# ERCOT: Transmission Planning Criteria For Valuation of GTC Exit Solutions NPRR 1070

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# Executive Summary

- The content in this deck presents additional information in response to comments and feedback received
- NPRR 1070 is consistent with PUCT rules which mandate the metric of production cost savings and allow for indirect benefits to be accounted for, but which do not prescribe specific modeling assumptions
- Five modeling practices are proposed:
    1. Reflect accurate bid price for categories of generators which typically bid negative, while fuel cost is kept at $0 for renewables
    2. Reflect the typical limit derate due to transmission outages or model an expected outage case
    3. Reflect derates  of limits for safety margins as applied by Operations
    4. Include the avoided cost of all avoided reliability projects
    5. Estimate the value of avoiding curtailment of generation due to GTCs during load shedding events

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# Bid Price

- **General Comment**:
  - The discussion is not about the societal impacts and costs of Production Tax Credits (PTC), **which is a federal policy decision**
  - The ask is that the planning models reflect what is happening in the market:
    - Different bid prices will change the dispatch, flows, and congestion costs.
    - Models need to accurately estimate the production cost change when the transmission topology is changed
    - Such approach is used in other RTOs as well (see table with bid assumptions used in planning models across RTOs)

**Bid Assumptions in Other RTO Planning Models**

| RTO | Wind PTC Bid Assumption ($/MWh) |
|---|---|
| SPP | -35.00 |
| PJM | -20.00 |
| MISO | -36.69 |
| CAISO | -25.00 |

- **Outcome**: The change in bid prices is not necessarily going to lead to an increase in benefits – some evaluations may have lower benefits with this change – we are seeking better accuracy not more benefit.

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# Bid Price

- **<u>Scope of change</u>:**
  - We don't suggest other resources should be ignored but have observed that the wind bid assumption is far from realistic.
    - Current language includes the word "wind"; however, the language could be made more general by removing the word "wind" in case of future changes to PTC qualification.
  - We do not want to be prescriptive with actual numbers in order to allow flexibility for future legislative changes or changing behavior of market participants. Current suggestions:
    - Grossed up PTC round number: -$30.00
    - Depending on in-service year, use phase-out percentages: 2022 at 80%, 2023 at 60%, etc.
    - Post PTC impact of RECs: -$2,-$1, or $0? Appropriate to keep it simple and stay with $0, due to small impact and uncertainty.

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# Outages

- Modeling outages can be a complex problem
  - MISO study found that APC change due to upgrades depends on location of specific outages assumed and a general derate could be more appropriate: https://cdn.misoenergy.org/20180612%20PSC%20Item%2005c%20Exploration%20of%20Transmission%20Outage%20Economic%20Modeling218538.pdf
- Current approach using sensitivities is labor intensive and disregards that outages are common and expected; however, the outage statistics and experience can inform the proposed approach
- Proposed language allows for ERCOT's discretion on whether to model outages explicitly (affecting limits and topology) or to simply derate the limits by an expected amount.
  - We support the simpler approach of derating seasonally by incorporating general expectations of future outage levels for prior outage lines.
  - The range observed in recent history for a sample of GTCs ranges from 1% to 9%, however the short history for some GTCs is likely skewing the range, while Panhandle GTC derates are inclusive of the more exceptional CREZ outages

| **GTC** | Panhandle Export | Valley Export | West Texas Export | Nelson Sharpe-Rio Hondo | Nedin-Lobo |
|---|---|---|---|---|---|
| **Impact of Outages on Limit*** | 9% | 1% | 4% | 4% | 3% |
| *Calculated impact from outages as average RT Generic Constraint Limit / maximum RT Generic Constraint Limit, (used monthly data as available from Jan 2019 to April 2021) – *results can be considered conservative because there could have been outages spanning a full month and setting the maximum limit* | | | | | |

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# Safety Margin Derates

- Export GTCs often have lower operational limits than the defined GTC limit, while Import GTCs may have lower or higher operational limits than the defined GTC limit due to required reserves for the load pockets

- Example IROL: "*WHEN: The BASECASE WESTEX flow is approaching 85% of the limit; THEN: Activate the BASECASE WESTEX constraint and control to 90% of the limit.*":

| Export Limit | If flow approaches: | Then derate limit to: |
|---|---|---|
| IROL (Panhandle, West Texas) | Flow -> 85%<br>Flow -> 92% | **Limit -> 90%**<br>Limit -> 85% |
| GTC Stability | Flow -> 85% | **Limit -> 98%** |

