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QUALITATIVE OPERATIONAL REQUIREMENT

FOR

RANGE EXTENSION OF THE HH-43B

PROJECT CORONA HARVEST

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No. 0005818

1. MISSION/FUNCTION. The Local Base Rescue (LBR) mission provides a twenty-four hour capability for expeditious recovery of personnel involved in aircraft/missile accidents, incidents, or similar occurrences on, or in the vicinity of, an air base. This mission is a function of the Air Rescue Service mission as defined in AFM 10-54.

2. MISSION CAPABILITY.

a. The HH-43B helicopter was designed and procured for the LBR function at air bases where the accident/incident potential is high by virtue of the type aircraft assigned and/or nature of air operations performed. The HH-43B is capable of providing a recovery capability, and is assigned an area of responsibility, within a 75 NM radius of its operating base. The LBR function is not limited to established operational bases. It is planned that the HH-43B helicopter be deployed to perform a like function in support of contingency operations at other than established LBR locations.

b. The 75 NM radius of action (area of responsibility) is adequate for most air bases requiring LBR support, however, it is not adequate at air bases such as Nellis AFB, Nevada; Suffolk County AFB, New York, or Wheelus AB, Libya, where high density air operations are conducted up to 150 NM from the base. At such locations, a high accident/incident potential exists beyond the present HH-43B operational range capability in areas of inaccessible terrain or over water.

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Additionally, northern bases such as Duluth, Minnesota, and Thule, Greenland, require a quick recovery capability during winter months to prevent loss of downed aircrews through exposure to extreme cold.

3. EQUIPMENT DEFICIENCY. The HH-43B operating range is deficient in respect to the LBR requirements at many established air bases around the world and in all probability will be deficient at bases planned for contingency operations.

a. Accidents/Incidents which occur more than 75 NM from a base cannot be resolved by the HH-43B without range extension and are necessarily resolved by time consuming surface means. In a few cases, when the HH-43B was the only means available, its range was extended by refueling enroute from fuel drums carried in the aircraft or from a source positioned for that specific mission. These makeshift range extension procedures, which are impossible over water and extremely hazardous over unknown snow/ice covered surfaces, are also time consuming and not in consonance with the inherent urgency of the rescue/recovery mission.

b. The need for extending the operational range of the HH-43B is immediate and will continue as long as the HH-43B is the primary LBR mission aircraft.

4. EMPLOYMENT.

a. Extended range HH-43B helicopters (or the provisions for extending the range) will be assigned initially to those bases that require LBR coverage beyond 75 NM.

b. HH-43B helicopters which are planned for use in support of contingency operations should possess or have available the extended

range capability. This concept should include all LBR HH-43B helicopters.

c. It is not envisioned for this requirement to alter the number of aircraft or personnel assigned to support the normal LBR program.

5. DESIRED PERFORMANCE CAPABILITIES. The HH-43B fuel capacity should be increased to meet the following performance requirements:

a. Range: 300 NM plus a ten minute hover capability in or out of ground effect and a thirty minute fuel reserve.

b. Speed: Minimum degradation consistent with gross weight increase.

6. SPECIAL INSTRUCTIONS.

a. The extended range mission will not be performed in conjunction with the fire suppression mission and fuel will be added as necessary for specific missions.

b. Fuel must be augmented by at least 100 gallons to meet the performance requirements.

c. Location of the augmented fuel in or on the aircraft should not interfere with normal hoist operation, fire suppression kit hook-up or delivery procedures, cabin configuration or cause an undesirable center of gravity position when empty or full.

d. Weight of additional fuel, tank(s), plumbing, and hardware should not exceed 1,750 pounds which is the difference between the recovery configured (without the fire suppression kit) takeoff weight of 6,500 pounds and the maximum allowable take-off gross weight of 8,250 pounds.

e. The augmented fuel should be fed directly into the main fuel tank to negate the requirement for duplicating major components of the fuel system.

f. The augmented fuel system should incorporate a dump or jettison capability, as appropriate, for rapid weight reduction in event of emergency.

g. If fuel augmentation utilizes more than one tank, single-point refueling should be considered to minimize the time required to fill the tanks when an extended range mission occurs.

h. The selected fuel augmentation system should be relatively easy to install and should not require a higher level of maintenance than that available at a field level maintenance facility. This would negate distant ferry or airlift of the aircraft and would not cause the LBR capability to be depleted over long periods of time.

i. Every possible method or configuration for fuel augmentation should be explored before considering use of the cabin (passenger) space.

7. POSSIBLE SOLUTIONS/RECOMMENDATIONS. Although the immediate requirement for extended range LBR HH-43B aircraft is limited to established operational air bases, it is recommended that all HH-43B aircraft be equipped for extended range in view of contingency LBR requirements and the fact that development and procurement costs should not vary appreciably. It is recommended that the following possible solutions be given primary consideration.

a. An internal installation consisting of fuel tanks beneath the flight deck in the area now occupied by the avionics equipment (stations 40 to 90) and in the step area aft of the present fuel tank (stations 156 to 175 approximately). This installation would add 126 pounds to the basic aircraft weight, would provide an additional 120 gallons/780 pounds of fuel, and would require the installation of a "chin pod" on the lower forward nose section in the vicinity of station

13.25 to accommodate the avionics equipment. The resultant weight increase is centered at station 147 when empty and at station 139.9 when full and would move the center of gravity forward from its present undesirable aft position. The tank in the step area should be constructed in a manner that would retain a step capability, that is, the tank could be indented or cutout to provide a step. The "chin pod" and tank arrangement described here is similar to the arrangement presently installed on Kaman Helicopter K1125.

b. An external installation consisting of two fuel tanks suspended from the lower section on each side of the fuselage between the fore and aft landing gear components. It is believed that the tanks could be positioned in a manner that would not interfere with fire suppression kit pick-up and delivery procedures, hoist recovery procedures, or aircraft entry through the side door. The tanks should be aerodynamically shaped and have a capacity of 50 to 75 gallons. For comparison, the tanks would be approximately one-fourth the size of a T-33 tip tank. Use of tanks similar to the U-3A wing tip tanks may provide a suitable solution. Such tanks can be installed with minimum modification and without interference to other operational capabilities.

8. Favorable consideration of this QOR is recommended. The need for range extension of the HH-43B is an urgent requirement for LBR support at many air bases and is further justified in view of contingency operations which will rely on the HH-43B for LBR support.