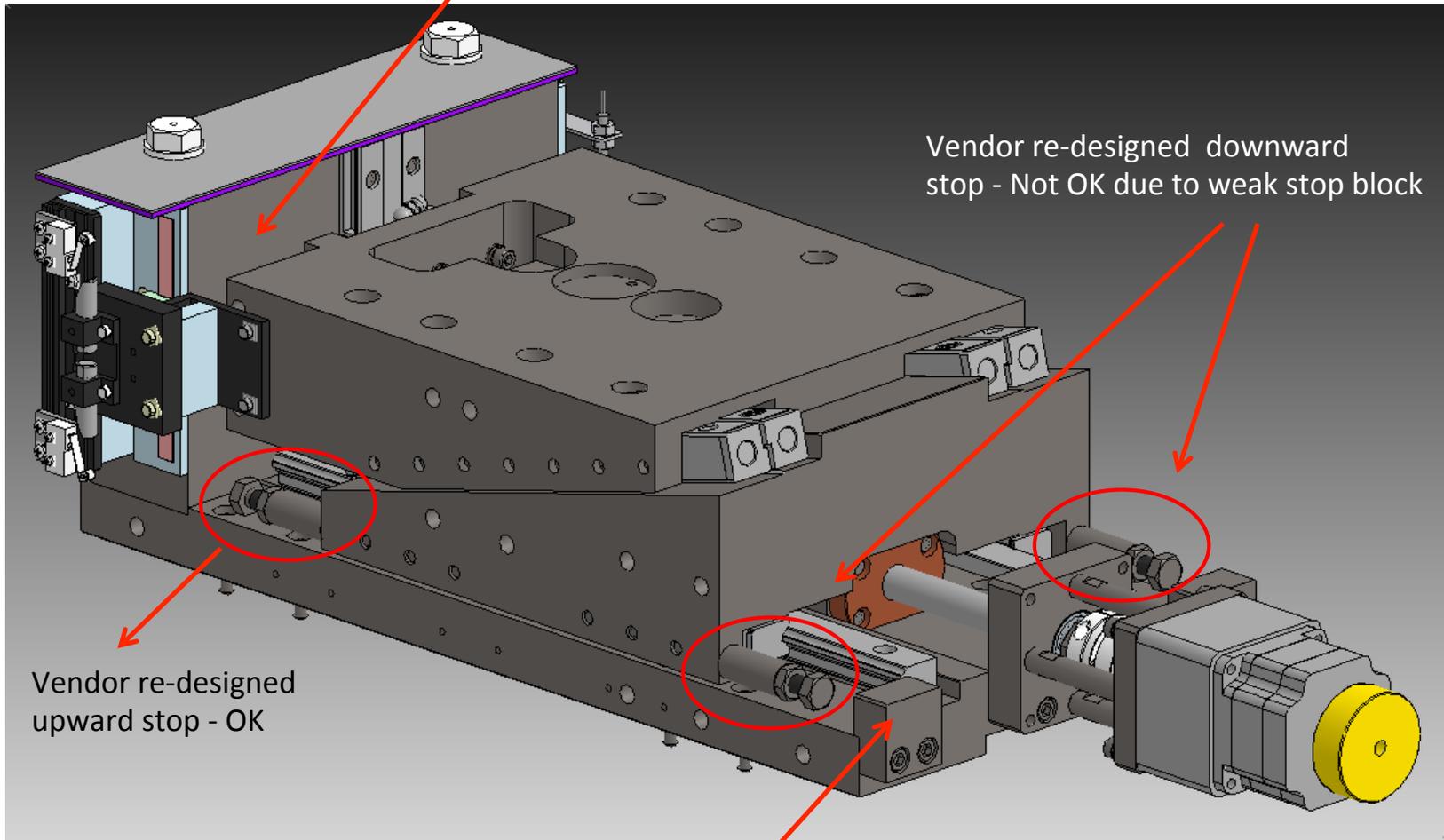


Summary of response to IRR concern about the FXI mirror hard-stop

1. Vendor re-designed hard-stop. NSLSII design review of this was held on Nov 7. Reviewers did not think it will work for the 'downward' side of the stage. The problem is that at the 'downward' limit of the stage, the stop block is held by two M6 screws in tension, which FEA shows is insufficient to resist the maximum force. Made suggestions for alternative solutions. (see next page and *FXI_Hardstop_DesignReview_Nov7 & PS-DRR-1064 – Collimating Mirror Hardstop PDR*)
2. Engineer Bernie Kosciuk came up with a new idea. Held a design review for his new idea on Dec 6. Review panel approved Bernie's design for the 'downward' limit and the vendor design for the 'upward' limit. The reason that the vendor design is approved for the 'upward' limit is because there, unlike the 'downward' side, the stage has a stop block that is held by eight M8 screws in shear that can easily withstand the maximum force. (see next page and *FXI_Hardstop_DesignReview_Dec6 & PS-DRR-1065 – Collimating Mirror Hardstop FDR*)
3. Revised mis-steered beam technical note (TN 265) to indicate that the stops are only needed to avoid high mirror incidence angles. That is, only need to worry about the downward motion on the upstream vertical stage and the upward motion on the downstream vertical stages. (see *FXI Mis-steeredPink Beam_v2*)
4. Revised and updated mirror drawings to reflect new hard stop solution. (see *PD-FXI-BL-1020, PD-FXI-BL-1101, 1102&1103*)
5. Stops installed (see pictures). Travellers updated.

Location of 'stop blocks'.

Upward side stop block- held by eight M8 screws in shear from below



Vendor re-designed downward stop - Not OK due to weak stop block

Vendor re-designed upward stop - OK

Downward side stop block – held by two M6 screws in tension