NSLS-II

NATIONAL SYNCHROTRON LIGHT SOURCE II

7-ID-1 Shielded Beam Pipe Acceptance Testing

Rev Date: 10/12/2016
Author: Joseph Zipper
Approved: 10/13/2016

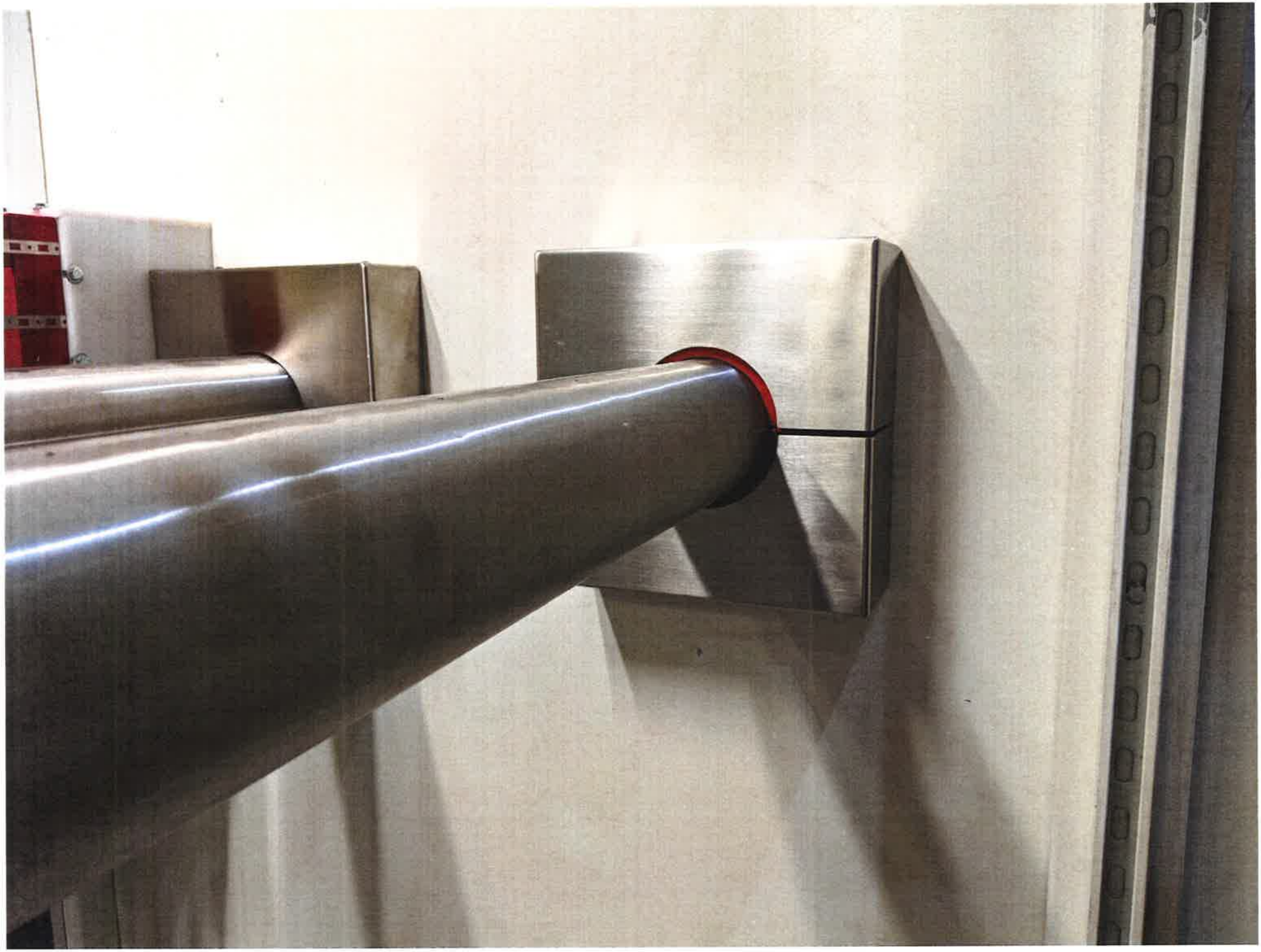
Title	Name	Approval Date
Beamline Engineering Group Leader	Mary Carlucci-Dayton	10/13/2016
ES&H Operations Manager	Lori Stiegler	10/13/2016
Quality Assurance Engineer	Joseph Zipper	10/12/2016

