

# REINHOLD ENVIRONMENTAL®



## **2022 Reinhold/PCUG Round Table Presentation**

Hosted by Duke Energy in the Charlotte Sheraton/Le Meridien  
Hotel, Charlotte, NC on June 27-28, 2022

All presentations posted on this website are copyrighted by **REINHOLD ENVIRONMENTAL®** (RE). Any unauthorized attempts to print, to download, to modify, to incorporate into other presentations, to link to other websites or to obtain copies for any other uses than the training of attendees to RE Conferences is expressly prohibited unless approved in writing by RE or the original presenter. RE does not assume any liability for the accuracy or contents of any materials in this library which were presented and/or created by persons who were not employees or subcontractors of RE.

# Fleet Flexibility Panel Discussion

**Facilitator: Ann Palmer (Southern Company)**

**Panelist: John Brotherton (Duke Energy), Tony Licata (Licata Energy and Environmental Consultants, Inc), Greg Betenson (PacifiCorp), Haley Turner (LG&E-KU), Ed Healy (Southern Company)**

**June 27, 2022**

# Topics For Panel Discussion

- Fleet Flexibility Drivers
- Co-Firing Natural Gas and Coal
- Minimum Operating Temperatures
- Fuel Supplies/Mixes/Variability/Availability
- Load Cycling/Turndowns/Starts & Stops
- Open Topics to Conference Attendees

# Fleet Flexibility Drivers



# Fleet Flexibility Drivers

- How does variable generation require fleet flexibility (California duck curve)
- How do utilities value turndown capability? (is it only a measure of negative power prices?)
- Do you think we will need spinning magnets or can we use smart inverters and over build on the renewable side to cover short term needs?
- What is the impact on reserve margin?
- Do ramp rates play a bigger role today versus years past?
- What are your thoughts on required flexibility for a large system (% turndown or other metric)?
- With coal plants going away, how will systems/utilities turn down?
- Other thoughts

		Operating Reserves	
On-line	Contingency Reserves Spinning (includes Regulating Reserves)	Online (AGC, Manual, FP&PA, PPAs) available capability of Units beyond 10 minutes and less than 90	
	Contingency Reserves Supplemental	Capability of off-line units available in 90 minutes	
		< = 10 Minutes	10 – 90 Minutes

**Figure 1: Operating Reserve Definition Diagram**

# Co-Firing of Natural Gas and Coal



# Co-Firing of Natural Gas and Coal

- Who is currently Co-Firing NG and Coal? Who has in the past or ran tests runs? What percentages? Who has plans within next few years?
- Was it successful and do you plan to continue?
- Did you experience any compliance issues? Do you run through your environmental controls during these periods?
- Did you experience any turndown issues?
- Did you experience logic or I&C issues?
- Did you experience moisture issues?
- Other thoughts

# Minimum Operating Temperatures



# Minimum Operating Temperatures

- Are you still optimizing for MOT on your units?
- Static vs. dynamic MOT calculations? If calculating MIT/MOT in real-time, what equations are you using (e.g., Matsuda, EPRI/UC-Irvine data, other?) and with what inputs?
- Have your units implemented a “tiered deNOx” approach where NOx emission setpoints are increased/decreased as needed for additional unit turndown, while still meeting instantaneous and rolling average permit limits?
- Have your units implemented sorbet injection (e.g., hydrated lime or SBS) upstream of the SCR for SO3 reduction? What issues/concerns were encountered?
- Did other processes (baghouse, air heaters, scrubbers, etc) effect MOT?
- Did you experience moisture issues?
- What are your combined cycle units doing for MOT and flexibility?
- Other thoughts

# Fuel Supply Impacts



# Fuel Supply Impacts

- What impacts have you experienced on fuel supply variability and availability?
- Are you changing fuel types/mixes and what impacts have you experienced?
- Have you changed up the way you operate the unit based on fuel changes?
- Have you experienced turndown issues with parts of the unit processes? Have you had to add/change equipment to either increase flows or allow for additional turndown capability?
- Other thoughts

# Load Cycling



# Load Cycling

- Has load cycling increased on your units?
- What impacts have you experienced with load cycling?
- What limitations have you experienced during periods of load cycling?
- Other thoughts



Southern  
Company