

Advanced LIGO Engineering Change Request (ECR)

ECR Title: PSL PD Assembly (Bug 71)

DCC No: E1300122-v2

ECR – Rework to PSL, ISS PD Assembly (Bug 71)

Date: 8th March 2013

Requester:

Impacted Subsystem(s):

**Rich Abbott, Scott Shankle,
Calum Torrie, Peter King**

PSL, INS

Description of Proposed Change(s):

Rework to Advanced LIGO, IO, PSL, ISS PD Assembly, [LIGO-D1101059-v1](#).

Refer to LIGO-E1300167: [DCN, Initial release of Aligo, IO, PSL ISS PD Connector Assembly & associated Docs.](#)

- 1) (In progress) Teflon (or PEEK) tubing will be added around the PD pins as an electrical insulating sleeve.
- 2) (In progress) New cable – New cable connections will be retrofitted onto the ISS PD Array cable (crimped ferrule connection rather than a soldered joint. (This is shown in the picture below.) - **Complete**
- 3) (In progress) New connector on array – The current baseline plan now is to change the method of connecting the cable to the PD Array. This involves the re-design of the PD clamping housing. (This is shown in the picture below.) – **refer to DCN above**
- 4) **(In progress) New connector on QPD Array, refer to DCN above.**
- 5) (To be started) Cable at flange – the team notes that the question of the inability to connect the ISS cable to the flange has not yet been fully addressed. A spare ISS PD cable has been requested to be shipped back from LLO. Once the cables arrives at CIT we will test the mating to the vacuum flange with and replace the SMP connectors with the new ferrule connectors mentioned above. – **Complete, see pictures and video at DCC link of this doc.**
- 6) (To be started) Kapton washers – the team also notes that they need to confirm the use of Kapton washers to electrically insulate the diode holding cylinder
- 7) **(To be started) ESD plan for connecting cables to flanges and devices**
- 8) **Not a change but listed anyway – 8 new PD's required for LLO assembly. In hand.**

Reason for Change(s):

The ECR covers the work highlighted in BUG 71 i.e. https://services.ligo-wa.caltech.edu/integrationissues/show_bug.cgi?id=71. The information in Bug 71 covers the reason for change.

Estimated Cost:

\$2000.00 per PD Array

Schedule Impact Estimate:

For LLO - Plan is to remove existing install at LLO on HAM2 and retrofit above items to existing design and re-insert prior to closing the chamber in mid-March 2013.

For LHO – Plan is to retrofit existing LHO design prior to install. Current install planned for mid-March 2013.

For both sites the need to machine and assembly new parts, cleaning, baking and re-assembly mean this is going to be tight to meet the existing schedule.

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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:

[LIGO-D1101059-v1](#).

- 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.):

Disposition (to be completed by Systems Engineering):

For approval status check associated DCC file card page.

- TRB
- CCB
- Approved
- Additional information required. Define:

[Requester re-submits with new information with the same DCC E-number for the ECR but the next version number.]

Concurrence by Project Management: (Acknowledged Electronically in DCC)

Project Systems Engineer: Dennis Coyne

Project Systems Scientist: Peter Fritschel

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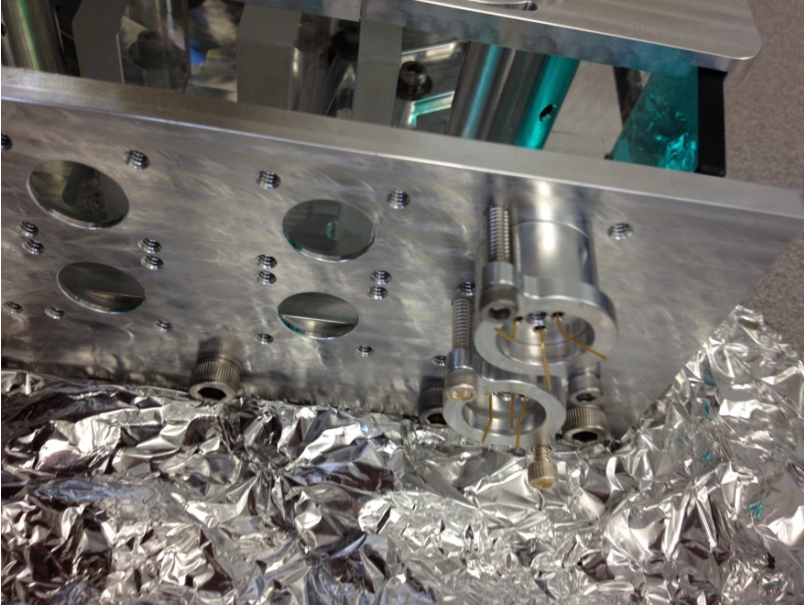