Serial No	Part No	Part Rev	ECN	Rev	ECN	Rev
	PD-SST-BL-SHLD-102					

Deviation & Waiver: _____

OP	Description	Name/Life #	Date	DR
10	Review the following for ES&H requirements: - PS-JRA-0006 Accelerator or Beam Line Components, Mechanical Assembly - PS-JRA-0014 Hand Tool Use - Handle all lead per PS-C-ESH-POL-004, Lead Working Requirements. Follow the requirements in the Work Permit, Procedures, and/or other work planning documents, including those for safe lifting and installation of all components.	Ciaran Whitlock Q64998	01/30/18	
20	Verify measuring and test equipment used for this procedure contains a valid calibration label in accordance with NSLS-II Calibration Procedure PS-QAP-0901, where applicable. The technician is responsible for notifying the technical supervisor and/or the cognizant engineer of any discrepancies occurring during the performance of this procedure. All discrepancies shall be identified and reported in accordance with NSLS-II Discrepancy Reporting Procedure PS-QAP-0002.	Ciaran Whitlock Q64998	01/30/18	
30	BEAMPIPE INFORMATION A. Record the top level part number on this sheet, in the box for "Part No". B. Record relevant drawings: PD-SST-BL-SHLD-102	Ciaran Whitlock Q64998	01/30/18	

OP	Description	Name/Life #	Date	DR
80	SURVEY GROUP A. Align the shielded pipe per drawing indicated in OP#70. B. Attach survey report to this traveler.	HUBBARD 20563	2/8/18	
90	Verify All Traveler Operations Complete	Brian Weiler Q6798	02/08/18	
100	REVISION HISTORY (This step is informational and does not require signoff) Rev - Description - Date A First Release			



Pb Shield
PNL 87
7-JD-A

NSLS-II

NATIONAL SYNCHROTRON LIGHT SOURCE II

51 ____Beamline Vacuum Comp./Sect. Acceptance Testing

Rev Date: 06/10/2014
Author: Robert Todd
Approved: 06/10/2014

Title	Name	Approval Date
Interface and Beamline Manager	Andrew Broadbent	06/10/2014
ES&H Operations Manager	Lori Stiegler	06/10/2014
CSX Beamline Scientist	Stuart Wilkins	06/10/2014
Quality Assurance Engineer	Joseph Zipper	06/10/2014

Serial No	Part No	Part Rev	ECN	Rev	ECN	Rev
7-ID	VACUUM SECTION # 14					

Deviation & Waiver: PGM

OP	Description	Name/Life #	Date	DR
10	Follow the ES&H and Personal Protective Equipment Requirements for the area.	JAMES STOLFI #21624	1/22/18	
15	Verify measuring and test equipment used for this procedure contains a valid calibration label in accordance with NSLS-II Calibration Procedure PS-QAP-0901, where applicable. The technician is responsible for notifying the technical supervisor and/or the cognizant engineer of any discrepancies occurring during the performance of this procedure. All discrepancies shall be identified and reported in accordance with NSLS-II Discrepancy Reporting Procedure PS-QAP-0002.	JAMES STOLFI #21624	1/22/18	
20	Vacuum Component/Section Information - This step shall be performed by the cognizant beamline engineer/scientist (CE/CS) A. Record the Beamline name (in the space provided) at the top of each page of this traveler. B. For a vacuum component, record the part number and description on this sheet in the box for "Part No". C. For a vacuum section, record the section number on this sheet in the box for "Part No" D. Record required base pressure for Vacuum Comp/Sec. 5.0×10^{-9} (Torr) E. Review this entire traveler and if a step (OP#) does not apply, write in that operation's sing-off box: "NA per OP#20"	[illegible] 06156	1/31/18	

