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IDENTIFICATION			
FPSTIFFENER LIGO-E950051-06-B			
TITLE: FITTING/PURGE PROCEDURE FOR STIFFENER ATTACHMENT WELDS	REFERENCE NO. 930212	SHT 1 OF 3	
	OFFICE COH	REVISION 6	
PRODUCT: LIGO BEAM TUBE MODULES CALIFORNIA INSTITUTE OF TECHNOLOGY	MADE BY RWP / CHKD BY BGG	MADE BY RAJ / CHKD BY KSD	
	DATE 1/25/94 / DATE 1/31/94	DATE 2/17/97 / DATE 2/18/97	

1.0 PURPOSE:

This procedure is to be used for the fitting, purging and welding of the vacuum stiffeners and support rings to the spiral welded tube. It is to be used in conjunction with WPS-ER308L/STIFFENER

2.0 STIFFENER PLACEMENT:

2.1 Layout cardinal lines on each end tube. Layout location of vacuum stiffeners, support rings and other applicable detail in accordance with the contract drawings.

2.2 Place vacuum stiffeners in their approximate location.

2.3 Fit the support ring (or rings) to the tube and bolt together at the appropriate location in accordance with the contract drawings. Support rings are to be machined to match the circumference of the tube in accordance with the contract drawings. Splices in the support ring to be aligned with the 90° and 270° cardinal lines.

3.0 PURGING:

3.1 Install the inflatable purge dams in the tube ends.

3.2 Purge the tube with nitrogen until the oxygen level within the tube falls below 1.0%.

3.3 Maintain purge during all fitting and welding. Check periodically during any tacking and welding operation.

4.0 FITTING STIFFENERS AND SUPPORT RINGS:

4.1 All tacking shall be done using WPS ER308L/GMA

4.2 Fit the vacuum stiffeners together with fitting device while making sure the stiffener is in the proper location. The vacuum stiffener may vary by ± 1/2" from the specified location. The splice of the stiffener must be positioned over the spiral weld with the lap of the splice positioned to minimize the length of unwelded stiffener.

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4.3 Tack vacuum stiffener to tube in accordance with WMS ER308L. Tacks shall be spaced approximately 12" apart. The tacks shall be on the side of the stiffener opposite the fillet weld and shall be a minimum of 1/2" in length with all craters backfilled. Tighten the fitting device if necessary to maintain tight fit.

4.4 Weld the vacuum stiffener splice after the vacuum stiffener is tacked to the beam tube in accordance with the contract drawings. Apply a 3/16" fillet weld to both sides of the splice leaving 1/4" not welded against the tube wall. Apply a minimum of 1" weld across the top of the splice. Apply a 1/8" fillet 3 1/2" long on the side of the stiffener opposite the fillet weld at the splice.

4.5 Repeat steps 4.1 through 4.3 for all the remaining vacuum stiffeners.

4.6 Insure that the support ring splices are aligned to the beam tube 90° and 270° cardinal lines. The support rings may vary by ± 1/4" in the longitudinal direction from the specified location. Tack the support rings to the beam tube as described in step 4.2 above.

4.7 Weld support ring splices after support ring is tacked to the tube in accordance with the contract drawings. Apply a 3/16 fillet weld to both sides of the splice leaving 1/4" not welded against the tube wall. Apply a minimum of 1" weld across the top of the splice.

5.0 WELDING:

5.1 Weld the vacuum stiffeners and support rings in accordance with WPS-ER308L/STIFFENER. The weld shall start at the splice continuing around the tube ending at the opposite side of the splice. The support rings will have two extra start/stops. One at the second splice and another at the spiral weld.

5.2 No welding over the spiral weld shall exist. Care must be taken to minimize the length of unwelded stiffener.

6.0 VISUAL INSPECTION:

6.1 Perform a visual inspection of the vacuum stiffener and support ring welds. If there are to be any welded repairs use WPS-ER308L/REPAIR.

6.2 The maximum tilt of the welded stiffener shall not exceed ten (10) degrees.