Dispatchable Reliability Reserve Service (DRRS)

TAC Workshop Presentation

January 7, 2026

Agenda

- Purpose
- DRRS Statutory Requirements
- DRRS Design Evolution
- Revision Request Overview
- Common Features of NPRR 1309 and NPRR 1310
- Unique Design Features of NPRR 1309 and NPRR 1310
- Comparison of Aurora's DRRS Ancillary Service (AS) Plus and NPRR 1310
- Additional Design Considerations
- Next Steps

Purpose

- At the December 2025 Protocol Revision Subcommittee (PRS), stakeholders requested one or more workshops to discuss concepts in NPRRs 1309 and 1310 which relate to the design and role of Dispatchable Reliability Reserve Service (DRRS).
- Focus of this workshop is on the DRRS design and optionality in the two NPRRs:
  - Describe the common features of the two NPRRs
    - Core mechanics in Day-Ahead Market (DAM) and Real-Time Market (RTM)
    - Reliability Unit Commitment (RUC) deployment
    - Constraints
    - Demand Curve
    - Settlement
  - Highlight the unique design features of the two NPRRs
- Comparison of Aurora Energy Research's 'DRRS Ancillary Service (AS) Plus' and NPRR 1310
- Discuss additional design considerations and next steps

DRRS Statutory Requirements

The impetus for developing DRRS comes from Public Utility Regulatory Act (PURA) § 39.159(d)-(e):

(d) The commission shall require the independent organization certified under Section 39.151 for the ERCOT power region to develop and implement an ancillary services program to procure dispatchable reliability reserve services on a day-ahead and real-time basis to account for market uncertainty. Under the required program, the independent organization shall:

1) determine the quantity of services necessary based on historical variations in generation availability for each season based on a targeted reliability standard or goal, including intermittency of non-dispatchable generation facilities and forced outage rates, for dispatchable generation facilities;

2) develop criteria for resource participation that require a resource to:

   A. be capable of running for at least four hours at the resource's high sustained limit;

   B. be online and dispatchable not more than two hours after being called on for deployment; and

   C. have the dispatchable flexibility to address inter-hour operational challenges; and

3) reduce the amount of reliability unit commitment by the amount of dispatchable reliability reserve services procured under this section.

DRRS Design Evolution

Since 2023, ERCOT and stakeholders have been developing the concept of DRRS as an Ancillary Service through three iterations.

May 2024

- Initially NPRR 1235 outlined how PURA § 39.159(d) attributes and other design elements would be incorporated in the Protocols.

Dec 2024

- At the Open Meeting, Public Utility Commission of Texas (PUCT) encouraged DRRS design to address operational forecast uncertainty while preserving optionality to support resource adequacy in the future.

2024-2025

- Through multiple workshops, ERCOT presented and refined design concepts to meet statutory requirements (including procurement, deployment, and real-time issues). Independent Market Monitor (IMM) and Hunt Energy Network (HEN) presented additional conceptual designs.

Nov 2025

- ERCOT submitted two NPRRs, 1309 and 1310, that meet all requirements of PURA § 39.159(d).

Dec 2025

- Aurora Energy Research presented its assessment of market design impacts under different data center load growth scenarios, to assess the risk of future involuntary load shed events.

Revision Request Overview

- New design for DRRS submitted in NPRR 1309 and associated NOGRR 283, establishes DRRS as a traditional Ancillary Service to address operational needs.
  - To address stakeholder feedback under this new design, DRRS procurements can be co-optimized with procurements of energy and other Ancillary Services. Also allows On-Line Generation Resources to participate
  - Fulfills all statutory design criteria in PURA § 39.159(d)
- NPRR 1310 was also submitted to include optionality.
  - To address stakeholder feedback, Energy Storage Resource (ESR) participation is added
  - To address PUCT guidance, a Release Factor (RF) is added to allow for supporting resource adequacy in the future
- NPRR 1235, *Dispatchable Reliability Reserve Service as Stand-Alone Ancillary Service*, was withdrawn.
- DRRS designated as a key PUCT priority in approval of ERCOT's budget in Nov. 2025.
- NPRR 1310 granted urgent status by stakeholders at Dec 2025 PRS.

