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SLAC Accelerators Power Electronic System Operation for Reliability

SLAC National Accelerator Laboratory is home to a two-mile linear accelerator—the longest in the world. Originally a particle physics research center, SLAC is now a multipurpose laboratory for astrophysics, photon science, accelerator and particle physics research. SLAC mission as National Laboratory seeks to be a leader in exploring frontier questions of science that are important to the nation.
The major particle accelerator relates programs SLAC currently undertakes to achieve its vision are:
• Linac Coherent Light Source (LCLS)
• Stanford Synchrotron Radiation Lightsource (SSRL)
• Experimental Particle Physics:
o Facility for Advanced aCcelerator Experimental Tests (FACET)
o Next Linear Collider Test Facility (NLCTA)
Power Conversion Department (PCD), provide power conversion talent and systems for high energy physics LINACs and storage rings. Maintain technical/engineering expertise for existing and future power conversion applications. Design, document, install, and maintain: Low and high power DC systems for beam generation, transport, shaping and delivery, Fast kicker, RF modulator pulsed systems, Power system control, monitoring, protection and raceway systems.
This paper will cover PCD organization, Tools and Policies, Metrics and Plans for SLAC accelerator power systems Operation management, Performance, Improvements and long term support plans.

Summary

Power Conversion at SLAC has develop a model to maintain the accelerator machines in two folds:
1) Service Level Agreement - Where the goals with our internal costumers (scientific programs) are set.
2) Sustaining Engineering Model - Where every single equipment have been assigned a System Manager and an A&S, supported by a 24/7 Maintenance Group.

The presentation will cover, SLAC
1) SLAC overview and Machines Availability Goals
2) PCD Sustaining Engineering Organization
3) Reliability/safety tools and Policies
4) Reliability Metrics
5) Upgrade program
6) Design for reliability
7) Conclusions

Primary author: Mr RAFAEL, Fernando (SLAC National Accelerator Laboratory)

Presenter: Mr RAFAEL, Fernando (SLAC National Accelerator Laboratory)