PPPL ENGINEERING CHANGE NOTICE (ECN) ECN # 5128R2

COGNIZANT INDIVIDUAL: D. Williamson

ECN TITLE: MCWF Type-A and -B Modifications

ASSOCIATED ECP: None

CC/WP/Job:9450-1*-1403** **AREA OR PROJECT: NCSX**

LIMITATION OF SCOPE - NOTE: A Work Planning Form is NOT required if the total change to be accomplished (ENG-032):

- Is not large or complex or does not represent a new installation into a usable space
- Does not have a significant ES&H impact
- Does not involve tritium or other radioactive contaminated or activated equipment
- Does not impact multiple projects, systems, or groups

OR does not change the scope or intent of the original design.

Responsible Line Manager CONCURRENCE: Brad Nelson Digitally signed by Brad Nelson DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov Date: 2006.06.15 09:52:47 -04'00'
(Signature indicates that no Work Planning form is required.)

If non-concurrence or associated with a work planning form, enter the WP Number:

DRAWING(S) AFFECTED NUMBER:	NEW Revision	TITLE
SE140-129	**0**	**Type-ABC Flange Hole Layout**
SE141-114	**7**	**Production Winding Form Type-A**
SE141-115	**8**	**Production Winding Form Type-B**
SE141-058	**3**	**Type-B Poloidal Break Shim Asm**
SE141-048	**3**	**Type-A Poloidal Break Shim Asm**

DESCRIPTION OF CHANGE: (State Drawing No., Zone/Group, or List Attachments)

1) Revise Type-A flange holes from clearance to tapped holes per RFD-14-018. Ref drawings SE141-114, sheets 4, 5.
2) Revise Type-B flange holes per memo, "Flange Hole Proposal for B Casting", from MTM, 6/9/06. Ref drawing SE141-115, sheets 4,5.
3) Revise Type-A T/C hole size and location per RFD-14-017. Ref SE141-114, sheet 9.
4) Revise Type-B T/C hole size and location per email from MTM, 6/9/06. Ref SE141-115, sheet 9.
5) Revise Type-B leads interface features, SE141-115, sheet7, quad B-4, to match lead block geometry.
6) Revise Type-B port geom to match MTM's NC programming. Ref Se141-115, sheet 8, quad C-1.

DESCRIPTION OF CHANGE (continued):
7) Revise .25-20UNC hole chamfer on -114, sht4, B4, -115, sht4,E1, -115, sht5, F7
8) Remove conflicting dimensions from poloidal break detail. Ref -114, sht 6, quad F7.
9) Revise size, location of VPI bleed hole shown on -115, sht-5.
10) Add "tee hole" to poloidal break shims. Ref SE141-048, SE141-058.
11) Removed tapped holes from Type-B tee in high-stress region. Ref SE141-115, sht2

REASON FOR CHANGE:

Major Tool noted casting interference at the bolt locations as shown in the attached figures for the Type A castings The interference is similar to what was noted on the Type-C winding forms, but more severe. NCSX reviewed the layout for Type-A and -B coils and changed some holes from clearance holes to tapped holes as shown in the attached figure.

In order to facilitate the drilling of the thermocouple holes, MTM proposed to increase the diameter of the hole for all except the last inch of depth. In addition, the location of the inboard thermocouple was changed to eliminate a setup.

Port geometry was changed very slightly in order to use a common setup for nearby external features on the part.

A Project-initiated modification to improve the lead block positioning resulted in a slight reorientation (2.2° horizontal change at the top and 0.114" vertical change) of the Type-B lead slots as shown in the figure (Ref RFD-14-022).

Tapped holes in the flanges (.25-20UNC) have an incorrect chamfer callout on the drawing, though the model is correct.

