



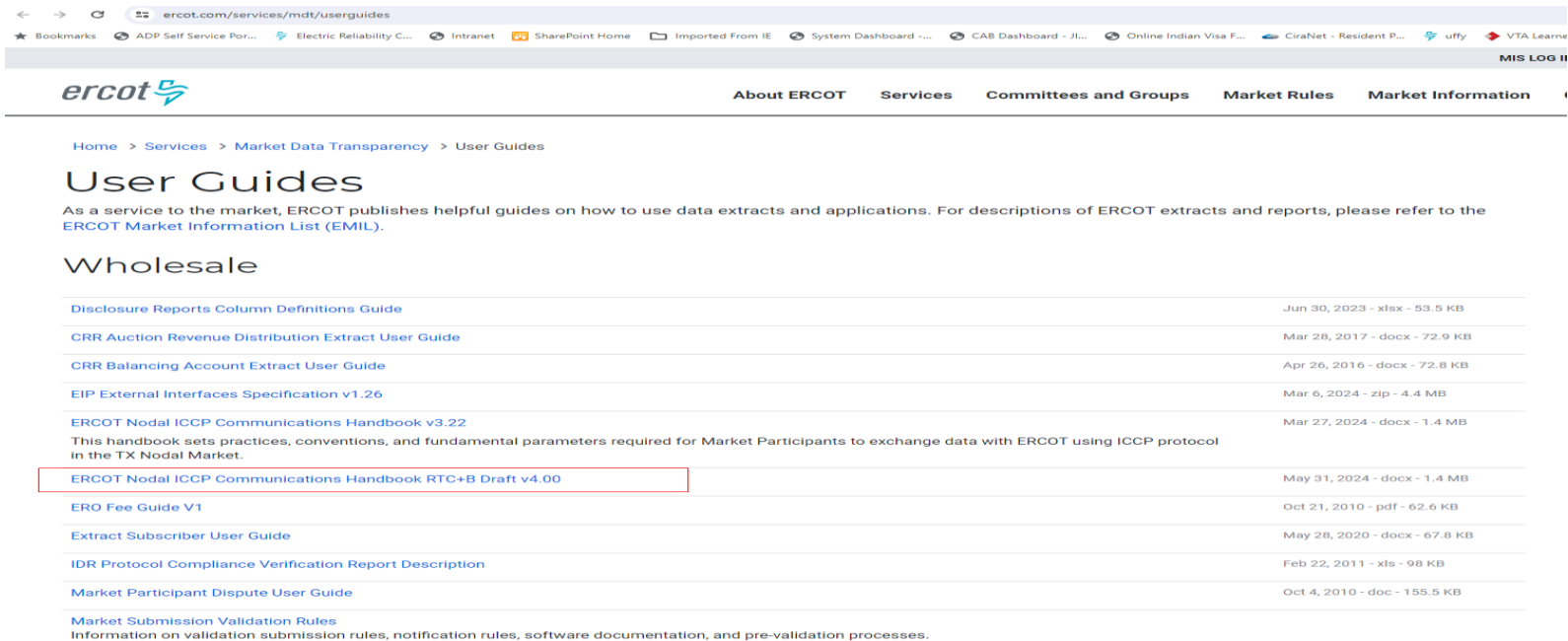
RTC+B Telemetry Changes

ERCOT Staff

6/14/2024

RTC+B ICCP Handbook Updates

- ICCP Handbook draft version with RTC+B ICCP Telemetry points modeling was published to ERCOT website (<https://www.ercot.com/services/mdt/userguides>) on 05/31/2024



ercot.com/services/mdt/userguides

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User Guides

As a service to the market, ERCOT publishes helpful guides on how to use data extracts and applications. For descriptions of ERCOT extracts and reports, please refer to the ERCOT Market Information List (EMIL).

Wholesale

Disclosure Reports Column Definitions Guide	Jun 30, 2023 - xlsx - 53.5 KB
CRR Auction Revenue Distribution Extract User Guide	Mar 28, 2017 - docx - 72.9 KB
CRR Balancing Account Extract User Guide	Apr 26, 2016 - docx - 72.8 KB
EIP External Interfaces Specification v1.26	Mar 6, 2024 - zip - 4.4 MB
ERCOT Nodal ICCP Communications Handbook v3.22 This handbook sets practices, conventions, and fundamental parameters required for Market Participants to exchange data with ERCOT using ICCP protocol in the TX Nodal Market.	Mar 27, 2024 - docx - 1.4 MB
ERCOT Nodal ICCP Communications Handbook RTC+B Draft v4.00	May 31, 2024 - docx - 1.4 MB
ERO Fee Guide V1	Oct 21, 2010 - pdf - 62.6 KB
Extract Subscriber User Guide	May 28, 2020 - docx - 67.8 KB
IDR Protocol Compliance Verification Report Description	Feb 22, 2011 - xls - 98 KB
Market Participant Dispute User Guide	Oct 4, 2010 - doc - 155.5 KB
Market Submission Validation Rules Information on validation submission rules, notification rules, software documentation, and pre-validation processes.	

