Listed below are vendor questions that were received prior to the requested deadline and the corresponding answers for RFB# AA17-RH-5150 – Dilution Refrigerator for the TolTEC Project per the following specifications or approved equal.

The original bid opening date will remain as scheduled for November 23, 2016 @ 1:00 pm EDT

Question #1: The temperature gradients specified across the thermal links are incredibly small for the amounts of power being applied and we are concerned to how achievable these numbers are:

For example: Our proposal would be to use cooling platform at the mixing chamber for the 0.1K stage, we would expect the ‘delta T’ across the thermal link with 250 uw applied to be greater than 0.005K, but we are confident that the end temperature where you connect your snout extension (i.e. the snout side of the thermal link) would be less than .0.7-0.8K, then with 10mW applied a temperature of ~1K is achievable on the snout side of the thermal link, but the gradient across the link may be greater than 0.1K is this acceptable?

Answer # 1:

The specification in the RFB of the thermal gradient across the heat straps was perhaps not the best way to describe our aims. Our primary goal is to achieve temperatures of the bus bars (and principal amongst these the 0.1K stage) consistent with those given in column 1 of Table 2 of the RFB given the heat loads given in column 2 of the same table. This goal overrides the specifications given in Table 1 of the RFB and so larger temperature gradients across the compliant thermal links are allowable as long as the bus bar temperatures meet the specifications in Table 2.

Question #2: The 45K thermal stage temperature is a problem as from the room temperature radiation shining on the PT1 shield of the pulse tube we can see that this is not achievable, more realistic in our opinion is 60-70K. Is this going to be a major problem?

Answer # 2:

This is not a problem.

Question #3: We assume the thermal links should be installed at the dilution refrigerator end of the snout arm. Please confirm.

Answer # 3:

This assumption is correct. The thermal links (aka thermal bus bars) will be rigidly connected inside the main cryostat. The thermal links we are requesting here will be connected inside the dilution refrigerator. The lengths of the respective bus bars will be agreed to based on your thermal link designs and the dilution refrigerator geometry.