

FY2010 PEMP Yearend Review
September 27, 2010

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Fermi National Accelerator Laboratory

Goal 1.0: Provide for Efficient and Effective Mission Accomplishment

- ❖ The contractor produces high quality, original and creative results that advance science and technology; demonstrates sustained scientific progress and impact; receives appropriate external recognition of accomplishments; and contributes to overall research and development goals of the department and its customers.
- ❖ Continuing wide coverage of Fermilab in general interest science magazines, newspapers, and other popular media (e.g., Possible Extension of Tevatron Collider Run, "Race for the Higgs", CDMS dark matter events).

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❖ 1.1 Science and Technology Results Provide Meaningful Impact on the Field

- ❖ **Science:** Fermilab continues to produce world leading results at the three frontiers of particle physics, maintaining its position as the most productive particle physics institution in the world today;
 - e.g., see results presented at Moriond EW and QCD conferences (where about 40% of the experiment talks were on Fermilab results, even larger if LHC experiments' status talks not counted in denominator; plus high profile talks by M. Carena, B. Kayser, Y-K Kim, S. Parke, and C. Quigg).
 - e.g., see results presented at ICHEP (~ 60 talks on Fermilab program by staff and collaborators).
- ❖ As of 9/15/2010, 213 publications in FY 2010 in 29 refereed journals (i.e., non-duplicate physics and development results), including 58 in Phys. Rev. D, 40 in Phys. Rev. Lett. , 29 in JINST, 14 in Astrophys. J, 12 in Phys. Lett. B, ...

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- ❖ **Energy Frontier:** fueled by the high integrated luminosities, the Tevatron has produced many results, graduating Ph.D.s at a rate of about 60/year and producing some 100 results/year.
- ❖ **Energy Frontier:** At the LHC and at the LHC Physics Center at Fermilab, we provide the main support for the US community in CMS across a broad front: simulation and analysis, hardware commissioning and theory.
- ❖ **Energy Frontier:** For the LHC accelerator proper, we have provided critical aid to CERN with the instrumentation LARP provided and in commissioning the machine.
- ❖ **Energy Frontier:** Continued successful development of ILC cryomodules and provided the case for a major investment of ARRA funds into SCRF infrastructure and industrialization. Developing US industrial capability achieving positive results.
- ❖ **Energy Frontier:** We are the leading institution and have been asked by the DOE to organize and head the Muon Accelerator Program for the development and design of neutrino factories and muon colliders.



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- ❖ **Cosmic Frontier:** Stage I approval of two dark matter experiments: COUPP 60 kg experiment at SNOLAB (E-999) and Darkside (E-1000) depleted argon experiment.
- ❖ **Cosmic Frontier:** CHASE successfully finished data collection. A paper in preparation will announce world-class limits on chameleon particles.
- ❖ **Cosmic Frontier:** Chicagoland Observatory for Underground Particle Physics (COUPP)
 - New best limits on WIMPs that would interact with nuclear spins.
 - COUPP 4 kg chamber moved to SNOLAB and is starting operations.
- ❖ **Cosmic Frontier:** Cryogenic Dark Matter Search (CDMS)
 - Published new limits on direct detection of dark matter particles in Science.
 - Two events seen with the characteristics of WIMPs, but expected background of ~ 1 event, so no signal claimed.
 - Widely covered result in the popular press and in the scientific community.

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- ❖ **Cosmic Frontier:** Pierre Auger South
 - New result on the composition of cosmic rays suggests that they are mainly protons at lower energy and mainly iron nuclei at the highest energies.
- ❖ **Cosmic Frontier:** Seventh data release by the Sloan Digital Sky Survey (SDSS).
- ❖ **Cosmic Frontier:** Fermilab plays critical roles in operating the experiments and participating all the way through, including doing physics analysis.

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- ❖ **Intensity Frontier:** Delivery of protons on target (POT) for the high energy neutrino beam (MINOS, MINERvA, and ArgoNeuT) and the low energy beam (MiniBooNE). The Main Injector reached a record hourly average beam power of 386 kW on 10 March, 2010, corresponding 4.5×10^{13} every 2.2 seconds. Total beam delivery to NuMI has now exceeded 10^{21} protons. Delivered POT for the fiscal year nearly 50% over the DOE goal, the DOE goal having been achieved already in May, 2010.
- ❖ **Intensity Frontier:** The MINOS Collaboration has presented results on the electron-neutrino appearance at twice the previous statistics, one of the most highly anticipated of recent results. It has presented a preliminary measurement of anti-neutrino oscillation parameters and observed a suggestive difference with neutrino parameters at low statistical significance. Also, on seasonal changes in cosmic muon flux, sterile neutrinos, and cross-sections.
- ❖ **Intensity Frontier:** The MINERvA detector completed construction and commissioning and is operating well with <20 channels dead out of 32,000. It has received over 10^{20} protons on target in low energy and special running neutrino mode.

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- ❖ **Intensity Frontier:** Completion of data taking by the ArgoNeuT test of liquid-argon detector in the NuMI beamline (February 22, 2010).
- ❖ **Intensity Frontier:** SciBooNE published results on neutrino neutral-current neutral-pion production – total and coherent production papers - interaction results most relevant to the T2K oscillation experiment.
- ❖ **Intensity Frontier:** The MiniBooNE Collaboration presented new, higher statistics results on anti-neutrino running and sees an excess of events that further statistics are needed to confirm. The experiment released several more cross-section results and has now published 16 papers in total.
- ❖ **Intensity Frontier:** Continuing development of the neutrino programs for both intermediate term (MicroBooNE & NOvA) and long range (LBNE), both with water Cherenkov and liquid argon TPC detectors).
- ❖ **Intensity Frontier:** Development of the mu2e experiment.
- ❖ **Intensity Frontier:** Consideration of a New g-2 experiment.

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- ❖ **Intensity Frontier:** Mu2e Milestone and Organization Progress and Effort:
 - Mu2e received CD-0, November 24, 2009.
 - Three Project Office people and five Level 2 Managers added (2 of the 8 total are replacements).
 - Five Project Office people planned to be added next year.
- ❖ **Intensity Frontier:** LBNE Milestone and Organization Progress and Effort:
 - Major milestone met by the LBNE Project this fiscal year: CD-0, January 11, 2010
 - Transfer or redirection of existing Fermilab staff this fiscal year:
 - Project Manager, six others in Project Office, and five Level 2/3 managers.
 - New hires this fiscal year:
 - One Level 2 Manager and four contractors for the Project Office.
 - Number and titles of any slots still needing staffing.
 - Active searches currently under way – two internal searches and four external searches.
 - Searches to be launched during FY2011 – seven planned.

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- ❖ **Intensity Frontier:** Progress on Project X
 - Organized as a national project with international participation:
 - Fermilab as the lead laboratory
 - Fermilab Project X Organization structure developed:
 - Associate Director for Accelerators: Stuart Henderson
 - Project Manager: Steve Holmes
 - Project Scientist: Sergei Nagaitsev
 - Project Engineer: Jim Kerby
 - SRF Coordinator: Bob Kephart
 - International Coordinator: Shekhar Mishra
 - Subsystem Managers: Numerous (All identified)
 - Collaboration Council organized:
 - Inter-institutional communication to facilitate execution of the RD&D phase, and prepare for a construction phase
 - Institutional representation from each of the MOU signatories



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❖ **1.1 Science and Technology Results Provide Meaningful Impact on the Field (Continued)**

- ❖ **Technology** – Fermilab continues to develop the technology needed to advance physics reach at all three particle physics frontiers, and for use more broadly.
- ❖ We continue the transition from detector R&D that was a broad program at the Division level to satisfy many purposes, including support and improvements to existing facilities, support of technical know-how between projects, and advanced detector R&D – to a more coherently managed program with specific goals in advanced detector R&D. E. Ramberg now heading the effort.

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- ❖ **LAr for Long Baseline Neutrino Experiments:** Systematic pursuit of liquid-argon technology. In close contact with European collaborations that recognize that the many problems in the development of the technology have been due to the lack of systematic approach to material tests and engineering.
- ❖ **Solid State Detectors (CDMS):** Demonstration of a new type of Ge detector (iZIP) with greatly improved discrimination against electromagnetic interactions in favor of nuclear recoils.
- ❖ **Bubble Chambers (COUPP):** Established new acoustic sensor technique for rejection of backgrounds from alpha particles.
- ❖ **Solid Xenon:** Demonstrated that large ($\sim 1\text{kg}$) crystals of solid Xenon can be grown reliably. These may prove to be excellent detectors for axion and WIMP searches. First laboratory to do so.
- ❖ **DECam:** Telescope Simulator assembly in Lab A to test camera systems.
- ❖ **Laser Technology:** New high-power laser lab in MP8 tunnel is operational.
- ❖ **Auger North Detectors:** Developing new designs improved from Auger South results and experience.

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- ❖ **Time-of-Flight:** Obtained resolution of 23 ps using Cherenkov radiators, read out with avalanche photo diodes operating in Geiger mode.
- ❖ **SOIPIX:** Submission of an imaging pixel detector in the SOI process and targeting exploration of the Au/In + adhesive 3D bonding process.
- ❖ **CAPTAN:** a new data acquisition system now used regularly for test beam experiments and equipment bench tests. A number of systems have been distributed to university collaborators and other national labs (e.g., IHEP, Beijing)
- ❖ **Optical Data Links:** assessing commercially available and prototype parallel optical transmission equipment performed at up to 6.25 Gbps.
- ❖ **Free-Space Optical Data Transmission:** Cable-less data readout experiments performed through bulk silicon and detector samples to characterize the bit error rate performance of a prototype link at multi-gigabit rates.
- ❖ **3D Circuits:** First successful submission of a Multi-Project Wafer run of a Fermilab-led 17-HEP-laboratory consortium using the 3D vertically integrated silicon technology, leading to a collaboration with 3 companies (MOSIS, CMP, CMC) to provide this service to the world community at large.

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- ❖ **Calorimetry:** First successful test of a crystal calorimeter with separate readout of Cherenkov and scintillation light.
- ❖ **Fermilab Test Beam Facility:**
 - Completed construction of a tertiary beamline that extends beam delivery of pions down to 300 MeV/c, a regime heavily requested by MINERvA for detector calibration and by calorimeter-development groups worldwide.
 - Tests by 9 groups in the Meson Test Beam during the first half of FY 2010, including of Micro Channel Plate Photomultiplier tubes obtaining timing single-detector resolution calculated to be 8 picoseconds for detection of single particles.

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❖ High-Field Magnets:

- Dipole style collar design and collaring process were successfully tested at Fermilab using 90-mm Nb₃Sn TQ coils.
- Quench performance and field quality consistent with models based on shell (TQS02a/c) and quadrupole collar (TQC02Ea) structures.
- Easily adopted for long Nb₃Sn quadrupole (and dipole) magnets => important for LARP and LHC upgrade needs.
- Coil pre-stress limit for Nb₃Sn magnets is larger than 150 MPa (up to ~190 MPa) → Possibility of higher field/field gradient and use in long magnets.

❖ High-Field Magnets:

- First successful test of a Nb₃Sn quadrupole magnet with long coils (4 m) within the LARP program, achieving the declared goal of 200 T/m.

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- ❖ **HINS:** 2.5 MeV beam accelerated by the HINS facility.
- ❖ **HINS:** Test of SSR1 in horizontal cryostat with magnet nearby. The good result is that the cavity reached the vertical test gradient. The even better result is that it was demonstrated that cavity quench is immune to magnetic field penetration, allowing the base design of Project X (or any ADS machine with short focusing period and low-energy SC elements) where, in the front end, cavities and focusing magnets are tightly packed.
- ❖ **ILC/ SRF:** First successful operation, at DESY, of the 3.9 GHz cryomodule built at Fermilab and shipped last year. (Check http://www.desy.de/e409/e4948/e78938/e87693/index_eng.html - where both FNAL and TD are amply mentioned.) First cool-down performance as expected.
- ❖ **ILC/SRF:** VTS has tested more than 90 cavities in FY2010, doubling again the number of VTS tests performed in FY2009.

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- ❖ **ILC/SRF:** More than 10 1.3 GHz cavities dressed. This is an incremental achievement, showing that dressing of the cavities at FNAL is reaching "production" rates.
- ❖ **ILC/SCRF:** Completion, commissioning and delivery to DESY of 2 tuning machines for the tuning of 9 cell 1.3 GHz cavities. Another machine was delivered to KEK as part of a tri-continental agreement, and a fourth machine was completed and is in operation at Fermilab.
- ❖ **ILC/SCRF:** Completion of Vertical Test Stands 2&3. Cryostat design within International Collaboration (India) and construction contract awarded to US company supported by ARRA funds. Expected cryostat delivery dates to Fermilab is December, 2010.
- ❖ **ILC/SCRF:** Demonstrated a novel algorithm for adaptive Lorentz Force Detuning (LFD) compensation. This algorithm successfully compensated LFD at 35 MV/m for the first time during both the flattop and the fill, and adaptively compensated for changes in the cavity gradient.

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- ❖ **ILC/SCRF:** Demonstrated first ever laser repair of pit in single cell SRF cavity.
- ❖ **ILC/SCRF:** Four of six Fermilab nine-cell ILC cavities fabricated by U. S. vendor (AES) exceeded 35 MV/m in a vertical test after processing at JLab.
- ❖ **ILC/SCRF:** Steady processing of nine-cell cavities achieving high gradients at joint ANL/Fermilab electro-polishing facility. EP processes will approach 40 in 2010 comparable to JLAB processing rate.
- ❖ **ILC/SCRF:** Vertical Test Stand #1 achieved design monthly test rate of 5 tests/month, additional Vertical Test Stand $\sim 2/3$ of civil construction complete.
- ❖ **ILC/SCRF:** Two US 1.3 GHz dressed ILC cavities fabricated at Fermilab and shipped to Japan for S1-global cryomodule.
- ❖ **ILC/SCRF:** Cryomodule-1 – Installed at NML; two satellite cryogenic refrigerators operational; commissioned 5 MW RF source, couplers conditioned, Cryomodule-1 cool down started.
- ❖ **ILC/SCRF:** 9 cavities dressed, 3 dressed cavity for Cryomodule-2 tested successfully above 30 MV/m, two above 35 MV/m in Horizontal Test Stand. Six more in the pipe line.

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- ❖ **ILC/SRF:** NML tunnel extension civil construction nearly complete and the refrigerator/test stand building contract issued and construction started.
- ❖ **ILC/SCRF:** Acceptable bids received for NML 300 W 1.8 K refrigerator on ARRA funds. Expect contract award in early October.
- ❖ **Project X/SCRF:** Commissioned Spoke Test Facility and tested first dressed 325 MHz single spoke resonator.
- ❖ **Project X/SCRF:** 650 MHz cell shape EM design complete, ordered single cell cavities from industry and JLAB.

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1.1 Science and Technology Results Provide Meaningful Impact on the Field

◆ Notable Outcome for 2010:

The CDF and D-Zero collaborations will improve the exclusion limits on the allowed mass of a standard model Higgs Boson, and continue to study the most pressing Standard Model issues accessible at the Tevatron. (Objective 1.1)

- ◆ CDF and D-Zero published separately and a joint new limit on the Higgs, with the combined result being published on the cover of PRL and a PRL editor's choice. Additional coverage appeared for the updates given at ICHEP.
- ◆ Strong performance of the Tevatron and the experiments has motivated a proposal for running the machine for three extra years, to double the luminosity and get to the standard model Higgs at all expected/reachable masses. The Fermilab Physics Advisory Committee and many in the community have strongly supported this proposal.