VS-14

OP	Description	Name/Life #	Date	DR
30	Configuration- This step shall be performed by the CE/CS. A. Is component/section in its final configuration? (circle one) YES or NO B. If "NO", provide a brief description of component/vacuum section _____	JAMES STOLFI #21624	1/22/18	
40	Visual Inspection Prior to pumping down, visually inspect that all flanges and vacuum connections to component/sector are tight and secure. Confirm the presence of burst disk (as required by the assembly drawing) and inspect for damage. Confirm all vacuum forces are restrained through the use of bolted stands/supports and appropriate bellows restraints. Any deviations from the assembly drawing shall be noted and the Cognizant Beamline Engineer shall be notified prior to proceeding.	JAMES STOLFI #21624	1/22/18	
50	Leak check Leak check component/vacuum section using calibrated He MSLD. Confirm total leak rate < 2x10-10 mbar l/sec He.	JAMES STOLFI #21624	1/22/18	
60	RGA scan Aquire RGA data. The CS/CE or Vacuum Engineer (VE) will aquire and interpret RGA and prescribe corrective action if necessary. Initial RGA scan shall include a baseline scan of RGA isolated from vacuum section/component to confirm RGA cleanliness.	N/A	—	
70	Bakeout BAKE START 1/22 Confirm that bakeout was performed according to procedure PS-C-XFD-PRC-013 (NSLS-II Beamline Vacuum Bake-Out Procedure) and the manufacturer's requirements with temperature ramp rate(s) soak time(s), soak temperature(s) and maximum temperature(s) all controlled within acceptable limits.	JAMES STOLFI #21624	1/22/18	
80	Hot leak check With the component/sector at the soak temperature, perform leak check using calibrated He MSLD. Confirm total leak rate < 2x10-10 std cc/sec He (mbar l/sec He).	Fitzel/18710	1/22/18	
90	Crossover to ion pumps Confirm with the Cognizant Beamline Engineer prior to switching from turbopump to ion pump(s). Record the date and time the ion pumps are turned on and the turbopump valved out. Date 1/29 Time —	Fitzel/18710	1/29/18	

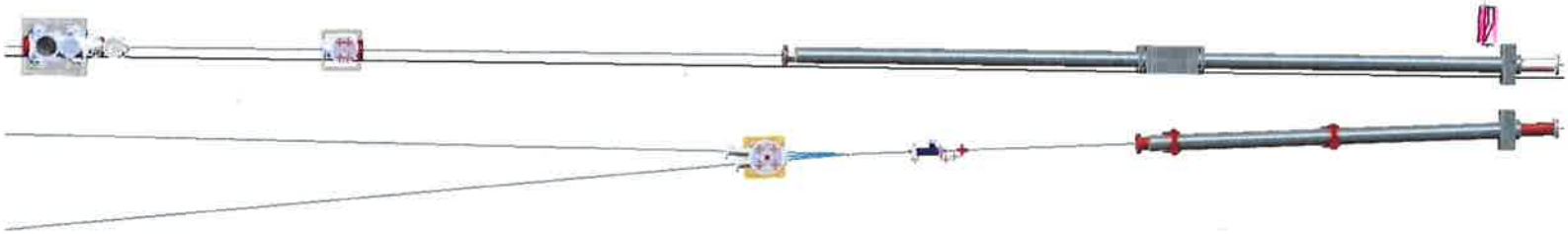
VS-14

OP	Description	Name/Life #	Date	DR
100	Final RGA scan When the component/section has reached room temperature, aquire RGA data. The CS/CE/VE will aquire and interpret the data to determine conformace to section 4.7.3 of spec LT-ENG-RSI-SR-VA-002 and prescribe corrective action if necesary. Attach RGA scan.	N/A	—	
110	Base pressure measurement. Confirm the required base pressure in OP 20 is met. The CE/BE/VE shall make this determination. Record base pressure measurement. 7.1×10^{-10} (Torr)	[illegible] 18710	2/1/18	
120	Forward this traveler and all attachments to QA for archiving.	[illegible] 18710	2/1/18	
130	REVISION HISTORY (This step is informational and does not require signoff) Rev - Description - Date B INITIAL RELEASE			

COOLED FRAME FOR FL SCR-M BRANCE APERTURE

Group to Group Relationship
Groups: FS BL REF to FS BL APP (Reported in FRAME&CONTROL::M1 DS)

