

Princeton University

Plasma Physics Laboratory

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Princeton, N.J. 08543

25 October 2005

Ms. Nancy Horton  
Energy Industries of Ohio  
6100 Oak Tree Boulevard, Suite 200  
Independence, Ohio 44131

SUBJECT: Subcontract S005242-F  
**REVISION 1 TO** Request for Deviation (RFD) Number 14-009

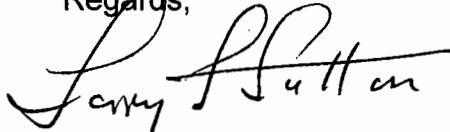
Dear Ms. Horton:

Attached is **Revision 1 to** Princeton Plasma Physics Laboratory (PPPL) initiated RFD 14-009.

Item No. 3 of the RFD is modified in this Revision No. 1 to include a drawing of the nut.

If there are any questions pertaining to this matter I may be contacted at (609) 243-2441 and by e-mail [lsutton@pppl.gov](mailto:lsutton@pppl.gov).

Regards,



Larry L. Sutton  
Senior Subcontract Administrator

Attachment: As stated

<i>NCSX RFD</i> <i>Part I</i>	Number: 14-009 Rev 1	RFD Description: Deviations on C1 Casting that are Applicable to Downstream Castings
Initiator: Phil Heitzenroeder		Organization: PPPL
List of Impacted Documents: ( <i>Specification, MIT/QA Plan, SOW, drawing, etc.</i> ): CSPEC (NCSX-CSPEC-141-03) and drawings SE141-103 (Item 1), SE141-078 (Item 2), DS11-036 (Item 3), and SE141-116 (Items 4-9).		
Cost Impact: ( <i>If none, so state</i> ): TBD, but C2 casting changes anticipated to be <\$2K. EIO/MTM to provide more detailed estimate within 30 days of receipt of this RFD.		
Schedule Impact: ( <i>If none, so state</i> ): TBD, but C2 casting changes not anticipated to result in a delay. EIO/MTM to provide more detailed estimate within 30 days of receipt of this RFD.		
Quality Impact: ( <i>If none, so state</i> ): NONE		
State Requirement Deviation is Requested For: ( <i>Specification, MIT/QA Plan, SOW, drawing, etc.</i> ): CSPEC will be updated (Rev 10 in process) and will incorporate drawings and models that include these changes.		
Full Description of the Deviation Requested: ( <i>Use continuation pages, e-mails, letter, sketches, etc. as needed and include amplifying information as appropriate to support deviation request.</i> )		
<p><b>Deviation Requested:</b> As a result of inspections of C1 casting, it was determined that the following changes shown on the attachment are necessary for all follow-on C castings to facilitate/correct errors and omissions:</p> <ol style="list-style-type: none"> <li>(1) Item 1 – Washer shown on SE141-103 is not compatible with insulator sheet (see RFD-14-008). Replacement of washer with bearing plates on SE141-137 and SE141-138 (new drawings)</li> <li>(2) Item 2 – Add instruction on drawing SE141-078 to chamfer all shim edges 1/16”.</li> <li>(3) Item 3 – Revise material on DS141-036 (stud) and DS141-060 (nut) to ASTM A453, Grade 660B. Revised 10/24/2005.</li> <li>(4) Item 4 - Change location of hole position shown on drawing SE141-116 Sheet 5 Zone E8</li> <li>(5) Item 5 – Change spherical size tolerance to +0.002/-0.003. Pilot hole up to 3/8” is acceptable. Lap final size tolerance of +0.002/-0.000.</li> <li>(6) Item 6 – Add 1/16” chamfer of all surfaces and edges of poloidal break shown on drawing SE141-116, Sheet 6, Zone D3.</li> <li>(7) Item 7 – Revise location and diameter of the interfering hole (old hole location will be removed from updated model to be provided in CSPEC Rev 10) and the diameter of other seven holes. Two views shown.</li> </ol>		