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1.1 Science and Technology Results Provide Meaningful Impact on the Field

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- ◆ Tevatron Higgs combination now disfavors a high-mass Higgs, and pushing up from low mass. **Expanded previous exclusion range by a factor of 4.**
- ◆ The Tevatron Collider program is at its peak.
 - Reached about 50 journal publications/experiment/year.
 - 64 Ph.D.'s listed in the Annual Users' Meeting program (June. 2010).
 - Continually pushing boundaries.

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1.1 Science and Technology Results Provide Meaningful Impact on the Field (Cont'd)

◆ Notable Outcome for 2010 (Continued):

The CDF and D-Zero collaborations will improve the exclusion limits on the allowed mass of a standard model Higgs Boson, and continue to study the most pressing Standard Model issues accessible at the Tevatron (Objective 1.1)

❖ Other highlights already at the time of the mid-year review:

- Most precise determination of the strong coupling constant at a hadron collider, and demonstrating running at high scales.
- Combination of CDF and DZero Results on the width of the W Boson (most precise measurement of W boson width, input to this combination, was published by DZero on 12/4/09)
- Precise measurements of B hadron lifetimes and polarization in
Bs → φφ decays by CDF
- New best top-quark mass measurement
- New QCD and electroweak measurements
- New exotic-particle searches

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1.1 Science and Technology Results Provide Meaningful Impact on the Field (Cont'd)

◆ Notable Outcome for 2010 (Continued):

The CDF and D-Zero collaborations will improve the exclusion limits on the allowed mass of a standard model Higgs Boson, and continue to study the most pressing Standard Model issues accessible at the Tevatron (Objective 1.1)

◆ Highlights from CDF since the mid-year review:

- Latest results - <http://www-cdf.fnal.gov/physics/S10CDFResults.html> - including:
 - Single experiment Higgs expected exclusion at 160 GeV.
 - Improved t' and b' searches that are now each discrepant with SM at the 2.5-3 sigma level.
 - New CDF top-quark mass and Tevatron combination
 - CP violation in $B_s \rightarrow J/\psi \phi$ - updated with doubled data
 - CP violation in $B^+ \rightarrow D_{DCS} K^+$ (ADS method for angle gamma) - first time at hadron collider and overtaking the b-factories.

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1.1 Science and Technology Results Provide Meaningful Impact on the Field (Cont'd)

❖ Highlights from DZero since the mid-year review:

- Latest results - <http://www-d0.fnal.gov/Run2Physics/D0ICHEP2010.html> - including:
 - Evidence for anomalous like-sign muon asymmetry which might help to understand matter-antimatter asymmetry in the Universe.
 - Substantially improved upper limit on the B_s to di-muon decay probability, which substantially reduces phase space for new physics models including supersymmetry.
 - Multiple improvements in searches for new phenomena with data sets up to 6 inverse femtobarns (fb^{-1}). World-best limits in searches for di-electron and di-photon resonances, searches for vector quarks, leptoquarks, hidden valleys, quirks and technicolor.
 - First evidence for exclusive di-jet production with di-jet masses above 100 GeV. Studies of double parton interactions with high energy jets and photons.
 - Detection of the single top quark production in final state with tau lepton.



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◆ 1.2 Provide Quality Leadership in Science and Technology

- ◆ **Strategic Planning:** The laboratory has been a leader in creating a national strategy that will sustain particle physics in the future. We continue to work with the community to implement that strategy within the very tight budget constraints of the field.
- ◆ **High Risk, High Payoff:** The Tevatron is an immensely complex machine that had high risk of not achieving the current performance. The present performance exceeds expectations, and has a large payoff. As shown by the LHC, massive accelerators comport large risks. We have helped LHC mitigate those risks and commission the new machine, both by providing Tevatron experts and LARP instrumentation.

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- ❖ **Uniqueness and Challenges:** Many of our projects are unique: the Tevatron is the only proton-antiproton collider in the world; the neutrino beams, the most intense in the world; the IR triplets, the most challenging magnets in the LHC; the neutrino factory and muon collider R&D and development of cryomodules for the ILC, enormously challenging.

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- ❖ **Collaborations:** We carry out all our programs fully integrating universities and other laboratories. We have developed the strategic plan and are implementing it relying on national collaborations. Project X, for example, led by Fermilab, involves 9 US and 4 Indian national institutions. We also provide the main support for the four dozen US institutions on CMS. We work closely with LBNL, BNL, and LANL in the development of the LBNE. We collaborate world-wide on ILC development, and work closely with the Muon Collaboration in the development of neutrino factory and muon collider technology. Already making progress on organizing the Muon Accelerator Program (MAP), involving DOE national laboratories and universities. We are working closely with Indian institutions and have the support of the leader of the Indian Atomic Energy Agency to work on Project X and related developments. We are investing considerable effort in collaborations with Italian institutions that will participate in Mu2e and the development of liquid argon TPCs for neutrino experiments.

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❖ Community:

- First meetings of the Community Advisory Board starting January 2010 (to work closely with the surrounding communities on the impact of local siting of future machines like ILC and on other issues).
- Worked with scientists and DOE to organize workshop in Washington and produce the report "Accelerators for America's future."
- Fermilab, a valuable resource to neighboring municipalities and public organizations by:
 - Providing access to the Fermilab Global Positioning System (GPS) base station used by public works of neighboring towns
 - Providing a controlled leaf composting facility for public works in neighboring towns
 - Participating in numerous native prairie seed trade agreements to enrich the biodiversity of area restorations
 - Sharing electric and fiber optic utility distribution facilities with the City of Batavia



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❖ Community:

- The National Environmental Research Park (NERP) sponsored 12 active research projects in 2010.
- Fermilab is an active participant in Chicago Wilderness and the Conservation Foundation, highly regarded regional open space management consortiums.
- FESS Roads and Grounds hosts several Boy Scout Eagle projects annually and facilitates public use of the Fermilab site through development and maintenance of recreational areas (fishing lakes and ponds, mowed dog run, horse trails, prairie trails, woodland trails, year-around bicycle and pedestrian paths)
- Fermilab Natural Areas, a recently organized 501(c)3 not-for-profit Illinois corporation to sponsor numerous volunteer activities at Fermilab. See <http://fermilabnaturalareas.blogspot.com/> and <http://www.fermilabnaturalareas.org/> and web site for public contributions to local economy, environment, and culture (first available near start of this fiscal year) <http://www.fnal.gov/pub/presspass/factsheets/index.html>



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❖ Community:

- Other things we do for the community and the environment:
 - 1) Seed Exchange Program
 - 2) Earth/Arbor Day celebration (planting/lunch)
 - 3) Volunteer Cleanup of the site (monthly)
 - 4) Habitat Restoration Group
 - 5) Ecological Land Management Committee
 - 6) ES&H Fairs
 - 7) Lincoln Park Zoo's project "Assessment of the Mammalian Community along an Urban to Rural Gradient"

More information on many of these is at:

<http://www.fnal.gov/pub/about/campus/ecology/prairie/volunteer.html>

<http://www.fnal.gov/pub/about/campus/ecology/prairie/index.html>

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❖ Education Outreach:

- Year to date we have shipped out 1100 computers/servers/laptops for the "Computers For Learning Program". There were 22 laptops and 1079 desktops in this number.
- Many education outreach efforts: 39 programs were active during the fiscal year. About 250 volunteers total, including active preparation for the National Laboratories Day visits to local schools.
- 71 mentors for the high school students coming to Fermilab; e.g., from ISMA and the Proviso Math and Science Academy.
- Also, Quarknet, Saturday Morning Physics, Ask-a-Scientist, and Family Science Days programs all continue.
- Over 37,000 students and 2500 teachers participated in 39 K-12 programs in FY 2010.
- Record number of summer internships: 24 high school students, 73 undergrads, and 22 secondary teachers held research appointments.

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❖ Education Outreach:

- Participated in National Lab Day the week of May 4. At the Air and Space Museum in Washington DC., four QuarkNet teams of high school students and their teachers from four states set up cosmic ray detectors for shower studies. More than 2700 students participated in a classroom presentation offered near the Lab.
- 23rd annual Wonders of Science Show (April 18) attended by 650 children and parents.
- Piloted a new program on insects for teachers and their students in grades 1 and 2.
- 2455 members of our community attended Ask-a Scientist or Getting to Know Fermilab.
- Planning for participation in the USA Science and Engineering Festival, October 23-24 on the Mall in Washington DC.

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- ❖ **3rd Annual Science, Technology, Engineering and Mathematics (STEM):** Career Expo (April 8): Organized by the Fermilab Education Office and career specialists from Kane and DuPage county schools; attracting hundreds of students from Kane and DuPage counties.
- ❖ **Fermilab Family Open House (hands-on science exhibits and tours):** Annual Family Open House (Sunday, February 21) for children in grades 3 and up http://ed.fnal.gov/ffse_new/openhouse/
- ❖ **American Association of Blacks in Energy, Southern California Chapter:** Representatives from the Equal Opportunity Office attended a student expo. Also had the Cryo Show as one of the presentations done by Fermilab's "Mr. Freeze", Jerry Zimmerman.
- ❖ **Community College Institute:** Equal Opportunity Office worked with DOE to be a site.
- ❖ **Including Underrepresented Students:** EO Manager met with the Director of Project Chance at Northern Illinois University to investigate ways of in our programs.



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- ❖ **DOE Community College Institute:** The Equal Opportunity Office was successful in getting funding for the DOE Community College Institute, and hosted two freshman students from the College of DuPage in summer 2010. Both were able to be placed in the Accelerator Division. One student plans to major in engineering and the second one has aspirations in Physics.
- ❖ **Project Chance:** The Equal Opportunity Office has established a partnership with Project Chance at Northern Illinois University, and has arranged for Fermi technical personnel to give guest lectures this fall semester. The first lecture will be November 11.
- ❖ **University of Illinois at Chicago (UIC) School of Public Health:** Practical-application visit now arranged for annual ventilation class to perform in depth reviews of FESS's Carpenter Shop ventilation system.

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- ❖ **Staff Members:** Provide top leadership in many collaborations. Experiment spokespeople are usually elected. Presently CDF, D-Zero, MiniBooNE, MINERvA, MicroBooNE, NOvA, mu2e, MIPP, Pierre Auger, CDMS, and DES have project managers or spokespersons from Fermilab. A Fermilab staff member manages the national CMS program, and also a staff member is the head of the Collaboration Board for global CMS. Two Fermilab staff members have recently started as the new DES Director and Deputy Director. Two staff members serve on HEPAP, and scientists and senior managers serve in numerous other national and international advisory bodies.
- ❖ **Staff Members:** Provide significant support to DOE and its other laboratories (e.g.: ANL, BNL, JLab, LANL, LBNL, ORNL, PNNL, PPPL, Sandia, SLAC), NSF's DUSEL/Sanford Laboratory and NHMFL, and the major international HEP labs (e.g.: CERN, DESY, IPMU, J-PARC, KEK), serving on reviews, advisory boards, etc.
- ❖ **Staff Members:** Provide significant support to other organizations: in HEP (IUPAP C11 chair, ICFA secretary and panel members, ILC GDE PAC and ILCSC multiple roles) regulatory (NFPA) and advisory groups, policy committees, boards, professional societies (APS), etc.



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Staff Professional Outside Activities Summary Table

(from 151 responses to a September 2009 poll of professional staff)

Review panel member for the DOE, NSF, NASA or foreign funding agency	31
Grant application reviewer, for US or foreign funding agency	40
Review panel member for another laboratory	35
Support ICFA, ILC MAC, or similar HEP organization	7
Officer in a professional society, or similar activity	30
Editor for a professional journal	15
Reviewer for a professional journal	49
Organizer of non-Fermilab, international conference or workshop	65

(Staff members often contribute to multiple categories, but are only counted once per category.)

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- ◆ **1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals**
 - ❖ **Research Outputs:** Meeting or exceeding all goals for research results in present programs. Tevatron collider and NuMI both exceeding performance of FY 2009; NuMI actually reaching FY 2009 protons on target in May of this fiscal year!
 - ❖ **Research Outputs:** Publications continue at high level in terms of numbers and interest in technical journals and popular press. Numbers of PhD's also track recent historical high patterns.
 - ❖ **Program Alignment:** Work closely with OHEP to keep all our programs aligned with and to further the objectives of OHEP and the national program.

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- ❖ **Completion of the MINERvA Project:** CD-4 approval (June, 2010).
 - Taking data with full detector as primary NuMI user at moment.
- ❖ **Successful Advancement of Future Projects:** Two projects moving forward successfully (NOvA and DECcam). Planning for future projects is moving forcefully with MicroBooNE , mu2e, and the LBNE and Project X at the Intensity Frontier; the COUPP 4 kg and 60 kg chambers, CDMS-15 kg, and WFIRST/JDEM operations center at the Cosmic Frontier; and LHC and CMS upgrades at the Energy Frontier.
- ❖ **DECcam:** Use of Telescope Simulator at Fermilab and operation of PreCam in Chile.
- ❖ **NOvA:** Looking at ways to speed up program and enhance detector with contingency funds.
- ❖ **COUPP:**
 - Operating 60 kg chamber underground in the NuMI tunnel.
 - Operating 4 kg chamber deep underground at SNOLAB after successful NuMI run.

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- ❖ **Project X:** Improved design concept and associated preliminary cost estimate for a world-leading energy-frontier facility. Project X R&D Collaboration functioning under Fermilab leadership, involving nine national and four Indian institutions.
- ❖ **SCRF:** Major investment in infrastructure and U.S. industrial development continuing and expanding this year with ARRA funding, in collaboration with other U.S. labs. Close coordination between Project X and ILC/GDE on SRF development.
- ❖ **Additional Projects:** We have a stack of additional projects that provide future options , reviewed favorably by the AAC & PAC. The particle astrophysics projects have also been favorably reviewed by PASAG and ASTRO2010.
- ❖ **Peer Review (FRA Visiting Committee):** The recent FRA visiting committee was very complementary on the performance of the laboratory and the plans for the future. Again, the committee felt that it could not tell us how to do things better.

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1.4 Provide for Effective Delivery of Science and Technology

- ◆ Goals/milestones/delivering on promises:
 - ❖ Tevatron integrated luminosity now above even the design goal, not to mention performance measure goal. Record initial luminosities too.
 - ❖ NuMI Integrated Proton-on-Target and Power Goals: Above design goals and exceeded FY 2009 delivered protons-on-target in May.
 - ❖ Booster Neutrino Beam Protons-on-Target recently improved performance, well above expectations following return of full Booster rf system (not an explicit performance goal, but good for physics).

