SCOPE OF WORK FOR NOSIH-AA-2 PROPELLANT FIRST ARTICLE TEST QUALIFICATION AND PRODUCTION QUANTITY PROCUREMENT

1.0 INTRODUCTION

Naval Surface Warfare Center, Indian Head EOD Technology Division (NSWC IHEODTD) has a requirement for the manufacture, test, acceptance, and shipment of NOSIH-AA-2 class 2 carpet roll propellant, NSN 1376-01-055-0994, in accordance with AS 2543H and engineering change proposal (ECP) MI-P4564.1. All further references to (1) AS 2543H include ECP MI-P4564.1 and (2) NOSIH-AA-2 implies class 2 carpet rolls unless noted otherwise. The procurement is in support of the MK 90 Mod 0 Propellant Grain 2nd Source Production Program.

1.1 Scope

This Statement of Work (SOW) establishes and defines the requirements for the manufacturing, testing, acceptance, and shipping of NOSIH-AA-2 sheetstock.
This requirement includes developing new source(s) to manufacture NOSIH-AA-2 solventless doublebase sheetstock propellant. The contractor is responsible for the review of the Technical Data Package (TDP) requirements, development of the propellant manufacturing process, verification of the test methods; prove out of the production facility, shipment and associated documentation, characterization and qualification of the material as needed. Contractor is required to manufacture and deliver 5,293 lbs of AA-2 propellant for first article testing at NSWC IHEODTD unless a waiver is granted. The successful completion of first article testing will qualify the producer as a source for NOSIH-AA-2 propellant (carpet roll).

2.0 APPLICABLE DOCUMENTS

The following documents are applicable to this Statement of Work:

2.1 Military Standards

Refer to the latest revision of the following:
TB 700-2, Department of Defense Ammunition and Explosives Hazard Classification Procedures, dated 30 Jul 2012 (UN Series 3 Tests)
MIL-STD-129 Department of Defense Standard Practice Military Marking for Shipment and Storage (Barcoding is not necessary)
MIL-STD-130 Identification Marking of U.S. Military Property
MIL-STD-286 Propellants, Solid; Sampling, Examination, and Testing
MIL-STD-810 Environmental Engineering Considerations and Laboratory Tests
MIL-STD-1168 Ammunition Lot Numbering and Ammunition Data Card
MIL-STD-1171 Acceptance and Description Sheets (For Propellants and Explosives)
MIL-HDBK-1461 Ammunition Manufacturers and Their Symbols
DOD 4145.26-M DOD Contractors' Safety Manual for Ammunition and Explosives

NOTE: Alternate test methods may be considered.

2.2 Specifications

Military Specifications:
MIL-W-181 Wax, Candellila
MIL-DTL-244 Nitrocellulose
MIL-N-246 Nitroglycerin
MIL-T-301 Triacetin (Glycerol Triacetate)
MIL-N-3399 2-Nitrodiphenylamine (2-NDPA)
MIL-D-22346 Di-Normal-Propyl-Adipate (DNPA)
MIL-B-85735 Ballistic Modifier LC-12-15

Naval Air Systems Command (Code Ident 30003)
AS 2543H Propellant, Double-Base, NOSIH-AA-2
AS 2544U Propellant Grain, Mark 90 Mod 0

2.3 Engineering Change Procedure

ECP MI-P4564.1 Spec Exception

2.4 Publications

Naval Sea Systems Command (Code Ident 53711)
OD 9376 Standard Methods and Procedures for the Strand Burning-Rate Evaluation of Rocket Propellant Powder

American Society for Testing and Materials
ASTM D 638 Tensile Properties of Plastics

2.5 Attachments

Attachment (a) U.S. Department of Transportation classification of explosives for Propellant, solid, UN0499, dated 07/09/2013

Attachment (b) Criteria Relating Nature of Circumstances to Probable Need and Level of Re-Validation

2.6 Code of Federal Regulations

Title 49 Code of Federal Regulations (CFR) 100-199 Transportation

Data Item Descriptions (DIDs)/ Contract Data Requirements Lists (CDRL):
DI-SESS-81315B Failure Analysis And Corrective Action Report (CDRL A001)
DI-CMAN-80640C Request For Deviation (CDRL A002)
DI-MISC-81356A Certificate of Compliance (CDRL A003)
DI-CMAN-80789 Propellant Description Sheet (Form 214) (CDRL A004)
DI-MGMT-80555A Program Progress Report (CDRL A005)

