

Fossil Maintenance Applications Center (FMAC) - Program 104

Program Overview

Program Description

Utilities face chronic equipment problems in the more than 1,500 fossil units that are at least 30 years old, and new maintenance challenges are created by the addition of equipment to upgrade the performance and improve the emissions of existing plants. Generators need to reduce maintenance-related O&M costs for aging equipment while improving equipment reliability, but are challenged by diminishing collective experience and knowledge and an urgent need to develop new maintenance and engineering staff as the workforce retires. And training and knowledge needed to develop new staff is not always readily available from vendors or equipment suppliers

The Electric Power Research Institute's (EPRI's) Fossil Maintenance Applications Center (FMAC) program (Program 104) provides practical information for improving fossil plant maintenance-related operations and maintenance (O&M) processes, reliability, and cost through collaboration with participating organizations.

Research Value

EPRI's Fossil Operations and Maintenance programs develop advanced processes and related technology that support improved plant reliability and reduced maintenance costs. The programs address the key tactical challenges facing fossil plant owners relating to predictive maintenance, work management, conduct of operations, instrumentation, workforce, condition monitoring, and risk. These programs are highly collaborative in nature, providing forums for EPRI members to jointly resolve issues, improve processes, and identify research gaps. Members of the FMAC program can use the R&D to:

- Improve reliability through guidelines that present the most current technology-based preventive and condition-based maintenance solutions
- Find faster solutions to day-to-day maintenance issues following proven techniques and access to hotline support
- Develop strategies to resolve urgent problems using guidelines developed according to member priorities
- Improve staff knowledge and competence through training that addresses industrywide needs
- Develop better maintenance practices and reduce human error through the use of clear, easy-to-read guidelines, complete with precautions and tips for error avoidance

Approach

Information is disseminated via maintenance guides, technical newsletters, hands-on workshops, user groups, Internet resources, and a toll-free technical support hotline. FMAC works to resolve maintenance, equipment, and reliability problems using solutions that are shared within communities of interest.

- Technical maintenance guidelines address plant maintenance, including equipment, systems, and processes. A typical equipment guide will include equipment descriptions, failure modes, application information, troubleshooting, preventive maintenance tasks and basis, and training material for maintenance, operations, and engineering.

Accomplishments

EPRI's FMAC program continues to develop maintenance guidelines and process guides that address new and continuing issues that the industry faces on a daily basis. Using input from the members, data collected during plant visits, and feedback from various meetings, the program compiles a list of needed products that members prioritize each year based on changing needs. R&D in this program has:

- Produced 93 maintenance applications guides and eight webcasts

- Supported seven component/issue user and interest groups that aid members' staff development efforts
- Organized four workshops per year, directly related to components targeted for the highest impact in improving reliability
- Delivered technology improvements on current reliability problem areas via a webcast series
- Provided annual electronic library CDs with information on past and current products for members who participate for three or more years
- Handled more than 100 hotline calls from members needing help to resolve plant problems, providing solutions or linking them to other members with similar experience

Current Year Activities

The program R&D for 2010 will focus on capital component reliability improvements and sustainability of gains already made through the use of the FMAC guidelines. FMAC plans to use primary communication pathways such as site visits and webcasts to assist our membership in learning how to best use the products and transfer EPRI technology to the various maintenance and operations practitioners at their facilities. Specific efforts will include:

- Member-selected component application guideline developed each year as guided by member priorities.
- Three to four component and process guideline transfers from the nuclear sector, applicable to fossil stations based on selections by FMAC members.
- Seven user and interest groups sessions.
- Three to four training workshops conducted annually.
- Collective industry knowledge and field-proven techniques to solve day-to-day maintenance issues.
- Two "FMAC Memo" newsletters that contain technical articles on maintenance-related topics, project updates, and a list of scheduled workshops and meetings.
- Webcast training opportunities, as prioritized by members, on a variety of topics related to maintenance. Full audio copies of webcasts are recorded and placed on the FMAC website for access at any time.
- Transfer of nuclear maintenance application guides to FMAC, based on member priorities.
- Hotline support for members' technical needs.

Estimated 2010 Program Funding

\$1.0M

Program Manager

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Summary of Projects

Project Number	Project Title	Description
P104.001	Fossil Maintenance Applications Center	FMAC develops technical guides for direct use by maintenance, operations, and technical support organizations that capture the experience-based knowledge of today's aging expert workers and combine it with design and vendor knowledge to deliver ready-to-use equipment guidance for the overall improvement of component reliability and cost reduction.

