

## Agenda

# Eighth Annual Monitoring and Situational Awareness Conference – Session 2

Theme: Energy Management System Reliability and Resiliency in the Pandemic

October 15, 2020 | 1:00 – 3:00 p.m. Eastern

### Welcome and Introduction

- Phil Hoffer, Vice Chair of NERC EMS Working Group

### ERO/FERC Real-time Assessment Report

- Dwayne Fewless, *ReliabilityFirst*

### Overview of Southern Company's Joint Real-Time Assessment

- Christopher Wakefield, *Southern Company*

### Session Summary

- Matthew Lewis, NERC, Manager of Event Analysis

# Speaker Biographies<sup>1</sup>

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### Phil Hoffer



**Phil Hoffer** has been with AEP Transmission Operations since 1986. He has a BSEE from The Ohio State University and is a registered Professional Engineer in the state of Ohio.

He is currently the manager of EMS Applications at AEP. His group is responsible for the state estimator and contingency analysis systems and maintaining the operational model of the transmission system network. In addition, a newly created shift engineering position under Phil will provide 24x7 on-site support for the State Estimator and TOP-010 compliance.

His primary focus right now is continuing to develop the shift engineer position by having half of the staff in Corpus Christi, Texas and the other half in New Albany, Ohio. This will provide coverage in the event of a local area issue.

### Dwayne Fewless



**Dwayne Fewless** is currently a Principal Analyst in the Operational Analysis & Awareness Department and previously held the position of Reliability Consultant in the entity Development Department at

ReliabilityFirst.

Mr. Fewless has over 14 years of utility industry experience working in Transmission Operations as a System Operator at Wolverine Power and responsible for Technical Training at MISO and ITC.

At Wolverine Power, Mr. Fewless was a Transmission Operator and was responsible for monitoring the Transmission System and responding to events, coordinating and switching on the Transmission System.

At MISO and ITC, as a trainer, Mr. Fewless taught classes on various tools and applications, as well as human performance improvement and situational awareness designed for the Control Room Operations staff. Mr. Fewless was also involved in new-hire training, simulation training, power system restoration drills, and evacuation drills. Mr. Fewless was responsible for developing

<sup>1</sup> Biographies are listed in order of presentation.

and carrying out training plans to include scheduling and facilitating.

### **Christopher Wakefield**

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**Christopher Wakefield** is currently serving as the Reliability Coordination Manager in the Bulk Power Operations department at Southern Company. In this role, Christopher ensures reliable operations across

southeastern sub-region of SERC, which encompasses the following entities: Alabama, Georgia, Gulf and Mississippi Power companies, Georgia System Operations Company, Municipal Electric Authority of Georgia, Southeastern Power Administration, and Power South Energy Cooperative.

While Christopher's primary responsibilities include providing oversight of real-time system operations for the Southeastern Reliability Coordinator and the Southern Company Transmission Operator functions, he also provides day ahead operational plan development and reliability commitment of generation resources.

During his 24 years of experience in the electric utility, Christopher has served in various operational roles to include supervisory and management positions. These roles includes: Balancing Authority manager, OASIS Administrator, Operations Planning, System Operator, Transmission Planning, R&D, and Asset Management.

Christopher also serves on various industry committees including the NERC Operating Reliability Subcommittee and EIDSN Interchange Distribution Calculator Steering Committee. He holds a BS in Electrical Engineering from the University of Alabama at Birmingham and is a

registered Professional Engineer in the state of Alabama.

Furthermore, Christopher maintains NERC Reliability Operator System Operator certification and is a proud veteran of the U.S. Navy.

### **Matthew C. Lewis**

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**Matthew Lewis** joined the North American Electric Reliability Corporation (NERC) on March 24, 2014 and currently serves as the Manager of Event Analysis and previously served as the Manager of Training and

Education. He retired with over 25 years of service as a U.S. Army officer. Matt served in a variety of leadership and staff positions in the fields of operations, special weapons effects and response, technical intelligence, and joint exercises/training. During his military service, he participated in combat tours in Desert Storm and Iraqi Freedom. Matt has a Bachelor of Science in Physics from the University of Arkansas at Little Rock and a Master of Science in Applied Physics from the Air Force Institute of Technology. You can learn more about Matt's professional experiences at his [LinkedIn](#) page.

