

COLD WEATHER EVENT

2021 Feb 15-16

March 19, 2021

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Vice President, Energy Delivery

THE BIG PICTURE

From SPP

THE BIG PICTURE



Early prep helped

2/4: Issued cold weather alert

2/8: Issued resource alert

2/11: Committed long-lead generation



Public appeals reduced demand

Demand dropped below forecast, helping minimize interruptions



We used every MW we could get

We ran every available generator and imported energy from neighbors



Service interruptions required

2/15
~1.5% of system demand for 57 min.

2/16
Up to ~6.5% of system demand for 3 hr. 23 min.



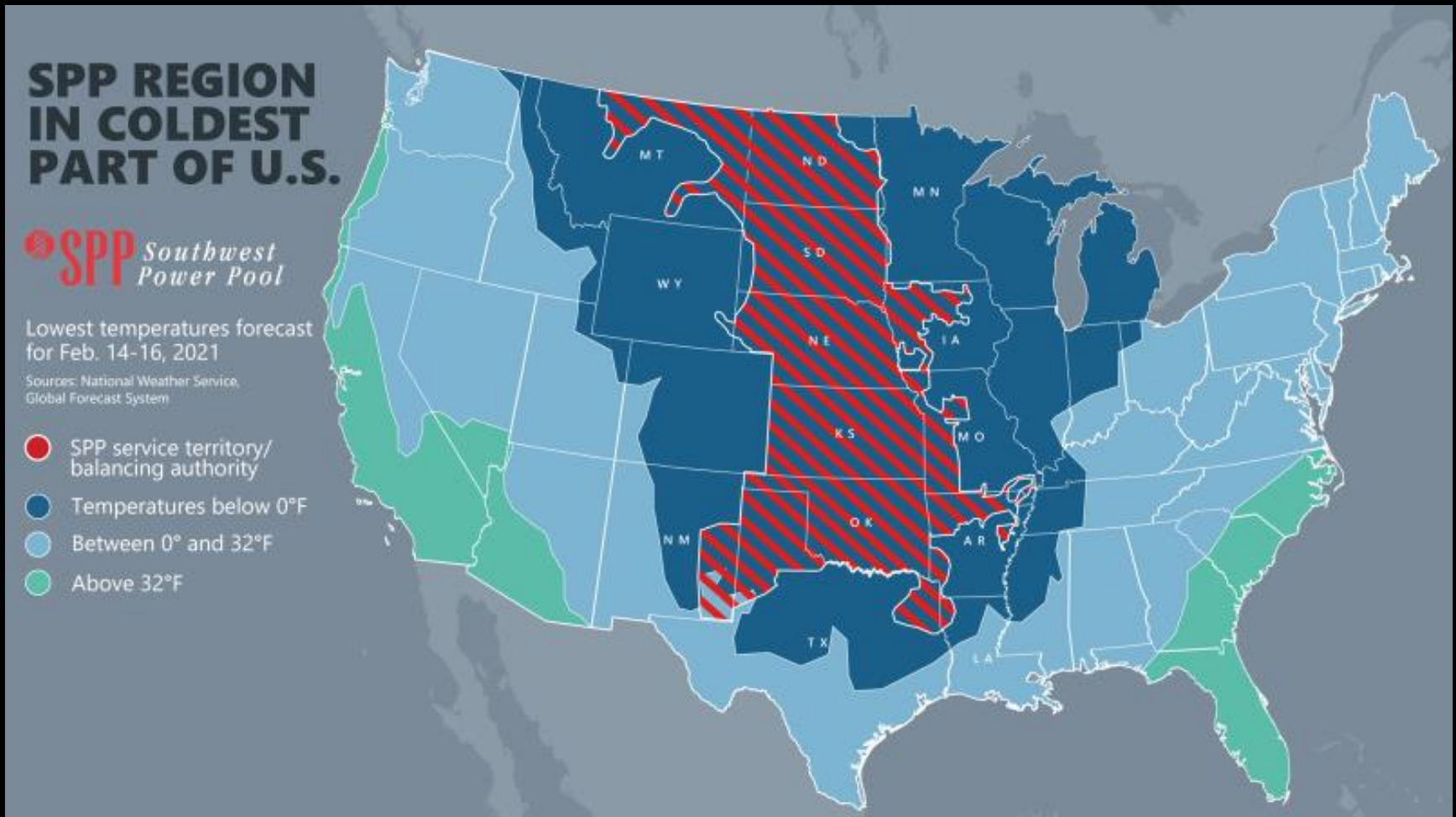
Collaboration reduced impact

Controlled, temporary interruptions prevented uncontrolled blackouts