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- ❖ **Results:** All results reported promptly through conferences, the archival literature, Fermilab documents, and otherwise web-available sources.
- ❖ **Workshops and Schools “sponsored” by Fermilab:**
- ❖ October 19-21, 2009 – Applications of High Intensity Proton Accelerators Workshop 2009
 - Fermilab - Batavia, IL
 - S. Mishra, Fermilab
- ❖ November 9-10, 2009 – 4th Workshop on Physics with High-Intensity Proton Source
 - Fermilab - Batavia, IL
 - S. Wojcicki, Stanford University, and Y. Kuno, Osaka University, Japan and R. Tschirhart, Fermilab
- ❖ November 10-12, 2009 – Muon Collider Physics Workshop, Machine/Detector/Physics
 - Fermilab - Batavia, IL
 - E. Eichten, Fermilab (Chair), J. Konigsberg, Univ. of Florida, K. Peach, Oxford & Univ. of London (Co-Chairs)



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Workshops and Schools (continued):

- ❖ November 19, 2009 – Higgs Physics at the Tevatron and LHC: The QCD Issues
 - Fermilab - Batavia, IL
 - J. Huston, Michigan State University

- ❖ December 14-15, 2009 – Minute Particulars & Hidden Symmetries: Chris Quigg Symposium
 - Fermilab - Batavia, IL
 - W. Bardeen and M. Carena, Fermilab

- ❖ December 17, 2009 – Fermi Gamma-Ray Space Telescope Data Analysis Workshop
 - Fermilab - Batavia, IL
 - J. McEnery, NASA



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Workshops and Schools (continued):

- ❖ January 5-9, 2010 – US CMS Extended J-Term V
 - Fermilab - Batavia, Illinois
 - D. Green, Fermilab, and I. Shipsey, Purdue University

- ❖ March 4 & 5, 2010 – Silicon-On-Insulator Pixel Detector
 - Fermilab - Batavia, IL
 - M. Demarteau and G. Deptuch, Fermilab

- ❖ March 8-11, 2010 -- Open Science Grid (OSG) All Hands Meeting
 - Fermilab - Batavia, IL
 - R. Pordes, Fermilab

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Workshops and Schools (continued):

- ❖ April 19-22, 2010 – Tesla Technology Collaboration Meeting
 - Fermilab - Batavia, IL
 - S. Mishra, Fermilab

- ❖ April 26-27, 2010 – Lattice QCD Meets Experiment Workshop
 - Fermilab - Batavia, IL
 - P. MacKenzie, Fermilab

- ❖ May 18-21, 2010 – Quarkonium Working Group Workshop
 - Fermilab - Batavia, IL
 - G. Bodwin, ANL, and V. Papadimitriou, Fermilab

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Workshops and Schools (continued):

- ❖ June 28-July 3, 2010 – International Symposium on Very High Energy Cosmic Ray Interactions
 - Fermilab - Batavia, IL
 - L. Jones, University of Michigan, and P. Mazur, Fermilab

- ❖ August 16, 2010 – Monte Carlo Generator Workshop
 - Fermilab - Batavia, IL
 - K. Ellis, Fermilab

- ❖ August 16-27, 2010 – Fifth CERN-Fermilab Hadron Collider Physics Summer School
 - Fermilab - Batavia, IL
 - D. Glenzinski and A. Kronfeld, Fermilab



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◆ Summary Remarks

- ❖ We are delivering on all fronts, and continue to find ways to improve the laboratory in both science and operations.
- ❖ We have an exciting strategic plan for the future, one with enough flexibility to respond to the new physics results from the Tevatron, LHC, neutrino experiments, dark-matter experiments, and elsewhere. We are limited by the availability of funding to take full advantage of opportunities such as the desire to extend the Tevatron run by three years.
- ❖ Suggested Grade for Goal 1 is **A**

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

**Goal 2.0 Provide for Efficient and Effective design,
Fabrication, Construction and Operation of research
Facilities**



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◆ Goal 2.0 Notable Outcomes:

The Long Baseline Neutrino Experiment will make satisfactory progress toward CD-1 as determined by a peer review held in FY 2010. (Objective 2.1)

- ◆ Received CD-0 - January 2010
- ◆ Jim Strait started as LBNE Project Manager - January 2010
- ◆ Conceptual Design Report (CDR): Complete drafts exist for Neutrino Beamline and Water Cherenkov Detectors, drafts advancing well for other volumes (Overview and Science, Near Detector, Liquid Argon TPC and Conventional Facilities) and all are expected to be complete before early November.
- ◆ Continuing the development of Project Management documents including the Risk Management Plan, Project Management Plan and and MOU with the DUSEL Project.

Performance Evaluation Management Plan

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- ❖ Project has been aggressively pursuing filling open positions within the Lab and outside with several positions posted. Several key positions have been filled, one offer is currently being prepared, and active searches are under way for several others.
- ❖ Director's Review of the project was conducted in mid-July to evaluate progress and schedule to complete CD-1 preparations. The committee concluded:
 - "Overall, the committee feels that the LBNE design is sound and progressing well, and will soon be of sufficient quality to support the CD-1."
 - "It is the committee's assessment that given the number of major issues that need to be addressed and tasks that need to be completed, as summarized above, it will be extremely challenging for the project to be ready for a CD-1 review in December 2010."
 - The current target date for a CD-1 review is February or March 2011.

Performance Evaluation Management Plan

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❖ **2.1 Provide Effective Facility Designs as required to Support Laboratory Programs (i.e. activities leading up to CD-2)**

- ❖ The laboratory is doing well here.
- ❖ Projects doing well – EVMS, ARRA, SLI, ...
- ❖ Major staffing hiccup – everything is tight
- ❖ Attention to detail and extra time worked as necessary.

Performance Evaluation Management Plan

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- ◆ **2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, post CD-2 to CD-4)**
 - ◆ See 2.1

Performance Evaluation Management Plan

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◆ Goal 2.0 Notable Outcomes:

The NOvA Project continue to progress towards completion on time and with budget. (Objective 2.2)

- ◆ Received CD-3b – October 2009
- ◆ DOE OECM rating of the NOvA project went from yellow to green in November 09 with continuing improvement of NOvA's Schedule Performance Index (SPI).
- ◆ Considerable progress at the Ash River site
 - Detector Building – 100,000 ton granite excavation completed, concrete floor and walls being poured, precast concrete roof over ½ the building.
 - Service Building – steel erected, floor poured, roof on, walls complete.
 - Assembly area – steel erected connecting Service Bldg to Detector Bldg.
- ◆ Major procurements (PVC resin, PVC extruding, mineral oil, pseudocumene, waveshifting powders, toll blending and waveshifting fiber) are in place and deliveries are beginning. Waveshifting powder delivery is complete.

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- ❖ Construction of Near Detector
 - Near Detector Surface Building constructed at Fermilab
 - Modules for 5 (of 6) blocks completed
 - 5 blocks assembled at ANL are at Fermilab.
 - Cracks discovered in fiber manifold covers on 1st 4 Near Detector blocks have been repaired and preventative measures are in place against further cracks. The 5th block has no cracks following a revision of the construction procedure.
 - Outfitting with electronics and scintillator is underway
- ❖ NOvA implemented "Get to Green" Plan to address Schedule Performance Index (SPI). Successful implementation of the plan resulted in the OECM rating being changed back to "Green" November 2009. The re-plan of the ANU work, acquiring additional Fermilab resources, and the weekly monitoring of actual hours worked against plan, is the key driver to improving and maintaining a good SPI for this part of the project.

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- ❖ Project has been informed about a delay in production and shipping of Avalanche Photo Diodes (APD) from the vendor in Japan, which will delay the completion of the Near Detector. 265 units are now in hand and the project now expects to meet all milestones in spite of the delay.
- ❖ IG Audit of NOvA during October 2009 through April 2010. Final report had no formal recommendations.
- ❖ Office of Science IPR held in August 2010. 16 recommendations being addressed. Final report not yet in hand
- ❖ We have obligated 98% of the ARRA funds (\$23.958M of \$24.436M) and costed 18% (\$4.394M of \$24.436M).

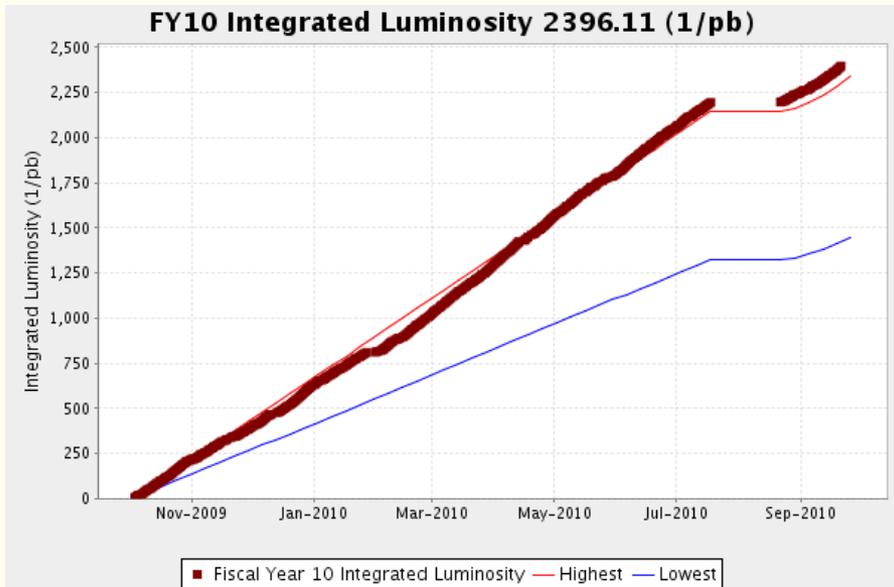
Performance Evaluation Management Plan

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◆ 2.3 Provide for effective and Efficient Operation of Facilities

- ◆ FY10 delivered luminosity is on-track for $> 2.4 \text{ fb}^{-1}$ exceeding the 1.9 fb^{-1} delivered in FY09
- ◆ Delivered luminosity exceeds the design curve
- ◆ FY10 store hours per week is 121, exceeding projection of 120.
- ◆ Detectors operating at $\sim 90\%$ efficiency
- ◆ A 4-week shutdown was completed August 20



Performance Evaluation Management Plan

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◆ 2.3 Provide for effective and Efficient Operation of Facilities

Relative to FY09,

- ◆ Record luminosity increased by 14% from 353×10^{30} to 402×10^{30}
- ◆ Record monthly luminosity increased from 263 pb^{-1} to 272 pb^{-1}
- ◆ Record antiproton accumulation for one week increased from 3724×10^{10} to 4072×10^{10}
- ◆ Average store hours per week increased 11% from 109 store hours per week to 121 store hours per week.

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◆ 2.3 Provide for effective and Efficient Operation of Facilities

- ◆ Unscheduled downtime through three quarters of FY10: 10% down from 15% last year
 - 6298 hours scheduled
 - 5654 hours delivered

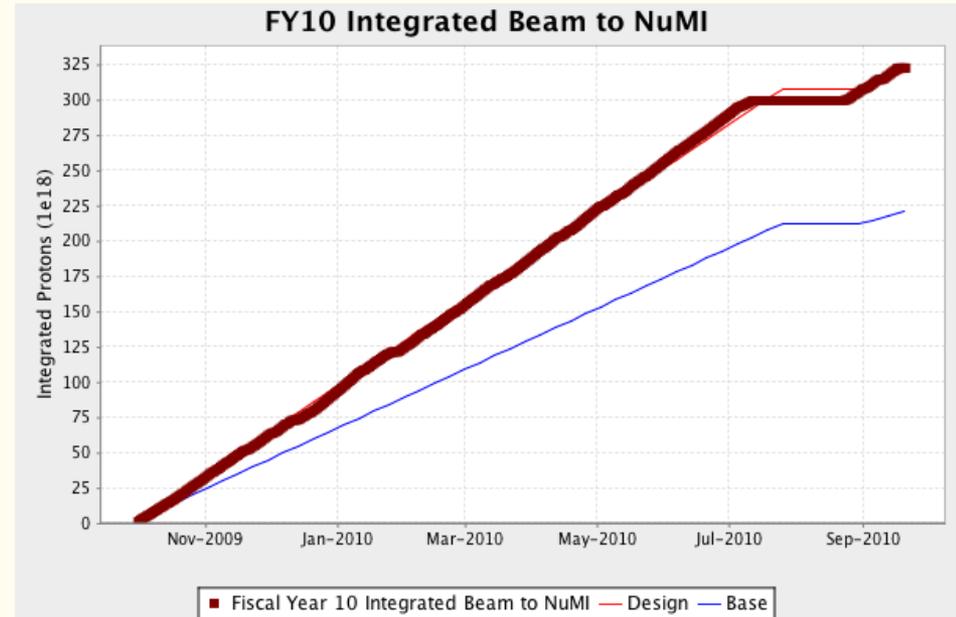
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❖ 2.3 Provide for effective and Efficient Operation of Facilities

- ❖ Protons delivered to the NuMI target is 3.2×10^{20} exceeding last year's total of 2.18×10^{20}
- ❖ Typical beam on target $\sim 300\text{kW}$
- ❖ Detectors operating at greater than 99% efficiency



Performance Evaluation Management Plan

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◆ 2.3 Provide for effective and Efficient Operation of Facilities

- ◆ Proton Improvement Plan fully implemented by start of FY10
- ◆ Design concept established for a multi-MW proton source to provide long term leadership at the intensity frontier
 - Supports future development of a muon-based energy frontier facility
 - Capitalizes on ILC technology

Performance Evaluation Management Plan

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❖ 2.3 Provide for effective and Efficient Operation of Facilities

- ❖ Tritium mitigation program has resulted in no measurable releases to any off-site creeks this year.
- ❖ Injury Performance (FY10 YTD)
 - AD: 5 DART cases
 - TD: 0 DART cases
 - APC: 0 DART cases

Performance Evaluation Management Plan

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◆ Goal 2.0 Notable Outcomes:

The Tevatron and NuMI will deliver at least as much data as in FY2009 (Objective 2.3)

- ◆ The Tevatron Collider delivered 2.4 fb^{-1} in 2010 exceeding last year's total of 1.9 fb^{-1}
- ◆ Beam delivered to the NuMI target is 3.2×10^{20} exceeding last year's total of 2.18×10^{20}

Performance Evaluation Management Plan

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◆ Summary

- ◆ Collider is running well above the performance of last year and has delivered 25% more luminosity than last year
- ◆ Protons delivered to the neutrino targets is 45% greater than last year.
- ◆ Both programs have run with higher reliability than last year– challenge will be to maintain this high performance level

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- ◆ Suggested Grade: **A**
- ◆ Rationale: Performance of the facility exceeds expectations as defined before the start of the year in terms of availability, beam delivery, luminosity. The performance is directly attributed to the sustained efforts of the laboratory staff and emphasis on efficient, high performance operation of the accelerator complex.

Performance Evaluation Management Plan

Greg Bock

Fermi National Accelerator Laboratory

❖ 2.4 Utilization of Facility to Grow and Support Laboratory's Research Base and External User Community

- ❖ **Perform influential science:** Fermilab is the major source of US HEP (and particle astrophysics) results.
- ❖ **Full use of facility for research base:** Reuse of facilities; e.g. MINERvA and NOvA Near Detector Prototype added to NuMI beamline, along with R&D tests; remote computing (GCC and LCC) in former fixed-target experiment areas; and ILC/SCRF R&D reusing MDB, NML, IBC areas. Modifications of MCenter for additional test beam capability. Reuse of KTeV Hall and beamline for E-906/SeaQuest experiment (largely funded by ONP).
- ❖ New experiments staged in CDF/DZero assembly areas.

