

PPPL ENGINEERING CHANGE NOTICE (ECN) ECN #5178R1

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|--|------------------------------|
| COGNIZANT INDIVIDUAL: Michael Kalish | |
| ECN TITLE: TF Coil Manufacturing Upgrades | |
| ASSOCIATED ECP: None | |
| CC/WP/Job: 9450 1*** 1361 | 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: _____
(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: | Current Revision | TITLE |
|--|-----------------------------|----------------------------------|
| SE131-085 | 2 | TF Coil Nose Casting Machining |
| SE131-035 | 1 | TF Coil Winding Assembly |
| SE131-003 | 1 | TF Coil Final Assembly |
| SE131-053 | 1 | TF Coil Lead Long Bent Right |
| SE131-081 | 1 | TF Coil Lead Long Right (Unbent) |

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

Changes that were requested by ETI to enhance manufacturability (See Attached ETI memo):

- Add Notch to the front edge of the Wedge Casting to make the glass tape wrap underflush on SE131-085.
- Add .406dia x .50deep tooling holes to front and back of wedge on SE131-085 per markup.
- Remove 3/8-16 tooling holes in four places on SE131- 085.
- Add 1/8" radius at the top and bottom edges of the Wedge Casting sheet 1 of SE131-085, Zones K4 and B4.
- Update the assembly drawing SE131-035 to show the boot at the top and the bottom of the Wedge Casting Blended in.
- Change note 1 on assembly drawing SE131-003 sheet 3 to reflect 6 inspection locations.
- Add 1" wide .040" deep fly cut on front surface of wedges at 6 inspection locations on final assembly drawing SE131-003.

PPPL Initiated Changes:

- Update the TF Flag Drawings (SE131-053 and SE131-081) to correct flat pattern so that it matches the model for Long Lead Right (Unbent) SE131-081 and Long Lead Right Bent SE131-053.
- Change Reference dimension on drawing SE131-035 Sheet 2 in zone C3 From: 27.428 To: 27.433.
- In Final Assembly Drawing (SE131-003) add clearance holes for metrology reference points designated in the TF Assembly Specification).

REASON FOR CHANGE:

ETI Requested Changes:

- Notch added to make tape on wedge under flush in VPI mold to enhance manufacturability (SE131-085).
- Tooling holes .406dia added to hold wedge assembly during final machining of wedge angle (SE131-085).
- Tooling holes 3/8 dia not required by Everson therefore these were removed (SE131-085).
- External radius added to wedge to enhance manufacturability of mold which needs an inside radius (SE131-085).
- The epoxy glass boot which pins the wedge structure in place will be feathered into the ground wrap instead of having a step to enhance manufacturability of the VPI mold.
- Number of inspections points were changed because one inspection point fell under the wrap (SE131-035).
- A .04" fly cut was added at the inspection points to provide a precise surface for the inspection fixture (SE131-003).

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REASON FOR CHANGE (continued):

PPPL Initiated Changes:

- Mistake corrected in flat pattern and bent TF Flag drawings to agree with model (se131-053 AND se131-081).
- Reference Dimension Corrected on SE131-035.
- Access holes on front face of wedge are added for metrology and assembly purposes (SE131-003).

ENGINEERING CHANGE NOTICE APPROVALS:

DATE: 11/14/2006

COGNIZANT INDIVIDUAL MAKING THE CHANGE:

RESPONSIBLE LINE MANAGER:

RLM COMMENTS: *Update drawings immediately.*

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November 14, 2006

Mr. Rodney Templon
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Plasma Physics Laboratory
Procurement Division
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Subject: Request for Modification to Subcontract #S006639-A, Torodial Field Coil Assemblies

Mr. Templon,

I would like to request a modification to the subject subcontract to address the following issues. The requested changes do not have a cost or schedule impact to the subcontract.

Request #1 – Modification to the proposed payment schedule

Everson Tesla would like to change the payment schedule in Article III of the subcontract. We would like to change item #2 and item #3 into a single item with a value of \$360,000.00. The remaining dollars left from items #2 and #4 will be spread across the coils in items #5 through #22.

