

## *DR's for Serial # QXFA202*

<i>DR</i>	<i>Description</i>	<i>Status</i>	<i>Disp.</i>	<i>Action Req</i>	<i>Closed Date</i>
AM-094	Loose strand during respooling	F	UAI		10/16/2018
AM-095	V-TAP mislocated	F	RPR	10/16/2018	10/19/2018
AM-097	Cable collapsed	F	RWK	10/16/2018	10/19/2018
AM-098	Insulation damage from V-TAP slit	F	RPR	10/16/2018	10/19/2018
AM-099	Raised wire during winding	F	RPR	10/16/2018	10/19/2018
AM-100	Cable collapsed during winding. Turns 15 & 19	F	RWK	10/16/2018	10/19/2018
AM-101	Cable collapsed during winding. Turns 1,9,10	F	RWK	10/16/2018	10/19/2018
AM-104	Conductor displaced radially during cure cycle	F	RWK	1/3/2019	1/7/2019
AM-108	Argon flow slowed	F	UAI		1/4/2019
AM-110	V-Taps Mislocated	F	RPR	11/29/2018	11/29/2018
AM-112	Insulation degradation @ LE saddle	F	RWK	1/7/2019	1/7/2019
AM-113	Midplane shim thickness anomalies	F	RWK	1/14/2019	1/14/2019
AM-118	Electrical values out of range	F	UAI		3/11/2019

# MAGNET DISREPAANCY REPORT

DR NUMBER: AM-094

Preliminary: 9-11-18

Action Required: ~

Final: 10-16-18

Part No: F10030927		Rev	Traveler No.: AUP-100	Rev: A
Part Name: QXFA Coil Winding & Curing			Traveler OP No.: 230	
Qty: 1	Ser. No./Lot No.: QXFA202		Operation: Respooling	
Initiator: H. Hocker		Life No.: 22131	Date: 9-11-18	
Type of Problem: (Check) Mechanical      Electrical      Other <input checked="" type="checkbox"/>				
Description			Disposition	CE
Continue on reverse side if required			RWK, RPR, UAI, SCP	DQAR
During respooling, a raised strands were detected on the side facing down (the side which would face the coil island). The raised strands continued for most of the length of the conductor.			UAI	<i>[Signature]</i>
Instructions: Continue on additional sheets if required			Name	Life #
USE AS IS - MONITOR AND NOTE CABLE STABILITY DURING COIL WINDING				
Reason for Discrepancy:				
UNSTABLE CABLE				
Corrective Action:				
REPORT ISSUE TO CABLE FAB GROUP - DONE 10/15/18				
Report reviewed by CE <i>[Signature]</i>			Date	<u>9/28/18</u>
DQAR <i>[Signature]</i>			Date	<u>10-16-18</u>

Distribution:  
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 Section Head, Electrical Systems  
 Section Head, Production Engineering

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 Date: 9-13-18

**MAGNET DISREPANCY REPORT  
(Continuation)**

Sketch:

Instructions:	Name	Life #	Date



**MAGNET DISREPANCY REPORT**  
**(Continuation)**

Sketch:

Instructions:	Name	Life #	Date



**MAGNET DISREPANCY REPORT  
(Continuation)**

Sketch:

Instructions:	Name	Life #	Date

# MAGNET DISCREPANCY REPORT

DR NUMBER: AM-098

Preliminary: 9-12-18  
 Action Required: 10-16-18  
 Final: 10-19-18

Part No: F10030927		Rev	Traveler No.: AUP-110	Rev: A	
Part Name: QXFA Coil Winding & Curing			Traveler OP No.: 750		
Qty: 1	Ser. No./Lot No.: QXFA202		Operation: V-Tap Installation		
Initiator: H. Hocker		Life No.: 22131	Date: 9-12-18		
Type of Problem: (Check) Mechanical      Electrical      Other <input checked="" type="checkbox"/>					
Description			Disposition	CE	DQAR
Continue on reverse side if required			RWK, RPR, UAI, SCP		
During winding, the slit made for voltage tap VTA04 caused the fiberglass insulation to separate, exposing ≈1/8" of the tap flag to the adjacent turn.			RPR	<i>[Signature]</i>	<i>[Signature]</i>
Instructions: Continue on additional sheets if required			Name	Life #	Date
INSTALL A PATCH OF .003" S2 GLASS					
RIBBON ~ 1" LONG OVER THE EXPOSED			<i>[Signature]</i>	15764	10/16/18
AREA					
Reason for Discrepancy:					
SLIT CUT IN FIBERGLASS MAY HAVE BEEN SLIGHTLY WIDER THAN NECESSARY.					
Corrective Action:					
CUT SLITS ONLY TO WIDTH OF TAP AND USE A MYLAR SHIM TO OPEN GLASS BEFORE TAP INSERTION.					
Report reviewed by CE <i>[Signature]</i> 9/28/18			Date <u>9/28/18</u>		
DQAR <i>[Signature]</i>			Date <u>10-16-18</u>		

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# MAGNET DISREPAncy REPORT

DR NUMBER: Am-099

Preliminary: 10-3-18  
 Action Required: 10-16-18  
 Final: 10-17-18

Part No: F10030927		Rev	Traveler No.: AUP-130	Rev: A	
Part Name: QXFA Coil Winding & Curing			Traveler OP No.: <u>820</u>		
Qty: 1	Ser. No./Lot No.: QXFA202		Operation: Winding - Layer 2		
Initiator: <u>J. Schmalz</u>		Life No.:	Date: <u>10-1-18</u>		
Type of Problem: (Check) Mechanical      Electrical      Other <input checked="" type="checkbox"/>					
Continue on reverse side if required		Description	Disposition <small>RWK, RPR, UAI, SCP</small>	CE	DQAR
		During winding a raised wire was noted in LE of turn 26 after the turn was complete. Attempt to push wire back into position slightly damaged the fiberglass insulation.	RPR	<u>JS</u>	<u>AK</u>
Instructions: Continue on additional sheets if required		Name	Life #	Date	
Pause, unwind turn, clamp coil, reduce cable tension, use hands / duckbill pliers to work cable strands back into position, apply binder to cable and cure with heat gun, reposition cable around the coil end, increase cable tension, remove clamp, continue winding. Add a patch of .003" glass ribbon over the damaged insulation.		<u>JS</u>	<u>15764</u>	<u>10/16/18</u>	
Reason for Discrepancy:					
Unstable cable					
Corrective Action:					
Report issues to the AUP cable fabrication group. - <u>DONE 10-15-18</u>					
Report reviewed by CE <u>J. Schmalz</u>			Date <u>10/3/18</u>		
DQAR <u>[Signature]</u>			Date <u>10-16-18</u>		

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# MAGNET DISREPARCY REPORT

DR NUMBER: AM-101

Preliminary: 10-3-18  
 Action Required: 10-16-18  
 Final: 10-19-18

Part No: F10030927		Rev	Traveler No.: AUP-130	Rev: A
Part Name: QXFA Coil Winding & Curing			Traveler OP No.: <u>660</u>	
Qty: 1	Ser. No./Lot No.: QXFA202		Operation: Winding - Layer 2	
Initiator: <u>J. Schmaltz</u>		Life No.:	Date:	
Type of Problem: (Check) Mechanical      Electrical      Other <input checked="" type="checkbox"/>				
Description			Disposition	CE
Continue on reverse side if required			<small>RWK, RPR, UAI, SCP</small>	DQAR
During winding the cable collapsed when winding around the coil end.				
It collapsed as the turn around the end was nearly complete.			<u>RWK</u>	<u>98</u>
Issue occurred: Turn 1 LE, Turn 9 LE, Turn 9 NL, Turn 10 NL				<u>CS</u>
Instructions: Continue on additional sheets if required			Name	Life #
Pause winding, clamp coil, reduce cable tension, use hands / duckbill				
pliers to work cable strands back into position, apply binder to cable and				
cure with heat gun, reposition cable around the coil end, increase cable			<u>CS</u>	<u>15764</u>
tension, remove clamp, continue winding.				<u>10/16/18</u>
Reason for Discrepancy:				
Unstable cable				
Corrective Action:				
Report issues to the AUP cable fabrication group. - <u>DONE 10/16/18</u>				
Report reviewed by CE <u>J. Schmaltz</u>			Date <u>10/3/18</u>	
DQAR <u>[Signature]</u>			Date <u>10-16-18</u>	

