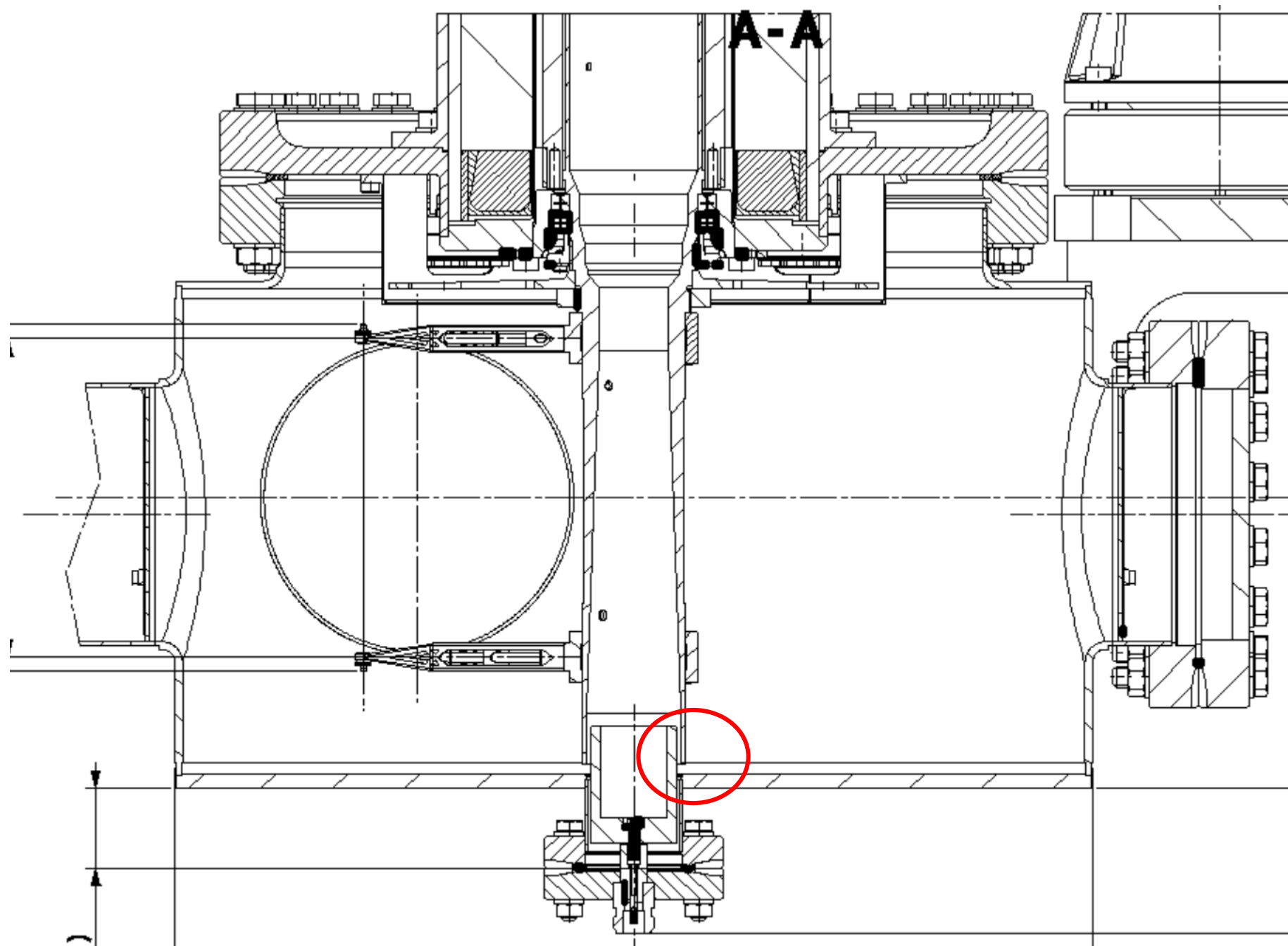


Request for a change of the PSB 4L1-R2 wire scanner

Ray VENESS / BE-BI

Background

- The Booster 4L1 ring 2 fast LIU wire scanner is currently blocked and will not rotate
 - It was tested and working normally when tested locally just after installation in late 2019
 - However, when tested with the new control electronics in summer 2020 it would not rotate
 - The problem was initially put down to either a cabling, control or scanner mechanics error
 - After extensive testing of all cabling and control electronics, physically changing the scanner and then testing the removed scanner on the bench, no problem could be found
- It has now been determined that there is a design/fabrication dimensional error in this one vacuum tank
 - The error is just large enough that the deflection of the tank under vacuum ($\sim 0.4\text{mm}$) will block the scanner shaft against the tank wall, but not so large as to prevent the instrument seal from closing normally
