

Title: FABRICATION PLAN FOR SPOOLS AND BEAM TUBES

FABRICATION PLAN
FOR
SPOOLS AND BEAM TUBES
LIGO VACUUM EQUIPMENT
Hanford, Washington
and
Livingston, Louisiana

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TECHNICAL DIRECTOR: D. C. McWaters
PROJECT MANAGER: Barclay Beatty

Information contained in this specification and its attachments is proprietary in nature and shall be kept confidential. It shall be used only as required to respond to the specification requirements, and shall not be disclosed to any other party.

Ø	PF 5/2/96	REB 5/2/96	ISSUED PER DED 0161 FOR FDR
REV LTR.	BY-DATE	APPD. DATE	DESCRIPTION OF CHANGE

PROCESS SYSTEMS INTERNATIONAL, INC.				SPECIFICATION	
INITIAL APPROVALS	PREPARED	DATE	APPROVED	DATE	Number A V049-2-083
	PF	5/2/96	REB	5/2/96	LIGO-E960134-00-V
					Rev. Ø

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1.0 PURPOSE

The purpose of this procedure is to define design guidelines, specifications, and procedures to enable PSI to specify, purchase, inspect, fabricate, test and ship the spools and beam tubes per LIGO requirements.

2.0 GENERAL

All Spools and Beam Tubes shall be fabricated per this fabrication plan. Each fabrication process shall be controlled via a written procedure. A "first article" approach will be used to validate all fabrication processes prior to release of the full vessel lot.

All vessels will be fabricated in accordance with the Quality Plan. Key points in the fabrication process shall be verified to ensure consistent results.

All vacuum equipment shall be fabricated in accordance with LIGO Project Contract PC175730 dated September 12, 1995, and subsequent change orders.

3.0 RESPONSIBILITY

The Manufacturing Department is responsible for the execution of this procedure, with input and monitoring by the Project Engineer, the Quality Assurance Department, and the Project Manager.

4.0 FABRICATION PLAN

- 4.1 A first article approach will be used to start the manufacturing cycle to validate the manufacturing procedures and technique prior to the full production release.
- 4.2 All Spools and Beam Tubes will be fabricated at PSI. PSI will perform vessel cleaning, leak checking, bakeout and preparation for shipment.
- 4.3 All Spools and Beam Tubes will be fabricated and tested per documents listed in Attachment I "Fabrication Documents".
- 4.4 All Spools and Beam Tubes will be fabricated according to the Fabrication Priority List, Attachment 2.

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4.5 Procurement

PSI will procure all S.S. plate and flange material.

PSI will purchase vessel heads.

4.6 Quality Assurance

Each Spool and Tube Fabrication Process shall be monitored and control via the Quality Plan.

PSI will inspect all incoming materials to purchase documents.

4.7 Shop Conditioning/Testing

The Spools and Beam Tubes will be shop conditioned (cleaning, bakeout, etc.) per PSI Procedure V049-2-047.

4.8 Preparation For Shipment

The Spools and Beam Tubes will be prepared and shipped per PSI Procedure V049-2-123.

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ATTACHMENT 1

SPOOLS AND BEAM TUBES DOCUMENTS

- | | | |
|-----|---|---------------------------|
| 1. | Spec. For Spool and Beam Tube Fabrication | V049-2-097 |
| 2. | Spool and Beam Tube Quality Plan | V049-2-099 |
| 3. | Flanges | V049-2-040 & V049-2-042 |
| 4. | Raw Material Handling Procedure | V049-2-120 |
| 5. | Weld Data Sheet Spec. | V049-2-084 |
| 6. | Weld Procedures | V049-2-070, 071, 072, 073 |
| 7. | Weld Repair Procedure | V049-2-074 |
| 8. | Cleaning Procedures | V049-2-015 |
| 9. | Painting Procedures | V049-2-077 |
| 10. | Component Shop Conditioning/Test Plan | V049-2-014 |
| 11. | Bakeout Procedure | V049-2-019 |
| 12. | Leak Test Procedure | V049-2-047 |
| 13. | Dimensional Verification Procedure | V049-2-121 |
| 14. | Component, Handling, and Shipping Procedure | V049-2-123 |
| 15. | PSI Drawings | |

- | | |
|---------------------------------------|------------|
| Adapter A-1, 44.62" ID x 72.25 ID | V049-4-A1 |
| Adapter A-2, 48.25" ID x 72.25 ID | V049-4-A2 |
| Adapter A-3, 48.25" ID x 60.5 ID | V049-4-A3 |
| 60" HAM Cover, Grooved | V049-4-A4 |
| Adapter A-6, 48.25" ID x 60.5 ID | V049-4-A6 |
| Adapter A-7, 60.5" ID x 72.25 ID | V049-4-A7 |
| Adapter A-12, 48.25" ID x 60.5 ID | V049-4-A12 |
| BSC End Cover 60" | V049-4-All |
| Adapter A-13, 60.5" ID With 72.25 ID. | V049-4-A13 |
| Adapter A-14, 44.62" ID With 60.5 ID | V049-4-A14 |
| Adapter A-15, 48.25" ID With 60.5 ID | V049-4-A15 |

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|-------------------------------|------------|
| Spool B-1, 72.25 ID | V049-4-B1 |
| Spool B-2A, 30.5 ID x 60.5 ID | V049-4-B2A |
| Spool B-2B, 30.5 ID x 60.5 ID | V049-4-B2B |
| Spool B03A, 30.5 ID x 60.5 ID | V049-4-B3A |
| Spool B-4, 48.25" ID | V049-4-B4 |
| Spool B-5A, 30.5 ID x 60.5 ID | V049-4-B5A |
| Spool B-6, 48.25" ID | V049-4-B6 |
| Spool B-7, 48.25" ID | V049-4-B7 |
| Spool B-8, 72.25" ID | V049-4-B8 |
| Spool B-9, 72.25" ID | V049-4-B9 |

