

Charge to the Fermilab ASIC Review Committee

November 2011

Over the past 25 years, Fermilab has been a leader in the development Application Specific Integrated Circuits (ASICs) for use in HEP. This development has included several very successful designs for the readout of silicon strip detectors at hadron colliders and the development of the Charge Integrator and Encoder (QIE) family of devices that has been used on four different experiments spanning fixed target kaons, neutrinos, and hadron colliders at Fermilab and CERN. Development in this area involves long lead times, significant engineering effort, expensive tools and prototyping.

Over the past five years, the Fermilab ASIC group has embarked on a program aimed harnessing the latest industry developments, 3D architectures, to revolutionize electronics for future experiments. At the same time they have continued with development along more conventional lines in several areas. They have also expanded their role in the design of some types sensors to work with these circuits. We would like you to evaluate the quality of the recent effort (past ~3 years) and planned program for the next 3 years (FY13-15). Evaluation of the planned program should be based on three possible budget scenarios: Flat for next 3 years, 5% cut in FY13 and flat after, 5% rise in FY13 and flat after.

Please consider the following questions:

1. Is the R&D undertaken appropriate to the goals of the laboratory and the US HEP program? For example, are there needs for future Intensity Frontier Experiments that are not being met?
2. Does the work have potential for significant impact on the field?
3. Is the balance between long term development and support of current and near term projects appropriate?
4. Is there an appropriate model for assigning priorities and providing access to group capabilities?
5. Are the resources appropriate for the work being done? Is the effort integrated with other technical resources in the laboratory?
6. Are there needs for significant changes in technical capability, balance of skills, or infrastructure (software, probe stations)?
7. Given the long time between applications in Particle Physics detectors, to what extent is it appropriate for the group to extend its work beyond traditional HEP applications, for example x-ray imaging, medical applications, and focal plane arrays?

This review is expected to consist of about ½ day of presentations by the proponents followed an executive session. Advance materials are likely to limited to draft slides and slides shown at prior reviews. We would like a short report in the form of findings, comments and recommendations to be provided to the PPD Division head within 2 weeks of the review.