1

POLAR VORTEX AT A GLANCE



From SPP

MAIN DRIVERS OF POWER INTERRUPTIONS

- GENERATION UNAVAILABILITY
 - Lack of fuel supply
 - Icing and extreme cold weather-related outages
- RAPID REDUCTION OF ENERGY IMPORTS
 - Related to transmission congestion (lines loading up due to power transfers)
 - Tightening supply conditions in neighboring areas
- RECORD WINTER ENERGY CONSUMPTION

LES' SHARE OF LOAD SHED

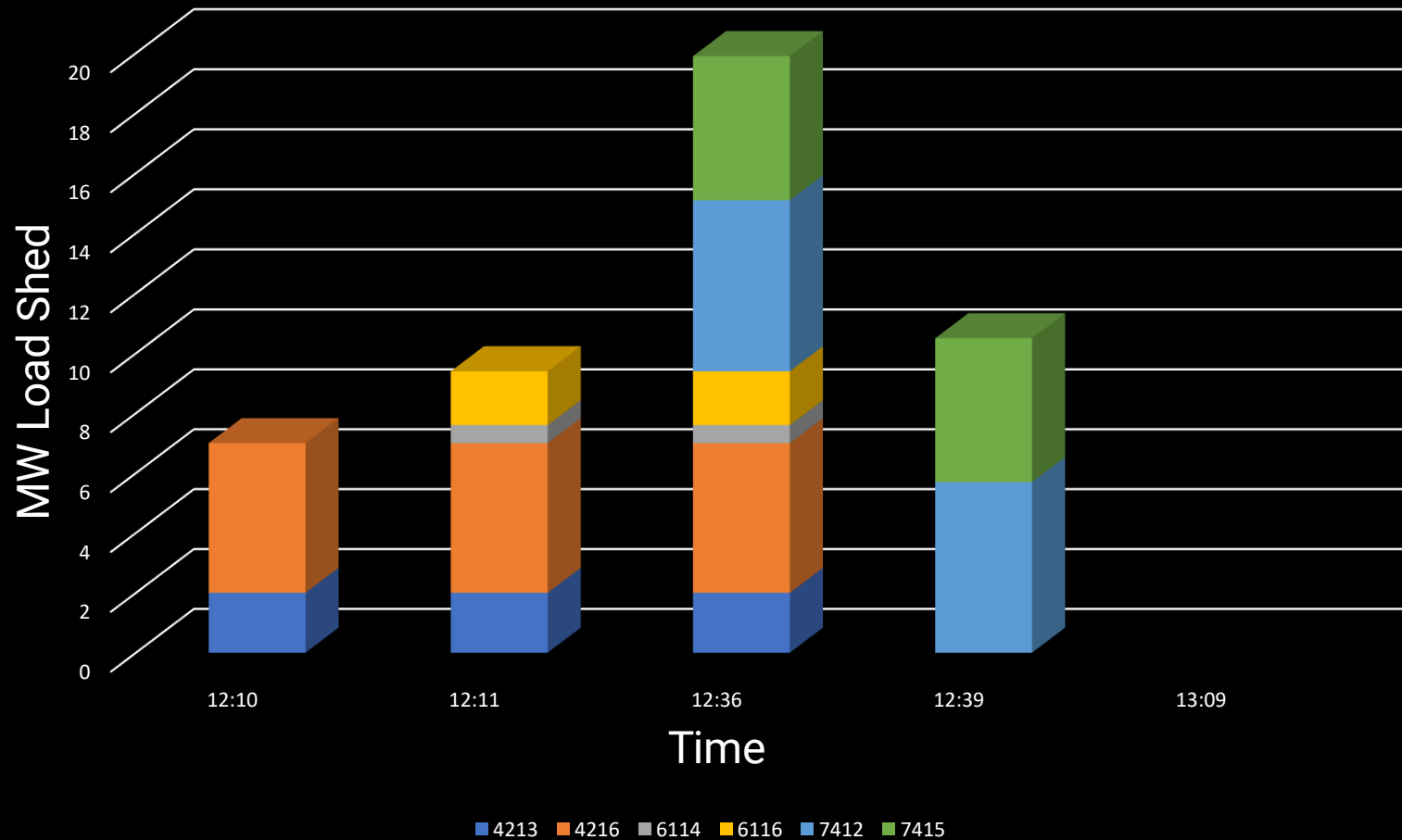
	ENTITY	% OF MW		ENTITY	% OF MW
1	CSWS	16.8	11	SECI	2.22
2	WAPA	13.5	12	EDE	2.19
3	SPS	12.4	13	LES	1.36
4	OKGE	12.4	14	SPRM	1.22
5	KCPL	9.68	15	KACY_N	0.92
6	WR	8.49	16	CBPC	0.83
7	NPPD	6.57	17	INDN	0.38
8	OPPD	4.6	18	SPA	0.28
9	WFEC	3.78	19	TSGT	0.13
10	GRDA	2.22		SPP TOTAL	100%