**NERC**

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

# The 8th Annual Monitoring and Situational Awareness Technical Conference – Session 2

Energy Management System Reliability and Resiliency in the Pandemic

Phil Hoffer, Vice-Chair of NERC EMS Working Group  
October 15, 2020

RELIABILITY | RESILIENCE | SECURITY

- Welcome and Introduction
- The pandemic and shaping the future of work continues
- Thank you for keeping the lights on
- Goal of the conference
- Themes, agenda and topics for today
- Feedback
  - Wei Qiu – [Wei.Qiu@nerc.net](mailto:Wei.Qiu@nerc.net)
  - Phil Hoffer – [pehoffer@aep.com](mailto:pehoffer@aep.com)
  - Venkat Tirupati – [Venkat.Tirupati@ercot.com](mailto:Venkat.Tirupati@ercot.com)

A map of North America is shown in the background. The United States is colored in a dark blue, while Canada and Mexico are in a lighter blue. A horizontal band of medium blue color stretches across the middle of the map, passing through the United States. The text "Thank You & Enjoy !!" is centered within this band.

**Thank You & Enjoy !!**



# NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

# ERO/FERC Real-time Assessment Report

Dwayne Fewless, ReliabilityFirst

Monitoring and Situational Awareness Technical Conference

October 15, 2020

RELIABILITY | RESILIENCE | SECURITY



- **Report currently in draft - complete**
- **Team finalizing comments – in progress**
- Participating entities will provide comments
- Report will be finalized with ERO and FERC
- Report will be published



- Why the study was completed?
- How many participants?
- What will come out of report?
  - Best Practices
  - Recommendations
- What is the report timeline?

- We talked to managers about the back up tools when primary tools failed
- An evaluation of system conditions using **Real-time data** to assess existing (**pre-Contingency**) and potential (**post-Contingency**) operating conditions.
- The assessment shall reflect applicable inputs including, but not limited to: load, generation output levels, known Protection System and Special Protection System status or degradation, Transmission outages, generator outages, Interchange, Facility Ratings, and identified phase angle and equipment limitations. (Real-time Assessment may be provided through internal systems or through third-party services.)

## Situational Awareness

- DYNAMIC STABILITY ANALYSIS
  - EMS TOOLS AND ALARMS
    - STATE ESTIMATOR
      - IROL
      - ICCP
    - REAL-TIME
  - WEATHER FORECASTING
- RTU MONITORING
  - SOL
- VOLTAGE STABILITY ANALYSIS
  - RTCA
  - SCADA
- FUEL AVAILABILITY

## SYSTEM OPERATOR

A stylized map of North America, including the United States, Canada, and Mexico. The map is rendered in shades of blue and grey. A horizontal band of medium blue color stretches across the middle of the map, passing through the United States. The text "Questions and Answers" is centered within this band.

## Questions and Answers



# Overview of SOCo's Joint Real-Time Assessment

Chris Wakefield



Southern  
Company

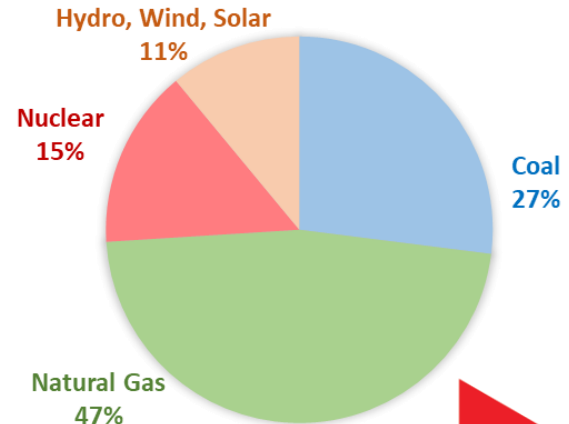
# Southern Company Overview



# Southern Company Overview



- ❑ Operating Companies in AL, GA and MS
- ❑ Service to over 4 million electric customers
- ❑ Vertically integrated
  - 27,000 miles of transmission lines
  - 3,700 substations
  - 156,000 miles of distribution lines
  - 2018 Energy Mix:





# EMS System Architecture



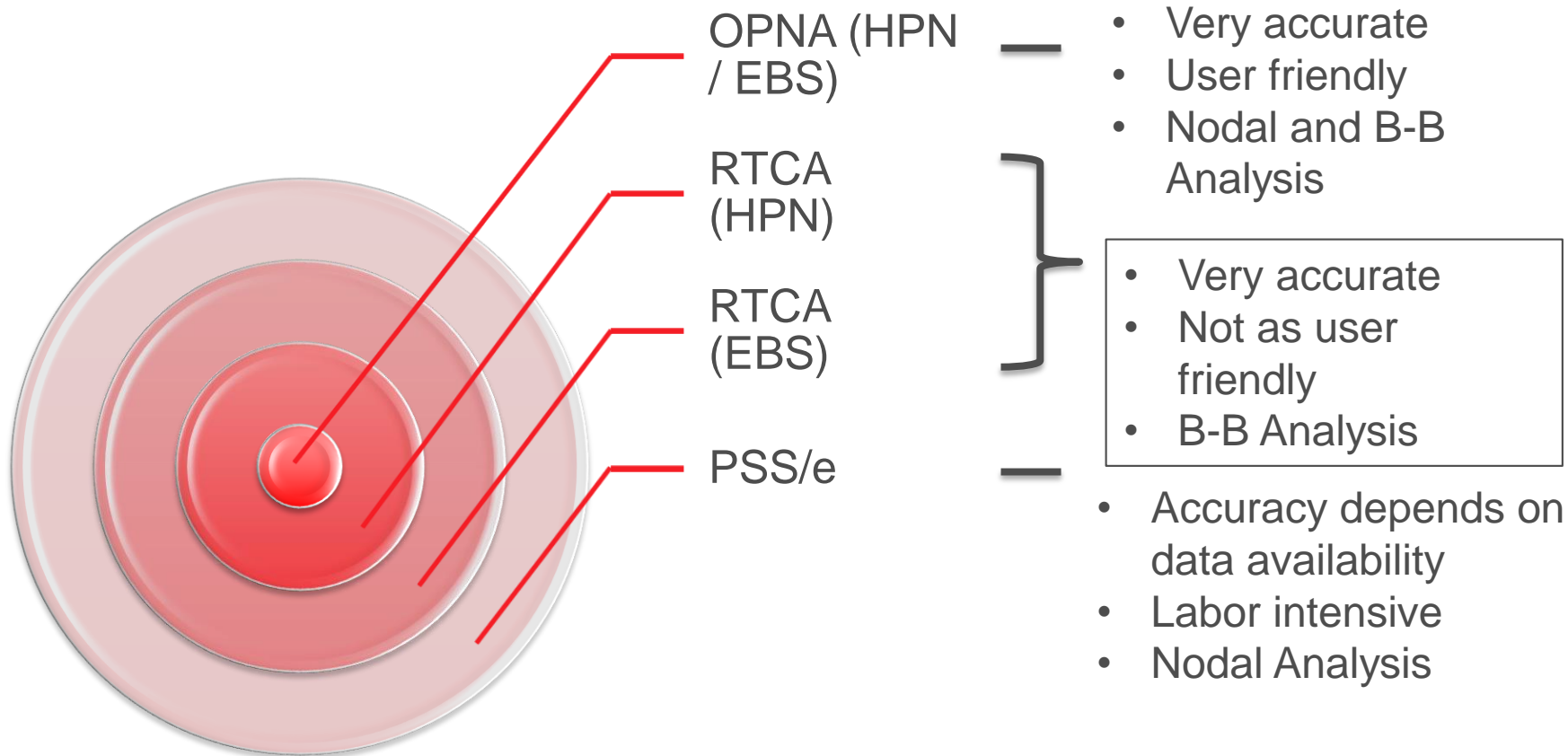
# Software Used for Performing RTAs



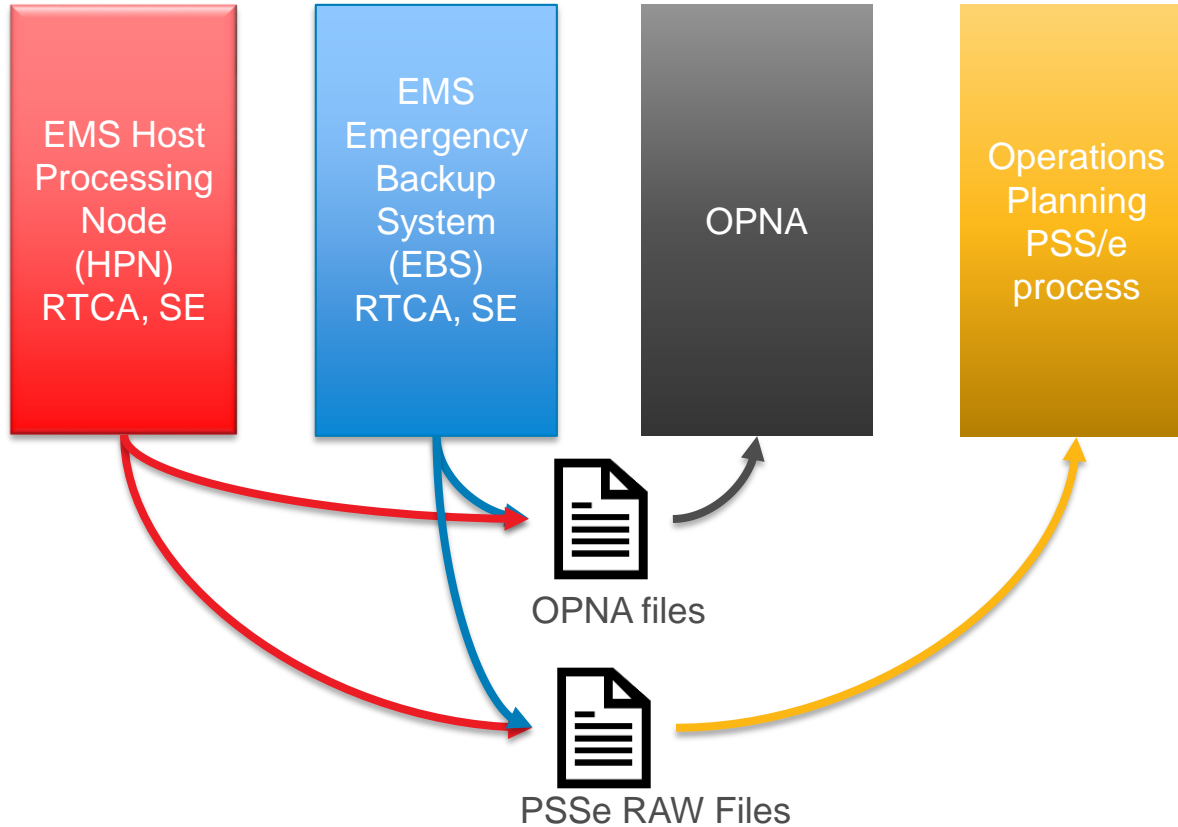
# RC/TOP Loss of Tools Overview



# RTA SOFTWARE LAYERS OF REDUNDANCY



# REAL-TIME ASSESSMENT LAYERS OF PROTECTION



Files are produced every SE run



## OFFLINE POWER NETWORK ANALYSIS (OPNA)

- RC/TOP System Operator's Primary Tool
- Automatically pulls latest SE case and can retrieve previous SE runs
- Nodal and/or breaker – breaker contingencies
- N-0, N-1, N-G-1, N-2, forward looking study capability (load scaling, dispatch)
- Reports contingency solution failures
- Voltage stability analysis (stability bus)
- Stores contingency solution notes (input by System Operators):
  - Specific to violated Branch or Bus
  - Specific to the Contingency

**\*\*\*\*\*PROPRIETARY SOUTHERN COMPANY TOOL\*\*\*\*\***

**THANK YOU!**