Figure (1) – (Above) Photo of existing PD and housing minus connector (and minus Kapton washers)
Refer to LIGO-E1300167: [DCN, Initial release of Aligo, IO, PSL ISS PD Connector Assembly & associated Docs.](#)

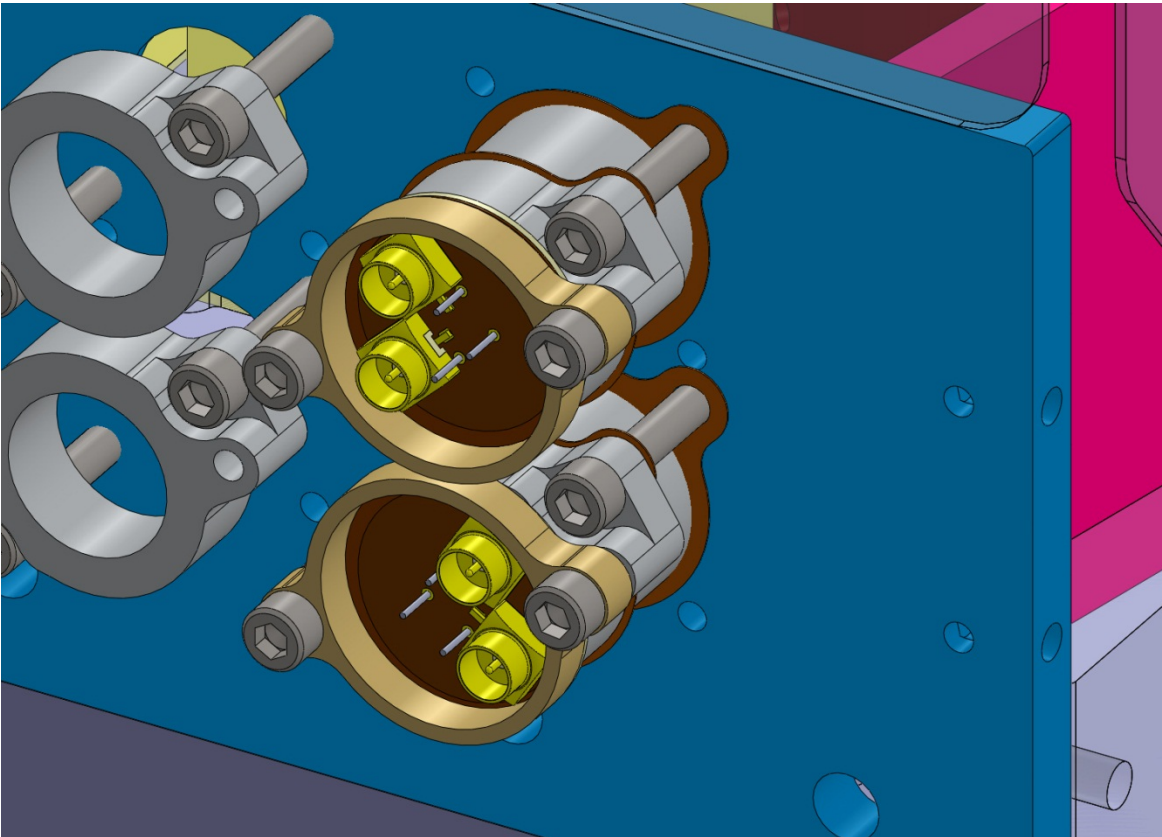


Figure (2) – (Above) Photo of proposed new cable connector and PC board
Refer to LIGO-E1300167: [DCN, Initial release of Aligo, IO, PSL ISS PD Connector Assembly & associated Docs.](#)

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Figure (2) – (Above) Photo of proposed new cable connector (previously soldered joint)