Performance Evaluation Management Plan

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- ❖ Strengthened by resident research community: Users directly involved in setting goals, planning, reviewing at Lab. Lab users also among leaders in research field.
- ❖ Peer reviews, participation in international design teams, program and staff reviews/oversight, etc.: Major role in LBNE planning, ILC GDE and its Technical Design Phase (TDP) and costing, SCRF teams (e.g., Tesla Technology Collaboration), Project X and Muon Accelerator Program.
- ❖ 18 DOE or DOE/NSF reviews; 8 topical Director's reviews; PAC, AAC, MuTAC, FRA Visiting Committee meetings, and many similar external/internal reviews at Division/Section/Center levels.

Performance Evaluation Management Plan

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- ❖ Healthy program of outreach to scientific community: Excellent Users Organization, fully supported by URA/FRA, and to wider scientific community through users at their own universities.
- ❖ National Environmental Research Park (NERP) – Under a new MOU.
- ❖ Lincoln Park Zoo's project "Assessment of the Mammalian Community along an Urban to Rural Gradient".
- ❖ Suggested Grade is A-

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management



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Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

◆ 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision

- ◆ Clarity of vision and its effective articulation by the Laboratory: recognized by users and oversight groups in reviews.
- ◆ DOE OHEP encouragement to develop strategy for Fermilab being primary US particle physics laboratory: site of Intensity Frontier, and eventual US site for potential ILC construction, neutrino factory, or muon collider.

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

- ❖ Joint planning with outside community: Project X physics workshops and accelerator collaboration meetings involve the widest possible participation. Vision for the future requires and involves nine major accelerator laboratories in the US. Five workshops held in the fiscal year aimed at future programs.
- ❖ Developing core competencies in established areas (e.g., accelerator design and operations, detector and computing techniques) and new areas (e.g., superconducting rf and 3D electronic devices).
- ❖ Doing R&D for new facilities: Focus on Project X and options for maximizing physics reach and flexibility for future programs, starting with high intensity proton beams for long-baseline neutrino experiments, but also for high-intensity muon, kaon, and other experiments at the Intensity Frontier of particle physics. In addition, organizing accelerator R&D for neutrino factory and muon collider through MAP which Fermilab was asked to lead.

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

- ❖ Highly qualified staff. Many staff members serve on national and international reviews, studies, and planning committees –providing insight for others and keeping Laboratory abreast of efforts, successes, and problems elsewhere.
- ❖ Staff retention/attractiveness. We compete well with top universities.
- ❖ Awards:
 - Staff serve as APS DPF, DPB, FIP officers.
 - Patricia McBride-IUPAP C11 chair.
 - Marge Bardeen and Patricia McBride elected a Fellow of the AAAS.
 - John Peoples awarded 2010 APS DPF Robert R. Wilson Prize.
 - Herman White awarded the 2010 APS Edward A. Bouchet Award.
 - New APS Fellows: Gaston Gutierrez, Craig Hogan, Patricia McBride, Robert Plunkett, Rob Roser.
 - Juan Estrada – Presidential Early Career Award (OSTP).

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❖ Awards (continued):

- Emanuela Barzi and Ryuji Yamada shared with Japanese colleagues the prestigious Japanese Superconductor Science and Technology Award
- DZero physicist Jan Stark awarded the French Physical Society Joliot-Curie Prize.
- Niki Saoulidou winner of one of two European Physical Society high-energy particle physics 2009 Young Physicists Prize.
- Tingjun Yang received the APS Mitsuyoshi Tanaka Dissertation Award in Experimental Particle Physics.
- Florencia Canelli won the IUPAP Young Scientist Prize from the IUPAP Commission on Particles and Fields (C11).
- Mayly Sanchez, a collaborator on Fermilab's MINOS and NOvA, winner of Outstanding Technical Achievement Award from the Hispanic Engineer National Achievement Award Corporation.
- Jose Nevares received Industrial Hygiene Award for work on Fermilab's Material Safety Data Sheet system.

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

❖ Awards (continued):

- Young-Kee Kim, Deputy Director, received Rochester Distinguished Scholar Award.
- Tim Koeth, Rutgers University post-doc, Tim Koeth with the Richard J. Plano Dissertation Prize for the best Ph.D. thesis in department.

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

❖ 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

- ❖ Quality of project planning and management perhaps best demonstrated by
 - The MINERvA Project receiving CD-4 approval on June 28, 2010 (3 months before the Baseline date), with \$1.5M in contingency remaining (9% of the TPC), which was reprogrammed out of MINERvA in the August 2010 financial plan.
- ❖ Quality of R&D and strategic plans: recognized very favorably in reviews.
- ❖ Office of Project Management and Oversight: mentoring and training of staff for the many new projects and their effective completion using DOE oversight framework. Technical risk management, a notable focus of added effort in projects. **Received Earned Value Management System certification.**

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

❖ 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management (continued)

- ❖ Office of Quality and Best Practices: Completion and implementation of 6 targets:
 - Root Cause Analysis Training and Graded Approach
 - Suspect/Counterfeit Item Program
 - Lessons Learned Program
 - Corrective & Preventive Action Procedure
 - Management (Self) Assessment Procedure
 - Science As-Is Assessment
- ❖ Additionally, two other targets completed:
 - Changing FICAP to integrate the H13 clause
 - Management system ownership identification

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

◆ 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

- ❖ 18 DOE or DOE/NSF reviews; 8 topical Director's reviews; PAC, AAC, MuTAC, FRA Visiting Committee meetings, and many similar external/internal reviews at Division/Section/Center levels.
- ❖ Risk management now fully integrated into project processes by OPMO, including technical, schedule, and other risks.
- ❖ Making hard choices in face of very tight and limiting budgets:
 - Planning for completion of MiniBooNE, MINOS, and Soudan Laboratory ramp-down.
 - Planning for decommissioning of CDF, DZero, Tevatron, MiniBooNE, and MINOS.
 - Center for Particle Astrophysics retreats dedicated to making program choices.
 - How to spend NOvA project contingency – speeding up construction or extending physics reach – **a nice, tough choice to be able to make!**

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

◆ Notable Outcome for 2010:

The Laboratory will make progress in matching their staffing to the needs of the planned program. (Objective 3.2)

- ◆ Any extension of Run II should include funds for the additional physics research staff required nationally for the higher-than-planned level of activity in FY12-FY14. Had assumed movement of research staff from the Tevatron to the Intensity Frontier.
- ◆ The OHAP (Organization and Human Asset Plan) has been developed as a tool to analyze and guide the evolution of workforce needed to carry out the strategic plan. The entire lab organization has been involved in this one coherent process. OHAP will help in planning for above changes at the Laboratory if Run II extension approved.
- ◆ A number of task forces were commissioned for various critical skills, in particular, engineering and project management, to support the process.
- ◆ The output of the OHAP has been implemented in staffing plan, resulting in new contract hires and a small number of permanent staff.
- ◆ Moving to automate the OHAP process updates.
- ◆ OHAP, Lab-wide WBS, and human resource tools are integrated.



Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

◆ Notable Outcome (Continued):

The Laboratory will make progress in matching their staffing to the needs of the planned program. (Objective 3.2)

- ◆ Surveyed scientific staff on plans for research directions over the next five years, including efforts on project management. Results were consistent with the transitions in the program that are part of the Laboratory strategy, if somewhat slower than what would be best if the projects could all go at their technically limited schedule. Of course, this will need reevaluation if there is an extension of the Tevatron Run II.
- ◆ Progress on all developing projects in filling management team positions; for example:
 - MicroBooNE: 6 new people added, 2 openings in process.
 - Project X: 5 new people in place, 4 more needed after CD-0.
 - Steve Holmes now full time Project Manager.
 - Mu2e: 8 new people in place; 5 more needed next fiscal year.
 - LBNE: 11 new people in place; 5 more needed next fiscal year.
- ◆ Reassigning management resources from MINERvA has helped.
- ◆ Hiring has been tilted toward Intensity Frontier, while maintaining past standards.

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

- ◆ **3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs**
 - ❖ Weekly and ad hoc meetings with DOE to ensure effective and up-to-date communications. DOE participation in internal Project Management Group meetings, All Experimenters' Meetings, and the like. Web-based reporting available to & for DOE regularly updated.
 - ❖ Direct notifications during the year of multiple levels of DOE as soon as any significant operational issues are known, both positive and negative events.

Performance Evaluation Management Plan

Young-Kee Kim

Fermi National Accelerator Laboratory

◆ 3.3 Provide Efficient and Effective Communications and Responsiveness to Customer Needs

- ❖ Large number of conferences and workshops organized and held at/near Fermilab to help communicate local program and define the future: 12 conferences/workshops, plus 2 schools sponsored by Fermilab in FY 2010, most of them sited at the Laboratory.
- ❖ Also, major effort to communicate through outside conferences, workshops, and university/laboratory seminars and colloquia.
- ❖ Points of contact at OHEP and at Fermilab for B&R categories enhancing communication and identification of “who is on-point for what”.
- ❖ Suggested Grade for Goal 3 is **A-**

Performance Evaluation Management Plan

Pier Oddone, Young-Kee Kim, Larry Hill

Fermi National Accelerator Laboratory

Goal 4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory



DOE FSO, FRA, LLC, Fermilab

Performance Evaluation Management Plan

Pier Oddone

Fermi National Accelerator Laboratory

◆ 4.1 Leadership and Stewardship of the Laboratory (Provide a Distinctive Vision for the Laboratory and an effective Plan for Accomplishment of the Vision to include Strong Partnerships Required to Carry Out those Plans)

- ◆ The laboratory has continued its policy of full information and transparency to all stakeholders.
- ◆ The laboratory works with the community in multiple forms and across a broad front, as exemplified earlier with the Steering Group which reached out for input from the community in developing the roadmap.
- ◆ In implementing the roadmap into the program, the laboratory continued to host accelerator and physics workshops and collaboration meetings.
- ◆ The Laboratory continued to use the International Fellows Program and other funding to bring the international community to the Fermilab program.

Performance Evaluation Management Plan

Pier Oddone

Fermi National Accelerator Laboratory

◆ 4.1 Leadership and Stewardship of the Laboratory (Provide a Distinctive Vision for the Laboratory and an effective Plan for Accomplishment of the Vision to include Strong Partnerships Required to Carry Out those Plans)

- ◆ The laboratory has strong collaboration with CERN, both directly and through the LARP and APUL programs (FNAL, LBNL, SLAC, BNL collaborations) towards commissioning of and upgrades of the LHC.
- ◆ Strong collaborations with Japan, India, and China. Special mention should be made of the growing India collaboration, including involvement of DOE up through Secretary Chu. Multiple exchange visits of Indian and US dignitaries.
- ◆ Strong collaboration with ANL in accelerator and detector development, cosmological computation, and accelerator education program.
- ◆ Strong collaboration with ANL, BNL, JLab, LANL, LBNL, SLAC, and university groups in the R&D program towards the intensity frontier programs (long-baseline neutrino experiments and muon-to-electron conversion experiment), a neutrino factory and a muon collider.

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

❖ 4.1 Leadership and Stewardship of the Laboratory (Provide a Distinctive Vision for the Laboratory and an effective Plan for Accomplishment of the Vision to include Strong Partnerships Required to Carry Out those Plans)

- ❖ Establishment and first meeting (January, 2010) of the Community Advisory Board
 - Third such board to be established by Fermilab.
 - Heavily oversubscribed with volunteers from neighbors.
- ❖ The laboratory continued old and established new strategic partnerships and communications with the public that support Fermilab's vision and plans.
 - Fermilab continues to take a leadership role in the *InterAction* collaboration.
 - Fermilab and CERN work very closely together on LHC communications.
 - Fermilab and SLAC jointly publish *symmetry* to keep stakeholders informed about topics and developments in the HEP community.

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

◆ 4.1 Leadership and Stewardship of the Laboratory (Provide a Distinctive Vision for the Laboratory and an effective Plan for Accomplishment of the Vision to include Strong Partnerships Required to Carry Out those Plans)

- ◆ Fermilab now communicates with the public via *Facebook*, *Twitter* and *YouTube*.
- ◆ Fermilab contributes to the *Energy Blog* managed by DOE.
- ◆ New *Doorways to Discovery* booklet on web site and published in hard copy.
- ◆ Fermilab continues to update its public Web site
 - The design follows the DOE Draft Directive on Web site design and the content supports the DOE Office of Science mission.
 - The science pages highlight the connections of the Fermilab research program to the three frontiers outlined in the joint DOE/NSF P5 report.
 - The Recovery Act pages summarize Fermilab's role and achievements and provide content for the DOE Web pages.
 - New Web sites for LBNE, Project X, the Muon Collider, and each of the current Frontier experiments help support the communication efforts of the HEP Users community.

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

◆ 4.1 Leadership and Stewardship of the Laboratory

◆ Notable Outcome for 2010:

Laboratory leadership will develop a strategic plan for the future scientific and technical activities of the Laboratory, which aligns with the Office of Science and Department goals, and a detailed strategy for executing the plan during the next 2-5 years. (Objective 4.1)

- ❖ The strategic plan has been well documented and has been made publicly available. It aligns with the P5 recommendations and HEPAP.
- ❖ Together with DOE HEP, the laboratory has been implementing this plan.
 - Tevatron → LHC → future accelerators (e.g., ILC and muon collider)
 - MiniBooNE, MINOS, MINERvA → NOvA, MicroBooNE, g-2 → LBNE, Mu2e, Project X
 - Auger, CDMS, COUPP → DES, Dark Matter downselect → Major DM Expt., LSST, WFIRST, BigBoss

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

4.1 Leadership and Stewardship of the Laboratory

◆ Notable Outcome (continued):

Laboratory leadership will develop a strategic plan for the future scientific and technical activities of the Laboratory, which aligns with the Office of Science and Department goals, and a detailed strategy for executing the plan during the next 2-5 years. (Objective 4.1)

- ❖ Strategic plan to push ahead with the Intensity Frontier remains, even if there is an extension of Run II.
- ❖ Doing R&D to be in position to recapture the Energy Frontier.
- ❖ Maintaining leadership in Cosmic Frontier research:
 - Program aligned with the recommendations of PASAG and the ASTRO2010 study.
- ❖ Engaging with US and international partners in all above.
- ❖ The OHAP process inside the Laboratory supports implementing the strategic plan (see 3.2)

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

- ◆ **4.2 Management and Operation of the Laboratory (Provide for Responsive and Accountable Leadership throughout the Organization)**
 - ❖ Earned Value Management System (EVMS) achieved certification.
 - ❖ Complete rewrite of Procedures for Researchers (PFX) as web based aid.
 - ❖ Making hard choices in face of very tight and limiting budgets:
 - Planning for completion of MiniBooNE, MINOS, and Soudan Laboratory ramp-down.
 - Planning for decommissioning of CDF, DZero, Tevatron, MiniBooNE, and MINOS – while maintaining options for continuation.
 - ❖ Systematically track outcomes and actionable recommendations from all reviews (in databases); prepare corrective action plans and close concerns. Developed new data bases and programs for Lessons Learned and Corrective Actions.

