

Winter Preparedness Webinar

2021



Agenda

- Level 1 Safety Review
- Opening Comments – Sam Holeman
- Transmission – Superpeak Review – Derek Messmore/Daniel Stephens
- Fuels & System Optimization – Ameya Deoras
- Regulated & Renewable Energy – Rick Llewellyn
- Nuclear Generation – Rick Green
- Customer Delivery – Gary Fry
- Demand Side Management – Mark Kametches/Kevin Fox
- Corporate Communications – Loree Elswick
- FERC Standards of Conduct Stop
- Transmission
 - Winter Maintenance – Ray Davis
 - Transmission Contingency Studies – Daniel Stephens

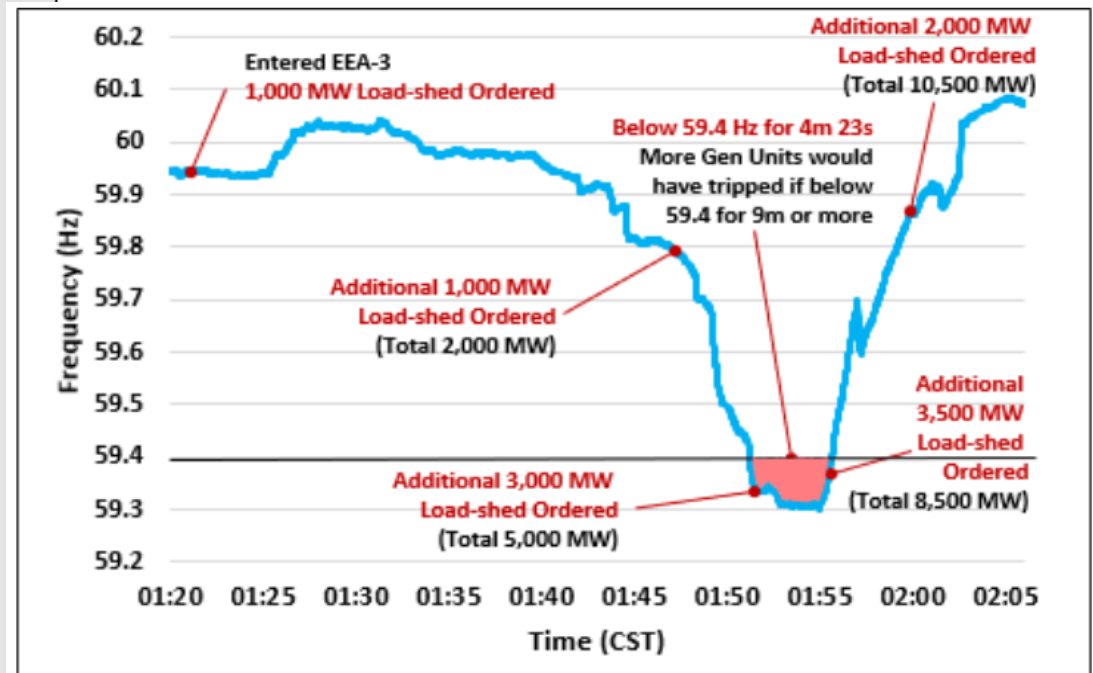
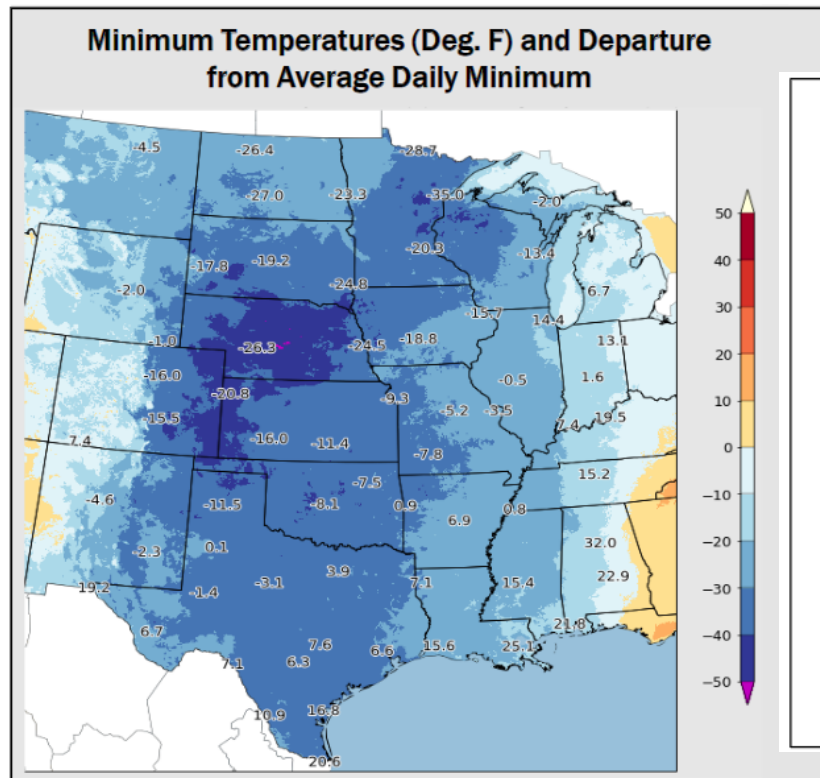
Level 1 Safety Review

