



Program 68 Overview

Instrumentation, Controls and Automation Interest Group Meeting

Neva Fox

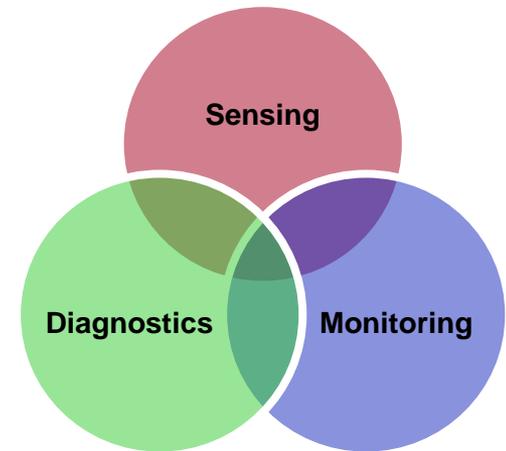
Senior Project Manager

Generation - Instrumentation, Controls and Automation

Instrumentation, Controls & Automation (68)

Improve reliability through more effective equipment monitoring, optimization of current control strategies and development of new technologies

- Strategically implement process changes to improve operational flexibility
- Attend Peer interest groups to collaborate and apply other's learnings
- Reduce cost through greater automation of process controls
- Improve reliability through advance anomaly detection, diagnostics and prognostics.
- Identify control improvements that can help lower unplanned maintenance costs



Program Manager

Neva Fox

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Provide instrumentation and controls solutions to enhance processes, technologies, operations and maintenance.



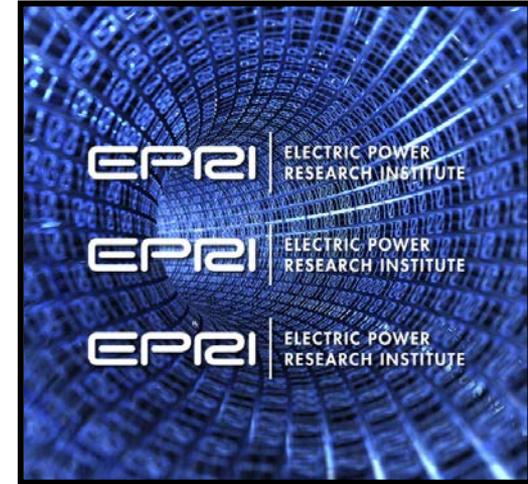
2012 Program Structure – Program 68

Instrumentation, Controls, and Automation

- **P68.001: Technology Development & Demonstrations**
 - Cyber Security Recommendations for I&C Systems
 - Impact of Pulverizer Performance
 - Integrated I&C Solutions for Enhanced Cycling and Turndown
 - 2 Shared Projects – Cyber Security Procurement and Flow Measurement
- **P68.002: Technology Transfer**
 - I&C Guideline: 2012 Topical Update
 - Fleet-Wide Monitoring Interest Group Meetings
 - Instrumentation, Controls and Automation Interest Group Meetings