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**MAGNET DISREPANCY REPORT  
(Continuation)**

Sketch:

Instructions:	Name	Life #	Date







# MAGNET DISREPAncy REPORT

DR NUMBER: AM-108

Preliminary: 11-2-18  
 Action Required: -  
 Final: 1-4-19

Part No: <u>F10030927</u>		Rev	Traveler No.: <u>AUP-150</u>	Rev: <u>A</u>	
Part Name: <u>COIL, REACTION</u>			Traveler OP No.: <u>735</u>		
Qty: <u>1</u>	Ser. No./Lot No.: <u>QXFA202</u>		Operation: <u>Oven Reaction Cycle</u>		
Initiator: <u>H. Hocker</u>		Life No.: <u>22131</u>	Date: <u>11-2-18</u>		
Type of Problem: (Check) Mechanical <input type="checkbox"/> Electrical <input type="checkbox"/> Other <input checked="" type="checkbox"/>					
Description			Disposition	CE	DQAR
Continue on reverse side if required			<small>RWK, RPR, UAI, SCP</small>		
During the reaction cycle, the rate of argon flow to the coil fixture slowed over a period of several hours during the 665 degree Celsius step (Step 7). Nominal flow rate is set to 25CFH. During Step 7, the flow rate slowly dropped to approx. 11 CFH before an adjustment of the supply equipment restored nominal pressure. The process alert for this flow is set to trigger at 15CFH.			<u>UAI</u>	<u>95</u>	<u>[Signature]</u>
<u>FIXTURE REMAINED UNDER POSITIVE PRESSURE AND NO INCREASE IN O2 LEVEL WAS OBSERVED</u>					
Instructions: <u>Continue on additional sheets if required</u>			Name	Life #	Date
<u>USE AS IS</u>					
Reason for Discrepancy:					
<u>ARGON CYLINDERS NOT BUILDING PRESSURE / PRESSURE BUILDING VALVE NOT OPENED ENOUGH.</u>					
Corrective Action:					
<u>CYLINDER &amp; VALVE HANDLING TECHNIQUES DISCUSSED WITH OPERATOR</u>					
Report reviewed by CE <u>[Signature]</u>			Date <u>12/5/18</u>		
DQAR <u>[Signature]</u>			Date <u>1-4-19</u>		

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 Date: 11-2-18





**MAGNET DISREPANCY REPORT  
(Continuation)**

Sketch:

Instructions:	Name	Life #	Date

# MAGNET DISCREPANCY REPORT

DR NUMBER: Am-112

Preliminary: 12-19-18  
 Action Required: 1-7-19  
 Final: 1-7-19

Part No:	Rev	Traveler No.: <u>MDC No. AUP-160</u> Rev: <u>A</u>			
Part Name:		Traveler OP No.: <u>245/585</u>			
Qty: <u>1</u>	Ser. No./Lot No.: <u>QXFA 202</u>		Operation: <u>Prep for Impregnation</u>		
Initiator: <u>Toby Levine</u>		Life No.: <u>21627</u>	Date: <u>12/4/18</u>		
Type of Problem: (Check) Mechanical <input checked="" type="checkbox"/> Electrical <input type="checkbox"/> Other <input type="checkbox"/>					
Continue on reverse side if required		Description	Disposition <small>RWK, RPR, UAI, SCP</small>	CE	DQAR
		<u>Inner layer lead end saddle fiberglass insulation between saddle curved end and coil was disintegrating and needed extra glass added.</u>	<u>RWK</u>	<u>9/1</u>	<u>2/1</u>
Instructions: Continue on additional sheets if required		Name	Life #	Date	
<u>Replace glass + add more where needed, to fill gap.</u>		<u>T. Levine</u>	<u>21627</u>	<u>12/4/18</u>	
Reason for Discrepancy: <u>  /  </u>					
Corrective Action: <u>Cut new piece of fiberglass to replace bad one and add second layer to middle section of saddle.</u>					
Report reviewed by CE <u>J. Schmaltz</u>		Date <u>1/7/18</u>			
DQAR <u>[Signature]</u>		Date _____			

