2024 Grid Reliability and Resiliency Assessment Assumptions

ERCOT
Regional Transmission Planning

September 2024

Introduction

- S.B. 1281 and 16 Texas Administrative Code (TAC) 25.101 mandate ERCOT to conduct a biennial Grid Reliability and Resiliency Assessment
  - Assess extreme weather scenarios
  - Consider different levels of thermal and renewable generation availability
  - Account for potential outages caused by extreme weather

Scenarios

- Two extreme weather scenarios will be included in the 2024 Grid Reliability and Resiliency Assessment
  - Winter extreme weather scenario
  - Summer hurricane scenario

Study Assumptions - Start Case

- 2023 RTP final 2029 summer case topology will be used as the start case
- The start case will be updated to
  - Add all generators that have met Planning Guide Section 6.9(1) requirements
  - Add generators that haven't met 6.9(1) requirements yet, but
    - Have signed the Interconnection Agreement
    - Are dispatchable Generation Resources without a signed Interconnection Agreement that have either completed or started the Full Interconnection Study (FIS)
  - Add recently approved RPG projects

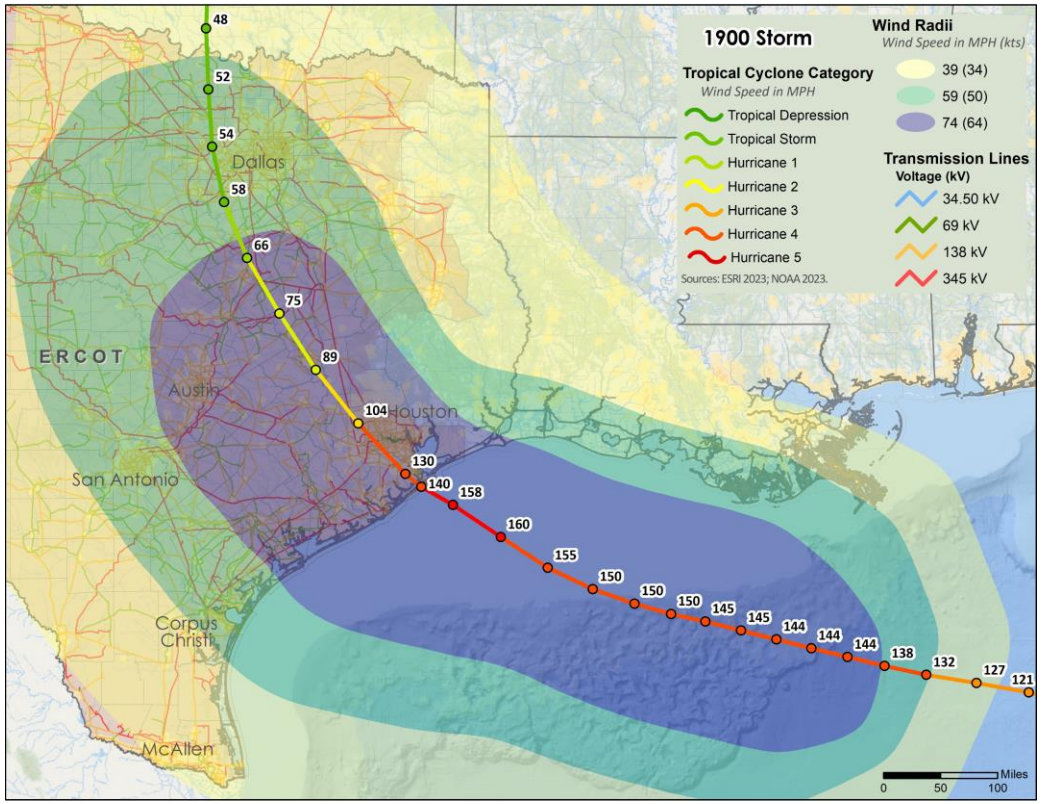
Summer Hurricane Scenario

Study Assumptions - Summer Hurricane Scenario

- Equipment damage information will be based on the 2024 Argonne National Lab's (ANL) Hurricane Impact Study worst case scenario results prepared for ERCOT

Study Assumptions - Summer Hurricane Scenario - Storm Details

- Houston landfall storm studied by ANL
  - Intensity at landfall: Category 5
  - Maximum wind speed: 160 mph
  - Storm surge: 22+ ft



