Next Generation Jammer Mid-Band (NGJ-MB)



In FY24, the Navy made substantial progress with the Next Generation Jammer Mid-Band (NGJ-MB) system, culminating in the completion of integrated testing (IT) in July 2024. Despite this progress, DOT&E could not draw definitive conclusions about the system's operational effectiveness or suitability based on the IT results. The data reveal that while progress has been made, significant technical challenges remain, particularly in the area of reliability, which currently hinders the system's ability to fully support operational missions. The NGJ-MB Program Office has actively worked to resolve these reliability issues both before and during IOT&E, which commenced in July 2024. The Navy deployed the system with Electronic Attack Squadron (VAQ-133) in July 2024, prior to the completion of IOT&E. In November 2024, DOT&E published a classified early fielding report (EFR).

SYSTEM DESCRIPTION

The NGJ-MB is an airborne electromagnetic attack system, consisting of two pods, mounted under the EA-18G wings, containing Active Electronically Scanned Arrays (AESA) that radiate over a range of frequencies. The NGJ-MB is the first of three proposed programs for the overall Next Generation Jammer upgrade that is intended to eventually replace the legacy AN/ALQ-99 Tactical Jammer System in the EA-18G. The NGJ-MB will add increased jamming capability at higher power and longer ranges than the AN/ALQ-99 Tactical Jammer System, as well as the ability to rapidly update hardware and software to counter rapidly evolving threat capabilities.

MISSION

Combatant commanders will employ NGJ-equipped EA-18Gs as an embedded component of Carrier Air Wings and joint forces to deny, degrade, disrupt, or deceive the adversary's use of the electromagnetic spectrum while protecting friendly forces. The NGJ-MB is typically employed as a component of a Carrier Air Wing, embarked on an aircraft carrier in support of operations in a Carrier Strike Group.

PROGRAM

The NGJ-MB is an Acquisition Category IC program. In May 2021, the Secretary of the Navy approved the NGJ-MB program to move past Milestone C, thereby authorizing procurement of the low-rate initial production pods. The Navy conducted an updated operational test readiness review in May 2024 to re-evaluate the progress made since the Navy's first operational test readiness review in April 2023. DOT&E determined that the NGJ-MB's progress toward test readiness, along with an update to the NGJ-MB IOT&E plan, warranted the system's entry into operational testing. DOT&E approved the IOT&E test plan in July 2024.

The Navy deployed the NGJ-MB with Electronic Attack Squadron (VAQ-133) in July 2024, prior to completing IOT&E. The deployed pods were loaded with an earlier software version (P5.2) than what is being tested in IOT&E. Further testing on the fielded software version is scheduled. The Navy seeks to complete IOT&E in 1QFY25 to support an FY25 full-rate production decision.

» MAJOR CONTRACTORS

- Raytheon, a subsidiary of RTX – El Segundo, California
- The Boeing Company St. Louis, Missouri
- Northrop Grumman Mission Systems – Linthicum, Maryland

TEST ADEQUACY

In March 2024, the Navy completed NGJ-MB IT with participation in Exercise Red Flag 2024. This testing was observed by DOT&E, but it was not conducted in accordance with a DOT&Eapproved test plan. During IT, the NGJ-MB was loaded with earlier software versions than the P5.3 series loaded on the pods for the ongoing IOT&E period. Following a 4QFY23 meeting with the Navy's **Operational Test and Evaluation** Force (OPTEVFOR) and Air Test and Evaluation (VX-9), the operational test squadron for the NGJ-MB and DOT&E agreed that some of the data collected during IT, using the earlier software build, could be used for operational test consideration upon further validation of subsequent software versions, and demonstration of an organized software development plan. DOT&E published a classified EFR in November 2024, containing data through the beginning of July 2024 when the Navy fielded NGJ-MB with software version P5.2 prior to the completion of IOT&E.

The Navy participated in Exercise Rim of the Pacific (RIMPAC) 2024 with NGJ-MB, conducting War at Sea scenarios. The Navy also conducted a capstone test event in 1QFY25 with NGJ-MB at the Electronic Combat Range in China Lake, California, to verify the performance of later system software versions. Both events were observed by DOT&E and conducted in accordance with the DOT&E-approved IOT&E test plan. The Navy intends to use modeling and simulation to supplement its evaluation of the NGJ-MB's operational effectiveness, to compliment electromagnetic warfare test and training on openair ranges and support adequate testing. After the test data from the accredited modeling and simulation has been received. DOT&E will be able to use the results from the modeling and simulation in June and July 2024 and Design Reference Mission (DRM) analyses in August 2024 to support an assessment of NGJ-MB performance for IOT&E. Model validation and accreditation are expected to be completed in 2QFY25.

Technical challenges were significant during the course of all testing in FY24. Specifically, reliability has been a clear challenge during the course of the program development, to the point of affecting suitability and the ability to assess the performance of the system overall. Early reliability issues were predominantly hardware related, but after further development and implementation of fixes, the remaining issues appear to be mostly software centric. Although data are still insufficient to fully assess the reliability of the system, data trends have been markedly improving, suggesting the potential for a strong positive reversal in the future.

PERFORMANCE

» **EFFECTIVENESS**

Insufficient test data are available from the later versions of NGJ-MB and EA-18G software to determine NGJ-MB operational effectiveness, suitability, and survivability. DOT&E published a classified EFR in November 2024. IOT&E will complete in 1QFY25, and DOT&E will publish an IOT&E report in 3QFY25.

» SUITABLITY

The NGJ-MB Program Office worked to mitigate observed reliability challenges, both before and during IOT&E. Initial suitability results are provided in the DOT&E September 2024 classified EFR. DOT&E will provide a full evaluation of operational suitability, to include reliability, availability, pilot and maintainer workload, usability, and training, in an IOT&E report after testing ends in 1QFY25.

» SURVIVABILITY

Program stakeholders assessed results from developmental cyber survivability testing using NGJ-MB software version P5.1.3 and are addressing any system vulnerabilities. DOT&E approved the developmental cyber testing with additional supply chain analysis as adequate to evaluate the system during IOT&E. DOT&E will assess the cyber survivability of the system in their classified IOT&E report, following completion of IOT&E in 1QFY25. The survivability determination will rely on the results of a previous cyber tabletop, multiple cooperative vulnerability identification events, and an adversarial developmental T&E cybersecurity event.

RECOMMENDATIONS

The Navy should:

- Complete IOT&E, performing the most rigorous testing possible on the open-air ranges, in accordance with the DOT&E-approved test plan.
- 2. Continue to develop and support advanced test and training infrastructure for electromagnetic warfare.
- 3. Continue to refine the software development plan; threat and technique libraries; and tactics, techniques, and procedures for the employment of NGJ-MB.