Advanced LIGO Engineering Change Request (ECR)

ECR Title: Move IO input beam PZT-mount from periscope to PSL/IO table surface

DCC No: E1500012-v2

Date: 16 January 2015

Requester:

Impacted Subsystem(s): IO

P Fritschel, M. Heintze

Description of Proposed Change(s):

Move the IO mirror mount that (IO_MB_M6) contains the Physik-Instrumente tip-tilt PZT actuator (for beam pointing control) from the current position at/near the top of the PSL/IO table periscope, down to the PSL/IO table surface, and put a fixed mirror mount in its place at the top. The new location is the position of IO_MB_M4. In the new configuration, IO_MB_M6 will be a U200 mount, with a 2" HR mirror. A new baseplate for this mount will be needed, to interface the mount to the holes in the periscope. (Calum Torrie has already offered his and Eddie Sanchez's help with this design) A beam dump for the IO_MB_M4 leakage beam also needs to be incorporated (a clip that can hold a piece of black glass).

Reason for Change(s):

The current combination of the PZT actuator and periscope causes excess beam jitter that shows up in the interferometer spectrum in peaks at 250 Hz and 135 Hz. The actuator move was tested successfully on L1; see LLO log entry 16331.

Estimated Cost: Few hundred $ for new baseplate for M6; designer time for baseplate

Schedule Impact Estimate:

Nature of Change (check all that apply):
☐ Safety
☐ Correct Hardware
☐ Correct Documentation
☒ Improve Hardware
☐ Improve/Clarify Documentation
☐ Change Interface
☐ Change Requirement

Importance:
☐ Desirable for ease of use, maintenance, safety
☐ Desirable for improved performance, reliability
☒ Essential for performance, reliability
☐ Essential for function
☐ Essential for safety

Urgency:
☐ No urgency
☐ Desirable by date/event: _____
☐ Essential by date/event: _____
☐ Immediately (ASAP)

Impacted Hardware (select all that apply):
☐ Repair/Modify. List part & SNs: _____

☐ Scrap & Replace. List part & SNs:_____

☒ Installed units? L1 & H1; IO_MB_M6 & M4

Impacted Documentation (list all dwgs, design reports, test reports, specifications, etc.):

PSL/IO table drawing: D0902114

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☐ **Future units to be built**

Disposition of the proposed change(s):

The disposition of this proposed engineering change request is to be completed by Systems Engineering and indicated in the "Notes and Changes" metadata field in the DCC entry for this ECR. The typical dispositions are as follows:

- **Additional Information Required**: in which case the additional information requested is defined. The ECR requester then re-submits the ECR with the new information using the same DCC number for the ECR but with the next version number.
- **Rejected**: in which case the reason(s) for the rejection are to be given
- **Approved**
- **Approved with Caveat(s)**: in which case the caveat(s) are listed
- **TRB**: the ECR is referred to an ad-hoc Technical Review Board for further evaluation and recommendation. It is the System Engineer's (or designee's) responsibility to organize the TRB. The System Engineer (or designee) then makes a technical decision based on the TRB's recommendation. Links to the TRB's documentation (charge, memos, final report, etc.) are to be added to the "Related Documents" field for this ECR.
- **CCB**: a change request for approval of additional funds or schedule impact is to be submitted to the Configuration Control Board. Links to the CCB's documentation (CR, etc.) are to be added to the "Related Documents" field for this ECR.

Concurrence by Project Management:

Acknowledgement/acceptance/approval of the disposition is to be indicated by the electronic "signature" feature in the DCC entry for this ECR, by one the following personnel:

- Systems Scientist
- Systems Engineer
- Deputy Systems Engineer