the particular helicopter. At altitudes within ground effect, operation of the disperser from a helicopter hovering or flying at speeds less than translational lift speed resulted in immediate contamination of each test helicopter except the HU-1A. The agent could be dispersed from the HU-1A without obvious contamination at altitudes of 10 feet or above.

f. The installation instructions were oriented toward an H-19 helicopter and were generally adequate. The instructions, however, should be revised to reflect proper installation instructions and photographs applicable to standard utility and cargo helicopters. In addition, it is considered that TI 319-12, "Operator and Organizational Maintenance Manual," should be revised to:

(1) Delete references to "web straps - six feet long" and substitute therefor, "cargo straps, Type MC-1."

(2) Include the description and purpose of the safety bolt on the agent-control valve and add its removal and insertion as part of the operational procedures.

(3) Use the term "tie-down rings" in lieu of "cargo cleats."

(4) Include the following in the installation instructions:

(a) The disperser must be secured in the helicopter in accordance with appropriate restraint criteria. (In the HU-1A, forward restraint can be achieved by fastening the disperser to the rear bulkhead of the cargo compartment.)

(b) The discharge end of the hose is fastened to the main landing gear leg of the H-19, the main landing gear vee brace of the

H-21, the cargo hook or main landing gear leg of the H-34, or the landing gear cross tube of the HU-1A.

(c) When the hose is fastened to a landing gear, there must be sufficient slack in the hose to allow for extension of the strut.

(d) In any helicopter installation, the hose is pointed downward from and slightly aft of the helicopter.

(5) Reflect the following in paragraph 20, "Operating the Disperser":

(a) The disperser should be operated upwind from the target insofar as practical.

(b) Add: WARNING NOTE - Operation of the disperser while the helicopter is hovering or flying at speeds less than translational lift speed when in ground effect may result in contamination of the helicopter due to circulation of the agent in the rotor wash.

(c) Add: WARNING NOTE - All personnel in a helicopter in which a disperser is being operated must wear gas masks. Do not wear an oxygen mask.

4. It is concluded that the helicopter-mounted irritant-gas disperser, E-16R1, will be suitable for use in Army utility and cargo helicopters when TI 319-12, "Operator and Organizational Maintenance Manual," is revised in accordance with paragraph 3f above.

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