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

- ❖ Safety Program success evident, for example, in the
 - National Safety Council “Million Work Hours Award” (without a DART...) for the Technical Division, October, 2010.
 - National Safety Council “Perfect Record Award” to the Finance Section (for No Days Away from Work due to Occupational Injury-Period from 4/1/2006 to 6/30/2010).
 - National Safety Council “Perfect Record Award” to the Business Services Section (for No Days Away from Work due to Occupational Injury-Period from 1/8/2009 to 6/30/2010).
 - National Safety Council “Expert Driver Award” to six Business Services Section drivers (for excellent driving performance-no at-fault vehicle accidents).
- ❖ Development of the engineering manual continues, a living document.
- ❖ Computing Division reorganization of user support through Service Desk, including “Password Doctor” booth in atrium (Dr. is In/Out service).
- ❖ Recertifications Received: National Sanitary Foundation-International Strategic Registrations-8/9/2010-Re-registered by NSF-ISR to ISO-14001 and OHSAS 18001.

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Fermi National Accelerator Laboratory

- ❖ Major efforts by Workforce Development and Resources Section to improve accessibility and transparency.
 - Visits to all major centers of activity for Q&A sessions
 - New web pages developed and on-line with user friendly goals
- ❖ Working with DOE-HEP program managers to structure requests for information and budgets.
- ❖ Establishment and meetings of the Community Advisory Board (the first in January, 2010) – heavily oversubscribed with volunteers from neighbors.
- ❖ Establishment and regular meetings of Employee Advisory Group (starting with the first meeting in March, 2010).
 - Action item from recommendations of focus groups following APS Diversity Study of Fermilab.
 - Also heavily oversubscribed with volunteers from staff.

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

4.2 Management and Operation of the Laboratory

- ❖ **Notable Outcome for 2010:** Laboratory leadership will make significant progress in defining and implementing its contractor assurance system. It is expected that a collaborative and uniform approach to this issue among all contractors will be evident. (Objective 4.2)
 - ❖ Office of Quality and Best Practices: Completion and implementation of 6 targets:
 - Root Cause Analysis Training and Graded Approach
 - Suspect/Counterfeit Item Program
 - Lessons Learned Program
 - Corrective & Preventive Action Procedure
 - Management (Self) Assessment Procedure
 - Science As-Is Assessment
 - ❖ Additionally, two other targets completed:
 - Changing FICAP to integrate the H13 clause
 - Management system ownership identification



Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

◆ 4.3 Contractor Value-Added (Provide Efficient and Effective Corporate Office Support as Appropriate)

◆ Notable Outcome for 2010

The contractor will fill all key leadership positions at the Laboratory in a timely manner. (Objective 4.3)

- ◆ Associate Director for Computer Science and Technology and Chief Information Officer appointed
 - Vicky White selected from among 376 applicants
- ◆ Associate Director for Accelerators
 - Stuart Henderson started in the position on August 16 following an international search, etc.
- ◆ Head of Office of Project Management and Oversight
 - Posting and search committee developed list of candidates; no satisfactory candidate found.
 - Will create a new structure for planning, OPMO, and OQBP in FY12.

Performance Evaluation Management Plan

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Fermi National Accelerator Laboratory

◆ Notable Outcome (Continued)

The contractor will fill all key leadership positions at the Laboratory in a timely manner. (Objective 4.3)

- ◆ Progress on all developing projects in filling management team positions; for example:
 - MicroBooNE: 6 new people added, 2 openings in process.
 - Project X: 5 new people in place, 4 more needed after CD-0.
 - Steve Holmes now full time Project Manager.
 - Mu2e: 8 new people in place; 5 more needed next fiscal year.
 - LBNE: 11 new people in place; 5 more needed next fiscal year.
- ◆ Reassigning management resources from MINERvA has helped.
- ◆ Some people above are shared among projects.

Performance Evaluation Management Plan

Larry Hill

Fermi National Accelerator Laboratory

❖ 4.3 Contractor Value Added (provide Efficient and Effective Corporate Office Support as Appropriate)

- ❖ Three-year term extension eligibility earned by FRA
- ❖ Leadership Issues
 - Reappointment of the Lab Director
 - New Associate Director for Accelerators – S. Henderson
- ❖ Continuous Improvement
 - Visiting Committee for Science Programs Review conducted on March 18-19, 2010: Chaired by Andrew Lankford from Cal-Irvine, and included FRA Board members Frank Sciulli and Michael Turner. No major findings or concerns
 - Visiting Committee for Administration & Operations Review conducted on August 2-4, 2010: Chaired by consultant Anne Street and included FRA Board member Greg Snow. Committee reviewed the quality and effectiveness of Fermilab's administrative organizations and operations support systems with no major findings or concerns. Review was structured as foundation for CAS

Performance Evaluation Management Plan

Larry Hill

Fermi National Accelerator Laboratory

◆ Corporate Financial Commitments

- ❖ Continue to remain on track to meet financial commitments “at no cost to the government” by the end of the first 5-year term
- ❖ The Strategic Lab Leadership Program continues to serve as a unique model for contractor value-added programs
- ❖ Joint appointments continue to serve as the area of most focus – joint searches continue at NIU and IIT; new joint appointments made with Virginia and Syracuse (beyond contract commitments) and discussions continue with Northwestern and University of Chicago

Performance Evaluation Management Plan

Larry Hill

Fermi National Accelerator Laboratory

◆ Ongoing Attention

◆ Contractor Assurance

- Solidifying the role of the Board and defining leaders to exercise appropriate oversight of the Lab CAS

◆ Board Issues

- New Board Secretary, T. Quinn, leading major redraft of by-laws and committee charters to drive better alignment and more robust processes

◆ Lab Program

- At October 2010 meeting, Board will assess recommendation by PAC to extend Tevatron run by 3 years
- Continuing to assist the Lab in positioning its basic science program in an “applied energy” environment

◆ Suggested grade is A-

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

Goal 5.0 Sustain and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection



DOE FSO, FRA, LLC, Fermilab

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

- ◆ **5.1 Provide a work Environment that Protects Workers and the Environment – B+**
 - ❖ The Lab has a DART rate of 0.29 and a TRC rate of 1.07. These are higher rates than desired, but the aging workforce has contributed greatly. Lost days and restricted days are low compared to most previous years.
 - ❖ Significantly revised our Traffic Safety Chapter (widely publicized), developed and implemented lab-wide Traffic Safety Awareness training, use pedestrian crossing signs on roadways, address staff traffic concerns promptly – a very active Traffic Safety Subcommittee.
 - ❖ Have many new systems in place to help us track and trend and look for continuous improvements (frESHTRK, LL database, Continuous Improvements database, Injury/Illness Prevention Subcommittee working on trending). This process is thus starting.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

- ◆ **5.1 Provide a work Environment that Protects Workers and the Environment**
 - ❖ Using many different communication tools (communication is key); Fermilab Today, Porcelain Press, Scheduling Meeting Handouts, Take 5 Posters & web page, signs at entrances to the lab, ES&H Fairs etc.
 - ❖ New ES&H web pages coming out early in FY11.
 - ❖ Continue to keep updating/improving “Take 5 for Goal Zero” – posters/web.
 - ❖ Human Performance Improvement training and the use of this technique to investigate accidents and injuries will help us to understand error precursors, improve systems and prevent incidents.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

❖ **5.1 Provide a work Environment that Protects Workers and the Environment**

- ❖ Current ITNA completion rate is ~97%, tracked, communicated.
- ❖ ALARA reviews performed in accordance with the Fermilab ALARA program; Laboratory continues to identify ALARA efforts and best practices.
- ❖ Developed of Industrial Hygiene work activities analysis form and database.
- ❖ Updated construction audit procedure to be more effective, cooperative.
- ❖ Hosted NEPA workshop in December – very useful, well attended.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

- ❖ **5.1 Provide a work Environment that Protects Workers and the Environment**
 - ❖ Documenting major processes and procedures, training back-ups for personnel and working on succession planning.
 - ❖ ES&H Fairs, Celebrations for meeting ES&H milestones, enhanced communication, and D/S/C specific incentive programs all help to contribute to a healthy ES&H program.
 - ❖ We have a new spill control and countermeasure plan (SPCC).
 - ❖ The recent Greenhouse Gas Review we very well – lauded for our open and healthy ES&H culture!
 - ❖ We continue to augment our Environmental Management System to address pollution prevention.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

◆ Goal 5.0 Notable Outcome:

FNAL will maintain ISO 14001 & OHSAS 18001 Registrations, as evidenced by successful completion of third-party surveillance audits conducted roughly every six months. (Objective 5.1)

Done!

- ◆ Re-registration audit was June 7-11, 2010; our laboratory was re-registered for both the 14001 and 18001. The auditors had many good things to say about the program and the speed of our continuous improvement over the past year. They spoke many people in the field and at all levels and were impressed with our ES&H culture and transparency. There were no findings. They stated that:

- The Integrated Management system has been improved over the last 3 years.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

ISO/OHSAS Audit Report. Strengths and Positive Practices noted by the audit team include:

- ◆ Alignment of EH&S Plans to Fermilab ES&H Performance Goals and Notable Outcomes,
- ◆ Flexibility and Effectiveness of the Job Hazard Analysis process,
- ◆ Rate of change and improvement since the last audit,
- ◆ FESS - Management Commitment to Communications Cultural Change,
- ◆ Human Performance Improvement - Concept and Implementation in many departments and sections,
- ◆ FSHTRK - Implementation,
- ◆ Lessons Learned Database,
- ◆ Continual Improvement Database,

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

ISO/OHSAS Audit Report. Strengths and Positive Practices noted by the audit team include:

- ◆ Emergency preparedness and response program and plans,
- ◆ Use of database to track employee qualification to LOTO procedures in Mechanical Department (AD),
- ◆ FESS Roads and Grounds - Exceptional communication style - management/staff culture,
- ◆ FESS Roads and Grounds - Records Management, Data organization.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

- ◆ **5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environmental Management – B+**
 - ❖ Standardization of FESHCom charters will enable us to use these subcommittee to advance the ES&H programs and help to ensure flow down to all D/S/C and subcontractors. These charters now explicitly include tracking and trending of issues and an annual assessment of the work done by the committee.
 - ❖ SSO Subcommittee has ad hoc groups working to improve programs lab-wide. One is looking at implementation of HPI lab wide.
 - ❖ Standardization of FESHM and the development and automation of the FESHM workflow will help to ensure this document is up to date.
 - ❖ New ES&H web pages due out early FY11.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

◆ 5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environmental Management – B+

- ◆ Lab Director and Deputy Director continue to conduct monthly walkthroughs, speaking to personnel about ES&H issues.
- ◆ Lab Director speaks to ES&H issues at weekly Scheduling Meetings and All Hands Meetings.
- ◆ D/S/C heads discuss their injuries at weekly Scheduling Meetings, often speak to ES&H Issues in their *Fermilab Today* articles, many publish monthly ES&H Newsletters, and all submit ES&H Plans and assessments each year.
- ◆ ES&H Tips are regularly featured in *Fermilab Today* and the *Porcelain Press*.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

◆ Goal 5.0 Notable Outcome:

FNAL will meet planned FY2010 milestones contained in the Corrective Action Plan that is being developed in response to the March 2009 Accelerator Safety Review. (Objective 5.2)

Done!

- ◆ We have also made good progress on the core chapters and are presently ahead of schedule.
- ◆ The development of a lab wide Safety Assessment Document and Accelerator Safety Envelope will make preparing SADs easier for projects as they can focus on their specific hazards and will help make the language consistent.
- ◆ Next milestones several years out (2014) .

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

- ◆ **Goal 5.3 provide Efficient and Effective Waste Management , Minimization, and Pollution Prevention – B+**
- ◆ **Goal 5.3 Notable Outcome:** In support of the Federal Electronics Challenge and the requirement of Executive Order 13423, FNAL will:
 - ◆ Reduce the environmental impact of using personal computers (including laptops), monitors and printers. **Done**
 - ◆ Establish formal policies and procedures on energy efficient computing. **Done**
 - ◆ Include energy efficiency in the evaluation criteria for the procurement of computers for scientific programming. **Done**
 - ◆ Perform a baseline assessment of the Laboratory's EPEAT system performance will be conducted by June 30, 2010 **Done**
- ◆ An ad hoc committee was formed last fall to address Federal Electronics Challenge initiatives and federal green computing goals of EO 13423.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

◆ **Goal 5.3 provide Efficient and Effective Waste Management , Minimization, and Pollution Prevention**

- ❖ Used the Earth Day Fair to promote environmental concepts and to solicit for new ideas for improvement.
- ❖ Opportunities to reduce hazardous and radioactive waste generation and ways to maximize recycling and reuse were sought for all of the projects/activities reviewed. Review processes used were:
 - Memorandum of Understanding (MOU), Safety Assessment Documents (SAD), National Environmental Policy Act (NEPA), Operational Readiness Clearance (ORC), and/or construction reviews.
- ❖ All projects go through an environmental review.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

◆ **Goal 5.3 provide Efficient and Effective Waste Management , Minimization, and Pollution Prevention**

- ◆ Six new Environmental Monitoring Program (EMP) plans have been developed. Each EMP seeks to improve a significant environmental aspect related to the operation of the Lab.
- ◆ In addition three assessments of environmental programs were performed by FSO to date: Environmentally Preferable Purchasing, Spill Prevention Control and Counter Measures, and a Status review of our Green House Gas Inventory. All reviews went very well and any corrective actions are being addressed.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

- ◆ **Goal 5.3 provide Efficient and Effective Waste Management, Minimization, and Pollution Prevention**
 - ❖ Have increased employee awareness through an article in Fermilab Today and participation in two ESH fairs, with tables highlighting elements of lifecycle computing.
 - ❖ Desktop/laptop purchasing procedures have been developed that include EPEAT requirements.
 - ❖ Specifications on energy efficiency for computer purchases are included in CD's Request for Quotation, the Acquisition Summary Component Specifications and the bid award process.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

Other Accomplishments:

- ❖ ES&H has a good, collaborative relationship with other labs/facilities:
 - ES&H Directors from various labs meet monthly by phone
 - FNAL and ANL ES&H Directors have visited each other and discussed issues.
 - Shared information on key current events, H1N1, NOvA, Environmental Management (ISO/OHSAS), radiation safety and ergonomics.
 - Emergency Response MOU with ANL, NEPA assistance from ANL and ANL agreement to help significantly with radionuclide analysis of FNAL samples.
 - Worked closely with other labs on the Accelerator Safety Order.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

Other Accomplishments:

- ❖ ES&H has a good, collaborative relationship with other labs/facilities:
 - Peer review of JLab Industrial Hygiene Program.
 - Assisted in many reviews and in guidance for DUSEL.
 - Benchmarked JLab ES&H Program and performed gap analysis for JLAB for OHSAS – 18001.
 - SLAC: participated in a Radiation Protection Review and provided technical assistance related to check sources.
 - Part of final Readiness Review of CARIBU Upgrade at ATLAS..
 - Facility for Rare Isotope Beams (FRIB) consultation.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

Summary: B+ in all areas (5.1, 5.2, 5.3, 8.1, 8.3) , we are doing well and met all notable targets

- ❖ Many program improvements completed, many more are in progress.
- ❖ New hires into the ES&H Section (radiation protection/project; Communication/Integration; Database Analyst/IT support; Shielding calculations/project & program support) are enabling us to better implement our programs.
- ❖ The challenge is to keep up with changing regulations/reporting, an aging workforce, increased workloads and effectively communicating ES&H information/tools.
- ❖ Increased personnel, ad-hoc groups, and the many communication tools we now have available will help us to appropriately address challenges.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 5.0 Notable Outcomes

- ◆ In support of the Federal Electronics Challenge and the requirements of Executive Order 13423, FNAL will reduce the environmental impact of using personal computers (including laptops), monitors and printers. During FY2010 FNAL will establish formal policies and procedures on energy efficient computing. Procurements of computers for scientific programming will include energy efficiency in the evaluation criteria for the procurement. A baseline assessment of the Laboratory's EPEAT system performance will be conducted by June 30, 2010.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 5.0 Notable Outcome Response

- ❖ An ad hoc committee was formed last fall to address Federal Electronics Challenge initiatives and federal green computing goals of EO 13423.
- ❖ Policy and procedures were posted in February on CD's website addressing lifecycle computing
- ❖ A Directors Policy addition covering environmentally responsible electronics stewardship will be added in the ES&H portion of the policy.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 5.0 Notable Outcome Response (continued)

- ◆ Required to purchase EPEAT registered personal computers
- ◆ A variance form is needed if user cannot use an energy compliant PC.
- ◆ Printers are purchased with power saving features enabled. This configuration is not changed.
- ◆ Specifications on energy efficiency for scientific computer purchases are included in CD's Request for Quotation, the Acquisition Summary Component Specifications and the bid award process.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 5.0 Notable Outcome Response (continued)

- ❖ Before formal policy and procedures – 88% of purchases are EPEAT registered
- ❖ After formal policy and procedures (Feb '10) - 97% of purchases are EPEAT registered

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 5.0 Additional Achievements

- ◆ Standard Configurations are provided to ease the acquisition of EPEAT registered personal computers.
- ◆ The Lab has won two FEC Bronze awards for the disposition of computers.