- Be aware of your surroundings and safety precautions
 - Know your safe locations and exit routes
 - Active Shooter Protocol: Run, Hide or Barricade, and last resort, Fight
 - For those returning to the office, re-familiarize yourself with safety equipment locations, use, and availability
 - Review the Portal for updates on requirements regarding COVID-19 safety
- If traveling, please use your device hands-free or hang up and rejoin when no longer mobile
- Safety Moment: As we move into the Fall Season, please pay attention to wet leaves as they provide the ideal setting for slips, trips, and falls

Sam Holeman – Vice President System Operations

Opening Comments

Feb 2021 Cold Weather Texas Event



Derek Messmore, Engineer III – System Operations

Winter Peak Discussion

2022 Winter Peak Evaluations

Region	2022 BA Winter Peak Forecast	Studied Super Peak Load	All-Time BA Winter Peak
DEC	20,075MW	23,072MW	21,620 MW
DEF	9,346MW	11,363MW	10,822 MW
DEP	13,804MW	15,759MW	15,569 MW
DEI	7,659MW	8,424MW	7,395 MW
DEOK	4,334MW	5,334MW	4,843 MW

System Operations – Super Peak Operating Reserves

Region	Operating Reserve Statement
DEC	DEC holds -118 MW of Total Operating Reserves in the super peak case study. *Reserves include 1046 MW of Net Exports and 533 MW of RSG Commitments
DEP	DEP holds 6 MW of Total Operating Reserves in the super peak case study. *Reserves include 1574 MW of Net Imports and 407 MW of RSG Commitments
DEF	DEF holds -405 MW of Total Operating Reserves in the super peak case study. *Reserves include 414 MW of Net Imports and 325 MW of RSG Commitments
DEOK	PJM normal and emergency procedures will dictate the actions taken to dispatch generation. DEOK continually works with PJM to ensure adequate resources are available regardless of system conditions.
DEI	MISO normal and emergency procedures will dictate the actions taken to dispatch generation. DEI continually works with MISO to ensure adequate resources are available regardless of system conditions.

Daniel Stephens, Mgr II System Operations

Capacity Dependencies and Limitations

Transmission - Capacity Dependencies and Limitations

- Gas Supply Dependencies
 - Several Units are Gas Only
 - DEC – WS Lee, Buck, Dan River: ~2200MW
 - DEF – Ancloste 1&2, Citrus Co CC 1&2, Hines CC 1, Osprey CC, Tiger Bay, Univ of FL: ~4000MW
 - DEP – Richmond CC 4 & 5, Sutton CC, HF Lee CC: ~2300MW
- When Load exceeds capacity Operations will implement emergent measures:
 - Tailgate communications
 - Additional Purchase
 - DSM Programs
 - Customer Appeals
 - Load Shed
- Load reduction plans are reviewed annually and covered during System Operations
Emergency Operations Training

Ameya Deoras, Mgr Quantitative Analytics

Fuel, System & Optimization

Carolinas Power – As-Available Capacity Agreement DEC/DEP

- We will continue to leverage the As-Available Capacity Agreement that enables DEC and DEP to sell each other capacity when one entity is short reserves, and the other entity has excess.
- The agreement was leveraged 28 times so far in 2021, for over 51,000 MWH of capacity and 9,176 MWH of firm energy.
- All 2021 transactions under the As-Available were from DEP to DEC.

