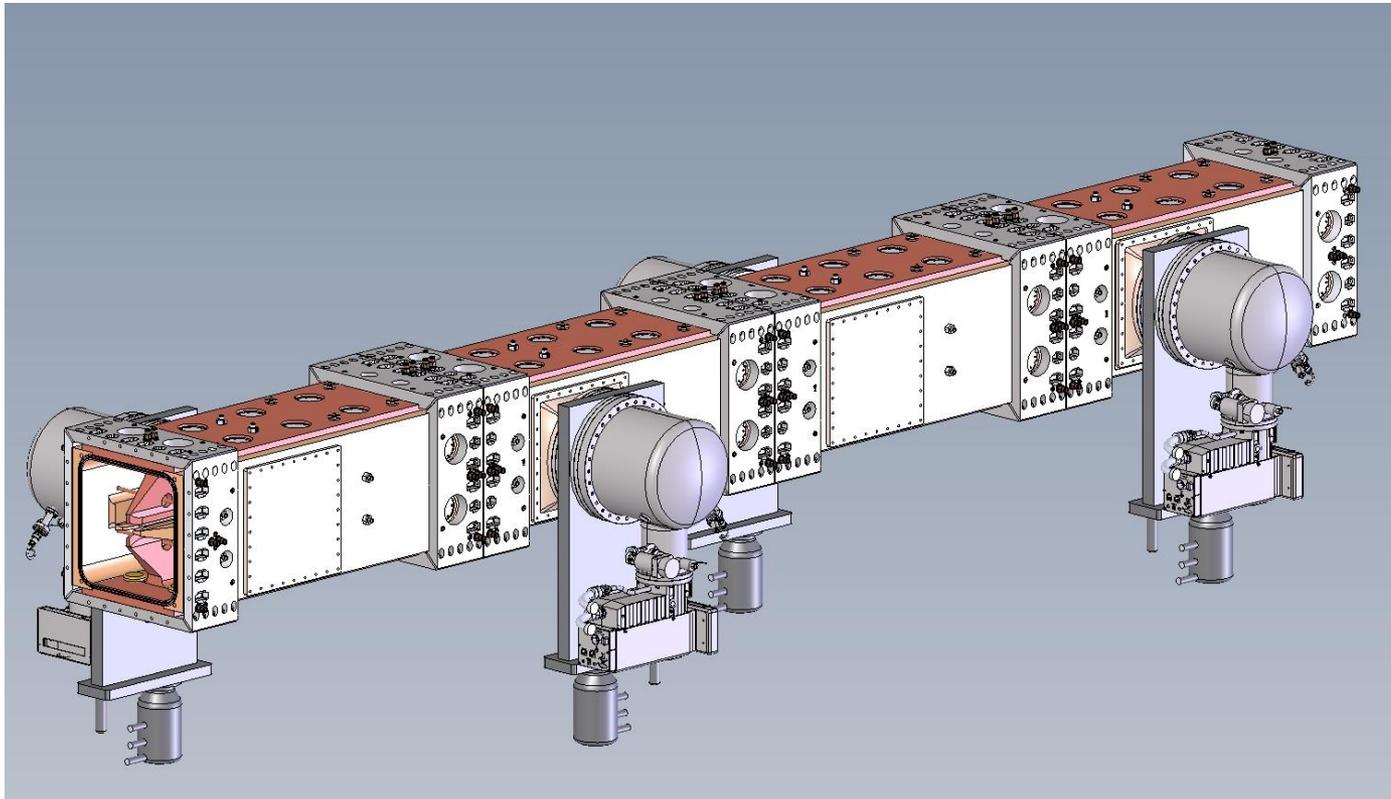


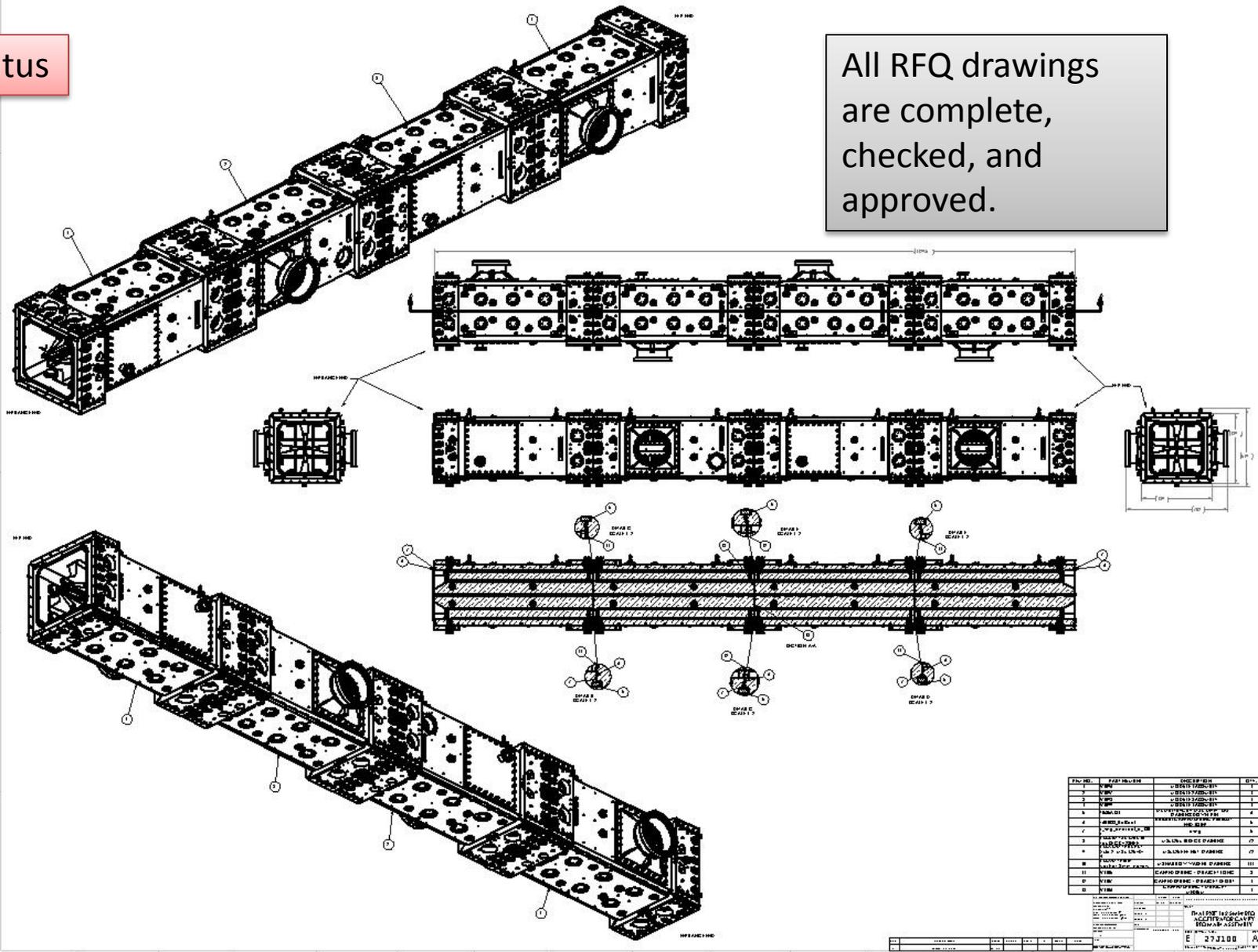
PXIE RFQ Status

11-5-13



Drawing Status

All RFQ drawings are complete, checked, and approved.



Fabrication Test

Modulation test pieces

Four test pieces fabricated and passed with different modulation patterns.



