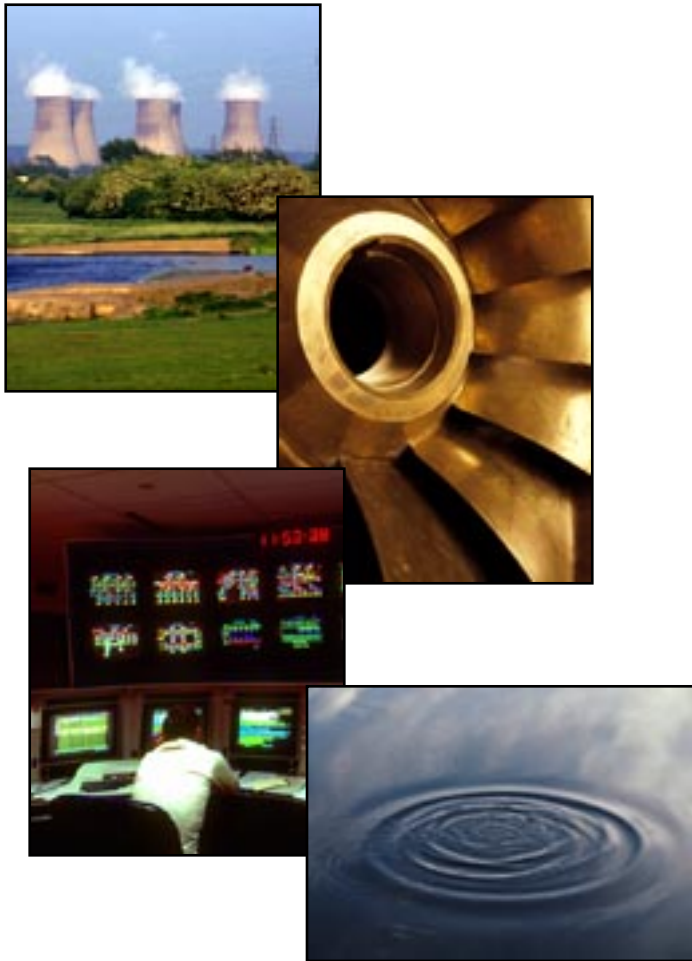


EPRI PSE Overview & EQ Motor Rewind Project Update

October 5th, 2005

Chris Abernathy
Project Manager
EPRI Plant Support Engineering (PSE)

EPRI Background



- Founded in 1973
- Unbiased, non-profit energy research consortium
- Voluntary funding from energy industry participants
- Collaborative research benefits members, their customers, and society
- Over 130 International participants
- Over 700 North American members
- U.S. members represent over 90% of U.S. electricity generated

EPRI Domestic / International Membership

Who are the members?

- Full Nuclear Members:
 - All United States Utilities
 - EdF, France
 - TEPCO, Japan
 - British Energy, UK
 - Candu Owners Group, Canada and Romania
 - Electronuclear, Brazil
- PSE participants:
 - Taipower, Taiwan (LCM & LR only)
 - KHNP, Korea.
 - Krsko plant, Slovenia
 - UNESA, representing all Spanish utilities
 - All Swedish plants



EPRI International Membership

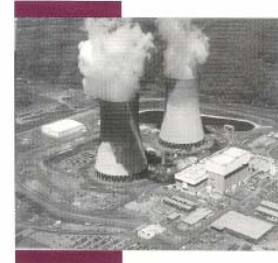
EPRI is growing through International Participation

- Benefits to PSE include:
 - Additional \$ to subsidize base funds (get more done!).
 - Additional participation in supplemental projects.
 - Continued utilization of previous products and information.
 - Additional advisory input.

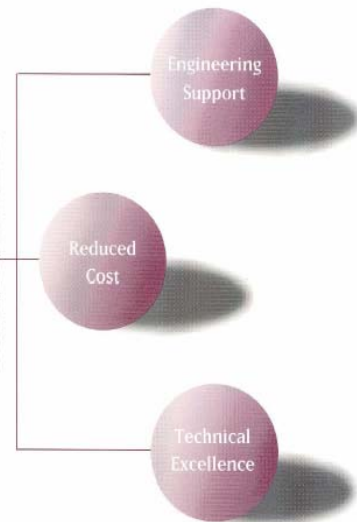


What is Plant Support Engineering?

