# Advanced LIGO Engineering Change Request (ECR)

**ECR Title: add baffle to PR3 Suspensions to prevent wire heating**

**DCC No: E1300788-v1**

**Date:** 16-Oct-2013

**Requester:** Peter Fritschel

**Impacted Subsystem(s):** SUS, INS, SYS

**Description of Proposed Change(s):** Add a baffle to the PR3 suspension structure in order to prevent the main beam light from heating the suspension wire.

**Reason for Change(s):** PR3 pitch drift seems to be coming from wire heating caused by absorbed light power on the wires, as reported in this LLO alog entry:

https://alog.ligo-la.caltech.edu/aLOG/index.php?callRep=9080

The HAM2 layouts (L1 D0900365-v9 and H1 D0901083-v9) show that there is room to place a baffle in front of the PR3/HLTS suspension (L1 D0900368-v9 and H1 D0901086-v3). However it would be easier and simpler to mount directly to the HLTS structure. It will also be easier to assure proper positioning relative to the PR3 optic if mounted to the HLTS structure.

This baffle can be polished, oxidized stainless steel (does not need to be black glass). It should be angled to direct specular reflected light into other baffles or the vacuum walls.

It would be best to have this baffle in hand for H1 before the vertex is closed in early November.

**Estimated Cost**: We need 3 sets of oxidized baffles, with an estimated procurement cost of ~$2k.

Labor costs for design/drawing, procurement, shipping, etc. is ~40hr.

**Schedule Impact Estimate:** None or inconsequential; this baffle will be installed when convenient, i.e. when the vertex is vented and available for other reasons.

**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: early Nov 2013 for H1
- ☐ Essential by date/event: _____
- ☐ Immediately (ASAP)

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**Impacted Hardware (select all that apply):**
☐ **Repair/Modify. List part & SNs: The PR3 assemblies:**
**H1: D0901086-v3**
**L1: D0900368-v9**

☐ **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.):
**H1 PR3: D0901086-v3 to –v4**
**L1 PR3: D0900368-v9 to –v10**
**H1 HAM2 Assy: D0901083-v9 to –v10**
**L1 HAM2 Assy: D0900365-v9 to –v10**

## 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