High-level overview of Telemetry From/To QSE in RTC

Resource Specific From QSE			
Unit Related		A/S Related	
High/Low Sustained Limits (HSL, LSL)	AVR Status (AVR)	FRRS Up/Down Participation Factor (FUPF, FDPF)	
High/Low Emergency Limit (HEL, LEL)	Dynamically Scheduled Resource Schedule (DSRS)[Gen]	FRRS Up/Down Responsibility (FURS, FDRS)	
Energy (Normal) Up/Down Ramp Rate (NURR, NDRR)	Lower/Raise Block Status (LBST, RBST) [Gen]	Regulation Up/Down Participation Factor (RUPF, RDPF)	
Emergency Up/Down Ramp Rates (EURR, EDRR)	PSS Status (PSS)	Regulation Up/Down Responsibility (RURS, RDRS)	
Net MW/MVAR (MW (aka NPF for CCP), MVAR)	POI kV Measurement/Target (KVM, KVT)	Responsive Reserve Responsibility/Schedule (RRRS, RRSC)	
Gross MW/MVAR (GMW, GMV)	Scheduled Power Consumption (SPC, SPC2) [CLR]	High Set Under Frequency Relay (HSUF) [NCLR]	
Resource Status (RST)	Storage Resource Charge/Discharge Data (MXCP, MXDP, MXOD, SOC)	Non-Spin Responsibility/Schedule (NSRS, NSSC)	
CCP Config No (CCC)	IRR MET Data (DEG, IRAD, MPH, PRES, PTMP, TEMP)	Regulation Up/Down Ramp Rate (based on 5-min blended)	
Non-Frequency Responsive Capacity (NFRG)	IRR Turbine/Panel Availability (NTOF, NTON, NTUN)	RRS PFR/FFR/UFR Capability	
Load Resource Breaker Status (LRCB) [NCLR]	CCP Frequency Responsive Capacity High/Low Limit, Frequency Responsive Factor	Non-Spin Ramp Rate (based on 30-min blended)	
Max/Low Power Consumption (MPC, LPC) [CLR, NCLR]	Inactive Power Augmentation Capacity	ECRS Ramp Rate (based on 10-min blended)	
Resource Breaker Status (Gen's and ESRs)	SoC, Max Soc, Min SoC, MXDP, MNDP (ESRs)	RRS-UFR/RRS-FFR/ECRS Self Provision (based on DAM Award and AS trades) [NCLR]	
	Retain ESR-GR Telemetry for ESR single model	ECRS Responsibility, Schedule	
	RRS-FFR deployment		
	ONSC RRS/ECRS deployment		
Resource Specific To QSE		QSE Specific To QSE	
Unit Related	A/S Related	A/S Related	
Base Point (BP)	Non-Spin Deployed (NDPL)	Regulation Up/Down MW (REGU, REDG)	
Locational Marginal Price (LMP)	RRS Deployed (RDPL) [NCLR]	FRRS Up/Down MW (FURQ, FDRQ)	
Curtailment (SBBH)	Regulation Up Award, Regulation Down Award	Responsive Reserve PFR/ONRR/FFR	
SCCT Status (SCCT)	Responsive Reserve PFR/FFR/UFR Award	ECRS Deployment (Gen, ONECRS)	
Updated Desired BP (UDBP)	ECRS Award, Non-Spin Award		
	Regulation Up Deployment, Regulation Down Deployment (Not to be used)		
	Updated Desired SP (UDSP:Includes Base Ramp and Regulation Instruction)		
	System wide MCPCs for all Ancillary Services		

Base telemetry list in this table has been created using [ERCOT Nodal ICCP Communications Handbook](#)

**RTC related changes that are identified in this list (reflected in red color) are based on KP1.3, 1.4, 1.5.

Resource Ancillary Service Telemetry from QSE

The following new telemetry to be submitted by QSEs to inform ERCOT of the current physical capability of a qualified resources to provide Ancillary Services. The telemetry points will be used as additional limits on Ancillary service awards below what could be awarded given the Resource's other constraints such as HSL, HDL, LDL and LSL.

