LCLS Linac Coherent Light Source — Stanford Synchrotron Radiation Laboratory, Stanford Linear Accelerator Center

Quality Assurance Traveler

ATTACH THIS FORM TO LCLS SYSTEMS AND COMPONENTS TO CONTROL THE SEQUENCE OF QUALITY ASSURANCE TASKS. RETURN THE COMPLETED TRAVELER TO THE LCLS QUALITY ASSURANCE COORDINATOR UPON COMPLETION.

System or Component Name: *LCLS Undulator Main Assembly*		
Part/Drawing Number: *L143-112000*	Revision: ____	Serial Number: 12
Manufacturer: Metalex MFG INC		Purchase Order Number: SA-10359

Special Instructions:

This form is to be completed prior to the acceptance of LCLS Undulator Main Assemblies

Quality Assurance Tasks (attach continuation sheets if additional steps are required)

Seq No.	Task Description *Inform the LCLS Technical Lead if a task cannot be competed or a requirement met	Completed by/Date*	Requirement Met	Requirement Not Met*
1	*Perform visual inspection of the completed assembly for workmanship and correctness.*	TMJ 10/12/06	☑	☐
2	*Perform visual inspection of the completed assembly for correct the following markings on the Strongback:* L143-11200-05 SA-381-001-35 Serial number same as the Strongback	[illegible] 10/12/06	☑	☐
3	*Perform visual inspection of the completed assembly for correct the following markings on the Magnet Structure Assemblies:* • Upper Left Magnet Structure Assemblies: L-143-110800-assembly no. 12 • Upper Right Magnet Structure Assemblies: L143-111200-assembly no. • Upper Middle Magnet Structure Assemblies: L143-111000-1,2,3-assembly no. • Lower Left Magnet Structure Assemblies: 143-110900-assembly serial no. • Lower Right Magnet Structure Assemblies: L143-111300-assembly serial no. • Lower Middle Magnet Structure Assemblies: L143-111100-1,2-3-assembly no.	[illegible] 10/12/06	☑	☐
4	*Verify correct gap size along the entire undulator length using contactor's go/no-go gages.*	[illegible] 11/01/06	☑	☐
5	*Verify correct gap size along the entire undulator length using calibrated gage blocks.*	[illegible] 11/01/06	☑	☐
6	*Check the peak field at each magnet location using a portable Hall probe.*	Shyam Sachdev	☑	☐
7	*Verify that the following quality assurance documentation has been completed by the contractor:* • ANL Acceptance Criteria Listings E5-026046, E5-020020, E5-069069 • LCLS Inspection/Acceptance Report for LCLS Magnets • LCLS Inspection/Acceptance Report for Supplier Inspection form for LCLS Magnet Assemblies • Magnet Sort List ? • Photographs showing correct magnet serial numbers and orientation • ANL Supplier Disposition Reports documenting any noncomformance to specifications drawings or other contract requirements N/A	TMJ 10/12/06	☑	☐
8	*Verify that the magnet photographs of the magnet sub assemblies are in agreement with the magnet sort list.*	[illegible] 11/01/06	☑	☐
9	*Review shipping container and that the contractor has Shockwatch monitoring devices available*	TMJ 10/12/06	☑	☐
10	*Forward completed traveler form to LCLS QA Coordinator Tom Barsz. B401, C4243.*	S. Hahn 11/2/06	☑	☐

LCLS Task Leader Pre-Approval: _____ **Date:** _____

LCLS QA Coordinator Pre-Approval: _____ **Date:** _____

Optional Approver Comments:

Why routers not signed. routers not used, Some pole acceptance not circled (ES-026046) ES-069069 magnet dim not accepted. (WI spec). Magnet photos not in package

Distribute completed traveler to: **Responsible Engineer, Task Leader, LCLS Quality Assurance Coordinator, Chief Engineer**

Other: _____

Enter Quality Improvements Lessons-Learned resulting from this activity below.

ARGONNE NATIONAL LABORATORY

ACCEPTANCE CRITERIA LISTING

1. DISTRIBUTION:

INSPECTION REQUIRED: ☑

4. ORIGINATOR'S NAME & DIVISION: Glen Lawrence/XFD 5. PHONE: 2-9298 6. DATE: 06/13/2005

9. FOR INSPECTION, DELIVER TO BLDG. NO.: DIVISION: XFD ATTN.: G. Lawrence

10. AFTER INSPECTION, DELIVER TO BLDG. NO.: SLAC DIVISION: LCLS ATTN.:

11. REFERENCES AND/OR REMARKS:

Item may be inspected by LCLS QA at Contractor site prior to shipment with follow-up inspection at receiving site. First Articles from each of the two contractors are to be shipped to ANL/APS to be magnetically shimmed and characterized in the APS Magnet Measurement room. The 38 remaining units shall be shipped directly to SLAC to be magnetically shimmed and characterized in the LCLS Magnet Measurement room.