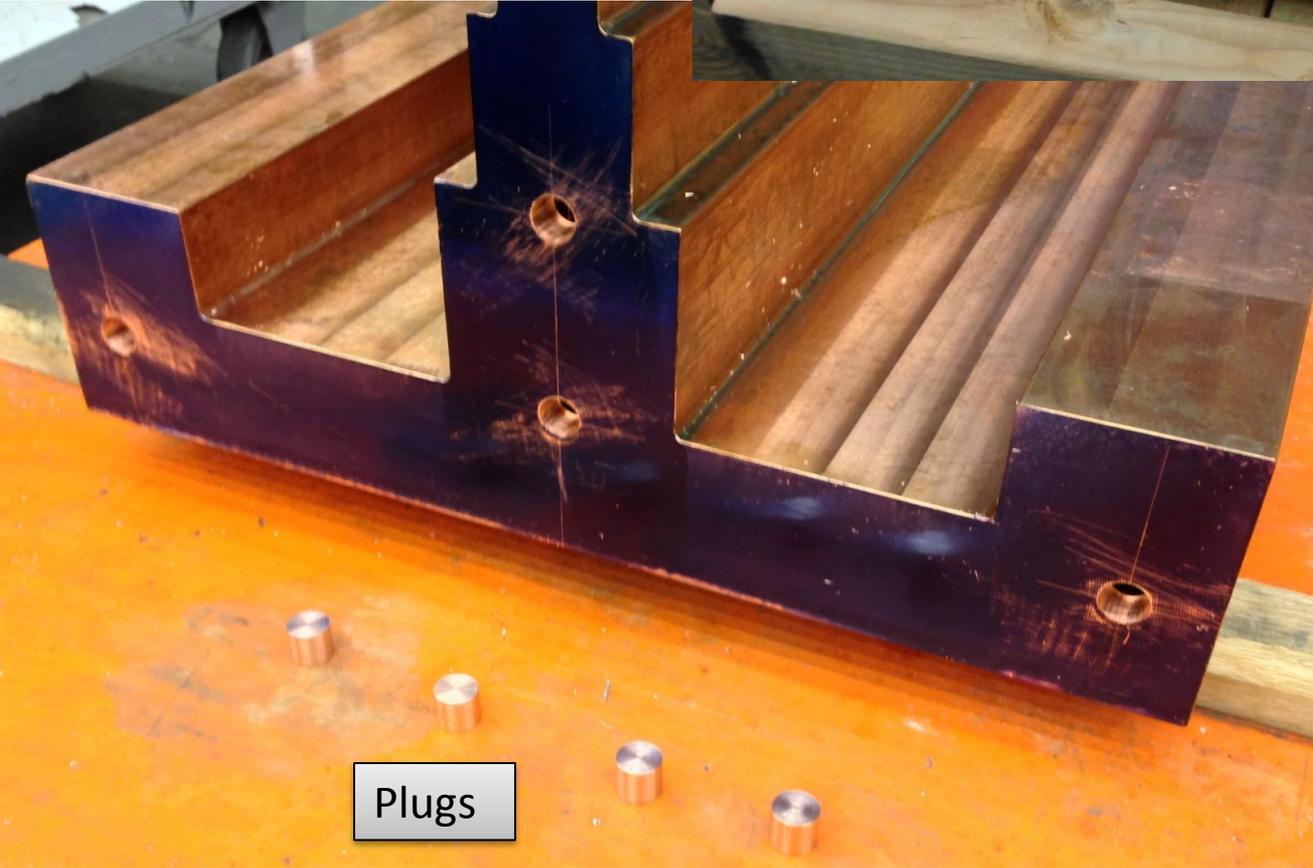
Fabrication Test

Full size vane

Module 1 horizontal vane passed test.



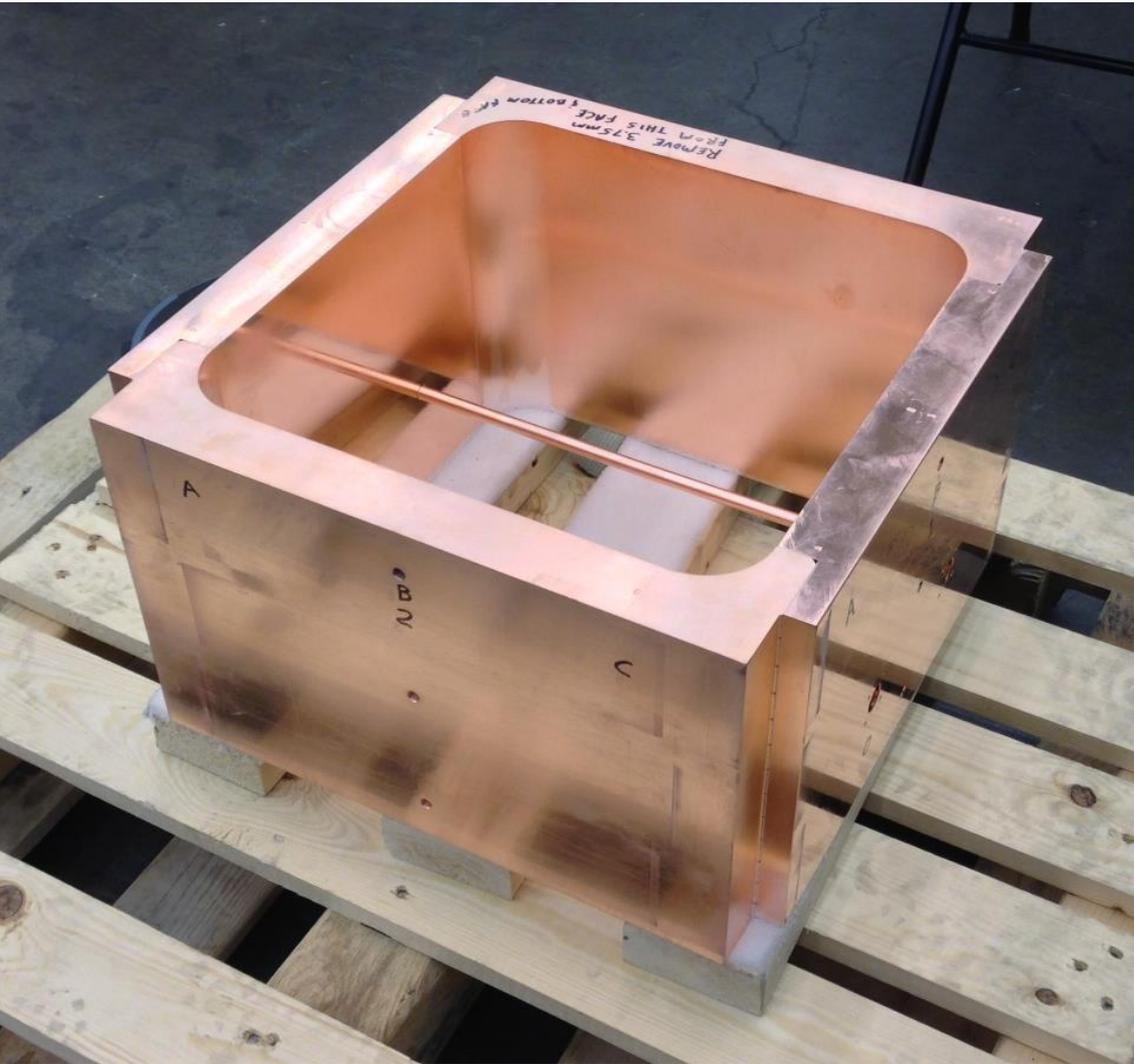
Plugs electron beam welded



Plugs

Gun drilled holes

Back from hydrogen furnace brazing at Bodycote in Fremont. Clamps removed.