<i>NCSX RFD</i> <i>Part I</i>	Number: 14-007	RFD Description: Deviations on C1 Casting that are Applicable to Downstream Castings
Initiator: Phil Heitzenroeder		Organization: PPPL
<p><b>Full Description of the Deviation Requested: (continuation page)</b></p> <p><b>Deviation Requested:</b> As a result of inspections of C1 casting, it was determined that the following changes shown on the attachment are necessary for all follow-on C castings to ensure clearance for wings:</p> <ul style="list-style-type: none"> <li>(8) Item 8 – Revised profile tolerance on drawing SE141-116, Sheet 10, Zone D2 to +0.05/-0.1 over area defined by the IGES surface.</li> <li>(9) Item 9 – Added new drawing view to drawing SE141-116 to show instructions for area of casting.</li> </ul>		
<p><b>Attachments:</b></p> <ul style="list-style-type: none"> <li>(1) Drawing changes showing each item in detail per Meeting Notes, Review of MCWF at PPPL, dated 10/14/2005</li> <li>(2) Power Point View of IGES File showing hole location</li> </ul>		
Initiator Signature: <u>Phil Heitzenroeder/RTS</u>		<small>Digitally signed by Phil Heitzenroeder/RTS  DN: CN = Phil Heitzenroeder/RTS, C = US  Reason: I am the author of this document  Date: 2005.10.24 12:57:22 -0400</small>

<i>NCSX RFD</i> <i>Part III</i>	Number: 14-009	RFD Description: Deviations on C1 Casting that are Applicable to Downstream Castings
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RLM: Brad Nelson	Organization: ORNL
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Impact on Interfaces with Other WBS Elements/Items: (If none, so state): WBS 14

**RLM Recommendation:**

Approve    Do Not Approve

**Additional remarks: Incorporate into next revision of CSPEC (including drawings). All changes will be reviewed again with MTM, PPPL, and ORNL to ensure mutual understanding.**

RLM Signature: Brad Nelson Digitally signed by Brad Nelson  
DN: cn=Brad Nelson, o=US, ou=ORNL, email=nelsonbe@ornl.gov  
Date: 2005.10.24 17:47:45 -0400

**Project Disposition:**

Approved. No ECP required.

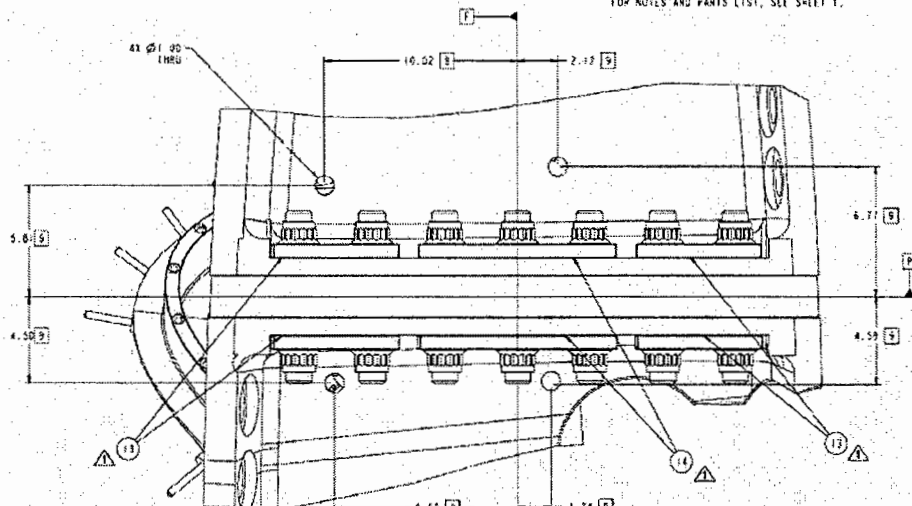
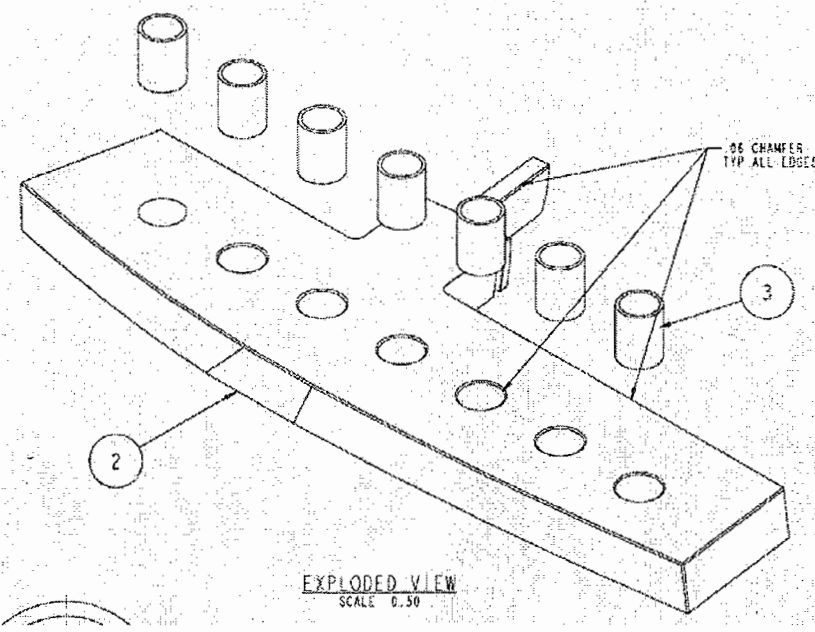
Approved. ECP -038 has been assigned and is in the process of being reviewed and dispositioned – this will be Revision 10 to CSPEC 141-03.

