



Item 5.2.2: New Market Facing Functionalities - Large Load Curtailment Manager and Real Time Operation Communications Tool

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Purpose

Large Load Curtailment Manager and Real Time Operation Communications Tools overview

For information only

No action is requested; for discussion only.

Key Takeaways

- Large Load Curtailment Manager (LLCM) will go live in June with minimum viable product (MVP) related to net metering use case of Senate Bill 6.
- Real Time Operation Communications (RTOC) Tool enhances ERCOT control room current Hotline call communications with QSEs/TOs during normal and emergency operations.

Large Load Curtailment Manager (LLCM)

BACKGROUND

Three separate drivers — SB6 policy requirements, steady-state frequency operating limits, and NPRR1238 — require ERCOT to issue curtailment instructions to certain Large Loads based on operating conditions

ERCOT is developing a Control Room-facing tool, the LLCM, to help ERCOT Operators to identify when curtailment of Large Loads is needed and issue deployment instruction to the responsible entities.

This tool will enhance operational efficiency, reduce manual actions, and improve grid reliability.

ERCOT is developing LLCM in parallel with the NPRR process, with configurable workflows and parameters that can be adjusted to reflect stakeholder input and final market rule outcomes.

TIMELINES

Phase 1 – MVP

Net-metering SB6 use case (i.e. Co-located with an existing Generating Resource)

Target: End of June 2026 | **Status:** In Implementation

Future Phases

NPRR1238-VECL, SB6 50% backup generation, 202C

Target: Later in 2026

SCOPE – PHASE 1

- Provide forward-looking assessment (i.e. forecast) of operating reserve margin to identify when a Large Load curtailment under SB6 may be initiated.
- LLCM tool issues XML instructions to selected Large Loads (net-metering arrangements under SB6).
- Accounting of instructed SB6 Large Load curtailment in SCED reliability deployment price adder.

Key Takeaway: ERCOT is developing the Large Load Curtailment Manager (LLCM) to enable ERCOT operators to proactively identify when large load curtailment is needed and efficiently issue deployment instructions to improve grid reliability.

Large Load Curtailment Manager (LLCM) Tool

Controls Favorites Profiles Market Operation Market Participation Outage Scheduler CIM System Administration Help Dashboards

100%

Tree Locate

- Ancillary Service Manager
 - ASM Workflow
 - ASM Messages
 - ASM Execution Control Para
 - ASM Non-Spin Deployment a
 - ASM Non-Spin Resource Sp
 - ASM Non-Spin Deployment h
 - ASM UFR/ECRS Deployment
 - ASM UFR/ECRS Resource S
 - ASM UFR/ECRS Deployment
 - ASM FFR Deployment and R
 - ASM FFR Deployment Histor
 - ASM ERS Deployment and F
 - ASM ERS Resource Specific
 - ASM ERS Deployment Histor
 - LLCM Deployment and Reca**
 - LLCM Resource Specific De
 - LLCM Deployment History
 - LLCM Resource Time-Quant
 - ASM Deployment and Recall
 - ASM Test Data Tool
 - ASM System Summary
- Market Participation
- User Tree

Deployment Recall

LLCM Deployment

1-Manual_Fetch

Total Available MW

Total Available MW: 310.00
 SB6BackupGen: 40.00
 SB6Colocated: 100.00
 202cBackupGen: 30.00
 VECL: 140.00

Current Deployment

Curr. Deployed MW:
 SB6BackupGen:
 SB6Colocated:
 202cBackupGen:
 VECL:

New Deployment

Deployment End Time 05/05/2026 24:00:00 CDT

Group: SB6BG Target MW: 50.00

Deployment End Time 05/06/2026 23:59:59 CDT Estimated Duration 3 HRS 57 MINS. Lead Time 30 mins

2-Select 40.00 MW 3-Deploy Last Action: 3 Time: 05/13/2026 22:04:18 CDT

Operator Actions:

- Manual Fetch – retrieves Qualified Large Loads into this tool
- Select Large Load Groups
- Enter curtailment Target MW, End Time and Lead Time
 - Auto Selection - LLCM selects the large loads of the selected group for the curtailment based on random order logic
- Deploy – LLCM Sends XML Instructions to entities to curtail selected Large Loads

