

Conventional Prompt Strike (CPS)



Flight testing by the Navy and Army of the Conventional Prompt Strike (CPS) prototype All-Up Round (AUR) continued in March 2023. This test, Joint Flight Campaign-2 (JFC-2), was an intended launch from the Army's Long Range Hypersonic Weapon (LRHW) prototype transporter-erector-launcher (TEL). The test did not occur because failed pre-flight checks prevented the launch. The Navy and Army reattempted JFC-2 in September 2023 but again could not launch the AUR due to failed pre-flight checks. The Navy and Army intend to reattempt JFC-2 and conduct JFC-3 in FY24, with both being LRHW TEL launches.

SYSTEM DESCRIPTION

CPS is a conventional, boost-glide hypersonic weapon system. The CPS AUR missile includes a two-stage solid rocket motor booster and a Common Hypersonic Glide Body containing a kinetic energy projectile warhead. The Navy will integrate CPS into both *Zumwalt*-class destroyers and *Virginia*-class submarines. The Navy will utilize cold-gas ejection (“cold launch”) to launch the AUR from both platforms. The Army LRHW system, which is being reported on in a separate article, will fire a common AUR from their TEL, igniting it in the launch canister (“hot launch”).

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 is employing a three-phase acquisition strategy to deliver CPS. Phase 1 is a Middle Tier of Acquisition (MTA) rapid prototyping effort to develop and demonstrate a prototype hypersonic missile system capability through a five-flight test campaign ending with JFC-5 in FY24. Phase 2 is an MTA rapid fielding effort. The Navy intends to begin the rapid fielding phase

after conducting a successful flight test. The Navy intends to field CPS aboard the first *Zumwalt*-class destroyer in FY25. The Navy intends to continue fielding CPS aboard the remaining two *Zumwalt*-class destroyers and commence fielding CPS aboard *Virginia*-class submarines as Phase 3. The program intends to complete an initial Life Cycle Support Plan by FY24 to address product support and fielding aboard both the *Zumwalt*-class destroyer and the *Virginia*-class submarine.

The CPS program continued development of the CPS AUR missile and elements of the weapons control system for the Army’s LRHW (Dark Eagle) program in FY23. The Army integrated the CPS AUR missiles and weapon control system into a prototype LRHW Battery Operations Center and TEL system.

DOT&E placed CPS under oversight in June 2021. The Navy updated their Master Test Strategy (MTS) to address programmatic changes and additional performance metrics in January 2023. DOT&E conditionally approved the updated MTS in March 2023, provided that the CPS Program Office submit the Phase 2 and Phase 3 test strategies, the cyber survivability test and evaluation strategy, and the LFT&E strategy to DOT&E for approval prior to the end of 2023. The Navy has committed to providing a Test and Evaluation Master Plan to address these strategies.

» MAJOR CONTRACTORS

- Lockheed Martin Space – Littleton, Colorado
- Dynetics, a subsidiary of Leidos – Huntsville, Alabama (Common Hypersonic Glide Body)

TEST ADEQUACY

In March 2023, the Navy and the Army attempted the JFC-2 test flight. This was to be a hot launch from the Army’s prototype TEL into a Broad Ocean Area in the Atlantic Ocean. The test did not occur due to failed pre-flight checks that prevented the launch. The Navy and the Army reattempted the JFC-2 flight test (JFC-2R) in September 2023. The AUR did not launch due to failed pre-flight checks. The Navy and the Army intend to reattempt JFC-2 and conduct the third test, JFC-3, in FY24. Both events use Army equipment and demonstrate hot-launch capability for the Dark Eagle program. JFC-4 and -5, to occur in FY24, are expected to demonstrate the cold-gas launch capability necessary for launch from *Zumwalt*-class destroyers and *Virginia*-class submarines. DOT&E will submit an early fielding report in FY25 in support of Navy fielding of CPS on the *Zumwalt*-class.