Bob Simmons Digitally signed by Bob Simmons  
DN: CN = Bob Simmons, C = US  
Reason: I am approving this document  
Date: 2005.10.24 11:59:19 -0400  
NCSX Systems Engineering Support Manager

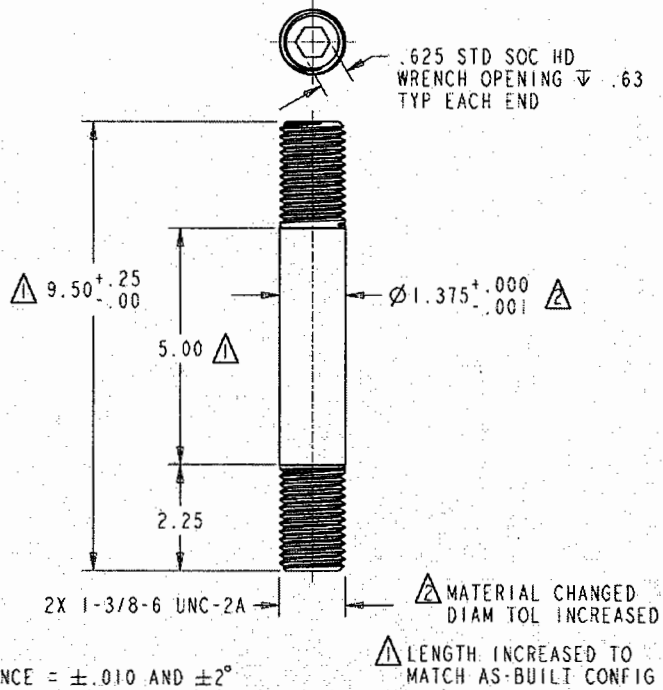
Not Approved. Reason(s) for disapproval:

Reference: Meeting Notes, Review of MCWF C1 at PPPL, 10/14/05

The following drawing changes are proposed:

Item	Drawing	Sheet	Zone	Issue	Resolution
1	SE141-103	1 2	C2 D5	Washer not suitable for thin flange, required bolt preload.	Replace washer with bearing plates, SE141-137 and SE141-138.
<p style="text-align: right;">FOR NOTES AND PARTS LIST, SEE SHEET 1.</p>  <p>The drawing shows a cross-sectional view of a component assembly. It features a central horizontal shaft with several bolts. Dimensions include 41 Ø 1.92 THRU, 16.52, 2.12, 5.0, 4.58, 6.77, 4.59, 6.50, and 1.74. Callouts 13, 14, and 15 are present. A note at the top right reads 'FOR NOTES AND PARTS LIST, SEE SHEET 1.'</p>					
2	SE141-078	1	F7	Shim edges are flush with insulator, making it difficult to seal for VPI. Also, potential for voltage breakdown.	Add instruction to chamfer all shim edges 1/16".
 <p>The drawing is an exploded view of a shim. It shows a rectangular shim with several circular holes. A chamfered edge is highlighted with a callout '3'. A note indicates 'Ø6 CHAMFER TYP ALL EDGES'. A callout '2' points to the shim. The text 'EXPLODED VIEW' and 'SCALE 0.50' is located at the bottom center.</p>					