Selected	Group	Resource_Name	AS Type	QSE_Name	Telem. MW	Curve MW	Available MW	Current Deploy	New Deploy MW	Deployed MW
DEPLOY	SB6BG	TEST_LL1	LLCM	QLUMN	20.00	30.00	20.00		20.00	20.00
	SB6CL	TEST_LL2	LLCM	QLUMN	50.00	50.00	50.00			
	202CBG	TEST_LL3	LLCM	QEXELO	30.00	100.00	30.00			
	SB6CL	TEST_LL4	LLCM	QLCRA	50.00	50.00	50.00			
DEPLOY	SB6BG	TEST_LL5	LLCM	GENROC	20.00	20.00	20.00		20.00	20.00
	VECL	TEST_LL6	LLCM	QLCRA	50.00	40.00	40.00			
	VECL	TEST_LL78	LLCM	GMP2EN	100.00	100.00	100.00			

Large Load Performance Monitoring in Real-Time

OVERVIEW

Large load performance monitoring display is built in Energy Management System (EMS) to provide ERCOT Operators with real-time situational awareness.

This EMS display provides real-time visibility into each Large Load's current consumption levels and curtailment status by tracking the average actual load reduction over a specified lead time against instructed curtailment target.

ERCOT_LLD_PERFORMANCE...											
Large Load Performance Monitor											
ERCOT		AGC	ACE: 89	ON CFC	Interchange -	Current: p 67	Gen: 73540	Frequency: 60.010			
					Scheduled:	0	Load: 73607				
QSE	Large Load Entity	LLD	LLD MW	Deployment	Deployment Start Time	Dply MW	LeadTime mins	Deployment Target Time	Active	Completed	Violation
		CHLDDATA_LL	0	<input checked="" type="checkbox"/>	11-May-2026 16:58:30	25	30	11-May-2026 16:58:30	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		MBPOD_LL	0	<input type="checkbox"/>		0	0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		SNDSW_LL	0	<input type="checkbox"/>		0	0		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Key Takeaway: Large Load Performance Monitoring display in EMS provides ERCOT Operators real-time visibility into each Large Load's consumption and curtailment status.

Real Time Operation Communications (RTOC) Tool

BACKGROUND

ERCOT Control Room currently uses Hotline Phone Calls as the primary method to communicate with TOs/QSEs operators when there is a grid event or system change.

During emergency operations such as EEA event, the number of phone calls can become overwhelming for operators.

SCR820 introduces RTOC tool to enhance ERCOT Hotline communication process, supporting three-part communications between ERCOT, TOs, and QSEs with Resources during normal and emergency operations.

KEY BENEFITS

- Significant reduction of phone calls as primary communication method.
- Message exchange like internet-based email between ERCOT and TOs/QSEs.
- Prepopulated templates streamline message crafting (e.g., Load Shed Template).
- All TOs/QSEs can confirm receipt for one-to-many broadcasts.
- Provides a log of all messages so that if an operator is pulled away, the operator can quickly reference logged communications with no information lost.
- Tool stores communications for real-time tracking and post-event analysis.

Key Takeaway: This new RTOC tool enhances and modernizes ERCOT's Control Room real-time communications by reducing reliance on Hotline calls and providing a streamlined, logged, and template-driven messaging platform for both normal and emergency operations.

Real Time Operation Communications (RTOC) - Timelines

2024	2025 Q1–Q2	2025 Q3–2026 Q2	2026 Q2-Q3	2027 Q1	2027 Q2
<p>Proof of Concept</p> <ul style="list-style-type: none"> Developed RTOC PoC Tool and made available to Market (TOs) . TOs evaluated tool capabilities and provided feedback. 	<p>Requirements and Design</p> <ul style="list-style-type: none"> Requirements developed. Incorporated market feedback in requirements. Design completed. 	<p>Development</p> <ul style="list-style-type: none"> Development completed. Internal testing is In Progress. 	<p>Market Testing</p> <ul style="list-style-type: none"> RTOC deployed into Production. TOs are actively testing. QSEs onboarding and testing is In Progress. Developing draft NPRR to update Protocols that allow Control Room to use this tool in addition to current Hotline Call 	<p>Parallel Operations</p> <ul style="list-style-type: none"> ERCOT and TOs/QSEs Test and verify RTOC messages in conjunction with Hotline Calls. RTOC will not be a designed communication medium and Hotline calls will be required. Timing depends on NPRR approval 	<p>Go-Live</p> <ul style="list-style-type: none"> RTOC is introduced into control rooms as a monitored 24x7 communication tool during normal and emergency operations. Timing depends on NPRR approval

Key Takeaways: ERCOT engaged market participants early in the process and incorporated their feedback into the requirements. The start of parallel operations and the RTOC go-live will depend on NPRR approval.

