

Business Requirements Specification

Hybrid Resources Phase 2C

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Revision History

Date	Version	Description
3/7/2022	1.3	<p>Updated language for the following BRQs: H.MACC BRQ035, H.MACC BRQ105, BRQ246, BRQ466, BRQ475, BRQ510, BRQ515, BRQ531, BRQ532, BRQ535, BRQ542, BRQ544, BRQ550, BRQ555, BRQ850 (market sim), BRQ831, BRQ832, BRQ975.</p> <p>Added BRQs: BRQ506, BRQ1005.</p> <p>Deleted BRQ: BRQ525, covered in new implementation note for BRQ515.</p> <p>RIMS requirements moved from Phase 2B to Future Phase (specifics to be updated in future External BRS V1.4).</p> <p>Note: All updates to V1.3 are reflected in red.</p>




Date	Version	Description
8/03/2022	1.4	<p>Updated language in the following BRQs: H.MACC-BRQ015, BRQ125, BRQ130, BRQ156A, BRQ160, BRQ175, BRQ245, BRQ350A, BRQ446, BRQ461, BRQ515, BRQ530, BRQ535, BRQ595, BRQ625, BRQ833,</p> <p>Added BRQs: BRQ156B, BRQ350B, BRQ996, BRQ1010, BRQ1020, BRQ1030, BRQ1040, BRQ1110, BRQ1120, BRQ1130, BRQ1170, BRQ1180</p> <p>Deleted BRQ: H.MACC-BRQ005 (duplicate of 010)</p> <p>Market Sim identifier updated from “BRQ” to “MKT” (see section 4.2.10)</p> <p>Note: All updates to V1.4 above are reflected in red.</p> <p>For RIMS BRQs in Phase 2B see sections 4.4.1, and 4.4.2.</p> <p>For RIMS BRQs in Phase 2C see section 4.5.</p>




Date	Version	Description
8/24/2022	1.5	<p>Updated BRQs: 045, 050, H.MACC – 065, H.MACC – 070, 170, 180, 825, 830, 1120.</p> <p>Added BRQs: 1200.</p> <p>Deleted BRQs (Internal items only): 590, 1010, 1020, and 1030.</p> <p>Updated Phasing for the following BRQs from Phase 2B to Phase 2C: 145, 345, 240, 255, 155, 350A, 245, 290, 260, 370, 375, 200, 205, 210, 220, 104, 097, 230, 265, 270, 280, 295, 310, 315.</p> <p>For RIMS BRQs in Phase 2B see sections 4.4.1, and 4.4.2.</p> <p>For RIMS BRQs in Phase 2C see section 4.5.</p>
10/14/2022	1.6	<p>Updated BRQs: BRQ080 (updated from BRQ195), BRQ1110, BRQ580</p> <p>Deleted BRQs (Internal items only): H.MACC-BRQ020</p> <p>Note: All updates to V1.6 above are reflected in red.</p>



Date	Version	Description
01/18/2023	1.7	<p>Updated BRQs: 135, 140, 165, 320, 535, 800, 811</p> <p>BRQs moved from Phase 2B to 2C: 190, 077, 079, 1170, 225, 100, 235, 103, 240, 250, 139, 305, 300, 320, 142, 141, 125, 330, 156A, 355, 365, 195, 360, 380, 385, 390, 991. Today's Outlook BRQs moved to Section 4.5.2.</p> <p>Added BRQs: 1240, 1241, 1263</p> <p>Note: All updates to V1.7 are reflected in red.</p>
8/16/2023	1.8	<p>Updated Today's Outlook and MPP reporting requirements in Phase 2B to Section 4.4.3.</p> <p>Updated the following Phase 2C BRQs: 215, 225, 103, 240, 265, 139, 290, 310, 141, 100, 235</p> <p>Added the following Phase 2C BRQs: 108, 1307</p> <p>Added Market Sim section 4.8: Added MKT-003, MKT-004</p> <p>Note: All updates to V1.8 are reflected in red.</p>

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Date	Version	Description
12/21/2023	1.9	Added Market Sim: MKT-005, MKT-006, MKT-007, MKT-008. Note: All updates to V1.9 are reflected in red.

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1 Introduction

This business requirements specification (BRS) supports the Hybrid Resources Phase 2 project.


1.1 Purpose

The ISO launched this stakeholder initiative to identify new or enhanced market rules and business processes needed to accommodate hybrid resources, resources that consist of two sets of market rule changes that will facilitate mixed-fuel type (*hybrid and co-located resources*) project participation in the ISO markets.

Prior to this initiative, Phase 1 identified a first set of modifications generally concerned with setting up and operating co-located resources, which was approved by the ISO Board of Governors in July 2020 and implemented on December 1, 2020.

Building on phase 1, Phase 2 focuses on modifications that will explore how hybrid generation resources can be registered and configured to operate within the ISO market. The initiative will further develop solutions allowing developers to maximize the benefits of their resource’s configuration. Additionally, hybrid resource configurations also raise new operational and forecasting challenges that the ISO plans to address during this initiative.


For an in-depth initiative background, reference the publically available Revised Final Proposal. <http://www.caiso.com/InitiativeDocuments/RevisedFinalProposal-HybridResources.pdf>

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2 Details of Business Need/Problem

2.1 Description


Business Opportunity/Problem Statement:	
What:	Interest in energy storage is significant and growing as state and federal policy makers and regulators support energy storage development to help decarbonize the grid.
When:	Refer to RUG slides for updated timeline for each phase.
Why do we have this opportunity/problem:	Currently the interconnection queue includes a significant volume of mixed fuel projects.

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3 Business Impacts

3.1 Business Practice Manuals (BPM)

BPM	Description of Impact(s)
BPM Change Management	No impact
Candidate CRR Holder Registration	No impact
Compliance Monitoring	No impact
Congestion Revenue Rights	No impact
Credit Management and Market Clearing	No impact
Definitions & Acronyms	No impact
Demand Response	No impact
Direct Telemetry	Impacts: <ul style="list-style-type: none"> • Update for Hybrid resources providing telemetry data for all VER components • Updates to add clarifications to what MPs will need to submit for hybrid resources and the underlying VER components • Potential change for the High Sustainability Limit (HSL) changes.
Distributed Generation for Deliverability	No impact
Energy Imbalance Market (EIM)	No impact
Generator Interconnection and Deliverability Allocation Procedures	No impact
Generator Interconnection Procedure (GIP)	No impact
Generator Management	No impact
Managing Full Network Model	No impact
Market Instruments	Impacts: <ul style="list-style-type: none"> • Attachment B: update for new NGR type and master file characteristics • Potential change for the High Sustainability Limit (HSL) changes • Identification of VER components • Dynamic Limit
Market Operations	Impacts:


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BPM	Description of Impact(s)
	<ul style="list-style-type: none"> • Update for new NGR type and master file characteristics • Potential change for the High Sustainability Limit (HSL) changes • Identification of VER components • Hybrid and co-located resources must be able to bid and be awarded AS • Dynamic Limit
Metering	Meter data is required at the component level for both ISOME and SCME.
Outage Management	No impact
Reliability Coordinator Services	No impact
Reliability Requirements	No impact
Rules of Conduct Administration	No impact
Scheduling Coordinator Certification and Termination	No impact
Settlements and Billing	Settlements shall exempt Hybrid Resources from being assessed RAAIM settlement.
Transmission Planning Process	No impact

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3.2 Other

Impact	Description (optional)
Market Simulation	Market simulation is needed for Market/SIBR, Master File, and Settlement changes along with forecasting changes that will be seen on CMRI.
Market Participant Impact	Market participants will be impacted due to the creation of the new unit type: hybrid resources.
User Acceptance Testing (UAT)	UAT is required on the new Dynamic Limit functionality as well as for the forecasting changes.
Internal Training	Internal training required for the new Dynamic Limit Tool and the new unit type, which is different than the existing NGR model. Internal training is also needed for the forecast changes.
External Training	External training is required for the hybrid resource unit type and new SIBR rules along with the Master File elections and new Dynamic Limit Tool.
Policy Initiative	Yes
Vendor	<ul style="list-style-type: none"> • <i>Siemens</i> work for SIBR, IFM/RTM, EMS • <i>Forecast Service Providers (FSP)</i>: will be impacted by the identification of VER components and how they're used by the Forecasting team and the settlement of only the forecasting fee.
Architectural Framework and Roadmap	This project will follow the recommendations as aligned within the architecture definition (AD).

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4 Business Requirements

The sections below describe the Business processes and the associated business requirements involved in the project. These may represent high-level functional, non-functional, reporting, and/or infrastructure requirements. These business requirements directly relate to the high-level scope items determined for the project.

4.1 Phase 2-A – A/S and HSL – Fall 2021


4.1.1 Business Process: N/A

4.1.1.1 Business Requirements


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ001	The System shall be able to receive the high sustainable limit (HSL) via telemetry for each co-located VER and VER component of a hybrid.	Core	EMS
HRp2-BRQ005	At the 10-second interval, the System shall receive the high sustainable limit (HSL) value at the amount that the resource is capable of producing regardless of other constraints; e.g., POI. Implementation Note: Based on current ambient conditions, the HSL should be the full MW capability. For example: The MW output of a site’s individual resource should be based on the total number of solar panels or wind turbines installed.	Core	EMS
HRp2-BRQ010	For Co-located Resources: If Telemetry of all co-located resources behind each ACC plus AS awards of all resources behind each ACC is greater than the ACC limit, the System shall subtract the amount exceeding the ACC limit from the available AS in EMS.	Core	EMS



HRp2-BRQ015	For hybrid resources: If Telemetry of the Hybrid Resources plus AS awards is greater than the Dynamic limit, the System shall subtract the amount exceeding the Dynamic limit from the available AS in EMS for that Hybrid Resource.	Core	EMS
HRp2-BRQ020	When a co-located battery has an AS award, the System shall account as available AS no more than two times the available state of charge (SOC). Example 1: Battery has 10 MW Spin award, it needs to maintain a SOC of at least 5 MWH. Anytime the SOC drops below 5 MWH the available Spin needs to be reduced. If storage resource has 10 MW award and only has a SOC of 4 MWH, EMS can only count 8 MW of Spin.	Core	EMS
HRp2-BRQ340	The System shall publish the high sustainable limit (HSL) with a quality flag to downstream systems.	Core	EMS
HRp2-BRQ345	The System shall publish all hybrid resource data points to downstream systems.	Core	EMS
HRp2-BRQ970	The System shall sum up the state of charge per ACC limits for all storage resources .	Core	EMS
HRp2-BRQ975	The System shall receive the Effective ACC Limits from RTD. Note: See BRQ532 for more information.	Core	EMS
HRp2-BRQ950	The System Resource Monitor’s new “Co-located Resources” user interface shall be presented (formatted) similar to the existing Generation Data display that will includes	Core	EMS