Product or Sub-product	Unit	Description	References
Regulation Up Ramp Rate	MW/Minute	5-Minute blended ramp rate that reflects the current physical capability of the qualified resource to provide Regulation Up. In addition to the Resource Limits and Regulation Up qualified MW, limits amount of Regulation Up that SCED can award to the Resource.	1. RTC Key Principle 1.4 https://www.ercot.com/mktrules/puctDirectives/kp1p4
Regulation Down Ramp Rate	MW/Minute	5-minute blended ramp rate that reflects the current physical capability of the qualified resource to provide Regulation Down. In addition to the Resource Limits and Regulation Down qualified MW, limits the amount of Regulation Down that SCED can award to the Resource.	2. RTCBTF refresher, as presented in RTCBTF on 9/7/2023 https://www.ercot.com/files/docs/2023/09/01/2_refresher-on-real-time-co-optimization-key-principles-rtcbtf-090823_v2.pptx
ECRS Ramp Rate	MW/Minute	10-minute blended ramp rate that reflects the current physical capability of the qualified resource to provide ECRS. In addition to Resource limits and ECRS qualified MW, limits the amount of ECRS that SCED can award to the Resource. This value will be the ten-min output change capability of the Resource divided by 10. For NCLRs, the ECRS capability telemetry includes the self-provided MWs.	3. NPRR1010 6.5.5.2 (2) (q) 4. NPRR1010 6.5.5.2 (5) (m)
Non-Spin Ramp Rate	MW/Minute	30-minute blended ramp rate that reflects the current physical capability of the qualified resource to provide Non-Spin. In addition to Resource limits and Non-Spin Qualified MW, limits the amount of Non-Spin that SCED can award the Resource. This value will be the 30-minute output change capability of the Resource divided by 30.	

Resource Ancillary Service Telemetry from QSE

Product or Sub-product	Unit	Description	References
Current Capability to Provide RRS-PFR	MW	Reflects the current capability of the qualified resource to provide RRS from PFR via Governor response. In addition to Resource Limits and qualification, limits the amount of RRS-PFR that SCED can award to the Resource.	1. RTC Key Principle 1.4 https://www.ercot.com/mktrules/puctDirectives/kp1p4
Current Capability to Provide RRS-FFR	MW	Reflects the current capability of the qualified resource to provide Fast Frequency Response. In addition to the Resource limits and Qualified MW, limits the amount of RRS-FFR that SCED can award to the Resource. For NCLRs, the RRS-FFR capability telemetry includes the self-provided MWs.	2. RTCBTF refresher, as presented in RTCBTF on 9/7/2023 https://www.ercot.com/files/docs/2023/09/01/2_refresher-on-real-time-co-optimization-key-principles-rtcbtf-090823_v2.pptx
Current Capability to Provide RRS-UFR	MW	Reflects the current capability of the qualified resource to provide RRS via UFR. In addition to Resource Limits and Qualified MW, limits the amount of RRS-UFR that SCED can award to the Resource. For NCLRs, the RRS-UFR capability telemetry includes the self-provided MWs.	3. NPPR1010 6.5.5.2 (2) (p) 4. NPPR1010 6.5.5.2 (5) (l)

Resource Ancillary Service Telemetry from QSE

Non-Controllable Load Resources that have UFR relay armed shall submit self-provision MW quantities based on Day-Ahead Market (DAM) awards, self-arranged and AS trades submitted by end of the adjustment period.

Product or Sub-product	Unit	Description	References
Self-Provided RRS-UFR	MW	Self-provided RRS-UFR for Non-Controllable Load Resources that have UFR relay armed, limited by the DAM Awards, self-arranged and AS trades.	1. RTC Key Principle 1.3 https://www.ercot.com/mktrules/puctDirectives/kp1p3
Self-Provided RRS-FFR	MW	Self-provided RRS-FFR for Non-Controllable Load Resources that have UFR relay armed, limited by the DAM Awards, self-arranged and AS trades.	2. RTCBTF refresher, as presented in RTCBTF on 9/7/2023 https://www.ercot.com/files/docs/2023/09/01/2_refresher-on-real-time-co-optimization-key-principles-rtcbtf-090823_v2.pptx
Self Provided ECRS	MW	Self-provided RRS-UFR for Non-Controllable Load Resources that have UFR relay armed, limited by the DAM Awards, self-arranged and AS trades.	3. NPRR1010 6.4.9.1.1 (3) 4. NPRR1010 6.5.5.2 (5) (f)

Resources with capacity that is not Frequency Responsive

The following telemetry is for Generation Resources that have Capacity that is not frequency responsive and not eligible for frequency responsive Ancillary Service Awards.