DI-NDTI-80809B First Article Test Report (CDRL A006)
DI-SAFT-81299B Explosive Hazard Classification Data (CDRL A007)
DI-PACK-81059A Performance Oriented Packaging Test Report (CDRL A008)
DI-MISC-80508B Technical Report–Study/Services (CDRL A009)
DI-NDTI-80566A Test Plan (CDRL A010)
DI-SAFT-81563 Accident/Incident Report (CDRL A011)
DI-MISC-80043B Ammunition Data Card (CDRL A012)

2.7 Order of Precedence

In the event of a conflict between the text of this Statement of Work and the references cited herein, the text of this Statement of Work shall take precedence. Nothing in this Statement of Work or references cited herein, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

2.8 Source of Government Documents

Copies of specifications, standards, and publications required by suppliers in connection with specific procurement functions should be obtained from:

On-line at http://assist.daps.dla.mil/quicksearch/ or www.dodssp.daps.mil or mail a request to:

Standardization Document Order Desk
700 Robbins Avenue, Building 4D
Philadelphia, PA 19111-5094

Copies of Naval Air Systems Command specifications required by suppliers of material defined by this statement of work should be obtained from:

Commander
Naval Surface Warfare Center, Indian Head EOD Technical Division
4895 McMahon Road, Building 526
Indian Head, MD 20640-5126
Attn: Bernadette Wackerle, Code MPBW, Building 526

3.0 REQUIREMENTS

3.1 General

The contractor shall manufacture, inspect, test, and deliver the NOSIH-AA-2 sheetstock per AS 2543H and the applicable documents listed in Section 2.0 of this statement of work.

3.2 Documentation

The contractor shall provide the documentation as specified by this Statement of Work and the Contract Data Requirements Lists, form DD 1423.

3.2.1 Discrepancy Reports

Within 5 days of identifying a discrepancy to the applicable drawings, specifications, SOW, or contract requirements, the contractor shall prepare and submit a discrepancy report describing the discrepancy observed and proposed corrective actions. Discrepancy reports are a deliverable per CDRL A001.

3.2.2 Requests for Deviation (RFD)

The contractor is responsible for preparing and submitting all requests for deviation. The contractor shall prepare and submit a single request for deviation for each proposed change to the engineering requirements as specified on the applicable drawings, specifications, Statement of Work, and contract. All requests for deviation shall be submitted per deliverable CDRL A002.

3.2.3 Certificates of Compliance

Certificates of Compliance shall accompany the test report for each production lot, sheet stock delivery, and request cited within this SOW. These certificates of compliance shall certify that all inspection and test data submitted is accurate and that the sheet stock submitted meets the requirements of the specifications, SOW, and contract. The Certificate of Compliance shall include the signature of a contract representative authorized to make such certification. Certificates of Compliance are deliverables per CDRL A003.

3.2.4 Propellant Description Sheet

A Propellant Description Sheet shall be prepared and submitted to the procuring activity within 15 business days after acceptance of each production lot or delivery per AS2543H paragraph 4.7. This report shall document the test methodology used to perform the lot testing and it shall document the results of each inspection/test. The format of this report shall be in accordance with MIL-STD-1171A. Propellant description sheets are deliverables per CDRL A004.

3.2.5 Progress Reports

Through completion of first article, the contractor shall submit monthly progress reports. These reports shall be the vehicle where by NSWC IHEODTD may be appraised as to work accomplished, work remaining, key personnel changes, milestone achievement, quality problems, raw material procurement schedules, tooling plans, and potential process changes. This report cycle starts on the award date of the contract and continues until the first article is completed. Progress reports are deliverables per CDRL A005.

3.2.6 First Article Test Report

A First Article Test Report shall be prepared and submitted to the procuring activity no later than 20 days after contractor testing and acceptance of the first article lot. The contractor report shall document the first article test results for the AA-2 sheetstock as outlined in AS2543H or per the first article test plan when required. FAT reporting is a deliverable per CDRL A006.