The Plant Support Engineering (PSE) program was initiated in 1991 to help member utilities **reduce engineering-related O&M costs** while continuing to improve the quality and effectiveness of plant engineering programs and activities.



PSE



- Develop new engineering products and services.
- Address emergent industry issues.
- Provide technical assistance in support of routine and emergent plant issues.
- Facilitate information exchange between member utilities.

PSE Program

PSE has many facets:

- Equipment Reliability.
- Long Term Planning/ License Renewal.
- Component and System Engineering.
- Engineering Skills and Knowledge.
- Technical Assistance Programs.
- Aging Management.

Activities within these areas are designed to support each other in meeting the overall “mission” of cost effective operation of existing plants.



EPRI PSE Staff – the team is growing/ re-structuring

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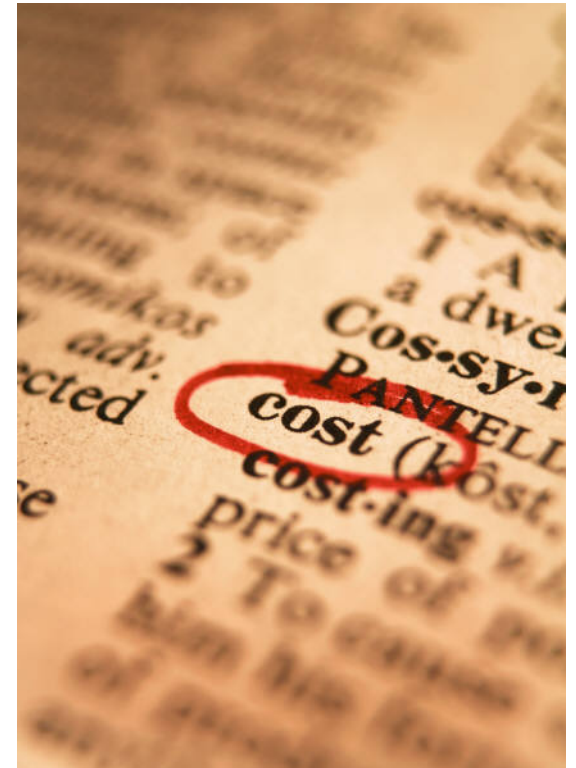


A Common Theme...

“Cost effective operation of aging assets”

This means:

- Understanding, recognizing and responding to aging phenomena.
- Maintaining high capacity factors and eliminating causes of forced outages and output reductions.
- Timely (planned) replacement of degraded components.
- Maintaining current high levels of technical staff expertise.



Future

- The “challenge” is operating up to and through the renewed license period:
 - Plants are in the middle of a 60 year life.
 - Equipment is predominantly original.
 - Staff are predominantly original.
 - The challenge of maintaining plant and staff adequacy is increasingly affected by a tough financial environment demanding reduced costs with increased output.
- Projections assume the majority of current plants will operate beyond their initial 40 year licensed life – how can we assure satisfactory, cost effective operations through a 60 year license period?
- Also, new plants are coming.....we need to be ready to support them.



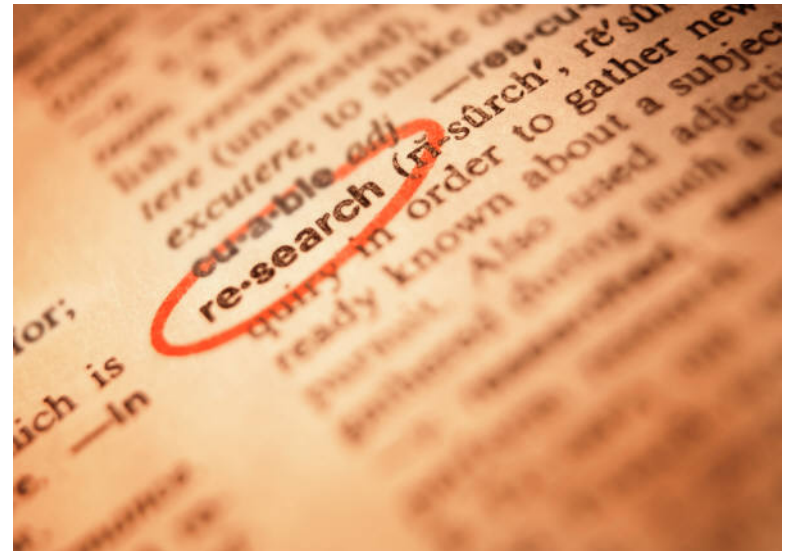
New plants?

