# Power Review of Operations & Maintenance Program (PRO&M)

**2015 Southwestern Federal Hydropower Meeting**
**Branson, MO**

[redacted]

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**17 June 2015**

US Army Corps of Engineers
**BUILDING STRONG®**

# Happy National Eat Your Vegetables Day!!

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# Happy National Apple Strudel Day!!

# Happy Stewarts Root Beer Day!!

# PRO&M Purpose

- Periodic assessment of power facilities
- Evaluates the application and effectiveness of operations and maintenance practices
- Power plant O&M performance and accomplishments are evaluated in accordance with specific instructions, standards, and regulations
- Ensures consistency and accountability throughout the hydropower program

# PRO&M History

- Bureau of Reclamation experienced several incidents prior to 1996
  - Standards were lacking and not followed
  - Inconsistent O&M practices
  - Funding was inconsistent
- Commissioner established a team to review the PRO&M Program for effectiveness and make recommendations to address problems
- Program was “reinvented” to provide more authority and emphasis on O&M practices
- Steering group was established to manage the PRO&M program and ensure it remained an effective process

# Corps PRO&M History

- Corps' Northwestern Division adopted program in 2004 (2006 Interim Policy Letter & Guidebook)
  - 27 out of 29 power facilities have had their initial review
  - Second round of reviews have been completed at some facilities
- Corps' South Atlantic Division adopted program in 2009
  - 11 out of 14 power facilities have had their initial review
- Corps' Southwestern Division adopted program in 2014
  - First review conducted at Tulsa District's Eufaula Power Plant in October 2014
- Remaining Divisions with hydropower facilities plan to adopt program and schedule reviews

# Corps PRO&M Program

- HQUSACE provides program oversight thru the National Hydropower Operations and Maintenance Practices Advisory Committee (NHOMPAC)
- National Power Review of O&M Workgroup (working under the NHOMPAC) is responsible for overall management and execution of the power review program
- Workgroup is comprised of members from each Division, a workgroup chair, and at-large appointments
- Engineering Regulation 1130-2-510 and Engineering Pamphlet 1130-2-510 currently being updated to include chapter (Chapter 8) on PRO&M program.

# Program Goals

- Operate facilities effectively, economically, and in accordance with applicable standards and regulations
- Provide optimal value to customers and stakeholders
- Protect the Federal investment
- Provide reliable service
- Adherence with safety & environmental requirements
- Compliance with legal and regulatory provisions
- Identify systemic issues
- Lessons learned

# Russia's Sayano–Shushenskaya Power Plant

# Millions of Dollars of damage
# 75 people lost their lives

# Failure of Head Cover Bolts

- Nuts missing on 6 head cover bolts
- Fatigue cracks found in 41 head cover bolts
- This could have been prevented!!

# Who Benefits from the Program?

- Plant Staff
- Facility Managers
- Management
- Power Marketers and Customers
- Public

# Review Schedules

- Comprehensive Hydroelectric Review (CHR) – Every 6 years
- Periodic Hydroelectric Review (PHR) – Every 6 years alternating w/ CHR
- Annual Hydroelectric Reviews (AHR)

# Review Team Staffing

- CHR – Generally staffed by reviewers outside of the power facility's Division. Team lead must be from outside Division.
- PHR – Staffed by reviewers within power facility's Division. Team lead must be from outside the facility's District.
- AHR – Performed by in-house power facility staff and District staff (as required)
- Shadows for CHR's and PHR's are recruited from outside or within the power facility's Division/District

# Funding Reviews

- All reviews (Comprehensive, Periodic, and Annual) are funded by the power facility being reviewed
- Labor and travel funds are provided for the lead reviewers
- Labor and travel for shadows are funded by their home office
- Observers are funded by their office

# Reviewer Qualifications

- Technical expertise in specialty area (Management, Operations, Mechanical, Electrical)
- Thorough knowledge of applicable requirements and standards
- Interpersonal skills needed to work effectively on a team and with project personnel
- Attended PRO&M training
- Participated as a shadow on at least one power review and received recommendation from reviewer he/she shadowed and the Review Team Lead
- Received recommendation from Division Hydropower Business Line Manager
- Received National PRO&M Workgroup approval

# Specific Areas Covered

- Electrical Maintenance (also covers NERC requirements)
- Mechanical Maintenance
- Operations
- Management
- SCADA (typically reviewed by Operations & Electrical reviewers)

# Reviews are Standards Based

- Bureau Facilities' Instructions, Standards, and Techniques (FIST) manuals can be found at the following link:

  http://www.usbr.gov/power/data/fist_pub.html

  - Electrical Maintenance (FIST Vol. 4-1B)
  - Mechanical Maintenance (FIST Vol. 4-1A)
  - Power Operations (FIST Vols. 1-11 & 1-12)
  - Power Management (FIST Vols. 6-1 & 6-2)
  - SCADA (FIST Vol. 3-33)
  - Equipment Specific FIST (CO2 Systems, Governors, etc.)
- Corps ER's, EP's, EM's, Safety Manual, etc.
- Corps has established a National Maintenance Standards team to develop specific standards similar to Bureau's FIST

# PRO&M Report

- Power Review team is responsible for developing a written report for Comprehensive and Periodic Power Reviews
- Reports are finalized and submitted in 120 days
- Corps' Facility Equipment Management (FEM) system used to track recommendations
- Recommendations resulting from a review fall into one of the following categories: Category 1, 2, or 3
  - Category 1: Severe deficiencies where immediate and responsive action is required
  - Category 2: Cover a wide range of important matters where action is needed
  - Category 3: Cover matters that are believed to be sound and beneficial suggestions to improve or enhance the O&M of the facility

# 2015 Power Review Schedule

1) J. Strom Thurmond (SAS) – April 27-30
2) Millers Ferry/Jones Bluff – May 11-15
3) John Day (NWP) – June 8-12
4) Libby (NWS) – June 15-19
5) St. Stephen (SAC) – July 13-17
6) Dworshak (NWW) – July 27-31
7) Willamette Valley Power Plants (NWP) – August 3-13
8) Narrows (MVK) – August 17-21
9) Garrison (NWO) - August 24-28

# Questions??