

MROI PROJECT
DELAY LINE SYSTEM

>>> AIV PROJECT PLAN UP TO PVM5 <<<

Last update -- FS/CS -APRIL-2010 - INT-406-ENG-00xx-rev02

POSITION	TASK LEVEL	P/N		TYPE	ORDER	DESCRIPTION OF ACTIVITIES	TASK SHEET TYPE	DEPENDENCY	TASK DURATION (weeks)	TASK DURATION (mm/dd/yy)		OWNER
		GROUP	IDENT							BEGIN	END	
0	0					MROI - BCF - DLA, OUTER BCA AND INNER BCA						
1												
2	1	INT	406	AIV	0001	HIGH LEVEL DELIVERABLES AND MAJOR DLS INPUTS	Description	-				FS
3	2					<4.06.01> DL supplementary hardware						
4	3	INT	406	AIV	0010	Fast acting valves	Description	-				FS
5	3	INT	406	AIV	0011	Gantry crane, ground lifting equipment and caster dolly	Description	-				FS
6	3	INT	406	AIV	0012	Services and communication in the DLA	Description	-				TC
7	3	INT	406	AIV	0013	Insulation of inner and outer BCA walls	Description	-				CS
8	3	INT	406	AIV	0014	Alignment hardware for pipes and supports	Description	-				CS
9	2					<4.06.01> Documentation						
10	3	INT	406	AIV	0015	Cambridge design documentation	Description	-				MF
11	3	INT	406	AIV	0016	Engineering technical documents	Description	-				FS
12	3	INT	406	AIV	0017	As-built drawing package and product tree	Description	-				CS
13	3	INT	406	AIV	0018	Maintenance/operational manuals	Description	-				MF
14	2					<4.06.02> Trolley #1						
15	3	INT	406	AIV	0019	Trolley and associated optics/electronics	Description	-				MF
16	3	INT	406	AIV	0020	Handling gurney hardware	Description	-				FS
17	2					<4.06.02> Trolley #2						
18	3	INT	406	AIV	0019	Trolley and associated optics/electronics	Description	-				MF
19	2					<4.06.01> Open test track at ISF						
20	3	INT	406	AIV	0021	Open test track system	Description	-				CS
21	3	INT	406	AIV	0022	Safety, handling and transporting hardware	Description	-				CS
22	2					<4.06.03> DL pipes and supports						
23	3	INT	406	AIV	0023	16" OD x 12ft length finished DL pipes	Description	-				FS
24	4	INT	406	AIV	0024	Metrology of DL pipes	WDS	23				CS
25	4	INT	406	AIV	0025	Machine shop working on DL pipes	Description	24				FS
26	3	INT	406	AIV	0026	Pipe supports	Description	-				FS
27	3	INT	406	AIV	0027	Other parts (end plates, windows, tensioning mechanism etc)	Description	-				FS
28	2					<4.06.04> Metrology system						
29	3	INT	406	AIV	0028	Metrology table for the MROI Inner-BCA	Description	-				FS
30	3	INT	406	AIV	0029	Agilent laser head and splitting module	Description	-				DK
31	3	INT	406	AIV	0030	Metrology block and shear camera module	Description	-				FS
32	2					<4.06.05> DL software						
33	3	INT	406	AIV	0031	Control Systems at ISF	Description	-				TC
34	3	INT	406	AIV	0032	Control Systems at BCF for DLs eg. electronics, computers	Description	-				TC
35	1	INT	406	AIV	0100	DLS AIV ACTIVITIES	Description	-				FS
36	2					<4.06.01> Planning & Infrastructure						
37	3	INT	406	AIV	0110	Integration of fast acting valve	WDS	4,78,84				FS
38	3	INT	406	AIV	0111	Integration of services and communication in the DLA	Description	6				TC
39	2					<4.06.02> Trolley #1						
40	3	INT	406	AIV	0112	Trolley preparation at ISF	Description	15				MF
41	4	INT	406	AIV	0113	Unpacking Trolley and associated components	WDS	41				MF

