Shield Pack

Statement of Work

1. Scope

This Statement of Work (SOW) is intended to invoke requirements for the fabrication, inspection and shipping of 60 Shield Packs.

This SOW covers the materials of construction, fabrication, inspection, examination, preparation for shipment, and shipment to ORNL of these components.

The Seller shall fabricate, inspect, and ship to the location specified by UT-Battelle, LLC.

These components shall be manufactured in accordance with this SOW and the Company supplied drawings. This SOW supplements company drawings. Where differences exist between the SOW and drawings, these should be brought to the attention of the Company for a decision.

2. Requirements

2.1. Material Requirements

The materials are specified on the drawings. Mill certifications are required for all Steels. The manufacturer of the equipment shall secure a certified materials test report from his supplier, and the material shall be properly identified for traceability. The material test report shall include the ASTM specification, number, type, grade, finish, the manufacturer's name, the heat number, and the results of all chemical analyses and mechanical tests in accordance with the applicable ASTM specification. Material purchased in accordance with equivalent ASME specifications is also acceptable.

2.1.1. Government Furnished Equipment (GFE)

UT-Battelle will provide the following parts; Item 10, 11, 13 ,15, 17 and 18 on drawing N3E020995A395, Items 4, 5 and 6 on drawing N3E020995A472. Seller to complete the modifications per the drawings. Seller to arrange for pickup from ORNL and delivery to sellers fabrication shop.

2.1.2. High Density Concrete

A. High density concrete for shielding shall be furnished by a company with a minimum of 5 years proven experience mixing and placing high density concrete.

B. Trial batch(es) of proposed mix design(s) shall be prepared and cured for minimum of 28 days to verify calculated minimum density and demonstrate shrinkage characteristics.

C. Concrete mixing and placing shall be in accordance with ACI-318. The mix design, mixing and placement shall be such to assure proper fill of all voids and consolidation without segregation that could degrade shielding properties.

D. When fully cured the concrete density shall be 230 pcf +/- 10%.

E. Minimum 28-day strength of 3000 PSI. Maximum aggregate size of 3/8 inch. Air entrainment of 2% +/- 1%.

F. Documentation of the concrete company experience mixing and placing high density concrete and proving the proposed mix design meets the requirements shall be submitted to The Company for Approval prior to concrete placement in the shield pack assembly.

G. During concrete placement sample cylinders of known volume will be filled at the start, mid-way and completion of shield pack assembly fills to establish batch density for each fill.

H. Shield pack assembly pieces shall be weighed prior to concrete placement and a minimum of 7 days after concrete placement to document adequate fill of void spaces.

I. Shield pack assembly must have a minimum concrete thickness of 4 ½" within the annulus of the body and lid.

2.2. Welding

Production welding shall not be undertaken until both the welding procedures and the welders or welding operators have been qualified in accordance with Section 2.2.1 and weld inspectors per Section 2.2.2. Complete welder qualification documents shall be submitted to the Company with the offer.

2.2.1. Welding Procedures and Welder Qualifications

The Seller shall qualify welding procedures used in accordance with Section IX of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code or American Welding Society (AWS). Performance qualification of welders

and welding operators shall conform to Section IX of the ASME Boiler and Pressure Vessel Code or AWS D1.1 & D1.6.

2.2.2. Weld Inspection

The weld examination report shall include Joint ID Number; Material thickness and heat numbers: Date of Examination; Procedure Designation; Name and Qualification Level of Inspector; Brand Name, Type and Batch Number of Penetrant, Examination Results shall be documented in a format similar to the attached sample Weld Examination Report.

For carbon steel weld inspection, magnetic particle can be used as a substitute for liquid penetrant

Proof of weld inspectors' certifications shall be submitted to the Company with the Sellers Offer. After award of a subcontract, proof of the certification of the inspector(s) assigned to the job shall be submitted for approval.

All welds are subject to inspection by Company inspectors. The Company reserves the right to accept, reject, or require removal of welds which do not meet specification/documents requirements. Welders performing welds found to be unsound shall be subject to the appropriate re-test provisions of the applicable Code or Standard: ASME or AWS.

2.3. Fabrication Tolerances

Fabrication tolerances shall be per drawing tolerances unless otherwise noted.

Clearance Holes for Shapes, Rounds, Pipe, Rectangular boxes, etc. shall be considered nominal. Final dimensions shall allow for part clearance and welding fit-up.