Name	FS BL REF			FS BL APP			Delta		
	X1 (mm)	Y1 (mm)	Z1 (mm)	X2 (mm)	Y2 (mm)	Z2 (mm)	dX (mm)	dY (mm)	dZ (mm)
US BOT BR	-6.178	-5.557	7354.207	-6.229	-5.568	7354.347	-0.051	-0.011	0.140
US TOP BR	-6.172	5.557	7354.296	-6.215	5.547	7354.431	-0.043	-0.011	0.135
FS BL_US	0.010	0.000	7360.418	-0.035	-0.013	7360.554	-0.045	-0.013	0.136
US BOT BL	10.969	-5.523	7371.303	10.923	-5.538	7371.438	-0.046	-0.016	0.135
US TOP BL	10.898	5.522	7371.314	10.860	5.507	7371.444	-0.038	-0.016	0.130
M BL BOT	6.199	-5.521	7371.318	6.153	-5.534	7371.455	-0.046	-0.012	0.136
M BL TOP	6.213	5.521	7371.330	6.175	5.509	7371.461	-0.038	-0.012	0.131
DS BOT BR	-6.188	-5.519	7370.913	-6.234	-5.523	7371.053	-0.046	-0.003	0.140
DS TOP BR	-6.182	5.519	7371.025	-6.220	5.516	7371.160	-0.038	-0.003	0.135
FS BL_DS APP CTR	0.010	0.000	7377.143	-0.030	-0.005	7377.279	-0.040	-0.005	0.136
DS BOT BL	6.206	-5.494	7383.265	6.163	-5.501	7383.402	-0.043	-0.007	0.136
DS TOP BL	6.220	5.494	7383.385	6.185	5.487	7383.516	-0.034	-0.007	0.131



local frame

SHIELDED BEAM PIPE M-BRANCH

Point Group
REPORT`::BL PIPE
Reported in FRAME&CONTROL::M1 DS

Point Name	X (mm)	Y (mm)	Z (mm)
US BR	-58.780	-0.359	8403.951
US BOT	-0.143	-59.073	8406.963
US TOP	-0.143	58.355	8406.963
US BL	58.493	-0.359	8409.974
DS BL	58.948	-0.322	11196.831
DS TOP	0.234	58.392	11196.838
DS BOT	0.234	-59.036	11196.840
DS BR	-58.480	-0.322	11196.847

SHIELDED BEAM PIPE L-BRANCH

Point Group
REPORT`::BR PIPE
Reported in FRAME&CONTROL::L2DS

Point Name	X (mm)	Y (mm)	Z (mm)
US BOT	-0.136	-57.784	2478.217
US TOP	-0.136	59.612	2478.217
US BR	-58.834	0.914	2478.081
US BL	58.562	0.914	2478.354
DS BL	59.278	0.849	7973.611
DS BOT	0.580	-57.849	7973.610
DS TOP	0.580	59.547	7973.619
DS BR	-58.118	0.849	7973.618

PGM ZERO ORDER MASK&UNCOOLED APERTURE ASSEMBLY FIDUCIALS

Group to Group Relationship
Groups: TRIPLE MSK ASSY to TRIPLE MSK ASSY FIDS (Reported in FRAME&CONTROL::M1 DS)

Name	TRIPLE MSK ASSY			TRIPLE MSK ASSY FIDS			Delta		
	X1 (mm)	Y1 (mm)	Z1 (mm)	X2 (mm)	Y2 (mm)	Z2 (mm)	dX (mm)	dY (mm)	dZ (mm)
F2	47.158	198.585	12709.571	47.121	199.576	12709.931	-0.037	0.992	0.360
F1	65.927	198.214	12774.351	65.928	198.975	12774.727	0.001	0.762	0.376
VS15 RF4	-0.222	75.198	12796.911	-0.348	75.863	12796.870	-0.126	0.666	-0.041
VS15 F2	56.922	71.668	12998.870	56.907	71.609	12998.793	-0.015	-0.059	-0.077