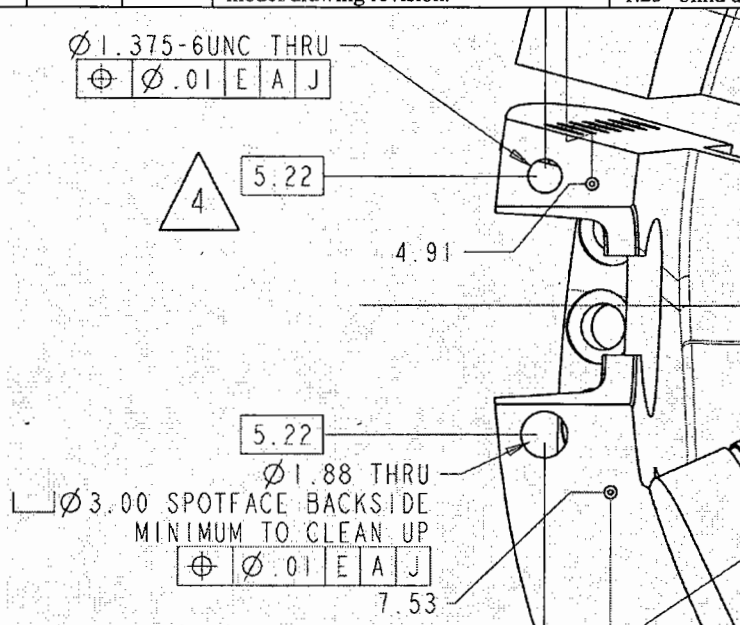
Item	Drawing	Sheet	Zone	Issue	Resolution
3	DS141-036 (stud)	1	N/A	Material specification is incorrect (both drvs) and stud length must match revised drawing to accommodate bearing plates.	Revise material to ASTM A453, Grade 660B.
	DS141-060 (nut)	1	N/A		(INFO REVISED 10/24/2005)



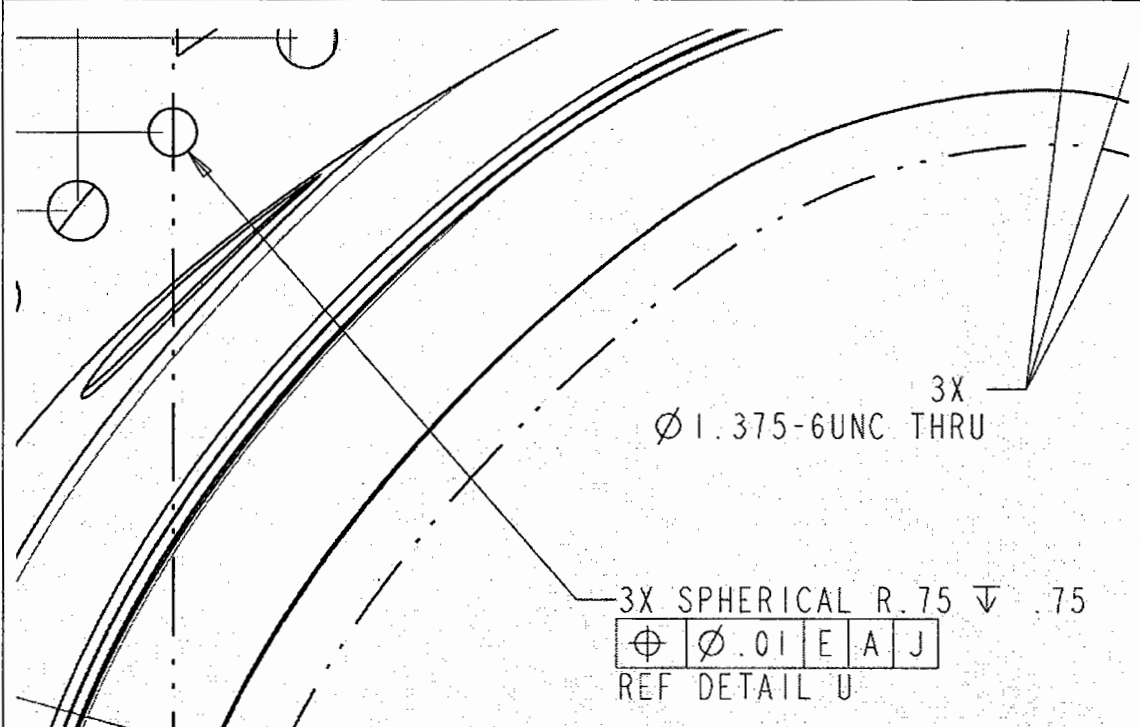
TOLERANCE =  $\pm .010$  AND  $\pm 2^\circ$