2.4. Fabrication Methods

2.4.1. Rolled Shapes

Weld shown considered typical. If more welds are required add additional welds as 1a, 1b, 1c, etc.

2.4.2. Formed Shapes

Weld shown considered typical. If more welds are required add additional welds as 1a, 1b, 1c, etc.

3. Quality Assurance

3.1. Seller's Quality Program

A. The Seller shall provide their Quality Assurance Program or Quality Assurance Project Plan (QAPP) for review by the Company's Non-Reactor Nuclear Facility Division (NNFD) Quality Assurance Department to ensure that this Program includes the needed controls for fabrication of the Shield Packs.

B. These requirements shall not be construed as a limitation on the Seller's responsibility to control all activities affecting the quality of the desired objective of this specification. Quality Assurance includes both the performing functions of attaining quality objectives as well as the functions of verifying that activities affecting quality have been correctly and currently performed.

3.2 Surveillance

A. As part of the Company's Quality Assurance Program, evaluation of the vendor's QA Program and/or source surveillance activities may be conducted at the Seller's facility or any sub-tier vendor facility as deemed necessary by the Company to assure quality objectives are met.

B. Such surveillance will include, but will not be limited to, auditing and monitoring of production processes, in-process inspection and controls, chemical/physical certifications, final inspections and tests, tests considered critical to the function of the equipment, preparation for shipment, and review of certification data.

C. The Seller shall provide Company representatives access to all data and operating areas that are pertinent to the contract.

D. Source surveillance by the Company representative shall not constitute product acceptance by the Company and shall in no way relieve the Seller responsibility to furnish acceptable items.

E. The Seller shall notify the Company at least ten days prior to any tests or inspections.

3.3 Fabrication Record

The Fabrication Record shall be maintained by the Seller until the completion of the job and shall include the following information:

3.3.1.1 Procurement Package consisting of a copy of all specifications, data sheets, drawings, etc., supplied by the Company to the Seller with the contract

3.3.1.2 Approved request for waiver or deviation.

3.3.1.3 Bill of Material Checklist

3.3.1.4 Material Certifications (see Section 2.1)

3.3.1.5 Weld Inspection Reports

3.3.1.6 Correspondence

3.3.1.7 Drawings – As Built

3.3.1.8 Other Pertinent Documents

3.3.1.9 Certificate of Compliance signed by an officer of the Seller's company confirming that Seller meets all requirements of the contract.

The Fabrication Record shall be labeled with the job name, Company P.O. number, Vendor name and Vendor P.O. number. The information (with the exception of the Company Drawings) shall be bound together in three-ring binders or acrylic coated 20 point pressboard binders. Plastic three-ring binders shall have non-plastic sheets between interior binder surface and printed text to prevent sticking of copier printing of folder contents to binder. Sections of the Record contained in the binders shall have non-plastic tabbed (tabs may be plastic) and labeled dividers.

3.4Nonconforming Items

The Seller shall establish a system for controlling nonconforming items, including procedures for identification, segregation, and disposition. The Seller shall submit detailed repair and rework procedure plans for Company approval prior to performing each repair and rework. The Seller shall supply a summary statement of all completed nonconformance repair and rework at time of shipment. All nonconformances shall have Company approval prior to shipment.

3.5Deviations

Requests for deviations from the requirements of this SOW and the drawings shall be submitted to the Company for approval. Any waivers or deviations shall be presented to the Company on the attached UT-Battelle ORNL-313, Deviation Request Form. Company approval of each waiver or deviation is required before proceeding with fabrication.

3.6As-Built Drawings

The Seller shall maintain one set of prints, designated (marked) as "record copy" or "as-built", on which all accepted nonconformance's, nonconformance's accepted after rework and/or modification, waivers, and approved deviations are recorded. These shall be recorded in red and shall be legible, complete and cross-referenced with the applicable "Nonconformance or Deviation Request". The "record copy" or "as-built" prints shall be furnished to the Company after completion of fabrication and testing by the Seller. The Seller shall certify that the as-built drawings correctly relate all aspects of the completed fabrication and all requirements of this SOW and the Company drawings.