ENERGY EMERGENCY ALERTS – DAY 1

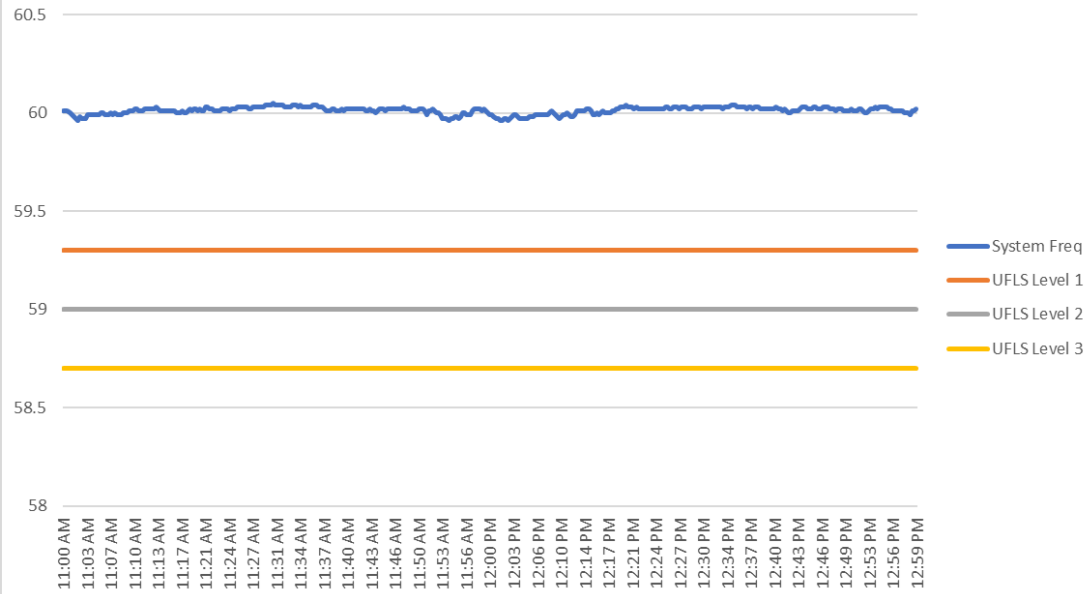
- Feb 9 @ 00:00 SPP BA issued Conservative Operations
- Feb 14 @ 05:00 SPP BA issued EEA1 level
- Feb 15 @ 07:22 SPP BA issued EEA2 level for the first time in its 80 year history
- Feb 15 @ 10:08 SPP BA issued EEA3 level for the first time in its 80 year history
- Feb 15 @ 12:04 SPP BA requested 610 MW load to be shed
- Feb 15 @ 12:11 LES shed 9 MW load
- Feb 15 @ 13:00 SPP BA issues full load restoration instruction
- Feb 15 @ 13:09 All load restored
- Feb 15 @ 14:00 SPP BA moves down to EEA2 level
- Feb 15 @ 19:21 SPP RC issued Transmission Emergency

