

# Hg Delivery System Fabrication Status

**V.B. Graves**

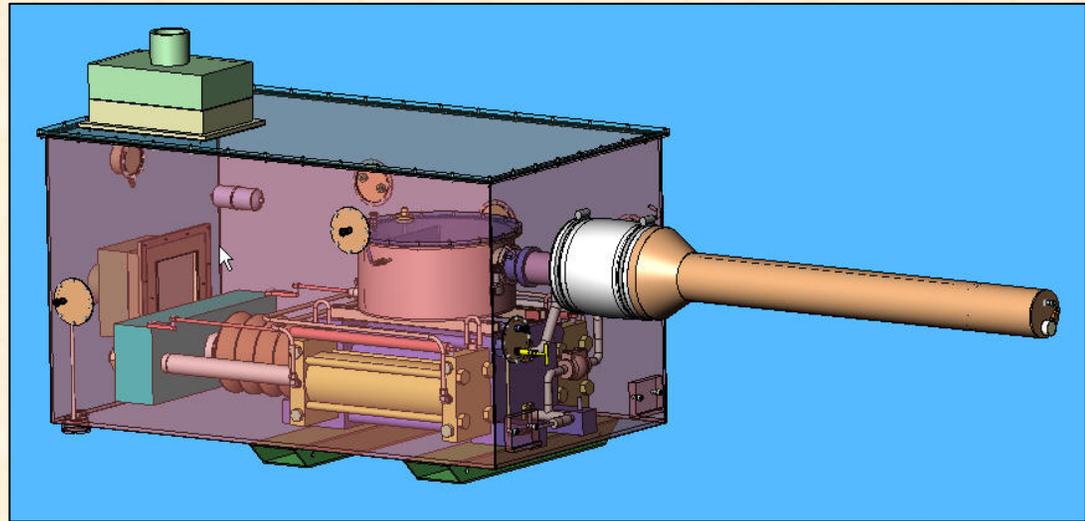
**P.T. Spampinato**

**Muon Collaboration Friday Meeting**

**May 5, 2006**

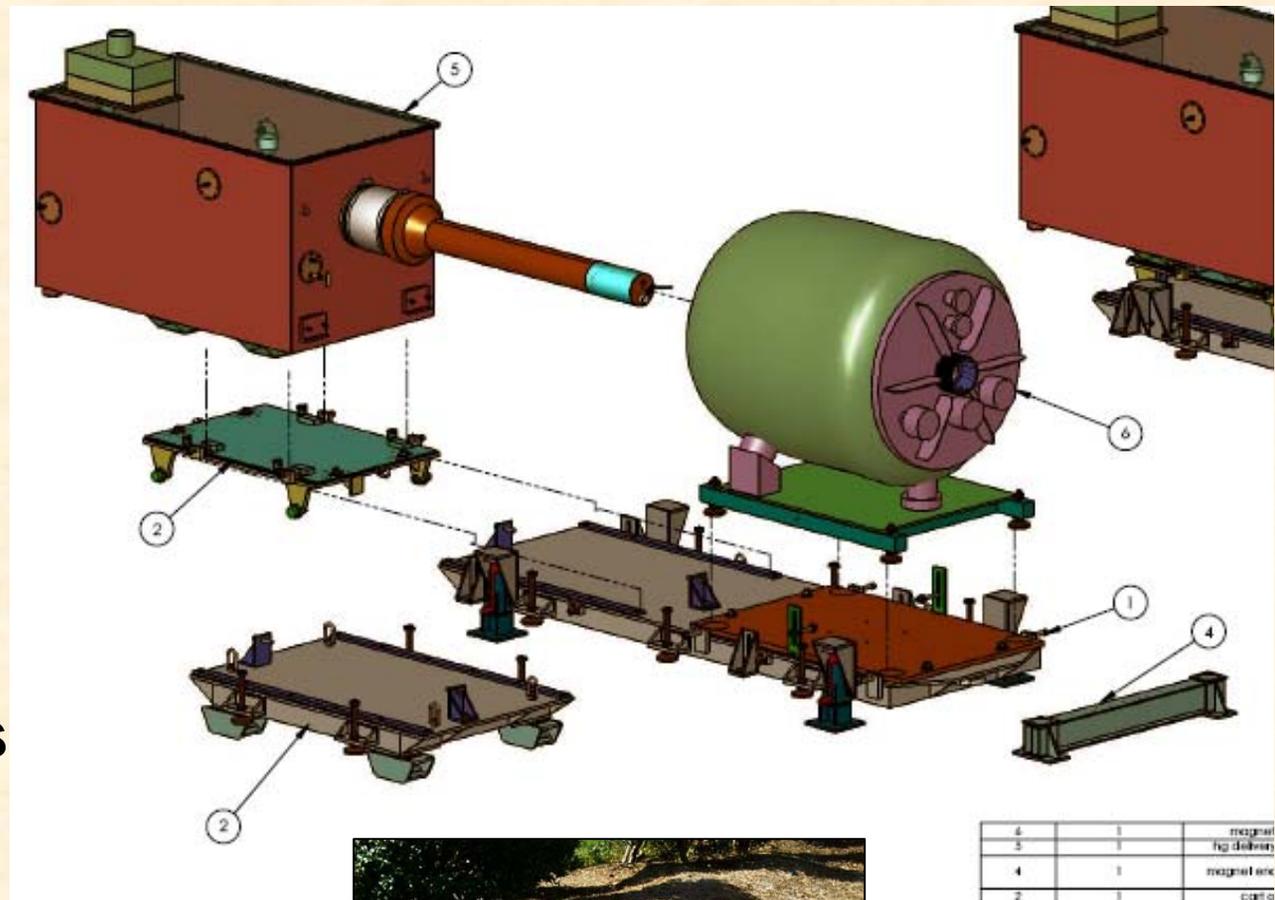
# Fabrication Packages

- All fabrication drawings completed
- Baseplates – UMiss
- Syringe pump – Airline Hydraulics
- Sump tank & piping – Airline Hydraulics
