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# UH-72A LAKOTA LIGHT UTILITY HELICOPTER (LUH)

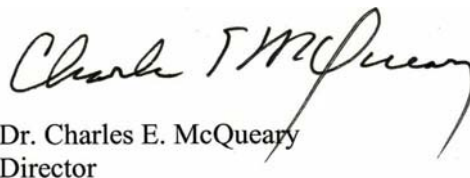
## Operational Test and Evaluation Report

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**July 2007**

This report on the UH-72A Lakota Light Utility Helicopter (LUH) fulfills the provisions of Title 10, United States Code, Section 2399. It assesses the adequacy of testing and the operational effectiveness, suitability, and survivability of the UH-72A Lakota LUH.

  
Dr. Charles E. McQueary  
Director



**UH-72A Lakota Light Utility Helicopter.**

## **Executive Summary**

The UH-72A Lakota Light Utility Helicopter (LUH) is effective in the performance of light utility missions, but is not effective for use in hot environments or for medical evacuation of two litter patients requiring critical medical care. The LUH is effective for air movement and aerial sustainment missions, but does not meet its prescribed performance criteria to lift required external and internal loads. The LUH provides an increase in demonstrated performance and mission effectiveness over the Kiowa and Huey aircraft it will replace (OH-58A/C and UH-1H).

The LUH aircraft is not operationally suitable due to excessive heat in the aircraft cockpit and cabin from the sun, heat generated by aircraft avionics, and inadequate ventilation. Additionally, the aircraft's Rotorcraft Flight Manual describes an avionics overheat condition where various avionics components have a 30-minute operating time if temperatures exceed safe operating ranges. This did not occur during the IOT&E.

The LUH meets required design standards for crashworthiness in accordance with the Federal Aviation Regulations to protect crew and passengers.

The LUH program executed the Initial Operational Test and Evaluation (IOT&E) in accordance with the DOT&E approved test plan. Testing was adequate to assess mission effectiveness, suitability, and survivability. Additional testing is needed to ensure deficiencies in effectiveness and suitability have been corrected.

### **System Overview**

The LUH will replace OH-58A/C and UH-1H aircraft to provide light utility support worldwide in non-hostile operational environments. The LUH will support homeland defense, U.S. Army test and training centers, and the U.S. Army National Guard and Reserve. It is the Army's intent that LUH aircraft operate in non-hostile environments.

The Army plans to purchase 322 LUH aircraft over an eight-year period with a peak production rate of 69 aircraft per year. The Air Ambulance Detachment, Fort Irwin, California, received its full complement of six aircraft during April 2007 becoming the Army's first unit equipped with LUH aircraft. Eurocopter is the prime contractor.

### **Test Adequacy**

The Army executed the Initial Operational Test & Evaluation (IOT&E) in accordance with the DOT&E-approved Test and Evaluation Master Plan and test plan. The LUH test execution was adequate to assess operational effectiveness, suitability, and survivability. The Army augmented the IOT&E with flight data from Reliability Verification Efforts, Source Selection Performance Demonstration, Army safety testing, and cross-country ferry flights of production aircraft to the IOT&E site at Fort Irwin, California. The combined flight hour data was adequate to demonstrate reliability. The

Army will not operate the LUH in combat. It is not a Live Fire test and evaluation covered system.

### **Operational Effectiveness**

The LUH is effective for light utility helicopter missions. In realistic operational scenarios, the LUH successfully completed 14 of 18 difficult light utility helicopter missions. The LUH provides an increase in demonstrated performance and mission effectiveness over the Kiowa and Huey aircraft it will replace (OH-58A/C and UH-1H).

The LUH cannot meet its prescribed performance criteria to lift an external load of 2,200 pounds, or an internal load of 1,250 pounds, at 4,000 feet pressure altitude and 95 degrees Fahrenheit. The LUH demonstrated the capability to accomplish air movement and aerial sustainment missions with lighter loads.

The LUH is not operationally effective for the MEDEVAC mission because the aircraft configuration precludes medics from providing medical treatment to two litter patients. The LUH is effective performing MEDEVAC missions with two medically stable litter patients requiring no in-flight medical care; a mission with one litter patient; and ambulatory patients as seated passengers. The LUH unit successfully completed three of five IOT&E medical evacuation missions. Two missions were unsuccessful because of insufficient cabin space and configuration to permit patient treatment by the in-flight medic.