Carolinas Power – Capacity Availability – Inside DEC

Generator	Owner	BA	MW	Comments
Cleveland County	Southern Company	DEC	185	Potentially available for Capacity Purchase. Unsold capacity also used for SOCO's pool load
Rowan	Southern Company	DEC	150	Potentially available for Capacity Purchase. Unsold capacity also used for SOCO's pool load
Cleveland	NCEMC	DEC	185 & 135	May need portion for their load... 8:30 AM strike w/ SOCO
Rowan	NCMPA	DEC	150	May need portion for their load... 8:30 AM strike w/ SOCO
Cleveland	NCMPA	DEC	185	May need portion for their load... 8:30 AM strike w/ SOCO
Kings Mountain CC	CPP	DEC	100 to 150	Varies based on customer load.

Carolinas Power – Capacity Availability – Outside DEC/PEC

Generator	Owner	BA	MW	Comments
Hillabee	Exelon	SOCO	300	Subject to transmission limits.
Yadkin Hydro	Macquarie	YAD	Up to 175	Macquarie markets power out of Yadkin.
PJM	Macquarie	PJM	200+	Macquarie can supply firm generation out of PJM that can be tied to DNR
SOCO Sources	Macquarie	SOCO	300	Macquarie has options on firm gen. Has firm path across SOCO.

Natural Gas Winter Operations Focus

- Gas Market
 - Likely Gas Price Spikes during high demand periods
 - Winter NYMEX Natural Gas + 80% since Beginning of year @ ~\$5.766 MMBtu/day
- Supply and Pipeline Management
 - Transco Pipeline daily operational restrictions (OFO's): 24-hour monitoring and coordination (Gas Dashboard) between Power Trading, ECC and Unit Commitment critical to avoiding pipeline penalties.
 - Supply sufficient to meet peak expected daily winter burn forecast
 - Carolinas Physical supply set-up incorporates diverse contracts to manage supply and daily volatility
 - Incremental Firm Transportation purchased for operational management
 - Carolinas maximize storage withdrawals and injections to manage intraday burn deviations

Fuel Oil Inventory and Management

- Gas - Fuel oil economics: ~\$5.60MMbtu vs ~\$18.25MMBtu
- Asheville CT Fuel Oil tanks currently under repairs, anticipate replenish fuel oil levels when tanks are released into service targeting 100 full load burn (FLB) hours
- Firm Transportation to Asheville CC's increase's reliability
- Carolinas additional 30 dedicated trucks to the winter emergency reservation program: Total 45 Dec-Feb
- DEF additional 15 dedicated trucks to the winter emergency reservation program Total 25 Dec-Feb
- Trucking capability in Carolinas to access non-Colonial sources including Plantation Pipeline and Waterborne supply
- Carolinas CT and CC on site storage tanks are ~ 80% full, ~ 84FLB hours inventory across the system
- DEF CT and CC on site storage tanks are ~ 47% full, ~ 50FLB hours inventory across the system
- DEF and DEC Offsite storage approximately 50,000 bbls
- If necessary, Open delivery window at plants to 24-hours.
- Daily communication of Fuel Oil Inventory levels including 7-day forecasts
- Leverage power markets, daily optimization of firm natural gas deliverability

Winter 2021-22 Coal Inventories and Transportation Planning

						<u>2021</u>	
						<u>Unconstrained*</u>	<u>Constrained</u>
DEC	Actual Ending Inventory 9/30/2021					31	31
	Projected Ending Inventory 12/31/2021					26	23
	Nov 2021 – March 2022 Projected Mean Coal Burn (tons)					3,195,489	NA
	Nov 2021 – March 2022 Coal Contract Commitments					3,542,867	NA
	Contracted Hedged %					111%	NA
DEP	Actual Ending Inventory 9/30/2021					19	19
	Projected Ending Inventory 12/31/2021					34	18
	Nov 2021 – March 2022 Projected Mean Coal Burn (tons)					1,679,839	NA
	Nov 2021 – March 2022 Coal Contract Commitments					1,935,266	NA
	Contracted Hedged %					115%	NA

* Unconstrained projections assumes all contract obligations received in 2021 and does not account for any potential supply chain disruptions.