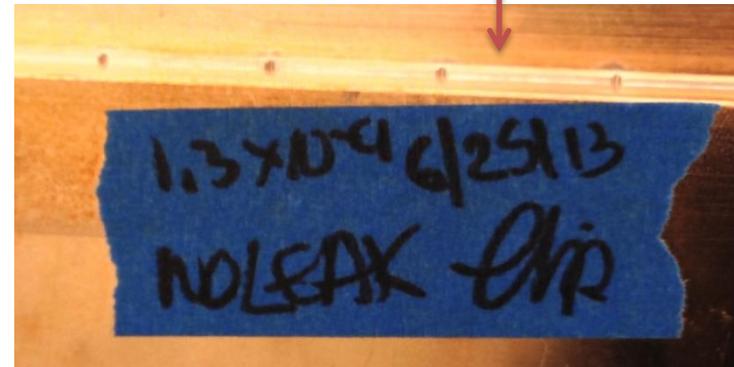
First braze test had minor issues:

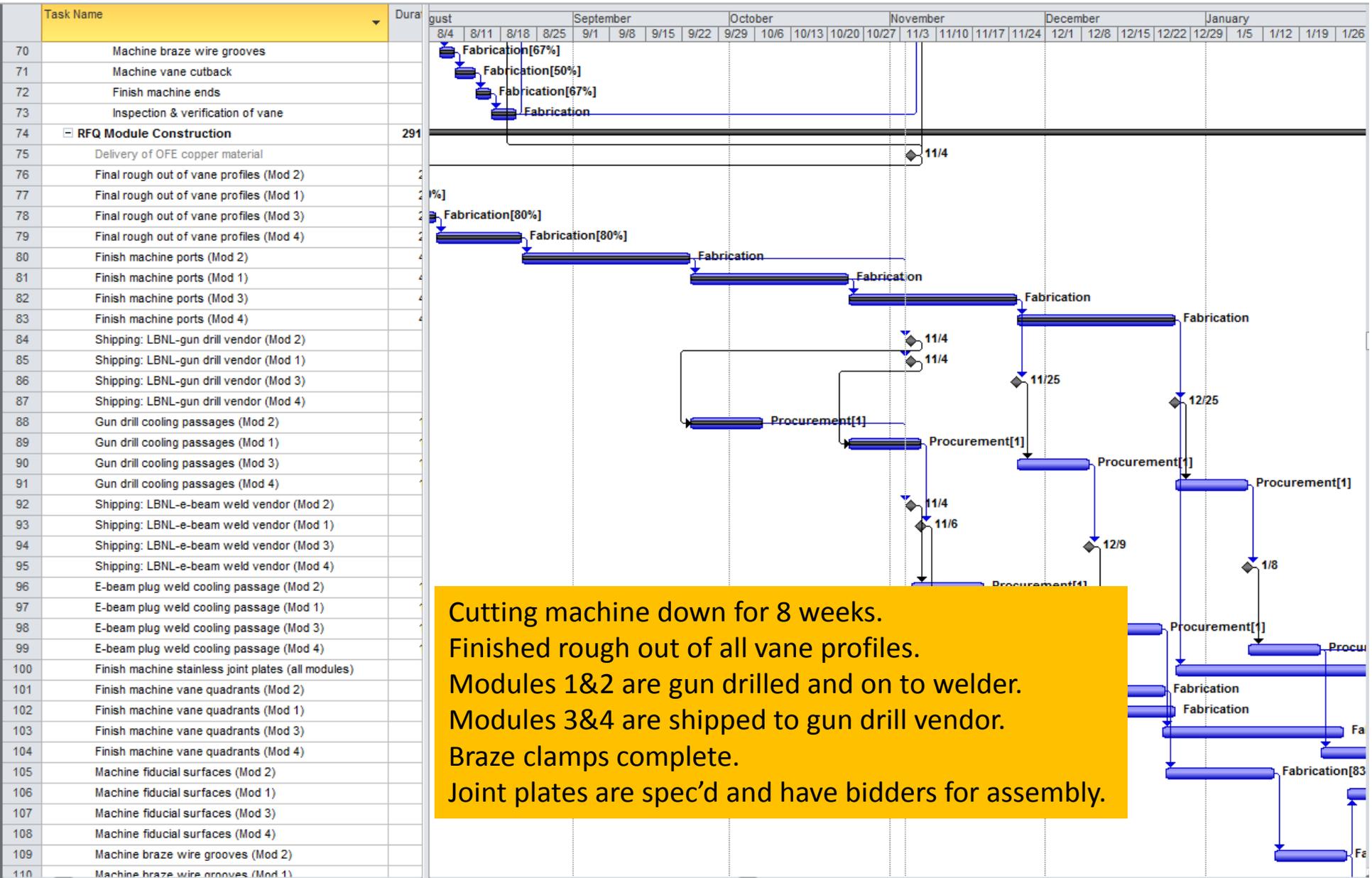
- Blushing of braze material in corners
- Pre-brazing dimensions not measured to spec

Second braze test nearly complete

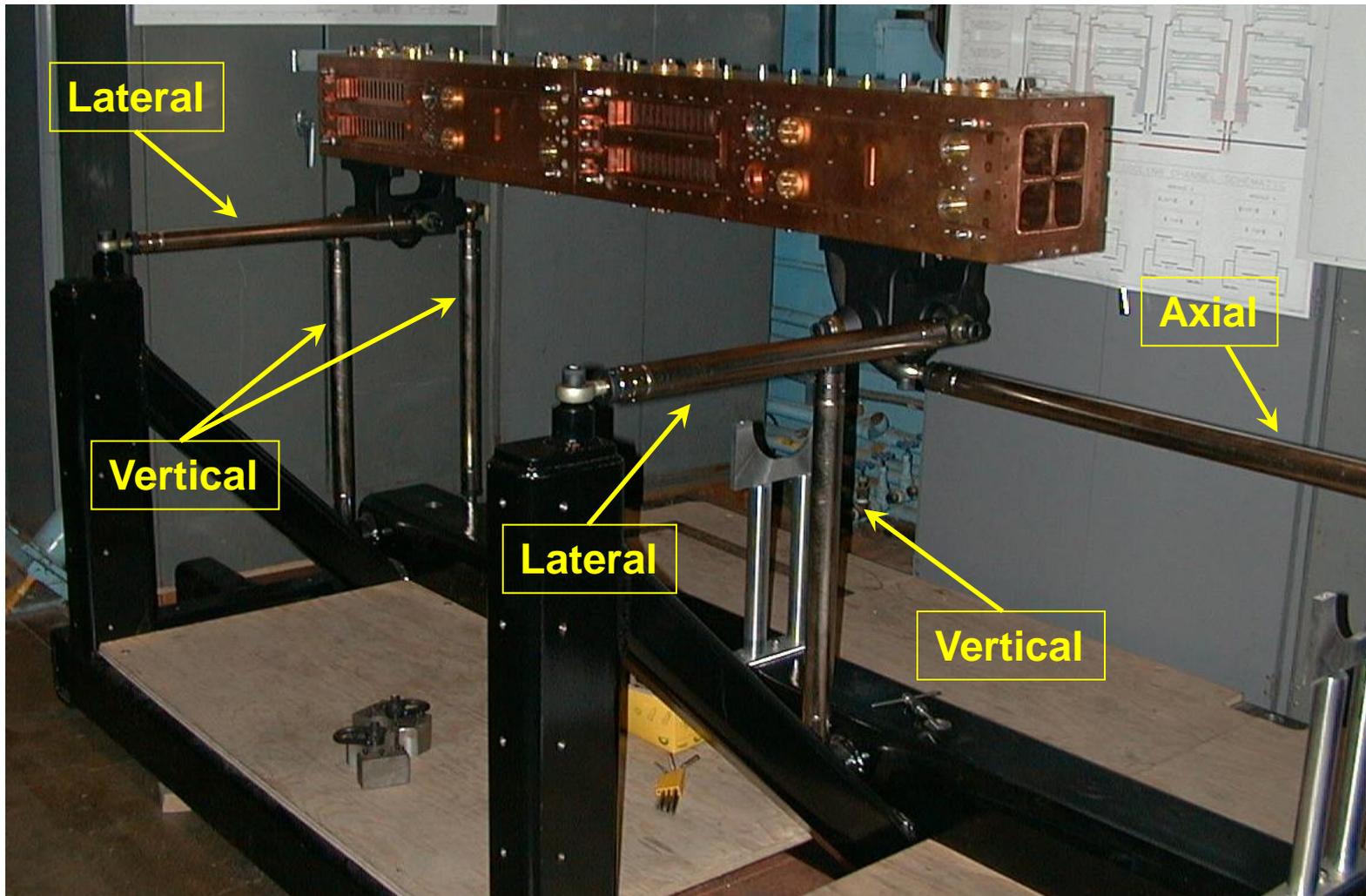
- Previous issues resolved
- Only vacuum tightness needs to be checked

