



Subject	Review Charge: LIGO A+ BeamSplitter (BS) Suspension (SUS) Preliminary Design Review (PDR)	
To	Review Committee:	
	Rich Abbott Stuart Aston GariLynn Billingsley (ex officio) Dennis Coyne (chair) Anamaria Effler Peter Fritschel (ex officio)	Ken Strain Charlie Taylor (ex officio) Calum Torrie (ex officio) Betsy Weaver Norna Robertson Mike Zucker (ex officio)
cc	<a href="mailto:aplus@ligo.org">aplus@ligo.org</a> <a href="mailto:systems@ligo.org">systems@ligo.org</a> Joe O'Dell Adam Huddart	
From	Dennis Coyne	
Refer to	L1900320-v <del>2</del> <u>21</u>	
Date	<del>4</del> <u>5</u> Sep 2019	

## 1 **Background**

The scope of the A-Plus (A+) Project ([M1800223](#), [M1800264](#)) includes a larger beamsplitter (BS) optic and a revised suspension for the larger BS optic. The scope of this PDR are the BS suspension modifications. The primary documents to be reviewed are as follows:

- LIGO-[T1900581](#)-v1, LIGO A+ BeamSplitter Preliminary Design Document (PDD)
- A+ Beamsplitter Assembly.EASM  
(a SolidWorks 3D e-Drawing posted at [T1900581](#))
- LIGO-[T1900583](#)-v2, A+ BS compliance matrix

The committee's comments, and the design team's responses, will be captured in a google document (link in the abstract for [E1900252](#)). Once the review has been completed, the committee's report will be posted at [E1900252](#) for review and approval by A+ Project management.

The following charge is developed based on the guidance document [M1500263](#)-v2.

## 2 **PDR Charge**

- 1) Has the A+ BS SUS Design Requirements Document ([E1900069](#)) been completed by resolving all "TBD" items and incorporating all changes adopted from the Conceptual Design and Requirements Review (CDR/DRR, [L1900205](#))?
- 2) Have all of the action items from the CDR/DRR ([L1900205](#)) been completed satisfactorily?

- 3) Are the interface requirements adequately defined and is the design compliant with these interfaces?
- 4) Has the revised design raised any assembly or installation procedure or tooling issues?
- 5) Has the revised design raised any new or revised safety issues?
- 6) Have all design issues/questions been resolved so that only detailed engineering drawings, specifications and procurement documents are needed for implementation? If not what design issues or questions remain to be resolved?
- 7) Have any long lead items been identified, i.e. items for which procurement must begin before the final design review? If so, have detailed engineering drawings, specifications and procurement documents been reviewed and approved by this committee?
- 8) Does the design comply with all of the design requirements? Not just the requirements associated with the revisions to accommodate the larger beamsplitter optic (defined in E1900069) but also the requirements on the original BS SUS (defined in sections 3 and 6 of T010007-v5). In particular are the displacement noise requirements shown to be met with revised dynamics modeling consistent with the proposed design?