◆ **Suggested Grade for Goal 5 is A-**

Performance Evaluation Management Plan

Cindy Conger

Fermi National Accelerator Laboratory

Goal 6.0 Deliver Efficient, Effective and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission



DOE FSO, FRA, LLC, Fermilab

Performance Evaluation Management Plan

Cindy Conger

Fermi National Accelerator Laboratory

❖ 6.1 Provide an Efficient, Effective and Responsive Financial Management System(s)

Primary activities:

- ❖ Pay employees and vendors - ~55,000 paychecks and ~30,000 invoices per year
- ❖ Maintain the lab's integrated books of account and submit monthly to DOE
- ❖ Coordinate the Lab's budget formulation exercises including annual submission to DOE-HQ and presentation to OHEP
- ❖ Monitor budget execution and provide appropriate information to management
- ❖ Produce relevant financial reports and analysis for management, DOE, and others
- ❖ Establish, monitor and adjust labor burden and lab indirect rates
- ❖ Monitor and administer grants, WFO, CRADAs and other incoming funds
- ❖ Document, assess and test risks and controls associated with financial processes (A-123 / Management Controls & Compliance)

Performance Evaluation Management Plan

Cindy Conger

Fermi National Accelerator Laboratory

❖ 6.1 Provide an Efficient, Effective and Responsive Financial Management System(s)

Primary activities (continued):

- ❖ “Care and feeding” of auditors throughout year—OIG, KPMG, Internal, DOE-CH
- ❖ Play key role in implementing new systems to improve efficiency and effectiveness of business processes
- ❖ Provide relevant information and advice on wide-ranging financial issues to management, employees, visitors, and DOE as needed.

Status:

- ❖ The laboratory has performed the above safely, timely and accurately, and in accordance with all laws, regulations and DOE and Lab requirements in FY2010.
- ❖ Successful, on-time implementation of the Fermilab Time and Labor system, in which Finance was a key player.
- ❖ FY10 A-123 internal control testing – all tested controls were found adequate and no corrective action plans were necessary



Fermilab

DOE FSO, FRA, LLC, Fermilab

Performance Evaluation Management Plan

Cindy Conger

Fermi National Accelerator Laboratory

◆ 6.1 Provide an Efficient, Effective and Responsive Financial Management System(s)

- ◆ FRA's external auditors (KPMG) had no lab-related comments in the FY09 Management Letter issued in January 2010.
- ◆ Internal Audit identified negligible unallowable costs in draft report on annual cost allowability audit for FY09.
- ◆ Implemented strong controls over ARRA funds. Recent OIG report on NOvA ARRA funds had no findings and found the lab in compliance with funds segregation requirements. Draft Internal Audit report on procurement controls contained no findings.
- ◆ Developed effective and efficient ARRA reporting processes to allow timely and accurate reporting to the Office of Science and federalreporting.gov. OIG report on NOvA found the lab in compliance with ARRA reporting requirements.
- ◆ Responded to OHEP FY12 budget scenarios in ~7 working days with full and complete budget presentation

Performance Evaluation Management Plan

Cindy Conger

Fermi National Accelerator Laboratory

◆ 6.1 Provide an Efficient, Effective and Responsive Financial Management System(s)

- ◆ Erroneous payments totaled .004% (dollar base) through August 31, 2010.
- ◆ Finance Section earned a National Safety Council “Perfect Record Award” for operating over 355,000 hours without a DART. There have been no recordable incidents in Finance since its inception in April 2006.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 6.1 Notable Outcomes

- ◆ FNAL will complete full implementation of the electronic FNAL Time and Labor System by the end of third quarter, 2010.

◆ Section 6.1 Notable Outcome Response

- ◆ All exempt and non-exempt employees (including summers, on-calls, URA) were successfully migrated to the new FTL electronic timecard system on June 22, 2010.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 6.1 Additional Achievements

◆ FTL

- Adoption of the hosted Kronos timecard system:
 - reduced development time and effort
 - Reduced onsite system support
 - reduced future support requirements
- Careful and extensive testing resulted in accurate payroll processing and interfacing with our financial systems.
- All staff trained on use of new system
- Reviewed and changed as necessary business processes to align with industry best practices

◆ Procard System Migration

- Migration from end of life system to modern hardware platform to improve system reliability and reduce support costs

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 6.1 Additional Achievements

◆ ARRA

- Implemented system to provide data collection and reporting capability to support the effective management of procurement and accounting activities associated with ARRA funding.

◆ **Section 6.1 Grade: B+**

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

- ❖ **6.2 Provide an Efficient, Effective and Responsive Acquisition Management System(s)**
 - ❖ **Summary Status: FY2010 Procurement obligations were the highest ever recorded at Fermilab. Overall performance was very good, and most performance metrics were met or exceeded.**
 - ❖ **Accomplishments & Outcomes:**
 - Procurement obligations totaled \$265 million; \$67 million for ARRA funded subcontracts. Customers are receiving their specified goods and services in a timely manner.
 - Fermilab and Argonne jointly hosted the November 2009 Office of Science Procurement Manager's meeting at Fermilab.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

❖ 6.2 Provide an Efficient, Effective and Responsive Acquisition Management System(s)

❖ **Accomplishments & Outcomes, continued:** (these next two items are relevant to both **Objectives 6.1 & 6.2**)

- 580 ARRA funded procurement actions totaling \$67 Million were awarded, using existing staff and systems. Reports that detail requisition, subcontract, and hours expended by subcontractors for ARRA funded work, are routinely generated and distributed as required.
- There were no OIG findings for ARRA procurements. A Fermilab Internal Audit of ARRA procurements completed late in FY2010 resulted in numerous positive comments and no Findings or Observations.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ 6.2 Provide an Efficient, Effective and Responsive Acquisition Management System(s)

◆ Accomplishments & Outcomes, continued:

- Performance metrics for customer satisfaction, subcontract file compliance, competition levels, requisition turnaround, procurement innovations, supplier management, employee alignment/satisfaction, and the cost to operate Procurement indicate high levels of performance.
- Small and Small Disadvantaged Business goals were met.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes

- ◆ **Objective 6.2 Notable Outcome:** “FNAL demonstrates the effectiveness of its procurement systems as evidenced by achieving a comprehensive score of **90** out of 100 on the DOE approved Procurement Balanced Scorecard.”
- ◆ **Result:** BSC Report Score Total = **93**. Grade = A-

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes

- ◆ **Objective 6.2: FY2010 Procurement Balanced Scorecard**
- ◆ **Evaluated results = 93/100.**
Notable Outcome target (90) exceeded.

<u>BSC Perspective</u>	<u>Score</u>
Customer	15 / 15
Internal	43 / 50
Learning and Growth	10 / 10
<u>Financial</u>	<u>25 / 25</u>
Total	93 / 100

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes (Details, Objective 6.2 – Procurement BSC)

◆ Areas of Strong Performance:

- **Customer Satisfaction** was very high. Procurement involvement with projects and early acquisition planning continues to pay dividends.
- **Effective Internal Controls** were validated by file reviews that demonstrated a high level of compliance. In particular, all ARRA subcontract files received a minimum of one post award review by Procurement senior staff. Audit samples were selected and reviewed by OIG and by Fermilab Internal Audit, with no Findings or Observations.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes (Details, Objective 6.2 – Procurement BSC)

◆ Areas of Strong Performance, continued:

- **Effective Competition** results were above Balanced Scorecard high targets.
- **Effective Utilization of Alternate procurement approaches** was demonstrated by continued improvements to the electronic solicitation system, and supported by development of an all electronic filing system.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes (Details, Objective 6.2 – Procurement BSC)

◆ Areas of Strong Performance, continued:

- The **procurement staff** handled a workload that surpassed the number of subcontract dollars obligated in FY 2009 by over \$100 Million. Six of the sixteen Procurement Staff now possess Master Degrees.
- The **cost to operate** procurement continues to demonstrate efficiency, controlled costs, and it is among the lowest in the DOE contractor community.
- **To summarize, three of the four BSC Perspectives earned the maximum points possible.**

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes (Details, Objective 6.2 – Procurement BSC)

◆ In the **Internal Perspective**, there are **six Core Objectives**.

Four of the six Core Objectives earned maximum points:

- **Effective Internal Controls** – 1 measure, earned max. points (14).
- **Effective Supplier Management** – 1 measure, earned max. points (2).
- **Use of Effective Competition** – 1 measure, earned max. points (6).
- **Effective Utilization of Alternate Procurement Approaches** – 3 measures, earned maximum points (6).

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes (Details, Objective 6.2 – Procurement BSC)

◆ Internal Perspective, continued:

◆ Two of the six Core Objectives did not attain the highest scores:

- **Acquisition Excellence through Timely Support.** 3 measures, we earned 11 of 12 possible points. Cycle time on procurements of \$100K or less is at 10 days, which is 1 day more than we needed to earn all 12 points.
- **Good Corporate Citizenship through Purchasing.** 5 measures. We exceeded our goals for 2 measures: Small and Small-Disadvantaged business. We did not make our goals for 3 measures: Woman Owned Small Business, HUBZone, and Service-Disabled/Veteran-Owned Business. We earned 4 of 10 possible points.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes (Details, Objective 6.2 – Procurement BSC)

◆ **Internal Perspective, continued:**

- **Good Corporate Citizenship through Purchasing, continued.**

Woman Owned Small Business, HUBZone, and Service Disabled/Veteran Owned Business subcontracting goals were not met. The reasons revolve around two foci: the mix of goods & services required and the availability of vendors in these three socioeconomic groups. Large dollar value subcontracts for highly technical items such as NOvA extrusions, resin, mineral oil, and toll blending, as well as SRF cavities and major construction work, could not be awarded to firms in any of these three socioeconomic groups for reasons of non-availability or non-competitiveness. Procurement outreach through venues promoting these socioeconomic groups vigorously continues.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

❖ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

❖ **Summary Status:** FY2010 results demonstrated very good performance of the Property and Fleet Management systems.

❖ **Accomplishments & Outcomes:**

- **The Property and Fleet Management System was approved for a 3 year extension after an assessment was completed by Chicago Operations Property Management staff in July 2010.**
- The Property Office sent out 160 surveys to our internal and external customers. **Thirty surveys have been returned with positive comments and ratings.**

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

◆ Accomplishments & Outcomes, continued:

- **Sensitive inventory** is almost completed, just under 2% remaining, through 11 months. We have not been able to account for 6 assets compared to a base of 17,500 assets. We expect to exceed the location rate of **99%**.
- **Equipment inventory** is almost complete, just under 2% remaining, through 11 months. We have not been able to account for 14 assets, compared to a base of 6,500 assets. We expect to exceed the location rate of **98%**.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

❖ Accomplishments & Outcomes, continued:

- **High Risk property inventory** is complete and all 261 items were verified in person by property personnel (**100%**).
- Through the first 11 months, **12 High Risk Assets were received**. All assets were processed into the Property Management System within 15 days.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

◆ Accomplishments & Outcomes, continued:

- **1,350 Sensitive Assets were received.** All but 1 were processed into the Property Management system within 15 days.
- **400 Equipment Assets were received** through 11 months. All but 2 were processed into the Property Management system within 30 days.
- **118 assets with a total acquisition value of \$166K were redeployed** from the internal Property Excess Center.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

❖ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

❖ Accomplishments & Outcomes, continued:

- **17 assets with a total acquisition value of \$1,102K** were obtained off of the **GSA Excess System**.
- The Property Office **transferred 1,100 computers** to eligible schools through the **Computers for Learning (CFL) Program**.
- Of the total **191 vehicles** in the Fermilab fleet subject to usage standards, 186 (**97%**) met or exceeded the **Local Use Objectives**. The goal for FY 2010 was **94%**.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

❖ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

❖ Accomplishments & Outcomes, continued:

- **Property & Fleet Management Improvement** – Electronic **CarChip** technology is being used to monitor vehicle utilization (trip data, time, date, speed, idle time, etc.) and spreadsheet analysis is performed. A rotating, random selection of vehicles are being monitored at a rate of approximately 80 vehicles per year. The Fermilab Fleet Utilization Committee performs utilization comparisons to improve vehicle allocation and determine best practices. This program resulted in a greater awareness and level of achievement of Local Use Objectives and fuel conservation.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

◆ Accomplishments & Outcomes, continued:

- **Fuel Use and Vehicle Emission improvements** – The **CarChip** devices monitor and report various usage patterns, such as idling time. The devices have gained some notoriety among the driving population. The Fleet Utilization Committee uses the data collected to analyze usage patterns and influence behavior, resulting for example, in reduced idling time and consequent vehicle emissions.

Performance Evaluation Management Plan

Dave Carlson

Fermilab National Accelerator Laboratory

◆ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

◆ Accomplishments & Outcomes, continued:

- The BSS/Transportation Services Department completed **acquisition of 25 alternative fuel or hybrid vehicles**, using American Recovery and Reinvestment Act funds, to replace aging petroleum based vehicles. Fermilab has been proactive in meeting federal guidelines regarding alternative fuel use and alternative fuel vehicles, and by the end of FY 2010, the entire (heavy and light duty) fleet of will be comprised of 81% alternative fueled vehicles.

