



# Update: Electric System Reliability Improvement Plans

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# Electric System Reliability History and Goals



**Reliability Improvement Program strategy** aimed at reducing outage frequency with a target to achieve SAIFI metric  $\leq 1.0$  and SAIDI  $\leq 60$



## **UCNSB 5 Year History Averages**

- Frequency SAIFI 1.68, CAIDI 55 and SAIDI 92

## **2020 Reliability.....Heading in the right direction with SAIFI to drive down**

- Frequency SAIFI 1.45, Restoration CAIDI 55 and SADI (SAIFI X CAIDI) = 79

**Maintain best in class CAIDI while improving SAIFI  $\leq 1.00$  and MAIFle**



Program and budgets coordinated with **Grid Modernization Roadmap** recommendations – approved by Commission Aug 2020



FY21-26 Grid Mod and Reliability Capital Budgets ~ \$22,945,000

# Florida and UCNSB Reliability Indices

## Florida Utility Distribution Reliability – 2020 Indices

	UCNSB	UCNSB 5 Yr. Avg	Munis	FPL	TECO	Duke	Gulf	FPUC
Duration (SAIDI)	79	92	89	47	68	88	47	158
Restoration Time (CAIDI)	55	55	65	62	72	94	67	91
Frequency (SAIFI)	1.45	1.68	1.37	0.76	0.94	0.94	0.71	1.74
Momentaries (MAIFle)	9.10		3.18	2.6	7.79	5.4	1.44	N/A

SAIFI = System Average Number of Interruptions per Customer

SAIDI = SAIFI X CAIDI

Momentaries = Less than 1 minute interruption, usually cleared by system cycling as designed but can be reduced through reducing veg. contact and wildlife interference, etc.

Legend
Best
2nd Best

# 2021-2023 Electric System Reliability Status Update

- Protection and Control device coordination system study - **Completed**
  - Standardized Fuse, TripSaver and Recloser sizing/programming for use across UCNSB Electric system
  - Assures system and equipment operates as designed and anticipated
- New Vegetation Management Plan - **50% of Lines Trimmed/Cleared**
  - Improvements being realized in both reduction of sustained and momentary outages
- New Feeder Configurations out of Smyrna Substation
  - New Line 28 (Line 11) - **Completed**
  - New Line 31 (Line 12) - **Completed**
  - Split Line 31 Equally – **75 % Completed, waiting FDOT Permit for SR 44**
    - New Line 31 (Line 12 section W/Smyrna Sub)
    - New line 29 (Line 12 section E/Smyrna Sub)
- Sectionalizing Lines to reduce outage impacts (SAIFI Target  $\leq 1.0$ )
  - Top 6 worst performing circuits planned to complete next 6-9 months
  - Equipment Orders
    - Pole-mounted Reclosers on overhead feeder mains (18)
    - TripSavers on overhead feeder taps > 75 customers (150)

# Electric System Reliability Improvements

## *Future work in Planning*

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- Load Transfer and Feeder Balancing to accommodate restoration switching schemes
- Distribution Automation, and integration SCADA for improved remote monitoring and control
- Aged Asset Upgrades
- System Hardening and Selective Undergrounding
  - Where it makes sense-based on best practice standards and reliability history

# FY21/FY22 – Reliability Improvement Plan

## Top 6 Worst Performing Circuits

- Lines 11(new 28),12(new 29, 31),14, 25 and 26 have been selected for Group 1 - Reliability Projects

- High SAIFI Metrics
- Average number of customers affected by outages
- Longest overhead feeders in the UCNSB system

5 Year Feeder Outage Information (2014-2019)							
LINE #	Industry Standard Metrics			Avg Number of Customers Affected	Total Outage Minutes	Total Momentary Outages	Total Sustained Outages
	SAIFI	SAIDI	CAIDI				
14	2.5	145	69.7	2031	1788300	17	15
12	1.8	61	31.2	2274	838720	74	11
3	1.5	56	39.3	3028	1014698	59	9
26	1.3	116	87	1259	895329	64	8
8	1.3	54	24.7	255	83021	30	8
7	1.3	42	16.3	2869	711712	51	8
4	1.2	65	51.9	1346	517170	43	7
25	1.2	67	49.2	3100	1240322	52	7
11	1.2	62	47.6	1762	711455	21	7
24	1	50	25.1	1203	413300	23	6
17	0.8	38	35.6	733	181681	23	5
16	0.5	16	15.5	2926	253180	58	3
15	0.5	13	13.3	3038	241180	86	3