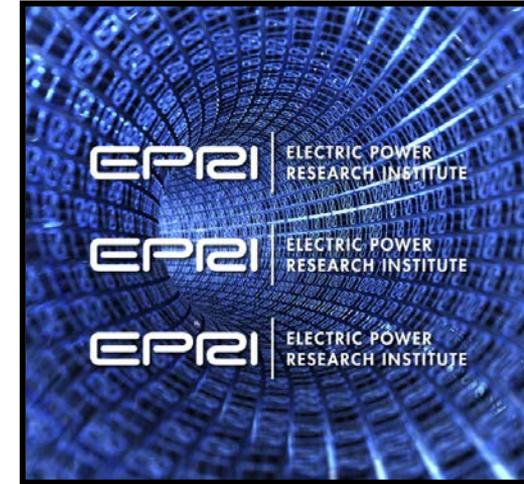
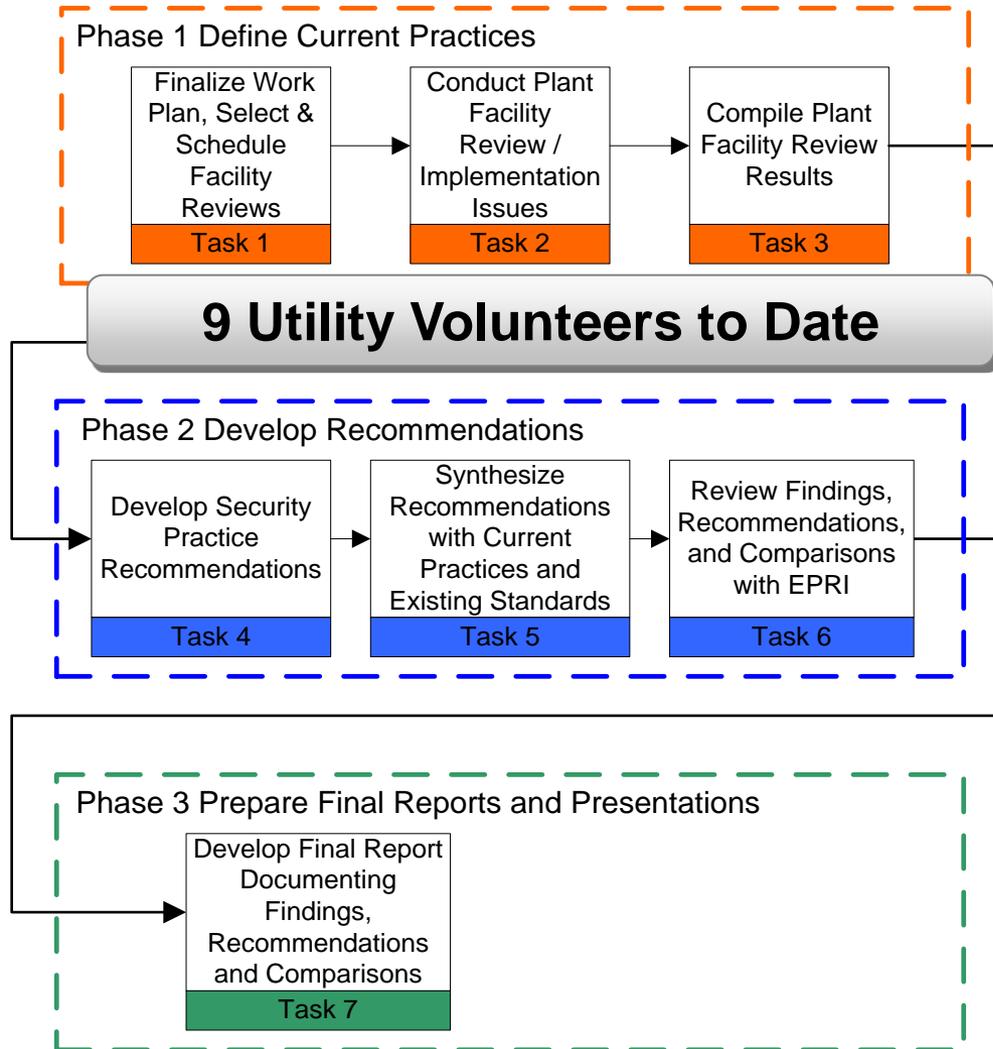
Cyber Security Recommendations for I&C Systems

- **Project Manager:** Neva Fox
- **Product Type/ Deliverable Date:** Webinar and Technical Update (Dec 2012)
- **Scope and Key Objectives**
 - Facilities not required by NERC-CIP
 - Determine the security practices for protecting I&C systems currently being utilized in a sample of generating facilities.
 - Recommend “prudent” or “good” security practices for protecting I&C systems.
 - Recommend “advanced” or “better” security practices for protecting the I&C systems



“You don’t have to be target to be a victim”

Cyber Security Recommendations for I&C Systems



Impact of Pulverizer Performance

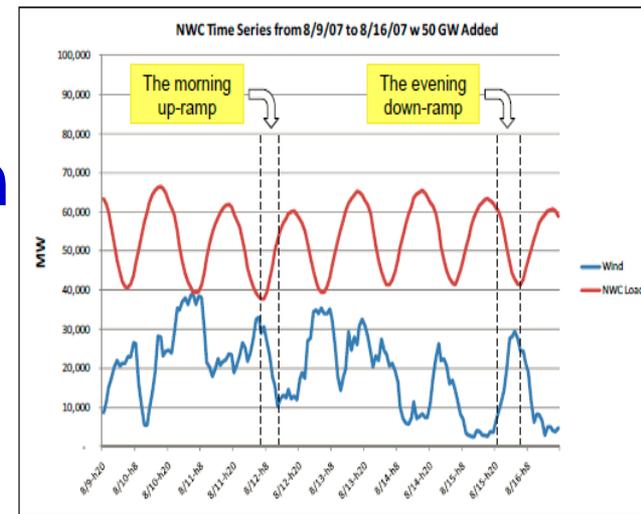
- **Project Manager:** Lam Bui
- **Product Type/ Deliverable Date:**
Technical Update (Nov. 2012)
- **Scope and Key Objectives**
 - The objective is to identify a mechanism to monitor and test pulverizer operation online to determine its responsiveness (or change in responsiveness).
 - Results will be used to determine if the pulverizer needs maintenance or if the control system needs repair or tuning
 - Host Plant – Miller, Southern Company



