



Corrective Action  
Carondelet Division - CA / PA / RGA Database  
Corrective Action Type NCR  
Date 8/1/2005 Revised 1-20-06  
CA Originator C. Ruud  
Applies to: A-1Coil

1347

### **Description of Defect / Non-Conformance**

Wall thickness below model minimum. Localized areas were measured below the 1.375" minimum wall thickness during metrology. MetalTek independently verified wall thickness and confirmed condition.

### **Root Cause**

The tooling produces a casting with a wall thickness less than required by the model. Measurements taken on A-3, A-4 and A-5 are consistent and lower than predicted by the model. Material losses during normal processing and heat treat with A-1 and A-2 are also a factor.

### **Corrective Action**

Request "Use As Is" disposition on wall thickness related dimensions on A-1 coil.

### **Verification of Corrective Action**

Not required. PPPL independently verified in conjunction with ORNL the design performance at a wall thickness of 1.05". Results were deemed adequate. Minimum measured dimension is 1.18" (to be verified).

### **Preventive Action**

Several steps need to be taken to resolve and propose:

1. Validation of 3D Scanco data. MetalTek proposes to use Romer Arm with Laser scanner as validation technique. This instrument will be used to validate subsequent parts and minimizes measurement technique error.
  - Completed - The data provided by 3D Scanco has been validated on A1.
2. Report to PPPL/ORNL. Understanding the concern that the wall not be thinner than measured and the limitations of the process, e.g. setting a large core into a mold with overhead crane, MetalTek will submit layout results to EIO wand set teleconference to review remediations to tool.
  - It was determined to produce A2 with no tooling changes.
3. Upon verification of 3D Scanco data, MetalTek will confirm results to EIO team to begin root cause determination. Additional layout may be required to assure compliance of tooling, depending on results of layout.
  - Transfer caliper dimensions were taken on A-2 and A-3 at pre-clean step and shown to exceed required minimum wall thickness. However a layout performed using Romer Arm indicated dimensions consistent with A-1.

4. Modification to tooling. Limited tooling modifications may be performed without severely impacting schedule or negating previous engineering (solidification modeling, etc.). These will be evaluated and proposed, where appropriate.  
- No tooling changes have been made.
5. Permanent deviation. Based on results of above, a permanent deviation may be required to dimensional tolerances in limited areas of the component. These will be known in greater detail later.

**Actual Completion Date**

All items complete, except a deviation.

Signed: C. Ruud 

CC: Roger Broman, Barry Craig, Joe Edwards, E.J. Kubick, J. Markham