LOAD SHED ON DAY 1

Monday Feb 15 Load Shed (9 MW)



Frequency - 2/15/2021



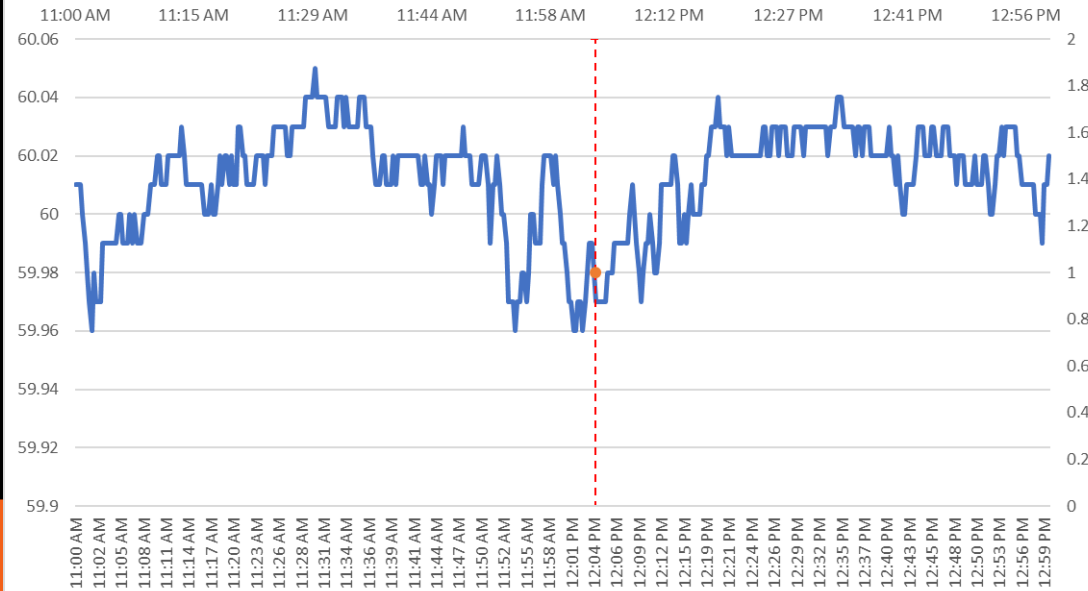
Automatic
UFLS

59.3 Hz

59.0 Hz

58.7 Hz

Frequency - 2/15/2021



Pole Failure at 05:33 Feb. 16th

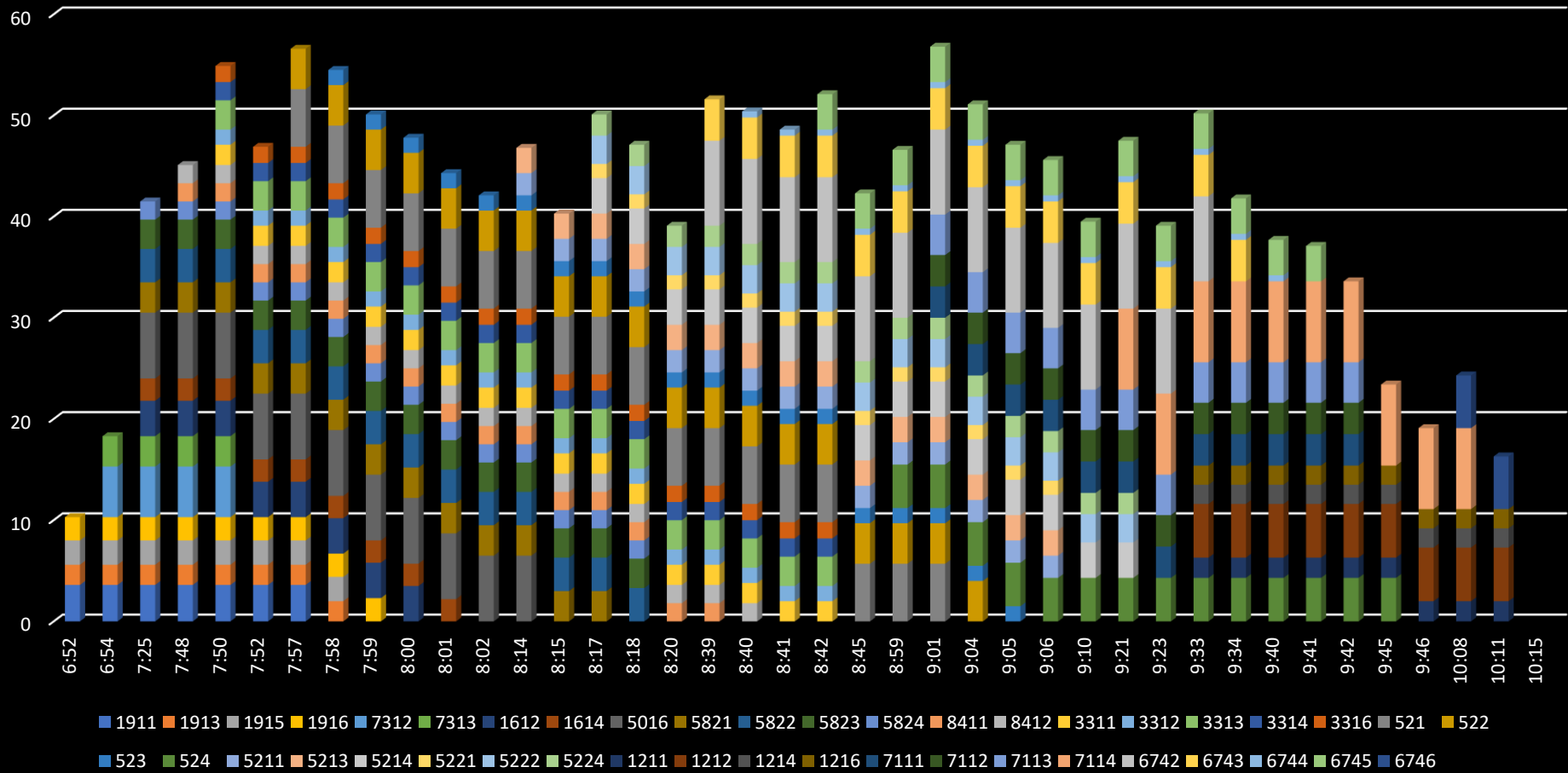


ENERGY EMERGENCY ALERTS – DAY 2

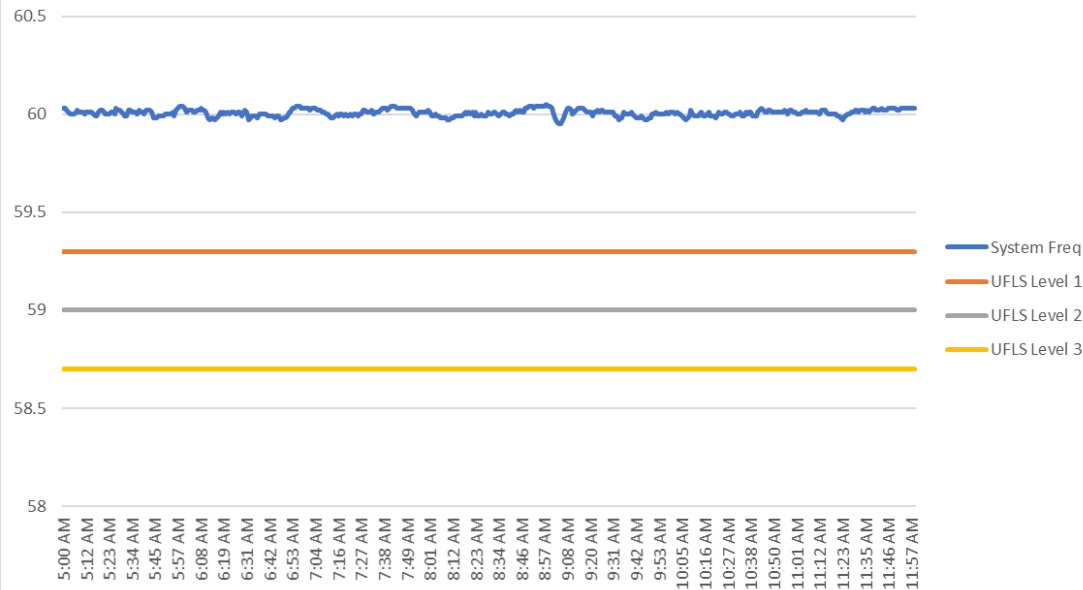
- Feb 16 @ 05:33 *LES Pole Failure locked out breaker*
- Feb 16 @ 06:15 *SPP BA issues EEA3 level*
- Feb 16 @ 06:44 *SPP BA requests 1359 MW load be shed*
- **Feb 16 @ 06:52** **LES sheds 19 MW load**
- Feb 16 @ 07:17 *SPP BA requested an additional 1359 MW load be shed*
- **Feb 16 @ 07:25** **LES sheds an additional 19 MW load**
- Feb 16 @ 09:48 *SPP BA issues partial load restoration instruction of 1359 MW*
- Feb 16 @ 10:07 *SPP BA issues load restoration of remaining 1359 MW*
- **Feb 16 @ 10:15** **All LES load restored**
- Feb 16 @ 11:30 *SPP BA moves down to EEA2 level*
- Feb 16 @ 12:31 *SPP BA moves down to EEA1 level*
- Feb 16 @ 16:21 *Transmission Emergency terminated; EEA1 level*
- Feb 16 @ 18:28 *SPP BA moves back up to EEA2 level again*