Vacuum tight
 1.3×10^{-9}

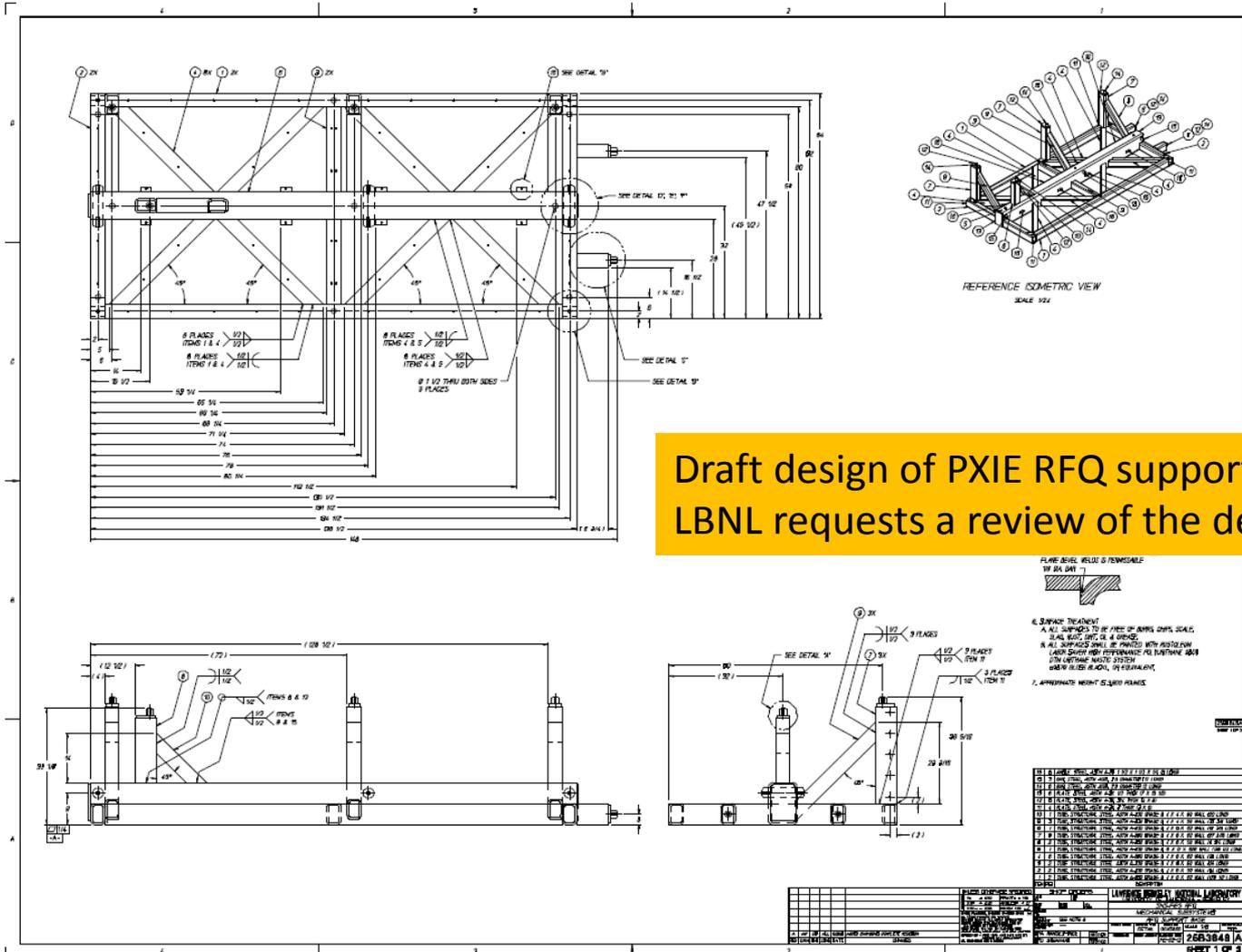




Six Strut Support Structure



SNS RFQ Support Drawing

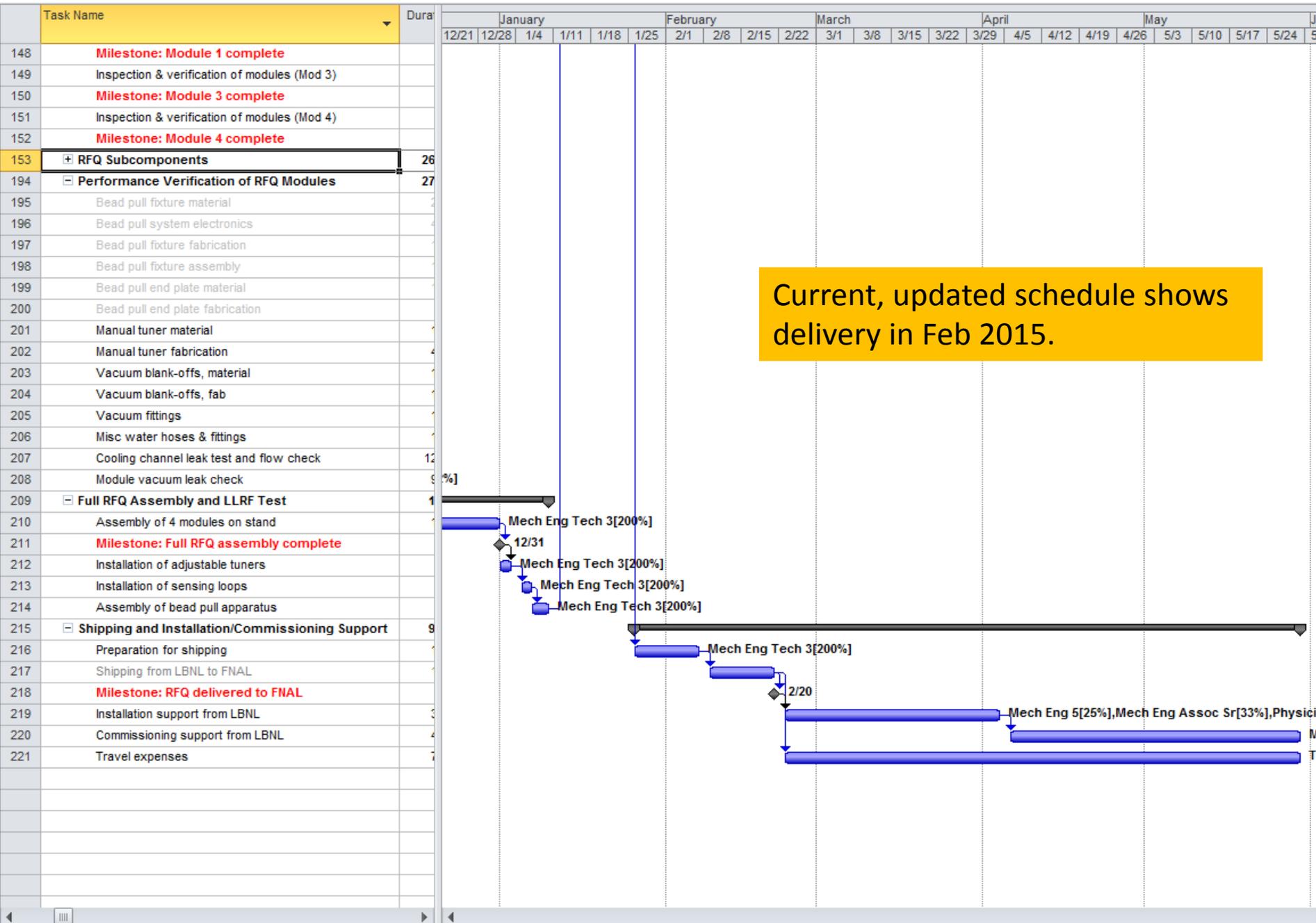


Draft design of PXIE RFQ support complete. LBNL requests a review of the design.



Steve Virostek: RFQ Subcomponents
 PXIE RFQ Fabrication Readiness Review
 LBNL - June 26-27, 2013