- Sending 210-car unit trains, where loading capabilities exist, to load NAPP coal increasing efficient use of rail resources
 - Standard unit train set is 110 cars
- Increasing CSX ratio into Marshall due to tighter NS supply relative to CSX
- Utilizing ability to redirect shipments between stations based on changing burns
- Utilizing trucks to deliver limestone shipments to build inventories while reducing competition for rail resources with coal deliveries
 - Belews Creek
 - Roxboro
 - Mayo
- Continue to collaborate closely with RRE
 - Moved to 24 hour unloading at Roxboro/Mayo
- Freeze proofing in place for treatment of shipments throughout the winter

Rick Llewellyn, Dir RRE Fleet Oper & Gov

Regulated & Renewable Energy Preparedness

Regulated & Renewable Energy

- Summer Events Impacting EFOF
 - Woodsdale U1 Gas Turbine HP Blade issue. Row 4 high pressure blade liberated requiring turbine rebuild and repairs to other collateral damage. Repairs took 65 days. Failure determined to be from an OEM weld repair. Investigation is ongoing to evaluate vulnerabilities.
 - Citrus Unit 2B 16 day forced outage due Hot Reheat Bypass valve failure. Valve would not open preventing blending CT 2B limiting U2 to a 1 on 1 combined cycle configuration. New component had to be manufactured. Extend of condition components have been proactively replaced, vulnerability is considered mitigated.
 - Gibson Tube Leaks
 - U2 extensive damage requiring 11 days to repair. Capital Project to replace vulnerable tubes in mixing region scheduled for the fall of 2022. Parts not available for spring replacement. Vulnerability remains for winter run and summer run of 2022.
 - U5 multiple leak locations requiring 6 days to repair. U5 is in an outage on track to conclude November 15th. No vulnerability expected.

Regulated & Renewable Energy

- Summer events impacting EFOF continued
 - Marshall Tube Leaks
 - U4 economizer leak location made repairs difficult due to accessibility requiring 11 days. Shielding is being installed in spring outage to improve reliability. Vulnerability for additional leaks is considered mitigated for winter run.
 - U2 water wall tube leak and expansion joint failure concurrently resulting 9 days to repair. Both issues fully repaired. No additional vulnerability expected.
 - U1 water wall tube leaks requiring 7 days and 5 days to repair. Short term repair only. Unit is vulnerable to future tube leaks. No long-term repairs planned for this unit.
 - Marshall U3 Startup bypass system valve failed requiring manual trip of the unit due to inability to control boiler pressure. 6 days to repair this component due to availability of parts. Component must be repaired in place. Repairs a complete, vulnerability mitigated.

Regulated & Renewable Energy

- Significant Derate Challenges for Winter
 - Carolina Regulated Renewable – none
 - Carolina Natural Gas – none
 - Carolina Coal
 - Allen U1 planning forced run period this fall to resolve anticipated coal plugging issues and ensure availability.
 - Midwest
 - Gibson U2 55 MW derate due to 2F pulverizer OOS. Parts due in mid January, return to service expected by February 1st, 2022.
 - Florida - none
- Winterization of Plants – Progress and Completion Timeframe
 - Local procedures and PMs are in progress and on track for completion by Thanksgiving. No exceptions.
- Capacity Updates – No changes.

Rick Green, Nuc CFAM - Outage

Nuclear Preparedness

Nuclear Generation

Site roles and responsibilities for cold weather readiness

- Operations:
 - Align and checks heating system and ventilation operation prior to cold weather, verifies equipment is working properly during cold weather, and performs special checks during extreme cold weather
- Maintenance:
 - Repairs equipment identified by OPS during performance of their procedure
- Online Work Management
 - Ensures all outstanding work on cold temperature sensitive systems/components is scheduled to complete before Nov. 1
 - Ensures special emphasis codes are placed on work orders to ensure proper priority is placed on repairing any defective equipment.

Nuclear Generation

Site roles and responsibilities

- Online Work Management (con't)
 - Leads critique of equipment operations/site response after extreme cold weather periods.
- Site Management
 - Ensures status of work is reported out frequently in plant status meeting.