Real-Time Operation Communications (RTOC) Tool

- ERCOT Operator initiating a firm load shed message.

The screenshot displays the ERCOT RTOC tool interface. The top navigation bar includes the ERCOT logo, 'RTOC', 'Logs', 'Communication 133', and 'Admin'. The main content area shows an 'Inbox' dropdown, a 'Label' field with 'Blackstart- QSE', an '+ Add to' button, an 'Export' button, an 'Order By' dropdown set to 'Received', and a '50 entries per page' selector. A list of messages is visible, including one from 'TCPSE' with the subject 'New FB with AVR1_ST1 & AVR1_CT1 @13:04 is 101.73' and a green 'Acknowledged' button.

A modal form is open for creating a new communication. The form fields are as follows:

- Template:** 201. T#8 EEA3 Firm Load Shed
- To:** x TO (+ Add)
- Subject:** T#8 EEA3 Firm Load Shed
- Category:** Emergency
- IG Classification:** Public
- Priority:** High
- Require Acknowledgement?
- Require Read Receipt?
- Sticky?

The message body contains the following text:

at {CurrentTime}, ERCOT is declaring EEA 3 firm load shed due to Physical Responsive Capability falling below 1500 MW, the clock-minute average system frequency is below 59.91 Hz for 20 consecutive minutes, steady-state frequency falls below 59.8 Hz. ERCOT is issuing an Operating Instruction for all Transmission Operators to shed their share of MW from the [winter season/summer season] load shed table]. Transmission Operators are to report to ERCOT when this is complete. Implement all measures associated with EEA 1 and 2, if not already implemented.

A 'Send' button is located at the bottom right of the modal form.

Real-Time Operation Communications (RTOC) Tool

- Load shed message in TOs view before acknowledgement - Highlights load shed commands visually and audibly until acknowledged by TOs.

The screenshot displays the ERCOT RTOC tool interface. At the top left is the ERCOT logo and the text "RTOC". A blue notification bubble shows "Communication 25". A "Logout" button is in the top right. Below the header is a navigation bar with "Inbox" (dropdown), "+ New Message", "Reply", "Reply All", and "Forward" buttons. A secondary bar includes "Export", "Order By: Received" (dropdown), a search box, and "+ Advanced Search". A "50 entries per page" dropdown is also present.

The main content area is divided into two panes. The left pane, titled "Inbox", lists messages. The top message is highlighted in red and reads: "T#8 EEA3 Firm Load Shed", "ERCOT", "Category: Emergency", "Priority: [red square]", "5/13/2026, 16:47:32", and "at 4:47:29 PM, ERCOT is declaring EEA 3 firm load shed due to Physical Resp...". A red "ACK Required" button is overlaid on this message. Below it is another message: "T#8 EEA3 Firm Load Shed", "ERCOT", "Category: EEA", "Priority: [red square]", "5/8/2026, 23:36:32", and "at 11:36:26 PM, ERCOT is declaring EEA 3 firm load shed due to Physical Res...". A "Priority Legend" button is at the bottom of the inbox pane.

The right pane shows a detailed view of the selected message: "T#8 EEA3 Firm Load Shed" with a "Not Acknowledged" status and timestamp "5/13/2026, 16:47:32". The message body states: "at 4:47:29 PM, ERCOT is declaring EEA 3 firm load shed due to Physical Responsive Capability falling below 1500 MW, the clock-minute average system frequency is below 59.91 Hz for 20 consecutive minutes, steady-state frequency falls below 59.8 Hz. ERCOT is issuing an Operating Instruction for all Transmission Operators to shed their share of MW from the [winter season/summer season] load shed table]. Transmission Operators are to report to ERCOT when this is complete. Implement all measures associated with EEA 1 and 2, if not already implemented." An "Acknowledge" button is at the bottom right of this pane.

At the bottom of the interface, it says "Showing 1 to 29 of 29 entries 1 row selected" with a pagination control showing "1". The footer includes "CONNECTED", "Welcome TONCOR1 of ONCOR ELECTRIC DELIVERY COMPANY LLC (TDSP)", and "Version: 1.1.1".