- Secondary containment box – Princeton U.
- Hg jet chamber & secondary containment sleeve – TBD
- Initial SS Hg nozzle & piping – TBD
- Final Ti nozzle / piping & beam windows - TBD



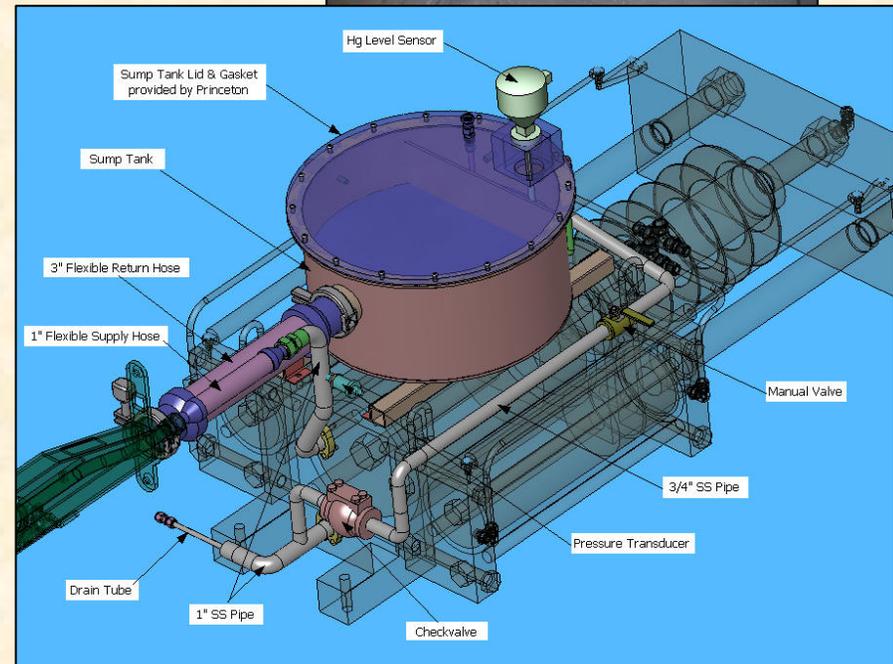
# Baseplates

- Primarily fabricated from Al 6061-T6
- All procured items received
- Fabricated items cut to size, in queue for welding