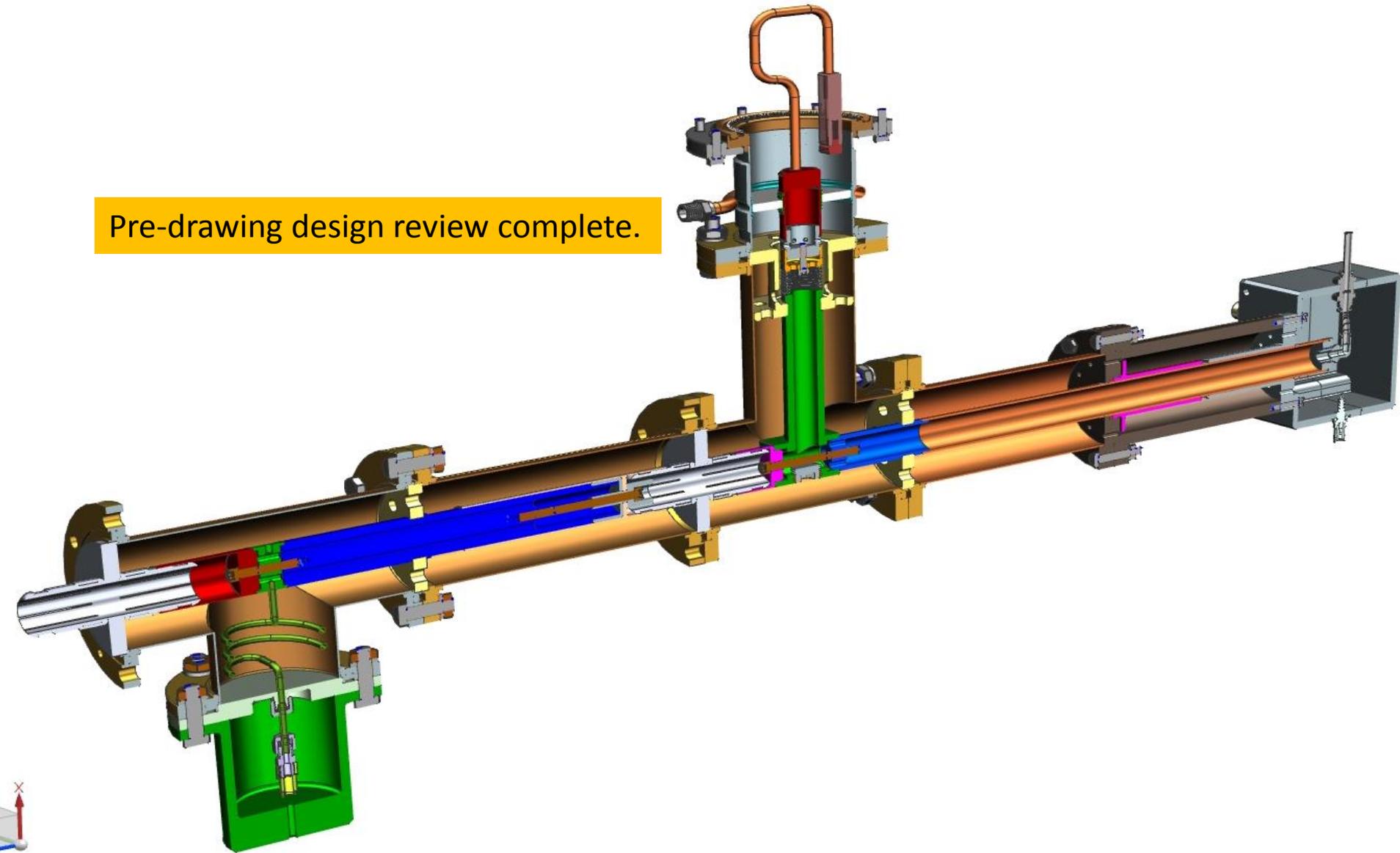


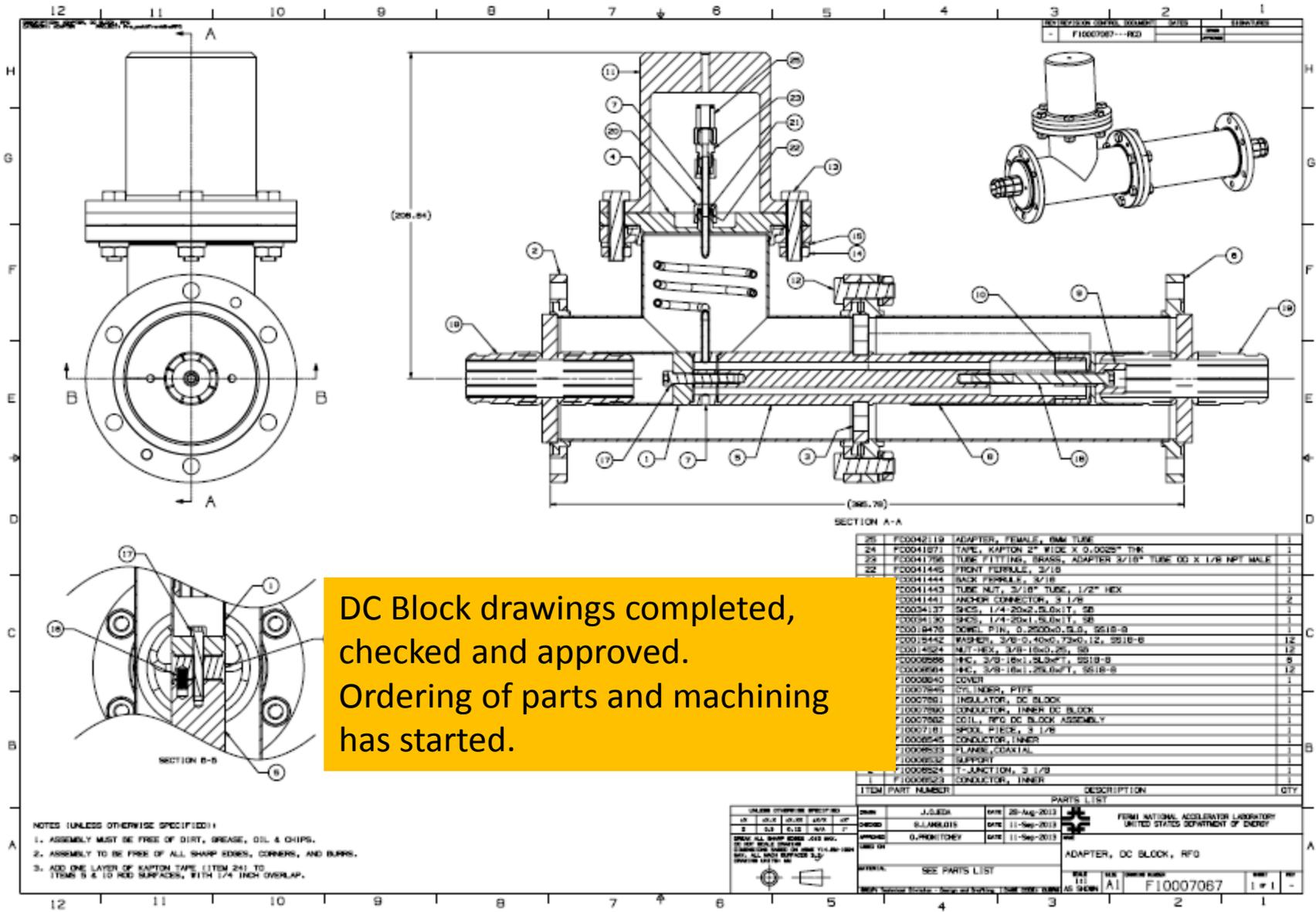


Current, updated schedule shows delivery in Feb 2015.

162.5 MHz Power Coupler with DC Block

Pre-drawing design review complete.





DC Block drawings completed, checked and approved. Ordering of parts and machining has started.

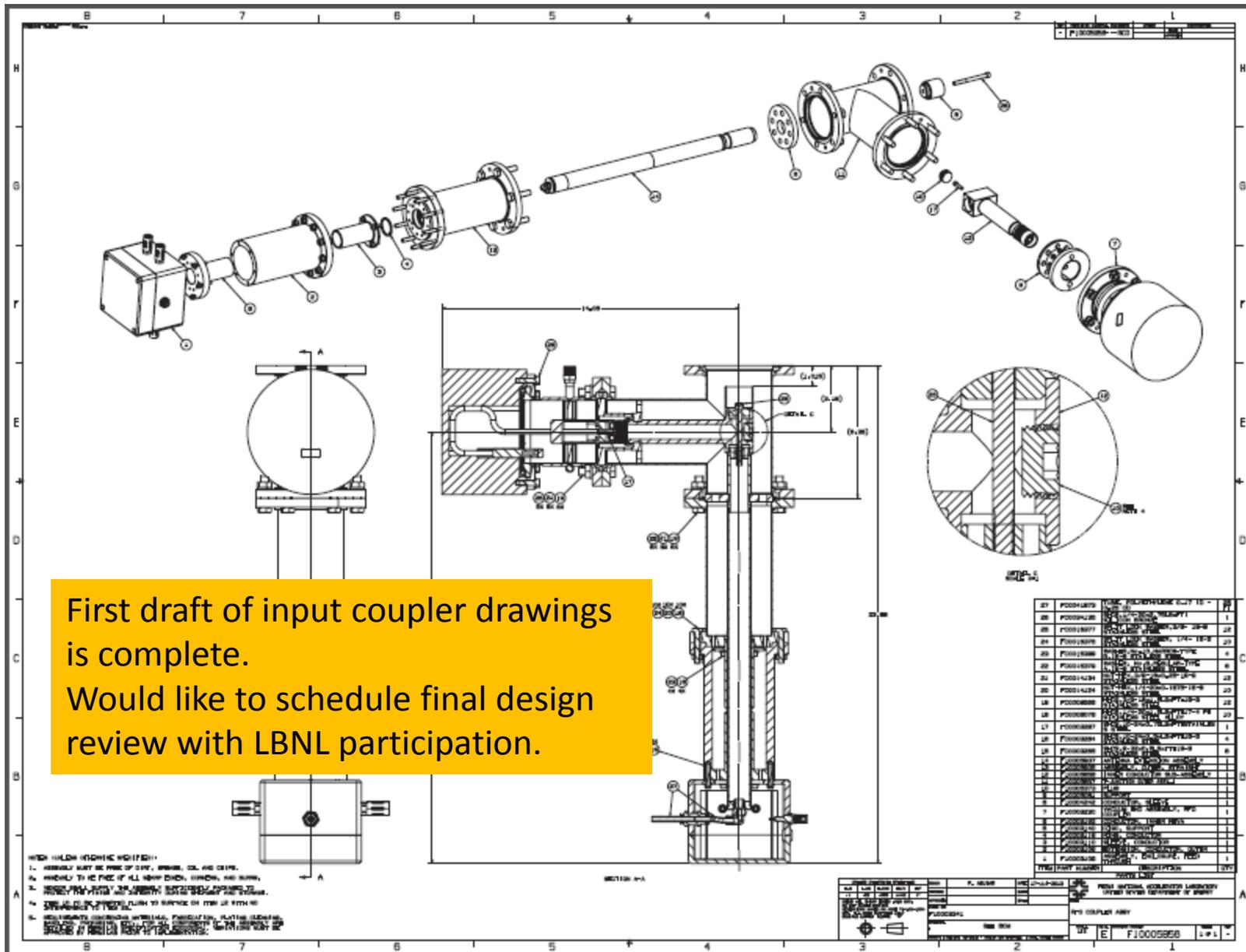
ITEM	PART NUMBER	DESCRIPTION	QTY
25	F0004219	ADAPTER, FEMALE, 6MM TUBE	1
24	F0004187	TAPE, KAPTON 2" WIDE X 0.0025" THK	1
24	F0004196	TUBE FITTING, BRASS, ADAPTER 3/16" TUBE OD X 1/8" NPT MALE	1
22	F0004146	FRONT FERRULE, 3/16	1
	F0004144	BACK FERRULE, 3/16	1
	F0004143	TUBE NUT, 3/16" TUBE, 1/2" HEX	1
	F0004141	ANCHOR CONDUCTOR, 3 1/8	2
	F0003437	SHCS, 1/4-20x1.5L6x1T, 5B	1
	F0003430	SHCS, 1/4-20x1.5L6x1T, 5B	1