The requested change is the result from change in the raw material for the wedge construction. The original proposal wedge material was a solid stainless steel plate construction method. We have changed the construction method to a casting. The change has resulted in a more consistent method for achieving the required magnetic permeability specification. The costs associated in the milestone payment are for the raw material to make the castings. The foundry uses ingots of the constituent components to mix the correct chemistry to yield the specific material specified. There are additional costs for engineering associated with casting pattern fabrication, computer simulations for the pouring of the casting, pattern fabrication, machine programming for the rough cut machining, shipping crate design, and project planning. There are engineering costs for the machining and drilling for the finished machined wedge assembly. This finished machined wedge has additional material that is machined off once the wedge is vacuum pressure impregnated to the coil.

The proposed payment schedule is below.

615 Daniels Road • Nazareth, PA 18064 • (610) 746-1520 • FAX (610) 746-1530
www.eversontesla.com

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Princeton University Plasma Physics Laboratory
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| Performance Milestone | Payment | Delivery Date |
|------------------------------|----------------|---------------|
| Tooling | \$186,345.00 | 8/15/2006 |
| Wedge Material & Engineering | \$360,000.00 | 10/31/2006 |
| Tooling (Climax) | \$75,000.00 | |
| Coil 1 Accepted | \$42,630.64 | 2/5/2007 |
| Coil 2 Accepted | \$42,630.64 | 2/26/2007 |
| Coil 3 Accepted | \$42,630.64 | 2/28/2007 |
| Coil 4 Accepted | \$42,630.64 | 3/9/2007 |
| Coil 5 Accepted | \$42,630.64 | 3/23/2007 |
| Coil 6 Accepted | \$42,630.64 | 4/6/2007 |
| Coil 7 Accepted | \$42,630.64 | 4/20/2007 |
| Coil 8 Accepted | \$42,630.64 | 5/4/2007 |
| Coil 9 Accepted | \$42,630.64 | 5/18/2007 |
| Coil 10 Accepted | \$42,630.64 | 6/1/2007 |
| Coil 11 Accepted | \$42,630.64 | 6/15/2007 |
| Coil 12 Accepted | \$42,630.64 | 6/29/2007 |
| Coil 13 Accepted | \$42,630.64 | 7/13/2007 |
| Coil 14 Accepted | \$42,630.64 | 7/27/2007 |
| Coil 15 Accepted | \$42,630.64 | 8/10/2007 |
| Coil 16 Accepted | \$42,630.64 | 8/24/2007 |
| Coil 17 Accepted | \$42,630.64 | 9/7/2007 |
| Coil 18 Accepted | \$42,630.62 | 9/21/2007 |
| Tooling & Res. Material | \$84,983.50 | 9/28/2007 |
| | | |
| Total | \$1,473,680.00 | |

Request #2 – Drawing changes to the wedge assembly.

The proposed change is to allow for safe handling and machine fixture hold down points of the wedge assemblies. The requested drawing changes are to call out tapped holes. The requested changes have been discussed with and accepted by the PPPL Technical Representative. An overview of the requested drawing changes is provided below.

Add Notch to the front edge of the Wedge Casting to make the glass tape wrap underflush on dwg SE131-085

Notch added to make tape on wedge under flush in VPI mold to enhance manufacturability

Add .406dia x .50deep tooling holes to front and back of wedge on dwg SE131-085

Tooling holes .406dia added to hold wedge assembly during final machining of wedge angle

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Remove 3/8-16 tooling holes in four places on dwg SE131-085
Tooling holes 3/8 dia not required by Everson so removed

Add 1/8" radius at the top and bottom edges of the Wedge Casting sheet 1 of SE131-085,
K4 and B4.
External radius added to wedge to enhance manufacturability of mold which needs an inside
radius

Update the assembly SE131-003 drawing to show the boot at the top and the bottom of the
Wedge Casting Blended-in.
The epoxy glass boot which pins the wedge structure in place will be feathered into the
ground wrap instead of having a step to enhance manufacturability of the VPI mold