- Models should therefore reflect the most likely limit used by Operations when the GTCs will be binding (90% or 98%) for export GTCs, which is currently being done but needs to be documented in protocols to ensure continued best practice

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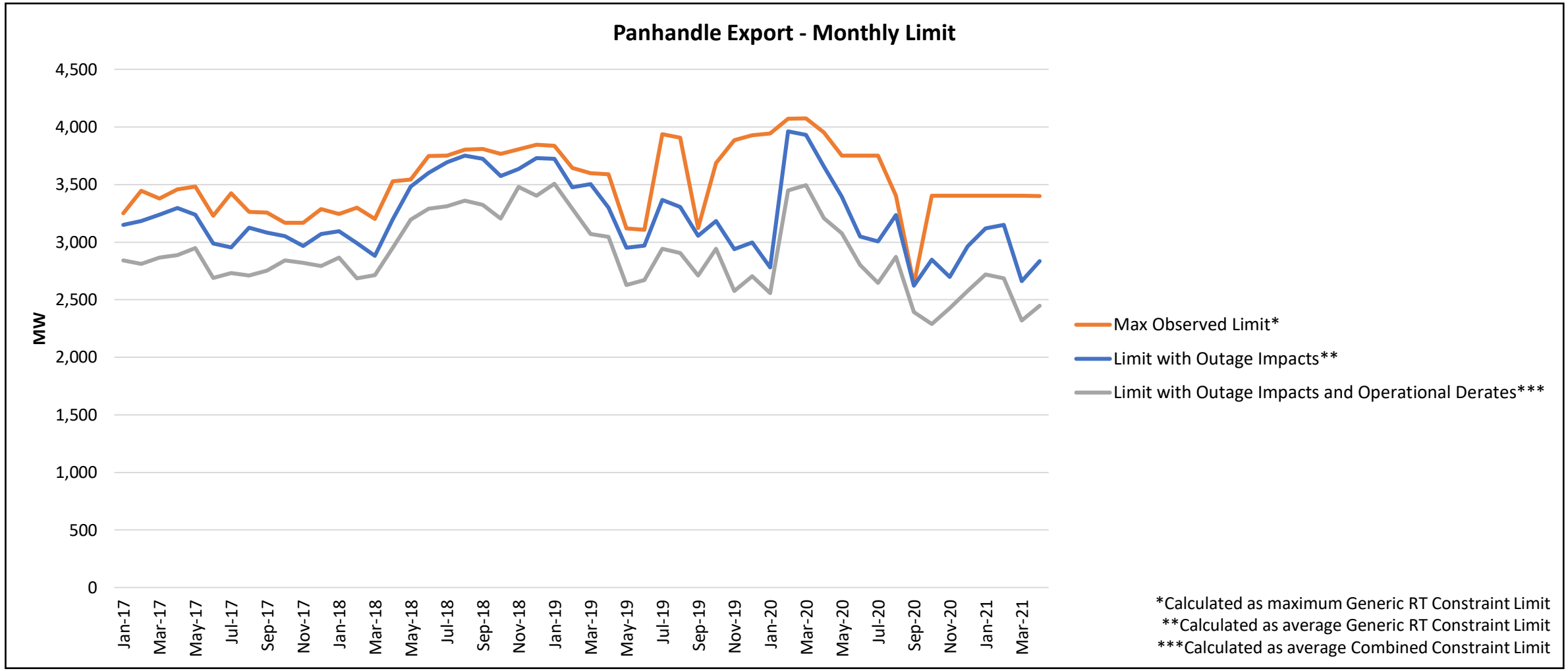
# Example of GTC Limit Derates from Both Outages and Operational Margins



# Reserve Margin Impact due to GTC-related Curtailments

- Currently there is no reflection of transmission constraints in reserve margin study and no accounting for impact to reserves in transmission planning
- During scarcity events, there could be a disconnect between demand within the GTC and the balance of system causing different levels of risk of load shed in different areas
- Different seasons have different impacts:
  - Spring/fall with high wind, low load, and lower conventional generation availability (e.g. April 2021)
  - Typical high load low reserve periods (summer/winter peak)
  - Post-storm conditions with high system load but locational generation, transmission, or demand outages
- Goal of proposal is to leverage existing studies to estimate the impact of this cost to the system (load at risk) that is not currently included
- This measure justifiably should also apply to thermal constraint analysis