Performance Evaluation Management Plan

Dave Carlson

Fermilab National Accelerator Laboratory

❖ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

❖ Accomplishments & Outcomes, continued: **A success story on meeting EO 13423 and EO 13514 requirements for annual 10% increase in alternative fuel use.**

- Although this measure is no longer in the Property BSC, Executive Orders 13423 and 13514 require federal fleets to achieve an annual 10% increase in alternative fuel use over a FY2005 baseline. In fiscal years 2006, 2007, 2008, and 2009, Fermilab exceeded that goal, in some cases by more than a factor of two. A strong baseline of AFV's in the fleet and those yearly successes now mathematically preclude our ability to sustain the same rate of increase. We have been purchasing alternatively fueled vehicles (AFV's) for over a decade and have reached a "saturation point." Now when we purchase new AFV's, they are mainly replacing existing AFV's. Currently 96% of our light duty fleet is fueled by alternative fuels. The rapid transformation of the Fermilab fleet should be viewed as a great success.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

◆ Accomplishments & Outcomes, continued:

- Although this measure is no longer a part of the Property BSC, Executive Orders 13423 and 13514 require federal fleets to achieve an annual **2% reduction in use of petroleum based fuels**. FY 2010 to date petroleum based fuel use **meets and exceeds** the 2% reduction requirement.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

❖ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s)

- ❖ **Objective 6.3: FY2010 Property Management Balanced Scorecard –** Maximum possible score = 100 if all results exceed expectations, **92 = meets expectations. Expected FY2010 result = 93. Grade = A-.**

Perspective	Max if Exceed	Max if Meet	Expected Results
• Customer	8	7	8
• Business Process	66	60	64
• Financial	26	25	21
Total	100	92	93

(see detailed table of results at end of this section, 6.3)

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s) – Property BSC, continued

❖ Areas of Strong Performance:

- **Customer Perspective** – One measure. Exceeded expectations.
- **Business Process Perspective** – Six measures. Expect four to meet, and two to exceed expectations.
- **Financial Perspective** – Five measures. Expect three to meet, one to exceed, and one not to meet expectations.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

❖ 6.3 Provide an Efficient, Effective and Responsive Property Management System(s) – Property BSC, continued

❖ Measures not expected to meet or exceed expectations:

- **90%** of Property made available within 60 days of local disposition. In the first half of FY 2010, 110 of 137 assets were processed within 60 days (**80%**). Through increased effort, cumulatively for the first 11 months of FY 2010, 331 of 392 assets were processed within 60 days (**84.5%**).
 - Inhibiting factor #1: A large excess shipment that was processed into the Excess Center (1,300 computer servers from Computing Division). Property personnel had to spend time sanitizing these servers for the Computers for Learning Program.
 - Inhibiting factor #2: Demand on staff time due to an increase in the amount of requests for material (assets) to be stored for future projects took personnel away from local disposition activities.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

- ◆ **6.3 Provide an Efficient, Effective and Responsive Property Management System(s) – Property BSC, continued – Detailed results.**

FY2010 BSC Self-Assessment Summary Scores

PERSPECTIVE	National Targets for BSC Objectives & Measures	FY2010 11 Month Actual	Points if Exceeds	Points if Meets
CUSTOMER				
80%	Customer Satisfaction Rating	8	8	7
BUSINESS PROCESS				
98%	Equipment Items Located	13	13	12
99%	Sensitive Items Located	13	13	12
100%	High Risk Items Located	12	13	12
98%	Sensitive Items Entered w/in 15 Days of Receipt	9	9	8
100%	High Risk Assets Entered w/in 15 Days of Receipt	8	9	8
98%	Equipment Items Entered w/in 30 Days of Receipt	9	9	8
FINANCIAL				
94%	Vehicles Meet Usage Standards	9	9	8
	Redeployment and Excess Acquisitions	3	3	3
	Property Management Improvements	4	4	4
90%	Property Disposal Through GSA	5	5	5
90%	Property Sold Within 60 Days of Local Disposition	0	5	5
SUMMARY TOTALS				
	FY2010 Summary BSC Assessment	93	100	92

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Goal 6.0 Notable Outcomes

Objective 6.3 Notable Outcome: “FNAL will upgrade its vehicle fleet maintenance software from the current FOCUS database to the Sunflower Maintenance module, thereby replacing an unsupported system with a more modern system that is integrated with other Property management (Sunflower) software. This will ensure the long term viability of the fleet management system.”

- ◆ **Result:** FNAL converted all of the fleet maintenance software from the previous FOCUS database to Sunflower Maintenance module integrated with the Property management (Sunflower) software. The system is working very well and all unsupported software has been removed from use. Long term viability is expected with the new system. **Notable Outcome achieved.**

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Other Significant BSS Achievements for FY2010:

- ◆ No OSHA Recordable or DART Cases since 1/8/2009 and continuing.
- ◆ **National Safety Council Perfect Record Award** for zero OSHA DART Cases for the period January 8, 2009 – June 30, 2010.
- ◆ **National Safety Council Safe Driver Awards** for six commercial drivers for no at-fault motor vehicle accidents since 11/1/2007 and continuing.
- ◆ **EPEAT Certification** for all BSS computer electronic acquisitions.
- ◆ Implemented use of recyclable cafeteria cups and certain food containers.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Additional BSS Achievements for FY2010:

- ◆ Recycled of ~5 cubic yards of cardboard from construction projects to reduce the amount of material to be disposed of as solid waste.
- ◆ Continued the Laboratory's already award-winning electronic recycling program: 36,925 pounds of electronics and 35,920 pounds of monitors from Fermilab, and 27,971 pounds of electronics and 16,155 pounds of monitors from ANL.
- ◆ Interacted with ANL procurement and shipping staff to obtain advice resulting in ~\$860K of cost savings for duty-free entry for wavelength-shifting optical fiber for the NOvA project.
- ◆ Implemented paper-free travel booking/invoice process in May 2010.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Additional BSS Achievements for FY2010:

- ◆ Organized the DOE Contractor Travel Managers' Meeting in May, 2010 in Chicago.
- ◆ Emergency services – Provided outreach to those travelers that were stranded in Chile and Europe during earthquake and volcano incidents.
- ◆ Rolled out the "Profile Express" system in October, 2009 to facilitate compliance with new Homeland Security/TSA boarding rules that become effective Nov. 1, 2010.
- ◆ Chose not to renew 36 publication titles in FY2010 which resulted in a cost savings of \$115.6K.

Performance Evaluation Management Plan

Dave Carlson

Fermi National Accelerator Laboratory

◆ Additional BSS Achievements for FY2010:

- ◆ As part of a global effort that includes CERN, DESY and other U.S. national laboratories, continued to pursue *Open Access* to various scientific journals that are very expensive. Approximately 75% of the needed commitments have been received from participating organizations.
- ◆ BSS/Information Resources continued to participate in the creation of INSPIRE which will replace the old SPIRES database for physics papers, articles, jobs, people, conferences, etc.
- ◆ To strengthen the Property function and to improve succession planning, created a new Assistant Property Manager position which replaced a lower level position when it became vacant.

Performance Evaluation Management Plan

Kay VanVreede

Fermi National Accelerator Laboratory

- ◆ **6.4 Provide an Efficient, Effective and Responsive Human Resources Management System(s) and Diversity Program**
- ◆ The HR function was reviewed well by an outside peer review. See below.
- ◆ “Two critical indicators of WDRS success are the performance of the Laboratory in assuring its employment practices are competitive in the marketplace and its ability to recruit and retain needed employees. Current benchmarking of Laboratory employee pay and benefits indicates they are competitive for all employee groups, compared to the practices in the selected market. In addition, the Laboratory’s ability to recruit desired employees of all types and to retain them as long as needed to accomplish the mission is solid. Maintenance and appropriate revision of processes to implement effective human resources practices also continue.” Quote from the final report of the Visiting Committee on Administration and Operations for 2010

Performance Evaluation Management Plan

Kay VanVreede

Fermi National Accelerator Laboratory

Significant Achievements FY10

- ❖ Increased operational effectiveness of HR through improved communications and customer satisfaction initiatives. Our new customer service initiatives were rated as a noteworthy practice by the Visiting Committee on Administration and Operations for 2010.
- ❖ Completely redesigned the HR website including frequently asked questions, quick links to all policies and frequently used forms, easy access to feedback mechanisms, event calendars, and an “announcement/what’s new” category for the Section and each department.
- ❖ Designed and implemented a customer satisfaction survey.

Performance Evaluation Management Plan

Kay VanVreede

Fermi National Accelerator Laboratory

- ❖ Initiated Ask HR - Site visits by different HR departments to meet employees, answer questions and distribute information about current topics.
- ❖ Designed retirement information sessions scheduled to be presented at various sites throughout the Lab.
- ❖ Designed a "Who Does What in HR" brochure accessible on the web and as a brochure.
- ❖ Initiated monthly all HR meetings where we discuss how our customer service initiatives are going, share news and new developments in our areas, and interact with guest speakers who keep us up-to-date on Lab programs.

Performance Evaluation Management Plan

Kay VanVreede

Fermi National Accelerator Laboratory

- ❖ Formed Management Training Curriculum Committee to evaluate the quality of the current management curriculum and identify what additional management development support is needed. Some changes have already been implemented. Other recommendations made to the Director. This initiative was deemed a noteworthy practice by the Visiting Committee on Administration and Operations for 2010.
- ❖ Extended diversity outreach and pipeline development by becoming a Community College Institute site through DOE.
- ❖ Fully implemented the Diversity Council. The Council started a lab wide mentoring program, produced a technical recruiting video and sponsored diversity events.
- ❖ Saved the Lab \$67,500 by reducing LTD premiums.

Performance Evaluation Management Plan

Kay VanVreede

Fermi National Accelerator Laboratory

- ◆ There is an excellent labor climate at the Lab evidenced by the quick negotiation of contracts and only one grievance filed.
- ◆ Completed process of entering over 300 new hires and over 1,500 existing employees into the E-verify system.
- ◆ Reviewed 20% of all job descriptions.
- ◆ Completed engineering and scientific job family reviews.
- ◆ Added scientific applicant tracking to our recruitment system.

Performance Evaluation Management Plan

Kay VanVreede

Fermi National Accelerator Laboratory

- ◆ **Challenges** – understanding the implications of Health Care Reform for the Laboratory.

Performance Evaluation Management Plan

Kay VanVreede

Fermi National Accelerator Laboratory

◆ Goal 6.0 Notable Outcomes

- ❖ FNAL will design/implement a Succession Plan and Executive Pay Grade Structure for senior management positions (Deputy Director, Chief Operating Officer/Associate Director, Chief Financial Officer, and Chief Information Officer) by the end of fourth quarter, FY 2010. (Objective 6.4)
- ❖ Succession Planning
 - Completed
 - Plan designed using best practices from other labs, industry and input from senior management.
 - Plan includes identification and a development plan for internal candidates and identification and a recruitment strategy for possible external candidates.
 - Succession plans executed for all six positions.
 - New plan (and its implementation) was cited as a noteworthy practice by the Visiting Committee on Administration and Operations for 2010.

Performance Evaluation Management Plan

Kay VanVreede

Fermi National Accelerator Laboratory

❖ Executive Pay Grade Structure

- Completed
- Plan designed using internal and external market benchmarks.
- Pay grade structure expanded.
- Top six senior management positions that were previously ungraded are now graded.
- Other previously ungraded management positions are now graded, and a job family review of other top management positions was performed
- The new approved structure was implemented September 1, 2010.

Proposed Year End Grade

Fermi National Accelerator Laboratory

◆ Suggested grade for objective 6.4 is **A-**

◆ Rationale

- ◆ Of two notable outcomes one was cited as a noteworthy practice by an outside peer review. The finished scope of the second exceeded the outcome requirements.
- ◆ The outside peer review group noted that we are successfully completing our core tasks.
- ◆ We improved and enhanced our services for the Lab through a good number of successful initiatives.

Performance Evaluation Management Plan

Bruce Chrisman

Fermi National Accelerator Laboratory

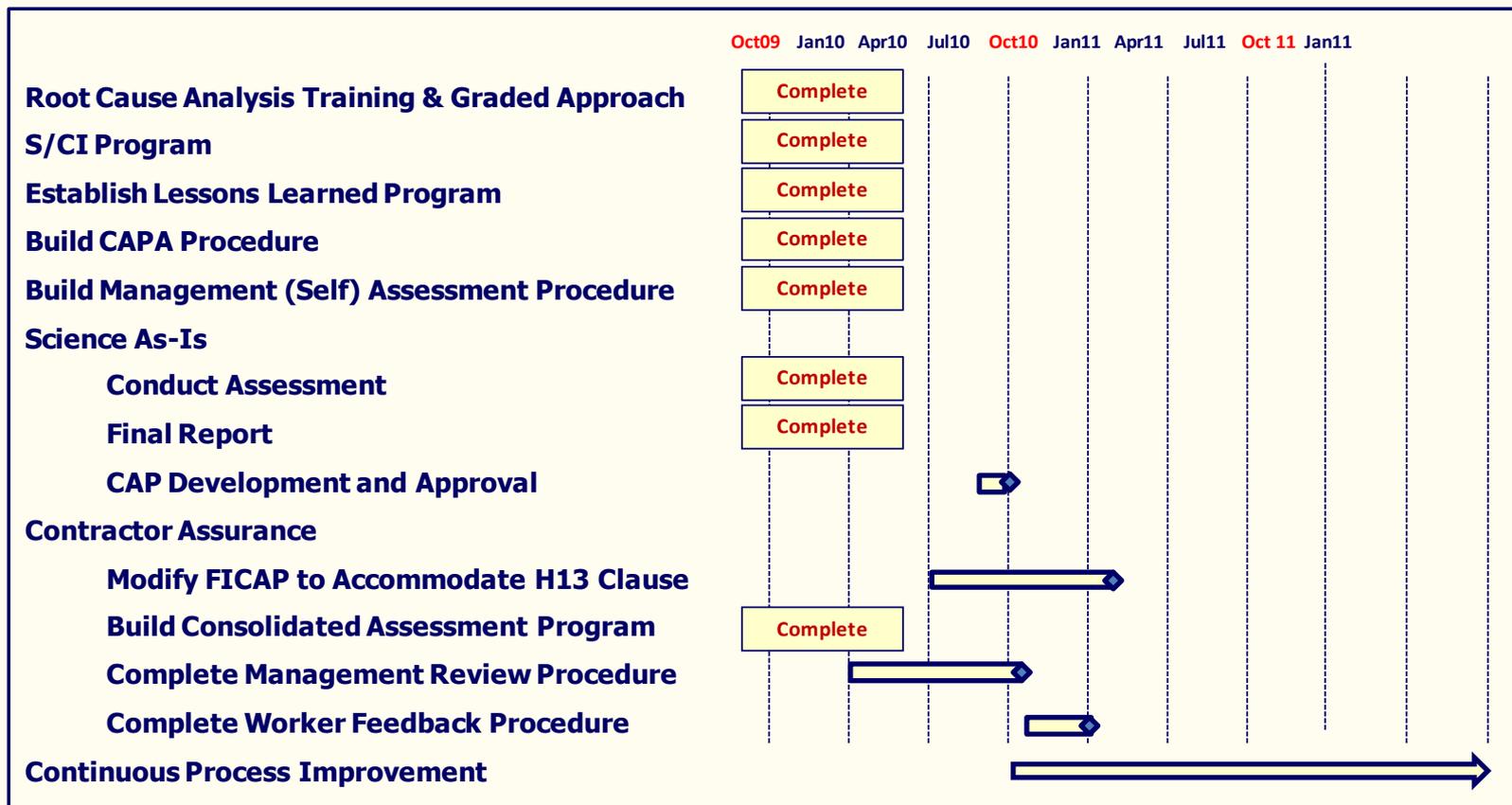
❖ **6.5 Provide an Efficient, Effective and Responsive Management System(s) for Internal Audit and Oversight; Quality; Information Management; and Other Administrative Support Services as Appropriate**

- ❖ Internal Audit is meeting the audit schedule agreed to with the IG with no significant findings.
- ❖ IQA is making headway in deployment. A new Records Management handbook was completed to improve the function.
- ❖ Efforts are underway to improve communications of program goals and objectives.
- ❖ Staff resistance to IQA implementation could be greater than anticipated.