- Top chosen lines serve ~10,000 customer meters out of UCNSB's ~26,000 electric customers



# Line 31

## *Impacted Area – Samsula , Vbay, Pioneer Trail W/ I95*

- Momentary Outage Causes
  - Weather
  - Vegetation
  - Equipment issue
- Sustained Outage Causes
  - Weather
  - Vegetation
  - Equipment failures



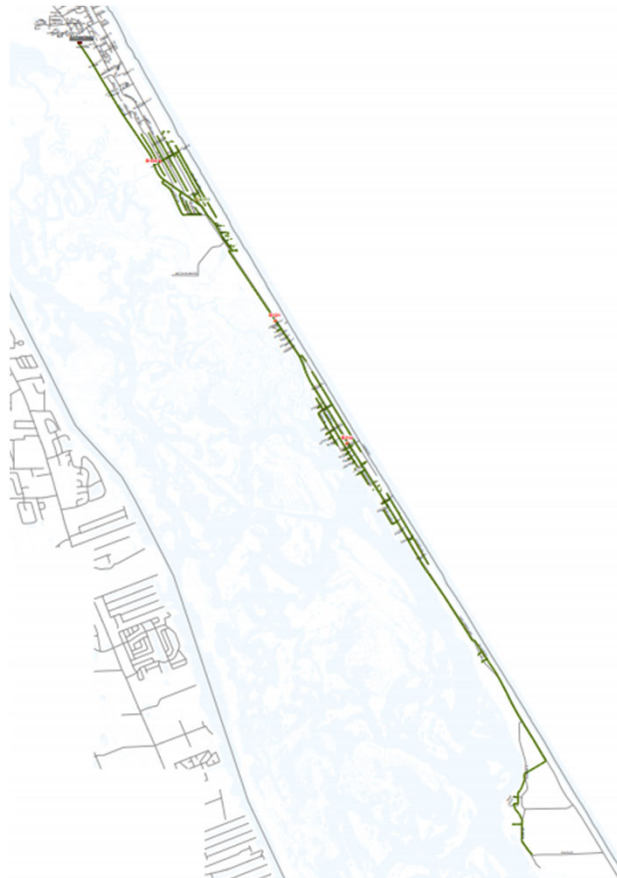
\* Line 31 will be split into Line 31 (W/I-95) and 29 (E/I-95)



# Line 14

## *Impacted Area – Beachside (26<sup>th</sup> Ave South)*

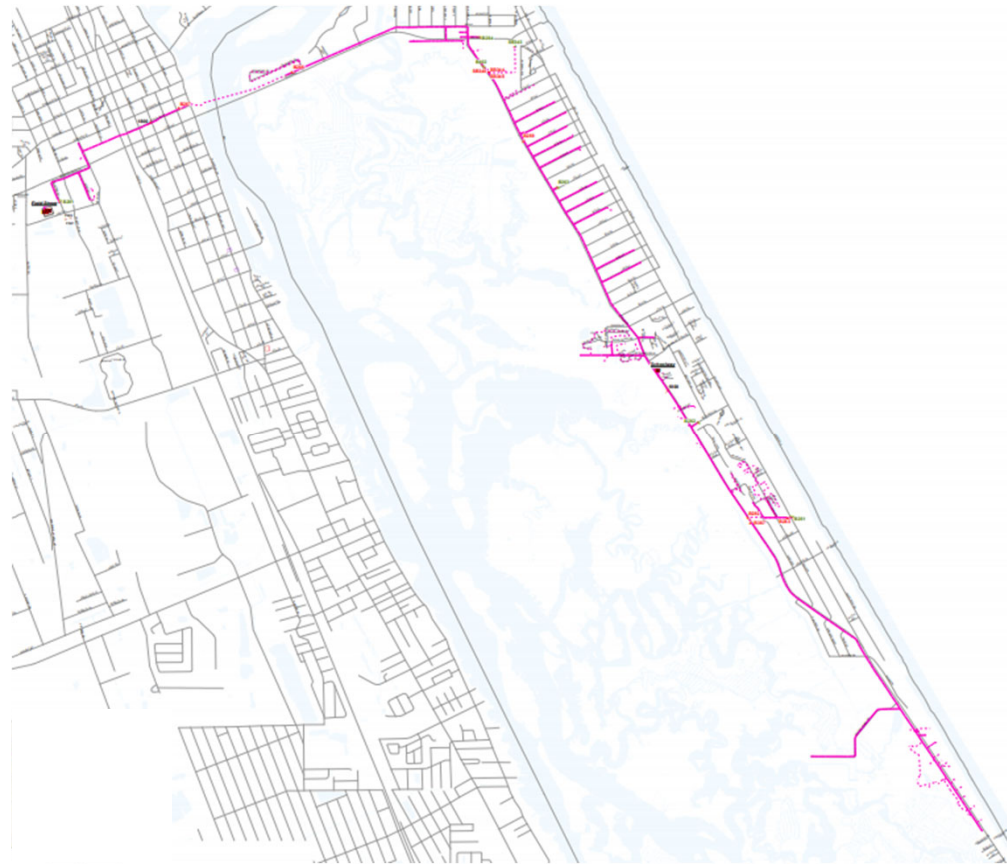
- Momentary Outage Causes
  - Weather
  - Wildlife
- Sustained Outage Causes
  - Weather
  - Equipment failures