- With two litters there is not sufficient room for the medic to provide immediate medical care to the patients.
- Medics are not able to properly perform or sustain critical medical treatment such as defibrillation or cardiopulmonary resuscitation.
- There is no dedicated provision for cabin ceiling rails to hang IVs, infusion hooks, or to store and secure medical equipment.
- At night, completing medical evacuation missions was hampered by insufficient cabin and external lighting to the rear of the aircraft.

### **Operational Suitability**

The LUH aircraft is not operationally suitable. During the IOT&E, excessive heat from the sun, heat generated by aircraft avionics, and inadequate ventilation resulted in elevated temperatures and limited operating time in the LUH cockpit and cabin. The LUH does not have the environmental control unit (air conditioner) common on most of the commercial EC 145 aircraft. High cockpit and cabin temperatures limit crew endurance and affect passengers and medical casualties. Additionally, the aircraft's Rotorcraft Flight Manual describes an avionics overheat condition where if temperatures exceed safe operating ranges, various avionics components have a 30-minute operating

time and will shut down. This did not occur during the IOT&E because of the moderate ambient temperature.

The reliability, maintainability, and availability of the LUH exceeded requirements. The LUH costs less to operate and support than the UH-60A/L helicopter. The LUH is compatible for transport by land, sea, and air. Despite excessive heat and the limited size of the cabin for MEDEVAC missions, LUH crews found the aircraft easy to fly and operate. The communications suite proved interoperable with military and civilian agencies. The pilots found the LUH to be compatible with the Air Warrior components. The New Equipment Training package is still in development as are the flight simulators.

### **Survivability**

The Federal Aviation Administration (FAA) has certified that the LUH meets FAA standards for crashworthiness. As a commercial aircraft, the LUH does not have ballistic tolerance criteria nor does the Army intend to employ this aircraft in operational hostile environments. The Army agreed to comply with the FAA certificate and plans to limit LUH flight operations as defined in the approved flight manual. When operating the LUH, aircrews can wear various components of the Air Warrior ensemble. These components (chemical masks, night vision goggles, survival equipment) afford protection to the crew in the event of an emergency.

### **Recommendations**

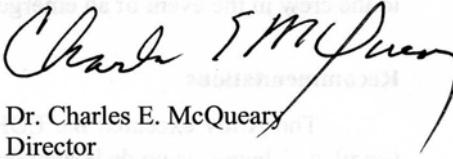
The Army executed the LUH IOT&E in accordance with the DOT&E approved test plan. There was no dedicated developmental testing for the LUH. Many deficiencies noted during the operational test of the LUH would have been identified and corrected prior to the IOT&E. In order to address deficiencies found in the IOT&E, the Army should consider the following recommendations:

#### *Operational Effectiveness*

- Reconfigure or modify the cabin to provide additional space for the medic and MEDEVAC equipment when in a two-litter configuration.
  1. Install provisions for cabin ceiling rails from which to hang IVs, infusion hooks, or to store and secure medical equipment.
  2. Add lighting to illuminate the tail rotor and rear clam shell doors to enhance safety and facilitate rear loading and unloading of litter patients.
- Develop unit tactics, techniques, and procedures to address the external and internal lift performance shortfalls.
- Continue to update, develop, and document LUH performance data to incorporate into a standardized flight manual and to facilitate more accurate mission planning.

### *Operational Suitability*

- Install and test potential material fixes such as an environmental control system to moderate excessive cockpit, and cabin temperatures to enable operations in hot/humid environments.
- Reconfigure the LUH communication package to allow simultaneous communication on Ultra High Frequency (UHF) and Frequency Modulation (FM) channels and secure communications.
- Install engine inlet barrier filters to reduce the probability of ingesting foreign object debris and increasing overall engine life cycle costs.
- Continue to develop the Aircrew Training Manual, Performance Planning Card, and revising Weight and Balance charts.
- Assess the New Equipment Training package and the hybrid maintenance concept planned for Army National Guard units once implemented.
- Install skid shoes to protect and extend the life of the LUH landing skids.
- Relocate first aid kit and fire extinguisher to allow for immediate crew chief and passenger access.



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