

FD1 PDS FDR Questions:

1. (D) Questions concerning Glass2Power (G2P) change?

- (i) Can we see in one place the evaluation of G2P performance, including aging? Or point us to existing documents.
- (ii) For PRR Is the vendor capable of producing as needed, or other vendors also available? Sole source? Risk to schedule before going to PRR.

2. (D) Questions on filters. What specifically will you change from ProtoDUNE I? How will these changes be validated?

3. (D) Can you show us results from ProtoDUNE I in situ calibrations?

4. (S) Re: Simulation results on contamination specs and quenching on performance

- (i) Can you show how much light is lost from quenching, attenuation, filter, etc to show that they are consistent with simulations.
- (ii) Show how electronics, firmware, etc are folded into the simulation. How were these validated?
- (iii) Was there a light yield measurement made in ProtoDUNE I? If so, please give the results.
- (iv) Were there nitrogen contamination measurements done in ProtoDUNE I? And in any of the test experiments used to measure the photon detection efficiency?

5. (S) What are the 2-3 biggest risks associated with ProtoDUNE II delay in completion of the design?

6. (S) Questions on S/N with respect to noise environment?

- (i) How was noise characterized in the measurements of S/N in each case? How much random and how much correlated in each setup?
- (ii) How does the noise environment of ProtoDUNE I compare with lab tests? Is it different in an active environment (e.g. large event) than in the lab?
- (iii) Any issue in cross-talk with CALCI or other systems sharing the cable tray?

7. (D) Aging tests on cold electronics

- (i) Provide detailed procedure for aging tests, including op amp in addition to transistor and how power supplies were operated during the tests.

8. (S) Interface to DDSS

- (i) Describe the interface, or if there is not a direct interface describe how the system safely operates for the PDS

9. (D) Specs on storage and handling – please provide and justify.

(i) Is water absorption an issue?

(ii) What are temperature range specs

(iii) Is there a radioactivity spec on radon exposure? Are any mitigation measures (e.g. mylar bag on units pre-installation) planned?

Post-installation environment and cleanliness. Is ISO-8 OK for you? How do we know?

10. (S) For the LED calibration system:

(i) Please give more specifics on QA/QC LED calibration system plan pre- and post-installation

(ii) the diffuser mounts are 3D printed, what aging tests have been done?

(iii) There is a discrepancy between the slides presented and the interface control document at EDMS 2088721. Is the distribution of the diffusers completely settled or are more studies needed? Regardless, the ICD should be updated to communicate the agreed upon layout.

11. (S) DAPHNE V2a vs. V3

(i) Plan to incorporate into design documents prior to PRR?

(ii) What tests need to be done to validate? Please provide document summary.

(iii) Describe tests done to validate self-triggering performance

12. (S) Re: QA/QC plan in general

(i) Will there be spot checking of materials delivered from manufacturers to ensure they are following agreed upon procedures?