

Stryker 30 mm Infantry Carrier Vehicle – Dragoon (ICV-D)

Executive Summary

- The Army developed the Infantry Carrier Vehicle – Dragoon (ICV-D) in response to an Operational Needs Statement submitted by 2nd Cavalry Regiment (2CR) in March 2015. It is not a Program of Record. When fielding is complete, the 81 ICV-D will comprise 50 percent of the vehicles in the rifle and scout platoons in the 2CR.
- The Army conducted an Early User Test and Evaluation (EUT&E) from February through April 2018, and an LFT&E from April 2017 through February 2018. The EUT&E findings support the Army PEO Ground Combat Systems decision to field the ICV-D to the 2CR.
- When equipped with the ICV-D, the majority of infantry and scout platoons from the 2CR were able to qualify using the 30 mm automatic cannon and accomplish their assigned tactical task and purpose.
- The lethality upgrades of the ICV-D allow crews to detect, identify, and defeat targets at greater ranges and against a wider array of enemy targets than crews not equipped with the upgrades. Unit leadership unanimously stated they would rather take the ICV-D to combat against a near-peer threat than the legacy ICV.
- The platform met its reliability requirements for the turret and gun system without degrading the reliability of the base Stryker chassis.
- The Stryker ICV-D survivability, to include force protection, is comparable to the legacy Stryker flat-bottom ICV equipped with the same protection kits.
- The ICV-D has cybersecurity vulnerabilities that can be exploited. In most cases, the exploited vulnerabilities pre-date the integration of the lethality upgrades.

System

- The Stryker ICV-D is a flat-bottom ICV that the Army modified with an unmanned Medium Caliber Turret-30 mm (MCT-30) weapons system. The Army improved select Stryker mobility components to accommodate the increased weight of the turret and electrical power draw.
- The ICV-D turret is stabilized and electrically operated. A stabilized sensor suite contains a thermal camera, day camera, and laser rangefinder.
- The XM-813 30 mm main gun operates by an electric motor that powers the ammunition feed and weapons functions (chambering, firing, extraction, ejection). The 30 mm ammunition is gravity fed from two boxes on either side of the turret above the weapon.



- The weapon fires two types of service rounds (the MK 238 High Explosive Incendiary – Tracer (HEI-T) and the MK 258 Armor Piercing Fin-Stabilized Discarding Sabot-Tracer (APFSDS-T), plus two training round counterparts (the MK 239 Target Practice – Tracer (TP-T) round and the MK 317 Training Practice Discarding Sabot – Tracer (TPDS-T) round).
- The ICV-D features a coaxial machine gun and smoke grenades on the turret.
- The Army developed the ICV-D in response to an Operational Needs Statement submitted in March 2015 by the commander of the 2CR Stryker Brigade Combat Team. When fielding is complete, the ICV-D will comprise 50 percent of the vehicles in the rifle and scout platoons for a total of 81 vehicles in 2CR. The ICV-D is not a Program of Record.

Mission

Units equipped with the Stryker ICV-D will provide the Commander, European Command a medium-weight force capable of rapid strategic and operational mobility to disrupt or destroy enemy military forces, to control land areas including populations and resources, and to conduct combat operations to protect U.S. national interests.

Major Contractors

- General Dynamics Land Systems – Sterling Heights, Michigan; Anniston, Alabama
- Kongsberg Protech Systems – Kongsberg, Norway; Johnstown, Pennsylvania
- Northrop Grumman – Mesa, Arizona

FY18 ARMY PROGRAMS

Activity

- The Army conducted a two-phased EUT&E from February through April 2018 in accordance with DOT&E-approved test plans:
 - Phase I testing was conducted at Grafenwoehr (Germany) Training Area and consisted of crew gunnery qualification on an instrumented multi-lane range.
 - Phase II (force-on-force) was conducted at Hohenfels (Germany) Training Area from April 10 – 20, 2018. The test unit was an infantry company headquarters, an infantry rifle platoon, and a scout platoon. U.S. Army Training and Doctrine Command (TRADOC) accredited the opposing force (OPFOR) and represented current and near-future threats.
- The Army Test and Evaluation Command (ATEC) conducted a Cooperative Vulnerability and Penetration Assessment of the ICV-D in July 2017 and an Adversarial Assessment during Phase II of the EUT&E in April 2018.
- The Army completed the Stryker ICV-D LFT&E program from April 2017 through February 2018 in accordance with DOT&E-approved LFT&E Strategy and test plans. Live fire testing, executed at the Army Test Center, included armor coupon tests, ammunition sensitivity testing, controlled damage testing, sub-system and full-up system-level testing to support the evaluation of Stryker ICV-D survivability (including force protection and post-engagement vehicle repairability) against threats likely to be encountered in a European theater. Live fire testing also included ground testing to support the evaluation of Stryker ICV-D lethality against light to mid-armored adversary vehicles and dismounted targets.
- DOT&E published an Early Fielding Report in November 2018

Assessment

- The lethality upgrades of the ICV-D allow crews to detect, identify, and defeat targets at greater ranges and against a wider array of enemy targets than crews not equipped with the upgrades. Because of the increased lethality, unit leadership unanimously stated they would rather take the ICV-D to combat against a near-peer threat than the legacy ICV.
- The Stryker ICV-D survivability and force protection is largely comparable to the legacy Stryker flat-bottom ICV when

equipped with the same protection kits. The Stryker ICV-D lethality is increased as compared to the legacy Stryker Family of Vehicles.

- During Phase I, six of nine crews qualified in accordance with Army gunnery standards. In addition, crew performance increased as they progressed through the gunnery tables demonstrating that the complexities introduced by the ICV-D advanced fire control unit can be mitigated as gunners gain experience and build “muscle memory” through practice and repetition. Crews noted a number of problems related to the design of the coaxial machine gun ammunition feed and ejection chutes that led to a number of stoppages during the gunnery tables.
- The lack of an appropriate Stryker training simulator poses a challenge to maintaining perishable gunner/crew proficiency gained through gunnery.
- During Phase II, when equipped with the ICV-D, infantry and scout platoons from the 2CR were able to accomplish their assigned task and purpose in 14 of 16 missions. During this phase, crews perceived their situational awareness degraded when operating mounted on the ICV-D.
- The platform met its reliability requirements for the turret and gun system without degrading the reliability of the base Stryker chassis.
- Adversaries demonstrated the ability to degrade select capabilities of the ICV-D when operating in a contested cyber environment. In most cases, the exploited vulnerabilities pre-date the integration of the lethality upgrades.

Recommendations

The Army should:

1. Restore lost situational awareness by providing true 360-degree situational awareness while on the move and stationary.
2. Improve design of coaxial machine gun assembly to reduce stoppages.
3. Provide higher fidelity simulation/simulator training resource for the ICV-D.
4. Correct or mitigate cyber vulnerabilities for the platform and government-furnished equipment.
5. Mitigate system design vulnerabilities to threats as identified in the classified report.