	F00018475	DRWL PIN, 0.2500x0.5L5, 5S18-8	1
	F00018442	WASHER, 3/8-16x0.75x0.12, 5S18-8	12
	F00014524	NUT-HEX, 3/8-16x0.75, 5B	12
	F00005595	W/C, 3/8-16x1.5L3x1T, 5S18-8	5
	F00005584	W/C, 3/8-16x1.25L3x1T, 5S18-8	12
	F10000540	COVER	1
	F10007565	SP. INNER, PIFE	1
	F10007561	INSULATOR, DC BLOCK	1
	F10007560	CONDUCTOR, INNER DC BLOCK	1
	F10007562	COIL, RFO DC BLOCK ASSEMBLY	1
	F10007181	SPOOL PIECE, 3 1/8	1
	F10006545	CONDUCTOR, INNER	1
	F10006523	PLATE, COAXIAL	1
	F10006532	SLIPFIT	1
	F10006524	T-JUNCTION, 3 1/8	1
	F10006523	CONDUCTOR, INNER	1

- NOTES (UNLESS OTHERWISE SPECIFIED):
1. ASSEMBLY MUST BE FREE OF DIRT, GREASE, OIL & CHIPS.
 2. ASSEMBLY TO BE FREE OF ALL SHARP EDGES, CORNERS, AND BURRS.
 3. ADD ONE LAYER OF KAPTON TAPE (ITEM 24) TO ITEMS 5 & 10 ROD SURFACES, WITH 1/4" INCH OVERLAP.