42	4	INT	406	AIV	0114	Assembly modules and sub-modules of a Trolley	WDTS	42					MF
43	4	INT	406	AIV	0115	Complete assembly of a Trolley	WDTS	43					MF
44	3	INT	406	AIV	0116	Integration of a Trolley to the open test track	WDTS	5,44,77					MF
45	3	INT	406	AIV	0117	Pre-acceptance tests of a Trolley at ISF	WDTS	45,112					MF
46	3	INT	406	AIV	0118	Trolley preparation for transportation to the MROI	Description	46					MF
47	4	INT	406	AIV	0119	Packing and shipping a Trolley to MROI	WDTS	5,47					MF
48	4	INT	406	AIV	0120	Unpacking a Trolley at the DLA	WDTS	5,48					MF
49	3	INT	406	AIV	0121	Integration of a Trolley to the handling gurney	WDTS	5,16,49					MF
50	3	INT	406	AIV	0122	Trolley preparation for a DL	Description	50					MF
51	4	INT	406	AIV	0123	Alignment of handling gurney to the end of a DL	WDTS	51					FS
52	4	INT	406	AIV	0124	First alignment of metrology laser to a Trolley	WDTS	52,99,116					MF
53	4	INT	406	AIV	0125	Integrity functional testing of a Trolley	WDTS	52,53					MF
54	3	INT	406	AIV	0126	Installation and integration of a Trolley to a DL	WDTS	54					MF
55	3	INT	406	AIV	0127	SAT of Trolley in a DL	WDTS	55					MF
56	3	INT	406	AIV	0128	OAT of Trolley in a DL	WDTS	56					MF
57	2					<4.06.02> Trolley #2							
58	3	INT	406	AIV	0112	Trolley preparation at ISF	Description	18					MF
59	4	INT	406	AIV	0113	Unpacking Trolley and associated components	WDTS	59					MF
60	4	INT	406	AIV	0114	Assembly modules and sub-modules of a Trolley	WDTS	60					MF
61	4	INT	406	AIV	0115	Complete assembly of a Trolley	WDTS	61					MF
62	3	INT	406	AIV	0116	Integration of a Trolley to the open test track	WDTS	5,62,77					MF
63	3	INT	406	AIV	0117	Pre-acceptance tests of a Trolley at ISF	WDTS	63,112					MF
64	3	INT	406	AIV	0118	Trolley preparation for transportation to the MROI	Description	64					MF
65	4	INT	406	AIV	0119	Packing and shipping a Trolley to MROI	WDTS	5,65					MF
66	4	INT	406	AIV	0120	Unpacking a Trolley at the DLA	WDTS	5,66					MF
67	3	INT	406	AIV	0121	Integration of a Trolley to the handling gurney	WDTS	5,16,67					MF
68	3	INT	406	AIV	0122	Trolley preparation for a DL	Description	68					MF
69	4	INT	406	AIV	0123	Alignment of handling gurney to the end of a DL	WDTS	69					FS
70	4	INT	406	AIV	0124	First alignment of metrology laser to a Trolley	WDTS	70,108,120					MF
71	4	INT	406	AIV	0125	Integrity functional testing of a Trolley	WDTS	70,71					MF
72	3	INT	406	AIV	0126	Installation and integration of a Trolley to a DL	WDTS	72					MF
73	3	INT	406	AIV	0127	SAT of Trolley in a DL	WDTS	73					MF
74	3	INT	406	AIV	0128	OAT of Trolley in a DL	WDTS	74					MF
75	2					<4.06.03> DL[W2] at MROI (100m)							
76	3	INT	406	AIV	0129	Assembly/verification of the open test track at ISF	WDTS	20					CS
77	3	INT	406	AIV	0130	Assembly of DL pipes/supports in DLA	WDTS	5,25,26,27					FS
78	3	INT	406	AIV	0131	Initial alignment of DL pipes/supports	WDTS	78					FS
79	3	INT	406	AIV	0132	Integration and verification of a DL to interfaces at BCF	WDTS	79,130					FS
80	3	INT	406	AIV	0133	Verification of vacuum integrity	Description	80,135					FS
81	3	INT	406	AIV	0134	Final alignment of a DL using Trolley	WDTS	55,80,81,113					MF
82	2					<4.06.03> DL[W1] at MROI (30m)							
83	3	INT	406	AIV	0130	Assembly of DL pipes/supports in DLA	WDTS	5,25,26,27					FS
84	3	INT	406	AIV	0131	Initial alignment of DL pipes/supports	WDTS	84					FS
85	3	INT	406	AIV	0132	Integration and verification of a DL to interfaces at BCF	WDTS	85,130					FS
86	3	INT	406	AIV	0133	Verification of vacuum integrity	WDTS	86,135					FS
87	3	INT	406	AIV	0134	Final alignment of a DL using a Trolley	WDTS	73,86,87,117					MF
88	2					<4.06.04> Metrology system [W2]							
89	3	INT	406	AIV	0135	Metrology table preparation & install in Inner-BCA	WDTS	29					FS
90	4	INT	406	AIV	0136	Assembly of full metrology table at Inner-BCA	WDTS	90					FS
91	4	INT	406	AIV	0137	Assembly of Agilent laser head to nominal position	WDTS	30,91					DK

