

# Advanced LIGO Engineering Change Request (ECR)

**ECR Title:**

**DCC No:** E1400434-v2

Revision of SUS OpLev and OpLev damping channels to be stored in the data frames.

**Date:** Nov 3<sup>rd</sup>, 2014

**Requester:**

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**Impacted Subsystem(s):**

**SUS, CDS**

## Description of Proposed Change(s):

Request a modification to the SUS QUAD, BSFM, HLTS model channel lists to enable the output of the OpLev Damping filters to be stored in both science and commissioning data frames. Some redundant/less informative OpLev channels will be removed from the channel lists.

For example, in the OLDAMP filter banks, we want to change to OUT from IN1/IN2, since the OUT are the actual feedback signals. Also, the SEG channels are less useful, since the IN1 are the ADC inputs, whereas the OUT have been offset corrected and whitening compensated.

## Reason for Change(s):

When OpLev damping was incorporated into SUS models little consideration was made regarding which channels would be most useful stored in the data frames. Furthermore, the existing channel selection appears somewhat arbitrary and inconsistent between different Suspension types. Therefore, we propose to a more informed choice regarding channel selection and uniformity across different Suspension types.

**Estimated Cost:** No physical cost associated with changes made to front-end software, just integrated testing down time and man-power implementation time.

## Schedule Impact Estimate:

Changes to SUS model library parts: HLTS\_MASTER.mdl, BSFM\_MASTER.mdl, and QUAD\_MASTER.mdl (i.e. all those with OpLevs). 15 minute to each library parts channel list, followed by a rebuild, install and restart of the model. Finally, a DAQ process restart would be necessary to write the data into the frame. Changes will be prepared ahead of time to minimize down-time to roughly 30 minutes. This would need to be carried out at both sites to propagate the changes.

## Software/Model Changes:

HLTS model, remove channels:

M3\_OPLEV\_SEG1\_IN1 256

M3\_OPLEV\_SEG2\_IN1 256

M3\_OPLEV\_SEG3\_IN1 256

M3\_OPLEV\_SEG4\_IN1 256

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## HLTS model, add channels:

M3_OPLEV_SEG1_OUT* 256	M3_OLDAMP_P_OUT* 256
M3_OPLEV_SEG2_OUT* 256	M3_OLDAMP_Y_OUT* 256
M3_OPLEV_SEG3_OUT* 256	M2_OLDAMP_P_OUT* 256
M3_OPLEV_SEG4_OUT* 256	M2_OLDAMP_Y_OUT* 256

## BSFM model, remove channels:

M3_OPLEV_SEG1_IN1 256	M2_OLDAMP_P_IN1 256
M3_OPLEV_SEG2_IN1 256	M2_OLDAMP_Y_IN1 256
M3_OPLEV_SEG3_IN1 256	M2_OLDAMP_P_IN2 256
M3_OPLEV_SEG4_IN1 256	M2_OLDAMP_Y_IN2 256

## BSFM model, add channels:

M3_OPLEV_SEG1_OUT* 256	M2_OLDAMP_P_OUT* 256
M3_OPLEV_SEG2_OUT* 256	M2_OLDAMP_Y_OUT* 256
M3_OPLEV_SEG3_OUT* 256	
M3_OPLEV_SEG4_OUT* 256	

## QUAD model, remove channels:

L3\_OPLEV\_SEG1\_IN1 256  
L3\_OPLEV\_SEG2\_IN1 256  
L3\_OPLEV\_SEG3\_IN1 256  
L3\_OPLEV\_SEG4\_IN1 256

## QUAD model, add channels:

L3_OPLEV_SEG1_OUT* 256	L2_OLDAMP_P_OUT* 256
L3_OPLEV_SEG2_OUT* 256	L2_OLDAMP_Y_OUT* 256
L3_OPLEV_SEG3_OUT* 256	L1_OLDAMP_P_OUT* 256
L3_OPLEV_SEG4_OUT* 256	L1_OLDAMP_P_OUT* 256

Net change = +22 channels -16 channels = +6 channels at 256 Hz data rate

(\*) denotes channel added to science frame as well as commissioning.

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## Nature of Change (check all that apply):

- Safety
- Correct Hardware
- Correct Documentation

- Improve Hardware
- Improve Software
- 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? List IFO, part & SNs: \_\_\_\_\_
- Future units to be built

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

## 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