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**TAC Request: List of WMS Related Items from February 2021 Weather Event**

Initial list of items that shows need for review of process/procedure/rule changes. The objective of creating the list is to identify area which need further review which are under the purview of WMS and its subgroups. The items which needs to be taken up higher level or at different subgroups are marked separately. TAC will create a consolidated list from all its subgroups and determine major issues/low hanging fruits/parking lot items to provide guidance on priority/how/where/when to analyze/address the item.

* **Higher-level issues or issues not specific to WMS**
  + Should there be enforceable standards for summer and winter weatherization to account for extreme temperatures in both seasons?
  + Should there be a set reliability requirement?
  + Should DSP circuits be granular enough to allow for rotating outages? Compare how different utilities managed load shed. What amount of load loss prohibits rolling black out?
  + Should there be a formal coordination process between the entities responsible for regulating electricity, water, and natural gas?
  + Should there be a uniform process for identifying and updating critical infrastructure across all industries that are needed in producing electricity, gas, and water?
  + Should there be a statewide communication mechanism to provide information in easy-to-understand terms for consumers before and during emergency event.
  + Should products that directly expose residential consumers to wholesale market prices be allowed?
  + Request for an overall assessment and root cause analysis of this event (submitter provided comments and questions regarding the process and content for the assessment)
  + Request for Review of:
    - ERCOT governance structure and identification of potential improvements to ERCOT bylaws and stakeholder process
    - ERCOT communications to the public and to stakeholders before, during, and after the event and identification of communication plan improvements
    - ERCOT’s emergency response plan and role in emergency preparedness and response before, during, and after the event; identification of process improvements
  + Request for benchmarking effort with other North American RTOs and ISOs to identify best practices and improvement opportunities in topics from post-event assessment
  + Should there be enhancements to the Gas Electric Working Group scope and activities to improve participation and effectiveness? Are the protocol 3.21.1 requirements regarding gas pipeline coordination for summer preparedness effective and are similar requirements for winter preparedness needed?
  + Are existing winter weatherization related ERCOT requirements, preparations, and processes, including protocol 3.21, sufficient and are there any gaps or improvements that should be considered, including standardized requirements?
  + Request to review the availability of blackstart units and consider potential process improvements including priority for non-curtailment of gas supply to ensure availability during extreme weather events
* **Pricing**
  + Should there be a minimum market notice & timeline for design changes that impact prices so as to allow MPs time for hedging?
  + Should DAM design for pricing AS be changed? Should ASDC be implemented in DAM. If not, should AS price be capped at $9,000/MW/hr? If not, should there be market participant training developed and notice sent explaining how maximum A/S MCPC can be $27k versus $9k.
  + Should LCAP be capped at $9k?
  + Are changes to the Peaker Net Margin methodology needed to protect ratepayers during extended scarcity events?
  + Should TCEQ exempt MWs be priced at a floor of $1500/MWh or higher? If ERCOT RUCs the resource, how is the resource compensated for lost opportunity of using the emissions limit during other scarcity time Vs the RUCed time?
  + Review converge of ORDC & PRC during the event.
  + How did exceptional fuel price process work?
  + Review constraint management process during EEA3: How much generation was curtailed for congestion during EEA3?
  + How did the resource adequacy incentives, including scarcity pricing mechanism, perform for promoting resource adequacy? Are alternative market design approaches necessary to promote/ensure resource adequacy?
  + What is the best way to ensure prices are consistent with market design during load shed?
* **Planning & Operating Reserves**
  + What changes are needed to the reserve margin target, reserve margin calculation methodologies used for the CDR and SARA, and planning reserve margin studies including EORM and MERM to account for impacts from this event? Should CDR be changed to better reflect climate change and extremes such as the 2011 heat events and the 2021 Polar Vortex. – average Vs extreme sensitivities Vs worst case scenarios? How to reflect reliability risk in CDR and SARA?
  + Request to accelerate ongoing efforts to improve the CDR and SARA and incorporate probabilistic modeling approach to evaluate the risk of various magnitudes of ERCOT emergency events. If existing deterministic scenario is retained, consider revisions to account for more extreme and overlapping events. Consider actions to be taken based on resource adequacy report results.
  + Should there be different PRC EEA trigger point & ORDC minimum reserves levels for winter and summer given potential for different events?
  + How should intermittent nature of renewable resources be accounted for to ensure proper dispatchable capacity is available to meet energy demands
  + Are the existing suite of Ancillary Service products and quantities adequate to ensure reliability or are changes needed?
  + Could fast frequency response play a bigger role?
  + How did batteries providing FFR perform? Were FFR providers allowed to charge and if not, what penalties did they get charged?
  + Should the Reliability Must Run (RMR) processes be extended to units proposed for seasonal mothball? Are the RMR and Must Run Alternative study and processes sufficient or are changes to study parameters, such as winter peak-, planned/forced outage-, or resource dispatch-scenarios, needed?
  + Are adjustments to the load forecasting methodology, scenario analysis and trend analysis needed in light of this event?
  + How should we revise extreme winter cases for planning assessments?
  + How should capacity reports be modified to include gas market coincident and offsetting risks with electric system?
  + What were the costs, benefits, and constraints of dual fuel and fuel storage? Are there potential market incentives based on lessons learned from this event?
  + Improve situational awareness by identifying all NG infrastructure that is critical for power plants, Identifying firm and non-firm supply power plants. Should payments for NG storage closer to NG plants be considered to avoid counting a major supply on long haul transport?
* **ERS** **/ DR/ DER/ SODG/DC Ties**
  + What % of $50M was used during winter period?
  + Did ERS work well during crisis? Are any modifications needed?
  + How much of the ERS load is from transmission connected load vs distribution connected and how much transmission connected load self-curtailed?
  + If ERCOT had more flexibility to increase ERS resources would it have helped?
  + To harden critical infrastructure should
    - ERS be expanded
    - new program similar to ERS be created to support DERs
    - encourage stand-alone self-contained microgrids.
    - encourage installation of fuel storage at or near gas plants
    - Install backup batteries/DG at critical facilities
  + How did DR perform? Should UFR deployed beyond the period of it obligation be compensated for the deployment? Should A/S Imbalance Charge to deployed Load Resources be revisited?
  + Should all prospective (and existing) Load Resources and ERS loads that are classified as essential to the transportation, compression, processing, and delivery of natural gas or any other power generation fuel not be allowed to participate as LR or ESR?
  + Did we place conflicting risks on any ERS loads?
  + Could more DERs have helped? In addition to settlement-only DERs (between 1 and 10 MWs) is more needed to be done for a heavy-version of DERs so they can compete in energy and ancillary market more directly or is the current DER-light approach good enough?
  + How did SODG perform?
  + How did DC ties perform during the event? Are there any impacts to planning assumptions and other DC tie policies as a result of this event?
* **Credit & billing**
  + What enhancements to the existing credit/collateral requirements and overall credit risk management policies are needed as a result of this event?
  + Should Collateral and Settlement be netted at CP level?
  + Should $2.5M/monthly default uplift be revisited?
  + Should correct credit calcs for DC Tie import/export during EEA be corrected as RTLE is based on history of value which could be exporting power while during EEA it would be importing?
  + What changes to ERCOT settlements and market uplift processes are needed as a result of this event?
  + Should there be modifications for Validation, Editing and Estimation of meter data? What is the extend of billing error caused by this?