Real-Time Operation Communications (RTOC) Tool

● TOs view after TO Acknowledgement

This screenshot shows the interface for Transmission Operators (TOs) after they have acknowledged a message. At the top, there are controls for 'Export', a refresh icon, 'Order By: Received', a search bar, and a '+ Advanced Search' link. Below these is a '50 entries per page' selector. The main content area is divided into two parts: an 'Inbox' list on the left and a detailed message view on the right. The 'Inbox' entry for 'T#8 EEA3 Firm Load Shed' shows it is from 'ERCOT', has an 'Emergency' category, and a 'Priority' flag. The message body in the detailed view states: 'at 4:47:29 PM, ERCOT is declaring EEA 3 firm load shed due to Physical Responsive Capability falling below 1500 MW, the clock-minute average system frequency is below 59.91 Hz for 20 consecutive minutes, steady-state frequency falls below 59.8 Hz. ERCOT is issuing an Operating Instruction for all Transmission Operators to shed their share of MW from the [winter season/summer season] load shed table]. Transmission Operators are to report to ERCOT when this is complete. Implement all measures associated with EEA 1 and 2, if not already implemented.' A green 'Acknowledged' button is visible at the bottom of the message preview in the inbox.

● ERCOT Operator view after TO Acknowledgement

This screenshot shows the interface for ERCOT operators after a TO has acknowledged a message. The top navigation bar includes the 'ercot' logo, 'RTOC', 'Logs', 'Communication 133', and 'Admin' tabs, along with a 'Logout' button. The interface features an 'Inbox' dropdown, a '+ New Message' button, and action buttons for 'Reply', 'Reply All', and 'Forward'. A 'Label: Blackstart-QSE' dropdown is present, along with '+ Add to All' and '+ Add to Selected' buttons. Similar to the TO view, there are 'Export', refresh, 'Order By: Received', search, and '+ Advanced Search' controls, and a '50 entries per page' selector. The 'Inbox' list shows an entry for 'RE: T#8 EEA3 Firm Load Shed' from 'TLCRA (tlcra1)' to 'ERCOT' at 5/13/2026, 17:33:08. The detailed message view shows the subject 'RE: T#8 EEA3 Firm Load Shed' and the body text: 'Received the load shed instructions. We will report back once it's implemented.' Below this, another message entry is visible for 'T#8 EEA3 Firm Load Shed' from 'ERCOT (pmeher)' to 'TO' at 5/8/2026, 23:36:32, with a body text starting 'at 11:36:26 PM, ERCOT is declaring EEA 3 firm load shed due to Physical Responsive Capability falling below 1500 MW, the clock-minute average system frequency is below 59.91 Hz for 20 consecutive minutes, steady-state frequency falls below 59.8 Hz. ERCOT is issuing an Operating Instruction for all Transmission Operators to shed their share of MW from the [winter season/summer season] load shed table]. Transmission Operators are to report to ERCOT when this is complete. Implement all measures associated with EEA 1 and 2, if not already implemented.'

Appendix

- Large Load Curtailment Manager (LLCM) Tool – Recall Display
- Real-Time Operation Communications (RTOC) Tool Displays – Dashboard and EEA Message

Large Load Curtailment Manager (LLCM) Tool - Recall

Controls Favorites Profiles Market Operation Market Participation Outage Scheduler CIM System Administration Help Dashboards

100%

Tree Locate

- Day-Ahead Market
- Reliability Unit Commitment
- Ancillary Service Manager
 - ASM Workflow
 - ASM Messages
 - ASM Execution Control Para
 - ASM Non-Spin Deployment
 - ASM Non-Spin Resource Sp
 - ASM Non-Spin Deployment I
 - ASM UFR/ECRS Deployment
 - ASM UFR/ECRS Resource S
 - ASM UFR/ECRS Deployment
 - ASM FFR Deployment and R
 - ASM FFR Deployment Histor
 - ASM ERS Deployment and R
 - ASM ERS Resource Specific
 - ASM ERS Deployment Histor
 - LLCM Deployment and Reca
 - LLCM Resource Specific De
 - LLCM Deployment History
 - LLCM Resource Time-Quant
 - ASM Deployment and Recall
 - ASM Test Data Tool

User Tree

Deployment Recall

LLCM Recall

4-Manual Fetch

For Auto Recall based on End Time, there are no Operator actions
 Manual Recall - Operator Actions:

- Manual Fetch – retrieves currently deployed Large Loads into this tool
- Select Large Load Groups
- Enter Recall Target MW for partial recall
 - Auto Selection - LLCM selects the large loads of the selected group based on random order logic
- Recall– LLCM Sends XML Instructions to entities to recall selected Large Loads curtailment

Current Deployment

Curr. Deployed MW:
 SB6BackupGen:
 SB6Colocated:
 202CBGGen:
 VECL:
 Deployment End Time: 04/28/2026 24:00:00 ...

New Deployment

Group: TARGET Target MW:

Deployment End Time: 04/29/2026 23:59:59 CDT Estimated Duration: 9 HRS 41 MINS.

