



Structure Engineering Notes

September 7, 1999

"Bowden Design Review"

There was a discussion of the list of written questions that Chris Dolphsen had prepared about Gordon's support design:

- o Only one ion pump is needed; two are shown reflecting two options
- o Adjustment capability: For "large" adjustments, one screw would be backed out while the opposing screw was advanced. For small adjustments, only one screw would be moved, similar to a four-jawed chuck, allowing a range of movement of around 50μ and a resolution of 5μ . The support would lastically distort in this process. Gordon included Belleville washers in case pre-loading is needed.
- o RF waveguide loading: The potential moments induced by the RF waveguide affects any design. Gordon did not attempt to deal with this. The waveguide most likely needs a rigid support tied to the structure support.
- o Distortion from the vacuum manifold at the center: Gordon has it brazed to the O.D. of only one cell to minimize distortion. Differentials during the heating and cooling ramps during brazing may be distortion contributors.
- o Vibration of the pump: The pump may have to have a separate support (with a vacuum load) to keep it from oscillating in a pendulum-like fashion.
- o More support points: The pre-DDS3 structure has almost a full sinusoidal shape. Gordon will have one additional tie-down bracket in his support design that can be located at the appropriate place.
- o Hard points on support: Gordon uses hardened balls rolling against a hardened surface to support the structure. The goal was a compact design that could take heavy loads.
- o Z-axis movement: Possibly a clutch-type disk (flexible in z but rigid in x and y) would also work.
- o Water and vacuum at the center: Designed to cut any alignment problems by a factor of two.
- o Three-structure design: Gordon envisages that the alignment components are brazed directly to the structures, and that the three structures would be set directly on the girder. The ends of each adjacent pair of structures would be aligned, and then the centers aligned to both ends.
- o Schedule: There is concern that the schedule may not allow the luxury of very much analysis of either support design. The KEK and ASSET schedules remain somewhat imprecise. The design discussions need to be tempered with schedule sensitivity.
- o Other generic concerns: mechanical hysteresis clearance for the CMM to take measurements cooling water specifics RF loads - probably four at 45° angles will be needed

◆ **For the next meeting:**

- o Carl will talk to Nancy and get together with Gordon on the specifics of the water cooling - flow rates, pressure drops, and delta T's.

- o Carl will generate a schedule for the construction of the Bowden or Palrang support to help with the overall scheduling.
- o Chris Pearson will prepare a schedule for the work he needs to accomplish on RDDS1, also to help with scheduling.
- o Any other questions that any participant has for either Gordon or Mike Palrang should be written down and forwarded to all members by e-mail, or sent to John C. for distribution.

Minutes by John Cornuelle