# Syringe Pump & Sump Tank Piping

- **Pump operational & tested**
  - Final modifications in progress
  - Non-magnetic tie rods in transit to AHC
- **Added sump tank / piping to original work scope**
- **AHC expects system ready to ship by May 19**



# Secondary Containment Box



- Machining completed, preparations for welding underway
- Work scope also includes various gaskets, lexan cover plates, port covers, optical diagnostic mounting hardware, & Hg vapor filter housings

NOTES

1. ALL WELDS MUST BE WATERTIGHT
2. WELDING & INSPECTIONS SHALL BE PERFORMED IN ACCORDANCE WITH AWS D.1.6
3. ALL WELDS SHALL BE DYE PENETRANT INSPECTED
4. MATERIAL CERTIFICATIONS REQUIRED

LIP CAN BE FABRICATED FROM STRIP, METER WELDED AND GROUND

ESTIMATED WEIGHT 923 LBS

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	LENGTH
12	1	BENT BRACKET, .75 WIDE X .10 THK	SS - 304L, ASTM A240	---
11	1	PLATE, 39.50 x 70.75 x .250	SS - 304L, ASTM A240	70.75
10	2	ROUND, .38 OD x 4.25	SS - 304L, ASTM A276	4.25
9	1	PLATE, 37.50 x 37.00 x .25	SS - 304L, ASTM A240	37.50
8	1	PLATE, 37.00 x 69.25 x .25	SS - 304L, ASTM A240	69.25
7	2	PLATE, 4.50 x 6.00 x 1.50	SS - 304L, ASTM A240	1.50
6	1	PLATE, 3.50 OD x .25 THK	SS - 304L, ASTM A240	N/A
5	1	PIPE, 3" SCH 40 x 1.00	SS - 304L, ASTM A312	1.00
4	1	PLATE, 38.00 x 37.00 x .250	SS - 304L, ASTM A240	37.00
3	1	PLATE, 37.00 X 69.25 x .250	SS - 304L, ASTM A240	69.25
2	1	PLATE, 37.50 x 68.75 x .50	SS - 304L, ASTM A240	68.75
1	1	PLATE, 11.88 DIA x .250	SS - 304L, ASTM A240	2.50