Performance Evaluation Management Plan

Bruce Chrisman

Fermi National Accelerator Laboratory



Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 6.5 Additional Achievements

Provide Efficient, Effective, and Responsive Management Systems for Internal Audit and Oversight; Quality; Information Management; and other Administrative Support Services as Appropriate

◆ **ITIL/ISO20K**

- Preparing for ISO20K certification for delivery of IT services
- ITIL processes:
 - Commissioned Change, Release, Capacity, Availability, IT Service Continuity
 - Maturing Incident and Problem
- Service Desk capability increased
 - through staff augmentation
 - metrics and trending
 - integration with additional ITIL processes

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 6.5 Additional Achievements (continued)

- Service Desk capability increased
 - through staff augmentation
 - metrics and trending
 - integration with additional ITIL processes

◆ **Section 6.5 Grade: A-**

Performance Evaluation Management Plan

Bruce Chrisman

Fermi National Accelerator Laboratory

❖ 6.6 Demonstrate Effective Transfer of Technology and Commercialization of Intellectual Assets

- ❖ The technology transfer activities at Fermilab are quite low. There were only 5 invention disclosures FYTD. CRADA and WFO activities are proceeding smoothly
- ❖ An influx of invention disclosures, WFOs, or CRADAs, would overwhelm our minimalist system.
- ❖ We are in the process of moving the routine transaction handling portion of the ORTA function to procurement. This transfer of responsibilities was slowed by the heavy procurement work load created by ARRA.

Performance Evaluation Management Plan

Bruce Chrisman

Fermi National Accelerator Laboratory

◆ Goal 6.0: Notable Outcomes

FNAL efficiently and effectively manages all activities in conjunction with the American Recovery and Reinvestment Act funding in accordance with all rules and requirements. No significant OIG or FNAL Internal Audit findings will serve as the measurement of success in meeting this notable target.

(Objective 6.1)

- ◆ Doing well here, with \$114M influx. Most major milestones met. Procurement has kept up with the additional ARRA work load with 68% of the funds obligated. This year is a record, in terms of \$ and numbers of Purchase Orders placed, for total Lab commitments.
- ◆ Developed effective and efficient ARRA processes to allow timely and accurate reporting to the Office of Science and federalreporting.gov.
- ◆ IG report on NOvA ARRA efforts found no deficiencies at the lab. CH review of lab's fund segregation had no negative comments on ARRA implementation.

Performance Evaluation Management Plan

Bruce Chrisman

Fermi National Accelerator Laboratory

- ❖ Performance challenges in this area are primarily related to subcontractor performance.
- ❖ Continued attention to detail paying particular attention to early warning signs is essential to addressing this challenge.
- ❖ Suggested grade for Goal 6 is **B+**

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

**Goal 7.0 Sustain Excellence in Operating,
Maintaining, and Renewing the Facility
Infrastructure Portfolio to meet Laboratory Needs**



DOE FSO, FRA, LLC, Fermilab

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

◆ 7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage and Minimizes Life Cycle Costs and Ensures Site Capability to Meet Mission Needs

- ◆ Scheduled maintenance performed at near 90%
- ◆ Enhanced utilities uptime for **accelerator**
- ◆ **Zebra Mussel infestation mitigation.**
- ◆ Metasys expansion to improve mechanical controls
- ◆ Hazard Analysis and work plan database established for a majority of building maintenance work
- ◆ Time and Materials contracts awarded
- ◆ FIMS database validated as green by DOE
- ◆ Prairie burn accomplishments and invasive plant control plan and progress
- ◆ Completed all planned maintenance activities for accelerator shutdown

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

Scheduled F&I Maintenance FESS



DOE FSO, FRA, LLC, Fermilab

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

- ❖ Accomplishments in excess of "B+" performance
 - Assessment of preventive maintenance tasks work flow was completed with plan developed to implement improvements
 - Improved FESS safety performance with significantly reduced recordable cases and no DART cases
 - Human Performance Improvement training for all managers and supervisors in FESS operations and department implementation

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

◆ 7.2 Provide Planning for and Acquire the Facilities and Infrastructure Required to Support the Continuation and Growth of Laboratory Missions and Programs

- ◆ Executing ARRA GPP projects on schedule and within budget
- ◆ Obtained CD-0 for SLI Utility Upgrade Project and completed successful CD-1 Lehman review
- ◆ Provided Level 2 manager for NOvA and completed a successful CD-3 Lehman review
- ◆ Provided Level 2 manager for Mu2e
- ◆ Provided Level 3 manager for LBNE
- ◆ Provided Level 1 manager for SLI utilities upgrade project
- ◆ Conversion of the C-0 Assembly building for program reuse
- ◆ Completed DWS at WH, GCC Room C, MINU and feeder GPP's
- ◆ Completed procurement and selected 12 large A/E selection
- ◆ Supported Project X, ILC and IARC planning

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

- ❖ Accomplishments in excess of "B+" performance
 - Helped the lab establish the Master Planning Task Force
 - Further developed the Fermilab Geographic Information System (GIS)
 - Commitment by science "projects" to include improved infrastructure for utility reliability and robustness
 - Received State of Illinois funding for IARC project

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

◆ Goal 7.0 Notable Outcomes

FNAL will develop a Mission Readiness Plan for FY2010 which includes participation in two peer reviews and the development of FNAL Mission Readiness policies and procedures. This plan will be implemented by the end of third quarter, FY2010. (Objective 7.2)

- ◆ Participated as team members and observers for the Argonne Peer Review in Nov. 2009
- ◆ Participated as team member for the PPPL Peer review in Jul. 2010
- ◆ Developed policies and procedures on mission readiness including Directors Policy on Planning, the Annual Lab Plan including the Facility Mission Matrix, and engineering matrix for project deliverables.

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

- ❖ Accomplishments in excess of "B+" performance
 - Member of Steering Committee for review and update to Lines of Inquiry
 - Fermilab provided the team leader, team member, and observer for the TJNAF Peer review in Sept. 2010
 - Agreed to provide team leader for the SLAC review in June 2011

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

◆ Goal 7.0 Notable Outcomes

FNAL will complete final designs and start construction on American Recovery and Reinvestment Act (ARRA) General Plant Projects (GPP) Augmentation covered under Work Authorization Number KA/CH14/9/ARRA-1, consistent with established milestones in the approved Project Operating Plans. (Objective 7.2)

- ◆ Final designs were completed and construction is underway on the six ARRA GPP projects consistent with established milestones
- ◆ Accomplishments in excess of “B+”
 - All milestones have been met
 - Obtained 91% of FY10 GPP “costing” projection
 - Media interviews and articles on construction contractors creating good DOE publicity for job creation
 - No OSHA recordable work incidents

Performance Evaluation Management Plan

Randy Ortgiesen

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◆ Goal 7.0 Notable Outcomes

FNAL will update the FNAL Transformational Energy Action Management (TEAM) Executable Plan (EP) for FSO approval by the date specified in the DOE Guidance. FNAL will meet specific FY 2010 goals established in this EP. (Objective 7.1)

- ◆ Executable Plan was updated and approved by the date requested
- ◆ All FY10 EP goals met
 - FY10 EP goals have been met for energy reduction, water reduction, renewable energy, and Fleet alternative fuels, and sustainability.

Performance Evaluation Management Plan

Randy Ortgiesen

Fermi National Accelerator Laboratory

- ❖ Accomplishments in excess of "B+" performance
 - Approval, award, construction management, and scheduled progress on the DOE ESPC contract
 - Participation on DOE working groups to help coordinate the DOE TEAM initiative with the new Executive Order
- ❖ Suggested grade for Goal 7.0 is **A-**

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

Goal 8.0 Sustain and Enhance Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems



DOE FSO, FRA, LLC, Fermilab

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

◆ 8.1 Provide and Efficient and Effective Emergency Management System. – B+

◆ 8.0 Notable Outcome:

A joint FNAL/FSO review of the Emergency Management Program will be performed no later than June 30, 2010. Corrective actions and lessons learned will be developed as appropriate. (Objective 8.1)

Done!

- ◆ The review started May 10th, 2010 and concluded June 24th, 2010. The findings state that the Lab needs to do a better job tracking the issues found during emergency drills, Emergency Operations Center drills and actual events. The report acknowledges that we've followed up on such issues, but don't get credit for fixing them because they were not formally tracked. FESHM has been updated to mandate that each D/S/C track their drill critique findings in frESHTRK and this has been communicated.



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Performance Evaluation Management Plan

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❖ **8.1 Provide and Efficient and Effective Emergency Management System.**

- ❖ All required drills are complete.
- ❖ 67 buildings require emergency plans – all are up to date and posted.
- ❖ No drills of Lab/Program level formally identified any issues.
- ❖ Finalized the Fermilab Continuity of Operations Plan.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 8.2 Notable Outcomes

All FNAL employees responsible for handling PII will receive training by the end of first quarter, FY 2010, and a review will be conducted of all applications in the ES&H area to clarify the need to maintain and handle PII. A new set of security plans will be written and approved in response to this review by the end of June 2010.

◆ Section 8.2 Notable Outcome Response

- ◆ All Fermilab employees handling PII were verified as having completed updated Advanced PII training in FY10.
- ◆ An extensive survey of all ES&H systems, including the Medical Office, was carried out.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 8.2 Notable Outcomes

- ◆ In accordance with the FNAL Corrective Action Plan Addressing S&S Cyber Security Findings, dated May 2009, all computers will be monitored using centrally managed tools to inspect the configuration for compliance with Microsoft Windows Class Baseline Security Configuration by July 2010.

◆ Section 8.2 Notable Outcome Response

- ◆ Windows, MacOS and Linux systems are being monitored using centrally managed tools to inspect the configuration for compliance with key configuration elements from each operating system baseline.

Performance Evaluation Management Plan

Vicky White

Fermi National Accelerator Laboratory

◆ Section 8.2 Additional Achievements

◆ PII

- Contract and process changes made eliminate PII from the data of our dosimetry vendor.
- Practices and systems for handling potential PII in medical office have been changed
- Interconnection agreements with vendors handling PII written and approved by DOE
- Basic PII training for employees completed
- Credit card handling reviewed labwide, standardized, policy written in coordination with Finance Section.

Performance Evaluation Management Plan

Vicky White

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◆ Section 8.2 Additional Achievements

◆ Architectural review of ES&H applications

- All Protected PII was moved into the Business Systems Major Application.
- Office processes were analyzed and modified to ensure proper handling of Protected PII.
- All Fermilab employees handling PII, including those in ES&H, were verified as having completed updated Advanced PII training in FY10.
- The Security Plan for ESHMEDSRV (medical office server) was rewritten and approved as accurately describing the minor application.
- A full understanding of all data and business processes was gained and documented
- Security plans have been updated

Performance Evaluation Management Plan

Vicky White

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◆ Section 8.2 Additional Achievements

◆ TuneITUp Campaign

- Deployed collection and monitoring tools and changed practices and attitudes.
- Our focus in the past year has been on better management and monitoring of our end user systems – an IT management function.
- During the “Tune IT Up” campaign, a physical inventory was completed which included deploying inventory software to Windows, Apple OSX, and Scientific Linux desktops;
- System management procedures were updated to ensure that inventory software is installed and functioning, and that key baseline elements are in compliance;
- Baseline committees established and updated baselines written for each major desktop operating system. Procedures defined to manage configurations and track variances.
- Improve efficiency and consistency of management of desktop and laptop computers.

Performance Evaluation Management Plan

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◆ Section 8.2 Additional Achievements

◆ TuneITUp Campaign (continued)

- During the “Tune IT Up” campaign (thru May 2010), over 3700 desktop systems were checked for inventory software;
- Over 3800 desktop systems are reporting to the inventory repository (Aug 2010);
- Eliminated unnecessary accounts with administrative privileges
- Enforced password complexity for local accounts
- Enforced password complexity for Email accounts

◆ Cyber Security Management and Technology

- Web proxy installed
- Border packet capture and inspection tools installed

Performance Evaluation Management Plan

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◆ Section 8.2 Additional Achievements (continued)

- Active communications and training program: frequent articles in Fermilab Today, Cyber Security awareness day, incident response handler training, system manager training.
- Manage life cycle processes including testing, risk analysis, incident response and reporting as documented in our Cyber Security Plans.
- Extensive use of scanning, intrusion detection and blocking tools and a web proxy to prevent and detect intrusions.
- Network Information Management and Issue Tracking (NIMI) infrastructure developed and expanded to allow monitoring and blocking of systems with vulnerabilities

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

- ◆ **8.3 Provide an Effective and Efficient System for the Protection of Special Nuclear materials, Classified Matter, and Property – B+**
 - ❖ No special nuclear materials and no classified matter. Fermilab is in complete compliance with the Fermilab Nuclear Materials Control & Accountability (NMC&A) Program. This was verified by external DOE reviews and self-assessments.
 - ❖ NMC&A reports required by DOE directives are completed in conformance with DOE requirements.
 - ❖ All NMC&A Program procedures, physical inventories, training, databases, certificates, logs, and self-assessments are up-to-date.
 - ❖ Program also assessed by the Office of Quality and Best Practices Assessment conducted during FY10.

Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

❖ **8.3 Provide an Effective and Efficient System for the Protection of Special Nuclear materials, Classified Matter, and Property**

- ❖ All required programmatic functions have been completed ahead of schedule and in conformance with DOE requirements and best management practices.
- ❖ DOE Chicago Operations Office inspection resulted in a Satisfactory Rating.
- ❖ DOE Office of Science Hazard Review identified no findings, one observation, and two noteworthy practices.
- ❖ DOE Office of Science teleconference review resulted in no findings.



Performance Evaluation Management Plan

Nancy Grossman

Fermi National Accelerator Laboratory

❖ **8.3 Provide an Effective and Efficient System for the Protection of Special Nuclear materials, Classified Matter, and Property**

- ❖ All required programmatic functions have been completed ahead of schedule and in conformance with DOE requirements and best management practices.
- ❖ DOE Chicago Operations Office inspection resulted in a Satisfactory Rating.
- ❖ DOE Office of Science Hazard Review identified no findings, one observation, and two noteworthy practices.
- ❖ DOE Office of Science teleconference review resulted in no findings.
- ❖ Office of Quality & Best Practices self-assessment conducted during FY10.

Performance Evaluation Management Plan

Bruce Chrisman

Fermi National Accelerator Laboratory

❖ 8.4 Provide an Effective and Efficient System for the Protection of Classified and Sensitive Information

- ❖ Fermilab holds no classified information. Only occasionally is the Lab privy to sensitive (proprietary) information – none this FY.
 - ❖ A large influx of proprietary WFOs would stretch our capabilities – unlikely.
 - ❖ Given the unlikely nature of the above challenge no specific plans have been developed. Since such WFOs would not all occur at once and WFO approval takes time there would be an opportunity to adjust.
- ❖ Suggested grade for Goal 8 is **B+**