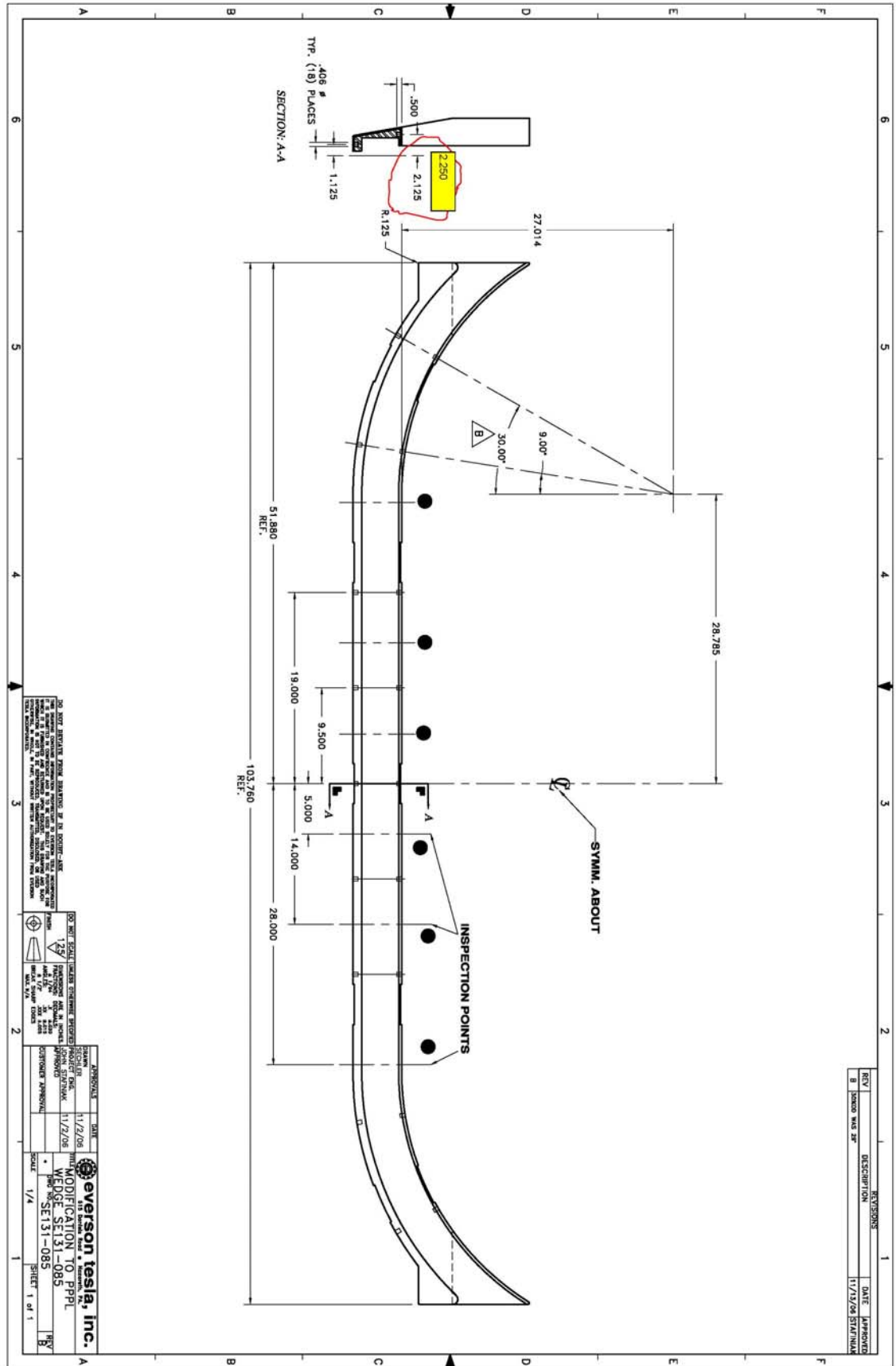
Add 1" wide .040" deep fly cut on front surface of wedges at 6 inspection locations on final
assembly drawing SE131-003.
Added at the inspection points to provide a precise surface for the inspection fixture

Please review these modification requests and let me know if there is any additional information
that is needed. I appreciate your consideration to these requests.

Regards,

Bill Umbenhour
Everson Tesla, Inc.

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| | | |
|-----------|----------|--|
| REVISIONS | DATE | DESCRIPTION |
| B | 11/15/06 | STANDARD |
| A | 11/21/06 | MODIFICATION TO PPPL WEDGE SET 131-085 |

everson testa, inc.
 131-085
 WEDGE SET 131-085
 SCALE: 1/4"
 SHEET 1 of 1

| | | |
|-----|-------------|----------|
| REV | DESCRIPTION | DATE |
| B | STANDARD | 11/15/06 |