Note that the contractor shall only be responsible for performing the AA-2 sheetstock testing outlined in AS2543H. NSWC IHEODTD will perform the grain/motor level first article testing per AS2544U.

3.2.7 Explosive Hazard Classification Data

Explosive hazard classification data shall be obtained through testing and submitted to the procuring activity if the Contractor decides not to package and ship the AA-2 sheetstock in accordance with EX2013070303. The hazard classification data is a deliverable per CDRL A007.

3.2.8 Performance Oriented Packaging (POP) Test Report

The contractor shall perform testing and shall acquire data necessary to support compliance with the POP requirements of hazardous materials as defined in Title 49, CFR, the International Maritime Organization's International Maritime Dangerous Goods (IMDG) Code, and the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Hazardous Goods. The contractor shall document the results of the testing and data acquisition per CDRL A008.

3.2.9 Technical Report–Study/Services

A first piece inspection report shall be prepared and submitted to the procuring activity as needed. The first piece inspection report is intended to document the results following a change to the qualified baseline per Section 4.3. The technical report is a deliverable per CDRL A009.

3.2.10 Test Plan

A test plan shall be prepared and submitted to the procuring activity for review and approval as needed. The test plan is intended for evaluating changes to the qualified baseline per Section 4.3. The test plan is a deliverable per CDRL A010.

3.2.11 Accident/Incident Report

An Accident/Incident Report shall be prepared and submitted to the procuring activity as needed. This report is a deliverable per CDRL A011.

3.2.12 Ammunition Data Card (ADC)

Ammunition Data Cards shall be prepared and submitted to the procuring activity with each delivery. ADCs are a deliverable per CDRL A012.

3.3 First Article Manufacture and Test

Any Contractor who obtains a first article waiver is not required to submit an initial first article quantity nor the First Article Test Report, per CDRL A006. The requirements of Section 4.3 of this SOW addressing changes to the qualified baseline shall be applicable to the Contractor.

The approved first article will serve as the qualified baseline and manufacturing standard for use in production. The contractor shall successfully complete FAT before submitting production NOSIH-AA-2 sheetstock for Government acceptance.

3.3.1 Manufacture & Test of NOSIH AA-2 First Article Quantity by Contractor

First article test material shall be production representative and conform to AS 2543H. The contractor shall ensure the first article NOSIH-AA-2 carpet rolls are manufactured and processed using the same facilities, equipment, material sources, production processes, methods, and procedures used for production quantity deliverables. Failure, at any time, of the first article test material to meet applicable drawings, applicable specifications, SOW, and/or contract requirements will result in rejection of the first article lot without further testing.

The contractor shall manufacture 5,293 lbs of Class 2 carpet rolls of AA-2 propellant from one sheetstock lot in accordance with AS 2543H and Section 3.4.2 of this SOW using the established manufacturing facilities, equipment, material sources, production processes, methods, and procedures. In accordance with Section 3.5 of the SOW, the contractor must perform product testing and provide a Propellant Description Sheet (Form 214) to the NSWC IHEODTD Technical point of contact (POC) showing product conformance. The NOSIH-AA-2 propellant shall be assigned a lot number in accordance with MIL-STD-1168B. The contractor is responsible for packaging and delivering the carpet rolls to NSWC IHEODTD in accordance with Section 3.6 of this SOW.

The Contractor shall submit a first article test report documenting conformance to AS 2543H and include the following: identification of ingredient sources, ingredient certifications of analysis, documentation of the NOSIH-AA-2 sheetstock manufacturing process and test methods, facility and equipment list, variances to the manufacturing and/or test methods, list of key terms, and first article material propellant description sheet. The first article test report is deliverable CDRL A006.

3.3.2 NOSIH AA-2 First Article Testing at NSWC IHEODTD

NSWC IHEODTD reserves the right to repeat AS 2543H specification testing to verify product conformance to requirements. NSWC IHEODTD will manufacture and inspect a minimum of 500 MK 90 MOD 0 Propellant Grains per AS 2544U.