15. ORIGINATOR OF PLAN: Glen Lawrence DATE: 06/13/2005

16. PLAN REVIEWED/APPROVED BY: DATE: 00/00/0000

17. QAR CONCURRENCE WITH PLAN: DATE: 00/00/0000

3. ACL NO.: E5-164018 LINE NBR: 1

7. PART NO. & NAME: L143-112000 LCLS Undulator Main Assy. 8. QUANTITY: 2

12. STEP NO.	13. INSPECTION/TEST REQUIREMENT	14. INSPECTION TEST LOCATION	18. ACCEPTED BY OR NONCONFORMANCE REPORT NO.	19. DATE
1	Inspect shipping container for evidence of damage or rough handling	eceiving / Inspectic	SLAC	
2	Inspect shipping sensors for record of temperature variations and shock/g loads in x,y and z during shipping	eceiving / Inspectic	SLAC	
3	Review all required certifications for compliance and completeness	actor Fac. or Rec.	[illegible]	10/12/06
4	Visual inspection of Undulator Assy for shipping damage	eceiving / Inspectic	SLAC	
5	Visual inspection of Undulator Assy for completeness to print, including all loose parts	actor Fac. or Rec.	[illegible]	10/12/06

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12. STEP NO.	13. INSPECTION/TEST REQUIREMENT	14. INSPECTION TEST LOCATION	18. ACCEPTED BY OR NONCONFORMANCE REPORT NO.	19. DATE
6	Verify Undulator gap using Go-NoGo gauge	Contractor Facility	GSL	10/12/06

Not Required Fields

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1. DISTRIBUTION:

INSPECTION REQUIRED: ☑

4. ORIGINATOR'S NAME & DIVISION: Glen Lawrence/XFD 5. PHONE: 2-9298 6. DATE: 03/10/2005

9. FOR INSPECTION, DELIVER TO BLDG. NO.: 401 DIVISION: XFD ATTN.: Glen Lawrence

10. AFTER INSPECTION, DELIVER TO BLDG. NO.: 401 DIVISION: XFD ATTN.: Glen Lawrence

11. REFERENCES AND/OR REMARKS:

Most of the magnets will be drop shipped directly to the Undulator Assembly Contractor, who will only perform limited physical inspection of the parts as they are highly magnetized. A sampling from each lot will be sent to ANL for verification of the magnetic field properties.

15. ORIGINATOR OF PLAN: Glen Lawrence DATE: 02/07/2005

16. PLAN REVIEWED/APPROVED BY: DATE: 00/00/0000

17. QAR CONCURRENCE WITH PLAN: DATE: 00/00/0000

3. ACL NO.: E5-069069 LINE NBR: 1

7. PART NO. & NAME: L143-110106 Upper Left Magnet Structure 8. QUANTITY: 192

12. STEP NO.	13. INSPECTION/TEST REQUIREMENT	14. INSPECTION TEST LOCATION	18. ACCEPTED BY OR NONCONFORMANCE REPORT NO.	19. DATE
1	Visual inspection of parts for shipping damage	ulator Ass'y Contra	MX	10-10-06
2	Visual inspection of parts for surface chips and pits	ulator Ass'y Contra	MX	10-10-06
3	Dimensional check of part for conformance to the drawing	ulator Ass'y Contra	MX	10-10-06
4	Review vendor certified test data agrees with SOW requirements	APS Bldg 401	TM	11/4/06
5	Review Vendor sort list for agreement with sort procedure.	APS Bldg 401	see Assy Traveler	

Not Required Fields

2. PAGE 2 of 2

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ACCEPTANCE CRITERIA LISTING

12. STEP NO.	13. INSPECTION/TEST REQUIREMENT	14. INSPECTION TEST LOCATION	18. ACCEPTED BY OR NONCONFORMANCE REPORT NO.	19. DATE
6	On random sampling, inspect magnetic field with magnetic visualization film for magnetic defects.	APS Magnet Group	[illegible]	11/3/06
7	On random sampling, confirm Magnetic Moment magnitude and vector components agree with vendor reports	APS Magnet Group	S. S.	
8	On radom sampling, verify the magnet s demagnetization and thermal stability.	APS Magnet Group	S. S.	

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ACCEPTANCE CRITERIA LISTING

1. DISTRIBUTION:

INSPECTION REQUIRED: ☑

4. ORIGINATOR'S NAME & DIVISION: Glen Lawrence/XFD 5. PHONE: 2-9298 6. DATE: 01/25/2005

9. FOR INSPECTION, DELIVER TO BLDG. NO.: N/A DIVISION: ATTN.:

10. AFTER INSPECTION, DELIVER TO BLDG. NO.: NA DIVISION: ATTN.:

11. REFERENCES AND/OR REMARKS:

The Magnet Poles are to be delivered to the Undulator Assembly Contractors by the Machining Contractor. Undulator Assembly Contractor shall inspect the Magnet Poles prior to acceptance. ANL shall review all Certifications and Machining Contractor's reported measurements & optionally perform on-site inspections.