DATE	BY	CHKD	DATE	REV	DESCRIPTION
25-Aug-2013	J.UEDE			1	ISSUED FOR MANUFACTURE
11-Sep-2013	S.LAMARZINI			2	REVISION
11-Sep-2013	G.PRONITCHEV			3	REVISION

DRAWN: ALL SHARP EDGES AND CORNERS TO BE ROUNDED TO R0.05 UNLESS OTHERWISE SPECIFIED.
 DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE TO BE HOLD.
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE TO BE HOLD.

MATERIAL: SEE PARTS LIST
 SCALE: AS SHOWN
 PART NUMBER: F10007067
 REV: 1
 QTY: 1

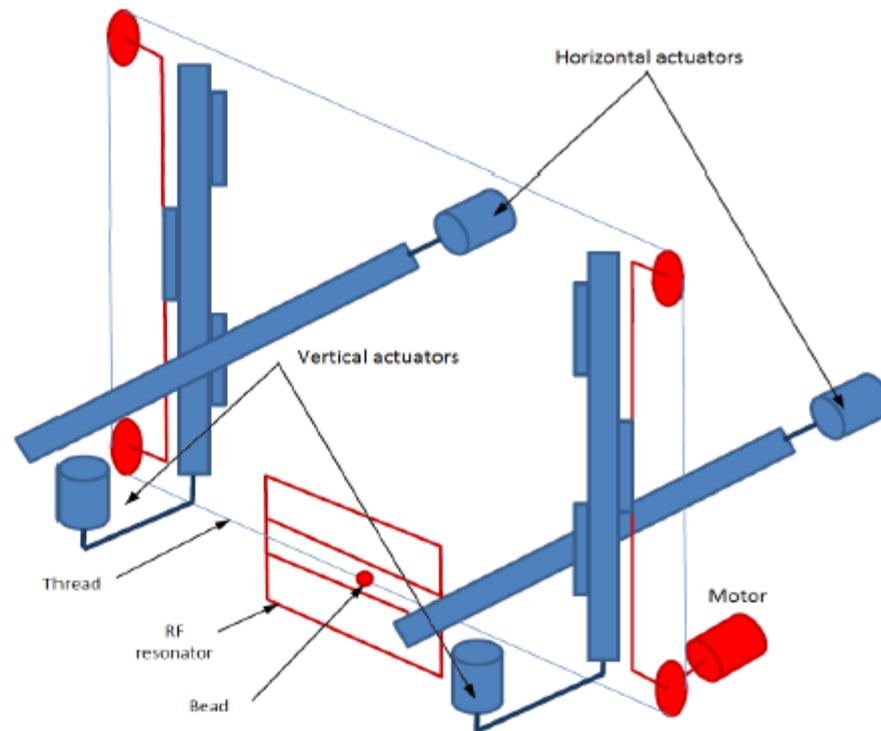
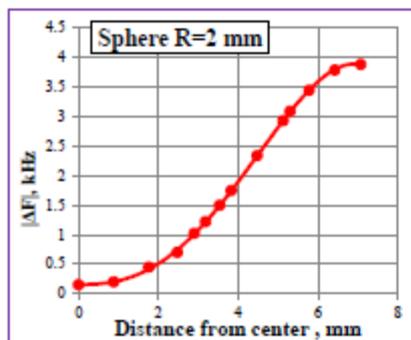
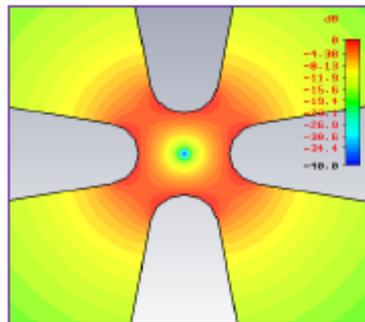
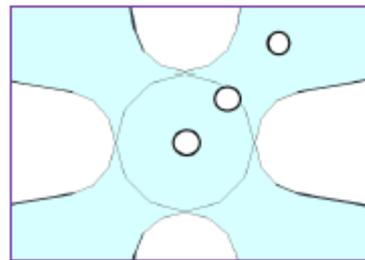


Status of RF Power

- Two 75kW power amplifiers from Sigma Phi still on schedule for December delivery.
- RFQ circulators have arrived and have been successfully tested up to 10kW. 10 kW circulator for Argonne HWR tests failed its tests, so we sent a 75kW circulator to Argonne until we have viable 10kW circulator.
- Currently planning on calibrating HINS 325MHz 6" directional couplers for testing power amplifiers. We hope to have money for 162.5MHz couplers later in the project.