NPRR 1309 and NOGRR 283 granted Board Priority status to support consideration at June 2026 Board meeting.

NPRR 1309 and 1310: Common Design Features

Core mechanism

- DRRS is a market mechanism designed to manage uncertainty on the ERCOT System while mitigating the need for Reliability Unit Commitment (RUC) instructions.
- DRRS is offered, awarded, and paid in both the Day-Ahead Market (DAM) and the Real-Time Market (RTM). To be awarded DRRS, the Resource must offer DRRS.
- Same DRRS demand curve and DRRS Constraints for both DAM and RTM.
- DRRS can be self-arranged and traded.
- Ancillary Service-only DRRS offers (i.e., virtual DRRS offers) can be submitted into the DAM.
- DRRS can be provided by eligible Off-Line Generation Resources and On-Line Generation Resources. A new Resource Status code (“DRRS”) will be developed for Off-Line Generation Resources providing DRRS that have not been deployed by ERCOT.
- Resources are required to undergo a qualification test as specified in the Protocols.
- Eligibility criteria aligned with statutory requirements:
  - The Resource must be capable of operating at its High Sustained Limit (HSL) for at least four consecutive hours
  - The amount of DRRS for which the Resource is qualified is limited to the capacity that can be ramped within two hours

Reliability Unit Commitment

RUC will prioritize committing Off-Line Generation Resources providing DRRS.

- This will be done by scaling down start-up and minimum energy costs of these resources relative to other Off-Line Generation Resources.*

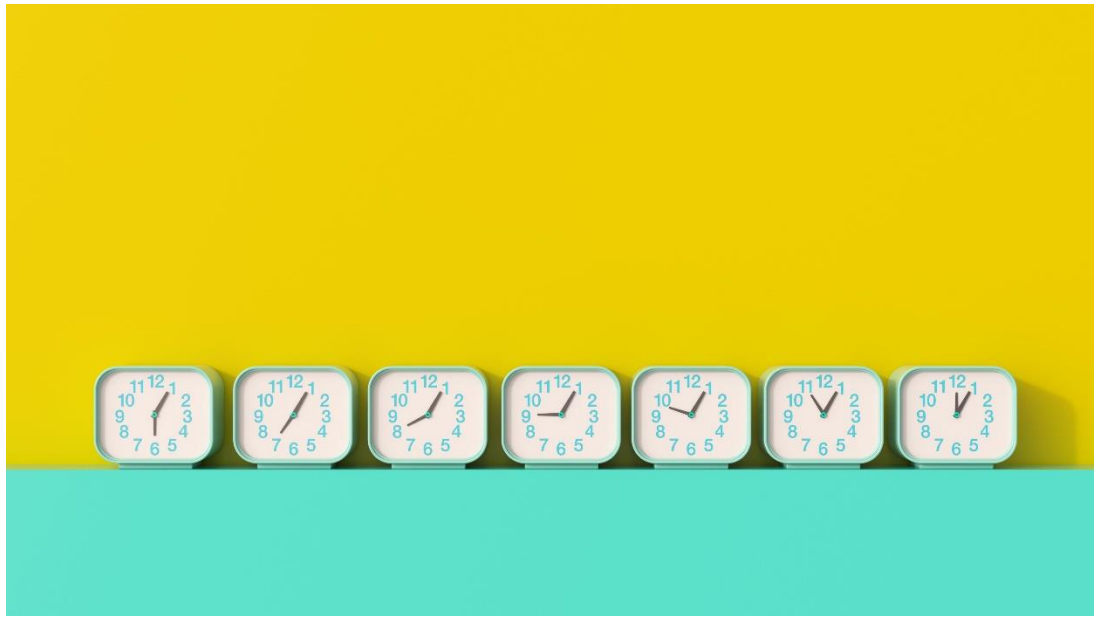
DRRS deployments of Off-Line Generation Resources will be included in the Reliability Deployment Price Adder (RDPA) process.