15. ORIGINATOR OF PLAN: Glen Lawrence DATE: 01/27/2005

16. PLAN REVIEWED/APPROVED BY: DATE: 00/00/0000

17. QAR CONCURRENCE WITH PLAN: DATE: 00/00/0000

3. ACL NO.: E5-026046 LINE NBR: 1

7. PART NO. & NAME: L143-110105 Upper Magnet Structure Pole 8. QUANTITY: 192

12. STEP NO.	13. INSPECTION/TEST REQUIREMENT	14. INSPECTION TEST LOCATION	18. ACCEPTED BY OR NONCONFORMANCE REPORT NO.	19. DATE
1	Visual inspection of parts for shipping damage	ulator Assy Contra	MX	10-10-06
2	Check that parts were "bagged and tagged" with serial no.'s and part no.'s (ANL & SLAC) per SOW L143-00031, Section 4.1.3	ulator Assy Contra	MX	10-10-06
3	Check that parts were marked with serial numbers per SOW section 4.1.3.	ulator Assy Contra	MX	10-10-06
4	Check that accompanying certifications have correct part serial numbers	ulator Assy Contra	MX	10-10-06
5	Check the material certification for compliance with ASTM A801, Type 1	tor Assy Contracto	MY	10-10-06

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12. STEP NO.	13. INSPECTION/TEST REQUIREMENT	14. INSPECTION TEST LOCATION	18. ACCEPTED BY OR NONCONFORMANCE REPORT NO.	19. DATE
6	Check the anneal certification for compliance with AMS-A801, or a specified material supplier's annealing schedule.	.tor Assy Contracto	MX	10-10-06
7	Check that the machining Contractor's certified dimensional measurements are in compliance with the drawing	ANL	S.S.	10/12/06
8	Verify the critical dimensions as listed in the SOW, Section 4.5.2 are in compliance with the drawing	ulator Assy Contra	MX S.S.	10-10-06

#12 Standard temp 22°C

	LOT# Device# 12 Date				
Slot No		Slot No		Slot Number	
1	~~-0.2967~~	51	-31	100	29
2	0.7633	52	28	101	-29
3	-1.2641	53	-28	102	29
4	1.33	54	29	103	-29
5	-1.30	55	-28	104	29
6	1.32	56	29	105	-28
7	-1.31	57	-29	106	29
8	1.31	58	29	107	-29
9	-31	59	-29	108	28
10	29 31	60	29	109	-29
11	-29 31	61	-29	110	29
12	29 31	62	29	111	-29
13	-31	63	-29	112	29
14	31	64	29	113	-28
15	-31	65	-29	114	28
16	31	66	29	115	-29
17	-32	67	-29	116	30
18	32	68	29	117	-29
19	-31	69	-29	118	29
20	31	70	29	119	-28
21	-31	71	-29	120	29
22	31	72	29	121	-29
23	-31	73	-29	122	28
24	31	74	29	123	-29
25	-31	75	-29	124	29
26	31	76	29	125	-29
27	-32	77	-29	126	29
28	32	78	29	127	-29
29	-31	79	-29	128	29
30	31	80	29	129	-28
31	-31	81	-29	130	28
32	31	82	29	131	-29
33	-32	83	-30	132	29
34	31	84	29	133	-29
35	-31	85	-29	134	29
36	31	86	29	135	-29
37	-31	87	-29	136	28
38	31	88	29	137	-28
39	-31	89	-29	138	29
40	29	90	29	139	-29
41	-29	91	-29	140	29
42	29	92	29	141	-29
43	-29	93	-29	142	29
44	29	94	29	143	-29
45	-31	95	-29	144	29
46	31	96	29	145	-29
47	-30	97	-29	146	28
48	31	98	29	147	-29
49	-31	99	-29	148	28
50	31			149	-29

#12

Slot Number		Slot Number	
150	29	200	29
151	-29	201	-29
152	29	202	28
153	-29	203	-29
154	29	204	29
155	-29	205	-29
156	29	206	29
157	-28	207	-30
158	29	208	28
159	-29	209	-30
160	29	210	29
161	-29	211	-29
162	29	212	28
163	-29	213	-28
164	28	214	28
165	-29	215	-29
166	29	216	29
167	-29	217	-29
168	29	218	28
169	-29	219	-29
170	29	220	28
171	-29	221	-29
172	29	222	28
173	-28	223	-31
174	29	224	24
175	-29	225	0.75
176	29		
177	-29		
178	28		
179	-29		
180	28		
181	-28		
182	28		
183	-29		
184	30		
185	-29		
186	29		
187	-28		
188	28		
189	-29		
190	29		
191	-29		
192	29		
193	-29		
194	29		
195	-29		
196	29		
197	-29		
198	29		
199	-29		

End Temp
22.1°C

Shigeru Sasaki

12 Oct 2006