Report of the LASTI Technical Advisory Committee
Based on its meeting held at the LSC meeting at LLO on March 22nd 2005.

T050061-00-R

Members in attendance: Dennis Coyne, Riccardo DeSalvo, Brian Lantz, Fred Raab, Norna Robertson (chair) and Alan Weinstein.

Dave Ottaway gave the presentation (G050189-00) on behalf of the LASTI team.

Dave brought the TAC up to date on LASTI progress since August 2004 and gave a summary of the medium term detailed plans, concentrating on the next year. As he noted, planning beyond that timescale depends both on the outcome of the ongoing SEI critical review (expected to end June 2005) and on available funding.

Recent progress includes various infrastructure developments in preparation for seismic and suspension tests. The triple controls prototype suspension has been successfully characterized and investigations on the HEPI system have continued. An important finding is that the floor tilts significantly (greater than the HEPI range and the OSEM range on suspensions) when the vacuum chambers are pumped out, so that optical tables will need to be set with this in mind. Also reported were measurements on the saturation characteristics of the Lightwave 10 W laser which compared well to the model. Since dedicated LASTI use of the laser is not required for some time it is available for power upgrade tests and as a source for squeezing experiments. The spare HAM chamber could be used for output mode cleaner tests if required but such work would require additional manpower.

A detailed schedule was presented to indicate how seismic and suspension development and testing could proceed in parallel over the next year or so before being brought together for combined tests. The suspension program could conceivably include preliminary locking tests between the quad controls prototype suspension and the triple suspension already at LASTI.

Overall the committee felt that the LASTI team was doing a very good job under circumstances which has called for them to be both adaptive and creative in the light of the delay in the delivery of the BSC seismic system for testing. We commend them for their efforts.

Three points arose in discussion among the committee members after the presentation and in subsequent e-mails.

1) An action which we believe needs to be taken quickly is to ask the SEI team to provide guidelines to LASTI on two pieces of hardware currently being designed, in particular to address the required stiffness or desired frequencies of the structures, since there was some confusion about this matter during the review. We note that there are cost

implications involved – and so compromises may need to be reached. The two pieces of hardware are:

a) The solid spacer which will go inside the BSC tank to take the SUS quad pendulum for stand-alone testing. This tank is equipped with HEPI and thus will interact with the HEPI control system.
b) The test stand for assembling the SEI and SUS systems outside the tank prior to installation. There was some debate about what stiffness / frequencies to aim for in the pillars of this stand.

In general we would like to promote the close working of the SEI team with LASTI as the plans for testing the BSC are progressed, so that the LASTI team is ready when delivery takes place.

2) The second point which was raised was that of the available manpower compared to the perceived manpower for the program ahead. We would like to raise an action for Dave Ottaway and the team to give some guidance to LIGO management on the manpower issue, including possible funding impacts.

3) We are aware that a LASTI test plan has been drafted with input from LASTI and the SEI and SUS groups, although this was not specifically discussed at the review. We encourage the various groups involved to complete this plan as soon as possible after the SEI critical review is ended, and suggest this is done by the next LSC meeting. We ask that the LASTI team inform the LASTI TAC of the name and number of the document when it is released to the DCC.

NAR for the LASTI TAC, 12th April 2005