Following manufacture of the first article units, motors will be assembled and subjected to testing at NSWC IHEODTD in accordance with AS 2544U. A quantity of 40 first article units will be subjected to temperature shock testing, x-ray inspected, and static fired (20 each at -50ºF and 150ºF). The temperature shock testing includes 3-1/2 temperature cycles with each cycle consisting of exposure to the low temperature limit of -65°F +/- 5°F followed by exposure to high temperature limit of +150°F +/- 5°F. The motors are conditioned at each temperature for 8-12 hours. An additional 60 motors will be selected and static fired (30 each at -50ºF and 150ºF). The ballistic test results will be assessed against the requirements of AS 2544U. A marginality of success will be performed to look for signs of incipient failure per AS 2544U.

The Government will document the results from the first article grain manufacture and motor testing performed at NSWC IHEODTD using contractor first article NOSIH-AA-2 carpet rolls. The Government will evaluate the contractor first article test report (CDRL A006) and NSWC IHEODTD test results. The Government will notify the Contractor of the results of the evaluation within 45 calendar days after receipt of the first article test report and completion of the AS 2544U first article program.

3.4 Sheetstock Production

All sheetstock delivered shall be representative of the same processes and procedures used for manufacture of NOSIH-AA-2 sheetstock in accordance with Section 3.3 of this SOW or established manufacturing processes in the event the first article quantity is waived. This means that the sheet stock shall be manufactured and processed using the same facilities, equipment, material sources, production processes, methods, and procedures that were used during first article manufacture. If at any time, a production test lot fails to meet the requirements of the applicable specifications, SOW, and/or contract, the production lot submission will be rejected without further testing. Any change to the qualified baseline (facilities, equipment, materials sources, production processes, methods, and procedures) shall be evaluated per Section 4.3 to determine the level of verification required before resumption of production activities.

3.4.1 Sheet stock Manufacture

The NOSIH-AA-2 propellant required under this contract must be in the form of Class 2 carpet rolls, from lot sizes of 85,000 +/- 5,000 lbs (unless smaller quantities are ordered) and be per AS 2543H and the applicable documents listed in Section 2.0 of this statement of work. Samples per Section 3.5.1 of this SOW of NOSIH-AA-2 propellant shall be provided from each production lot. The Class 2 carpet rolls shall be coiled with a diameter of 14-3/4 ± 1/4 inches.

Propellant shall be 100 percent processed through metal detection prior to packaging and shipment. The carpet rolls shall be passed through a metal detector capable of detecting ferrous materials down to 4.8 millimeters in diameter, non-ferrous materials down to 6.35 millimeters in diameter, and stainless steel materials down to 7.6 millimeters in diameter. The certification of conformance shall reference completion of 100 percent metal detection on the material to be delivered. (CDRL A003)

Each lot of AA-2 propellant shall be assigned a lot number in accordance with MIL-STD-1168B.

3.4.2 Additional Carpet Roll Parameters

The Class 2 carpet rolls shall be coiled with a diameter of 14 3/4 ± 1/4 inches. No laps are allowed and gaps should be limited to 3/8 inches (maximum) between sheets on the carpet rolls. The center of the carpet rolls (i.e. hubs / cores), are formed out of one single sheet with an outside diameter of 3 ½ +/- 1/8 inches. The inside diameter should be made as small as physically possible which generally is ½ inch.

3.5 Sheetstock Chemical, Physical, and Ballistic Testing

The test procedures noted in the specifications and additional clarifications in this document are the standards by which all testing shall be performed. For each carpet roll lot/delivery, including first article quantities, the contractor must perform testing and submit copies of all inspection/test results and any additional data to the NSWC IHEODTD Technical POC for review.

3.5.1 Product Conformance

The NOSIH-AA-2 sheet stock will be analyzed per the test requirements of Specification AS 2543H and per Table 1 below. Two sets of samples shall be taken. One set of samples will be analyzed by the contractor and the second set of samples will be shipped to NSWC IHEODTD for analysis. Each pair of samples shall be taken from the same location to ensure the samples are comparable.

Except as otherwise specified, the contractor may utilize his own facilities or any commercial laboratory acceptable to the US government, for testing and inspection of samples included in the TDP. Sample units will be randomly selected from the entire lot/test quantity. Unless otherwise specified, the sample units are considered to be destructively tested and are in addition to those delivered under the contract.