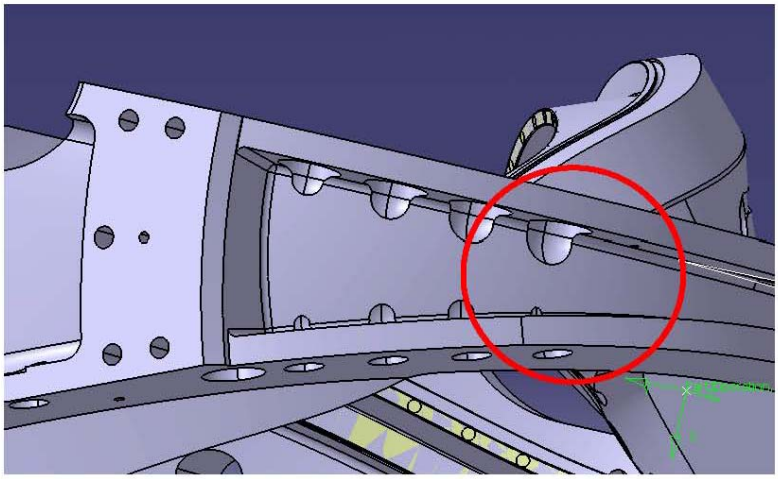
Bleed holes were not called out on -115, and one of them is the wrong size. The hole axis represented in the model may exit the casting at a bad spot, depending on the amount of stock present. Dimensions and note should allow some flexibility in hole location while meeting the requirements.

Tapped holes have been removed from a portion of the Type-B tee to improve stress.

ENGINEERING CHANGE PROPOSAL: N/A DATE: June 15, 2006

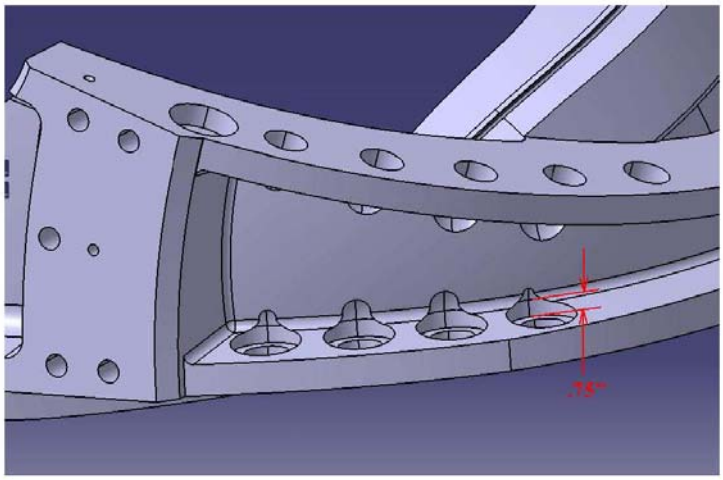
COGNIZANT INDIVIDUAL MAKING THE CHANGE: D. Williamson
David Williamson
2006.06.15 09:42:28 -04'00'

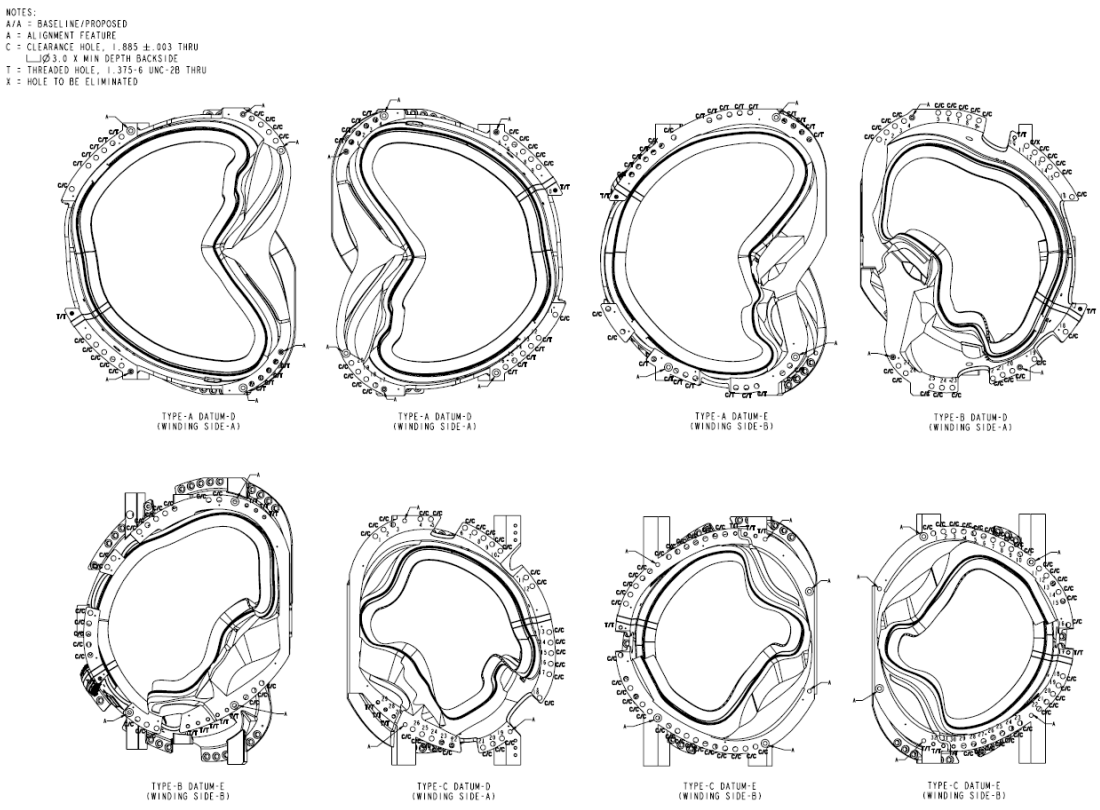
RESONSIBLE LINE MANAGER: B. Nelson Brad Nelson
Digitally signed by Brad Nelson
DN: cn=Brad Nelson, c=US, o=ORNL, ou=FED, email=nelsonbe@ornl.gov
Date: 2006.06.15 09:53:30 -04'00'