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	<p>columns: OMS Availability, Resource ID, SCID, Fuel Type, ACC ID, ACC Name, effective ACC Limit, Injection (Positive) and withdraw (negative) ACC Limit, and any current column that is displayed on the 'Gen Data' display.</p> <p>If the sum of the resources telemetry belong to ACC group is positive then use Injection limit as effective limit. Otherwise use withdrawal limit.</p> <p>Business Rule 1: The UI will default to show a single row for each ACC with all available data as columns.</p>		
HRp2-BRQ955	<p>For each ACC constraint, the System Resource Monitor's new "Co-Located Resources" user interface shall display a user selectable option that when selected, will expand to show all co-located resources for the ACC constraint.</p>	Core	EMS
HRp2-BRQ960	<p>The System Resource Monitor's new "Co-Located Resources" user interface shall display a user selectable 'show all' option that when selected, will expand to show all child resources by Resource ID.</p> <p>Business Rule: In line filters will work for child resources when expanded.</p>	Core	EMS

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4.1.2 Business Process: Manage Real Time Hourly Market (RTPD)

4.1.2.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ020	<p>The System shall receive the high sustainable limit (HSL) with a quality flag from EMS.</p> <p>Implementation Note: EMS will send HSL limits by resource ID: a one-to-one relationship between the resource and HSL.</p>	Core	RTD
HRp2-BRQ025	<p>For EIRs, VERs, including those associated with Co-Located, and/or hybrid resources, with an AS award, the System shall set the FOLLOW_DOT flag as "Y."</p> <p>Implementation Note: When the Follow_DOT flag is Y, the resource will be on ALFS forecast with Enh.</p>	Core	RTD
HRp2-BRQ446	<p>For co-located resources, when any resource within a standalone ACC has an AS award, the System shall set the FOLLOW_DOT flag to "Y" for all VERs behind the ACC.</p> <p>Implementation note: This requirement is updated to be restricted to standalone ACC (i.e., a Master ACC without Sub-ACC). Reference BRQ1005 for handling Sub and Master ACC.</p>	Core	RTD
HRp2-BRQ030	<p>When the Follow_DOT flag is Y for co-located resources as per BRQ446, the System shall display the Follow DOT flag internally and externally.</p> <p>Reference BRQ 445</p>	Existing	ADS




HRp2-BRQ035	Existing logics of Persistent Forecast, FOLLOW_DOT, and Operating Instruction shall still be applied to VER.	Existing	RTD
HRp2-BRQ460	The System shall have activation flags by unit type (wind and solar) to use HSL data for persistent forecast logic.	Core	RTM
HRp2-BRQ040	If HSL is not available, the System shall fall back to use telemetry for the persistent forecast.	Core	RTM
HRp2-BRQ465	The System shall automatically identify stale HSL data in the market and switch off persistence to external FSP (ALFS) Forecast. Implementation Note 1: Stale HSL is defined as 15 minutes of repeated actuals.	Core	RTM
HRp2-BRQ045	Within the existing ACC Schedules / RTD screen, the System shall display the 'Follow DOT' flag and ancillary services (AS).	Core	RTD
HRp2-BRQ509	If the System has used the HSL in place of telemetry in the persistent forecast logic to replace the upper and/or lower economic limits submitted in the clean bid, the System shall send the revised clean bid to downstream systems as a final bid, in lieu of the clean bid.	Existing	RTD, RTDD, RTCD
HRp2-BRQ050	For EIRs with an AS award, the System shall switch the resource off persistent forecast logic only when no good HSL data is available and set the FOLLOW_DOT flag as Y.	Core	RTM
HRp2-BRQ055	When the HSL feature is activated and the HSL data quality flag equals 'Y', the System shall use the HSL data to update the persistent forecast logic, regardless of the Follow DOT Flag, in replace of telemetry data.	Core	RTM



HRp2-BRQ060	When the HSL feature is activated and the HSL data quality flag equals 'N', the System shall apply the existing persistent forecast logic. Implementation Note: A new quality flag will be used for HSL.	Core	RTM
HRp2-BRQ065	When the HSL feature is not activated, the System shall apply the existing PF logic to EIR and VERs.	Core	RTM
HRp2-BRQ070	The System shall continue to include the AS award in the supplemental dispatch value as it is currently done today.	Existing	RTM
HRp2-BRQ075	The System shall validate that ACC constraints include energy, AS, and FRU/FRD as follows: $\sum_{i \in S} (EN_i + RU_i + SR_i + NR_i + FRU_i) \leq UL$ $\sum_{i \in S} (EN_i - RD_i - FRD_i) \geq LL$ Notation: EN = Energy RU = Regulation up RD = Regulation Down SR = Spinning Reserve NR = Non spinning reserve FRU = Flex ramp up FRD = Flex ramp down UL = Upper Limit LL = Lower Limit	Existing	RTM
HRp2-BRQ545	The System shall publish the shadow prices for ACC constraints in IFM to downstream systems.	Core	DAM




HRp2-BRQ546	The System shall not publish the shadow prices of ACC constraint for NPM BAAs; Only applicable to the MPM pass.	Core	DAM
HRp2-BRQ547	The System shall publish the shadow prices for ACC constraints in RTM to downstream systems.	Core	RTM
HRp2-BRQ549	When publishing the market clearing, the System shall publish the ACC as a scheduling constraint with a scheduling constraint type equal type equal to Aggregate Capability Constraints, the scheduling limit as the MW limit of the constraint, the shadow price as the shadow price of the constraint, the MRID is the ACC name, and the scheduling limit direction as 'Upper' and 'Lower'.	Core	RTM
HRp2-BRQ532	<p>The System shall include effective ACC limits in the existing payload for transmission limits for binding intervals in RTD as a resource group and broadcast to downstream systems.</p> <p>Implementation Note 1: The resource group is a new data element in the constraint clearing outcome XSD.</p> <p>Implementation Note 2: 'Effective ACC Limits' is what the Market is using in the run (can be MF or an override value).</p> <p>Implementation Note 3: Downstream systems include CMRI (BRQ811), MPP (BRQ830), and EMS (BRQ975).</p>	Core	DAM/RTM

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4.1.3 Business Process: TBD

4.1.3.1 Business Requirements


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ570	Similar to today’s EDAS telemetry non-compliance process, add HSL to the existing process.	Business Process	N/A
HRp2-BRQ575	The System shall send the FSPs AS Cleared and AS Dispatched information. Implementation Note 1: AS Cleared has a longer time horizon. Implementation Note 2: The requirement applies to both CAISO and EIM resources.	Existing	ADS

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4.1.4 Business Process: TBD


4.1.4.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ090	<p>The System shall use the existing FORECAST_SELECTION flag in combination with the new VER_NGR_FF flag to identify an NGR resource with a VER component that is using ISO forecast for calculating the forecast fee.</p> <p>Implementation Note: This requirement was brought forward from Hybrid Phase 1B.</p>	Existing	Settlements

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4.1.5 Business Process: Market/Business Simulation


ID#	Guidance on Market Participant Impacts	Source System	Reason for Potential Scenario
HRp2-BRQ095	Market Participant to check for the Must Follow DOT flag when any resource behind an ACC constraint has an AS award.	Market	Rule impact

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4.1.6 Business Process: Multiple ACC

4.1.6.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ100	Utilize the Master ACC methodology for sub-groups of Resource_IDs within a facility behind a given POI, not just at a POI level.	Business Process	Not applicable
HRp2-BRQ105	No Resource_ID can be in more than one (1) ACC, and there is no relaxation of it in the market. Note: The facility should still be installing a limitation scheme that limits the MWs that come from the facility to the POI.	Business Process	Not applicable
HRp2-BRQ110	Model the ACC constraints as a hard constraint that cannot be relaxed and ensure that the ACC limits combined with any Pmax value not under a ACC for a given generating facility is less than or equal to the POI limits.	Business Process	Not applicable
HRp2-BRQ968	The changes to the data in MF and RIMS to support Fall 2021 Multiple ACC implementation will need to be handled manually.	Business Process	Not applicable

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4.2 Phase 2-B – Spring 2022

4.2.1 Business Process: N/A

4.2.1.1 Business Requirements


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ395	<p>The System shall receive a hybrid resource’s attributes from the market participants to include the Component ID and VER component NGR flags in the RDT.</p> <p>Reference the Appendix for attributes that are viewable vs. those that are editable externally.</p>	Core	Master File
HRp2-BRQ400	<p>The System shall contain hybrid resource information and the hybrid component specific attributes.</p>	Core	Master File
HRp2-BRQ405	<p>The System shall treat all hybrid resources as NGR with fuel type as hybrid (HYBD).</p>	Core	Master File
HRp2-BRQ410	<p>The System shall ensure that all of the hybrid resource component effective dates match the effective date of the hybrid resource.</p>	Core	Master File
HRp2-BRQ415	<p>The System shall be able to store a hybrid resources minimum and maximum state-of-charge limit.</p> <p>Implementation Note: As part of the NGR model, this is existing functionality.</p>	Regression Test	Master File
HRp2-BRQ420	<p>The generator resource data template (GRDT) shall be updated to include resource or VER component attributes:</p> <ul style="list-style-type: none"> • VER_ID • LATITUDE_FF • LONGITUDE_FF • FUEL_TYPE • PI_MW_TAG_FF • MAX_GEN_FF • VER_NGR_FFFORECAST_SELECTION_FF 	Core	Master File



	<ul style="list-style-type: none"> • MIN_GEN_FF • MAX_CONT_ENERGY_LIMIT_FF • MIN_CONT_ENERGY_LIMIT_FF • ENERGY EFFIC_FF <p>Implementation note: Based on confirmation from policy, we can have multiple battery components for a hybrid, so we need to have the ability to model the battery specific data at the component level.</p>		
HRp2-BRQ425	The generator resource data template (GRDT) shall reflect all VER component attributes at the component-level are read-only.	Core	Master File
HRp2-BRQ430	The System shall support mapping a hybrid resource to individual VER components. Implementation Note: Renewable registration for VER components currently mapped to Resource ID will need further automation to map to individual VER component.	Core	Master File
HRp2-BRQ435	The System shall identify a hybrid resource component as dispatchable or not dispatchable. Implementation Note: This will occur at the Resources ID level and the VER component level.	Core	Master File
HRp2-BRQ440	The System shall store resource attributes that are required to associate hybrid resource components. Reference Appendix.	Core	Master File
HRp2-BRQ445	When adding a hybrid resource, the System shall set the 'MOO Qualified Flag' to "N"	Core	Master File
HRp2-BRQ450	Prior to project go-live, all existing hybrid resources shall be updated to the new hybrid resource format; that being, change the fuel type, create VER components, and map the VER components to the resource. Implementation Note: This is a one-time manual process to identify existing resources.	Core	Master File




HRp2-BRQ455	Hybrid resource components shall be assigned the new Resource Type of "COMP" Implementation Note: If any currently existing Hybrid Resources are converted (i.e., their FUEL_TYPE changes to 'HYBD') MCI will add 'COMP' at the same time.	Core	Master File
HRp2-BRQ461	The System shall validate that the dispatchability flag is set to 'N' for resources and components with fuel type of WIND or SOLR & 'HYBD' in the database tables.	Core	Master File
HRp2-BRQ465	The System shall validate that the dispatchability flag for a hybrid resource is set to 'N', if this flag for all the underlying components is 'N' based on their fuel type. If at least one component has the dispatchability set to 'Y', then this flag for the hybrid resource shall be 'Y'.	Core	Master File
HRp2-BRQ470	The System shall no longer restrict the FORECAST_SELECTION parameter to be the same for the components of a hybrid resource. <i>Implementation Note 1:</i> This parameter for the individual VER components are independent of each other. <i>Implementation Note 2:</i> There is no need to restrict the resource to ISO if there are more than one VER component.	Core	Master File
HRp2-BRQ475	For hybrid resources, the System shall only set the FORECAST_SELECTION parameter at the component level.	Core	Master File
HRp2-BRQ480	The System shall not allow Aggregate Capability Constraints (ACC) to be applied to pseudo tie resources or dynamic resources.	Core	Master File

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4.2.2 Business Process: N/A

4.2.2.1 Business Requirements


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ485	The System shall receive hybrid resource, component level telemetry data from the market participants as defined in the Direct Telemetry BPM.	Core	EMS
HRp2-BRQ969	The System shall sum up state of charge for all hybrid NGR component resources to create one total value.	Core	EMS
HRp2-BRQ935	The System Resource Monitor’s ‘Generation Data’ user interface shall display Co-Located Resources, the High Sustainable Limit (HSL), DOT flag, and the dynamic limit.	Core	EMS
HRp2-BRQ1241	<p>System (EMS) must receive the dynamic limit from SIBR.</p> <ul style="list-style-type: none"> • If EMS never receives dynamic limit from SIBR, EMS will use zero as default limit. • EMS will hold last valid limits received from SIBR incase payload is not received from SIBR <p>Note: This BRQ is in relation to BRQ1240.</p>	Core	EMS

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4.2.3 Business Process: Manage Real Time Hourly Market

4.2.3.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ490	<p>For each 5-minute interval, the System shall provide Scheduling Coordinators (SC) the ability to submit dynamic limits for hybrid resources and the System shall receive from the Scheduling Coordinators the dynamic limits as upper and lower economic limits for a rolling 6-hour window.</p> <p>Implementation Note: This capability is similar to how forecasts are captured for VERs.</p>	Core	SIBR
HRp2-BRQ495	The System shall perform basic dynamic limits validation of the Master File (MF) minimum and maximum operating limits.	Core	SIBR
HRp2-BRQ500	On a rolling 7-day basis, the System shall store the submitted dynamic limits.	Core	SIBR
HRp2-BRQ505	For each 5-minute interval, the System shall publish a resource's upper and lower economic limit to the real-time market for up to 60 intervals (5 hours total).	Existing	SIBR
HRp2-BRQ510	The System shall not allow the SCs to submit the VER forecast data for those resources that have elected "SC" for the FORECAST_SELECTION flag in Master File.	Core	SIBR

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HRp2-BRQ1240	<p>System (SIBR) must broadcast dynamic limits to both EMS and RTM. SIBR shall send a minimum of 12 intervals of data per resource (current interval plus 11 intervals in the future) in such a way as to cover at the very least the next trading hour. SIBR shall populate the dynamic limits as follows:</p> <ul style="list-style-type: none"> • If participant submitted a dynamic limit for a particular interval, System (SIBR) must utilize that value (or the most recently-submitted one if there were multiple submissions) as dynamic limit for said interval. • If a participant has <u>not</u> submitted a dynamic limit for a particular interval, System (SIBR) must utilize the economic bid limits as dynamic limits for said interval <p>Note: This BRQ is in relation to BRQ1241.</p>	Core	SIBR
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4.2.4 Business Process: Manage Real Time Hourly Market (RTPD)

4.2.4.1 Business Requirements


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
BRQ538	The System shall receive the SC submitted VER forecast data submitted to ALFS.	Core	RTM
HRp2- BRQ506	For 5min intervals whose dynamic limits are missing/unavailable, the system shall use the economic limits instead. Note: See BRQ535's Implementation Note 1 for how the FMM should handle missing/unavailable dynamic limit data.	Core	RTD
HRp2- BRQ515	The System shall display the hybrid resources' upper and lower dynamic limit for each interval in the market horizon on RTM and BAAOP. Implementation Note: This is a new user interface available internally and externally. For 5min intervals, the system shall display raw dynamic limits, as received by the market from SIBR. For 15min intervals, the system shall display the averages calculated as per BRQ535.	Core	RTM [RTD, RTPD, RTCD, STUC], BAAOP
HRp2- BRQ520	When consuming the dynamic upper/lower economic limits, the System shall use them in place of the upper/lower economic limits submitted in the clean bid. Implementation Note: If the lower limit is higher than the self-schedule, the lower limit will be used.	Core	RTD, RTPD, RTCD, STUC



HRp2-BRQ530	The System shall use the most restrictive LEL/UEL average value and rerates /derates.	Core	RTD, RTPD, RTCD, STUC
HRp2-BRQ535	The System shall consider the upper and lower dynamic limit as the average of the 5-minute data corresponding to the 15-minute interval for hybrid resources in a similar fashion as for VER forecasts. Implementation Note: for RTBS, the system shall also use the average of the 5min dynamic limit data as calculated above for hybrid resources in the bid range capacity and flex ramp sufficiency tests. BPM: Market Operations	Core	RTBS, RTPD, STUC
HRp2-BRQ992	In the real-time market, the Hybrid resources will be included in MPM. When consuming the dynamic upper/lower economic limits, the System shall consider them in the dynamic competitive path assessment, in the calculation of withhold capacity and supply of counter flow in the Market Power Mitigation (MPM) process.	Core	RTD, RTPD
HRp2-BRQ993	In the real-time market, hybrid resource bids are not subject to bid mitigation.	Core	RTM
HRp2-BRQ994	In the day-ahead market, the Hybrid resources will be included in Market Power Mitigation (MPM) process, but the bids are not subject to mitigation.	Core	IFM
HRp2-BRQ531	The System shall include ACC limits for DA and DA+1.	Core	DA Market

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	Implementation note: Do not publish the ACC limits that belong to PAC in NPM in the Day-Ahead Market (DA and DA+1).		
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4.2.5 Business Process: Publish ACC Constraint Shadow Prices


4.2.5.1 Business Requirements

Section 5.7.1 note for OASIS requirements: The activation of the ACC Constraint is controlled by the market.

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ540	The System shall receive the shadow prices of binding ACC constraints from DAM.	Core	OASIS
HRp2-BRQ541	The System shall receive the shadow prices of binding ACC constraints in the binding intervals from RTD and FMM. Implementation Note: This requirement is applicable to CAISO and EIM resources.	Core	OASIS
HRp2-BRQ542	The System shall publish the shadow prices of binding ACC constraints in DAM. Implementation Note: When receiving the market clearing, the System [OASIS] shall publish the ACC as a scheduling constraint with a scheduling constraint type equal type equal to Aggregate Capability Constraints, the shadow price as the shadow price of the constraint, scheduling constraint equal to ACC name, and constraint direction as “Upper” and “Lower.” Note: This shadow price will not inform locational marginal prices for applicable resources.	Core	OASIS
HRp2-BRQ543	The System shall not publish the shadow prices of binding ACC constraints in the NPM area in DAM. Implementation Note: System shall filter out the shadow prices for NPM ACC constraints for JIM BRIDGER from IFM Market clearing.	Core	OASIS

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HRp2-BRQ544	<p>The System shall publish the shadow prices of binding ACC constraints in the binding intervals in RTD and FMM.</p> <p>Note: This shadow price will not inform locational marginal prices for applicable resources.</p> <p>Implementation Note: This requirement is applicable to CAISO and EIM resources.</p>	Core	OASIS
HRp2-BRQ545	<p>The System shall receive the shadow prices of binding ACC constraints in the binding intervals from RTD and FMM.</p>	Core	OASIS
HRp2-BRQ550	<p>The System shall publish the shadow prices of binding ACC constraints in DAM. Note: This shadow price will not inform locational marginal prices for applicable resources.</p>	Core	OASIS
HRp2-BRQ555	<p>The System shall publish the shadow prices of binding ACC constraints in the binding intervals in RTD and FMM.</p> <p>Note: This shadow price will not inform locational marginal prices for applicable resources.</p>	Core	OASIS

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4.2.6 Business Process: TBD

4.2.6.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ565	The System shall identify individual renewable components that make up a hybrid resource.	Core	ALFS
HRp2-BRQ575	<p>The System shall be configured for SCs to submit the VER forecast data for those resources that are gen / TG belonging to CAISO BAA and/or VER components that have elected "SC" for the FORECAST_SELECTION flag in Master File.</p> <p><i>Implementation Note 1:</i> SCs currently submit VER forecast data to SIBR. This requirement moves the functionality to ALFS.</p> <p><i>Implementation Note 2:</i> Resource ID, VER component, and SCID validations against MF shall be enforced.</p>	Core	ALFS, ALFSSOA
HRp2-BRQ580	<p>The System shall be configured for SCs to retrieve the VER forecast data for those resources and/or VER components that have elected "SC" for the FORECAST_SELECTION flag in Master File.</p> <p><i>Implementation Note:</i> SCs currently retrieve VER forecast data to SIBR.</p>	Core	FDR
HRp2-BRQ585	<p>The System shall validate that the SC VER forecast values are between the resource and/or components Pmin and Pmax values as registered in Master File.</p> <p><i>Implementation Note:</i> Resource components must be registered in MF.</p>	Core	ALFS

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HRp2-BRQ589	The System shall consume the new “HYBD” fuel type value and display the value for hybrid resource outages.	Core	OMS
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4.2.7 Business Process: TBD

4.2.7.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ595	<p>The System shall retrieve a hybrid resource and the hybrid resource's component attributes from Master File.</p> <p>Implementation Note 1: Mapping to Entity_Component_Type as HYBD and Entity_Component_Subtype for HYBD as NREM for hybrid resources. Applicable only for hybrid resources and not hybrid components.</p>	Core	Settlements, MRI-S Metering
HRp2-BRQ600	The System shall receive hybrid resource component forecast selection (ISO or SC).	Core	Settlements
HRp2-BRQ605	The System shall expect the project's Phase 2 meter data submission to be received at the same timeline meter data frequency as it is received today.	Core	MRI-S Metering
HRp2-BRQ610	<p>The System shall use the existing NGR model for hybrid resources.</p> <p>Implementation Note: Treat the hybrid as a generic NGR with the exception of forecast fees.</p>	Core	Settlements
HRp2-BRQ615	<p>When calculating the hybrid resource forecasting fee, the System shall receive meter data for the VER component ID that is associated to a hybrid resource with a resource ID.</p> <p><i>Implementation Note 1:</i> Settlements only plans to use the component data for the Forecasting Fee; not intermixed.</p>	Core	Settlements

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	<i>Implementation Note 2:</i> Settlements only plans to settle at the resource level; no settling at the component level.		
HRp2-BRQ620	The System shall receive each hybrid resource component’s meter data using both generation and load measurement types.	Core	MRI-S Metering, Settlements
HRp2-BRQ625	The System shall fully exempt a hybrid resource from Generic RA.	Core	Settlements
HRp2-BRQ630	The System shall publish the resource and VER component meter data and statements to external participants.	Core	MRI-S Metering, Settlements
HRp2-BRQ635	The System shall display the meter data at the component level for hybrid resources.	Core	MRI-S Metering
HRp2-BRQ640	The System shall allow the Hybrid resource’s Component ID to be selected as part of the WREGIS report.	Core	MRI-S Metering

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4.2.8 Business Process: TBD

4.2.8.1 Business Requirements


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ810	The System shall display the hybrid NGR resources forecast at only the renewable (VER) component ID level.	Core	CMRI
HRp2-BRQ815	The System shall publish the 5-minute hybrid VER component forecast information within the Variable Energy Resource Forecast.	Core	CMRI
HRp2-BRQ820	The System shall publish the hybrid resource forecast data specific to each external participant entity.	Core	CMRI
HRp2-BRQ825	<p>System (CMRI) must publish the constraint definitions of all aggregated facilities which includes:</p> <ul style="list-style-type: none"> • Effective period - effective start & end dates • Constraint Name • Resource - aggregated facility resource identifier. An aggregated facility can have one more resources. <p>Exclusion/s: Published data must not include any NPM constraints</p> <p>Access: Any registered SC can access the complete ACC definition which may include resources from multiple other SCs.</p> <p>Purpose: data transparency</p>	Core	CMRI



	<p>Note: ACC Definitions need not be classified as Protected Data subject to the NDA requirements specified in section 6 of the tariff (BRQ confirmed with Legal and Policy on 08/17/2022)</p>		
HRp2-BRQ996	<p>The System shall provide access to the hybrid forecast users that are not the owners of the resource.</p> <p>Implementation note: This applies to VER forecast and interval VER forecast reports.</p>	Core	CMRI
HRp2-BRQ830	<p>System (CMRI) must publish the constraint limits of all aggregated facilities which includes:</p> <ul style="list-style-type: none"> • Market • Time period - Opr date, Opr Hour, Opr Interval • Constraint Name • Direction – Up/Down • Limits <p>Exclusion/s: Published data must not include any NPM constraints</p> <p>Access: Any registered SC can access the complete ACC Limit which may include resources from multiple other SCs.</p> <p>Purpose: data transparency</p> <p>See sample data as reference - Appendix U</p>	Core	CMRI

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HRp2-BRQ811	The System shall consume the 5-min and 15-min DA ACC limits.	Core	CMRI
HRp2-BRQ833	The System shall publish Day Ahead, Rolling Hour-Ahead, and Locked Hour-Ahead hybrid resource VER component forecasts at a resource component level granularity on the VER Forecast report and Interval VER Forecast Report.	Core	CMRI

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4.2.9 Business Process: Market/Business Simulation

This section shall provide a basis for the development of the Market/Business Simulation Scenarios. These requirements will provide guidance on the market participant impacts, inputs into the Scenarios, endpoints to the Scenarios and reasons for potential Scenarios. The guidance on market participant impacts shall be gathered from the requirements that impact rules, interfaces, applications/reports, new system processes, new/modified data models and new user roles. The source and sink systems shall be determined through the development of the system context diagram and the web service requirements. The Reason for the Potential Scenario column will be to offer guidance regarding what potential Scenarios, and their context, may be needed for this project. This section applies to all policy development projects, market enhancements, technology enhancements, operation enhancements, Energy Imbalance Market (EIM) implementations and Reliability Coordination (RC) service implementations.


In the Reason for Potential Scenario column, the Business Analyst must select one or more of the following reasons:

1. **Rule Impacts:** Generalized changes in market rules, bidding rules, settlements rules, market design changes, or other business rules.
2. **Interface changes:** Changes that impact templates (e.g. the Resource Adequacy {RA} supply plan), user interface (UI), and application programming interface (API) (e.g. retrievals of new shadow settlement data).
3. **New application/report:** Changes that cause addition/modification of market software or reports, especially when market data input is required by the market participant.
4. **New system process:** Modification of data flow in systems, especially if the new process requires the market participant to demonstrate proficiency prior to production.
5. **New/Modified model data:** Addition or substantial modification of model data as a market solution provided by the ISO.
6. **New user role:** The addition or modification of access permissions for a user role applied to specific business units within an EIM entity or market participant organization (e.g. Load Serving Entity (LSE) as a Local Regulatory Authority (LRA) role). Scenarios are beneficial for market participants taking on a new function or process within their organization.


4.2.9.1 Business Requirements

This section’s requirements will be used for unstructured scenarios.

ID#	Guidance on Market Participant Impacts	Source System	Sink System	Reason for Potential Scenario
HRp2-MKT835	Master File updates: Market Participant shall be able to verify and retrieve the hybrid resource data.	Master File	External	Interface changes

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HRp2-MKT840	Market participant submission of hybrid resources' upper and lower dynamic limits.	External	SIBR	Interface changes
HRp2-MKT845	Review the hybrid resource award to be within the dynamic limit as submitted by the Market Participant.	Market	CMRI	Rule impact
HRp2-MKT850	Market Participant forecast submission of their hybrid resource that has a single VER component. <i>(Market Participant to test submission and receipt)</i>	External	ALFS	New/Modified model data. End-to-End testing.
HRp2-MKT855	Publish the ISO forecast data for hybrid resources at the VER component level on CMRI.	ALFSWS	CMRI	Interface changes
HRp2-MKT860	Hybrid Resource take part in Resource Adequacy to demonstrate RAAIM exemption.	External	Settlements	New/Modified data, End-to-End testing
HRp2-MKT865	Hybrid Resource to utilize ISO forecast, verify in Settlements Statement.	MRI-S	Settlements	New/modified data, End-to-End testing


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4.3 Phase 2-B-1 – Multiple ACC – Spring 2022

4.3.1 Business Process: Multiple ACC (Master ACC, Subordinate ACC)


4.3.1.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
H.MACC-BRQ030	The System shall identify different sub types for Master ACC and Sub-ACC. Reference Appendix.	Core	Master File
H.MACC-BRQ035	The following validations shall be performed by the MF script. <ul style="list-style-type: none"> One sub-ACC can map to one master ACC. One master ACC can have multiple sub-ACCs. One resource can be mapped to only one master ACC. If a resource is under a master ACC, it can be mapped to up to one sub ACC. The sub ACC must be one of the sub ACCs under the master ACC. If a VER associated with a master ACC is also mapped to a sub-ACC then each VER resource associated with that master ACC must be mapped to a sub ACC. 	Business Process	Master File
H.MACC-BRQ040	The System shall make available Master-ACC and Sub- ACC resource mapping and the corresponding default upper/lower limit to downstream systems.	Core	Master File

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4.3.1.2 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
H.MACC-BRQ045	For all resource IDs, all variable energy resources or EIRs shall be subject to Appendix Q requirements.	Business Process	RIMS
H.MACC-BRQ050	Each resource ID shall have specific meteorological stations for forecasting purposes.	Business Process	RIMS


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4.3.1.3 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
H.MACC-BRQ065	<p>The System shall receive the Master / Sub-ACC type from Master File for each ACC.</p> <p>Note: a Master ACC without Sub-ACCs is also referred to as a "standalone" ACC.</p>	Core	IFM / RTM Transfer Script
H.MACC-BRQ070	<p>The configurable Master ACC penalty cost shall be higher than the PBC violation cost.</p> <p>Implementation Note 1: The existing ACC penalty cost parameter can be used for the Master ACC penalty cost.</p> <p>Implementation Note 2: Standalone ACCs use the same penalty cost as Master ACCs.</p>	Core	IFM / RTM
H.MACC-BRQ075	<p>The configurable Sub-ACC penalty cost shall be lower than the PBC violation cost so that Sub-ACC can be relaxed in the scheduling run before the PBC.</p> <p>Implementation Note: the default cost is TBD.</p>	Core	IFM / RTM
H.MACC-BRQ080	<p>If a Sub-ACC is relaxed in the scheduling run, all Sub-ACCs that are associated to its Master ACC shall not be enforced in the pricing run; <i>in this case</i>, only the Master ACC will be enforced in the pricing run for the resources behind this POI.</p>	Core	Market applications
H.MACC-BRQ085	<p>The shadow price of a binding Sub-ACC shall not be included in the LMPs.</p>	Core	IFM / RTM



H.MACC-BRQ090	When the Master and Sub-ACC is relaxed, the System shall normally use the relevant bids.	Core	IFM / RTM
H.MACC-BRQ095	To get the reduction limit for the Master ACC / Sub-ACCs, the System shall use the existing functionality from the ACC constraints. Implementation Note: Related to the Market Operator UI to override the ACC limits without violating the POI value.	Core	IFM / RTM
H.MACC-BRQ100	The ACC Constraints and ACC Schedules user interfaces shall display the Master ACC, Sub-ACC, and Standalone ACC with their corresponding types.	Core	IFM / RTM
H.MACC-BRQ105	When an ED is entered for any resource that is part of an ACC constraint, the following warning shall be issued in the ED tool; "Warning: Resource XXX is associated with an ACC."	Core	IFM / RTM
H.MACC-BRQ110	The System shall provide the mapping of the Sub ACCs to the Master ACC.	Core	IFM / RTM Transfer Script
H.MACC-BRQ115	Within the existing ACC Schedules / RTD screen, the System shall display the 'Follow DOT' flag and ancillary services (AS) regardless of the ACC type (Master or Sub-ACC).	Core	IFM / RTM
H.MACC-BRQ120	The System shall validate that Master ACC and Sub-ACC constraints include energy, AS, and FRU/FRD as follows: $\sum_{i \in S} (EN_i + RU_i + SR_i + NR_i + FRU_i) \leq UL$ $\sum_{i \in S} (EN_i - RD_i - FRD_i) \geq LL$ Notation: EN = Energy	Core	RTM

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	RU = Regulation up RD = Regulation Down SR = Spinning Reserve NR = Non spinning reserve FRU = Flex ramp up FRD = Flex ramp down UL = Upper Limit LL = Lower Limit		
H.MACC-BRQ125	In the existing ACC Constraints market UI, allow for overriding the injection and withdrawal limits for all ACC constraints regardless of the type (Master ACC or Sub-ACC) while enforcing the same validation rules that currently exist.	Core	RTM
H.MACC-BRQ130	Market applications shall source the injection and withdrawal limits for the Master ACC or Sub-ACC constraints from Master File.	Core	RTM

4.4 Phase 2B – RIMS

4.4.1 Business Process: N/A

4.4.1.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ1200	System (RIMS) must have the following drops downs removed: MPAl -> Project Details Display ->“Co-Located” and “Hybrid”.	Core	RIMS
HRp2-BRQ1040	System must have fuel type combinations with non-generation project type for the following: Natural gas, hydro, wind, land fill gas, geothermal, biomass, load.	Core	RIMS




<p>HRp2-BRQ1110</p>	<p>System must have data migration related to configuration Forecast Election on existing projects.</p> <p>Note: All other status will be "Not Applicable" for forecast election.</p>	<p>Core</p>	<p>RIMS</p>
<p>HRp2-BRQ1120</p>	<p>System must have IR Form validations for the following:</p> <ol style="list-style-type: none"> 1. In case of a single configuration, the IR form should contain one row only with Gen type, Fuel type and MW values filled. The all other rows will be blank 2. In case of Colocated only: <ol style="list-style-type: none"> a. ICs can select one row with gen type, fuel type, MW and Colocated checkbox selected leaving all other rows empty b. ICs are allowed to select multiple rows with collocated checkbox only selected with gen type, fuel type, and MW values filled. And the combination of gen type & fuel type for each row needs to be unique. Example below of a valid combination: <ol style="list-style-type: none"> i. G1: Cogen F1: natural gas 	<p>Core</p>	<p>RIMS</p>




	<ul style="list-style-type: none"> ii. G1: Cogen F2: Geo thermal iii. G2: Fuel Cell F1: natural gas iv. G2: Fuel cell F2: Hydrogen <p>3. In case of Hybrid only</p> <ul style="list-style-type: none"> a. ICs need to select minimum of two rows of gen type, fuel type and MW values and select hybrid checkbox for each row. And the combination of gen type & fuel type for each row needs to be unique. Example below of a valid combination: <ul style="list-style-type: none"> i. G1: Cogen F1: natural gas ii. G1: Cogen F2: Geo thermal iii. G2: Fuel Cell F1: natural gas iv. G2: Fuel cell F2: Hydrogen b. ICs are allowed to select up to four rows of gen type, fuel type and MW values and select hybrid checkbox for each row. And the combination of gen type & fuel type for each row needs to be unique <p>4. In case of Hybrid and Colocated checkboxes are selected:</p> <ul style="list-style-type: none"> a. ICs need to select minimum of two rows of gen type, fuel type and MW values for hybrid. b. ICs can select any number of (up to 4) Colocated checkboxes with the gen type, fuel type and MW values filled c. And the combination of gen type & fuel type for each row needs to be unique. Example below of a valid combination: <ul style="list-style-type: none"> i. G1: Cogen F1: natural gas ii. G1: Cogen F2: Geo thermal 		
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	<p>iii. G2: Fuel Cell F1: natural gas</p> <p>iv. G2: Fuel cell F2: Hydrogen</p> <p>5. ICs needs to enter Gen type, Fuel type and MW value in the IR form. If they miss any of them, display an error saying "Please select a Gen type, Fuel type and enter a MW value"</p> <p>6. Validation rules: Sum of all Gen types & fuel types MW values must be greater than or equal to the net MW at the POI for Single, Hybrid, Co-located and their combinations. If SUM total MW < net MW at the POI then display an error saying "Please enter Gen type, Fuel type(s) where SUM MW value is greater than or equal to the net MW at the POI"</p> <p>Error messages for invalid scenarios:</p> <ul style="list-style-type: none"> • 4c: A single configuration should not contain multiple rows and can't have Hybrid checkbox selected • 4c: For Hybrid only: Please enter Gen type, Fuel type and MW value (minimum of two rows for Hybrid) • 4c: For Hybrid: Single gen type, fuel type configuration - Unselect Hybrid • 4c: At the minimum user must enter one row for IR form submission. If they submit an empty 4c section, please say : "Please select Gen type, Fuel type and enter a MW value" • 4c: For multiple Gen type, fuel type, please select Hybrid and /or Colocated for each row • 4c: Gen type/Fuel type Combination has to be unique for multiple entries 		
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	Implementation Note: When an IC submitting an IR form with Hybrid/Colocated configuration, they can't combine a Single configuration with this. Single configuration can be submitted through separate IR form.		
HRp2 – BRQ1180	Add Macros to all three IR Forms (Cluster, Non-cluster, and Repower) to map gen-type to fuel-type.	Core	RIMS
HRp2- BRQ170	The Systems Project View > General Information table in the Gen module shall display the hybrid or co-located, fuel type, and capacity (net MW at the POI), forecast election attributes by resource ID consistent with the template provided. Allow display of multiple fuel type and capacity combinations.	Core	RIMS (Gen)
HRp2- BRQ175	For the General Information table For the General Information table in the NRI Module, the System shall work as is with respect to access control for various existing roles. There is no change to the current system access for all roles.	Core	RIMS (App & Study)
HRp2- BRQ180	When entering a project into the Gen module, the System shall utilize a use case to validate for the sum of the 'MW by fuel type' for all non-cancelled projects submitted into the Gen module from exceeding the net MW at the POI by fuel type in the A&S module > Equipment Configuration > Generation and Fuel Type. Implementation Note 1: This requirement applies to any project (hybrid and co-located	Core	RIMS (Gen)

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	<p>included) associated to a queue number or a set of queue numbers.</p> <p>Implementation Note 2: This requirement applies to 3-party projects. If no corresponding data exists in A&S, then it should pass this validation step.</p>		
HRp2-BRQ115	<p>The System shall receive the Project Details Form (PDF) with hybrid projects detail information from the market participant.</p> <p>Implementation Note: Access to the hybrid PDF details once parsed into RIMS will be defined via the security requirements.</p>	Core	RIMS
HRp2-BRQ125	<p>The Project Details Form (PDF) shall be updated to allow a customer to indicate the VER hybrid resource at the fuel type level solar component and the associated 3 other fuel type options selected will either be ISO forecasted or SC forecasted. The customer's choice will be visible in RIMS > MPAI > Project View after a project is created within the RIMS application after successful upload of the PDF.</p> <p>Security Roles: No security roles for PDF upload. However, for the UI, these fields will be read-only for any external roles, and only editable by internal Admin and Power User role, all other internal ISO roles are read-only.</p>	Core	RIMS (Gen)
HRp2-BRQ130	<p>The Project Details Form (PDF) shall be updated to allow a customer to indicate the VER hybrid resource at the fuel type level, wind component and the associated 3 other fuel type options selected will either be ISO or SC forecasted. The customer's choice will be visible in RIMS > MPAI > Project View after a project is created within the RIMS application after successful upload of the PDF.</p>	Core	RIMS (Gen)

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	<p>Security Roles: No security roles for PDF upload. However, for the UI, these fields will be read-only for any external roles, and only editable by internal Admin role, all other internal ISO roles are read-only.</p>		
HRp2-BRQ135	<p>The System's Project View / Megawatt by Fuel Type section for the Project in the Gen module shall provide an option to indicate whether a configuration type of hybrid or Hybrid & Co-Located with the Fuel Type as solar component will be either CAISO forecasted or Schedule Coordinator forecasted. Also, business must have the capability to change forecast election.</p>	Core	RIMS (Gen)
HRp2-BRQ140	<p>The System's Project View / Megawatt By Fuel Type section for the Project in the Gen module shall provide an option to indicate whether a configuration type of hybrid or Hybrid & Co-Located with the fuel type as wind component will be CAISO forecasted or Schedule Coordinator forecasted. Also, business must have the capability to change forecast election.</p>	Core	RIMS (Gen)
HRp2-BRQ185	<p>The Interconnection Request (IR) form shall be revised to include hybrid or co-located resource, fuel type, and capacity (net MW at the POI) attributes.</p> <ul style="list-style-type: none"> • Cluster IR Form, • Fast Track / ISP IR Form, <p>Repowering / Material Modification / GIA Conversion IR Form</p>	Core	RIMS (App & Study)

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HRp2-BRQ060	<p>The Systems A&S ‘Generation and Fuel Type’ table and ‘Generation as Modeled and Implemented’ table shall display the hybrid or co-located resource ID, fuel type, and capacity (net MW at the POI) attributes by resource ID consistent with the template is provided.</p> <p>Implementation Note: A&S equals 3-party Agreements. Path: A&S > Project View > Equipment Configuration.</p>	Core	RIMS (App & Study)
HRp2-BRQ160	<p>For the Generation as Modeled and Implemented table, the System shall work as is with respect to access control for various existing roles. There is no change to the current system access for all roles.</p>	Core	RIMS (App & Study)
HRp2-BRQ165	<p>For the Generation and Fuel Type table, the System shall provide read-only access to the Interconnection Customer and PTO, read-only access for CAISO Contributing User and Internal Read User, and read/write access for CAISO Power Users and CAISO Admin Users.</p>	Core	RIMS (App & Study)
HRp2-BRQ215	<p>The System shall capture within the newly created STF section, store, and be part of the audit log the following information for all VER resources level and components level of resources from the customer:</p> <ul style="list-style-type: none"> • Park Potential (MW; numeric-float field [example: 100.5]) • EIR or VER Project Corner Coordinates in WGS84 format • Meteorological Station ID Numbers • Meteorological Station Coordinates in WGS84 format • Met Height AGL 	Core	RIMS (Gen)

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	<p>Implementation Note: The above requirements are to replace the site information sheet Excel document; they need to be entered into the newly created STF section.</p>		
HRp2-BRQ089	<p>When the Forecast Option is changed, the System shall notify the Short Term Forecasting team.</p>	Core	RIMS (Gen)
HRp2-BRQ090	<p>After a project is open in RIMS and if multiple renewable energy types have been selected as the Fuel Types of a Hybrid resource type, the System shall allow CAISO Internal Users the ability to change the Forecast Option.</p>	Core	RIMS (Gen)
HRp2-BRQ120	<p>The System shall provide interconnection customers and PTO users secure access, as appropriate, to their entity’s project information in all modules.</p> <p><i>For example, an interconnection customer with multiple interconnection requests can view as a group some or all of the information related to its separate interconnection requests (note: when an interconnection customer makes multiple interconnection requests, it is a separate interconnection customer with respect to each generating facility. The applicable PTO would only see the interconnection customer’s transmission information and the status of all generation projects connecting to the PTO’s system.</i></p>	<i>Existing</i>	RIMS
HRp2-BRQ080	<p>Update the Gen Module's Project Details Form to include Configuration type (Single, Hybrid, Co-located, hybrid Co-located) and Fuel type 1 through 4 and related MW and Forecast election values.</p> <p>Allow for multiple fuel type and capacity combinations.</p>	Core	RIMS (Gen)

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	Implementation Note: The Security Role will be followed for this specific data throughout the Gen module.		
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4.4.2 Business Process: Multiple ACC (Master ACC, Subordinate ACC)

4.4.2.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
H.MACC-BRQ001	The Interconnection Request Form shall provide Interconnection Customers (IC) the ability to define the resource level as co-located, hybrid, or none.	Core	RIMS
H.MACC-BRQ010	The Project Details Form (PDF) shall provide Interconnection Customers (IC) the ability to define the resource level as co-located, hybrid, or none.	Core	RIMS
H.MACC-BRQ015	<p>The Interconnection Customers (IC) shall have the ability to enter a resources association to a Master ACC or Sub-ACC.</p> <p>Note: IC to enter resource association to M.ACC or Sub-ACC in Generating agreement. Resources association to M/ACC or Sub-ACC captured in MF (see MF BRQs). No system changes in RIMS expected, but part of RIMS IC agreement business process.</p>	Existing, Business Process	RIMS/MF
H.MACC-BRQ025	The ISO shall train the EIM entities on how to request resources be included in a Master ACC or Sub-ACC.	Training	RIMS

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4.4.3 Business Process: Short Term Forecast Reporting

4.4.3.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ645	<p>The System shall display a “Current Hybrids” pie chart showing the hybrid component generation by fuel type.</p> <p>The values will be updated at a frequency to match the “current supply” and “current renewables” pie charts.</p> <p>Implementation Note: There is no change to the frequency at which the current renewables pie chart displays MW values.</p>	Core	Today’s Outlook, ISO Today Mobile Application
HRp2-BRQ650	<p>The System shall display the percentage of total hybrids serving load.</p> <p>The value will be updated at a frequency to match the “current supply” and “current renewables” pie charts.</p> <p>Implementation Note: There is no change to the frequency at which the current renewables pie chart displays MW values.</p>	Core	Today’s Outlook, ISO Today Mobile Application
HRp2-BRQ655	<p>The System shall allow an option in the “Current hybrids” pie chart for a breakout of renewable vs non-renewable fuel types instead of displaying all of the individual fuel types.</p> <p>Note: Requirement shall only be activated after resources are made available and tested.</p>	Core	Today’s Outlook, ISO Today Mobile Application
HRp2-BRQ660	<p>The Systems “Current supply” pie chart shall be updated to included hybrid renewable</p>	Core	Today’s Outlook, ISO Today Mobile Application, RDS



	<p>components in the appropriate resource types.</p> <p>For example, the “renewables” data will be updated to a new PI tag that incorporates all renewable components (renewable + hybrid renewable components).</p> <p>Implementation Note: There is no change to the frequency at which the chart displays MW values.</p>		
HRp2-BRQ665	<p>The Systems “Current renewables” pie chart shall be updated to included hybrid renewable components in the appropriate resource types.</p> <p>For example, the “solar” data will be updated to a new PI tag that will incorporates all solar (solar + dynamic+ hybrid solar).</p> <p>Implementation Note: There is no change to the frequency at which the chart displays MW values.</p>	Core	Today’s Outlook, ISO Today Mobile Application, RDS
HRp2-BRQ670	<p>The Systems “supply trend” graph shall be updated to included hybrid resources in the appropriate lines.</p> <p>For example, the “renewables” data will be updated to a new PI tag that incorporates all renewable components (renewable + hybrid renewable components).</p> <p>Implementation Note: There is no change to the frequency at which the chart displays MW values.</p>	Core	Today’s Outlook, ISO Today Mobile Application, RDS
HRp2-BRQ675	<p>The Systems “Current solar” generation number shall be updated to include hybrid solar components.</p> <p>Implementation Note: There is no change to the frequency at which the chart displays MW values.</p>	Core	Today’s Outlook, ISO Today Mobile Application



HRp2-BRQ680	<p>The Systems “Renewables trend” graph shall be updated to include hybrid resources in the appropriate lines for each fuel type.</p> <p>For example, the “solar” data will be updated to a new PI tag that incorporates all solar (solar+ dynamic+ hybrid solar).</p> <p>Implementation Note: There is no change to the frequency at which the chart displays MW values.</p>	Core	Today’s Outlook, ISO Today Mobile Application, RDS
HRp2-BRQ685	<p>The System shall display a “hybrids trend” graph showing a breakdown of the hybrid generation throughout the day by hybrid component type.</p>	Core	Today’s Outlook, ISO Today Mobile Application
HRp2-BRQ690	<p>Within the “hybrid trends” graph, the System shall allow options to show the daily peak value for each hybrid component fuel type.</p> <p>Implementation Note: There will be new PI tags created to display the daily peak for each hybrid component fuel type.</p>	Core	Today’s Outlook, ISO Today Mobile Application, RDS
HRp2-BRQ695	<p>Within the “hybrid trends” graph, the System shall allow options display a breakout of renewable vs non-renewable fuel types.</p> <p>Note: Requirement shall only be activated after resources are made available and tested.</p>	Core	Today’s Outlook, ISO Today Mobile Application
HRp2-BRQ700	<p>The Systems “Current wind” generation number shall be updated to include hybrid wind components.</p> <p>Implementation Note: There is no change to the frequency at which the chart displays MW values.</p>	Core	Today’s Outlook, ISO Today Mobile Application




HRp2-BRQ705	The Systems “Current renewables” generation number shall be updated to include hybrid renewables components. Implementation Note: There is no change to the frequency at which the chart displays MW values.	Core	Today’s Outlook, ISO Today Mobile Application
HRp2-BRQ710	The Systems “batteries trend” graph shall include an option to display ‘Hybrid Batteries’ graph line and value.	Core	Today’s Outlook, ISO Today Mobile Application
HRp2-BRQ715	The Monthly Renewables Performance Report’s curtailment section shall be in sync with the Wind and Solar Curtailment report, and the Oversupply Page.	Core	Monthly Renewables Performance Report
HRp2-BRQ720	Any new item added or modified to Today's Outlook’s ‘Supply and Renewables’ section shall be added to the Monthly Renewables Performance Report’s ‘Summary’ section. Implementation Note: All existing tags will remain.	Core	Monthly Renewables Performance Report
HRp2-BRQ725	The Monthly Renewables Performance Report’s ‘Monthly Maximum Percent of Load Served by Renewables’ graph shall display all hybrid renewables for the 5-minute market.	Core	Monthly Renewables Performance Report
HRp2-BRQ730	The Monthly Renewables Performance Report’s ‘Monthly Metered Renewable Generation’ graph shall display all hybrid renewables for the 5-minute market.	Core	Monthly Renewables Performance Report
HRp2-BRQ735	The Wind and Solar Curtailment Report shall contain renewable hybrid VER component data for hybrid resources.	Core	‘Wind and Solar Real-Time Dispatch Curtailment Report’, Over Supply Page, Monthly



			Renewables Performance Report
HRp2-BRQ740	The Wind and Solar Curtailment Report shall contain renewable component data for co-located resources.	Core	'Wind and Solar Real-Time Dispatch Curtailment Report', Over Supply Page, Monthly Renewables Performance Report
HRp2-BRQ745	The Market Performance and Planning Forum presentation shall include a slide(s) displaying the accuracy of the hybrid and forecast accuracy of the wind and solar hybrid components. Implementation Note: Accuracy of hybrid is determined by the evaluation of the hybrid resources following their DOT (comparison of DOT to actual).	Business Process	'Market Performance and Planning Forum' presentation
HRp2-BRQ750	The System shall not include the hybrid solar and hybrid wind components in the actual and forecasted net load calculation when displaying the system's 'Net Demand' graph.	Core	Today's Outlook, ISO Today Mobile Application
HRp2-BRQ755	The Market Performance and Planning Forum presentation shall not include hybrid or renewable component information in slides: <ul style="list-style-type: none"> • Day-ahead wind forecast accuracy has improved in recent months • Day-ahead solar forecast accuracy improved in recent months • Real-time solar forecast accuracy has improved in the second half of the year 	Business Process	'Market Performance and Planning Forum' presentation



	<ul style="list-style-type: none"> Real-time wind forecast accuracy remains within historical levels 		
HRp2-BRQ760	The System shall be updated to include hybrid renewable components in Wind, Solar, and Renewables values.	Core	Today's Outlook, Monthly Renewables Performance Report
HRp2-BRQ765	The System shall display the hybrid solar component daily production in MWh.	Core	Today's Outlook, ISO Today Mobile Application
HRp2-BRQ770	The System shall display the hybrid wind component daily production in MWh.	Core	Today's Outlook, ISO Today Mobile Application
HRp2-BRQ775	The System shall display the hybrid non-renewable component daily production in MWh. Note: Requirement shall only be activated after resources are made available and tested.	Core	Today's Outlook, ISO Today Mobile Application
HRp2-BRQ780	The System shall display the total hybrid daily production in MWh.	Core	Today's Outlook, ISO Today Mobile Application
HRp2-BRQ785	The System shall display the hybrid renewable component daily production in MWh. Note: Requirement shall only be activated after resources are made available and tested.	Core	Today's Outlook, ISO Today Mobile Application
HRp2-BRQ790	The System shall display the hybrid battery component daily production in MWh.	Core	Today's Outlook, ISO Today Mobile Application

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HRp2-BRQ795	The System shall display the total battery (battery + hybrid battery) daily production in MWh.	Core	Today's Outlook, ISO Today Mobile Application
HRp2-BRQ800	The System shall display the total wind (wind + dynamic + hybrid wind) daily production in MWh.	Core	Today's Outlook, ISO Today Mobile Application
HRp2-BRQ805	The System shall display the total solar (solar + dynamic + hybrid solar) daily production in MWh.	Core	Today's Outlook, ISO Today Mobile Application

4.5 Phase 2C

4.5.1 Business Process: N/A

4.5.1.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ225	<p>When the EIR, VER, or VER component of a hybrid resource is solar within the STF section, the System shall allow a customer to select 'Solar Type' field:</p> <ul style="list-style-type: none"> • Photovoltaic, • CPV, • Solar Thermal <p>Implementation Note 1: This requirement will replace the site information sheet Excel document; it will need to be entered into the newly created STF section.</p> <p>Implementation Note 2: The 'Solar Type' field Option only applies when customer selects solar as a fuel type.</p>	Core	RIMS (Gen)



HRp2-BRQ100	When a user selects “solar thermal” as the ‘Solar Type’, the System shall display a new field to state the hours or % of supplemental heating. Reference BRQ 225.	Core	RIMS (Gen)
HRp2-BRQ235	The System shall validate the information submitted in the newly created STF section in the Gen module for the Solar Type (Photovoltaic or Solar Thermal) against associated data in the App&Study module. If validation fails, display error message, “Submittal of Photovoltaic or CPV and Solar Thermal does not match app and study. Please re-visit and update.” Note: If the Customer selects Photovoltaic or CPV in the Solar Type drop down of the STF Info section, this needs to be validated on the A&S side and to see if it has Photovoltaic.	Core	RIMS (A&S, Gen)
HRp2-BRQ103	The System shall capture and validate in the site information web form with the information contained in the Gen module project view: <ul style="list-style-type: none"> • Address • MW Generation Capacity • Plant Location (Latitude and Longitude) 	Core	RIMS (A&S, Gen)
HRp2-BRQ240	Within the newly created STF section, the System shall capture and store the following fields when the customer submits a solar resource : <ul style="list-style-type: none"> • MW Generation DC • Meteorological Station Sharing (Y or N: If ‘Yes’, require the project ID of the resource that is being shared) (Validate that project key/code of host site exists) 	Core	RIMS (Gen)




	<ul style="list-style-type: none"> • Date Scheduling Coordinator Solar Meteorological Station Sharing Agreement (date field) • [section title] Panel Specifications: • Panel Manufacturer (alphanumeric field) • Panel Model (alphanumeric field) • Number of Panels (numeric field) • Panel Power Rating (numeric field) • Number of Inverters (numeric field) • Inverter Ratings (alphanumeric field) • Tracking (Yes or No Dropdown) • Single or Dual Axis Tracking (Single, Dual, or None Dropdown) • Tracker Manufacturer (alphanumeric field) • Tracker Model (alphanumeric field) • Wind Protection (Speed in m/s) • Altitude Angle of Panels (alphanumeric field) • Azimuth Angle of Fixed Panels (alphanumeric field) • Height of Panels Above Ground Level (alphanumeric field) • Concentrating PV (Yes or No Dropdown) <p>Implementation Note: This requirement will replace the site information sheet Excel document; it will need to be entered into the newly created STF section.</p>		
HRp2-BRQ108	If the Sharing Agreement is required and the Meteorological Station Sharing indicates Y, the System shall validate that approval has been obtained prior to COD if Y is present.	Core Compliance: Appendix Q	RIMS (Gen)
HRp2-BRQ250	If the Sharing Agreement is not within the Forecasting BU review for approval, the System shall send the Customer Project Contact (i.e., Resource Owner) an email to upload a sharing agreement.	Core	RIMS (Gen)



	<p>Implementation Note 1: Email should state that the Sharing Agreement is required per Appendix Q of the CAISO Tariff.</p> <p>Implementation Note 2: Send the STF BU a notification once the email is sent.</p>		
HRp2-BRQ139	<p>Within the newly created STF section, the System shall capture and store the following fields when the customer submits a solar resource:</p> <ul style="list-style-type: none"> Nameplate Capacity of Solar Component (numeric in MW) Nameplate Capacity of Battery (numeric in MW) MW Point of Interconnection (POI) Agreement (numeric in MW) Solar Component Forecast (numeric in MW) 	Core	RIMS (Gen)
HRp2-BRQ305	The System shall allow a meteorological station to be identified as a 'primary' met station.	Core	RIMS (Gen)
HRp2-BRQ300	The System shall only accept a Topo Map via the Site Info web form.	Core	RIMS (Gen)
HRp2-BRQ320	<p>The System shall validate wind and solar meteorological station submissions described in BRQ 265 & 310 to not allow a Lidar or Sodar to be the primary or only meteorological station.</p> <p>If validation fails, return the site information to the customer and ask for updates.</p>	Core	RIMS (Gen)
HRp2-BRQ142	<p>The System shall capture and store customer information:</p> <ul style="list-style-type: none"> Nameplate Capacity of Solar Component Nameplate Capacity of Battery MW Point of Interconnection (POI) Agreement: 	Existing – Regression Testing	RIMS (Gen)




	<ul style="list-style-type: none"> Solar Component Forecast Plant Type Wind Component Forecast 		
HRp2-BRQ141	<p>Within the newly created STF section, the System shall provide the capability to enter the following fields when the customer submits a wind resource:</p> <ul style="list-style-type: none"> Plant Type (drop-down: "wind", "hybrid", "co-located") Nameplate Capacity of Wind Component (numeric in MW) Nameplate Capacity of Battery (numeric in MW) MW Point of Interconnection (POI) Agreement (numeric in MW) Wind Component Forecast (ISO/SC selected) 	Core	RIMS (Gen)
HRp2-BRQ125	<p>The System shall capture and store customer information:</p> <ul style="list-style-type: none"> Address VER Resource ID MW Generation Capacity Plant Location (Latitude and Longitude) 	Existing – Regression Testing	RIMS (Gen)
HRp2-BRQ330	<p>When a wind or solar site sheet is submitted, the System shall validate that the sheet contains no blank fields. An error message will be provided to the customer, "Blank field left empty. Please enter missing information."</p>	Core	RIMS (Gen)
HRp2-BRQ156A	<p>The System shall require customer to complete Site sheet form, and upload the topographical map, before email notification for the forecasting team to review needed documents for site sheet, topographical map, and if needed sharing agreement acceptance.</p>	Core	RIMS (Gen)

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	<p>Implementation Note: Acceptance of site sheet and topo map within BU review folder indicates pass of validation checks site info (validated manually outside RIMS) for key tariff components identified in BRQ 240, 290.</p> <p>Note: See BRQ156B for Phase 2C BRQ.</p>		
HRp2-BRQ355	The System shall return all information upon STF rejection to customer for information updates.	Core	RIMS (Gen)
HRp2-BRQ365	When a site sheet, Shape File, and topographical map are 'conditionally accepted', the System shall notify STF once VER resource IDs have been entered into the system.	Core	RIMS (Gen)
HRp2-BRQ195	For any VER resource marked as 'accepted' by STF, the System shall store a copy of the site information, Shape File, and topographical map. Implementation Note 1: For forecasting purposes, a resource is deemed to be at the Component ID level, or renewable resource level.	Core	RIMS (Gen)
HRp2-BRQ360	The System shall notify EDAS at EDAS@caiso.com of FSP designated turbine (DT) selection for an 'accepted' Wind resource.	Core	RIMS (Gen)
HRp2-BRQ380	The System shall set the hybrid resource as 'approved' after all of the resource's components have been accepted. Implementation Note 1: Hybrid resource level and component level must be placed in bucket 1 in the BU. Implementation Note 2: COD cannot be achieved until all component level resources have been approved.	Core	RIMS (Gen)
HRp2-BRQ385	The System shall maintain an audit record of all changes made to any site sheet field within the system utilizing the existing system fields:	Core	RIMS (Gen)



	<ul style="list-style-type: none"> • Table Modified • Field Name • Audit Action • Previous Value • New Value • Update Date • User Who Updated 		
HRp2-BRQ390	The System shall add to the 'BU Review section of RIMS' the number of projects awaiting STF review, declared 'conditionally accepted', and a number of projects awaiting FSP review.	Core	RIMS (Gen)
HRp2-BRQ991	The System shall send the customer a notification when the submitted documents have been accepted.	Core	RIMS (Gen)
HRp2 – BRQ1170	System (RIMS) must undo the functionality of uploading a site info form with the existing functionality on MPAL.	Core	RIMS
HRp2-BRQ190	The System shall display the 'ACC End Date' below the SC End Date field within the Retired Mothball Resource section under the Activities section. Implementation Note: Date field should be implemented with a popup calendar.	Core	RIMS (App & Study)
HRp2-BRQ077	Within the Retired Mothball Resource section, under the Activities section, the System shall display below the Work Type: <ul style="list-style-type: none"> • RC • NRI • MF • SC 	Core	RIMS (App & Study)

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	<p>Implementation Note: Each of these Work Types will have a Comment field to enter alphanumeric comments and a check box to mark when the tasks are Complete for each Work Type.</p>		
HRp2-BRQ079	<p>After a system generated message has been sent to a department, the System shall track each sent message and the associated completion date by department.</p>	Core	RIMS (App & Study)
HRp2-BRQ145	<p>For any hybrid resource project created with a fuel type of Solar or Wind, the System shall mark the Topo Map, Site Info Sheet, and Shapefile bucket 1 requirements to be required =Yes.</p> <p>Implementation Note: the Shapefile is being added to Bucket 1; does not currently exist.</p>	Core	RIMS (Gen)
HRp2-BRQ345	<p>The System shall receive and indefinitely store Topographical Map and Shape Files when uploaded by the customer. Information shall store even if the information does not pass validation.</p>	Core	RIMS (Gen)
HRp2-BRQ155	<p>The System shall accept '.XLSX' and '.PDF' for topo map submissions.</p>	Core	RIMS (Gen)
HRp2-BRQ350A	<p>When the system rejects a customer's submission of a site sheet, topographical map, or Shape File, the System shall log the reason for the rejection, using one of the following reasons:</p> <ul style="list-style-type: none"> • Error with Information Accuracy (System observes that coordinates are written incorrectly, addresses or numerical values are filled in inappropriately). • Violation of CAISO Tariff system notices that resource owner is attempting to share meteorological stations for wind resources (Meteorological Station Coordinates field in the STF section) 	Core	RIMS (Gen)

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	<ul style="list-style-type: none"> System notices that meteorological station installation does not meet required number of stations relative to megawatt generation that is ≥ 5 MW (compare against the General Info>Name Plate (MW) field) requires at least two meteorological stations). <p>Implementation Note: Notify the user of validation error.</p>		
HRp2-BRQ245	<p>The System shall require resources that opted 'Y' to Meteorological Station Sharing to submit a Sharing Agreement Document for review and approval.</p> <p>Implementation Note 1: The sharing agreement will have the same approval process as the site info and topo map.</p> <p>Implementation Note 2: The sharing agreement will be in bucket 1 of forecasting BU.</p> <p>Implementation note 3: when the Met Sharing is marked as "No" in the site info form then the system needs to update the bucket item of "Sharing Agreement" to "Not Required" if it is currently set as "Required".</p> <p>Implementation note 4:</p> <ul style="list-style-type: none"> Set to default to "No" on bucket 1 for sharing agreement, if it is non-solar fuel type. For Solar fuel type, we need to set the bucket 1 required flag to "Yes" 	Core	RIMS (Gen)