DEVIATION FORM

1. DEVIATION NO: DR-			2. DIVISION:
3. PROJECT TITLE:		4. PROGRAM:	
5. ITEM/ACTIVITY NAME:		6. SPECIFICATION/PROCEDURE:	
7. DRAWING NO:	8. SHOP ORDER:		9. WORK/PURCHASE:
10. Description of Deviation			
11. Justification and Limitations			
12. Requested by:	13. Title:		14. Date:
15. Drawing/Document is to be revised ☐ NO ☐ YES (if yes, list):			

Approved by: As Appropriate	16. Task Leader:	Date:	19. Item User:	Date:
	17. Requirement Originator:	Date:	20. Other:	Date:
	18. QA Group	Date:	20. Other:	Date:

Continuation Page

DEVIATION NO: DR-	PAGE_____ OF _____
10. Description of Deviation	
11. Justification and Limitations	

PRINT SAVE

INSTRUCTIONS FOR COMPLETING THE DEVIATION FORM

NOTE: Not all blocks of this form are applicable to every deviation requested. Fill out only those blocks that are appropriate to the subject deviation.

NOTE: Divisions/Programs may use a modified version of the form, provided all requirements of this procedure are met.

1. **DEVIATION NUMBER:** Record the Deviation Request number obtained from the applicable document management center. The number should be of the form DR-YY-XX-ZZZ, indicating year, division acronym, and sequential number, such as DR-98-OQS-001.

2. **DIVISION:** The applicable division requesting the deviation by name, such as Chemical Technology Division.

3. **PROJECT TITLE:** The general title of the project or activity that is requesting the deviation, such as HFIR Upgrades.

4. **PROGRAM:** The general title of the program doing the requesting such as Environmental Restoration or WasteManagement.

5. **ITEM/ACTIVITY NAME:** The name of the item or activity to which the deviation applies or for which it is being requested.

6. **SPECIFICATION/PROCEDURE:** The specific requirement document containing the requirement to be deviated.

7. **DRAWING NO.:** The applicable drawing containing the requirement that is to be deviated.

8. **SHOP ORDER:** The shop order containing the requirement or the batch/lot of items to which the deviation will apply.

9. **WORK/PURCHASE ORDER**: The work or purchase order containing the requirement or to which the deviation will apply.

10. **DESCRIPTION OF DEVIATION:** A description of how the planned action will differ from the original requirement.

11. **JUSTIFICATION AND LIMITATIONS:** The technical justification supporting the requested deviation and the exact limits as to scope, duration, or applicable batch/lot for the deviation from requirement.

12. **REQUESTED BY**: The signature of the requestor of the deviation.

13. **TITLE:** Title of the requestor.

14. **DATE**: The date the request was initiated.

15. **DRAWING/DOCUMENT IS TO BE REVISED:** If the deviation is to be incorporated as a permanent change, check the box and list the applicable document/drawing numbers that will require changing.

NOTE: Signatures required to approve a deviation vary according to the complexity of the deviation and the safety significance of the deviation. Where the requirement is specifically made by the customer, their signature of approval must be obtained.

16. **TASK LEADER:** The leader of the task or activity that is performing the work for which the deviation is being requested.

17. **REQUIREMENT ORIGINATOR:** A representative of the organization that specified the requirement from which a deviation is being requested. The deviation must not invalidate the original basis for the requirement in question.

18. **QA GROUP:** A representative of the cognizant Quality Assurance Group must approve the deviation certifying that the process was followed and that the deviation will not represent a degradation of item or service quality.

19. **ITEM USER:** The ultimate customer of the item or service, if different from the Task Leader or requirement originator.

20. **OTHER:** Additional signatures as deemed necessary to ensure all appropriate disciplines have been considered and concurred in the deviation, such as the appropriate functional or corporate policy manager if the deviation affects established policy.

UT-Battelle -ORNL

Weld Examination Report

Job Title: _____ **IR:** _____ **MJR.:** _____

Specification: _____ **Examination Procedures (Rev.):** _____

Drawing No.: _____ **Line No.:** _____ **Auxiliary Light Equip.:** _____

Sketch or Weld Map No./Other: _____

Weld No.	Materials			WPS	Welder Stencil	Exams	Inspector Level	Time & Date of Inspection	Results	Comments
	Base A *Size and Heat	Base B *Size and Heat	Filler *Size and Heat							

* Pipe size or Plate Thickness

1. Joint Preparation and Fit –up
2. Visual Root Pass
3. P. T. Root Pass
4. Intermediate Visual
5. P. T. Final Pass
6. Final Pass
7. Final R.T.
8. A.W.S. QC1 Final Acceptance
9. In Process
10. Other _____

Penetrant Material Batch No.

SKL-S _____

SKC-S _____

SKD-S _____

NOTE: This form is for use with Type II Visible, Solvent Removable only. PT reject indications must record type, location and extent.