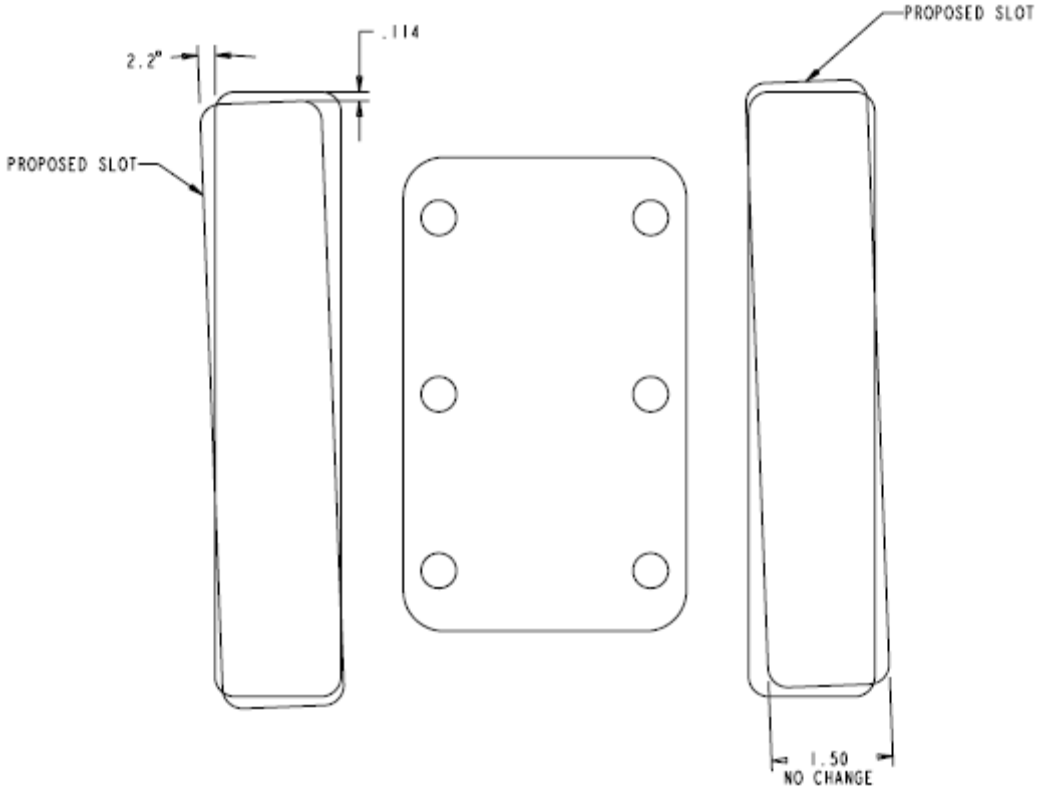
Relief area cut into cast wall

The pictures below illustrate how much casting wall interference there will be on the type A casting. The current machining models for all three winding forms have this interference problem to some degree. The models have a 3" counterbore that extends .75" from the face and the remainder of the feature is a 1.5" radius (see below). This is why Major Tool had to perform the grinding around the counterbores on C4 in order to get the 3" diameter gage to fit.



