

LIGO - T940036-00-B



# FACSIMILE MESSAGE

1501 North Division Street  
Plainfield, Illinois 60544-8929

Fax No. is: 815 439 6010  
Verify No. is: 815 439 6000

Page 1 of 2

November 16, 1994

To: Larry Jones  
LIGO Project Caltech Pasadena, California

Fax No. (818)304-9834

From: M. L. Tellalian Phone (815)439-6517

Plainfield Engineering - PAE

RE: Cleaning Procedure For the 8' Trial Section  
LIGO Design & Qualification Test - Caltech Contract C146  
Larry,

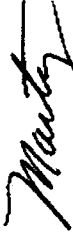
Below is our current plan for cleaning the inside of the beam tubes as we understand it. Please review and give us your comments so we can proceed with writing the new cleaning procedure.

1. Blacklight inspect the inside of the beam tube and clean areas with gross contamination with isopropyl alcohol. Collect a longitudinal sample of isopropyl alcohol for chemical analysis. (Note: The current cleaning procedure states "Remove all deposits of hydrocarbons indicated by the black light using acetone and/or alcohol soaked lint free clean rags and/or paper towels." The evaluation section is the 8' section with the circumferential weld. This section is virtually covered with fluorescence due to the personnel and equipment entry associated with the circumferential welding. Prior to taking the longitudinal sample, an area was rinsed with propanol to confirm the presence of bleeders. If the next step is to remove hydrocarbons with solvent, nearly the entire surface will be cleaned with solvent prior to the use of the Merichem. The cleanliness after the Merichem would be a combination of the solvent cleaning and the Merichem. On the other hand, if the fluorescence is not cleaned prior to the Merichem, the sample taken after Merichem could contain hydrocarbons not associated with the bleeders. Should the spot cleaning of the 8' section be eliminated?)
  2. Wash the inside of the beam tube with full strength Merichem 500.
    - Place the section of beam tube to be cleaned on the turning rolls. The beam tube will be level to 1/4" from end to end.
    - Clean end caps and seals Seal both ends of the beam tube.
    - Pour the full strength Merichem 500 into the beam tube. The quantity of Merichem 500 to be used in cleaning will be 1/5 gallon per foot of tube length.
    - Roll the beam tube at 1/3 RPM for 30 minutes.
  3. Pressure rinse the inside surface immediately after cleaning (before the inside surface can dry). Raise one end of the beam tube to provide a 1:20 slope for the rinse water to drain from the tube. Apply three (3) gallons of water per foot of beam tube length. Use deionized water at 100 psig.
  4. Steam rinse the inside surface immediately (before the inside surface can dry) after the pressure rinse. Apply three (3) gallons of steam per foot of beam tube length. Rinse at a rate of 6" of beam tube length per minute. Use deionized water to generate the steam.
  5. After the inside surface of the beam tube has dried, collect a longitudinal sample of isopropyl alcohol for chemical analysis. Also, blacklight for bleeders and perform the water break test at both ends of the beam tube.

6. Solvent wash the inside of the beam tube with isopropyl alcohol.
  - Place the section of beam tube to be cleaned on the turning rolls. The beam tube will be level to 1/4" from end to end.
  - Clean end caps and seals. Seal both ends of the beam tube.
  - Pour the isopropyl alcohol into the beam tube. The quantity of isopropyl alcohol to be used in the solvent was will be 1/5 gallon per foot of tube length.
  - Roll the beam tube at 1/2 RPM for four (4) complete turns.
7. Solvent rinse the inside of the beam tube with isopropyl alcohol immediately after the solvent wash is complete. Use the same parameters as use for the solvent wash.
8. After the inside surface of the beam tube has dried collect a longitudinal sample of isopropyl alcohol for chemical analysis. Also, blacklight for bleeders and perform the water break test at both ends of the beam tube.
9. Seal the ends of the beam tube section to keep clean. Clean covers before installing.

I'll call you later this morning.

Regards,



M. L. Tellalian  
Plainfield Engineering