92	3	INT	406	AIV	0138	Assembly/integration of Metrology System for a DL	WDTS	31,91				DK
93	3	INT	406	AIV	0139	Integration of shear camera to the Metrology System	WDTS	31,91,115				DK
94	3	INT	406	AIV	0140	Integration of Metrology System to a Trolley	WDTS	55,92,93,114				MF
95	3	INT	406	AIV	0141	Integration of shear camera to a Trolley	WDTS	55,92,94,115				MF
96	3	INT	406	AIV	0142	Final alignment of Metrology System to Trolley	WDTS	95				MF
97	3	INT	406	AIV	0143	Final alignment of shear camera to Trolley	WDTS	96				MF
98	3	INT	406	AIV	0144	Verification of Metrology System for a DL	WDTS	97				MF
99	3	INT	406	AIV	0145	Verification of shear camera system for a DL	WDTS	98				MF
100	2					<4.06.04> Metrology system [W1]						
101	3	INT	406	AIV	0138	Assembly/integration of Metrology System for DL	WDTS	31,91				DK
102	3	INT	406	AIV	0139	Integration of shear camera to Metrology System	WDTS	31,91,119				DK
103	3	INT	406	AIV	0140	Integration of Metrology System to Trolley	WDTS	73,92,102,118				MF
104	3	INT	406	AIV	0141	Integration of shear camera to Trolley	WDTS	73,92,103,119				MF
105	3	INT	406	AIV	0142	Final alignment of Metrology System to Trolley	WDTS	104				MF
106	3	INT	406	AIV	0143	Final alignment of shear camera to Trolley	WDTS	105				MF
107	3	INT	406	AIV	0144	Verification of Metrology System for DL	WDTS	106				MF
108	3	INT	406	AIV	0145	Verification of shear camera system for DL	WDTS	107				MF
109	2					<4.06.05> DL Software (Trolley#1 at DL[W2])						
110	3	INT	406	AIV	0146	Integration and verification of Trolley Controls for ISF	Description	20,33,45				TC
111	3	INT	406	AIV	0147	Integration and verification of System Controls ISF	Description	20,33,45				TC
112	3	INT	406	AIV	0148	Integration and verification of Trolley Controls for a DL	Description	34,50				TC
113	3	INT	406	AIV	0149	Integration and verification of metrology controls for a DL	Description	34,51				TC
114	3	INT	406	AIV	0150	Integration and verification of shear controls for a DL	Description	34,51				TC
115	3	INT	406	AIV	0151	Integration and verification of System Controls for a DL	Description	34,51				TC
116	2					<4.06.05> DL Software (Trolley#2 at DL[W1])						
117	3	INT	406	AIV	0148	Integration and verification of Trolley Controls for a DL	Description	35,69				TC
118	3	INT	406	AIV	0149	Integration and verification of metrology controls for a DL	Description	35,69				TC
119	3	INT	406	AIV	0150	Integration and verification of shear controls for a DL	Description	35,69				TC
120	3	INT	406	AIV	0151	Integration and verification of System Controls for a DL	Description	35,69				TC
121	1	INT	406	AIV	0500	PREPARATION TASKS BREAKDOWN STRUCTURE	Description	-				FS