Prior to delivery, the lot shall have been inspected and met all other requirements of the contract. Unless otherwise authorized by the Government, a lot shall **not** be delivered if rejected for nonconformance to the detailed requirements of the specification(s), drawing(s), and SOW.

Table 1: Summary of Test Requirements:

Test Description	Governing Specification
Chemical Analysis	AS 2543H
Total Volatiles	AS 2543H
Heat of Explosion	AS 2543H
Strand Burn Rate	AS 2543H
Taliani Stability	AS 2543H
Physical Properties	AS 2543H
Impact	TB 700-2 (UN Series 3 Tests)*
Friction	TB 700-2 (UN Series 3 Tests)*
Thermal Stability	TB 700-2 (UN Series 3 Tests)*
Ignition without Confinement	TB 700-2 (UN Series 3 Tests)*

*UN Series 3 testing may need to be performed for hazard classification.

3.6 NOSIH-AA-2 Propellant Packaging and Delivery

The contractor shall be responsible for shipment of NOSIH-AA-2 propellant from manufacturing site to NSWC IHEODTD. The contractor shall have a current interim/final hazard classification as required for delivery to NSWC IHEODTD. If an interim hazard classification is used then the contractor shall at least have submitted documentation through Department of Transportation to obtain an approved final hazard classification to transport the NOSIH-AA-2 propellant from the contractor's production facility to NSWC IHEODTD. The contractor shall also process all required import/export and associated shipping documentation. Shipping costs for the propellant delivery to NSWC IHEODTD shall be included in this contract price.

3.6.1 Packaging

The NOSIH-AA-2 propellant must be packed out with two carpet rolls per leverpackas described in this section and in accordance with EX2013070303, refer to SOW Attachment (b). Any exceptions shall be submitted to the NSWC IHEODTD Technical POC in writing for consideration and shall require the contractor to submit hazard classification test data and requests to assign interim/final hazard classification. (CDRL A007)

The inside dimensions of the drum must include a height of 10.5 inches, a diameter of 17 inches, and a minimum opening of 16 inches in diameter. Typical outside dimensions of the drums are 11.625 inches in height and17.25 inches in diameter.

The leverpack/drum must be manufactured, POP tested, and marked in accordance with CFR Title 49 for UN 0499 material, DOT 1G/X115/S/** or 1G/Y76/S/**. The lever packs shall be sealed with traceable seals and palletized for shipment**.** The leverpacks must be palletized for shipment, with Performance Oriented Packaging (POP) markings and the Drum Labels provided by the contractor. (CDRL A008)

3.6.2 Delivery Address

NSWC IHEODTD
EXPLOSIVE SCALES FACILITY
ATTN: EXPLOSIVE SCALES FACILITY
BLDG 1104
5021 SAFE HAVEN WAY
INDIAN HEAD MD 20640-5173
FOB: Destination

4.0 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the contractor may utilize his own facilities or any commercial laboratory acceptable to the government. The government reserves the right to perform any of the inspections set forth in the specifications or this statement of work. The test procedures called out in the specifications and this statement of work are the standards by which all testing shall be performed.

4.2 Government Inspection of Facilities

The Government, through any authorized representative, may visit the plant or plants of the contractor or of any subcontractors engaged in the performance of this contract. If any examination or test is made by the Government on the premises of the contractor or a subcontractor, the contractor shall provide and require subcontractors to provide all reasonable facilities and assistance for the safety and convenience of the Government inspectors in the performance of their duties. All examinations and tests by the Government shall be performed in such a manner as will not unduly delay work. Final inspection and acceptance of production quantities will be made by an authorized representative of the Contracting Officer at the contractor's plant prior to shipment.

4.3 Verification of Changes to the Qualified Baseline

Any change to the qualified baseline shall be evaluated to determine the level of verification required before resumption of production activities. Depending on the level of change, Subcontractor Internal Validation, First Piece Inspection, a First Article Test, a Tailored FAT (TFAT), or a Requalification may be required. Some minor changes may not require any level of testing or analysis. Attachment (b) contains a listing of changes and the level of verification required. Attachment (b) provides the classification of changes in accordance with (IAW) the TDP; those changes identified as affecting critical, special, major or minor characteristics shall be applicable to the lowest level of supplier at which that characteristic is generated. Any change that does not fit one of the categories in Attachment (b) shall be submitted to the Technical POC for the Government to determine the level of verification required. The contractor shall provide written

notification (email is acceptable) to the cognizant DCMA, PCO, and Technical POC seven (7) business days before a FAT or TFAT is performed.