Corporate office roles and responsibility

- Oversight of site report out of status of work on Friday fleet call during cold weather season preps
- Ensures operating experience is shared across the fleet related to cold weather issues

Nuclear Generation

- Winterization of Plants
 - Progress and Completion Timeframe

Site	PMs outstanding	Correctives outstanding	Total work orders outstanding
BNP	4	0	4
CNS	1	6	7
HNP	0	0	0
MNS	0	0	0
ONS	8	2	10
RNP	8	0	8

There are no challenges to the Nov 1st Milestone date for completion of Winter readiness activities.

- Summer Events
 - No events occurred relative to hot weather or inadequate preparedness for the hot weather season.

Nuclear Generation

- Emergency Diesel Generator (EDG) Maintenance Windows in Winter Months

Site	EDG window
BNP	EDG 3
CNS	1A EDG, 1B EDG
HNP	A EDG
MNS	1B EDG, 2A EDG
ONS	N/A
RNP	A EDG

Risk management plans will be implemented during the EDG work windows.

Gary Fry, Lead Engineer

Customer Delivery

Customer Delivery

	Duke Energy West (DEC)	Duke Energy East (DEP)	Duke Energy Florida (DEF)	Duke Energy Midwest (DEM)
Grid Readiness "Common Actions"	Grid Actions Proactive: • Partner and coordinate with ECC and Distribution field counterparts • DCC/Grid will operate at an elevated awareness level monitoring system conditions • Load transfers will be implemented where needed to provide adequate operating margins • Abnormal system conditions will be returned to normal where possible • Distribution IT systems hands off, if needed to ensure software operability • Alarm Adjustments - make sure proper season settings are set • Review planned switching vs. planned switching procedures • Identify weaknesses in the regional grid and request Distribution Planning to initiate project(s) to resolve Grid Actions Reactive: • Load transfers as needed • Additional resources may be requested to perform restoration due to additional sectionalizing and cold load pickup requirements after an extended outage • Review and adjust DSCADA alarms			

