Advanced LIGO Engineering Change Request (ECR)

ECR Title: ECR: Replacement of IO_MB_M2 2.1% beam splitter with 10% beam splitter

DCC No: E12xxxxx-vx

Date:

Requester: Alberto Stochino, Daniel Sigg, Keita Kawabe

Impacted Subsystem(s): PSL, ISC

Description of Proposed Change(s): We propose to replace the optic currently in place of IO_MB_M2 on the PSL table, which is a beam splitter to pick-off the ALS beam directed to ISCT1. With this change the current beam splitter, with a transmissivity of 2.1%, would be replaced with a different beam splitter with a 10% transmissivity. The PSL operating procedure will also be changed by requiring that the ALS pick-off is blocked when the PSL mode is switched to high power, that is greater than 20 W.

Reason for Change(s): The pick-off beam of the PSL directed to ISCT1 for frequency doubling needs to maintain a constant power of about 1.5 W. With the PSL running in low power mode (~15 W) and the current transmissivity of IO_MB_M2 (2.1%), the pick-off beam would not have adequate power.

To avoid delivering more than 2 W on ISCT1 when the PSL runs on high power (~170 W), we require that in those circumstances the ALS pick-off is completely blocked on the PSL table. This will prevent damage of the frequency doubling crystal and potentially excessive power to impinge on the ALS viewport on HAM1.

Estimated Cost: Zero. The new 10% beam splitter is already available in stock as a spare.

Schedule Impact Estimate: No affect on schedule if the change is completed before IMC lock acquisition begins. Possible interference with IMC alignment if completed after.

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: 11/16/2012
- ☐ Essential by date/event: _____
- ☐ Immediately (ASAP)

Impacted Hardware (select all that apply):
- ☐ Repair/modify. List part & SNs: _____
- ✓ Scrap & Replace. List part & SNs: IO_MB_M2
- ☐ Installed units? List IFO, part & SNs: _____
- ☐ Future units to be built

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

LIGO-D0902114-v12

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Disposition (to be completed by Systems Engineering):

☐ **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