“It’s not always mechanical”

Integrated I&C Solutions for Enhanced Cycling and Turndown

- **Project Manager:** Neva Fox
- **Product Type/ Deliverable Date:**
Technical Update (Dec. 2012)
- **Scope and Key Objectives**
 - **Phase 1** (2012 work) – Develop Roadmap
 - Research and industry survey to develop a Roadmap
 - Identify where I&C solutions can mitigate the effects of cycling while improving operational flexibility through optimized ramp rates and lowered sustainable minimum load requirements.
 - **Phase 2** (yearly update) – Develop Integrated Solutions
 - Solutions for specific equipment, processes and systems prioritized based on industry need.
 - Collaboration between Program 68 and other programs to coordinate effective and viable solutions for each set of topics with the industry experts in both instrumentation and controls and the specific topical areas.



Flow Measurement

(Shared with P71)

- **Project Manager:** Sam Korellis
- **Product Type/ Deliverable Date:**
Technical Update (Dec 2012)
- **Scope and Key Objectives**
 - Multi-year project focusing on continuous measurement of flow for the most important flow rates in the power plant.
 - **Task 1** – Develop and Issue and industry survey on the measurement of feedwater flow in fossil fueled power plants and Compile the results received
 - **Task 2** – Conduct an on-site evaluation of one or more power plant feedwater flow measurement systems, typical of those commonly used today
 - **Task 3** – Analyze Alternative Feedwater Flow Measurement Techniques



Surveys have been distributed

Cyber Security Procurement

(Shared Cross Section – Fossil/Nuclear and PDU)

Phase 1 – Benchmark Study

- Any existing guidance/specs?
- Any under development?