- We cannot afford to make the same mistakes again;
 - PSE will, where appropriate, retain/ gather lessons learned, and current knowledge to be ready to support new programs.
 - PSE will work to understand and advocate opportunities for simplification.
- How to source components and how to install and commission;
 - Industry knowledge is waning, PSE will capture this for existing plants and use this knowledge to support new build.



Key Current and Future Projects

- License Renewal Commitments.
- Key Component Replacement.
- Obsolescence Solutions.
- Aging Management.
- Technical Assistance Programs.
- Maintaining Staff Expertise.
- Equipment Failure Watch List.
- OEM Coatings DBA testing.
- LTP Sourcebooks and Knowledgebase.



PSE Information

Information Sources:

- EPRI Web Site
 - PSE Web Site
- PSE Newsletter
- PSE Product Brochure
- PSE Presentations
 - Site Visits

PSE Technical Assistance Programs

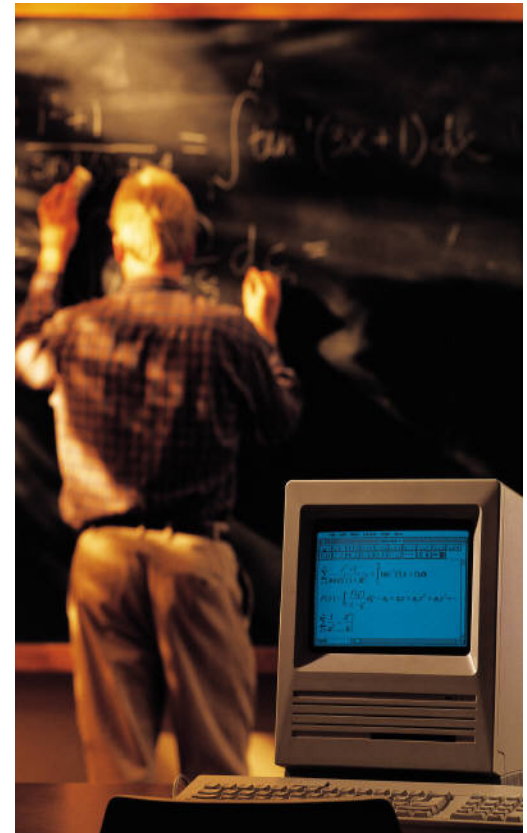
	SWAP	P ² EP	JUTG	EQ	ESC	NUCC
Hotline Assistance	✓	✓	✓	✓	✓	✓
Plant Contacts	✓	✓	✓	✓	✓	✓
Technical Libraries	✓	✓		✓		✓
Utility Surveys	✓	✓	✓		✓	✓
Industry Workshops	✓	✓	✓	✓		✓
epri.com Pages	✓	✓	✓	✓	✓	✓