MV: 5-Select Last Action: 1 Time: 04/29/2026 14:21:11 CDT

TARGET
 SB6BG
 SB6CL
 202CBG
 VECL
 ALL

Selected	Group	Resource Name	AS Type	QSE Name	Tele. MV	Curve MV	Available MV	Current Deploy	New Deploy MV	Deployed MV
RECALL	SB6BG	TEST_LL1	LLCM	GLUMN	20.00	30.00	20.00			
RECALL	SB6CL	TEST_LL2	LLCM	GLUMN	50.00	50.00	50.00			

Real-Time Operation Communications (RTOC) Tool

- Default Dashboard

The screenshot displays the RTOC tool's default dashboard. Key components include:

- PRC (Preliminary Report Conditions):** A gauge showing 'OPERATING RESERVE' at 12,268 MW.
- User Connection Status:** Two donut charts showing 'Active TOs' at 52% and 'Active QSEs' at 14%.
- Geomagnetic Disturbances (GMD):** A bar chart titled 'Estimated Planetary K index (3 hour data)' for the period starting Mon, 23 Apr 2025 00:00:00 GMT.
- Recent Communications:** A section with 'Inbound (3)' and 'Outbound (6)' tabs. A '9 New Messages' notification is present. A message snippet is visible: 'Blackstart Testing Coordination... Category: Advisory... Priority:'. It includes status indicators for 'READ: 100%' and 'ACK: 0%'. A callout points to the 'ACK: 0%' indicator.
- TO Active Status:** A modal window showing a table of active TOs. A callout points from the 'Active TOs' donut chart to this modal. The table has columns for 'Company' and 'Active' status.
- Acknowledgment Info:** A modal window showing a table of acknowledgment details. A callout points from the 'ACK: 0%' indicator in the message list to this modal. The table has columns for 'Company', 'Acknowledged By', and 'Acknowledged On'.

Real-Time Operation Communication (RTOC) Tool

- EEA Message

The screenshot shows the RTOC tool interface. At the top, there are tabs for 'RTOC', 'Logs', 'Communication 8', and 'Admin'. A '+ New Message' button is highlighted with a green box. Below this, there are search and filter options, including a 'Label' dropdown set to '[None]', '+ Add to All', '+ Add to Selected', 'CSV', and 'Order By: Received'. A list of messages is displayed, with one message titled 'Site Failover' selected. The message content includes: 'Site Failover', 'From: ERCOT (dcyphers)', 'To: TO', and a body text starting with '@ 15:30 on 4/9/26, ERCOT will perform a site failover...'. A green arrow points from the '+ New Message' button to a detailed message composition window on the right.

The detailed view of the message composition window shows the following fields:

- Template: 143. EEA 1
- To: x TO
- Subject: EEA 1
- Category: EEA
- IG Classification: Public
- Priority: High
- Require Acknowledgement?:
- Require Read Receipt?:
- Sticky?:
- Body text: ERCOT is declaring EEA 1 due to due to Physical Responsive Capability falling below 2500 MW.
- Send button

Real-Time Operation Communication (RTOC) Tool

- EEA Message template full screen

The screenshot displays the EEA Message template full screen interface. The top navigation bar includes the ERCOT logo, 'RTOC', 'Logs', 'Communication 133', and 'Admin'. A 'Logout' button is visible in the top right corner. The left sidebar shows an 'Inbox' dropdown, a 'Label: Blackstart- QSE' field, an 'Export' button, an 'Order By: Received' dropdown, and a '50 entries per page' selector. The main content area is a form for creating a message template. It includes a 'Template' dropdown set to '143. EEA 1', a 'To' field with a '+ Add' button, a 'Subject' field set to 'EEA 1', a 'Category' dropdown set to 'EEA', an 'IG Classification' dropdown set to 'Public', and a 'Priority' dropdown set to 'High'. There are three checkboxes: 'Require Acknowledgement?' (checked), 'Require Read Receipt?' (checked), and 'Sticky?' (unchecked). The message body contains the text: 'ERCOT is declaring EEA 1 due to due to Physical Responsive Capability falling below 2500 MW.' A 'Send' button is located at the bottom right of the form. The bottom of the screen shows a 'Priority Legend' button, a pagination bar with 'Showing 1 to 50 of 170 entries' and page numbers 1, 2, 3, 4, and a 'CONNECTED' status indicator. The footer includes the text 'Welcome Preethi Meher Malla of ERCOT' and 'Version: 1.1.1'.