4.3.1 Subcontractor Internal Validation

The need for Subcontractor Internal Validation shall be determined IAW criteria established in SOW Attachment (b). Subcontractor Internal Validation does not require Government approval or notification. The contractor is responsible for ensuring the adequacy of the Subcontractor Internal Validation, test plans and reports. The subcontractor shall maintain the qualification records for Government and contractor review.

4.3.2 First Piece Inspection

The need for a First Piece Inspection shall be determined IAW criteria established in SOW Attachment (b). First Piece Inspections do not require prior Government approval or formal test reports. The contractor shall provide written notification (email is acceptable) to the cognizant DCMA, PCO, and Technical POC 72 hours before a First Piece Inspection is performed. A description of the First Piece Inspection along with the result shall be provided to the Technical POC. (CDRL A009)

4.3.3 First Article Test/TFAT for Changes to the Qualified Baseline

The determination as to whether or not a change requires a FAT, including a tailored FAT, shall be IAW SOW Attachment (b). The determination shall be submitted to the Technical POC. The Government shall concur with or decide the level of FAT and/or tailored FAT requirements.

The contractor shall ensure the first article units are manufactured using the same facilities, equipment, material sources, production processes, methods, and procedures to be used for production units under the contract. The approved first article will serve as a new manufacturing standard. The contractor shall successfully complete FAT before submitting additional production sheetstock for Government acceptance. First Article Test shall be performed for the end item propellant grains as required by the applicable specifications.

When changing from the manufacturing standard established during the initial qualification per Section 3.3, the contractor shall prepare FAT plans. (CDRL A010) The contractor shall not initiate FAT prior to Government approval of the test plan and shall perform FAT IAW the Government approved plan. The contractor shall prepare FAT reports. (CDRL A006) The contractor shall provide written notification (e-mail is acceptable) to the cognizant DCMA, PCO, and TPOC seven (7) business days before a FAT or a TFAT is performed.

4.3.4 Requalification

The need for requalification shall be determined IAW criteria established in SOW Attachment (b). Based upon a technical review of the change, the level of validation will be determined and agreed upon by the Government. The contractor shall prepare requalification plans. (CDRL A010) The contractor shall not initiate requalification prior to Government approval of the test plan and shall perform requalification IAW the Government approved plan. The contractor shall prepare requalification reports. (CDRL A006)

5.0 NOTES

5.1 Security

The contractor must protect sensitive conventional arms, ammunition, and explosives (AA&E) manufactured for the Government in accordance with security requirements of DoD Directive 5100.76-M and Army Regulation 190-11.

5.2 Accident/Incident Reporting

The contractor must report immediately any major accident/incident (including fire) resulting in any one or more of the following: causing one or more fatalities, or two or more disabling injuries; damaging of Government property exceeding $10,000; affecting program planning schedules; degrading the safety of equipment under contract such that personnel injury or property damage may be involved; identifying a potential hazard requiring corrective action.(CDRL A011)

5.3 Lot Numbering and Packaging

All product lot numbering and packaging shall be in accordance with the requirements of MIL-STD-1168.

5.4 Ammunition Data Cards

Ammunition Data Cards shall be prepared in accordance with MIL-STD-1168 and DI-MISC-80043B and submitted electronically. Two copies of ADCs shall be signed and dated by the Government inspector and provided with every lot shipped. A copy of the ADC shall be emailed to the technical POC on the contract. Detailed requirements for obtaining and using a manufacturer's identification symbol, which is an integral component of the ammunition lot number, can be found in MIL-HDBK-1461. (CDRL A012)

5.5 Marking of Data

All contractor-submitted data, including drawings, specifications, reports, plans, agenda, minutes and test results shall be marked on the cover sheet or sheet 1 of the document and must include the following two statements:

“Distribution Statement D: Distribution authorized to the DoD and DoD contractors only; military technology; Mar 2011. Other requests for this document shall be referred to the Commander, Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division, Code E11, Indian Head, MD, 20640.”