PSE Technical Assistance Programs

- PSE Training Courses and Workshops

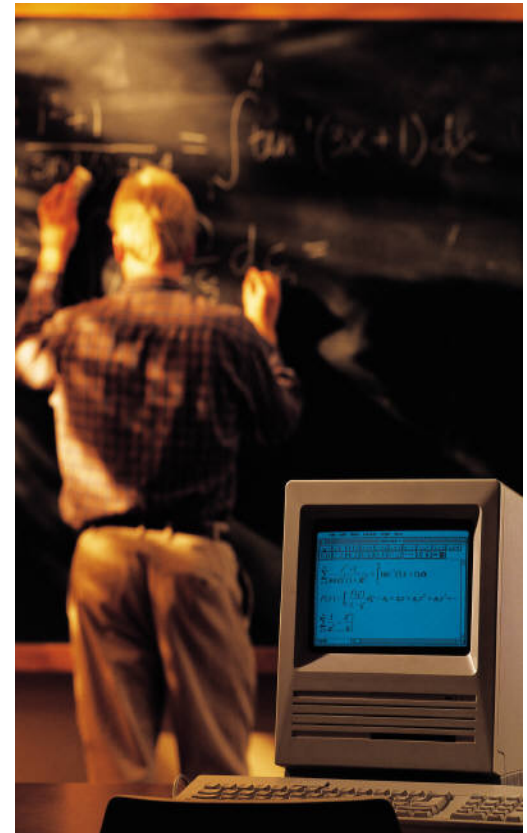
- Training

- Seismic Orientation Training.
- Computer Based Training:
 - Basic atomic and nuclear physics.
 - Engineering fundamentals.
- Engineering Technical Training Modules (Supplemental program):
 - Electrical Series.
 - I&C Series.
 - Mechanical Series.
 - Civil/Structural Series.



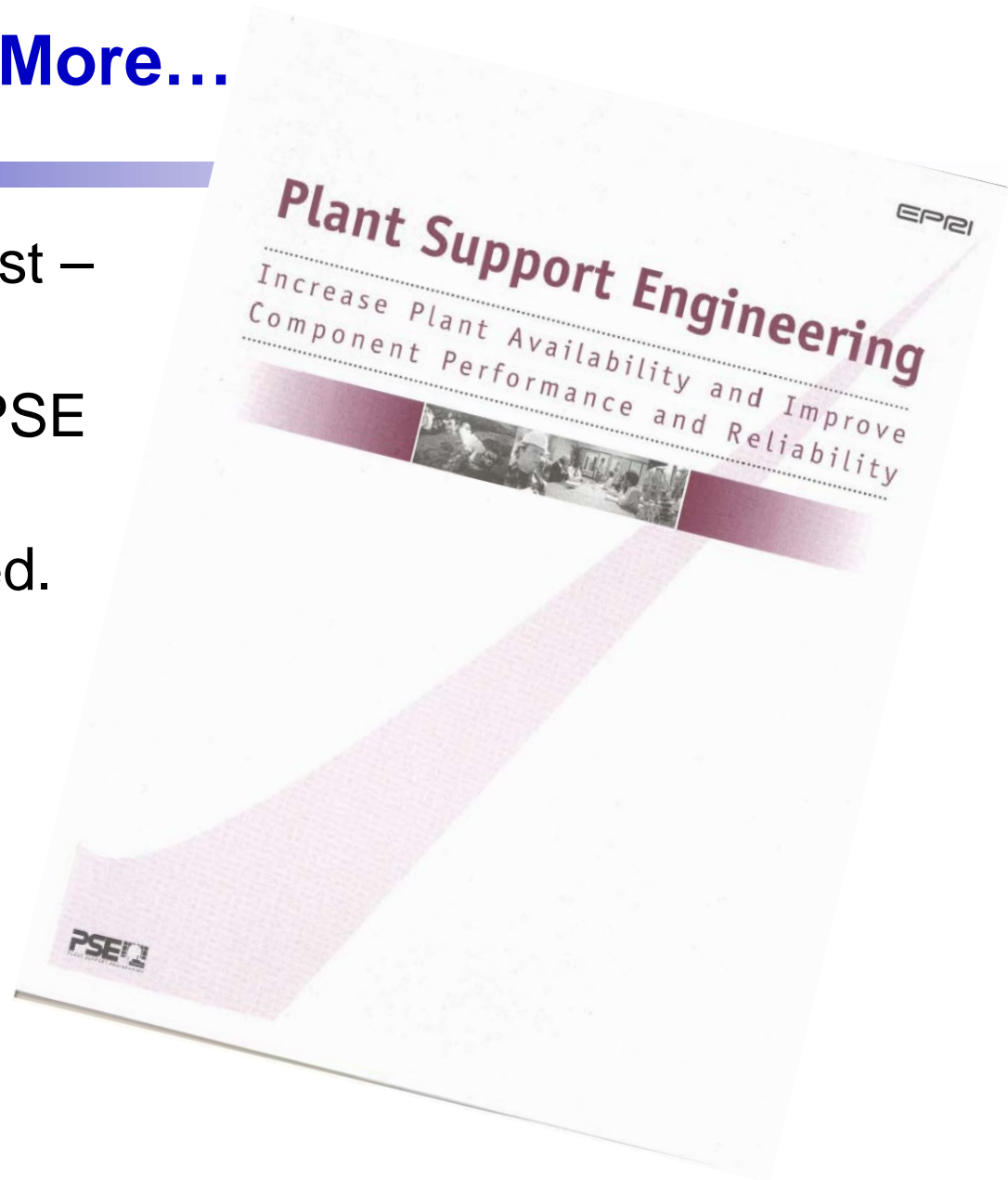
PSE User Groups (supplementally funded)