Qualified Scheduling Entities' (QSEs') RUC Capacity Short charges will consider the QSE's DRRS position and DRRS eligible capacity in its Resource portfolio to cover the QSE DRRS position.

*The current value for the scaling factor is 20%, and ERCOT shall provide a Market Notice prior to implementation of a revised value

RTM Eligibility Check

- RTM eligibility check to verify that these resources maintained a Current Operating Plan (COP) status of DRRS/ON (or OFF if eligible to provide Non-Spin) for DRUC and for each subsequent HRUC for a given Operating Hour (i.e., they were always available for the RUC optimization).
  - An Off-Line Resource carrying DRRS may choose to self-commit (show as ‘ON’ in COP)
  - DRRS-eligible Resources that did not receive a DAM award may offer into the RTM provided they meet this eligibility check



Examples

Example 1: Off-Line DRRS Not Deployed via RUC

HRUC	HE	Resource COP Status	RUC Status	Notes
05:15	17	DRRS	OFF	
06:15	17	DRRS	OFF	
07:15	17	DRRS	OFF	
08:15	17	DRRS	OFF	
09:15	17	DRRS	OFF	
10:15	17	DRRS	OFF	
11:15	17	DRRS	OFF	
12:15	17	DRRS	OFF	
13:15	17	DRRS	OFF	
14:15	17	DRRS	OFF	
15:15	17	DRRS	OFF	
16:16	17	DRRS	OFF	

- Resource awarded DRRS in the DAM
- Capacity available for RUC
- No deployment
- Real-Time Telemetered Status: DRRS
- Maintained a COP status of DRRS/ON for DRUC and all subsequent HRUCs for given hour
- Eligible for Real-Time DRRS award

Example 2: Off-Line DRRS and Deployed via RUC

HRUC	HE	Resource COP Status	RUC Status	Notes
05:15	17	DRRS	OFF	
06:15	17	DRRS	OFF	
07:15	17	DRRS	OFF	
08:15	17	**DRRS**	**ON**	Resource Committed by RUC
09:15	17	ON	ON	
10:15	17	ON	ON	
11:15	17	ON	ON	
12:15	17	ON	ON	
13:15	17	ON	ON	
14:15	17	ON	ON	
15:15	17	ON	ON	
16:16	17	ON	ON	

- Resource awarded DRRS in the DAM
- Capacity available for RUC
- Deployed via RUC
- Real-Time Telemetered Status: ON
- Maintained a COP status of DRRS/ON for DRUC and all subsequent HRUCs for given hour
- Eligible for Real-Time DRRS award

Example 3: Off-Line DRRS from Day-Ahead to Real-Time

HRUC	HE	Resource COP Status	RUC Status	Notes
05:15	17	DRRS	OFF	
06:15	17	DRRS	OFF	
07:15	17	**ON**	**ON**	Resource changes status to ON indicating plan to self-commit for that HOUR
08:15	17	**ON**	**ON**	
09:15	17	**DRRS**	**OFF**	No longer plans to self-commit and reflects change in status to DRRS
10:15	17	DRRS	OFF	
11:15	17	DRRS	OFF	
12:15	17	DRRS	OFF	
13:15	17	DRRS	OFF	
14:15	17	DRRS	OFF	
15:15	17	DRRS	OFF	
16:16	17	DRRS	OFF	

- Resource awarded DRRS in the DAM
- Capacity available/accounted for by RUC
- No deployment
- Real-Time Telemetered Status: DRRS
- Maintained a COP status of DRRS/ON for DRUC and all subsequent HRUCs for given hour
- Eligible for Real-Time DRRS award

Example 4: Off-Line DRRS that Self-Commits

HRUC	HE	Resource COP Status	RUC Status	Notes
05:15	17	DRRS	OFF	
06:15	17	DRRS	OFF	
07:15	17	**ON**	**ON**	Resource changes status to ON indicating plan to self-commit for that Hour
08:15	17	ON	ON	
09:15	17	ON	ON	
10:15	17	ON	ON	
11:15	17	ON	ON	
12:15	17	ON	ON	
13:15	17	ON	ON	
14:15	17	ON	ON	
15:15	17	ON	ON	
16:16	17	ON	ON	