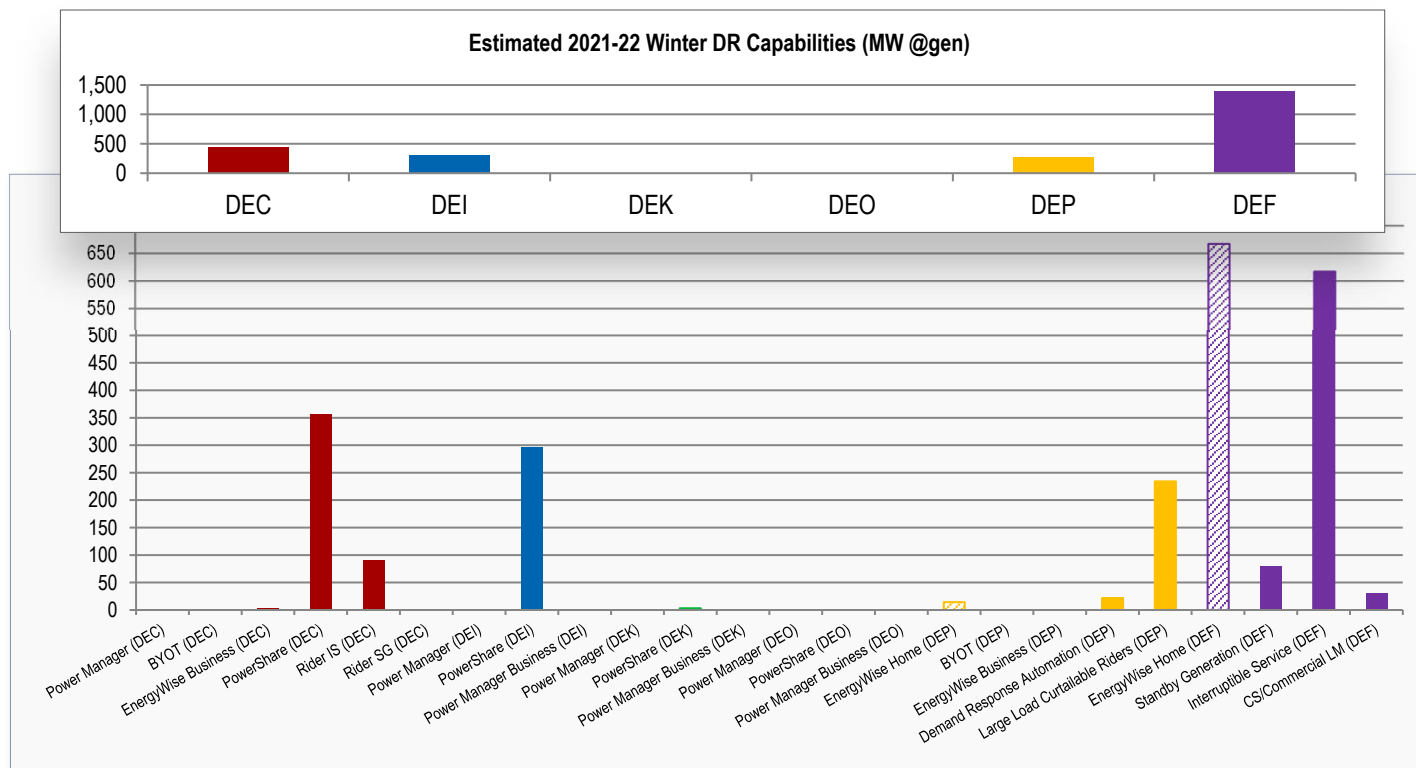
Customer Delivery

	Duke Energy West (DEC)	Duke Energy East (DEP)	Duke Energy Florida (DEF)	Duke Energy Midwest (DEMW)
Voltage Reduction	None	Two Emergency Levels • EM1 - 2.9% • EM2 - 5.0% DSDR ≈3.6% on average	Normal CVR (Conservation Voltage Reduction) w/2 levels • Level 1 - 2.5% • Level 2 - 3.0%	<u>Ohio, Indiana</u> Continuous Energy Reduction and Demand, Target of 2% Reduction <u>Kentucky</u> None
Power Factor Control	None	Power Factor Control via Yukon	Power Factor Control via Yukon	Power Factor Control via GE LVM
Load Shed	Shed: Automated Rotation Plans: Automated Rotation Interval: 15 min Available Load ≈ 9,100 MW Total Forecasted Load ≈ 17,250 MW	Shed: Automated Rotation Plans: Automated Rotation Interval: 15 min Available Load ≈ 4,000 MW Total Forecasted Load ≈ 14,100 MW	Shed: Automated Rotation Plans: Automated Rotation Interval: 20 min Available Load ≈ 5,400 MW Total Forecasted Load ≈ 9,950 MW	Shed: Automated/Manual Rotation Plans: Manual Rotation Interval: Varied Available Load ≈ 2,700 MW Total Forecasted Load ≈ 9,500 MW

Mark Kametches, Sr Products & Services Mgr
Kevin Fox, Mgr Residential Demand Response

Demand Side Management Programs

Customer Delivery - DSM



Customer Delivery – Non-Residential DSM

Winter 2021-22 Preparedness Activities

- **Coordination with internal stakeholders**
 - Complete annual training sessions
 - Update internal distribution lists
 - Provide updates on program capabilities in advance and during tailgate/event calls
 - Review/update event-related IVR Call Center scripts and Help files as necessary
- **Customer interaction**
 - Coordinate C&I customer engagement through LAM to ensure readiness, accuracy of contact information, and understanding of contractual commitments
 - Conduct pre-season notification system tests and review of standard event messaging templates
- **Functional updates and testing of systems**
 - Schedule push of new software releases for internal and vendor-hosted program/device management systems
 - Continued monitoring of control/paging networks
 - Investigate and replace/remove inactive or disconnected devices

Customer Delivery – Non-Residential DSM

WINTER 2021-22 PREPAREDNESS ACTIVITIES LARGE BUSINESS DEMAND RESPONSE PROGRAMS	Date Task Scheduled to be Completed					
	DEF	DEP	DEC	DEI	DEK	DEO
Coordination with internal stakeholders						
Conduct annual training sessions	-	3/17/2021	3/17/2021	10/25/2021	10/25/2021	
Provide updates on program capabilities	Ongoing	11/15/2021	11/15/2021	Ongoing	Ongoing	
Update IVR scripts and Help files, as necessary	-	-	-	Ongoing	Ongoing	
Update internal distribution lists	Ongoing	-	-	6/1/2021	6/1/2021	
Customer interaction						
Engage participants to ensure readiness	-	12/1/2021	12/1/2021	12/31/2021	3/31/2021	
Conduct pre-season notification system tests	-	5/27/2021	5/27/2021	5/27/2021	6/2/2021	
Functional updates and testing of systems						
Schedule software updates for headend systems	10/31/2021	6/16/2021	6/16/2021	9/16/2021	9/16/2021	
Verify operability of control networks	12/7/2021	Monthly	Monthly	-	-	
Replace inactive/obsolete devices	Ongoing	7/30/2021	Monthly	-	-	