Phase 2 – Methodology

- Method for creating specs
- Worked example

Phase 3 – Guidance & Specification

- Specification language

Phase 4 – Computer-Based Training

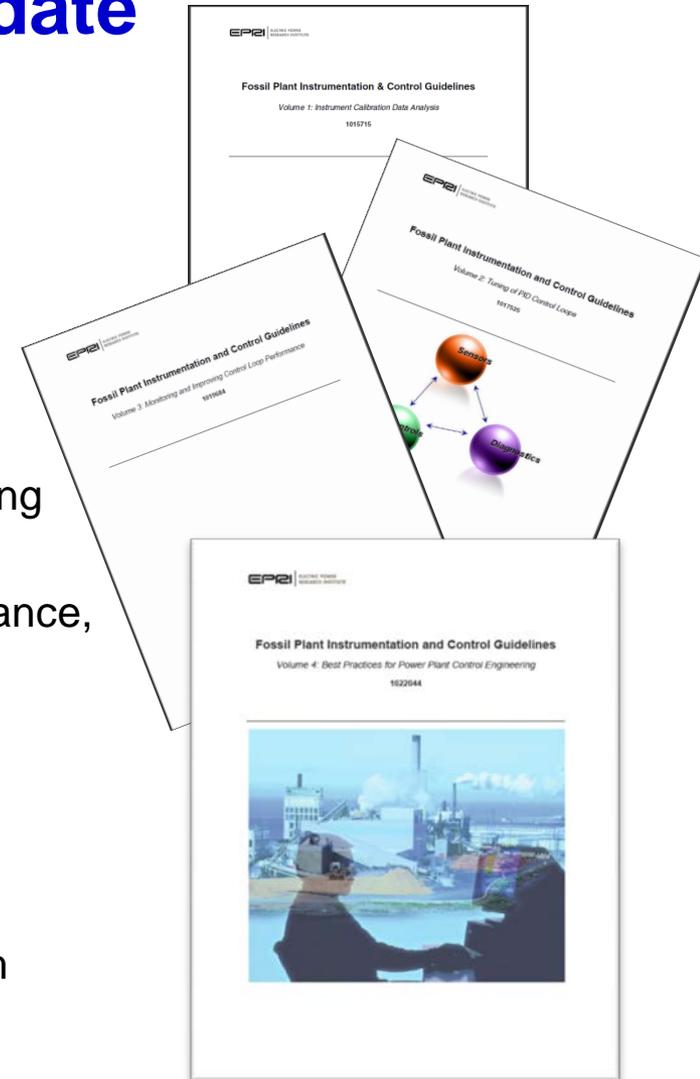
- Utility module; Vendor module



Phase 1 – Report Published – 1023502

I&C Guideline: 2012 Topical Update

- **Project Manager:** Lam Bui
- **Product Type/ Deliverable Date:** Technical Update (Dec. 2012)
- **Project Description:**
 - Volume 2 – different PID controller algorithms and tuning techniques.
 - Volume 3 – factors that affect the control loop performance, as
 - Volume 4 – several tuning techniques
 - **Volume 5 – Job Cards**
 - The control loop tuners will be able to apply the knowledge gained in past Volumes, with hands on instructions and guidance from Volume 5 to perform each task.



Putting knowledge to use

Instrumentation, Controls & Automation Interest Group

- **Project Manager:** Neva Fox
- **Product Type/ Deliverable Date:**
Technical Resource (throughout the year)

- **Project Description:**

- EPRI's Instrumentation, Controls & Automation Interest Group (ICA IG) provides a forum where utilities can share I&C experiences in a peer-to-peer setting.

June 6 – 7, 2012

Austin, TX



Collaboration with the DOE

Cyber Security Solutions for I&C Systems

Supplemental Project

Objectives and Scope

- Explore and document specific strategies for securing control systems
- Prioritize and address top topics based on input from Project Members
- Assess field applications both in and out of the Utility Industry

Process and Deliverables

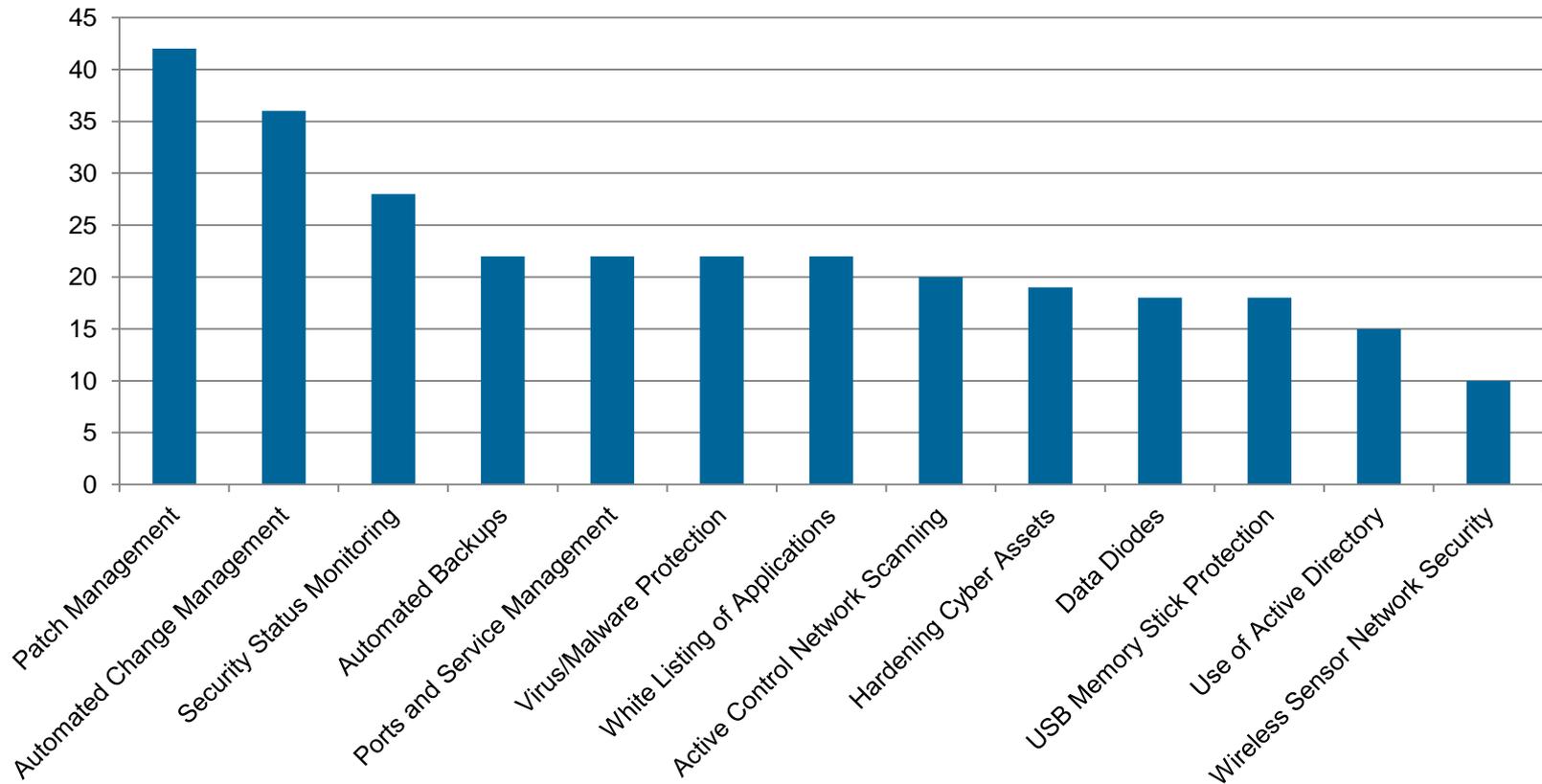
- Topical Area Deep Dive:
 - Conduct research to focus on technology gaps and new developments
 - Conduct Site Visits that have applied strategies and technologies to gather real-world experience
 - WEBCAST to promptly get solutions to the end user
 - Technical Update Report