- Resource awarded DRRS in the DAM
- Decides to self-commit for Hour Ending (HE) 17
- Real-Time Telemetered Status: ON
- Maintained a COP status of DRRS/ON for DRUC and all subsequent HRUCs for given hour
- Eligible for Real-Time DRRS award

Common Design Features – Constraints

- Same DRRS Constraints in both DAM and RTM
- DRRS System level constraints

$$\sum_{r,h} DRRS\ MW\ Award_{r,h} = Cleared\ MW\ DRRS\ Demand\ Curve_h \rightarrow Shadow\ Price_h = DRRS\ MCPC_h$$

- DRRS Resource level constraints:
  - On-Line and Off-Line Resources:

$$HSL_{r,h} \geq DRRS\ MW\ award_{r,h}$$

  - On-Line Resource that is DRRS-Eligible and has submitted DRRS Offer. For example, for a Generation Resource (r), in hour (h):

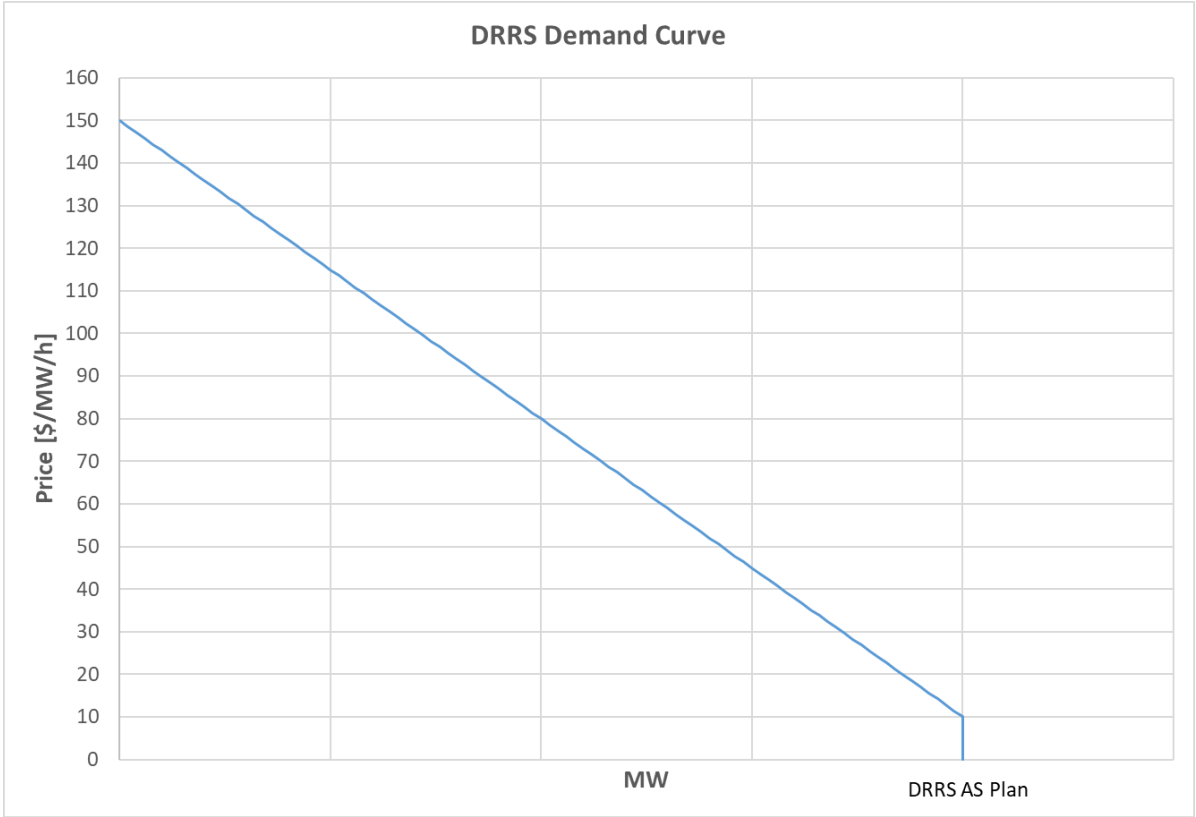
$$Energy\ MW\ award_{r,h} + RegUpMW\ award_{r,h} + RRS\ MW\ award_{r,h} + ECRS\ MW\ award_{r,h} + NSPIN\ MW\ award_{r,h} + (1 - RF_h)\ DRRS\ MW\ award_{r,h} \leq HSL_{r,h}$$