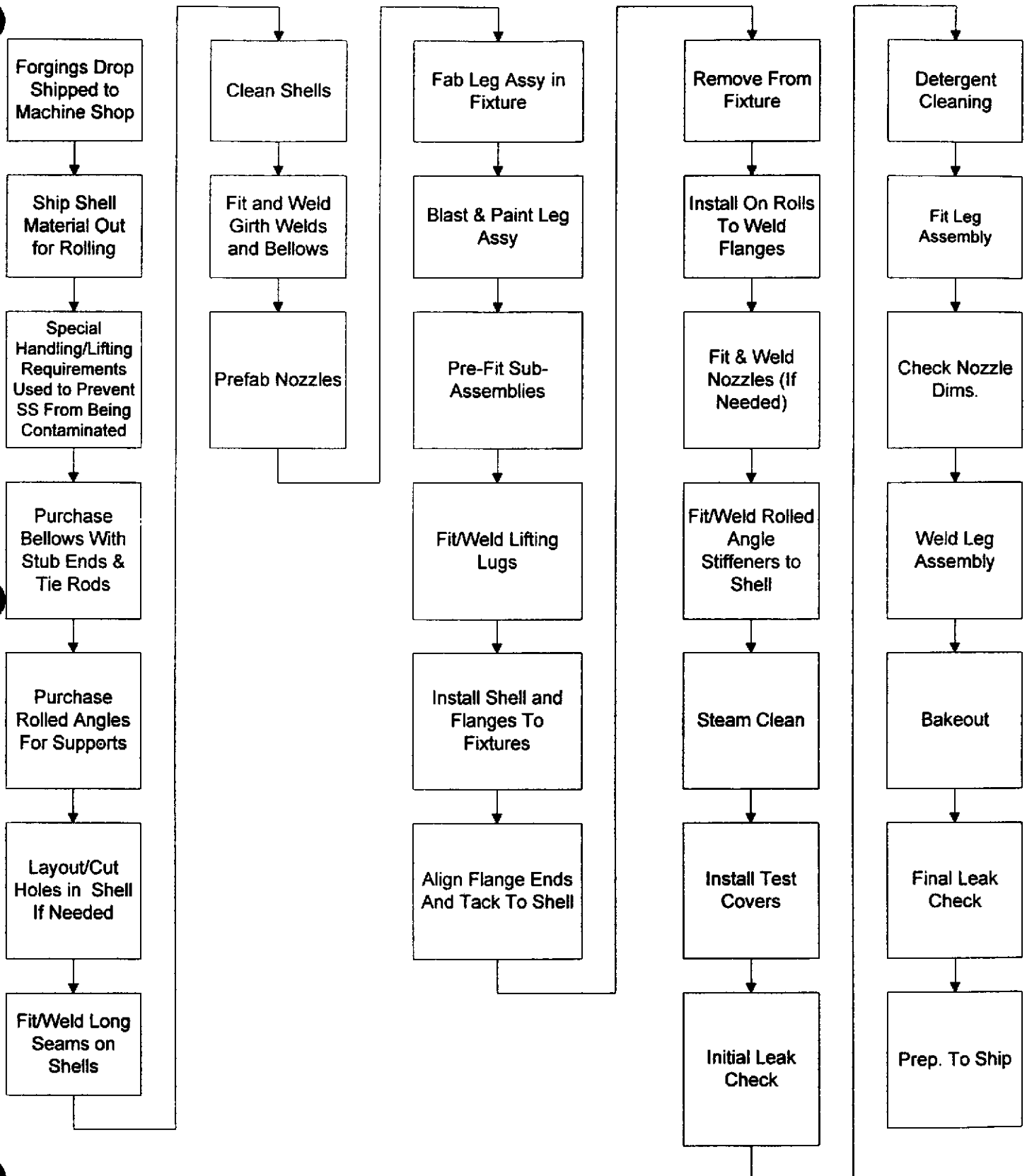
- | | |
|---|-------------|
| Spool BE-1, 72.25" ID | V049-4-BE1 |
| Spool BE-2, 60.5" ID | V049-4-BE2 |
| Off Set Spool BE-3, 60.5" ID x 60.5 ID | V049-4-BE3 |
| Off Set Spool BE-3A, 60.5" ID x 60.5 ID | V049-4-BE3A |
| Spool, BE-4, 44.62" ID | V049-4-BE4 |
| Spool, BE-5, 72.25" ID | V049-4-BE5 |
| Spool, BE-6, 72.25" ID x 72.25 ID | V049-4-BE6 |

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ATTACHMENT 2 SPOOLS AND BEAM TUBE FABRICATION PROCESS DIAGRAM



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ATTACHMENT 3

SPOOL AND BEAM TUBE FABRICATION PRIORITY LIST

First Priority For Washington

Second Priority For Washington

2-A1
2-A3
1-A6
1-A12
2-A13
2-A15
2-A15
2-B1
2-B2A
1-B3A
1-B4
1-B5A
1-B6
1-B7
2-B8
2-BE2
2-BE3
2-BE3A
2-BE4
1-BE5
1-BE6
2-BE9

4-A1
2-A7

2-A14
2-BE4

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ATTACHMENT 3

SPOOLS AND BEAM TUBE FABRICATION PRIORITY LIST

For Louisiana Site

4-A1

2-A2

2-A3

2-A4

2-A7

2-B1

1-B3A

1-B5A

2-B9

2-BE1

2-BE2

4-BE3

4-BE4

1-BE5

1-BE6

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