10 Project Funders to Date

Next Topical Areas

Topic Rankings



Remote Access in progress – completion June 14

HRSG Damage Reduction Through Improved Controls

Objectives and Scope

- Document existing controls and their performance
- Identify I&C improvements
- Perform detailed design of identified improvements
- Implement identified improvements
- Testing and evaluation of benefits

Value

- Improve system performance, heat rate and thermodynamic efficiency
- Prevent HRSG damage and cracking



7 Project Funders to Date

Questions/Comments



Together...Shaping the Future of Electricity

2012 Meeting Schedule

UPCOMING MEETINGS/EVENTS	DATE	LOCATION	COMMENTS
Spring Advisory Meeting	February 21, 2012	Scottsdale, AZ	COMPLETE
Spring FWMIG	May 9 – 10, 2012	Charlotte, NC	COMPLETE
ISA POWID	June 4 – 8, 2012	Austin, TX	COMPLETE
ICA IG Meeting	June 6 – 7, 2012	Austin, TX	You Are Here
Fall Advisory Meeting	October 2, 2012	Nashville, TN	
Fall FWMIG	October 22 – 24, 2012	Dallas, TX	
Fall IG Meeting	Week of October 22	Tentative	Based on funding

2012 Member Update Schedule

PROGRAM 68 UPDATES	DATE	COMMUNICATION	COMMENTS
1Q12 Update	March	Email	(status and overview) COMPLETE
Cyber Security Project Kickoff Meeting	April 4	Webcast	COMPLETE
2Q12 Update	June 20	Webcast	(technical focus)
3Q12 Update	September	Email	(status and overview)
Impact of Pulverizer Performance Technical Update	October	Webcast	
4Q12 Update	December	Email	(status and overview)

2012 Deliverables

PROJECT	2012 DELIVERABLE
Integrated I&C Solutions for Enhanced Cycling and Turndown	Technical Update
Cyber Security Recommendations for Protecting I&C Systems	Technical Report
I&C Guideline: Annual Update – Boiler Control Loop Tuning	Technical Update
Impact of Pulverizer Performance	Technical Update
Instrumentation, Controls and Automation Interest Group	Technical Resource
Fleet-Wide Monitoring Interest Group	Technical Resource
Cyber Security Procurement (Shared with Nuclear & PDU)	Technical Update
Flow Measurement (Shared with P71)	Technical Update

2013 Key Planned R&D Topics

Distributed Control Life Cycle Management

- Develop a life cycle management plan (LCMP) to cost-effectively avoid reliability and obsolescence issues.
- Provide an optimum maintenance plan, schedule and cost profile for a plants Distributed Control Systems.
- Evaluate how to implement security system changes into already established systems.

Interest Groups

- Fleet Wide Monitoring
- Instrumentation, Controls and Automation

I&C Guidelines – Volume 6

- Continuation of Volumes 1 – 5