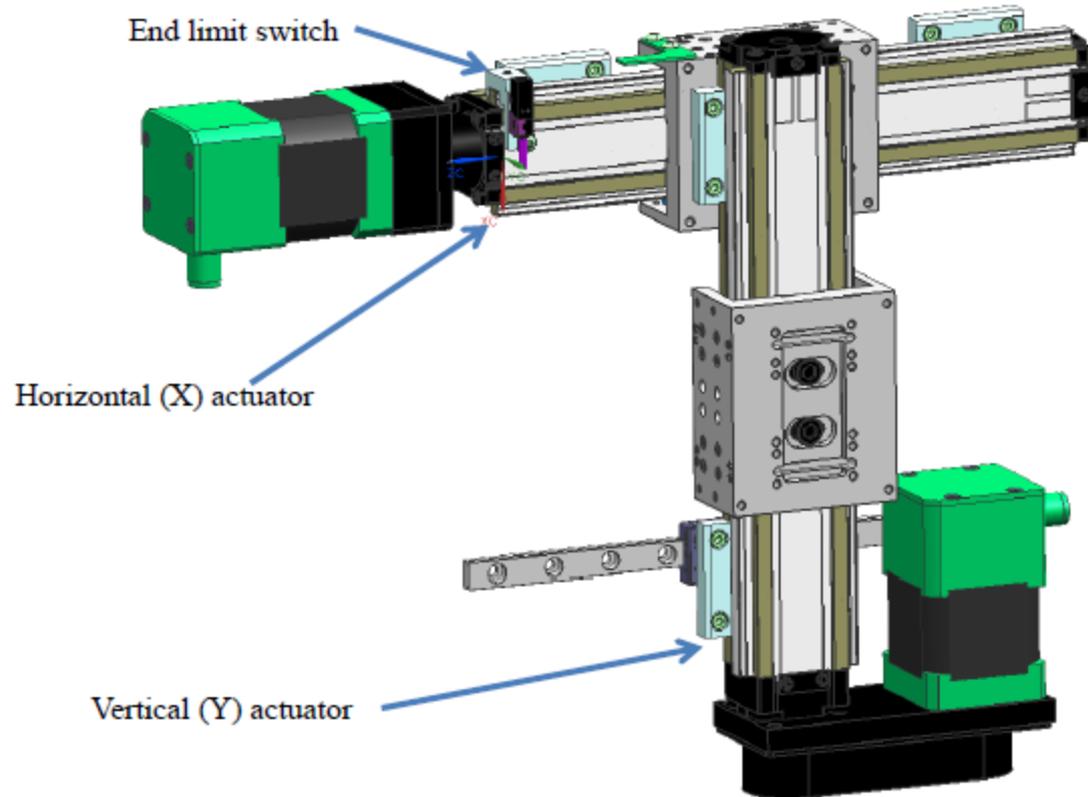
Bead Pull System Block Diagram

Bead pull diagram



Bead Pull Partial Assembly

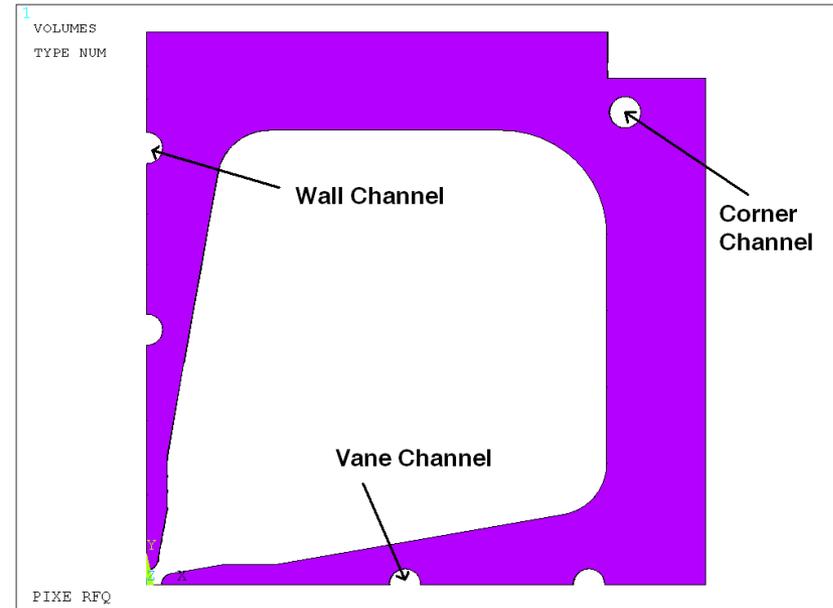
XY positioner partial assembly



Motor hardware, supports, and switches on order, due in December. Should have system constructed and tested before Module 2 complete.

RFQ Cooling Channels

- PXIE RFQ is cooled via wall, corner and vane water channels
 - Can be used for dynamic tuning of the RFQ
 - Allow for different channel temperatures
 - Temperature difference must be regulated to better than 0.1°C to keep RF drive compensation below 1dB.



PXIE Frequency Shift	Average
Overall (kHz/°C)	-2.8
Vane (kHz/°C)	-16.7
Wall (kHz/°C)	13.9
Sum of Vane and Wall (kHz/°C)	-2.8
Theoretical Shift (kHz/°C)	-2.9
% Error	3.8%

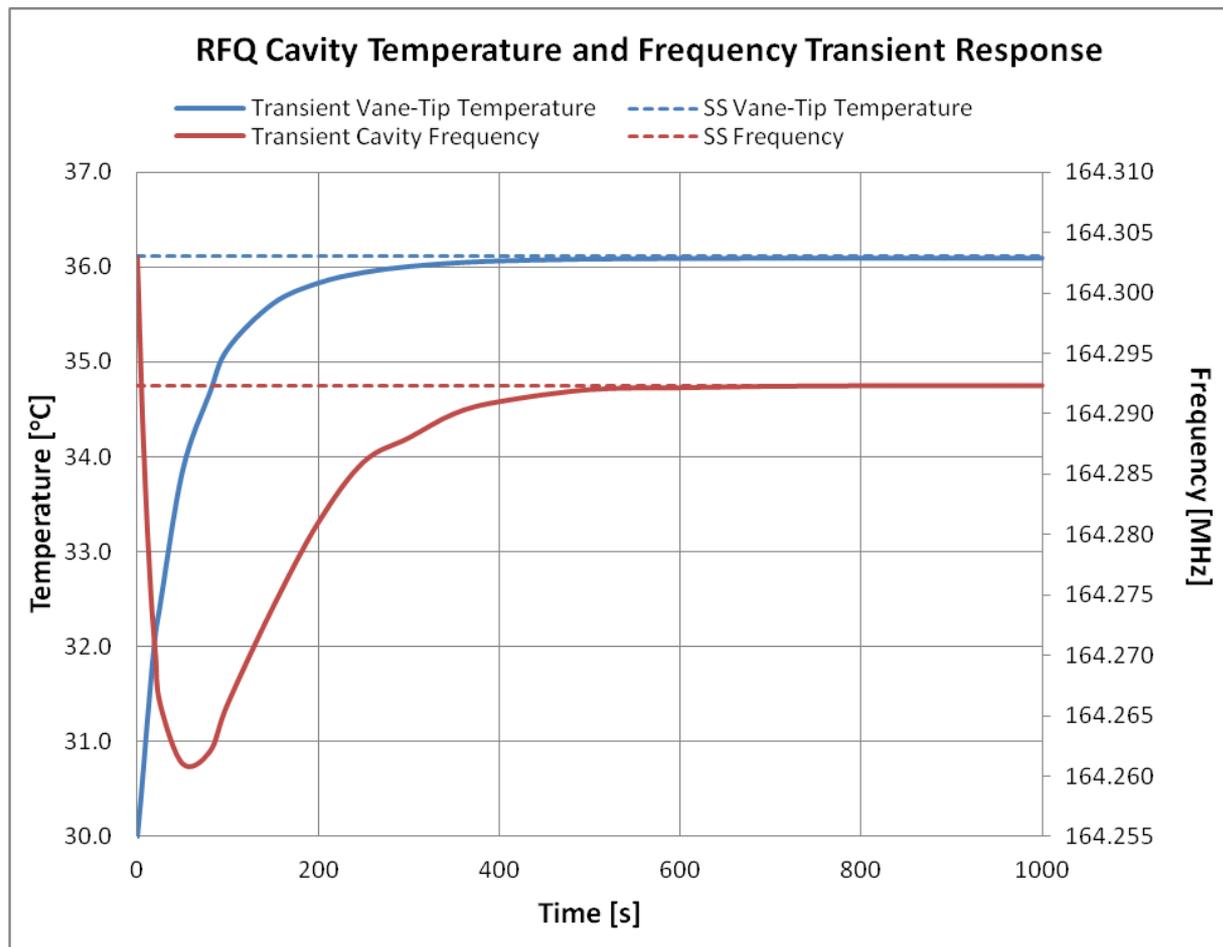
RFQ Cooling Conclusions

- PXIE RFQ cooling requirements:
 - Chiller 1: 38 kW @ 78 GPM
 - Chiller 2: 65 kW @ 163 GPM
- Instrumentation
 - Pressure: 16
 - Temperature: 36
 - Flow Rate: 28

Water system designers aware of specifications.

Plan to have chiller system specified in time for FY15 purchase.

Temperature and Frequency Response



Time response of resonant frequency from a cold start.

Laundry List of Tasks

- Currently working on hazard and operational limit analysis on each RFQ subcomponent; includes analyzing x-ray shielding requirements.
- Need to come up with documented commissioning plans for subcomponents (i.e. bead pull, RF power testing, input coupler test cavity).
- Need to come up with comprehensive RF control design, including water cooling design and limitations.
- Need to come up with RF interlock system design. NML design not compatible with CW operation.