JUGGLING LOADS ON DAY 2

Tuesday Feb 16 Load Shed (2 blocks of 19 MW each)

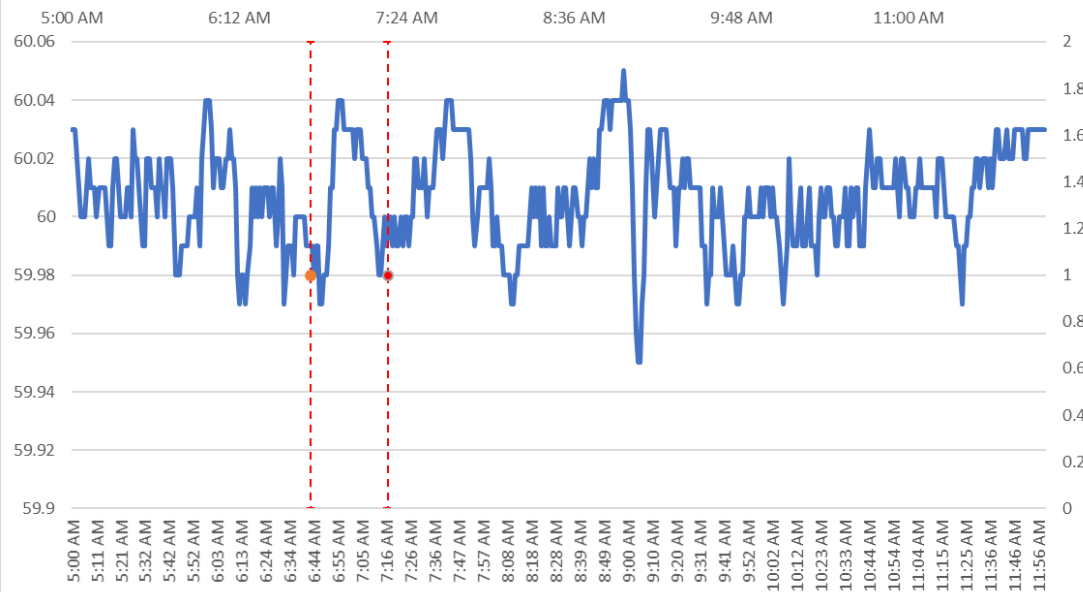


Frequency - 2/16/2021



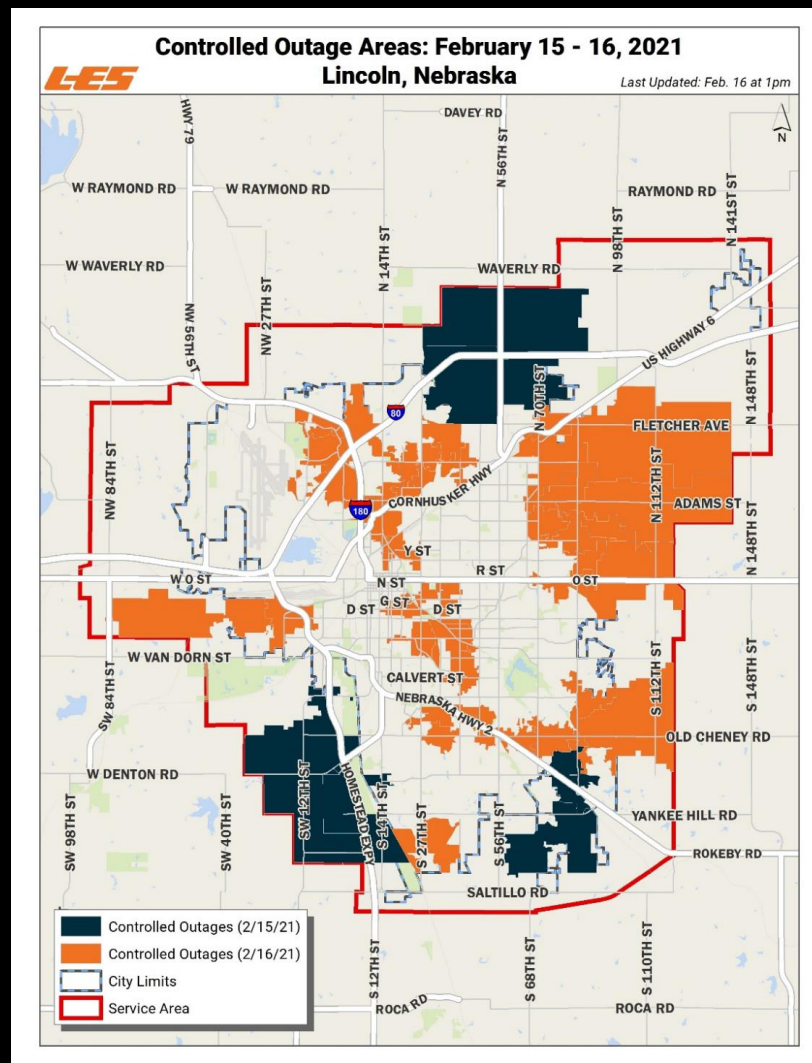
Automatic
UFLS
59.3 Hz
59.0 Hz
58.7 Hz

Frequency - 2/16/2021





KEEPING CUSTOMERS INFORMED



ENERGY EMERGENCY ALERTS– DAY 3-6

- Feb 17 @ 13:15 SPP BA moves down to EEA1 level
- Feb 17 @ 18:20 SPP BA moves back up to EEA2 level
- Feb 17 @ 22:59 SPP BA moves back down to EEA1 level
- Feb 18 @ 09:30 SPP BA moves down to Conservative Operations
- Feb 18 @ 18:25 SPP moves back up to EEA1 level
- Feb 19 @ 09:20 SPP moves back down to Conservative Operations