MATERIAL	UNS S66286	SOURCE	BID / PREFERRED
SPEC	ASTM A453 GRADE 660B	VENDOR	

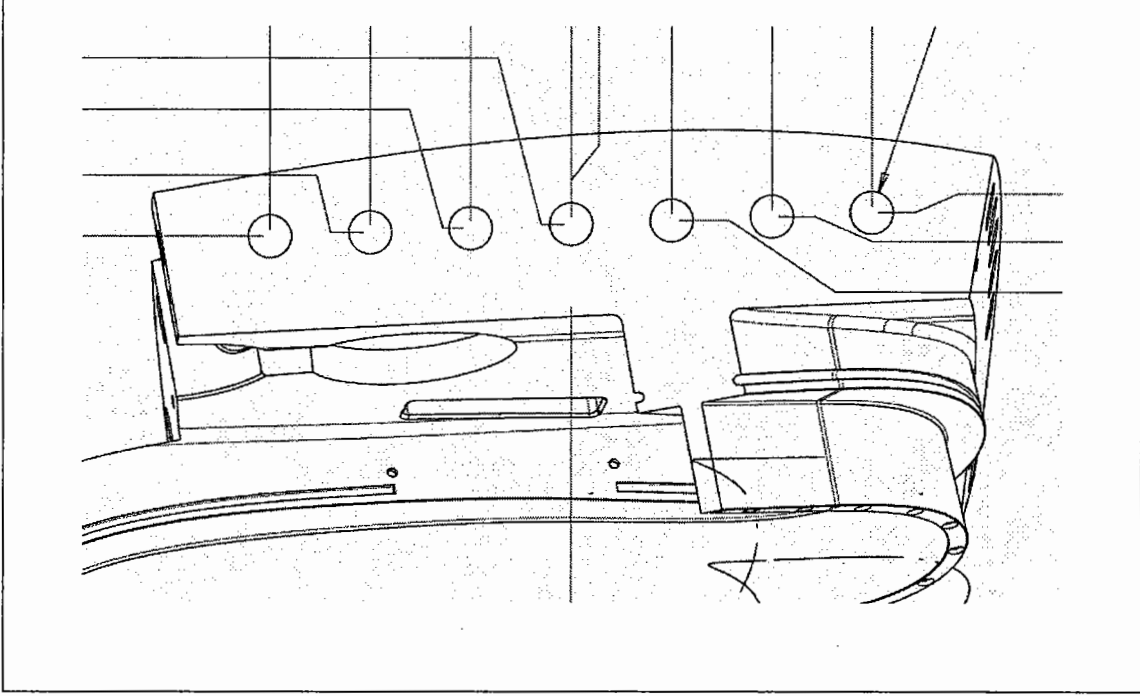
4	SE141-116	5	E8	Tapped and thru hole were not positioned according to latest model/drawing revision.	Adopt latest rev for hole position, change tapped hole from thru to 1.25" blind due to flange radius.