 - This means that the problem only appears when the scanner is under vacuum. This has been verified by venting the sector and operating at atmospheric pressure – the error is systematically repeatable

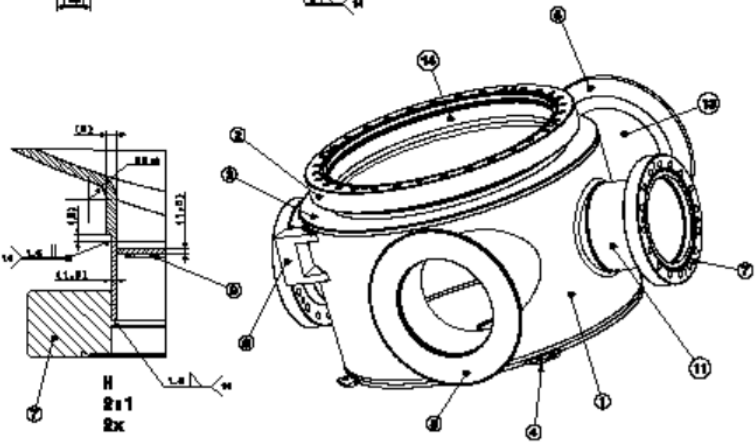
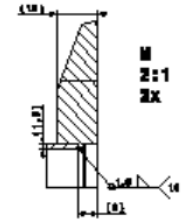
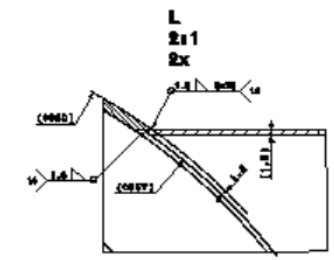
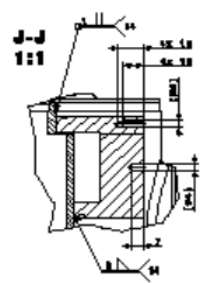
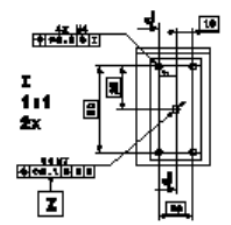
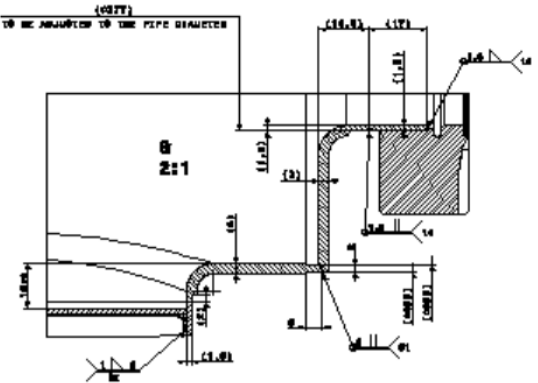
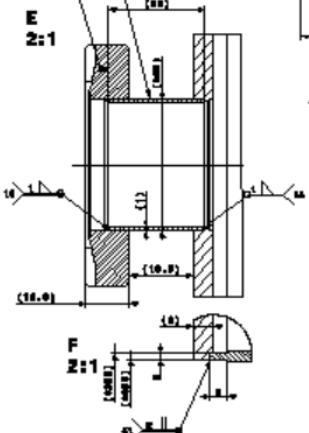
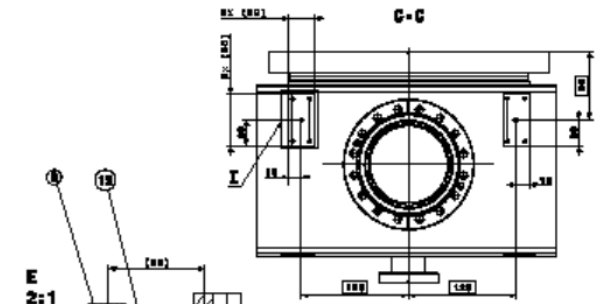
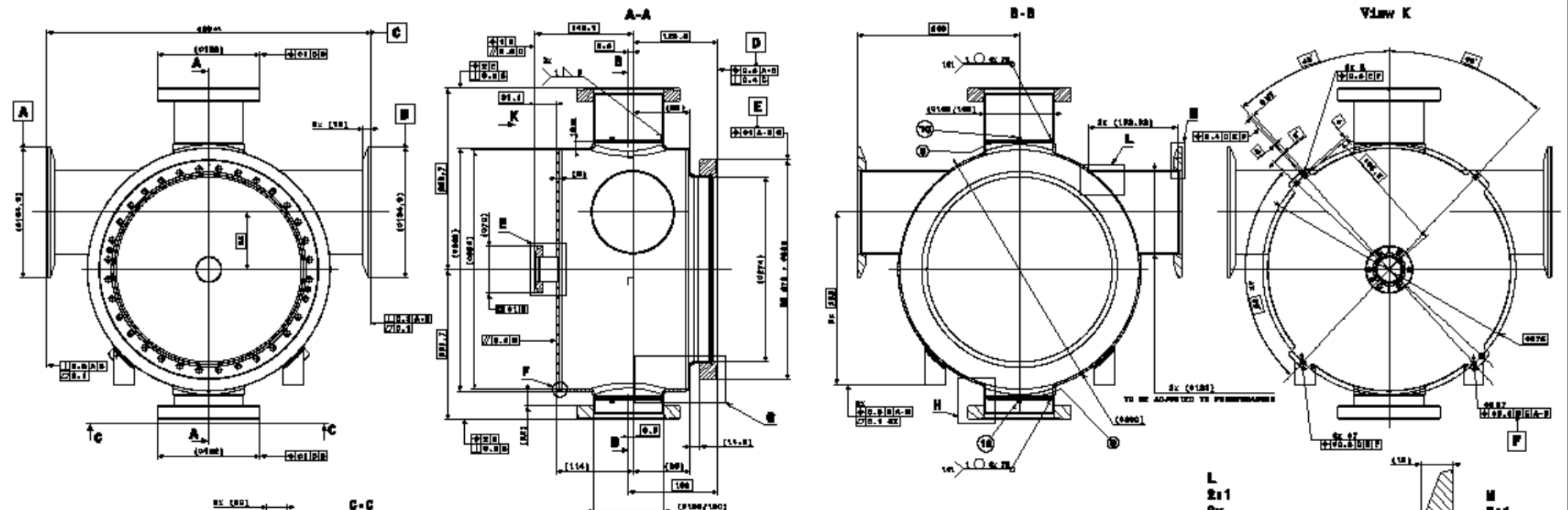


Proposed actions

- Replace the scanner and tank assembly
 - Fortunately a spare scanner tank was produced for all variants and this exists for the PSB-H design. This spare tank is conforming to requirements and has been re-cleaned and prepared
 - Ad-hoc meeting yesterday with OP, VSC plus other discussions has converged on a proposal for a **vacuum intervention on Tuesday 5th Jan 2021**
 - The complete assembly of tank + scanner will be removed and replaced with the spares, then re-surveyed. This intervention (not including vacuum recovery) will take less than 1 day.
- Other actions
 - All other LIU scanners in all machines (PSB, PS and SPS) have been operated under vacuum and do not show this issue. In addition, the external dimensions of all other tanks have been controlled and do not show the same error
 - Exception is the Booster 4L1-R1 tank, which shows the dimensional error to a lesser degree
 - The drawings will be corrected by MME and the faulty tank modified to be recovered as a spare

End

Thanks to many people for their work and help with this



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