

ERR Committee comments on the NPS collaboration response to the recommendations of the ERR Report

First of all we thank the NPS collaboration for detail response to our comments and recommendations presented in the ERR committee report dated May 28, 2019. For the most part, responses adequately address questions and concerns raised in recommendations. However there are still few items that must be addressed/clarified for full satisfaction of the ERR report. Below are our comments for what we think to incomplete responses to the recommendations ordered by Charge number.

Charge #1: A draft of the run plan for both Run Groups have been presented with the ordering of kinematic settings as they are plan to run. The ordering takes into account equipment radiation, in order to optimize changeover time. However, the question of the priorities between the settings have not been addressed.

Charge #3: It is understood that no threshold will be used for the readout of individual modules. Thresholds, rates, and energy resolution must still be determined for the trigger to function in an efficient and meaningful way. We are not aware of an existing firmware that allows to effectively set FADC readout thresholds independent of trigger.

Answer to the question of rates states "... the maximum rate in the calorimeter will be smaller than 1 MHz per module ...". What threshold this maximum rate corresponds. As was mentioned at the review, for one of the settings of PR12-14-003, the rate of e-, γ , e+ with energy > 1 GeV was estimated to be 1.2 MHz. It is important to know how high the rates of much lower energy particles will be that will pass the threshold for the trigger formation and how this rate translates to a rate per module.

Charge #4: Clear explanations of which magnets are under accelerator control and which are controlled by the Hall C are given. But the question of who will be in control of the NPS magnet is not answered. The statement in the response says "The NPS magnet **can be** owned and controlled by Hall C", is it "can be" or "will be", and who will write the procedures for operating the magnet.

Charge #7: The simulations performed in 2013 do not appear to include the effect of the radiator on the doses. In particular, the combination of the radiator and sweeping magnet may significantly impact activation in the area around the calorimeter. Dose to the calorimeter may also be affected, though perhaps not drastically. Similar configurations in other experiments have incorporated shielding around the radiator. The possibility of some shielding between the radiator and the target was discussed in the PAC proposal, but no discussion of this was included in the ERR presentation.

A new studies of the radiation background are underway with the help of the radiation control group. These simulations should include evaluations of added shielding at the radiator. The results of these simulations may indicate a need to develop a method for magnet/calorimeter position adjustments that reduces the need for manual rigging and hence time spent in the area by personnel. Work being conducted by IPN-Orsay to evaluate radiation dose to the PMT bases should also take the radiator into account.

Charge #8: Details of the trigger validation using a random trigger with beam will be helpful. Also, it is necessary to develop a software for the simulation of the trigger firmware operation to validate the trigger performance.