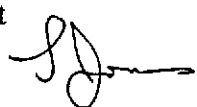


CALIFORNIA INSTITUTE OF TECHNOLOGY  
Laser Interferometer Gravitational Wave Observatory (LIGO) Project

To: P. Lindquist  
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Refer to: LIGO-E960091-00-B  
Date: June 5, 1996

Subject: Quarterly Report: Beam Tube, 3/96-5/96

## Beam Tube Activities

### Significant accomplishments during last quarter:

- Management plans and implementation plans were submitted by CBI; these plans have been reviewed and approved.
- The updated design review was held on March 27, and approval has been given to proceed with the design.
- A plan has been developed for monitoring the activities at CBI and their subcontractors; monitoring has begun on: stainless steel coil annealing and pickling, baking, slitting and shearing; coupon outgas testing; weld wire cleaning.
- CBI has mobilized their field staff (including team management) at the Hanford site.
- A model of the beam tube and beam tube enclosure has been installed at the Caltech campus.
- Contracts were awarded to two contractors for the baffles fabrication.
- A contract was awarded for glass coating the baffles.

### Discussion of accomplishments

The updated design review was successfully completed. Quoting the design review board report, "The overall fabrication and installation plans are well thought out and reflect an appropriate balance of the technical and logistical trade-offs needed to optimize the end-to-end process. We detected very few weaknesses, ..... which are judged to be minor and easily corrected. .... We found a positive, productive "can-do" attitude on the part of the participants in this review and would fully expect CBI's endeavors to be successful."

The first batch of stainless steel coils (of eight batches), 58 tons for expansion joints, was successfully processed and sent to the expansion joint manufacturer. The hydrogen outgas screening test verified an effective degas bake, with outgas levels a decade below the maximum allowable. All of the weld wire for the beam tube contract, 5.5 tons, was processed with the same procedure used during the qualification test. The second batch of stainless steel coils, 100 tons for tube sections, has been started through the process cycle. Monitoring of these operations has been helpful in identifying and removing potential sources of contamination. Both LIGO team members and JPL QA personnel are being used to monitor beam tube activities.

CBI signed the lease on the temporary fabrication building at Pasco, WA, and has started work to modify it for beam tube fabrication. These modifications include upgrading the facility electrical supply, installing walls to isolate the leak check and cleaning areas and installing a tracked tube transport system. CBI has located office trailers at the WA site and plans to move management staff from Pasco to Hanford as soon as telephones are installed.

Two hardware changes have been incorporated in the beam tube contract: one adds "soft" supports under the termination gate valves. The second implements a value engineering design change (a shared cost reduction) for the beam tube supports.

Contracts have been let for fabrication and coating all baffles for both LIGO sites. Prototype baffles are being fabricated to check out vendor fixtures and processes. These will be used for the same purposes by the glass coating contractor. The beam tube model is being used to check out baffle installation procedures.

The spiral tube mill and the tube end expander/cutoff machine are in final development and will be qualified in June.

**Work to be accomplished during the next quarter:**

- Incorporation of all changes resulting from the updated design review.
- Completion of the fabrication facility modifications
- Qualification of the spiral tube mill, including an outgas measurement of spiral tube mill welding
- Qualification of all fabrication equipment and fixtures
- Completion of stainless steel coil batch #2 process
- Completion of the first two lots (40) of expansion joints
- Conduct the fabrication readiness review
- Initiation of beam tube fabrication
- Completion of fabrication and coating of the first 200 baffles

lj

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