**Questions on Shortfall Market Notice & Settlements**

* + Please provide clarity on how ERCOT is applying its discretion with regard to credit and settlement
  + What is the impact of bankruptcy uplift to load serving entities?
  + What is the full scope of unpaid invoices and has ERCOT exhausted all means of collecting collateral?
  + What if any actions are being taken in regard to the Denton Temporary Restraining Order?
  + How does Brazos bankruptcy impact ERCOTs ability to collect any short pay funds from Brazos?
  + Has ERCOT developed any kind of credit facility to allow payment?
  + What is the potential default uplift exposure for different entities?
    - MMARS of all counterparties that have defaulted, for Munis, for Coops, for other entities with short pay but not defaulted.
    - Total Accumulated Short Pay for defaulted Counterparties, for munis or coops that have not yet defaulted, for other Counterparties that have not yet defaulted
    - Total credit instruments exercised and unexercised
  + The Brazos Electric chapter 11 filing listed a $500M line of credit to BAML in addition to the $1.8B due to ERCOT, both as unsecured claims. Is the $500M line of credit the entirety of the financial security Brazos posted to ERCOT, and if so, does this mean ERCOT will have difficulty recovering any of the short-pay from their collateral?
  + Are the $800M of CRR Auction Revenues that were used to mitigate the initial short pay intended as a temporary measure, or will CARD recipients simply be short paid over the next ~3 years? Section 9.11 seems to indicate that if the CARD process is short, recipients are simply short-paid pro-rata and nothing goes into the default uplift process.
  + Has ERCOT run any analysis on the possibility of cascading defaults due to the default allocation process, maybe something like assessing if the initial default allocation amounts would exceed some percentage of the currently posted collateral for any participants. Please explain as to what is and isn’t include in RDPA, ORDC, LMP and SPP in simple terms for end use customers to understand?
  + Would there be make whole payments for extremely high fuel costs during EEA3?
  + What is the market impact of reactivating the PNM trigger?
  + Please explain as to what is and isn’t include in RDPA, ORDC, LMP and SPP in simple terms for end use customers to understand?