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# MAGNET DISREPAncy REPORT

DR NUMBER: AM-113

Preliminary: 12-20-18  
Action Required: 1-14-19  
Final: 1-14-19

Part No:	Rev	Traveler No.: <u>AUP-160</u>	Rev: <u>A</u>
Part Name: <u>Prep for impregnation</u>		Traveler OP No.: <u>680</u>	
Qty: <u>1</u>	Ser. No./Lot No.: <u>QXFA202</u>	Operation: <u>880 Midplane shim install</u>	
Initiator: <u>T. Levine</u>		Life No.: <u>21627</u>	Date: <u>12-12-18</u>
Type of Problem: (Check) Mechanical <input checked="" type="checkbox"/> Electrical <input type="checkbox"/> Other <input type="checkbox"/>			

Description <small>Continue on reverse side if required</small>	Disposition	CE	DQAR
	<small>RWK, RPR, UAI, SCP</small>		
<u>One midplane shim was found to be .005 thicker than the other one. .091 vs. .086.</u>			
<u>Discrepancy was found to be consistent down the full length of shim, as shown on attached sheet.</u>	<u>RWK</u>	<u>JA</u>	<u>CB</u>

Instructions: <small>Continue on additional sheets if required</small>	Name	Life #	Date
<u>MARK EACH SHIM WITH ACTUAL THICKNESS.</u>			
<u>OMIT THE LAYER OF .005" MYLAR FROM THE MIDPLANE WHERE THE OVERSIZE SHIM IS INSTALLED.</u>	<u>T. Levine</u>	<u>21627</u>	<u>12/7/18</u>

Reason for Discrepancy: DISC. IN SUPPLIES TOOLING

Corrective Action: FERMI TO PROVIDE UPDATED SHIMS

Report reviewed by CE J. Schmalz Date 1/14/19  
 DQAR [Signature] Date \_\_\_\_\_

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**MAGNET DISREPANCY REPORT  
(Continuation)**

Sketch:

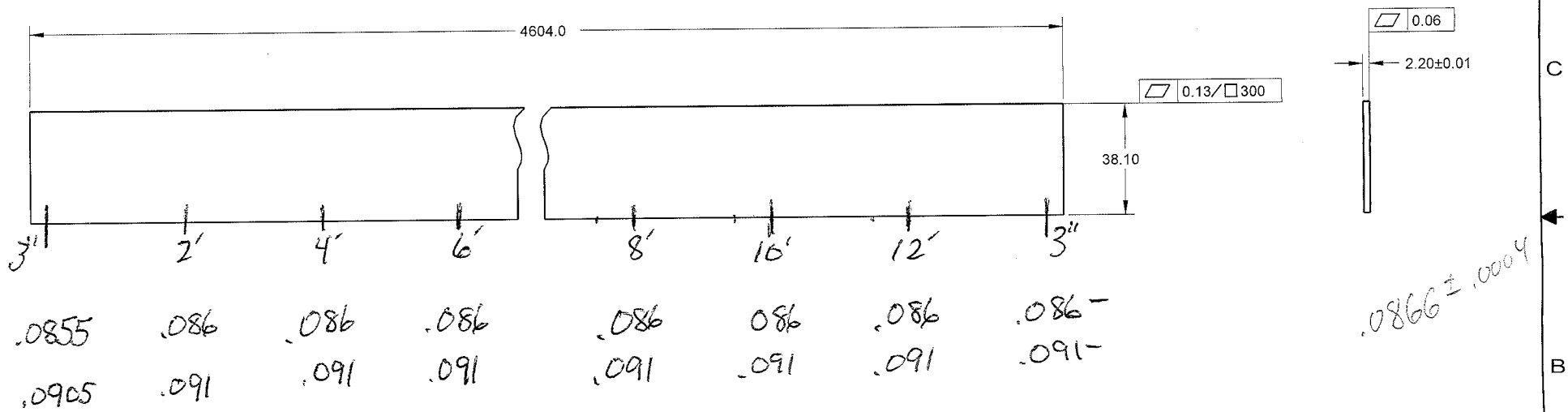
Instructions:	Name	Life #	Date

NOTES:

1. MATERIAL: STAINLESS STEEL TYPE 304 ANNEALED PER ASTM A276

ITEM NO.	QTY	DESCRIPTION	MAT	WGT. NO. NO.	REV
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DR AM-113  
2/2



.0866 ± .0004

A	INITIAL RELEASE	JS	11/15	-	-
REV	DESCRIPTION	BY	DATE	CKR	APP

INTERPRET IN GENERAL ACCORDANCE WITH ASME Y14.24 UNLESS OTHERWISE SPECIFIED		SUPERCONDUCTING MAGNET DIVISION		BROOKHAVEN NATIONAL LABORATORY BROOKHAVEN SCIENCE ASSOCIATES UPTON, N.Y. 11973	
DIMENSIONS ARE IN MILLIMETERS DECIMAL TOLERANCES X4 5 X4 13 ANGULAR TOLERANCE ± 1°		DRAWN BY SCHMALZLE 10/19/15	CHECKED BY SCHMALZLE 10/19/15	TITLE: LARP QXFA REACTION / IMPREGNATION FIXTURE MIDPLANE SHIM	
63 FINISH	BREAK SHARP EDGES MAXIMUM .20 MINIMUM .10	ENGINEER APPROVAL SCHMALZLE 10/19/15	SUPERVISOR APPROVAL ANERELLA 10/23/15	SAFETY APPROVAL CHUC 11/2/15	SIZE: C DRAWING NUMBER: 25-2033109 REV. A
		THIRD ANGLE PROJECTION		MATERIAL: NOTED SCALE: 1/1 WEIGHT: SHEET 1 OF 1	

# MAGNET DISREPARANCY REPORT

DR NUMBER: AM-118

Preliminary: 3-11-19  
 Action Required:         
 Final: 3-11-19

Part No:	Rev	Traveler No.: See Below	Rev:	
Part Name: Coil Assembly		Traveler OP No.: See Below		
Qty: 1	Ser. No./Lot No.: QXFA202		Operation: See Below	
Initiator: H. Hocker		Life No.: 22131	Date: 3-11-19	
Type of Problem: (Check) Mechanical <input type="checkbox"/> Electrical <input checked="" type="checkbox"/> Other <input type="checkbox"/>				
Description		Disposition <small>RWK, RPR, UAI, SCP</small>	CE	DQAR
Continue on reverse side if required				
1) Overall coil resistance should be 590.0-610.0 mΩ. During coil testing, above average values were found ranging from 613.08 - 617.15 mΩ (See notes on sheet 2)		UAI	JA	AB
2) During final electrical testing (traveler AUP-180 Op 350), inductance readings were out of range: @ 20Hz should be 4.60-5.00 mH, is 5.06 @ 100Hz should be 3.00-3.40 mH, is 3.58				
Instructions:	Continue on additional sheets if required	Name	Life #	Date
None				
Reason for Discrepancy:				
Nominal targets are not reflective of finished nominal coils wound with supplied conductor				
Corrective Action:				
Program should review limits with intent to adjust based on pre-production experience				
Report reviewed by CE <u>J. Schmaltz</u>		Date <u>3/11/19</u>		
DQAR <u>      </u>		Date <u>3-11-19</u>		

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**MAGNET DISREPANCY REPORT  
(Continuation)**

Sketch:

Instructions:	Name	Life #	Date

AUP-160      Prep for Impregnation

- Op 540 Resistance (Voltage) Check      SB 590.0-610.0 mv, is 615.26
- Op 645 Resistance (Voltage) Check      SB 590.0-610.0 mv, is 613.08

AUP-170      Impregnation

- Op 460 Resistance (Voltage) Check      SB 590.0-610.0 mv, is 614.74

AUP-180      Final Inspection /Prep for Shipping

- Op 110 Resistance (Voltage) Check      SB 590.0-610.0 mv, is 616.02
- Op 150 V-Tap Checks:
  - B3 SB 405.0-425.0 mv, is 427.8
  - B2 SB 590.0-610.0 mv, is 616.15
  - B3 SB 590.0-610.0, is 616.19
- Op 340 Resistance (Voltage) Check      SB 590.0-610.0 mv, is 617.15