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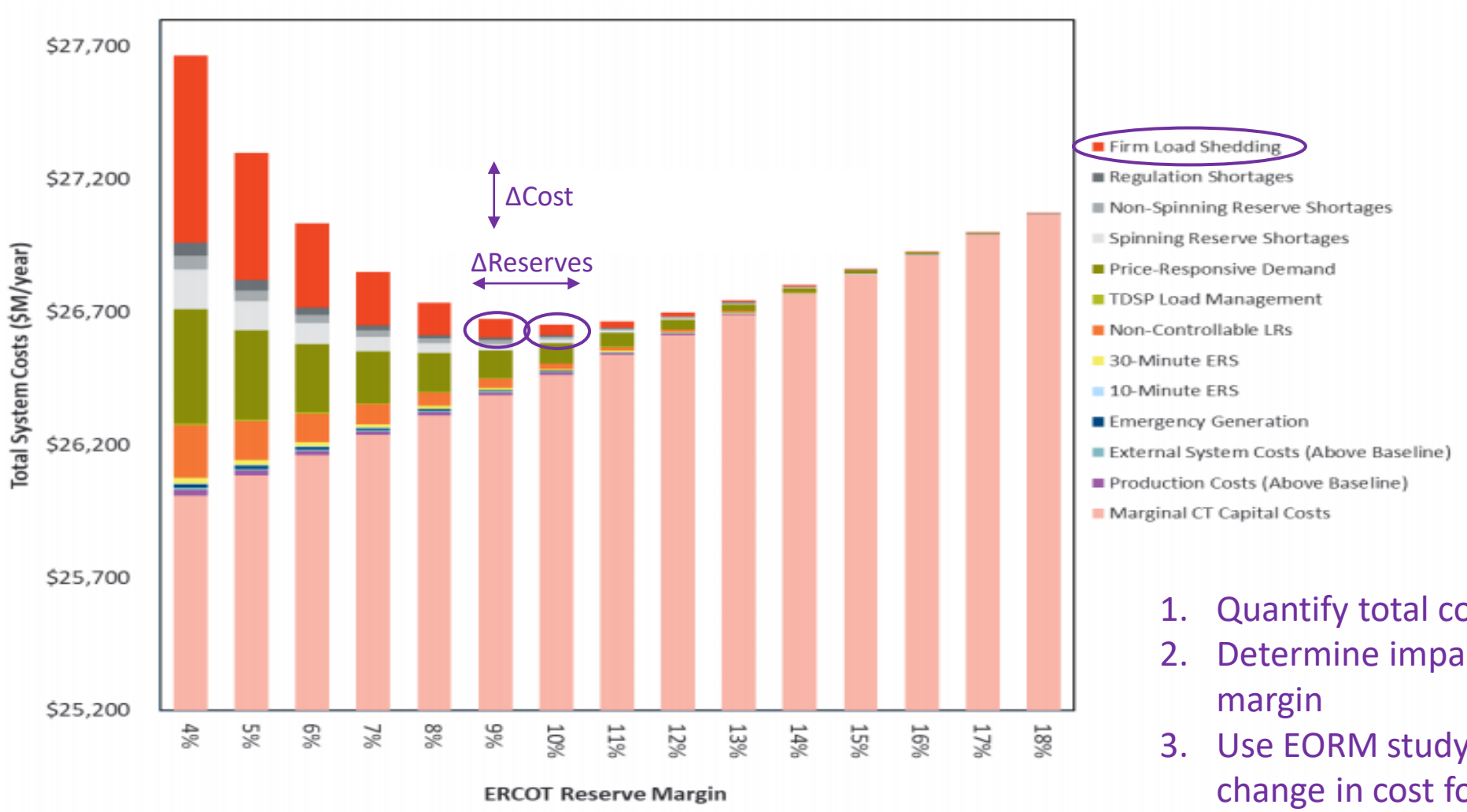
# Reserve Margin Impact due to Curtailments




Source: 2020 EORM Study SAWG Presentation 10/26/2020

1. Quantify total constrained generation
2. Determine impact on system reserve margin
3. Use EORM study results to determine change in cost for change in reserves
4. Allocate to each constraint

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