Advanced LIGO Engineering Change Request (ECR)

ECR Title: Retrofitted ESD Cable Connections

DCC No: E1400399-v1

Date: 11 Oct 2014

Requester: Rich Abbott **Impacted Subsystem(s):** SUS

Description of Proposed Change(s): We have had numerous problems with the high voltage connections at the vacuum chamber feedthroughs for the Electro-Static Drive (ESD) actuation for the Test Masses. See Integration Issue & ECR Tracker entry #907 for more background:

https://services.ligo-wa.caltech.edu/integrationissues/show_bug.cgi?id=907

The proposed design is indicated in D1400342-v1.

Reason for Change(s): Reliability concerns/problems.

Estimated Cost: $1400 per ESD, or Test Mass. So [3 IFOs x (4 TMs/IFO + 1 spare/IFO)] x $1,400 ea = $21K

Plus installation/test labor. SWAG about 2 person weeks, where installation is serendipitous.

Schedule Impact Estimate: None

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)** – as other testing/commissioning activities allow and serendipitous with other vent needs.

Impacted Hardware (select all that apply):
- ☐ **Repair/Modify. List part & SNs: _____**
- ☐ **Scrap & Replace. List part & SNs:_____**
- ☐ **Installed units? List IFO, part & SNs: _____**
- ☐ **Future units to be built**

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

D1400177-v2, ESD SYSTEM WIRING DIAGRAM

D1101617-v2, ESD In-vacuum coaxial cable (Flange to Table) – *or create new cable number & obsolete this one*

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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