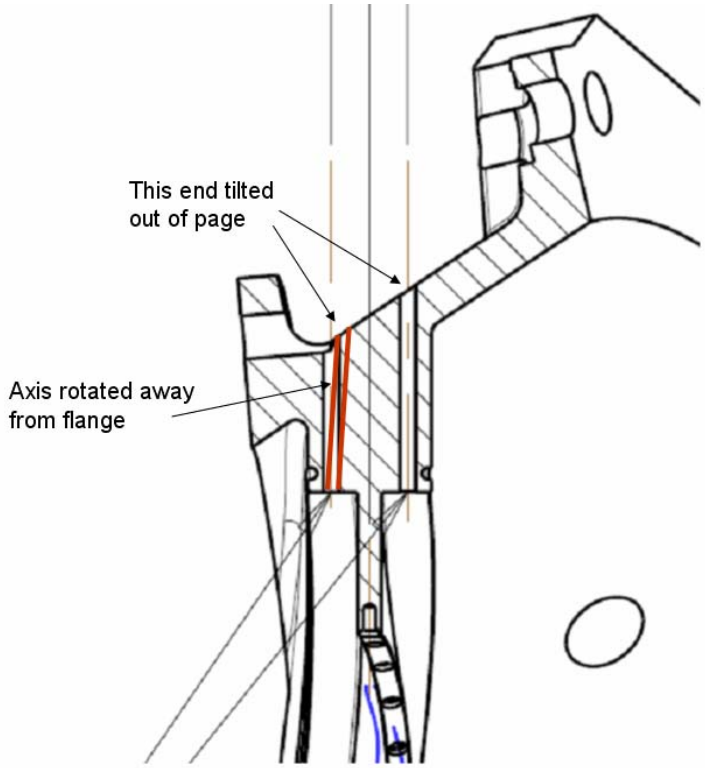


Ref drawing SE140-129 (to be released)

