Advanced LIGO Engineering Change Request (ECR)

ECR Title: Unfied ALS Frequencies

DCC No: E1300697-v1

Date: 9/3/2013

Requester: Daniel Sigg **Impacted Subsystem(s): ISC**

Description of Proposed Change(s): Change all ALS frequencies to the nominal H1/L1 frequencies. This is what it should be:

H1X/L1X: f=24.407079 MHz,
H1Y/L1Y: f=24.482125 MHz,
H2X: f=24.440707 MHz, and
H2Y: f=24.515730 MHz.

And here is what we have:

S1000575	24.407079	500-14927	LHO H1 EX	no change
S1000576	24.407079	500-14927	LHO spare	no change
S1000577	24.407079	500-14927	LLO L1 EX	no change
S1000578	24.407079	500-14927	LLO spare	no change
S1000581	24.440707	500-14927	LHO H1 EY	24.482125
S1000582	24.440707	500-14927	LHO spare	24.482125
S1000583	24.440707	500-14927	LLO L1 EY	24.482125
S1000584	24.440707	500-14927	LLO spare	24.482125
S1000585	24.482125	500-14927	LHO H2 EX	24.407079
S1000586	24.482125	500-14927	LHO spare	see E1300659-v1
S1000579	24.515730	500-14927	LHO H2 EY	24.482125
S1000580	24.515730	500-14927	LHO spare	see E1300659-v1

Change the H2 IMC frequency to the same as H1/L1.

S1000569	24.078360	500-14927	H1 IMC corner	no change
S1000570	24.078360	500-14927	LHO spare	no change
S1000571	24.078360	500-14927	L1 IMC corner	no change
S1000572	24.078360	500-14927	LLO spare	no change
S1000573	22.993090	500-14927	H2 IMC corner	24.078360
S1000574	22.993090	500-14927	LHO spare	see E1300659-v1

Reason for Change(s): The RF sources for the ALS frequencies are partially wrong. This is part due to an initial error and part due to the fact that the third interferometer has been converted into a straight configuration. Since the IMC lengths are all identical now, so should the RF frequencies.

Estimated Cost: ALS RF oscillators on hand, rework and retesting.

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Schedule Impact Estimate: none. The change needs to be implemented by the start of HIFO-X.

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: _HIFO-X_____**
- ☐ **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.):

E1000482

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, or Deputy Systems Engineer