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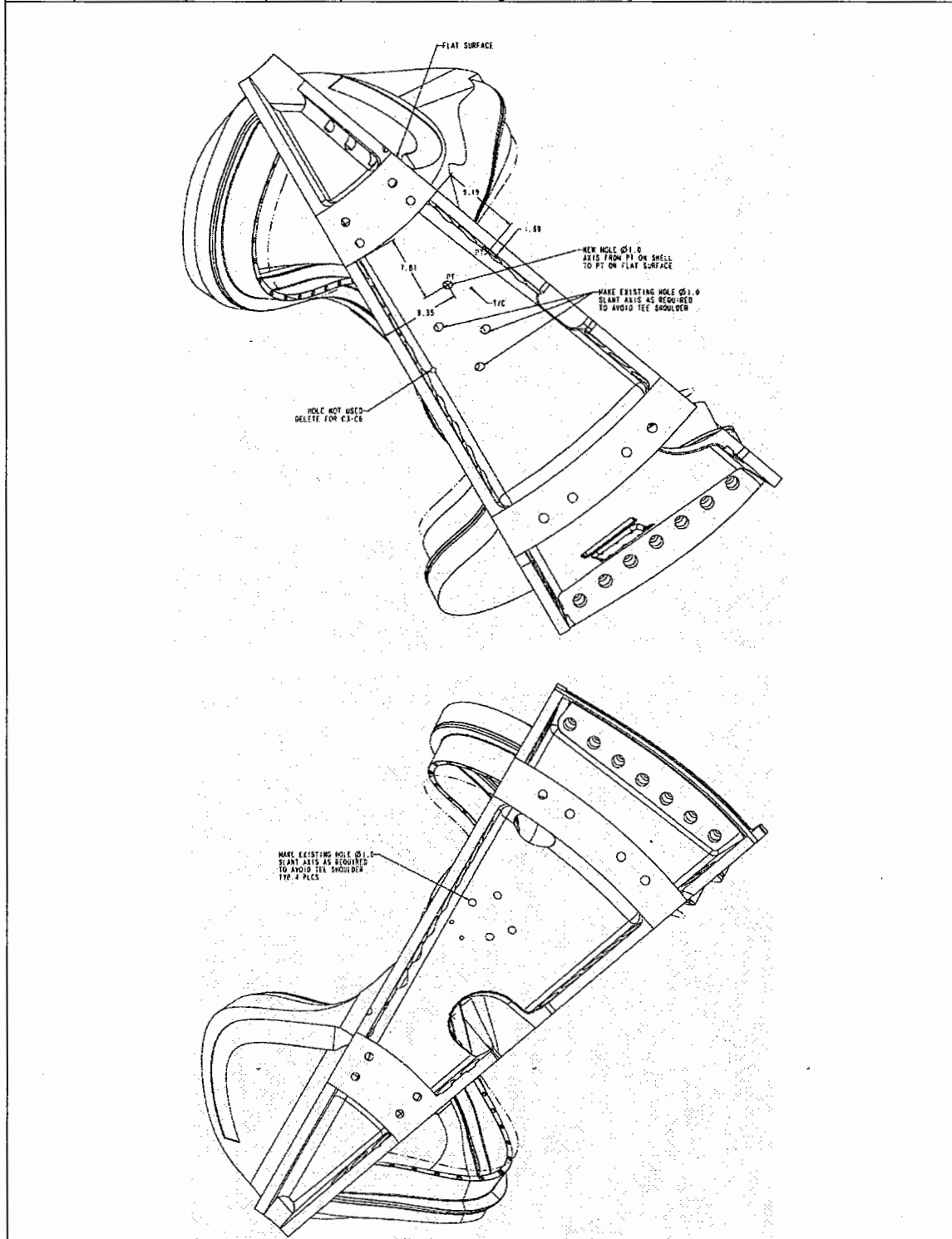
Item	Drawing	Sheet	Zone	Issue	Resolution
5	SE141-116	5	F7	Spherical seat size tolerance +/- .01 is not suitable for intended use.	Change size tolerance to +.002/-.003. Pilot hole up to 3/8" is acceptable. Lap finish to final size tolerance of +.002/-.000.



