

# **RUC & VC Workshop**

Presented by:

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#### Part 1



#### Incentives

- The incentives regarding self-commitment of resources have changed dramatically.
  - ✓ More frequent RUC instructions
  - ✓ Ahead of lead time
- There are tiered claw-back percentages based on offers or awards in the day-ahead market.
  - ✓ Often resources can ensure that they at least make up their costs, and have an opportunity to keep up to 50% of revenues above cost during RUC intervals (up to 100% during QSE clawback intervals)
    - This opportunity is strong for frequently inframarginal resources
- Committing economic resources through the RUC process leads to artificial increases in ORDC revenues for the rest of a portfolio
  - Due to ORDC adjustment (removing RUC headroom from online reserves) and the real-time reliability deployment price adder.



# Monthly RUC time percentage of total run time by resource type



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# Monthly RUC time percentage of total run time by age group





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### **Economic RUC Analysis**

- Conducted an analysis on ONRUC (meaning the resource received a RUC instruction and did not opt out) resource SCED intervals since roughly the start of conservative operations (July 2021) to current day (June 2023) to gauge market impact of the increased adders
- Using submitted costs and real-time pricing, a RUC was gauged to be economic if, for the duration of the RUC block, their start-up and minimum energy costs could at least be covered by their locational marginal price plus the online adder recalculated without removing RUC
  - ✓ Out of the total 126,623 ONRUC resource SCED intervals, 9,059 were gauged to be economic
- To calculate market impact, new online ORDC adders were calculated by adding only the economic RUC's HSL back into ORDC online reserves and for intervals where the economic RUCs were the only reliability deployment trigger, RDP was reduced to zero





# Economic RUC Methodology Change and Results

• Improvements were made to the input cost considerations for resource RUC hours where no real-time offer submission for the delivery hour existed, resulting in some reduction to the 2022 economic RUC intervals and resultant market impact stated in the 2022 State of the Market report

	Year RTC	Year RTORPA Cost Difference		Difference	
	<b>2021</b> -\$9,481,263		-\$5,919,412		
	2022	-\$818,085,07	-\$40,705,210		
	2023	-\$34,943,20	68	-\$5,093,668	
Year	Resource Group	Total RUC Resource-Hours	Economic RUC Resource-Hours	<b>Economic RUC</b>	%
2021	Combined Cycle	149.3	95.9	64	4.3%
	Simple Cycle	26.0	8.8	3.	3.7%
	Gas Steam	2,183.3	44.5		2.0%
	Other	18.0	0.0		0.0%
2022	Combined Cycle	423.9	94.0	22	2.2%
	Simple Cycle	280.0	85.2	30	0.4%
	Gas Steam	5,594.7	145.6		2.6%
	Other	1.8	0.0		0.0%
2023	Combined Cycle	264.5	173.9	6	5.8%
	Simple Cycle	38.7	17.5	4	5.3%
	Gas Steam	1,376.7	68.4	:	5.0%
	Other	0.0	0.0		0.0%





#### **Forced Outages - Summer**

Forced Outage Percentage per Season







#### **Forced Outages - Shoulder**

Forced Outage Percentage per Season







#### **Forced Outages - Winter**

Forced Outage Percentage per Season





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#### Part 2



#### **ORDC Real-Time Online Reserves**

- From 2018 to 2022, there have generally been increased amounts of ORDC real-time online reserve observed at higher levels of generation requirement (note that these would not include RUC HSL)
- Below are comparisons of the average ORDC online reserves (with and without Non-Controllable Load Resources) per 500MW generation requirement steps (excludes 2/15-2/20/21)



#### **Reserve Target**

• Below is a graph of the average RTOLCAP without NCLR values per 50MW PRC steps



- A target of 3,500MW of PRC seems reasonable to address reliability concerns stemming from insufficient headroom (PRC triggers for ECRS & NSPIN currently set at 3,200MW; ERS deployed at 3,000MW; 500MW of spacing above 3,000MW to allow recovery in line with what was recommended by ERCOT in NPRR1176)
- From the above graph, the average online reserve level corresponding to 3,500MW of PRC observed between 2018 and 2022 is between **4,800MW to 5,300MW**





# Average hourly DAM load forecast error Spring/Fall July 2021 – June 2023

Regional hourly variables are the non-coincident averages of day-ahead (previous day 10am snapshot) over-forecast (positive value) and under-forecast (negative value) errors. The positive bars are mean errors for only hours with over-forecast error, and vice versa, the negative bars are mean errors for only hours with under-forecast error. Similarly, the positive and negative system-wide markers indicate the average over-forecast and under-forecast values respectively, while the system-wide trend line represents the average net error across all hours.



### Average hourly DAM load forecast error Summer/Winter July 2021 – June 2023

• Over the two-year period from July 2021 to June 2023, early morning hours have generally been associated with a trend of net under-forecasting, while afternoon hours have been associated with a trend of over-forecasting. The former trend is most apparent when viewing the Winter and Spring seasons, while the latter is more apparent during the Summer and Fall seasons.