# Line 25

## *Impacted Area – Beachside (3<sup>rd</sup> Ave South)*

- Momentary Outage Causes
  - Weather
  - Equipment issues
- Sustained Outage Causes
  - Weather
  - Equipment failures



# Line 26

## *Impacted Area – Glencoe Rd , Old Mission (SR 44)*

- Momentary Outage Causes
  - Weather
  - Vegetation
  - Equipment issues
- Sustained Outage Causes
  - Weather
  - Vegetation



# Agenda Item 7-a Request for Expenditure Approval

- Budgets for each Line totaling \$2,856,000.00:

Work Order #	Line #	Service Territory	Budget	
			FY21	FY22
21-UE1018	Line 28 (Old Line 11)	SR44 Commercial, Advent Health Hospital (alt feed), Residential	\$0	\$460,000
21-UE1019	Line 14	Beachside 26 <sup>th</sup> Ave South	\$185,000	\$305,000
21-UE1030	Line 31 (Old Line 12 W/Smyrna Substation)	Samsula, Pioneer Trail W/ I-95	\$175,000	\$305,000
21-UE1031	Line 25	Beachside 3 <sup>rd</sup> Ave South	\$154,000	\$332,000
21-UE1032	Line 26	Glencoe Rd, Old Mission (S/ Rt 44)	\$155,000	\$305,000
21-UE1033	Line 29 (Old Line 12 E/Smyrna Substation)	Coastal Woods, Pioneer Trail E/ I-95	\$0	\$480,000
<b>Total</b>			<b>\$669,000</b>	<b>\$2,187,000</b>

- A motion to approve the Feeder Reliability Level 1 Projects (six projects) in the total combined amount of \$2,856,000.00 (inclusive of pre-approved amount of \$67,050 -18 TripSavers for Line 25 Project), and authorize the General Manager/CEO or his designee to execute all documents associated with this matter.





# Metrics Definitions

# Electric Utility Standard Outage Metrics

- SAIFI (System Average Interruption Frequency Index) measures how often a customer can expect to experience an outage
  - $SAIFI = \text{Sum of outage Customers Interrupted} / \text{Total number of customers served}$
- SAIDI (System Average Interruption Duration Index) measures average outage duration per customer
  - $SAIDI = \text{Sum of outage Customer Minutes of Interruption} / \text{Total number of customers served}$
- CAIDI (Customer Average Interruption Duration Index) measures average outage duration if an outage is experienced, or average restoration time
  - $CAIDI = \text{Sum of outage Customer Minutes of Interruption} / \text{Sum of outage Customers Interrupted}$
- MAIFle (Momentary Average Interruption Event Frequency Index) – measures the total number of momentary interruption events divided by the customer base for the relevant period (typically a year), provided that momentary interruptions that are associated with sustained interruptions are excluded from the calculation
  - $MAIFle = \text{Annual number of momentary interruptions (less momentary interruptions associated with sustained interruptions)} / \text{Total number of customers served}$