P104.001 Fossil Maintenance Applications Center (100846)

Key Research Question

Aging generation facilities face rising costs as more equipment becomes obsolete and equipment suppliers focus on upgrades instead of repair options. Power stations also are losing experienced maintenance and engineering plant staff, and have limited resources to develop new maintenance and engineering staffs. As a result, some stations have experienced serious day-to-day maintenance issues that require more complex repairs. In addition, most plants are installing new equipment to upgrade performance or control emissions, creating new maintenance challenges from significantly different equipment.

Approach

Technical maintenance guidelines address component or equipment maintenance at a tactical level for both the technical staff and the maintenance technicians. A typical equipment guide include equipment descriptions, failure modes, application information, troubleshooting, preventive and condition-based maintenance tasks, operator inspection tasks, and any special considerations for each component. The guides also provide basic knowledge about the components to help stations develop a solid training basis for the staff. The Preventive Maintenance Basis Database (PMBD) is supported by FMAC. Information used to create the guide documents is applied to the PMBD to maximize overall reliability based on failure risk.

Impact

- Guidelines provide updated information on critical fossil plant equipment.
- Guidelines are in standard formats and include the most current technology-based solutions in preventive and condition-based maintenance.
- Subsections in the guidelines provide basic and advanced knowledge to strengthen or provide staff training.
- The guideline contents are capable of export to users' documents for inclusion of plant-specific information or into planning documents for maintenance instructions.
- Information is provided in a clear, consistent, easy-to-read manner, with precautions and advice to reduce human error.

How to Apply Results

More than 90 maintenance applications guides currently are available for members to distribute internally throughout their systems. A CD (electronic library) is an annual compilation of past and current guideline documents. These guides function as reference material for job planning, equipment troubleshooting, and component performance monitoring. Members can use FMAC webcasts of technology improvements on current reliability issues for plant-specific training, either for new hires or continuous improvement. FMAC supports seven component/issue user and interest groups and four workshops per year, focused on fossil components that can have the highest impact on improving the reliability of plant equipment. Hotline calls help members resolve plant problems by providing solution suggestions or by linking them to other members with similar experience.

2010 Products

Product Title & Description	Planned Completion Date	Product Type
<p>Technical Guides: Member-selected topics are developed into technical maintenance guidelines that address member needs in plant maintenance, including plant equipment, systems, and processes. Current topics suggested in recent surveys and meetings being considered include:</p> <ul style="list-style-type: none"> • Best practices in addressing North American Electric Reliability Corporation (NERC) reporting guidance • Industrial safety improvement techniques • Maintenance guidance on baghouses • Dust collector explosion mitigation practices • Ash pond/impoundment maintenance best practices • Use of the lean concept in maintenance 	12/31/10	Technical Report
<p>Workshops: FMAC will support two workshops per year on components with the highest impact on improving reliability. The workshops are shared with the Nuclear Maintenance Application Center (NMAC) as a supporting organization, and may be provided in conjunction with various user group meetings.</p>	12/31/10	Workshop, Training, or Conference
<p>Equipment User Group: FMAC sponsors component/issue user and interest groups in eight focus areas for member staffs to share information, gather new methods for maintenance, and develop industry contact lists to achieve broader understanding of maintenance and operational impacts on component health. These groups include a joint pump user group with nuclear stations, a fossil-only pump user group, transformer and switchyard user group, circuit breaker user group, pulverizer user group, motor user group, relief valves user group, and rigging/hoisting user group.</p>	12/31/10	Technical Resource
<p>Webcasts: Information is delivered via webcast on technology improvements to resolve current reliability problems that member advisors suggest during surveys. In addition, FMAC provides training on its products and processes to improve the end users' capabilities.</p>	12/31/10	Technical Resource
<p>Hotline Support: The hotline contact system helps members resolve plant problems by providing solution suggestions or linking them to other members with similar experience. FMAC uses phone access (both toll and toll-free lines) and email access points for members around the world to contact the EPRI team. The EPRI organization has significant experience with power plant and management issues that can be accessed by the members.</p>	12/31/10	Technical Resource

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
<p>Technical Guides: Technical guides based on member-selected topics will address member needs in plant maintenance, including plant equipment, systems, and processes. Topics suggested in past surveys and meetings will be combined and refined by member oversight. Past surveys have suggested FMAC develop best practices addressing issues such as NERC reporting guidance; industrial safety improvement techniques; maintenance guidance on baghouses; dust collector explosion mitigation practices; ash pond/impoundment maintenance best practices; and use of the lean concept in maintenance.</p>	12/31/11	Technical Report

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