COOLED FRAME FOR FL SCR-M BRANCE FIDUCIALS

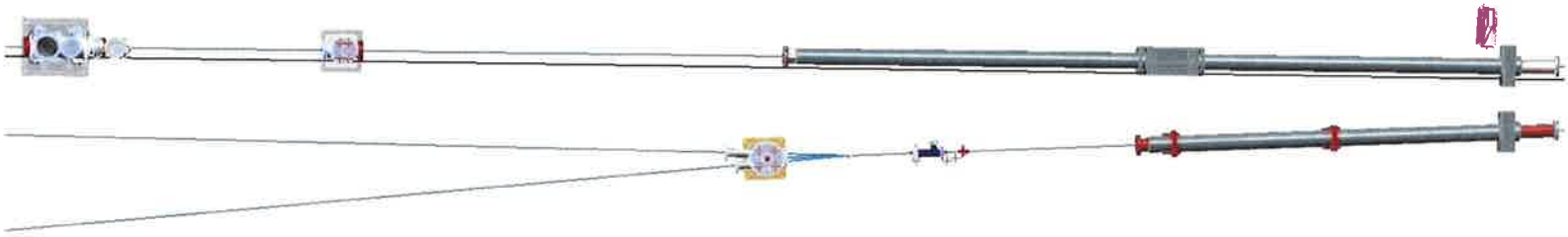
Group to Group Relationship
Groups: FS BL REF to FS BL&FS BR USMN (Reported in FRAME&CONTROL::07 ID SST PRACTICAL FRAME)

Name	FS BL REF			FS 06 FID			Delta		
	X1 (mm)	Y1 (mm)	Z1 (mm)	X2 (mm)	Y2 (mm)	Z2 (mm)	dX (mm)	dY (mm)	dZ (mm)
FS BL_F1	390.442	284.678	35884.677	390.616	284.617	35884.622	0.174	-0.062	-0.055
FS BL_F2	395.185	283.815	36002.900	395.351	283.806	36002.895	0.167	-0.009	-0.005
FS BL_F3	312.504	283.152	36010.020	312.681	283.204	36010.072	0.177	0.053	0.052

COOLED FRAME FOR FL SCR-M BRANCE APERTURE

Group to Group Relationship
Groups: FS BL REF to FS BL APP (Reported in FRAME&CONTROL::07 ID SST PRACTICAL FRAME)

Name	FS BL REF			FS BL APP			Delta		
	X1 (mm)	Y1 (mm)	Z1 (mm)	X2 (mm)	Y2 (mm)	Z2 (mm)	dX (mm)	dY (mm)	dZ (mm)
US BOT BR	345.066	-5.557	35924.827	345.022	-5.568	35924.969	-0.044	-0.011	0.142
US TOP BR	345.077	5.557	35924.915	345.041	5.547	35925.052	-0.036	-0.011	0.137
FS BL_US	351.565	0.000	35930.712	351.527	-0.013	35930.850	-0.038	-0.013	0.138
US BOT BL	363.068	-5.523	35941.020	363.029	-5.538	35941.157	-0.039	-0.016	0.137
US TOP BL	362.998	5.522	35941.035	362.966	5.507	35941.166	-0.031	-0.016	0.132
M BL BOT	358.305	-5.521	35941.280	358.266	-5.534	35941.418	-0.039	-0.012	0.138
M BL TOP	358.320	5.521	35941.291	358.289	5.509	35941.424	-0.031	-0.012	0.133
DS BOT BR	345.914	-5.519	35941.511	345.875	-5.523	35941.653	-0.039	-0.003	0.142
DS TOP BR	345.926	5.519	35941.622	345.895	5.516	35941.759	-0.031	-0.003	0.137
FS BL_DS APP CTR	352.424	0.000	35947.415	352.391	-0.005	35947.553	-0.033	-0.005	0.138
DS BOT BL	358.926	-5.494	35953.211	358.890	-5.501	35953.349	-0.035	-0.007	0.138
DS TOP BL	358.946	5.494	35953.329	358.918	5.487	35953.462	-0.028	-0.007	0.133



global frame

SHIELDED BEAM PIPE M-BRANCH

Point Group
REPORT`::BL PIPE

Point Name	X (mm)	Y (mm)	Z (mm)
US BR	346.425	-0.359	36975.887
US BOT	405.139	-59.073	36975.884
US TOP	405.139	58.355	36975.884
US BL	463.853	-0.359	36975.882
DS BL	607.377	-0.322	39759.040
DS TOP	548.741	58.392	39762.062
DS BOT	548.741	-59.036	39762.063
DS BR	490.104	-0.322	39765.084

