

Stryker Nuclear, Biological, and Chemical Reconnaissance Vehicle (NBCRV)

Executive Summary

- Based on emerging test results, the Stryker Nuclear, Biological, and Chemical Reconnaissance Vehicle (NBCRV) demonstrated improved reliability during the IOT&E conducted in September and October 2010. The point estimate for mean miles between operational mission failure of the base vehicle increased from 243 miles during IOT&E in 2006 to 902 miles during IOT&E in 2010. The point estimate for the mean time between operational mission failure of the mission equipment package increased from 79 hours in the 2006 IOT&E to 158 hours in the 2010 IOT&E. The 2010 operational test was conducted with an NBCRV equipped with slat armor as shown.
- The weight of the a second armor kit, Stryker Reactive Armor Tile Generation II (SRAT II), caused driveshaft and half-axle failures during NBCRV SRAT II durability testing, which will adversely affect operational effectiveness, suitability, and survivability.

System

- The NBCRV is one of nine configurations of the Infantry Carrier Vehicle variant of the Stryker family of vehicles. Chemical, biological, and radiological sensors and communications systems are integrated with the Stryker vehicle to perform chemical, biological, radiological, and nuclear (CBRN) detection, identification, marking, sampling, and reporting of these hazards.
- The NBCRV provides the four-member crew with levels of protection against small-arms, fragmenting artillery, mines, and rocket-propelled grenades (RPGs). RPG protection is currently provided by add-on slat armor (high hard steel arranged in a spaced array).
- The NBCRV is equipped with a filtering and over-pressure system that provides its crew protection from CBRN threats.
- The CBRN Mission Equipment Package includes the following:
 - Joint Biological Point Detection System
 - Joint Service Lightweight Standoff Chemical Agent Detector
 - Chemical and Biological Mass Spectrometer II
 - Chemical Vapor Sampling System



- NATO standard markers and deployment system
- Automatic Chemical Agent Detector Alarm
- AN/VDR-2 and AN/UDR-13 Radiological detectors
- A NBCRV team consists of a Stryker NBCRV and a four person crew.
 - The Stryker Brigade Combat Team (BCT) has one platoon of three NBCRV teams.
 - The Heavy BCT has one squad of two NBCRV teams.
 - The Division or Corps Chemical Company has six NBCRV teams.

Mission

CBRN reconnaissance units conduct surveillance, and route, zone, and area reconnaissance to determine the presence and extent of CBRN contamination using the CBRN reconnaissance techniques of search, survey, surveillance, and sampling. A CBRN reconnaissance unit, as part of an early entry combat force, is capable of limited independent operations.

Major Contractor

General Dynamics Land Systems – Sterling Heights, Michigan

Activity

- General Dynamics Land Systems conducted a Design Failure Modes Effects Analysis to discover failure modes, and to design and implement corrective actions.
- The program conducted reliability growth testing at Yuma Proving Ground, Arizona, from May to December 2009 with

ARMY PROGRAMS

the NBCRV equipped with slat armor to assess design changes and improvements in reliability.

- The program conducted reliability testing on the NBCRV equipped with SRAT II at Yuma Proving Ground, Arizona, from May to July 2010 to assess the impact on system reliability caused by the addition of SRAT II.
- The Army Test and Evaluation Command conducted a 72-hour operational test of the NBCRV equipped with SRAT II, a driver comparison test of NBCRV equipped with each of the two add-on armor kits, and a Joint Biological Point Detector System Field Training Exercise from July to October 2010. Two of three test events were conducted in accordance with the DOT&E approved TEMP and test plan.
- The Army Test and Evaluation Command conducted a second phase of IOT&E at Dugway Proving Ground, Utah, from September 20 to October 1, 2010. The test was conducted in accordance with the DOT&E approved TEMP and test plan.
- In June 2010, the Army completed the first phase of additional controlled damage experimentation in support of the NBCRV LFT&E program.
- The Army completed initial risk reduction testing of SRAT II tiles in July 2010 and began risk reduction testing of a ballistic hull in September 2010 to support a ballistic vulnerability assessment of the NBCRV with SRAT II.
- Delays in delivery of the SRAT II and live fire test planning caused a delay in the execution of the live fire testing for SRAT II. The Stryker Double V-Hull LFT&E program continues to delay the Stryker NBCRV SRAT II LFT&E program.

Assessment

- Based on emerging results from IOT&E conducted in September and October 2010, the NBCRV demonstrated

improved base vehicle and mission equipment package reliability. The point estimate for mean miles between operational mission failure of the base vehicle increased from 243 miles during 2006 IOT&E to 902 miles during the 2010 IOT&E. The point estimate for the mean time between operational mission failure of the mission equipment package increased from 79 hours in the 2006 IOT&E to 158 hours in the 2010 IOT&E.

- During developmental reliability growth testing, the NBCRV demonstrated base vehicle reliability of 1,600 mean miles between operational mission failure.
- The 2010 operational test was conducted with an NBCRV equipped with slat armor. A second armor kit that could be used in place of the slat armor, the SRAT II, adds an additional 7,600 pounds to the weight of the base vehicle. This weight led to driveshaft and half-axle failures during NBCRV SRAT II durability testing. Additional developmental testing of the vehicle equipped with SRAT II is required to understand the conditions that lead to these failures and their operational impact.

Recommendations

- Status of Previous Recommendations. The Army satisfactorily addressed previous recommendations.
- FY10 Recommendation.
 1. The program should address driveline and suspension failures caused by the weight of the SRAT II kit prior to fielding this kit with the NBCRV.