Specification No. 203-HJT-9002 R0

Specification for the Secondary Containment for the MERIT Mercury-Jet Target Experiment

February 17, 2006

SPECIFICATION FOR THE SECONDARY CONTAINMENT FOR THE HIGH POWER MERCURY-JET TARGET EXPERIMENT

Prepared by:

V.B. Graves _____
(Oak Ridge National Laboratory)

P. T. Spampinato _____
(Oak Ridge National Laboratory)

Approved by:

H.G. Kirk _____
(Brookhaven National Laboratory)

K.T. McDonald _____
(Princeton University)

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1.0 Scope

This procurement specification is issued on behalf of Oak Ridge National Laboratory (ORNL), hereafter referred to as the Company. It is a "build-to-print" procurement and contains the requirements for fabrication and assembly of a secondary containment structure as detailed below.

The secondary containment is an enclosure for the Mercury Intense Target (MERIT). MERIT is a system for testing a mercury jet within a primary containment at ORNL, MIT's Plasma Science and Fusion Center, and CERN in Switzerland. Drawing 203-HJT-0500 shows the mercury delivery system and the secondary containment, and is included for reference only.

Acceptance tests at the Seller's site shall consist of checking several critical dimensions, verifying the leak-tightness of the containment structure, and verifying the location and operation of the various surface-mounted connectors. Upon completion of the acceptance tests, the equipment shall be delivered to Oak Ridge National Laboratory (ORNL) in Oak Ridge, TN.

It is pointed out that although this containment equipment is for a mercury-based target experiment, the Seller will not deal with nor handle mercury in any way.

Under the provisions of this subcontract the Seller shall provide the following:

1. **The fully assembled components and subassemblies shown in drawing 203-HJT-0700, except for**
   - P/N 5, "Double Window Monitored," N/A 203-HJT-0706, and
   - P/N 6, Secondary Tube Assy, N/A 203-HJT-0710.

   The two components listed above are shown on the assembly drawing for completeness, but are part of a separate procurement package.

2. **The sling braces shown in drawing 203-HJT-0501.**

3. **Furnish the Company with as-built drawings or drawing mark-ups for any fabrication deviations that were approved by the Company.**

The attachment to this specification contains the drawings referenced above. The drawings, in addition to specifying dimensions, also specify component materials, commercially available procurements, field notes that refer to welding and inspections, and material certification requirements.

Since the Containment Structure described above will be used during MERIT testing in high magnetic fields, all materials are specified to be non-magnetic. Any deviation from the materials listed in the drawings must be approved by the Company.

2.0 Applicable Codes and Standards

- American Welding Society D.1 – standard practices

3.0 Inspection and Testing

As part of the Company's quality assurance program, the Company shall have the right to inspect the Seller's facility or any sub-tier Seller facility that the Company determines necessary to ensure that quality objectives are met. Source surveillance by the Company representative shall in no way relieve the Seller of the responsibility to furnish acceptable items.

3.1 Acceptance Testing

The Company shall have the right to witness final functional testing and inspection of the equipment at the Seller's site. Such testing shall be specified by the Seller to ensure full compliance of the equipment with the requirements of this specification. The requirement for witnessed-tests and inspections are at the Company's discretion upon notification by the Seller that the work has been completed. Acceptance tests shall take place at the Seller's site using the actual components, equipment, and materials that will be delivered to the Company.

- Final acceptance tests of the secondary containment assembly shall include checking overall size dimensions, verifying the leak-tightness of the containment structure, and verifying the location and integrity of the various surface-mounted connectors. The leak tests shall be performed as follows:

    - The containment structure shall be filled to height of approximately 0.75-inch, or approximately 9 gallons of water and demonstrate no liquid leakage through the base of the containment.
    - After sealing all openings, the containment structure shall be pressurized to 0.5 psig, and a soap bubble test shall be applied to all flanged covers, gasketed joints, and welded joints to verify leak tightness.

3.2 Seller's Responsibilities

The Seller shall notify the Company ten (10) working days prior to the start of tests and inspections that are designated above. The Company at its discretion shall have representatives

witness the performance tests. In addition, the Seller shall supply the Company with material certifications as specified on certain drawings in the attached drawing package.

4.0 Quality Assurance

4.1 Non-Conforming Items

The Company expects to receive equipment items, components, materials, and documentation that conform to all codes, standards, specifications, and procedures in the Agreement. The Seller may use its own nonconformance program to identify, report, and recommend disposition of all non-conforming items, but disposition that would leave any remaining nonconformity must be submitted to the Company for approval. A nonconformity request should identify the affected item(s) by name and serial number (if applicable), citing the drawing/specification number and revision number containing the specific requirement that has not been met. The Seller or the Seller's supplier may attach a description of the cause, and a corrective action plan and schedule if pertinent.

Note: The issuance and acceptance of such a request does not limit or affect the warranty provision of the Agreement. Such a request shall not establish a precedent or obligation to accept existing or future items not conforming to all provisions of the Agreement.

4.2 Seller's Requested Deviations

The Seller may propose deviations from the specifications, drawings, or other technical requirements of this procurement. Where time is a consideration, the Seller may communicate the proposed deviations or changes directly to the Company's principal engineer or technical lead with a copy to the Company's buyer. The engineer or technical lead will evaluate the technical aspects and recommend to the buyer, who will communicate acceptance or disapproval to the Seller. The request should identify the affected items, drawing/specification number and revision number, a description of the proposed deviation, and the justification for it.

4.3 As-Built Drawings

The Seller shall note any changes to the drawings due to errors or missing information, or changes to the components due to Company approved deviations, and provide the Company with a copy of the marked-up drawings.

5.0 Schedule

The support structure fabrications and acceptance testing shall be completed 10 weeks after subcontract award. Delivery to ORNL shall take place immediately thereafter.

6.0 Packing, Shipping and Handling

The containment structure assembly shall be packed for shipping in a sturdy wooden crate with loose pieces suitably wrapped to prevent damage during shipment, and shipped via truck transport.

6.1 Equipment Identification

Each major assembly or component shall be tagged indicating the Seller's name and address, the Seller's equipment identification information, date of manufacture, and Company information as shown below:

Seller name and address
Seller equipment identification number
Date of manufacture

UT-Battelle, LLC
ORNL, MERIT Hg Target Experiment
Oak Ridge, TN 37831
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