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## MEMORANDUM

TO: LIGO Laboratory, LIGO Science Collaboration  
FROM: Carol Wilkinson (Advanced LIGO Development Project Manager)  
SUBJECT: Assignment of Action Items from the COC Design Requirements Review  
Refer to: LIGO-L040025-00-M  
Date: February 26, 2004

Please find below a table of action items from the Report of the Core Optics Components (COC) Design Requirements Review Committee, LIGO-T040009-00-D, 1/28/04. (See [http://www.ligo-wa.caltech.edu/~cwilkins/COC/COC\\_DRR](http://www.ligo-wa.caltech.edu/~cwilkins/COC/COC_DRR) for a temporary listing of the review document.) Individuals responsible for the resolution of each item are indicated in the table.

Several action items must be resolved before the COC Materials Downselect for Sapphire or Fused Silica, which is scheduled for June 30, 2004. These items show due dates of June 14 or earlier. The remaining items are due by the COC Preliminary Design Review (PDR). The current planned COC PDR date is October 2004. If you feel that you cannot accept an assignment or cannot complete it by the due date, please let me know so I can make other arrangements.

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**Assignment of Action Items from the COC Design Requirements Review**

<b>Item #</b>	<b>Action Item Description</b>	<b>parag. #</b>	<b>Assigned</b>	<b>Due Date</b>	<b>Status</b>	<b>Sign-off</b>
1	Provide better thermal compensation requirements and interfaces.	1	P. Willems/ G. Billingsley	6/14/04		P. Fritschel for requirements, D. Coyne for interfaces
2	Institute a research plan to measure and model coating absorption issues, with respect to thermal compensation requirements, and provide preliminary results by the sapphire/fused silica downselect.	1	B. Kells	3/15/04		D. Shoemaker
3	AOS will provide input to COC on the size (and possibly material if negative dn/dT materials are considered) of the compensation plates. Include the suspension method for the CP in the CDD.	2	M. Smith/ G. Billingsley	5/1/04		D. Coyne
4	Carefully study the deformation of the HR surface of the ITM at high arm power before the downselect, to understand what compensation is needed and possible, how much the ITM would be heated to provide this compensation, and what requirement on coating absorption is needed to make thermal compensation practical.	3	P. Willems	6/1/04		P. Fritschel
5	The committee feels that the 75ppm total loss budget for a single arm cavity is stringent and cannot be met given the large surface scatter in the initial LIGO optics. Can the 75ppm arm loss requirement be relaxed by SYS?	4	P. Fritschel	4/1/04		D. Shoemaker
6	Pursue further studies to determine scatter and diffraction losses in the interferometer arms.	4	B. Kells	PDR		D. Shoemaker
7	Characterize Rayleigh scattering in sapphire.	5	G. Billingsley	6/1/04		D. Shoemaker
8	Evaluate cleaning procedures with respect to their contribution to lowered performance. Include cleaning requirements in the requirements and design documents.	6	H. Armandula	PDR		D. Coyne
9	Provide better phrasing and intent on contamination requirements during use and handling.	7	H. Armandula	PDR		P. Fritschel
10	Add the requirements listed in this paragraph (8) to the DRD and the CDD.	8	G. Billingsley	PDR		P. Fritschel
11	Specify the wedge and radii of curvature requirements for the pickoff beams and ghosts.	9	B. Kells	PDR		D. Coyne
12	Include a discussion of the coating characterization and design philosophy in the documents.	10	G. Harry	PDR		P. Fritschel

**Assignment of Action Items from the COC Design Requirements Review**

<b>Item #</b>	<b>Action Item Description</b>	<b>parag. #</b>	<b>Assigned</b>	<b>Due Date</b>	<b>Status</b>	<b>Sign-off</b>
13	Bring all coating requirements in the CDD up to date.	11	H. Armandula	PDR		P. Fritschel
14	Set requirements for charging of optics - from SYS for noise forces and from SUS for control issues. Rapidly develop a research plan and study mitigation of effects.	12	G. Harry	5/1/04 (req's and plan)		D. Shoemaker
15	Develop a realistic schedule and a priority listing of activities for the overall COC development plan.	13	G. Billingsley	6/1/04		C. Wilkinson
16	Amend the Downselect Document to give a clearer plan of what we need to know and are likely to know by the downselect.	14	G. Billingsley	6/1/04		D. Shoemaker
17	Provide more specification for operations and handling issues, including 'travelers' procedures, transport, equipment (e.g. carriers), clean room conditions, and static control.	15	H. Armandula	PDR		D. Coyne
18	Correct typos, missing information, and obscure phrasing found in the documents.	16	G. Billingsley	5/1/04		P. Fritschel