

LIGO Laboratory / LIGO Scientific Collaboration

LIGO-T070229-01-W

ADVANCED LIGO

09/17/2007

AdLIGO PSL Infrastructure PDR Summary

Doug Cook

Distribution of this document:

LIGO Science Collaboration,

David Shoemaker, Carol Wilkinson, Mike Zucker, Fred Raab, Eric Gustafson, Peter King, Rick Savage, Rusyl Wooley, Allen Sibley, John Worden, Richard McCarthy, Bill Tyler, Rich Riesen, Anamaria Effler, Rana Adhikari,

This is an internal working note
of the LIGO Project.

California Institute of Technology

LIGO Project – MS 18-34

1200 E. California Blvd.

Pasadena, CA 91125

Phone (626) 395-2129

Fax (626) 304-9834

E-mail: info@ligo.caltech.edu

Massachusetts Institute of Technology

LIGO Project – NW22-295

185 Albany St

Cambridge, MA 02139

Phone (617) 253-4824

Fax (617) 253-7014

E-mail: info@ligo.mit.edu

LIGO Hanford Observatory

P.O. Box 159

Mail Stop S9-02

Richland, WA 99352

Phone 509-372-8106

Fax 509-372-8137

LIGO Livingston Observatory

P.O. Box 940

Livingston, LA 70754

Phone 225-686-3100

Fax 225-686-7189

<http://www.ligo.caltech.edu/>

David,

Please find the PSL Infrastructure PDR review summary, action items and results here.

SCOPE

This reviews primary concerns were the adLIGO PSL laser pump diode room design including the final room locations, chiller locations, optic fiber runs, temperature controls to handle heat loads, cleanliness issues, electrical and other utility needs. It covered both LHO and LLO sites allowing for any site sensitive issues. This same infrastructure will be used for eLIGO so eLIGO requirements and scheduling need is to be met. Some further modifications may need to be met at a later date for adLIGO.

Note: This review did not specifically include any building or modifications to enclosures around the PSL optics tables. However, cleanliness and laser hazard mitigation may necessitate some sort of temporary barriers. This was left off primarily due to HAM2 being moved outside of HAM1 for adLIGO which calls for the PSL table to be moved further out, which calls for the relocation of the enclosures. Temporary work a rounds are assumed for eLIGO (see action items below).

PRESENTATION

The presenters did a great job of presenting and replying to the reviewer's comments and questions and included detailed reports and layouts pertinent to all of the above issues (see reference documents below). Reviewer participation was also thorough and helpful. The panels collaborated well, expediting the facility details making recommendations, leaving some options open to further investigation to determine their best resolution.

FINDINGS

There were no 'show stoppers' that surfaced and the committee recommends moving ahead with architect/engineering drawings, calculations and going out for quotes. No major safety issues were defined as being "Unacceptable".

FUTHER ACTIONS

We have a list of ongoing action items that need to spell out construction details and safety requirements to be in place prior to laser start up. It is to the best interest that both sites keep this installation as uniform as possible. The Final Design Review should make sure the action items are completed.

Action item list and contact personnel:

- HVAC system decisions (split system with Freon units outside and fans inside) - John and Rick for LHO; Allen and Rusyl for LLO
- Chiller locations and specifications may vary between eLIGO and adLIGO – Rick and LZH
Could end up being different between LLO and LHO. Water cooled vs air cooled options to be decided.
There may be a need to coordinate with TCS chiller locations and requirements.
- Finalize length of optic fibers. Considering the HAM2 move for adLIGO – Rick and LZH.
- Budgeting and account setup. – Carol and Mike Z. (?)
- Modify "Kill" circuit for emergency service.- facilities/Richard and Rich R(LLO)
- Outline the requires for a temporary laser enclosure/barrier if needed and include their description in the SOP for the eLIGO laser. – Rick, Peter and Doug
- Extend access card system to pump diode room. Doug and Rich R.

Look into a modification that would allow both the PSL enclosure and diode room to be under the same control at the same time by the same Responsible Operator when either end is read into. This would work similar to a lock and tag procedure. If not hardware compatible then it needs to be a procedure control.

- Write SOP and Operating procedures and get approvals. Rick S. and Peter King and Co.
- LZH to qualify the need for distilled water to the pump diodes due to direct contact with diodes. - Peter K.
- Qualify the water temperature tolerances with LZH \pm °F (10ths of degrees level?)
- Include house water booster pumps to sustain temperature to pump diodes if we do not use a separate system. – John/Allen
- Look into the possibility of manufacturing fibers with different colored jackets to better separate the H1 and H2 interferometer fiber runs.
- Get Architect drawings, calculations and quotes. John, Rick, Allen, Rusyl.
- Clear of racks and move them and there contents to a new storage location – facilities

REFERENCE DOCUMENTS:

1/ Advance LIGO PSL Infrastructure and Safety Review LIGO-G070615-01-D
(Response to Committee Comments)

2/ Preliminary Design AdLIGO PSL Laser Diode Room LIGO-T070195-04-W

3/ Advanced LIGO PSL Hazard Analysis LIGO- T070145-01-D report

4/ Advanced LIGO Pre-stabilized Laser Safety Plan LIGO-T070010-05-D.

5/ Preliminary Architect drawing layouts and calculations from both sites were delivered.

PANELS:

Presenting Members:

Peter King
Rick Savage
Rusyl Wooley

Review Panel:

John Worden
Richard McCarthy
Allen Sibley
Rich Riesen
Bill Tyler
Doug Cook (chair)

Non Panel comments from:

David Shoemaker
Eric Gustafson
Mike Zucker