The Navy has not evaluated the effect of a contested environment (e.g., GPS denial, threat electromagnetic spectrum operations, threat kinetic and non-kinetic defensive capabilities) on CPS AUR missile performance. The

Navy plans to use a combination of modeling and simulation (M&S), component testing, and hardware-in-the-loop evaluations to assess CPS performance in the contested environment but has yet to detail this test strategy. DOT&E will report on the operational effectiveness in an IOT&E report upon completion of Phase 3 in FY29, but adequate testing in the contested environment is required to determine CPS effectiveness under combat conditions.

The Navy completed nine cyber survivability tabletop events in FY23 to identify the attack surface and potential vulnerabilities of the CPS AUR missile and its supporting combat system. These events will support cyber survivability evaluations in Phase 2 and Phase 3. The Navy has not yet submitted a cyber survivability test strategy for DOT&E approval. Cyber survivability testing of CPS in Phase 2 and Phase 3 must be adequate to support determination of its installation on the *Zumwalt*-class destroyer and the *Virginia*-class submarine.

As noted in the FY22 Annual Report, insufficient data are available to determine the survivability of CPS to kinetic or non-kinetic attack because the Navy has not yet completed the LFT&E strategy nor evaluated CPS against operationally representative threats. DOT&E will evaluate the validity of the Navy's proposed approach, including the use of M&S to bridge testing gaps, when the LFT&E strategy is submitted for approval in 1QFY24.

PERFORMANCE

» EFFECTIVENESS

The CPS Program has not demonstrated a prototype operational capability. JFC-1 experienced an in-flight anomaly that prevented collection of data over portions of the intended flight profile. The Navy has implemented corrective measures that have not yet been demonstrated. Further, no data are available to assess the effectiveness of CPS in the full-spectrum operational threat environment because the Navy has yet to evaluate these effects on CPS.

DOT&E will provide an assessment of the demonstrated capability of the CPS prototype system at the completion of the Phase 1 CPS prototype flight tests and Phase 2 CPS rapid fielding tests. DOT&E will assess CPS operational effectiveness within an IOT&E report upon the completion of Phase 3 testing that is planned for FY29.

» LETHALITY

As noted in the FY22 Annual Report, CPS sled and flight tests have not included operationally representative targets and consequently do not provide direct evidence of the weapon's lethal effects. The Navy is investigating methods to obtain lethality and effectiveness data by incorporating representative targets into the JFC tests and/or ground tests. The LFT&E strategy, which would allow

DOT&E to evaluate the validity of the proposed approach, including the use of M&S tools to bridge testing gaps, is expected to be submitted for DOT&E approval in 1QFY24. A failure to demonstrate end-to-end effectiveness using representative targets could also limit the Navy's ability to create validated weaponizing tools, limiting operational utility.

» SUITABILITY

The CPS is not sufficiently mature to assess suitability. DOT&E will provide an assessment of the suitability metrics at the completion of Phase 1 CPS prototype flight tests and Phase 2 CPS rapid fielding tests. DOT&E will assess CPS operational suitability within an IOT&E report upon the completion of Phase 3 testing that is planned for FY29.

The program intends to complete an initial Life Cycle Support Plan in FY24 to address product support and fielding aboard both the *Zumwalt*-class destroyer and the *Virginia*-class submarine.

» SURVIVABILITY

Insufficient data are available to determine the survivability of CPS to operationally relevant threats. DOT&E will report CPS survivability at the completion of Phase 2 CPS rapid fielding tests and within an IOT&E report upon completion of Phase 3 testing that is planned for FY29.

RECOMMENDATIONS

The Navy should:

1. Develop and submit for DOT&E approval in FY24, a test strategy for all phases of CPS development and delivery and that will sufficiently determine CPS AUR missile effectiveness, suitability, and survivability in the full spectrum contested environment.
2. Develop, and submit for DOT&E approval in FY24, a cyber survivability test strategy that supports assessment of CPS on the *Zumwalt*-class destroyer in Phase 2 and the *Virginia*-class submarine in Phase 3.
3. Develop and submit for DOT&E approval in FY24, the LFT&E strategy to evaluate the survivability and lethality of the CPS AUR missile in the operationally representative environment against threat representative targets. Coordinate this effort with the Joint Technical Coordinating Group for Munitions Effectiveness to include data required to validate the CPS weaponeering tools for operational use.