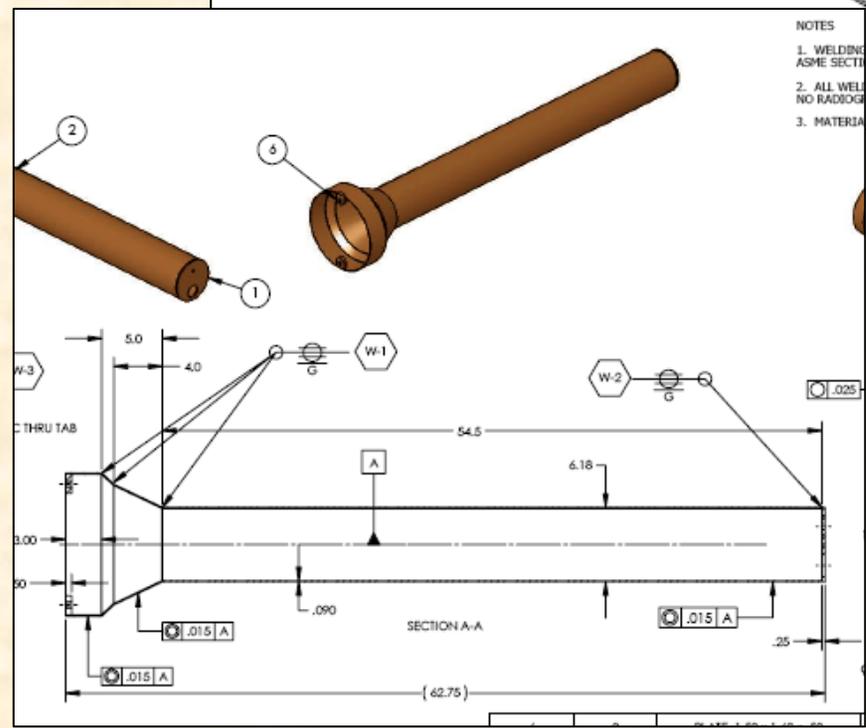
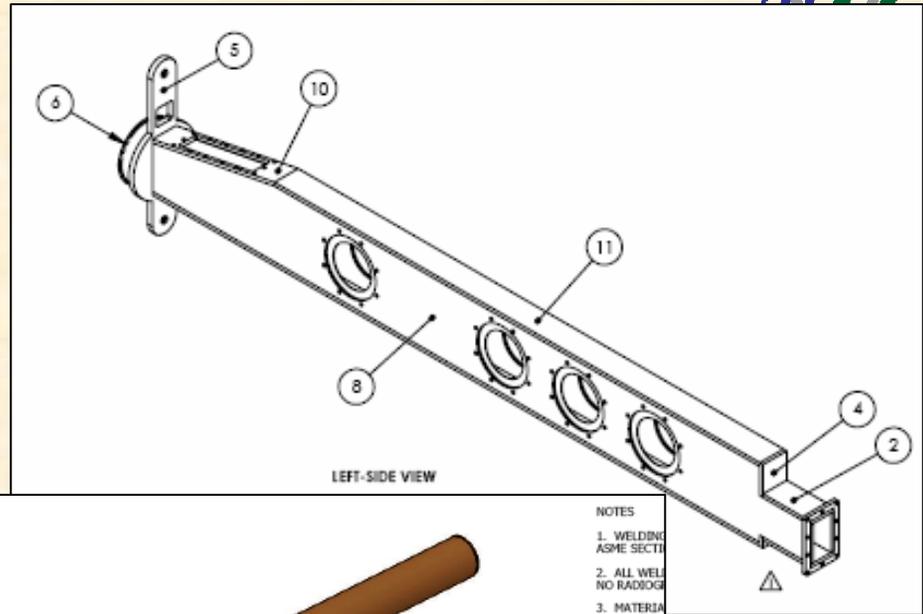
<p>THIRD-ANGLE PROJECTION</p> <p>UNLESS OTHERWISE NOTED:</p> <ol style="list-style-type: none"> <li>1. ALL DIMENSIONS ARE IN INCHES</li> <li>2. SURFACES UNLESS OTHERWISE SPECIFIED SHALL BE FINISHED TO THE FOLLOWING TOLERANCES FOR SIZE AND FINISH:</li> <li>3. MACHINED SURFACES: .0015" (12.5) (12.5) (12.5)</li> <li>4. MACHINED SURFACES: .010" (12.5) (12.5) (12.5)</li> <li>5. MACHINED SURFACES: .010" (12.5) (12.5) (12.5)</li> <li>6. MACHINED SURFACES: .010" (12.5) (12.5) (12.5)</li> <li>7. MACHINED SURFACES: .010" (12.5) (12.5) (12.5)</li> <li>8. MACHINED SURFACES: .010" (12.5) (12.5) (12.5)</li> <li>9. MACHINED SURFACES: .010" (12.5) (12.5) (12.5)</li> <li>10. MACHINED SURFACES: .010" (12.5) (12.5) (12.5)</li> </ol>	<p>This drawing was prepared by ORNL solely for use in work performed under Department of Energy contract number DE-AC05-00OR22725 and applicable Work for Others Agreements and Cooperative Research and Development Agreements. This drawing is property of ORNL and must be returned upon completion.</p>	<p>OAK RIDGE NATIONAL LABORATORY operated for the U.S. Department of Energy under contract DE-AC05-00OR22725 Oak Ridge, TN</p>
	<p>REMOTE SYSTEMS GROUP NUCLEAR SCIENCE &amp; TECHNOLOGY DIVISION</p>	<p>MERIT EXPERIMENT SECONDARY CONTAINMENT ASSY SECONDARY CONTAINMENT BOX WELDMENT</p>