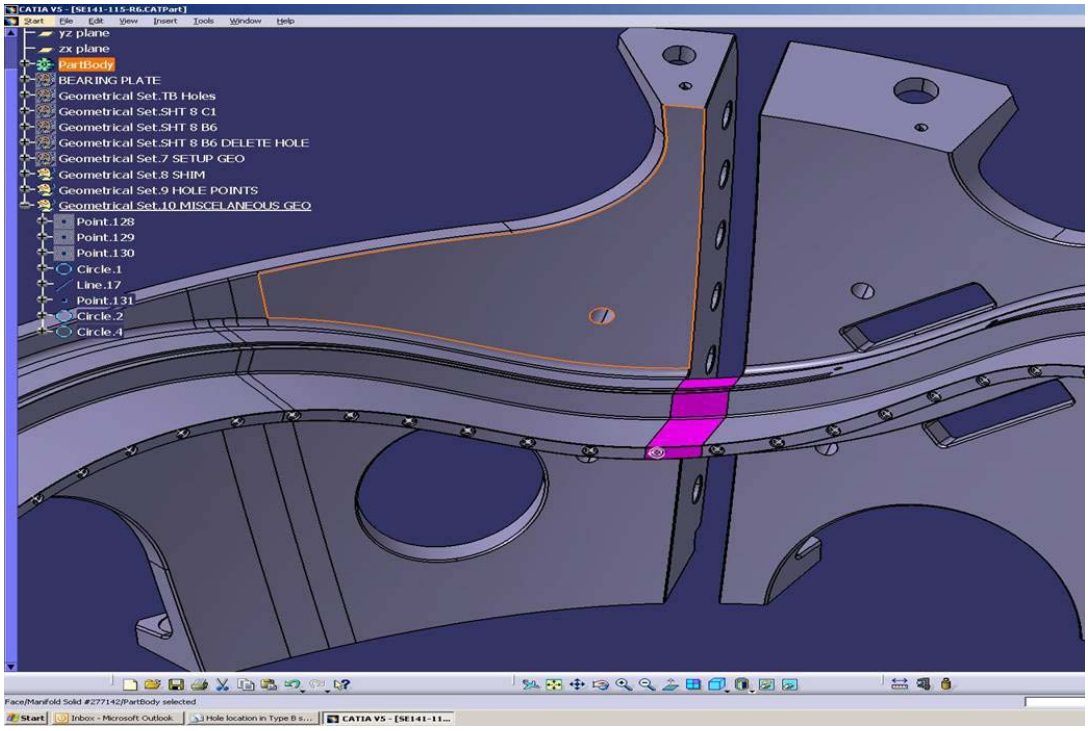


Type-B leads area (Ref SE141-115, sht7, B4)

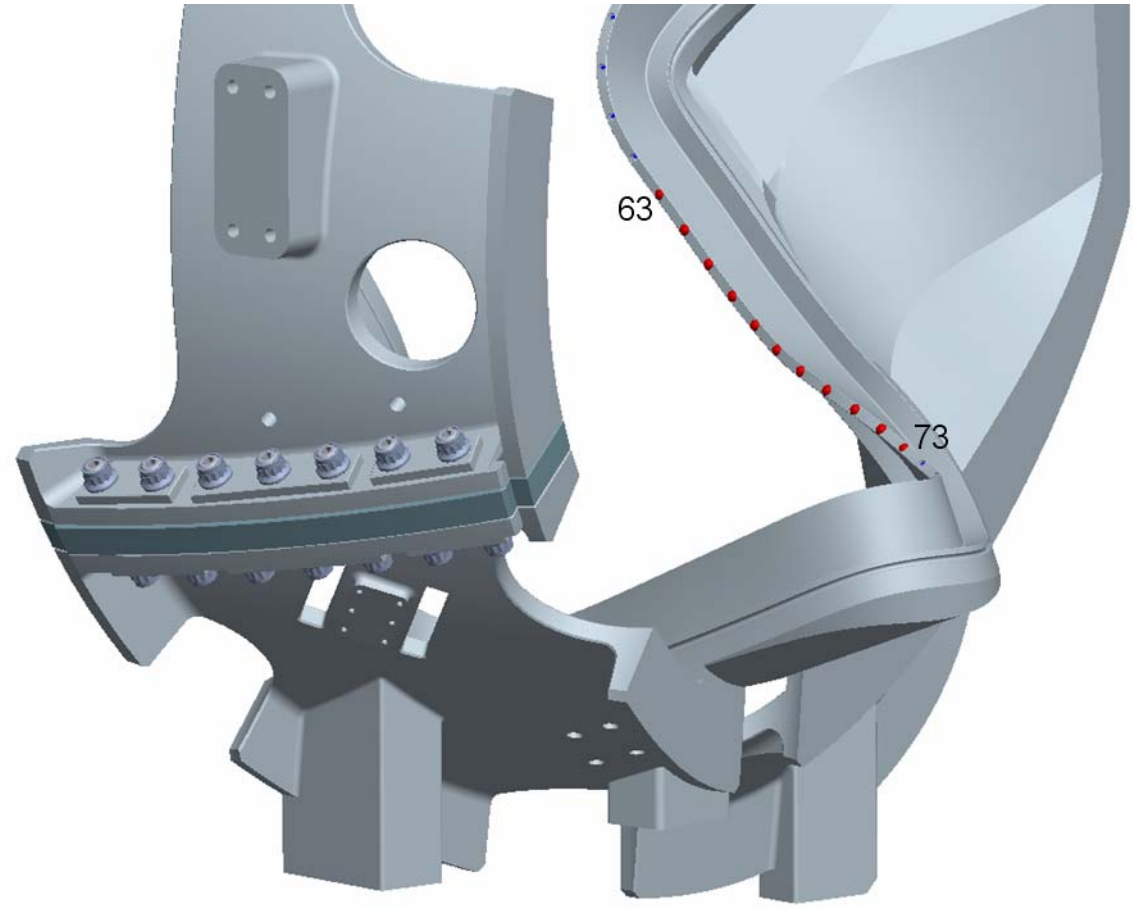
ECN # 5128R2



Type-B VPI Bleed Holes



Type-B Tee Hole in Shim



Type-B Tee Holes Changed to "Spot-Face Only"