SHIELDED BEAM PIPE L-BRANCH

Point Group
REPORT`::BR PIPE

Point Name	X (mm)	Y (mm)	Z (mm)
US BOT	-99.132	-57.784	36978.211
US TOP	-99.132	59.612	36978.211
US BR	-157.830	0.914	36978.211
US BL	-40.434	0.914	36978.211
DS BL	-26.963	0.849	42473.452
DS BOT	-85.661	-57.849	42473.587
DS TOP	-85.661	59.547	42473.596
DS BR	-144.358	0.849	42473.732

Nominal:

SBT-M (mm)	x-coord.	y-coord.	z-coord.
SBT-M US TOP	405.2811738	58.8	36975.88409
SBT-M US BOT	405.2811738	-58.8	36975.88409
SBT-M US OUTB	464.1586687	6.47986E-13	36975.88131
SBT-M US INB	346.403679	6.72208E-13	36975.88686
SBT-M DS TOP	548.5055255	58.8	39762.07436
SBT-M DS BOT	548.5055255	-58.8	39762.07436
SBT-M DS OUTB	607.2279901	7.51553E-14	39759.05573
SBT-M DS INB	489.7830608	9.81356E-14	39765.09299

Measured:

SBT-M (mm)	x-coord.	x-deviation	x-tol. (+/-)	y-coord.	y-deviation	y-tol. (+/-)	z-coord.	z-deviation	z-tol. (+/-)
SBT-M US TOP	405.139	-0.14217384	2	58.355	-0.445	2	36975.884	-8.55246E-05	5
SBT-M US BOT	405.139	-0.14217384	2	-59.073	-0.273	2	36975.884	-8.55246E-05	5
SBT-M US OUTB	463.775	-0.38366873	2	-0.359	-0.359	2	36975.882	0.000693431	5
SBT-M US INB	346.503	0.09932105	2	-0.359	-0.359	2	36975.887	0.00013552	5
SBT-M DS TOP	548.741	0.235474538	2	58.392	-0.408	2	39762.062	-0.012361474	5
SBT-M DS BOT	548.741	0.235474538	2	-59.036	-0.236	2	39762.063	-0.011361474	5
SBT-M DS OUTB	607.377	0.149009904	2	-0.322	-0.322	2	39759.04	-0.015728111	5
SBT-M DS INB	490.104	0.320939171	2	-0.322	-0.322	2	39765.084	-0.008994837	5

Nominal:

SBT-L (mm)	x-coord.	y-coord.	z-coord.
SBT-L US TOP	-98.9974884	58.75	36978.21175
SBT-L US BOT	-98.9974884	-58.85	36978.21175
SBT-L US OUTB	-40.1973301	-0.05	36978.21175
SBT-L US INB	-157.797647	-0.05	36978.21175
SBT-L DS TOP	-86.2369358	58.75	42476.5625
SBT-L DS BOT	-86.2369358	-58.85	42476.5625
SBT-L DS OUTB	-27.4370942	-0.05	42476.42604
SBT-L DS INB	-145.036777	-0.05	42476.69897

Measured:

SBT-L (mm)	x-coord.	x-deviation	x-tol. (+/-)	y-coord.	y-deviation	y-tol. (+/-)	z-coord.	z-deviation	z-tol. (+/-)
SBT-L US TOP	-99.273	-0.27551155	2	59.616	0.866	2	36978.211	-0.000753478	5
SBT-L US BOT	-99.273	-0.27551155	2	-57.78	1.07	2	36978.211	-0.000753478	5
SBT-L US OUTB	-40.575	-0.3776699	2	0.918	0.968	2	36978.211	-0.000753478	5
SBT-L US INB	-157.97	-0.1723532	2	0.918	0.968	2	36978.211	-0.000753478	5
SBT-L DS TOP	-85.661	0.575935832	2	59.547	0.797	2	42473.596	-2.966503554	5
SBT-L DS BOT	-85.661	0.575935832	2	-57.849	1.001	2	42473.587	-2.975503554	5
SBT-L DS OUTB	-26.963	0.474094183	2	0.849	0.899	2	42473.587	-2.839041093	5
SBT-L DS INB	-144.358	0.678777482	2	0.849	0.899	2	42473.732	-2.966966014	5