<p>DATE: 3/7/2006</p> <p>BY: VBG</p> <p>APPROVED: VBG</p>	<p>CAD FILE: SEC BASE HUT</p> <p>PREV ASSY: 203-HJT-0700</p> <p>SCALE: 1:12</p> <p>SHEET: 1 of 4</p>
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# Hg Jet Chamber & Secondary Containment Sleeve

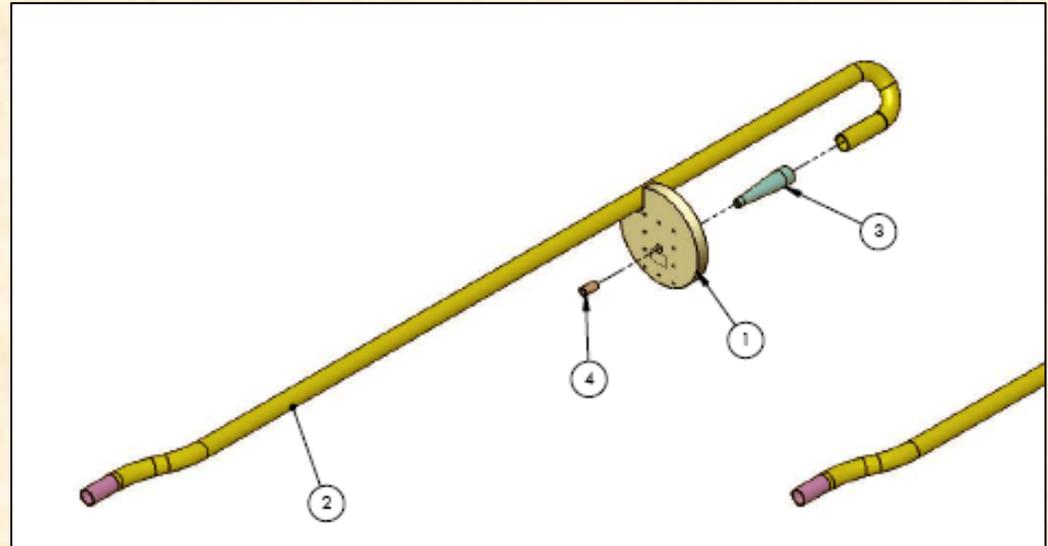
- Both components SS316L
- Bids have been received & are being evaluated
  - Single procurement



- NOTES
1. WELDING ASME SECTION 9
  2. ALL WELLS NO RADIUS
  3. MATERIAL

# SS Nozzle & Piping

- Initial testing will incorporate **SS** components rather than Ti for cost & schedule benefits
- Two configurations being fabricated
  - Reducer before 180° bend
  - Reducer after 180° bend
- Test both at ORNL, hopefully eliminate changes at MIT
- Vendor TBD, possibly Princeton U.



# Ti Nozzle/Piping & Beam Windows

- **In-beam nozzle flange & beam windows must be fabricated from Ti6Al4V**
- **Prefer that entire Hg supply assembly be fabricated from Ti to eliminate dissimilar metals issues**
- **Bids requested based on current design of Ti components**
  - Possible long delivery times
  - Ti material has been procured by Princeton
  - May require two fabricators, one for machining & one for welding

# Conclusions

- **Most Hg delivery system components either in fabrication or close to being awarded**
- **Titanium fabricator search continuing, awaiting bids from several vendors**
- **Expect working syringe system at ORNL by end of May**
- **Control system development will continue upon receipt of syringe hardware**