- Feb 20 @ 20:00 SPP returns to Normal Operations

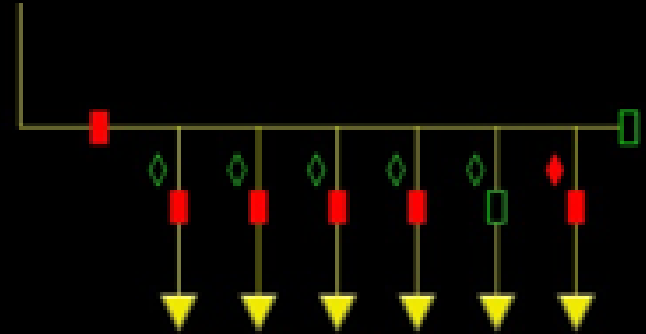
CRITICAL LOAD CUSTOMERS

- Facilities that provide or support fundamental public services that have a substantial impact on public welfare and safety.
- These loads have a higher priority placed on them during outage restoration and load shedding schemes

Load Shed Options

36 Load-Serving Substations

- 182 Feeders serving load
- 28 Feeders with identified critical loads
- 154 Feeders available for manual load shed
 - 49 utilized during 2/15-2/16
- 61 Feeders included in Underfrequency Load Shed



QUESTIONS:

