
 California ISO RC West	Reliability Coordinator Procedure	Procedure No. RC0120
		Version No. 5.4
		Effective Date 4/01/24
Guidelines for RC West IRO-010 Data Specification and Collection		Distribution Restriction: None

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Purpose

Provide guidance to applicable functional entities on expectations for provision of required data to the Reliability Coordinator (RC West) in order for the RC, to perform its Operational Planning Analyses, Real-time monitoring, and Real-time Assessments.¹

1. Responsibilities

- Balancing Authorities (BA)
- Transmission Operators (TOP)
- Reliability Coordinator (RC)


2. Scope/ Applicability

2.1. Background

NERC IRO-010-4 requires the RC to maintain a documented specification of the data necessary for the RC to perform Operational Planning Analyses, Real-time monitoring and Real-time Assessments; and provide these to applicable entities. The RC West data specifications are addressed within four documents:

1. RC0120A – RC West IRO-010 Data Specification:
 - Addresses specifications for forecast data, resource commitment data, power system modeling data, outage data, Real-time status (telemetry and ICCP) data, procedures and documentation.
2. RC0120B - RC West IRO-010 Data Specification for Adjacent RCs:
 - Addresses specifications for forecast data, resource commitment data, power system modeling data, outage data, Real-time status (telemetry and ICCP) data, procedures and documentation.
3. RC0120C - ICCP Data Request Procedure:
 - Addresses how to request real-time ICCP Data from the Western Data Sharing Pool (WDSP), which is hosted by RC West.
4. RC0130 - Notification Requirements for Real-time Events:
 - Addresses Real-time transmission and balancing area events and outages identified in the OPA or Real-time timeframes that require immediate notification to the RC operator by phone, BA/TOP Messaging Tool and/or RC West Outage Management System (OMS).

¹ IRO-010-4 R1, 1.1

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2.2. Scope

The guidance provided in this document covers data provision for items, which need further clarification, but does not list all items contained in RC0120A and RC0120B. The RC0120A and RC0120B attachments contain the detailed documented specifications for the data necessary for RC West to perform its Operational Planning Analyses, Real-time monitoring, and Real-time Assessments. The process for Western Interconnection Data Sharing Agreement (WIDSA) signatories to request real-time ICCP Data from the Western Data Sharing Pool (WDSP) is covered in RC0120C. The data requested within the RC0120A and RC0120B attachments includes, but is not limited to, non-BES and external network data, notification of current Protection System and Special Protection System status or degradation that impacts System reliability, real-time facility data, schedule type data, facility outage information and electronic modeling data.² The periodicity for providing data and the deadline by which the Responsible Party is to provide the indicated data are specified in the RC0120A and RC0120B attachments.³

Additional guidance provided within this document includes process expectations for mutually agreeable:

- Format
- Process for resolving data conflicts
- Security Protocol

2.3. Applicability


Although Responsible Parties designated in the RC0120A and RC0120B attachments are ultimately responsible for ensuring RC West receives the requested data, they can delegate data provision to another NERC Registered Functional Entity such as a Generator Owner, Generator Operator or Transmission Owner. This arrangement is permissible, provided the decision is mutual, i.e. both entities agree, and is documented and supplied to RC West via a CIDI ticket or an email to ISORC@caiso.com. Agreement can be documented via email or other supporting documentation. Such data submission arrangements do not absolve the Responsible Party listed in the RC0120A, RC0120B, and RC0120C attachments of its obligations.

Note: *RC0120B documents the arrangements between RC West and other RCs for data exchange and is not intended to change or increase obligations for RC West entities. Existing data exchange practices between RC West entities and other WECC RCs do not have to change, especially if the adjacent RC area is an adjacent BA or TOP area for your entity. RC0120B documents the minimum expectations, more data exchange, which is above and beyond the requirement, is normal.*

Each applicable entity that is required to provide data to RC West shall appoint at least one contact who is responsible for working with the RC in order to provide the requested data in the specified format. If applicable, contacts for each section are preferred. Entities should maintain their Data Exchange Working Group contact name(s), email address(es) and phone number(s) on the RC Portal Contact List. If a

² IRO-010-4 R1.2

³ IRO-010-4 R1.3, 1.4

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responsible entity does not have access to the RC Portal, then entities should notify RC West via email with their contact name(s), email address(es) and phone number(s) at ISORC@caiso.com.

Each applicable entity shall collaborate with RC West to satisfy the obligations of the documented specifications by using:⁴

- A mutually agreeable format,⁵
- A mutually agreeable process for resolving data conflicts,⁶ and
- A mutually agreeable security protocol.⁷

If normally established data transfer methods are unavailable for any reason, the responsible entity will provide information/ data via alternate methods until issues are resolved. It is expected that the RC and Responsible Parties will communicate and coordinate on which data is needed at particular times as well as a periodicity for providing updates until the normal data communication methods are back in place. The time sensitivity of the information or data, will dictate the urgency of the communications.

3. Procedure Detail

3.1. Format and Security Protocols

The specified formats and security protocols and protections, include the requirements in the currently effective NERC Standard CIP-012 and have been previously recognized as mutually agreeable. For the NERC Standard CIP-012-1, Requirement R1.3, RC West will protect Real-Time Assessment and Real-Time Monitoring data through either Transport Layer Security (TLS) encryption (for generation resource telemetry) or through network layer encryption applied at each California ISO Control Center connection to the Energy Communication Network (ECN). Each Generator Owner or Generator Operator will be responsible for maintaining digital certificates that provide for the TLS encryption of generation telemetry data exchange. Each RC customer will be responsible for applying network layer encryption at each of their Control Center connections to the ECN. In the event that a Generator Owner, Generator Operator or RC customer is unable to implement the aforementioned encryption practices, the parties may utilize other mutually agreeable protections to the transmission of Real-time Assessment and Real-time Monitoring data between Control Centers that satisfy the requirements in NERC Standard CIP-012-1.

The appointed contact person(s) shall notify RC West via a CIDI ticket submission or an email to ISORC@caiso.com of any instances where the specified formats or security protocols are not agreeable to the entity.


The methods and formats for the data items in the RC0120A and RC0120B attachments include: Inter Control Center Protocol Data (ICCP), system specific Application Programming Interfaces (APIs) and

⁴ IRO-010-4 R3

⁵ IRO-010-4 R3.1

⁶ IRO-010-4 R3.2

⁷ IRO-010-4 R3.3

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User Interfaces (UIs), secure system and website uploads, email, and real-time notification messages and phone calls.

The RC0120A and RC0120B attachments contain the specific data RC West requires from each Responsible Party and contains columns which denote the:


- Section – Used to help with sorting and filtering groups of items within the data specification
- Category – Used to arrange request items with shared characteristics
- Request Number (Req #) – Used for document coordination and communication purposes;
Note: RC West will continue to use the numbering convention established by Peak Reliability.
Note: For RC0120B, RC West will continue to use the numbering convention established by Peak Reliability with an “RC” prepended on each request number.
- Responsible Party – Applicable entity responsible for ensuring its data is being provided to RC West
- Data Item – Specific data being requested
- Data Transfer Method – Method by which data is provided to RC West
- Data Update Frequency – Periodicity for providing the specified data
- Data Request Effective Date – Date by which specified data is to begin being provided to RC West (If a request number has been retired, it will be documented by the word “retired”)
- Related NERC Standards – if applicable, related NERC standards
Note: includes key standards, but is not limited to this list)
- CAISO Guidance Document – if applicable, related process, procedure or technical specifications document

3.1.1. Section 1 - Real-Time Network Measurement Data

Real-time Analog and Status point data as detailed in the RC0120A and RC0120B attachments. The data provider must include data quality along with the data. This data quality shall follow the ICCP Data Quality Standards as described in the IEC ICCP User’s Guide (870-6-505).

If real-time ICCP data transfer is unavailable for any reason, the responsible entity will provide critical real-time system data via phone to the RC real-time desk. Data or data points that are considered critical may change based on current system conditions. It is expected that the RC and Responsible Parties will communicate and coordinate on which data is needed at a particular time as well as a periodicity for providing updates until the normal data communication methods are back in place.

These data items are intended to provide adequate data for RC West to properly monitor all BES Facilities, and other non-BES Facilities that may have an impact to the BES. RC West’s monitoring, state estimator and real-time assessment accuracy are negatively impacted if the necessary sub-100 kV systems are not in the network model with appropriate measurement availability.

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Measurement data that should be provided to RC West includes:

- Data associated with Facilities or equipment which are included in the Bulk Electric System (BES) definition, and
- Measurement data for non-BES Facilities/equipment that impact the BES, including but not limited to parallel sub-100 kV systems, as determined by the Transmission Operator (TOP) or by RC West as being necessary to support the accuracy of Operational Planning Analyses, Real-time monitoring and Real-time assessments or to determine SOL exceedance(s) on BES Facilities.

3.1.1.1. Req #s 1.9, 1.10 and 1.11

RC West's real-time measurement/ICCP request requires data to be made available, which already exists within the TOP's or Balancing Authorities (BA) SCADA system. This is not a request for the TOP or BA to install additional measurement devices in the field.

A RAS in service status may or may not be available via ICCP. If there are Real-time changes to the availability and indication is available via a Responsible Parties EMS, that value should be provided to RC West. If ICCP data is not available for RAS in-service status, other documentation or other information must be provided to be sure that RC West understands how the RAS is operated. See related Data Request items 5.10, 5.11, 6.18, 6.19.

An example of a RAS associated analog arming value is: X MW of generation is armed to be dropped, or Y MW of load is armed to be dropped.

3.1.1.2. Req # 1.13

RC West has functionality in the Energy Management System (EMS) to receive dynamic ratings in the following ways:

- Provide the dynamic equipment rating in MVA as an analog point via Real-time ICCP, and
- If temperature based, then also provide the actual temperature via Real-time ICCP

Dynamic Facility Ratings help ensure that RC West has the most accurate Facility Ratings in its situational awareness tools, thus reducing incorrect application results and unnecessary phone calls to entity operators.


3.1.1.3. Req # 1.14

This is only applicable for responsible entities with a stability limitation that the RC, in collaboration with the TOP, determines to require submission in Real-time.

3.1.2. Section 2 - Real-Time Balancing Authority Data

Real-time Analog and Status point data as detailed in the RC0120A and RC0120B attachments. The data provider must include data quality along with the data. This data quality shall follow the ICCP Data Quality Standards as described in the IEC ICCP User's Guide (870-6-505).

If real-time ICCP data transfer is unavailable for any reason, the responsible entity will provide critical real-time system data via phone to the RC real-time desk. Data or data points that are considered critical may change based on current system conditions. It is expected that the RC and Responsible Parties will

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communicate and coordinate on which data is needed at a particular time as well as a periodicity for providing updates until the normal data communication methods are back in place.

These data items are intended to provide adequate data for RC West to properly monitor impacts to WECC Interconnection frequency, to determine adequate Balancing Authority Contingency Reserve during potential or actual Capacity Emergencies, and to assist with SOL and IROL mitigation plans. RC West's monitoring and Real-Time Assessments are negatively impacted if the necessary information is not provided with appropriate measurements.

3.1.2.1. Req # 2.1

RC West uses NERC's definition for Net Energy for Load for BAA Load: Net Balancing Authority Area generation, plus energy received from other Balancing Authority Areas, less energy delivered to Balancing Authority Areas through Interchange. It includes BAA losses but excludes energy required for storage at energy storage facilities.

3.1.2.2. Req #s 2.2 – 2.3

Interchange used for Area Control Error (ACE) calculation.

Balancing Authority Operating Plans: See Req # 5.15

3.1.2.3. Req # 2.4

ACE used for NERC reporting requirements.


3.1.2.4. Req # 2.8

BA Contingency Reserve Obligation as defined in the NERC Glossary of Terms or, if the BA is part of a Reserve Sharing Group (RSG), the BA's allocated obligation as defined by the RSG.

Balancing Authority Operating Plans: See Req # 5.15

Note: for Reserve Sharing Group data, for the RSG totals and RSG zone totals, RC West will collaborate with the power pool representatives and its members on a separate data request, outside of the IRO-010 specification, for RSG type data to be sent via ICCP. For example:

- For the RSG totals:
 - The MSSC for the "Power Pool A" Reserve Sharing Group as a whole
 - The Contingency Reserve Obligation for the "Power Pool A" Reserve Sharing Group as a whole
 - The Contingency Reserve Available for the "Power Pool A" Reserve Sharing Group as a whole
- If applicable, the totals for each RSG zone:
 - The MSSC for each RSG zonal area within the "Power Pool A" Reserve Sharing Group
 - The Contingency Reserve Obligation for each RSG zonal area within the "Power Pool A" Reserve Sharing Group
 - The Contingency Reserve Available for each RSG zonal area within the "Power Pool A" Reserve Sharing Group

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3.1.2.5. Req # 2.10

The Most Severe Single Contingency (MSSC) value that is provided to RC West must be a Real-time value that captures the actual output of the generator that is the MSSC at any given moment. If MSSC calculations are being done based on other application results, such as Real-time contingency analysis, it is acceptable to provide the update at the frequency of the calculation. This is not a request for a Reserve Sharing Groups (RSG) MSSC.

3.1.2.6. Req # 2.11 – 2.13

It is acceptable to send BES and non-BES information, RC West does not expect the responsible entity to filter out resources less than 10 MW. 10 MW is provided as a threshold value.

3.1.2.7. Req # 2.14

This is not the anticipated energy on the tag, rather a real-time calculation of MWs associated with the Dynamic Schedule.

3.1.2.8. Req # 2.15

This is a real-time calculation of MWs associated with each pseudo tie used in ACE calculation. This is not an alternate method for inclusion in congestion management procedures.

Dynamic Schedules and pseudo ties are important for implementation in the Enhanced Curtailment Calculator, as well as for general awareness of MW flows associated with the dynamic transfers.

3.1.2.9. Req # 2.16

This is a single value – summation of all wind generation currently online. This value should represent wind generation at the BES level.


3.1.2.10. Req # 2.17

This is a single value – summation of all solar generation currently online. This value should represent solar generation at the BES level.

3.1.3. Section 3 - Forecast Data

Schedule type data as identified in the RC0120A and RC0120B attachments to be delivered electronically in accordance with the Data Update Frequency. For daily submission items, RC West will accept, but does not require, data ranges up to seven (7) calendar days. If the entity's data submission includes a range of dates and/or hours and thus the entity has less frequent submissions, this is allowable. RC West expects that if assumptions or inputs change for the previously submitted data, the responsible entity will submit an update.

If the entity is unable to provide the data in accordance with the requested Data Transfer Method and/or Data Update Frequency, please submit a CIDI ticket or send an email to ISORC@caiso.com. RC West's Operations Engineering and technical staff will work with each entity's staff as needed to achieve a mutually agreeable format including the method and frequency of submission.

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3.1.3.1. Req # 3.1 (retired)

RC West is retiring Data Item “Hourly BA Net Scheduled Interchange forecast through the end of the next calendar day”. RC West will obtain the data needed from WIT.

3.1.3.2. Req # 3.2

The total resources the Balancing Authority normally counts for its reserves could be leveraged to determine max "available" (Contingency Reserve Availability) for the next day. It is an estimate, and it may change in real-time, so for real-time updates, RC West will rely on the IRO-010 requirement 2.8 ICCP data.

3.1.3.3. Req # 3.3 – 3.4

Examples of load forecast submission: On Monday, a BA shall submit the hourly load forecast for Monday, Tuesday, Wednesday, Thursday and Friday. On Tuesday, a BA shall submit the hourly load forecast for Tuesday, Wednesday, Thursday, Friday and Saturday. As RC West will accept up to seven (7) calendar days, Tuesday’s submission could also include Sunday and Monday.

For hourly submissions, a BA can submit data every hour, or alternatively if data has been submitted for multiple hours, the BA can just resubmit updates if the forecast changes. RC West will accept whichever works best for the BA’s data submission process.

RC West validates forecasted load by comparing it to the actual load value provided via ICCP. BAs should be proactive and perform the same validation to ensure that RC West is receiving consistent and accurate load forecast data.


Balancing Authority Operating Plans: See Req # 5.15

3.1.3.4. Req #s 3.5, 3.8

NERC BES Definition of Generator inclusion: Generating resource(s) with gross individual nameplate rating greater than 20 MVA or gross plant/facility aggregate nameplate rating greater than 75 MVA including the generator terminals through the high-side of the step-up transformer(s) connected at a voltage of 100 kV or above. RC West requests that Balancing Authorities also include 20 MVA or aggregated 75 MVA generating resources, which are connected to distribution level facilities. Due to the impacts on the system, this data is needed for reliability studies. RC West will accept, but does not require resource modeling, data and schedules for resources 1 MW and above that are not BES.

Resource Dispatch MW: The average MW value corresponding to the expected output of the generator, or based on plant level configuration, during the forecast interval specified by the start / stop times. This value can represent a unit, a plant (set of units), a share of a jointly owned unit (JOU), or a set of plants aggregated (such as small units). Aggregations of units or plants should only be used when the fuel type is the same and when electrically connected in the same geographic region. Specific unit data is preferred over aggregations whenever possible. Positive values shall be submitted when units are generating, whereas negative values shall be submitted for consumption of power (such as motoring units, pumped storage, etc.)

Forecasts for jointly owned units (JOUs) or pseudo ties shall be submitted for each owner's share. If the resource is modeled as a Tie Generator (Dynamic Schedule), then the plant operator submits the whole

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plant output. If the unit is in an outage, the forecasted schedule shall be zero. For hourly submissions, a BA can submit data every hour, or alternatively if data has been submitted for multiple hours, the BA can just resubmit updates if the forecast changes. RC West will accept whichever works best for the BA's data submission process.

Balancing Authority Operating Plans: See Req # 5.15

3.1.3.5. Req # 3.6, 3.7, 3.9 – 3.12 (retired)

RC West is retiring multiple data items in Section 3. RC West will use daily submissions of hourly resource dispatches (req # 3.5) and hourly resource dispatches (req# 3.8) for its Operational Planning Analyses. RC West will calculate resource availability based on resource modeling data (req# 6.8.1) outages, which reduce resource availability. Per Section 5 Scheduled and Unscheduled Outage Information, RC West will accept derates and will assume the derate has been lifted when the outage ends.

3.1.4. Section 4 - Documentation and Procedures

Due to information security concerns, RC West prefers all documents are uploaded to the RC Portal secure site. An email address is provided for each data item, however emailing attachments for RC West to post may be subject to delays.

RC West will maintain acceptable use guidelines for the RC Portal. Only Balancing Authorities, Transmission Operators and neighboring Reliability Coordinators that have agreements with RC West will have access to the RC Portal secure content. Designated pages, tools and libraries, which are accessed through the RC Portal, will be further restricted to limit access to users with specific permissions.


3.1.4.1. Req #s 4.1, 4.2, 4.5

Plans, which require RC West review and/or approval, have a designated library for submissions to RC West to facilitate the review process – the Plan Review Submissions library. RC West will post feedback and review and/or approval letters in this same library, and will notify the applicable entity via email. All entities have access to the Plan Review Submissions library, but visibility to the review documentation is limited to RC West and the responsible entity, which owns the document. All users associated with the responsible entity will have access to the Plan Review Submissions library.

RC West will work with responsible entities to establish a mutually agreed, predetermined annual submission schedule for EOP-005-3 System Restoration Plans. Emergency Operations Plans (EOP-011-1) and Geomagnetic Disturbances Operating Procedures (EOP-010-1) can be submitted for RC review as needed anytime those documents are updated and/or in accordance with the responsible entity's review schedule.

3.1.4.2. Req #s 4.3, 4.4, 4.6 – 4.8

The responsible entity's procedure, protocol, plan and guideline type documentation will be uploaded to the BA/TOP Procedure library anytime the document is updated. The user uploading the document has the option to restrict visibility to operationally affected parties. For example, when a user uploads an updated EOP-008 Loss of Control Center Functionality document, they have the option to share with all

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entities with access to the secure site BA/TOP Procedure library OR they may select specific entities to share with such as their neighboring BAs and TOPs and adjacent RCs. RC West and California ISO BA and TOP have access to all documents by default.

Users with access to the BA/TOP Procedure library are able to maintain subscriptions for change notifications. When sharing documents with other parties, if the responsible entity's business practice is to maintain an email audit trail, then after uploading updated document(s) to the BA/TOP Procedure library, RC West recommends sending an email notification to operationally affected entities with a link to the RC Portal location.

If the filenames of the Section 4 documentation do not change with each update, the user uploading the document can update the associated metadata with each upload (e.g. title, effective date, version, operationally affected parties).

3.1.4.3. Req # 4.9

In accordance with the RC's SOL methodology, the templates in the SOL Methodology library must be used. These include:

- Stability Limits Communication – TEMPLATE
- System Voltage Limits – TEMPLATE
- Always Credible Multiple Contingencies – TEMPLATE

The Operations Planning Engineers use this information to determine if there are any exceptions, which fall out of the normal BES definitions as this, may drive the need for additional modeling or data. This could influence outage studies as well as contingency monitoring. If there are particular facilities, which are in question, the TOP shall coordinate with the Operations Planning team.

3.1.5. Section 5 - Scheduled and Unscheduled Outages

The Outage Management System (OMS) is the primary mechanism for required outage submittals. OMS has a web user interface for easy data entry. Submissions can be automated via a Web Services API by working directly with the system vendor. RC West will maintain the webOMS manual, training and OMS technical specifications.


Scheduled and unscheduled outages are to be submitted in accordance with the RC West RC0630 Outage Coordination Process.

3.1.5.1. Req # 5.1, 5.16

Refers to outages on Facilities/equipment identified in the In-Scope Outage Categories section of the RC West Outage Coordination Process. Request 5.1 includes operating limitations listed in IRO-010-4 R1.3.1.

3.1.5.2. Req # 5.2

Derates should be submitted to OMS per the instructions of the webOMS manual, and in accordance with the Short-Range Study Window Submission Timeline specified in the RC West Outage Coordination Process.

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3.1.5.3. Req # 5.3

Derates shall be submitted to OMS per the instruction of the webOMS manual.

3.1.5.4. Req # 5.5


If a resource contains multiple generating units under it (aggregated per req # 6.8.1), then a note regarding which units are affected can be included in the outage card description field. In this case, additional separate outage cards are not needed for individual physical resources.

3.1.5.5. Req # 5.7 – 5.9

RC0630 Outage Coordination Process requires the responsible entity provides TTC information if it is part of an operating plan. The seasonal TTCs and any outages, which reduce those TTCs, are included in a daily report to WECC for defined paths. Paths currently required for submission are:

Path Name	WECC Path Number	Path Operator
Northwest – British Columbia	3	BPA
West of Cascades – North	4	BPA
West of Cascades – South	5	BPA
NWACI/Path 104	104	BPA
North of Hanford	N/A	BPA
Midway- Los Banos	15	CISO
Northern – Southern California	26	CISO
CFE_BG	45	CISO
West of Colorado River (WOR)	46	CISO
Lugo – Victorville 500 kV	61	CISO
COI	66	CISO
CASI	Multi	CISO
Idaho - Northwest	14	IPCO
Intermountain Power Project DC Line	27	LADWP
Pacific DC Intertie	65	LADWP
TOT 2C	35	NEVP
Montana - Northwest	8	NWMT
Idaho – Montana	18	NWMT
Montana Southeast	80	NWMT
TOT 4A	37	PACE
TOT 4B	38	PACE
TOT 2B1	78	PACE

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Path Name	WECC Path Number	Path Operator
TOT 2B2	79	PACE
Bridger West	19	PACW
NW-WA IROL	Multi	N/A – RC West
Oregon export IROL	Multi	N/A – RC West

Note: this list is subject to change; reference the Path Limit Calculator (PLC) tool for the most up-to-date list.

3.1.5.6. Req #s 5.10 – 5.11

Telemetry and Control Equipment: RC West is requesting data necessary to facilitate Real-time Assessments and Operational Planning Analyses. Equipment in this category includes, but is not limited to, ICCP, SCADA and RTUs. When reporting this type of equipment to RC West, consider the effect the equipment has on the ability to perform assessment or analysis.

For example, has the equipment caused or does the equipment include one of the items below:


- Loss of operator ability to remotely monitor or control BES elements,
- Loss of communications from multiple SCADA Remote Terminal Units (RTUs),
- Unavailability of ICCP links, which reduces BES visibility,
- Loss of the ability to remotely monitor and control generating units via AGC, or
- Unacceptable state estimator or real-time contingency analysis solutions

Outages do not need to be reported where redundant or backup equipment remains in service and is not jeopardized by the work being performed. Isolated, individual RTU outages are not required to be reported; however, RC West accepts the use of ICCP quality codes as a means of reporting if desired. If the entity does not have the ability to provide ICCP quality codes, a Grid Messaging System (GMS) message will suffice.

3.1.5.7. Req # 5.15

Balancing Authority Operating Plans: NERC Standard TOP-002-4 R7 requires each Balancing Authority to provide its Operating Plan for next day operations identified in TOP-002-4 R4 to its Reliability Coordinator. Given the four requirements TOP-002-4 R4 needs to address, those same requirements are being fulfilled in this data request by items, 3.5 (R4.1), 2.2 and 2.3 (R4.2), 3.3 (R4.3), and 2.8 and 5.15. (R4.4).

Each Balancing Authority shall have an Operating Plan(s) for the next day that addresses several items, one of which is its Capacity and Energy Reserve requirements, including deliverability capability. Any deliverability constraints that may be identified that affect either the amount or location of Capacity or reserves should be provided. RC West requires constraints identified by next-day studies, not real-time operations. Typically, this is a transmission constraint or system limitation provided to the Balancing Authority by one of its Transmission Operators that results in a requirement that either reserves or

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capacity be procured in specific locations in order to ensure energy is deliverable upon a single Contingency.

3.1.6. Section 6 - System Network Modeling

The EMS Network Model updates will be provided through the Model Update Process. Model update details are in the RC0120A and RC0120B attachments and, unless otherwise specified, are required in accordance with the Full Network Model schedule posted on the RC Portal (additions, deletions or changes in energized equipment). If there are no network changes, then there is no need to submit updates.

At a minimum, RC West requires modeling data associated with Facilities or equipment, which are included in the Bulk Electric System (BES) definition, as well as data for non-BES Facilities/equipment that impact the BES. This includes, but is not limited to; parallel sub-100 kV systems as determined by the TOP or by RC West as being necessary to support the accuracy of Real-Time Assessments or to determine SOL exceedance on BES Facilities. Lack of this information in the RC West EMS Network Model leads to potential inaccuracies in advanced Real-time applications such as state estimation, Contingency analysis, and voltage stability.

Transmission operator is generally responsible for submitting updates to transmission facilities. However, the transmission operator may delegate data provision to another NERC Registered Functional Entity such as a Balancing Authority. This arrangement is permissible, provided the decision is mutual, i.e. both entities agree, and is documented and supplied to RC West via a CIDI ticket or an email to ISORC@caiso.com. Agreement can be documented via email or other supporting documentation.

3.1.6.1. Req # 6.1


Topology model changes must include the documentation, which supports the modeling process. Please refer to the RIMS User Guide for further details.

The model file for incremental updates may be submitted using one or more of the following Network Model Data Formats:

- CIM XML (Version 15 or 10)
- Non-CIM
 - PSSE
 - PSLF
 - PowerWorld
 - Model Report File (Excel)

Network model changes including the following equipment/facilities for generation and transmission changes:

- Circuit breakers, disconnects and switches: connectivity and normal status. Applicable for all equipment > 100 kV and other lower kV BES equipment.
- Transformers: connectivity, high/low side tap ranges and per-unit impedance. Applicable for all equipment > 100 kV and other lower kV BES equipment.

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- Shunt devices: connectivity, nominal Mvar. Applicable for all equipment > 100 kV and other lower kV BES equipment.
- Lines: connectivity, per-unit impedance and charging susceptance. Applicable for all equipment > 100 kV and other lower kV BES equipment.
- Series Capacitor/Reactor: connectivity and per-unit impedance. Applicable for all equipment > 100 kV and other lower kV BES equipment.
- HVDC Line: A one-line diagram that shows the entire configuration of the HVDC line including breakers/switches, converter transformers, DC poles, converters, DC lines (monopole or Bipolar, ground return or line return), as well as the following equipment parameters for both sides:
 - Converter Transformer:
 - 2 winding or 3 winding, nominal kV on each winding, R and X
 - Tap changer: lowest, highest, and nominal step number, step size, AVR status
 - DC Pole:
 - Regulation Schedule for Voltage, Current, and MW, including set point and deviation
 - Regulation type (on Voltage, MW or Mvar)
 - Converter:
 - X0 (Constant term of valve group reactance), X1 (First-order term of valve group reactance)
 - Amp rating, nominal kV, bridge number
 - Min and max extinction angle, min and max firing angle
 - DC Line:
 - R (positive sequence series resistance)
- Phase shifter: connectivity, per-unit impedance, phase tap range, nominal tap, impedance tables and step size in degrees. Applicable for all equipment > 100 kV and other lower kV BES equipment.
- Generators: connectivity, gross and net MW maximum and reactive capability curves (if no curve available, Mvar minimum and maximum required); List of units normally on AVR- a list shall include voltage set point(s) with High and Low range representing voltage regulation criteria.
- Loads: connectivity and conforming/non-conforming status. Please include default load Pfixed and Qfixed. RC West will utilize default load P & Q to calculate default power factor for each load bus in the model so that forecasted load can be applied accordingly in each BA. Instead of providing “power factor”, this can also be provided similar to submission to WECC base case (i.e., it can be submitted as default seasonal MW and Mvar load for each bus).

3.1.6.2. Req # 6.2-6.7, 6.9 (retired)

RC West is retiring Data Items 6.2 through 6.7 and 6.9 in order to consolidate all transmission modeling items into req# 6.1. Please see Section 3.1.6.1 for further details.

3.1.6.3. Req # 6.8.1

Responsible Party is listed as Transmission Operator or Balancing Authority. If the responsibility needs to be delegated to another NERC functional entity, this arrangement is permissible, provided the decision is mutual, i.e. both entities agree, and is documented and supplied to RC West via a CIDI ticket or an

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email at to ISORC@caiso.com. Agreement can be documented via email or other supporting documentation.

Data Item: The network model contains the physical generating resource and the Master File contains the aggregate resource. When an entity submits the Supplemental Generator Information Template (SGIT), this should include a definition of the aggregate and how it breaks down to the physical resources.

For resource forecasting (req # 3.5, 3.8) and resource outages, the resource definition from Masterfile is used. **Therefore**, if the Masterfile indicates aggregates, then RC-BSAP and webOMS expect transactions for the aggregate. For the outage example, the details of the impacts to the physical resources should be provided within the outage card.

Frequency: If the resource is already in the model, then this document can be processed in 10 business days. If the resource is not in the model or an existing resource is requesting a PMax increase greater than its nameplate rating, then it will be included with the model update timeline. The generator changes need to be submitted via the SGIT at least 10 business days prior to the change. If there is an urgent change, please upload the SGIT to RIMS and let us know via RDT@caiso.com. The change will be evaluated to see how quickly it can be implemented.

If you are an RC-WEIM customer, please submit the Generation Resource Data Template found in the Resource data submission section of the Network and Resource Modeling page on caiso.com.

3.1.6.4. Req # 6.10

Data should be provided in accordance with the model timelines. However if between model builds, then updates to transmission facility ratings can be submitted via outage card in accordance with RC West Outage Coordination Process.


This item includes thermal ratings for transmission equipment as well as normal and post-contingency voltage limits (kV) for all substation buses. The bandwidth for normal voltage limits must fall within the bandwidth of the post-contingency voltage limits. Special voltage limitations for abnormal operating conditions such as heavy or light demand may be specified.

For overload relay trip settings, if it set to less than or equal to 125% of highest emergency rating, then the emergency rating is reduced in the model to be lower. This is to ensure that the new highest emergency rating does not encroach 125%. For example, if an emergency rating were 100 MVA with a relay trip setting at 110 MVA, our model would be updated for $\frac{100 \text{ MVA}}{125 \text{ MVA}} * 110 \text{ MVA} = 88 \text{ MVA}$. The exception to this requirement is for RAS, which follows Req # 6.18.

3.1.6.5. Req # 6.11

This item is a list of all transmission and generation ICCP object ID available for the entity's area. It includes the SCADA definition relating to each object ID. The TOP-003 Reference Data library in the RC Portal contains the complete list for sharing.

Note: That this request is different from the ICCP SCADA template submitted to RIMS. The ICCP SCADA template is specific to the network model update and is included in 6.1 for incremental updates.

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3.1.6.6. Req # 6.12

This item includes transmission system network one-line indicating station-to-station connectivity, station names, and voltage levels – not just single stations. This item includes as-built diagrams to be shared with RC West and neighboring BAs and TOPs.

Note: This item is not for the single line drawings for each change to a construction project or related to a move program. For those requirements, please refer to req # 6.1 and the RIMS User Guide.

3.1.6.7. Req # 6.13

Data should be provided in a spreadsheet with a minimum of substation name (which matches name used for modeling), longitude and latitude. Not required, but if the entity also includes additional information such as locations of transmission towers and poles, this can help validate modeling for visualization tools such as weather and fire maps. Please refer to the RC Data Gathering Template and the RIMS User Guide for further details on submission.

3.1.6.8. Req # 6.14

Please refer to the RC Data Gathering Template and the RIMS User Guide for further details on submission.

3.1.6.9. Req # 6.16

Dynamic Schedules and pseudo ties are important for implementation in the Enhanced Curtailment Calculator, as well as for general awareness of MW flows associated with the dynamic transfers. A list of Dynamic Schedules and pseudo ties for each BA must be provided along with appropriate descriptions and purposes for the dynamic transfers.


3.1.6.10. Req # 6.17

Data that should be provided to RC West includes:

- Data associated with Facilities or equipment which are included in the Bulk Electric System (BES) definition, and
- Measurement data for non-BES Facilities/equipment that impact the BES, including but not limited to parallel sub-100 kV systems, as determined by the TOP or RC West to be necessary to support the accuracy of Real-time Assessments or to determine SOL exceedance on BES Facilities. This request is intended to provide adequate data for RC West to properly monitor all BES Facilities, and other Facilities that may have an impact to the BES. RC West's state estimator accuracy is negatively impacted if the necessary sub-100 kV systems are not in the RC West EMS Network Model with appropriate measurement availability.

Examples of applicable switching devices include those associated with:

- Transmission lines
- Transformers
- Series Compensation
- Station bus switches including auxiliary buses and bus tie switches

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- Shunt devices*
 - When shunt devices (such as shunt reactors or shunt capacitors) are normally available, the disconnect and breaker status should be modeled as normally closed. Additional information is required in accordance with request 6.15 to provide normal regulation status and voltage set points for each of the shunt devices.

3.1.6.11. Req # 6.23

The Equipment Long Name should be the facility name commonly used by the BA/TOP operators. These Long Names are shown in RC West applications such as webOMS and HANA, and are intended to help operators use common names for Transmission interface Elements and Facilities in their oral and written communications. All of the equipment that is modeled in the Western Interconnection network model needs to be included to the circuit breaker/disconnect level. Each Resource Description Framework Identifier (RDFID) needs a unique common name within the same substation.

3.1.6.12. Req # 6.25

RC West utilizes the EMS model to perform Real-Time Transient Stability Analysis. The dynamic model is also used for the model validation under the MOD-033. RC West has noticed that WECC published base case are often not matching with the EMS cases that BA/TOP send to RC West. RC West is requesting that when BA/TOP send EMS data, those EMS data is mapped to the dynamic data that it sends to WECC. This will ensure consistent model to be used for dynamic stability assessment. This data can be provided in the same GE PSLF format that is being submitted to WECC base case development. It is important to provide clear mapping between the EMS model to the GE PSLF dynamic model.

3.1.7. Other Operational Information

3.1.7.1. Req #s 7.1 – 7.5 (Retired) and new 7.6


RC West is retiring req #s 7.1 – 7.5 in order to reduce the duplication between RC0120A and RC0120B and the real-time procedures for the System Operators. See RC Operating Procedure RC0130 Notification Requirements for Real-time Events for full list of requirements. This procedure addresses real-time transmission and balancing area events that require immediate notification to the RC operator by phone, the Grid Messaging System (GMS) and/or RC West Outage Management System (OMS).

3.2. Process for Resolving Data Conflicts⁸

Data conflicts shall be resolved collaboratively whenever possible. RC West subject matter experts will collaborate with Operations Compliance and entities to reach resolution of any known data conflict.

Entities should notify RC West via a CIDI ticket or an email to ISORC@caiso.com immediately upon becoming aware of a data conflict. RC West will collaborate with the entity to resolve the conflict in a mutually agreeable manner that maintains RC West's ability to perform its Operational Planning Analyses, Real-time monitoring and Real-time Assessments.

⁸ IRO-010-4 R3.2

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3.3. Questions and Comments

RC West will work with each entity to address compliance questions and requests for clarification, or to address issues related to the technical nature of the data. All data specification inquiries should be sent to RC West via a CIDI ticket or an email to ISORC@caiso.com.

4. Supporting Information

Operationally Affected Parties

Shared with the Public and AESO RC, BC Hydro RC, SPP RC, and RC West BAs and TOPs.

References

NERC Requirements	IRO-010-4
BA/TOP Operating Procedure	
Other References	

Definitions


The following terms capitalized in this Operating Procedure when used are defined below:

Term	Description
None	


Version History

Version	Change	Date
1.0	Approved by Steering Committee.	1/23/19
2.0	Reviewed by RC West – Data Exchange Working Group (DEWG). Added new attachment RC0120B - RC West IRO-010 Data Specification for Adjacent RCs. Updated references to RC Portal, CIDI and RC West throughout document. Section 3.1.3.3 – req #s 3.5-3.12 – updated section name to only include remaining items (new since 5/17 draft). Section 3.1.4.1 – req #s 4.1, 4.2, 4.5 – updated references to Plan Review Submissions library.	7/01/19

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When downloaded or printed, this document becomes UNCONTROLLED.*

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Version	Change	Date
	<p>Section 3.1.5.4 – req # 5.5 – clarified submissions for aggregated resources.</p> <p>Section 3.1.6.1 – req # 6.8.1 - Clarification regarding responsible parties is added. This update is due to questions received from generators, and an inability for generators to submit via the specified methods. If special arrangements need to be made to allow for specific generator data submissions, contact RC West so those arrangements can be made.</p>	
2.1	<p>URGENT UPDATE for 11/1 –</p> <p>Section 3.1.5.5– req # 5.7-5.9 updated list included in the PLC tool. Added references to new appendix RC0120C.</p>	11/01/19
3.0	<p>Reviewed by RC West – Data Exchange Working Group (DEWG).</p> <p>Section 3.1.3.2 – req # 3.2 added.</p> <p>Section 3.1.3.4 – updated for clarity on applicability.</p> <p>Section 3.1.4.3 – req # 4.9 added.</p> <p>Section 3.1.5.5 – req # 5.7-5.9 updated for new Paths required for submission and listed that the PLC tool has the most up-to-date list.</p> <p>Section 3.1.6 – clarification added on applicability.</p> <p>Section 3.1.6.1 – req # 6.1 added, includes all topology changes.</p> <p>Section 3.1.6.2 – req # 6.2-6.7, 6.9 retired for consolidation to 6.1.</p> <p>Section 3.1.6.3 – req # 6.8.1 expanded for frequency clarification.</p> <p>Section 3.1.6.4 – req # 6.10 expanded for clarity.</p> <p>Section 3.1.6.5 – req # 6.11 expanded for clarity.</p> <p>Section 3.1.6.6 – req # 6.12 expanded for clarity on as-built diagrams.</p> <p>Section 3.1.6.7 – req # 6.13 expanded for clarity. Removed state and city.</p> <p>Section 3.1.6.8 – req # 6.14 added.</p> <p>Section 3.1.6.11 – req # 6.23 added.</p> <p>Errata Change: Reviewed changes with Data Exchange Working Group.</p>	1/01/20
4.0	<p>Section 3.1.6.1 – req # 6.1 expanded on default load for Pfixed and Qfixed values.</p> <p>Section 3.1.6.10 – req # 6.17 clarified for shunt devices.</p> <p>Section 3.1.6.12 – req # 6.25 added.</p> <p>Errata Change: Annual Review.</p>	6/26/20
5.0	<p>Annual Review:</p> <p>Section 3.1.5.5 – removed Path 49 with coordination with AZPS. Updated references of CAISO to RC West where applicable.</p> <p>Updated Operationally Affected Parties and Reference sections.</p> <p>Updated in coordination with AZPS.</p>	4/01/21
5.1	<p>Updated references of NERC IRO-010-2 to IRO-010-3.</p> <p>Section 3.1 - added supporting language for implementation of NERC Standard CIP-012.</p>	10/01/21
5.2	<p>Annual Review:</p> <p>Section 3.1 - added supporting language for implementation of NERC Standard CIP-012.</p>	4/18/22

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Version	Change	Date
	Section 3.1.2: Added purpose language. Section 3.1.3.4: Clarified forecast for split share units. Section 3.1.5.5: Removed Path 73 with coordination with BPA. Reviewed changes with Data Exchange Working Group on 3/9/2022.	
5.3	Annual Review: Updated references to IRO-010-4. Added to data request 5.1 for coverage of IRO-010-4 R1.3.1. Section 3.1.6.11 – defined RFID. Section 3.6.6.3: Updated from “RC-EIM” to “RC-WEIM”. Minor grammar and punctuation edits.	4/01/23
5.4	Annual Review: Updated NERC Standards references. Updated Section 3.1.5.5 path references. Minor formatting and grammar edits.	4/01/24

5. Periodic Review Procedure

Document Maintenance


The RC West Operations Compliance team will maintain this document as well as RC0120A and RC0120B. California ISO and RC West Subject Matter Experts (SMEs) are responsible to notify and collaborate with the Operations Compliance team whenever:

- Revisions to RC0120A, RC0120B, and RC0120C are required, or
- Issues arise regarding format, data conflicts or security protocol

The Operations Compliance team will collaborate with SMEs to correspond with entities, document, and approve any issues related to mutually agreeable format, data conflict resolution and security protocols.

This RC0120 guidance document (both clean and redline versions) will be posted whenever changes occur. Minor changes will be noted by decimal version changes. (I.e. correcting a spelling error would change the version from 12.2 to 12.3). Periodic reviews and major changes will be noted by whole number version changes. (I.e. A new item would change the version from 12.2 to 13.0). RC0120, RC0120A, RC0120B, and RC0120C will each maintain a version history section.

Operations Compliance will collaborate with the RC West Data Exchange Working Group (DEWG) when there are potential updates to the IRO-010-4 documentation. Updates will generally include at least two comment periods. Major updates with potential impacts to processes, procedures and tools will start engagements with DEWG as early as possible in order to allow sufficient time to implement. Major updates may need Task Forces, which work collaboratively across multiple RC West Working Groups. RC West will work with DEWG and other working groups to address urgent changes due to NERC Alerts or other requirements, which require rapid implementation.

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The RC West distributes this document and the associated RC0120A, RC0120B, and RC0120C attachments to applicable entities by posting on the www.caiso.com website and in the RC Portal Procedure library and then providing an email notification.

Review Criteria & Incorporation of Changes

There are no specific review criteria identified for this document.

Frequency

RC0120, RC0120A, RC0120B, and RC0120C will be reviewed at least once annually.

Appendix

RC0120A RC West IRO-010 Data Specification

RC0120B RC West IRO-010 Data Specification for Adjacent RCs

RC0120C ICCP Data Request Procedure