  - Off-Line Resource that is DRRS-Eligible and has submitted DRRS Offer. For example, for a Generation Resource (r), in hour (h):

$$ECRS\ MW\ award_{r,h} + NSPIN\ MW\ award_{r,h} + (1 - RF_h)\ DRRS\ MW\ award_{r,h} \leq HSL_{r,h}$$

Common Design Features – Demand Curve

- The demand curve is sloped, which will result in more efficient price formation.
- The Ancillary Service Demand Curve for DRRS is a linear line connecting each point as shown.
  - Starting point of $150/MW/h at 0 MW
  - Ending point of $0/MW/h at the AS Plan for DRRS for a given Operating Hour



* If the PUCT approves setting the DRRS Release Factor to a non-zero value, the portion beyond the Operating Reserve requirement would be a flat 10 $/MW/h

Common Design Features – Settlement

- Resource-Specific and DRRS Only awards in DAM will be paid the DAM MCPC for DRRS.
  - For each hour *h*: DAM DRRS AS Revenue = (-1) * DAM DRRS MCPC * DRRS MW Award
  - Charges will be allocated on a load ratio share basis, same as other products
  - No change to DAM Settlement of other products
- DRRS deployments will not qualify for RUC Make-Whole Payments or RUC Clawback Charges.
- RUC blocks that are contiguous with a DRRS deployment will not receive startup costs; only minimum energy costs for the RUC hours will be included in the RUC Guarantee.
- A QSE's DRRS position will be included in the calculation of RUC Capacity Short, same as other AS positions.
- An Ancillary Service Imbalance Settlement will be created for DRRS in RTM.
  - For each 15-min settlement interval : (-1) * [¼* RTM DRRS MW Award_r * DRRS RTM MCPC - ¼* (DAM DRRS MW Award_r - Self Arranged DRRS + DRRS Trade Purchases - DRRS Trade Sales) * RTM DRRS MCPC]
  - No change to RT Imbalance Settlement of other products

Common Design Features – Settlement

- Charges in RTM for DRRS Trade overages and DRRS Virtual Awards.
  - ¼* MW quantity * RTM DRRS MCPC
- Imbalance amount and charges for DRRS trade overages and virtual awards are allocated on a load ratio share basis.
- DRRS revenues will be considered in the following Settlements:
  - Revenues used to offset the DAM guarantee in DAM Make-Whole Payments,
  - Revenues used to offset the RUC guarantee in RUC Make-Whole Payments,
  - Emergency Settlements,
  - Switchable Generation Make-Whole Payments,
  - Real-Time Ancillary Service deration payments, and
  - DAM Settlement for Market Participants impacted by omitted procedures or manual actions to resolve the DAM
- DRRS only awards will be included in the calculation of a Counter-Parties MW activity for Default Uplift Charges.

NPRR 1309 and 1310: Unique Design Features

NPRR 1309 and 1310: Unique Design Features

1309	1310
• DRRS can be provided by eligible Off-Line Generation Resources and On-Line Generation Resources • No participation model for ESRs is included. • Release Factor is not included.	• DRRS can be provided by eligible Off-Line Generation Resources and On-Line Generation Resources. • Upon PUCT approval, ESRs may provide DRRS using only their injection capability, to the extent they can meet DRRS requirements.* • For optionality to support resource adequacy in the future, a DRRS Release Factor is included (which can be set from 0 to 1). This number determines the proportion of DRRS awarded capacity that can overlap with energy and other Ancillary Service awards. • The DRRS Release Factor will be set to 0 unless and until the PUCT approves an adjustment. • If ESRs are eligible to provide DRRS, then in RUC Capacity Short calculations for DRRS the Release Factor will be used to account for ESR's State of Charge (SOC).

* ESRs that demonstrate a two-hour ramping capability to a specified output level, and operate at a specified output level for at least four consecutive hours

Release Factor Concept

- Key attribute is that awarded capacity is shared between DRRS and energy and other AS using a “Release Factor” between 0 and 1. The release factor can be adjusted based on season, time of day, etc.
  - Similar to the ramp-sharing concept in RT-SCED between energy and regulation.
  - A Release Factor of 0 means no DRRS-awarded capacity can overlap with energy and other AS awards, whereas a value of 1 indicates that all DRRS-awarded capacity can overlap with energy and other AS awards.
  - Thus, a Release Factor of 0, accompanied by a DRRS quantity in the Ancillary Service Plan reflective of the amount of expected forecast uncertainty, would be the approach taken if *only* meeting an operational uncertainty mandate.
- Co-optimization of energy and ancillary services ensures that the LMPs for energy and AS Market Clearing Prices for Capacity (MCPCs), including DRRS, will account for opportunity costs.
- In Real-Time under stressed system conditions, the non-overlapping DRRS-awarded capacity from On-Line Resources can be converted to energy. Priority of which AS will go short will depend on the price points on the DRRS demand curve vs. the demand curves for the other AS.

DRRS Release Factor Example: Setup

- Consider an example of a DRRS-qualified Generation Resource for a given hour
- Consider the Generation Resource has HSL = 100 MW and LSL = 10 MW
- Assume DRRS Release Factor (DRRSRF) = 0.8

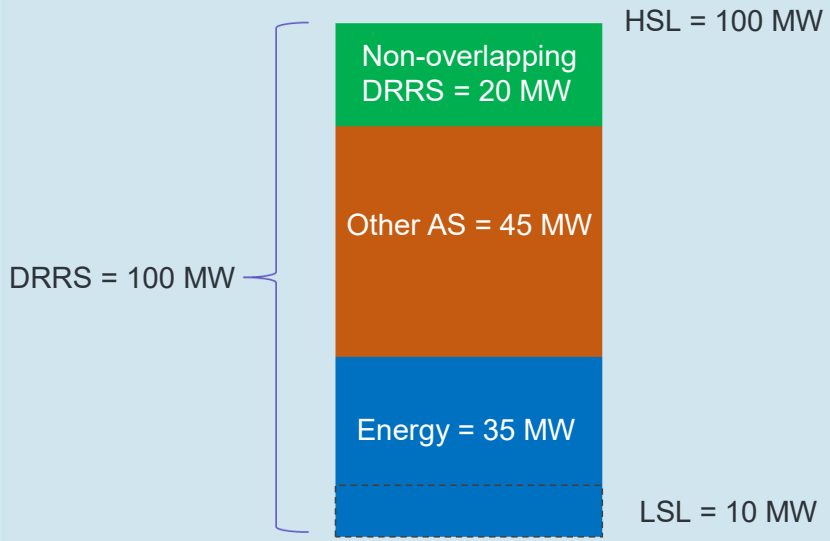
- **DAM**: Generation Resource is On-Line in DAM (either through self-commitment or DAM commitment)
- **RTM**: Generation Resource is On-Line in RTM, with RT conditions tighter than those in DAM

Values of DRRS Release Factor and DRRS Awards are for illustrative purpose only.

DRRS Release Factor Example: DAM and RTM Awards

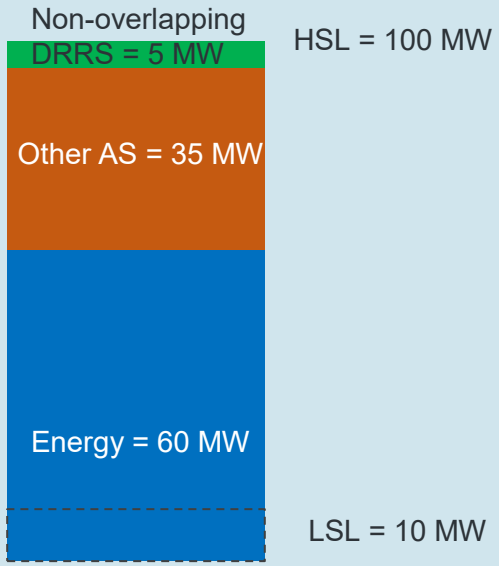
DAM

- Assume the Generation Resource offers and is awarded DRRS for its full HSL of 100 MW for the given hour
- Its DAM awards could be as shown below
- Non-overlapping DRRS = (1 – DRRSRF) * DRRS Award = (1-0.8)*100 = 20 MW



RTM

- Assume we go short on AS, starting with DRRS
- The Generation Resource's RTM awards could be as shown below
- Non-overlapping DRRS = (1 – DRRSRF) * DRRS Award = (1-0.8)*25 = 5 MW



Comparison of Aurora DRRS Ancillary Service (AS) Plus and NPRR 1310

Aurora DRRS AS Plus	NPRR 1310
• DRRS AS Plus is an hourly availability payment designed to address long-term resource adequacy needs. • Pays eligible dispatchable generators for being available for dispatch. • Also modeled a second case allowing eligible 4+ hour batteries. • Annual budget based on prior year's peaker net Cost of New Entry (CONE), with budget capped at $5 billion. • Non-dispatchable renewables are not eligible. • Prices based on supply offers. No demand curve modeled. • Hourly procurement volumes based on projected need for dispatchable resources. • Higher payments during hours of system stress.	• DRRS Ancillary Service designed to address short-term operational uncertainty, with a Release Factor which can be set to a non-zero value to also address resource adequacy. • Qualification limited to eligible On-Line and Off-Line Generation Resources. • Maintains optionality to allow ESR participation, using their injection capability. • To be awarded DRRS, the resource must offer DRRS. • No budget included. • Prices based on competitively cleared supply offers. Includes a sloped demand curve from $150/MW/h (0 MW) to $10/MW/h (AS Plan MW). • Procured in DAM and RTM like any other AS.

Additional Design Considerations

- Procurement quantities for DRRS will be determined as part of the annual ERCOT Methodology for Determining Ancillary Service Requirements.
  - The DRRS requirement is expected to be an hourly value.
  - Unless and until the PUCT approves, the DRRS Release Factor will be set to 0, i.e., no overlap exists. Hence DRRS requirement will be secured to serve operational uncertainty only.
- If the PUCT approves setting the Release Factor to a non-zero value, DRRS may also be procured to support Resource Adequacy (RA).
  - The DRRS Release Factor (DRRSRF) would be an hourly parameter input into the clearing engine in the Day-Ahead and Real-Time Markets.
  - Following such PUCT approval, ERCOT shall provide a Market Notice prior to updating the value of the DRRSRF.
- Under PUCT's reliability standard rule 16 TAC § 25.508, ERCOT must conduct a triennial assessment to determine whether the ERCOT System is meeting the reliability standard.
  - If the modeling finds that ERCOT is not meeting the reliability standard in 2026 or 2029, DRRS will be considered in the options for market design changes.
  - Assuming DRRS as AS is implemented in 2028, the option for non-zero Release Factor is expected to be part of the 2029 reliability assessment.

Next Steps

- Continue discussions in subsequent Technical Advisory Committee (TAC) workshops.
  - ERCOT will capture information/action items based on the questions in today's workshop.
- Board has asked for updates on progress to the Feb and Apr Board meetings.
- ERCOT requests that the TAC submit a recommendation on the Revision Requests for consideration at the June 2026 Board meeting.