- Cable User Group:
 - Utility collaboration to address cable aging issues.
- SQRSTS User group:
 - Collaborative approach to share seismic testing protocols and test facilities.
 - Full or library membership.
- EQ Management System:
 - Generic qualification data and software system for EQ Program development and management.
- Heat Exchanger Performance
 - Collaborative group to share heat exchanger performance tools and methods.
 - Single tube test device
- PSE Member Requested Support.



How to Find Out More...

- The PSE Product List – (1011107)
 - Lists all current PSE products.
 - Regularly updated.



EQ Motor Rewind Project

Presentation Purpose:

- Provide status update for on-going PSE project with potential application benefit throughout the industry

Project Scope

Qualify motor stator rewind insulating systems & publish qualification test reports, materials data, & rewind procedures for:

- Medium Voltage (<7 kV), AC Form Wound Motors for Outside Containment Applications
- AC Random-Wound, Environmentally Qualified (EQ) Motors: Intermittent Duty (MOV) Applications
- AC Random-Wound, Environmentally Qualified (EQ) Motors: Continuous Duty Applications

Completed

Medium Voltage (<7 kV), AC Form Wound for Outside Containment Applications

- *Test Report on Testing of Form-Wound Medium Voltage (<7 kV) Motor Insulating Systems*, Report #1001036, June 2001
- *Procedure for Rewinding AC Form-Wound Stators for Environmentally Qualified Motors: Low-Voltage and Medium Voltage (<7 kV) Motors*, Report #1003481, September 2002
- *Baseline Materials Data to Support Procedures for Rewinding Environmentally Qualified Motors: AC Random-Wound Stators (Intermittent-Duty Applications) and AC Form-Wound Stators (Low-Voltage and Medium Voltage [<7 kV] Motors)*, Report #1003516, December 2003

Completed

AC Random-Wound, Environmentally Qualified Motors: Intermittent Duty (MOV) Applications

- *Test Report on Testing of Random-Wound Motor Insulating Systems, Intermittent Duty MOV Applications, Report #1000867, October 2000*
- *Procedure for Rewinding AC Random-Wound Stators for Environmentally Qualified Motors: Intermittent Duty (MOV) Applications, Report # 1003480, June 2002*
- *Baseline Materials Data to Support Procedures for Rewinding Environmentally Qualified Motors: AC Random-Wound Stators (Intermittent-Duty Applications) and AC Form-Wound Stators (Low-Voltage and Medium Voltage [<7 kV] Motors), Report #1003516, December 2003*

In Progress

AC Random-Wound, Environmentally Qualified Motors: Continuous Duty Applications

- Two (2) of the 5 motors have successfully completed LOCA testing.

Qualification Testing of Random-Wound Continuous Duty Motor Insulating Systems – Test 1, Report #1009972, issued March 2005, addresses Motor #2. Testing on Motor #4 was recently concluded.

- LOCA testing on two (2) of the motors is in progress & should be completed in early Oct.
- Motor #1 will not be LOCA tested if Motor #3 passes the LOCA test. These 2 motors utilize the same epoxy system and Motor #3 was aged at a higher temperature for the same time period. The wire in Motor #1 was used in Motor #2.

Yet To Be Done

AC Random-Wound, Environmentally Qualified Motors: Continuous Duty Applications

- Complete remaining LOCA test(s) and issue Qualification Test Reports
- Issue the Materials Data Report
- Issue the Rewind Procedure Report

All of these reports should be issued by 1st Qtr 2006.

Need Additional Information

**Request The Listed EPRI Documents Or
Contact The EPRI Project Manager Directly**

- Ken Caraway
- (704) 717-6431

Questions / Comments ...