Telemetry	Unit	Description	References
Inactive Power Augmentation Capacity	MW	Power Augmentation capacity that is not On-Line for Resources that have power augmentation capacity included in HSL. This is used in SCED to determine the portion of the Non-Spin award that will be provided by power augmentation capacity that is not active and deployed as offline Non-Spin.	1. RTC Key Principle 1.3
High Frequency Responsive Capacity Limit	MW	High limit of the Resource's capacity that is frequency responsive, used in SCED to ensure frequency responsive Ancillary Service awards are on frequency responsive capacity.	https://www.ercot.com/mktrules/puctDirectives/kp1p3
Low Frequency Responsive Capacity Limit	MW	Low limit of the Resource's capacity that is frequency responsive, used in SCED to ensure frequency responsive Ancillary Service awards are on frequency responsive capacity.	https://www.ercot.com/files/docs/2023/09/01/2_refresher-on-real-time-co-optimization-key-principles-rtcbtf-090823_v2.pptx
Frequency Responsive Capacity Factor		Maximum amount of total Base Point provided by the frequency responsive capacity of the resource, used in SCED to ensure frequency responsive Ancillary Service awards are on frequency responsive capacity.	2. RTCBTF refresher, as presented in RTCBTF on 9/7/2023 3. NPRR1010 6.5.5.2(2) (j)&(o)

Resource level telemetry from ERCOT to QSEs

Telemetry	Unit	Description	
Regulation Up Award	MW	Regulation Up award from each SCED execution.	1. RTC Key Principle 1.3 https://www.ercot.com/mktrules/puctDirectives/kp1p3 2. RTC Key Principle 1.5 https://www.ercot.com/mktrules/puctDirectives/kp1p5 3. RTCBTF refresher, as presented in RTCBTF on 9/7/2023 https://www.ercot.com/files/docs/2023/09/01/2_refresher-on-real-time-co-optimization-key-principles-rtcbtf-090823_v2.pptx 4. NPPR1010 6.5.7.4.1 5. NPPR1010 6.5.7.6.2.1 (8) (9) & (10) 6. NPPR1010 6.4.9.1.1
Regulation Down Award	MW	Regulation Down award from each SCED execution.	
RRS-PFR Award	MW	RRS-PFR award from each SCED execution.	
RRS-FFR Award	MW	RRS-FFR award from each SCED execution.	
RRS-UFR Award	MW	RRS-UFR award from each SCED execution.	
ECRS Award	MW	ECRS award from each SCED execution.	
Non-Spin Award	MW	Non-Spin award from each SCED execution.	
UDSP	MW	UDSP = Base Ramp + Regulation Instruction; Base Ramp will be a 4-min ramp to the new Base Point, starting MW of the Base Ramp is expected MW output of the resource using previous Base Point and last Resource specific Regulation Instruction from LFC. Ending MW of the Base Ramp is the new Base Point.	
Regulation Up Instruction	MW	The calculated system level Regulation Up requirement will be allocated to each resource proportionate to their Regulation Up awards and Resource limits. This telemetry is information only, Resource level Regulation Up Instruction is included in UDSP.	
Regulation Down Instruction	MW	The calculated system level Regulation Down requirement will be allocated to each resource proportionate to their Regulation Down awards and Resource limits. This telemetry is information only, Resource level Regulation Down Instruction is included in UDSP.	
ONSC RRS/ECRS Deployment Instructions		Resource level RRS and ECRS deployment instructions from ERCOT for the Resources that have RRS or ECRS awards	
RRS-FFR Deployment Instruction		Resource level RRS and ECRS deployment instructions from ERCOT for the SCED dispatchable Resources that have RRS-FFR awards.	

Other telemetry from ERCOT to QSEs

Telemetry	Unit	Description	
MCPC for Regulation Up	\$/MW	System wide market clearing price for capacity for Regulation Up	1. RTC Key Principle 1.5 https://www.ercot.com/mktrules/puctDirectives/kp1p5 2. RTCBTF refresher, as presented in RTCBTF on 9/7/2023 https://www.ercot.com/files/docs/2023/09/01/2_refresher-on-real-time-co-optimization-key-principles-rtcbtf-090823_v2.pptx 3. NPPR1010 6.5.7.3
MCPC for Regulation Down	\$/MW	System wide market clearing price for capacity for Regulation Down	
MCPC for RRS	\$/MW	System wide market clearing price for capacity for RRS	
MCPC for ECRS	\$/MW	System wide market clearing price for capacity for ECRS	
MCPC for Non-Spin	\$/MW	System wide market clearing price for capacity for Non-Spin	