Distribution – Residential DSM

Winter 2021 Preparedness Activities

	DEC	DEF	DEP
Appliance Type	Thermostat	Water Heaters, Pool Pumps, Heat Pumps	Water Heaters, Heat Strips
Internal Stakeholder Coordination	Provide updates on capabilities during tail gate calls	Continuation of activities that occur due to year round usage	Provide updates on capabilities during tail gate calls
Customer Interaction	Email	Bill Message	None
Functional Updates and Testing of Systems	Small scale connectivity test	Pole transmitters every five minutes year round	Pole transmitters daily and monitoring equipment
COVID Impact Assessment and Mitigation	New program, still assessing opt out, but the more people are home, the higher the opt-out rate will be.	Field techs and trade allies have appropriate PPE to service devices.	Attempting to perform field verification of all units due to low EM&V (Evaluation, Measurement and Verification) results last year. Staff have appropriate PPE.

Loree Elswick, Director Communications

Corporate Communications

Corporate Communications: Summer Event Review

- August 24, 2021
 - Posted Grid Alert on the Portal
 - Updated Carolinas stakeholder engagement group with key messages
 - Distributed proactive internal energy conservation message via email to all NC and SC teammates
 - Subject line: Conserve energy today
 - Developed messages for external soft appeal
 - Prepared draft news release for record summer peak and began approval process
- Opportunities for improvement
 - Finalize updates to messaging
 - Build creative collateral

Corporate Communications Message Updates

- Revised messages through the lens of events from Texas
- Tested messages by gathering feedback from nearly 3,000 customers in the Carolinas and Florida
- Validated:
 - Each individual **message was clear**
 - The messages are **simple and easy to understand** and explain why Duke Energy needed to take action
 - The messages **would effectively communicate important information** to customers during a load shedding period.
- Developed collateral

Corporate Communications Message Updates



Protecting reliability

Preparing the energy grid for extreme conditions

Extreme conditions, caused by weather or other events, can put a severe strain on the energy grid and available power supplies.

That's why we have detailed plans for managing the grid through all types of extreme conditions, from the heat of summer to the cold of winter. We use historical data, real-time analysis and predictive modeling, advanced technologies and years of operational experience, to help reliably meet customer energy needs – even in the most challenging of times.

During periods of unusually high demand, you can help by conserving energy – [see our tips](#).

What we're doing

Here are some of the ways we're working throughout the year to protect the energy grid and the reliability you count on:

Corporate Communications Message Updates

A graphic featuring a low-angle shot of a high-voltage electrical transmission tower against a clear blue sky. The bottom of the image shows a close-up of thick, white, frost-covered power lines.

DUKE ENERGY.

***ALERT:
OUTAGES
POSSIBLE***

Record cold is driving energy demand to critical levels. Help conserve electricity and avoid rolling blackouts.

LEARN HOW

A graphic featuring a low-angle shot of a high-voltage electrical transmission tower against a clear blue sky. The bottom of the image shows a close-up of thick, white, frost-covered power lines.

DUKE ENERGY.

***EMERGENCY
POWER
OUTAGES***

Record cold has pushed energy demand above available supplies. Please power down nonessentials.

GET DETAILS

Corporate Communications: Messages to the Public

- Updated messages with the new language
- Developed templates
- Developed updated talking points – to share with liaison groups
- Fully trained communications team
- Prepared to activate the JIC/JIS

Additional Items before Transmission Specific Information

- Reminder that the Grid Ex VI event is scheduled for 11/16 & 11/17
 - For any questions about the event, speak to your department reps or email Jacquelyn Brochman
- The December Meeting on 12/16 @ 1300 is to review Action Items from this meeting
- Send any questions or comments to David Mc Ree

Thanks for Attending 2021 Winter Preparedness Webinar

