

Conventional Prompt Strike (CPS)



Flight testing of the Conventional Prompt Strike (CPS) prototype All-Up Round (AUR) began in June 2022 with Joint Flight Campaign-1 (JFC-1). During JFC-1, the missile experienced an in-flight anomaly which prevented data collection over a portion of the planned flight profile. The Navy reports identification of the root cause and implementation of corrective actions for the anomaly, and is preparing to execute JFC-2. The Navy has four JFCs planned through 4QFY24 to develop and demonstrate a hypersonic, cold-gas launched missile system prototype capability. The Army plans to employ the prototype AUR from mobile land-based launchers as part of the Long Range Hypersonic Weapon (LRHW) program. The Navy intends to transition to rapid fielding aboard the *Zumwalt*-class destroyer in FY25 and achieve initial operational capability aboard the *Virginia*-class submarine in FY29.

SYSTEM DESCRIPTION

CPS is a conventional, boost-glide hypersonic weapon system. The CPS all-up-round missile includes a two stage solid rocket motor booster and a Common Hypersonic Glide Body containing a kinetic energy projectile warhead.

MISSION

U.S. Combatant Commanders will launch CPS from *Zumwalt*-class destroyers and *Virginia*-class submarines to penetrate air defenses to strike high-value, time-sensitive targets.

PROGRAM

The Navy currently has a three phase acquisition strategy to deliver CPS: 1) Phase 1, Middle Tier of Acquisition (MTA) Rapid Prototyping, to develop and demonstrate a hypersonic, cold-gas launched missile system prototype capability; 2) Phase 2, MTA Rapid Fielding, to field CPS onboard a *Zumwalt*-class destroyer; and 3) Phase 3, transition to a Major Defense Acquisition Program at Milestone C, to field CPS onboard *Virginia*-class submarines and the remaining *Zumwalt*-class destroyers.

The Navy's CPS program will provide the all-up-round missiles and elements of the weapons control system for the Army's LRHW (Dark Eagle) program in FY23. The Army will integrate

the common all-up-rounds with their weapon control system into a prototype LRHW Battery Operations Center and transporter-erector-launcher system.

In 2019, the Navy developed a Master Test Strategy (MTS) for Phase 1 of CPS. In June 2021, DOT&E placed CPS under oversight. The Navy is updating the MTS to address programmatic changes and additional performance metrics, and plans to provide for DOT&E approval in 1QFY23. However, the alignment of weapon system requirements to flight test objectives across all three phases of the program is not yet mature and is being worked by the Navy. The Navy intends an additional update to the MTS in 1QFY24 that will provide an overall test strategy with alignment of planned missile flights to the planned advances in missile capability for each phase of CPS delivery.

The Navy has yet to identify test conditions and associated test resources that will be evaluated across the three CPS phases to adequately assess lethality and operational effectiveness in the threat-contested environment. The Navy is considering inclusion of the threat-contested environment in Phase 1 testing, but has yet to commit due to developmental test requirements. These data are necessary to validate and use model and simulation for operational testing, and delays in data collection could increase operational test cost in later CPS phases. DOT&E will work with the Navy to maximize

efficiencies within the test strategy provided in the follow-on update to the Phase 1 MTS.

» MAJOR CONTRACTOR

- Lockheed Martin Space
– Littleton, Colorado

TEST ADEQUACY

The Phase 1 test strategy was developed to demonstrate an operational capability of the CPS prototype. Phase 1 includes five JFC events to evaluate flight performance of the CPS all-up-round and common components of the hypersonic weapon systems within mission-relevant scenarios. The Navy expects Phase 1 test data to support modeling and simulation validation. The Navy plans to evaluate the operational effectiveness, operational suitability, survivability, and lethality of CPS in a contested environment through the completion of all three phases. However, the test strategies for phases 2 and 3 are not developed.

In June 2022, the Navy conducted the first JFC event, JFC-1, to test a single CPS all-up-round at the Pacific Missile Range Facility. The test was a DT event and did not require DOT&E approval; however, DOT&E observed the test event. JFC-1 experienced an in-flight anomaly that prevented data collection for portions of the planned flight profile. The Navy has determined the cause, implemented corrective actions, and is preparing to execute JFC-2.

The second flight test, JFC-2, will be launched from the prototype Army weapon control system, Battery Operations Center, and transporter-erector-launcher with soldier observation during the test. The test will occur at Cape Canaveral Space Force Station, Florida.

The third flight test event, JFC-3, will launch from the prototype Army transporter-erector-launcher and provide a demonstration of launch capability for the Army's Dark Eagle program. The final events in Phase 1, JFC-4 and JFC-5, are intended to demonstrate the Navy's cold-gas launch capability and residual operational capability.

PERFORMANCE

» EFFECTIVENESS

The Navy is early in test and has not yet demonstrated an operational capability for the CPS prototype. DOT&E will provide an assessment of demonstrated capabilities and limitations of the CPS prototype at the completion of Phase 1 flight tests in FY24. DOT&E will report CPS operational effectiveness within an IOT&E report upon the completion of Phase 3 testing in FY29.

CPS sled and flight tests have not included operationally representative targets and consequently do not provide direct evidence of the weapon's lethal effects against intended targets. The Navy could attain both lethality and effectiveness data by incorporating representative

targets into the JFC tests and/or ground tests, but currently does not intend to do so. A lack of lethality data using representative targets could limit the Navy's ability to validate weaponeering models.

» SUITABILITY

The Phase 1 CPS prototype is not sufficiently mature to assess suitability metrics. DOT&E will report suitability metrics for the Phase 1 CPS prototype at the completion of flight tests in FY24. DOT&E will report CPS operational suitability within an IOT&E report upon the completion of Phase 3 testing in FY29.

The program intends to complete an initial Life Cycle Support Plan by FY25 to address product support and fielding aboard both the *Zumwalt*-class destroyer and the *Virginia*-class submarine.

» SURVIVABILITY

The Navy has not demonstrated the effect of a contested environment on CPS prototype performance. The Navy's standing plan for Phase 1 is to rely on a combination of flight environment modeling and simulation, component testing in a simulated environment, and a full hardware-in-the-loop evaluation to incorporate a contested environment into their performance assessment of the CPS prototype. The Navy has yet to provide an overarching strategy to assess CPS performance in contested environments across all three phases of acquisition, risking an inefficient test design

across the three phases and the potential need for unplanned test resources in Phases 2 and 3. The Navy intends to detail their performance and test objectives in each of the three phases within an update to the Phase 1 MTS. DOT&E will report CPS survivability upon completion of IOT&E in Phase 3.

RECOMMENDATIONS

The Navy should:

1. Provide an update to the Phase 1 MTS with intended modifications to CPS and an overarching test strategy for the CPS program as soon as feasible, as this will maximize test efficiency across all three phases of test.
2. Incorporate operationally representative targets and flight environments into CPS ground and flight tests in order to provide lethality demonstrations against intended targets and to identify survivability vulnerabilities that can be fixed early in system development.
3. Develop and execute an LFT&E strategy as soon as feasible to ensure data collection necessary for the verification and validation of modeling and simulation tools and to enable a credible lethality assessment.