122	2	INT	406	AIV	0501	<4.06.01> Monumentation	Description	-				FS
123	3	INT	406	AIV	0502	To prepare scope of work/requirements for monumentation at the BCF	Description	-				RS
124	3	INT	406	AIV	0503	To secure, monitor and close a contract for successful delivery	Description	-				RS
125	3	INT	406	AIV	0504	To procure proper tools needed to install & align the DLS	Description	-				SR
126	2	INT	406	AIV	0505	<4.06.01> Measurements	Description	-				FS
127	3	INT	406	AIV	0506	To measure the shape & flatness of the DLA technical slab	Description	124,125				RS
128	3	INT	406	AIV	0507	To measure any temperature gradient along the DLA	Description	-				DK
129	3	INT	406	AIV	0508	To install anchor bolts on the DLA main slab	WDTS	7,121				FS
130	2	INT	406	AIV	0509	<4.06.01> Controlling of interfaces	Description	-				FS
131	3	INT	406	AIV	0510	To manage the ICD: Delay Line to ICS	Description	-				TC
132	3	INT	406	AIV	0511	To manage the ICD: Delay Line to Beam Relay System	Description	80,86				FS
133	3	INT	406	AIV	0512	To manage the ICD: Delay Line to BCF infrastructure (building)	Description	80,86				FS
134	3	INT	406	AIV	0513	To manage the ICD: Delay Line to Metrology System	Description	93,102				FS
135	3	INT	406	AIV	0514	To manage the ICD: Delay Line to Vacuum System	Description	80,86				FS
136	3	INT	406	AIV	0515	To manage the ICD: Metrology System to BCF	Description	80,86				FS
137	3	INT	406	AIV	0516	To manage the ICD: Metrology System to Beam Relay System	Description	93,102				FS
138	2	INT	406	AIV	0517	<4.06.01> Signals and Services in the BCF	Description	6				RS
139	3	INT	406	AIV	0518	Determine the signal & service requirement for the anticipated DLs	Description	6				TC
140	3	INT	406	AIV	0519	To design & install the required electrical service	Description	139				RS
141	3	INT	406	AIV	0520	To design & install the required data communications service	Description	140				RS

142	3	INT	406	AIV	0521	To set the requirements needed for operations & maintenance	Description	-					RS
143	2	INT	406	AIV	0522	<4.06.01> Supplies in the DLA	Description	-					RS
144	3	INT	406	AIV	0523	To setup a limited furnished shop with tools and fasteners in the DLA	Description	-					RS
145	2	INT	406	AIV	0524	<4.06.01> Temporary work areas	Description	-					RS
146	3	INT	406	AIV	0525	To arrange workspace in the BCF	Description	-					RS
147	2	INT	406	AIV	0526	<4.06.03> Open test track at ISF	Description	-					CS
148	3	INT	406	AIV	0527	To arrange workspace and workbenches at ISF	Description	-					CS
149	3	INT	406	AIV	0528	To provide tools and handling hardware at ISF	Description	-					CS