Source: ANL Potential Severe Weather Event Study presentation given at the August RPG meeting

Summer Hurricane Case Assumptions - Generation

- Wind and solar dispatch based on the December 2023 Capacity, Demand and Reserves (CDR) report capacity factor (CF) values for summer
- Battery CF based on the methodology described in note [3] on the “Peak v High Net Load Hour 2024” tab of the December 2023 CDR report

	Solar	Wind-Coastal	Wind-Other	Wind-Panhandle	Battery
CF	76%	60%	22%	29%	20%

Winter Extreme Weather Scenario

Study Assumptions - Winter Extreme Weather Scenario

- The 2029 coincident winter peak load forecast based on the 2021 weather year condition will be used as the base load forecast
- The load forecast will be further adjusted with the IHS load and large load incorporated in the 2023 RTP
- Bus level load will be adjusted to reflect the winter peak load profiles
- Winter ratings will be applied to transmission and generation as appropriate
- Capacity loss or reduction related to the winter extreme weather condition will be obtained through historical data analysis

Winter Extreme Weather Case Assumptions - Load

- 2029 coincident winter peak load forecast based on the 2021 weather year condition, no self-serve load or losses (MW)

Year	Total	Coast	East	Far West	North Central	North	South Central	Southern	West
2029	91,134	20,620	3,767	8,532	26,801	1,595	19, 218	8,057	2,544

- Including large load*, IHS load* adjustment, EV loads, rooftop solar, no self-serve load or losses (MW)

Year	Total	Coast	East	Far West	North Central	North	South Central	Southern	West
2029	105,123	20,955	3,804	14,807	28,607	4,020	21,635	8,123	3,172

* As incorporated in the 2023 RTP

Winter Extreme Weather Case Assumptions - Generation

- Wind and solar initial dispatch is based on December 2023 CDR CF values for winter. These dispatch values are an initial baseline and will later be adjusted to account for the effects of extreme winter weather
- Battery dispatch based on the state of charge seen during the top 4 peak load hours of the coldest day and two following days of winter storms Elliott and Heather

	Solar	Wind-Coastal	Wind-Other	Wind-Panhandle	Battery
CF	14%	56%	26%	37%	25%

Winter Extreme Weather Case Assumptions - Renewable Generation Lost Capacity

- 2,318 MW renewable generation capacity lost
  - Calculate the average CF during the top 4 peak load hours of the coldest day and two following days during winter storms Uri, Elliot, and Heather
  - Calculate the three storm capacity weighted average (3SCWA) CF
  - Subtract the 3SCWA dispatch from the CDR winter dispatch to estimate lost renewable capacity due to the extreme weather

	Total	Solar	Wind-Coastal	Wind- Other	Wind-Panhandle
CF - CDR		14%	56%	26%	37%
CF – 3SCWA		13%	40%	24%	34%
Est. Lost Capacity (MW)	2,318	579	945	636	158

Winter Extreme Weather Case Assumptions - Thermal Generation Lost Capacity

- 9,471 MW thermal generation capacity lost
  - Calculate average of thermal forced outages during the top 4 peak load hours of the coldest day and two following days during winter storms Uri, Elliott, and Heather
  - Average each storm average together to get the final outage value
  - Lost capacity will be distributed by both fuel type and weather zone as a derate

	Total	East	Coast	North	North Central	Southern	South Central	West	Far West
Gas (MW)	7,186	464	2,028	253	2,434	465	1,077	78	387
Coal (MW)	2,285	320	989	0	398	391	187	0	0
Total (MW)	9,471	784	3,017	253	2,832	724	1,264	78	387

Study Approach and Resiliency Criteria

- The study cases will include final adjustments to balance generation and load
- Steady state analysis will be performed for the following planning events
  - P0, P1, P2-1, P7
- Resiliency Criteria:
  - Identify transmission projects that may
    - Prevent Cascading, instability or uncontrolled islanding
    - Reduce the impact of non-consequential Load loss
  - A Revision Request for this Resiliency Criteria is currently being developed

Questions and Comments

For any comments on the 2024 Grid Reliability and Resiliency Assessment, please contact:

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