

**N00039-12-R-0002**  
**Digital Modular Radio (DMR)**  
**200W Power Amplifier Interoperability Testing Notice**

## **1 Purpose**

The Space and Naval Warfare Systems Command (SPAWAR), Program Executive Office (PEO) Command, Control, Communications, Computers and Intelligence (C4I) Navy Communications Program Office, Code PMW-170 will be procuring 200 watt (W) power amplifiers (PAs), both a ship/sub variant and a shore variant for the Digital Modular Radio (DMR) program. The purpose of this Interoperability Testing Notice is to instruct Offerors interested in the proposed acquisition (solicitation N00039-12-R-0002) about the Advisory Multi-Step Process FAR 15.202.

The Advisory Multi-Step Process allows the Government the opportunity to advise Offerors on whether or not their 200W PA is capable of operating with an AN/USC-61(C) DMR, which will be a mandatory requirement for solicitation N00039-12-R-0002. The evaluation will be based on an interoperability Test Plan identified below. Upon completion of interoperability testing at the Government's lab, the Government will provide a Certification of Interoperability to those Offeror's who have successfully demonstrated their 200W PA, whether ship/sub variant or shore variant, is interoperable with a DMR. A product which has previously demonstrated to be interoperable with the DMR but does not have the certification will be required to re-test in order to receive the certification.

## **2 Overview**

DMR is a software definable radio with embedded INFOSEC, capable of transmitting and receiving on four RF channels simultaneously. It is based upon an open system architecture and is interoperable over-the-air with existing HF/VHF/UHF Line of Sight & UHF SATCOM circuits such as DAMA, SINCGARS, VHF Civilian Air Distress, and other circuits utilizing legacy radios. Each RF channel of the radio is capable of operating anywhere in the 2MHz to 2GHz frequency band. The ship/sub PA variant operates in the 30MHz to 400 MHz range. The shore PA variant operates in the UHF SATCOM range, 292MHz to 318MHz.

The contemplated contract will procure an estimated four hundred forty-nine (449) ship/sub variant 200W PAs and two hundred eighty-eight (288) shore variant 200W PAs over a five year period via a Firm Fixed Price (FFP) contract. The RFP is planned to be released in August 2012.

## **3 Directions**

A Government test lab located in San Diego, CA, will be made available to those Contractors interested in having their 200W PA tested. Contractors interested in this

procurement are invited to bring their 200W PA to the Government lab for DMR interoperability testing between 23 April 2012 and 31 July 2012. Testing at the Government lab will be coordinated by contacting Chris Goetschel, Contract Specialist, at 619-524-3558 or [chris.goetschel@navy.mil](mailto:chris.goetschel@navy.mil).

## **4 Test Plan**

The purpose of this test plan is to identify specific criteria that will allow the Government to determine whether a Contractor's 200W PA, whether a ship/sub variant PA or a shore variant PA, is interoperable with the AN/USC-61(C) Digital Modular Radio (DMR). In order to certify an amplifier as interoperable with a DMR, the amplifier must meet functional standards and successfully meet the test criteria set forth, below, in either the ship/sub PA interoperability test (paragraph 4.1) or the shore PA interoperability test (paragraph 4.2). The Government will test a ship/sub variant PA interoperability in three specific areas: System Calibration (SYSCAL), Amplitude Modulation (AM) and Frequency Modulation (FM). The Government will test a shore variant PA interoperability using the dedicated UHF SATCOM waveform.

### **4.1 Ship/Sub PA Interoperability Test**

The Government will test a ship/sub variant PA in three specific areas: System Calibration (SYSCAL), Amplitude Modulation (AM) and Frequency Modulation (FM).

#### **4.1.1 System Calibration (SYSCAL)**

SYSCAL is a DMR waveform that is used to calibrate the transmit path of the DMR channel with the power amplifier under test. SYSCAL is a multi-step automated process by which the RF channel outputs the appropriate input RF signal to the amplifier thereby allowing the amplifier to output the correct commanded RF value (as commanded from the DMR Human Machine Interface or HMI).

#### **4.1.2 SYSCAL Test Procedure**

The test procedure for SYSCAL is as follows:

1. After the PA is properly connected and programmed to communicate with the DMR channel, a SYSCAL waveform will be instantiated on the DMR HMI.
2. Once the PA is running, ensure the 'Active Range' is set for 30 – 400 MHz, and begin the test.
3. If no faults or errors are seen during the SYSCAL process and the Message Viewer located with the DMR HMI displays "All frequencies successfully calibrated" the amplifier under test is considered compatible with the DMR for SYSCAL.

The amplifier is considered to have "Passed" the SYSCAL test if no faults or errors were seen during the SYSCAL process, and the Message Viewer displays "All frequencies successfully calibrated" upon completion.

#### **4.1.3 AM Test Procedure**

The Government will test AM waveforms using 10-count voice checks in either direction to/from the PA while under test. The five (5) AM waveforms that will be tested are:

1. UHF\_AM\_LOS\_CT
2. UHF\_AM\_LOS\_PT
3. UHF\_AM\_HAVEQUICK (Ext. KY-58) Frequency Hopping
4. UHF\_AM\_HAVEQUICK\_PT Frequency Hopping
5. VHF\_AM\_ATC25

The PA is considered to have “Passed” the test if the 10 voice checks in *each* direction are clearly audible, for each of the five (5) waveforms identified above.

#### **4.1.4 FM Test Procedure**

The Government will test FM waveforms using 10-count voice checks in either direction to/from the PA while under test. The six (6) FM waveforms that will be tested are:

1. UHF\_FM\_LOS\_CT
2. UHF\_FM\_LOS\_PT
3. VHF\_FM\_SINCGARS Single Channel (SC) PT
4. VHF\_FM\_SINCGARS Single Channel (SC) CT
5. VHF\_FM\_SINCGARS (Ext KY-58) Frequency Hopping (FH)
6. UHF\_SATCOM

The PA is considered to have “Passed” the test if the 10 voice checks in *each* direction are clearly audible, for each of the six (6) waveforms identified above.

#### **4.2 Shore PA Interoperability Test**

The Government will test a shore variant PA using 10-count voice checks in each direction using the dedicated UHF\_SATCOM waveform.

The PA is considered to have “Passed” the test if the 10 voice checks in *each* direction are clearly audible.