6	SE141-116	6	D3	Poloidal break edge is flush with insulator.	Add instruction for 1/16 chamfer all surfaces and edges of break.
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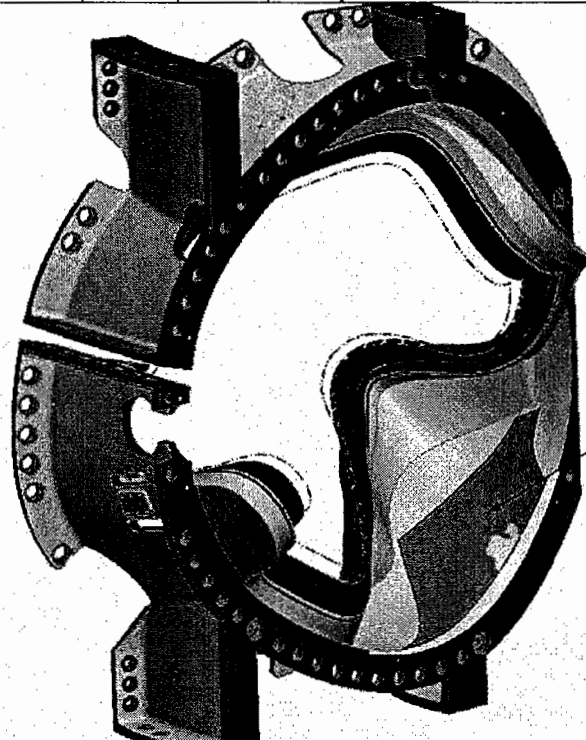


Item	Drawing	Sheet	Zone	Issue	Resolution
7	SE141-116	9	C7 F3	Cooling inlet/outlet thru hole diameter is too small, and one hole interferes with flange.	Revise location and diameter of the interfering hole and the diameter of the other seven holes.



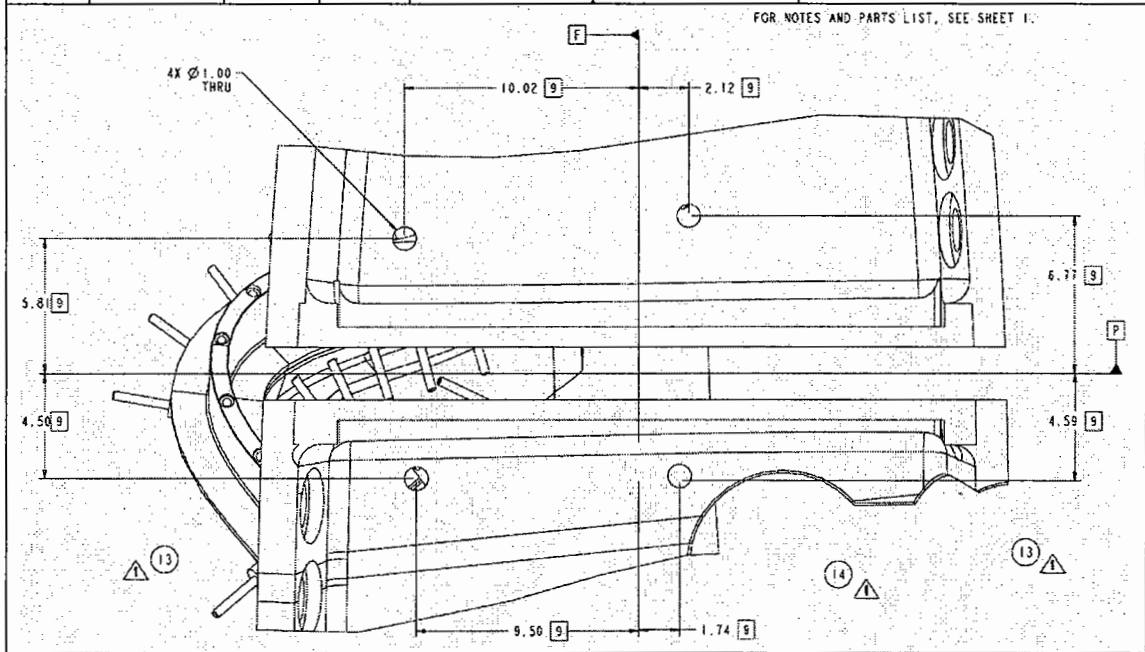


Item	Drawing	Sheet	Zone	Issue	Resolution
8	SE141-116	10	D2	As-cast tolerance is not suitable over a small area where wing of adjacent coil overlaps.	Revise profile tolerance to +0 / -.1 over area defined by IGES surface.



MACHINE / GRIND THIS AREA TO PROFILE TOLERANCE OF +0/ -.1

9	SE141-116	NEW	N/A	Four thru holes to be added for cooling line inlet/outlet at poloidal break.	Add drawing view.
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**Attachment 2  
IGES View of Holes**

Hole Features in IGES Format