HRp2-BRQ290	<p>Within the newly created STF section, the System shall provide the capability to enter the following fields when the customer submits a wind resource:</p> <ul style="list-style-type: none"> • Turbine Specifications: • <i>Number of Turbines (numeric field)</i> • <i>Turbine Manufacturer (alphanumeric field)</i> • <i>Turbine Model (alphanumeric field)</i> • <i>Turbine Maximum Generation Capacity (numeric field)</i> • <i>Turbine Height Above Ground Level (numeric field)</i> • <i>Cut in Speed (numeric field; in m/s)</i> • <i>Cut Out Speed (numeric field; in m/s)</i> • <i>Cold Weather Package (Yes or No Dropdown)</i> • <i>Hot Weather Package (Yes or No Dropdown)</i> • <i>Low Temperature Cut Out (numeric field)</i> • <i>High Temperature Cut Out (numeric field)</i> • <i>Rated Speed (m/s)</i> • Wind Turbine ID Numbers (alphanumeric field) • Elevation (numeric field; in meters) • Hub Height (numeric field; in meters) • Turbine(s) Latitude(s) and Longitude(s) Coordinates (WGS84 Coordinate Field) <p>Implementation Note 1: All fields are mandatory.</p> <p>Implementation Note 2: The above requirements are to replace the site information sheet Excel document; they need to be entered into the newly created STF section.</p> <p>Implementation note 3: User must have the capability to submit multiple Turbine Specifications information.</p>	Core	RIMS (Gen)
HRp2-BRQ260	<p>If resource has shown that it is sharing then for all Bucket 1 projects under the CAISO’s new resource implementation process with an identified solar fuel component, the System shall</p>	Core	RIMS (Gen)




	display if the Sharing Agreement was accepted or not accepted.		
HRp2-BRQ370	The System shall not allow VER resources to be accepted for COD if the Site Information, Shape File, topographic map, and if needed Sharing agreement are not accepted by STF.	Core	RIMS (Gen)
HRp2-BRQ375	The System shall allow acceptances at the VER resource level and component level. For example; if a resource is a Hybrid, component level VER acceptances are needed for each component to have their own site information sheet and topographic map.	Core	RIMS (Gen)
HRp2-BRQ200	The System shall allow site sheet information to be entered through a web form.	Core	RIMS (Gen)
HRp2-BRQ205	When a customer submits site sheet information via the Web form and fails validation, the System shall identify the site sheet form errors so the customer can easily identify what information needs to be corrected.	Core	RIMS (Gen)
HRp2-BRQ210	The System shall display an 'STF Information' section at the VER resource level and component level.	Core	RIMS (Gen)
HRp2-BRQ220	The System shall provide the capability to enter multiple entries of : <ul style="list-style-type: none"> • EIR or VER project corner coordinates, • meteorological station ID numbers, • meteorological station coordinates, and MET Height AGL. 	Core	RIMS (Gen)
HRp2-BRQ104	The user shall be required to enter at minimum four (4) project corner coordinates for a VER or EIR.	Core	RIMS (Gen)




HRp2-BRQ097	<p>When an interconnection customer submits documentation, the System will shall assign a submission status of: Accepted, Conditionally Accepted, Pending, or Not Accepted.</p> <p>Submission status definitions:</p> <ul style="list-style-type: none"> Accepted – submitted documentation is accurate and approved by CAISO. Conditionally Accepted – submitted documentation is accepted, but the Resource ID is missing. Pending – submitted documentation requires CAISO review before assigning another status. <p>Not Accepted – submitted documentation does not meet standards and requires corrections before being approved.</p>	Core	RIMS (Gen)
HRp2-BRQ230	<p>The System shall populate within the STF section the following information from the PDF:</p> <ul style="list-style-type: none"> Is resource hybrid, co-located, or neither. Is resource pseudo-tie, dynamic, or neither. 	Core	RIMS (Gen)
HRp2-BRQ265	<p>Within the newly created STF section, the System shall allow a customer to enter the solar meteorological equipment information when onboarding a new Solar resource and entering information into RIMS:</p> <ul style="list-style-type: none"> Lidar or Sodar (required) Make /Met Station Equipment (required; free text) Model (required; alphanumeric) Wind Speed (Anemometer) (required; alphanumeric) Wind Direction (Anemometer) (required; alphanumeric) Air Temperature (required; alphanumeric) 	Core	RIMS (Gen)



	<ul style="list-style-type: none"> Barometric Pressure (required; alphanumeric) Irradiance (required; alphanumeric) Back Panel Irradiance (required; alphanumeric) <p>Implementation Note 1: The above requirements are to replace the site information sheet Excel document; they need to be entered into the newly created STF section.</p>		
HRp2-BRQ270	<p>Within the newly created STF section, the System shall allow for multiple meteorological station information to be submitted.</p> <p>Reference BRQ 118.</p>	Core	RIMS (Gen)
HRp2-BRQ280	<p>When attaching a Sharing Agreement to the Site Info web form, the System shall validate that any attached document is named "SharingAgreement."</p>	Core	RIMS (Gen)
HRp2-BRQ295	<p>Within the newly created STF section, the System shall allow for multiple submissions of the following fields:</p> <ul style="list-style-type: none"> Wind turbine ID, <ul style="list-style-type: none"> Elevation, Hub height, Turbine lat/long. 	Core	RIMS (Gen)
HRp2-BRQ310	<p>Within the newly created STF section, the System shall allow a customer to enter the wind meteorological station information when onboarding a new VER resource level or component level in RIMS:</p> <ul style="list-style-type: none"> Make/Met Station Equipment (free text) Model (alphanumeric) Wind Speed (Anemometer) (alphanumeric) Wind Direction (Anemometer) (alphanumeric) 	Core	RIMS (Gen)

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	<ul style="list-style-type: none"> • Air Temperature (alphanumeric) • Barometric Pressure (Barometer) (alphanumeric) • Lidar <i>or</i> Sodar (required) <p>Implementation Note 1: The above requirements are to replace the site information sheet Excel document; they need to be entered into the newly created STF section.</p> <p>Implementation Note 2: All fields are required fields.</p>		
HRp2-BRQ315	<p>Within the newly created STF section, the System shall allow for multiple meteorological station information to be submitted.</p> <p>And one to be selected as primary met station and the rest as secondary.</p> <p>Reference BRQ 120.</p>	Core	RIMS (Gen)
HRp2-BRQ156B	<p>The System shall require customer to complete Site sheet form, and upload the topographical map, and Shape File before email notification for the forecasting team to review needed documents for site sheet, topographical map, and if needed sharing agreement acceptance.</p> <p>Implementation Note: Acceptance of site sheet and topo map within BU review folder indicates pass of validation checks between site info and Shape File for key tariff components identified in BRQ 240, 290 and 340.</p>	Core	RIMS (Gen)
HRp2-BRQ150	<p>For VER Projects, users shall upload the Shapefile related documents as a zip file, and the zip file shall contain the .CPG, .DBF, .PRJ, .SHP, and .SHX file types.</p>	Core	RIMS (Gen)


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	<p>Implementation note: .SHP, .SHX, .DBF, and .PRJ are mandatory.</p>		
HRp2-BRQ275	<p>When a project includes a renewable resource or renewable fuel component, the System shall display within the Bucket 1 view, a ‘Shape File’ bucket item name.</p>	Core	RIMS (Gen)
HRp2-BRQ285	<p>The System shall only accept a Shape File via the Site Info web form.</p>	Core	RIMS (Gen)
HRp2-BRQ335	<p>The System shall cross-reference and validate the Wind and Solar site sheet and Shape File information for accuracy. The following information needs to match between the site information and the submitted Shape File:</p> <ul style="list-style-type: none"> • Resource project corners • Meteorological station coordinates <p>If the validation fails and the two systems do not match the system shall return an error message to the customer stating, “Information between the site information submitted and the Shape File do not match, please review and re-submit.”</p> <p>Implementation Note 1: Shape File will be unique to wind and solar. Compare VER resource form and Shape File contents for matching accuracy.</p> <p>Implementation Note 2: The .dbf file in the uploaded shapefile zip files will be used for the comparison of data.</p>	Core	RIMS (Gen)
HRp2-BRQ340	<p>All EIRs or VERs that are wind resources or hybrid resources with a wind component shall be subject to an extra validation check between the Wind site sheet and Shape File:</p> <ul style="list-style-type: none"> • Turbine ID • Turbine Latitude and Longitude 	Core	RIMS (Gen)



	<ul style="list-style-type: none"> • Turbine Elevation • Turbine Hub Height • Turbine Group Number <p>Implementation Note 1: If the validation fails and the two systems do not match the system shall return an error message to the customer stating “Information between the site information submitted and the Shape File do not match, please review and re-submit.”</p> <p>Implementation Note 2: The .dbf file in the uploaded shapefile zip files will be used for the comparison of data.</p>		
HRp2-BRQ325	<p>When a Shape File is submitted, the System shall validate that the sheet contains no blank fields.</p> <p>If a field is blank, the System shall notify the customer which field(s) needs to be filled in.</p>	Core	RIMS (Gen)
HRp2-BRQ143	<p>For VER Projects, users shall upload the ShapeFile related documents as a zip file, and the zip file shall contain the .CPG, .DBF, .PRJ, .SHP, and .SHX files types.</p>	Core	RIMS (Gen)
HRp2-BRQ144	<p>When uploading a ShapeFile, the System shall validate during the upload that all the file types are encapsulated in the zip file, and if not, the System shall reject the upload with error.</p>	Core	RIMS (Gen)
HRp2-BRQ350B	<p>When the system rejects a customer’s submission of a site sheet, topographical map, or Shape File, the System shall log the reason for the rejection, using one of the following reasons:</p> <ul style="list-style-type: none"> • Error Opening/Reading Documents (System is unable to open or read data from the Shape File) <p>Implementation Note: Notify the user of validation error.</p>	Core	RIMS (Gen)

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4.6 Phase 2C – Tie Generator Resources for Settlements

4.6.1 Business Process: N/A

4.6.1.1 Business Requirements (System impacted: Settlements)


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ1263	The System shall assess forecast fee on TG hybrid resource.	Core	Settlements

4.7 Phase 2C – Metered Quantities

4.7.1 Business Process: N/A

4.7.1.1 Business Requirements (System impacted: Settlements)

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
HRp2-BRQ1307	System shall allow the scheduling coordinator of a hybrid resource the ability to submit metered quantities on a component ID only. SC must submit metered quantities for all components IDs on the hybrid Resource. This ability will be available regardless if the resource is a CAISO metered entity or scheduling coordinator metered entity.	Core	Internal System

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4.8 Business Process: Market/Business Simulation

This section shall provide a basis for the development of the Market/Business Simulation Scenarios. These requirements will provide guidance on the market participant impacts, inputs into the Scenarios, endpoints to the Scenarios and reasons for potential Scenarios. The guidance on market participant impacts shall be gathered from the requirements that impact rules, interfaces, applications/reports, new system processes, new/modified data models, and new user roles. The source and sink systems shall be determined through the development of the system context diagram and the web service requirements. The *Reason for the Potential Scenario* column will be to offer guidance regarding what potential scenarios, and their context, may be needed for this project. This section applies to all policy development projects, market enhancements, technology enhancements, operation enhancements, Energy Imbalance Market (EIM) implementations, and Reliability Coordination (RC) service implementations. If the project team has deemed that no structured testing is needed, an end-to-end test case must be specified.

In the Reason for Potential Scenario column, select one or more of the following reasons:

- 7. Rule Impacts:** Generalized changes in market rules, bidding rules, settlements rules, market design changes, or other business rules.
- 8. Interface changes:** Changes that impact templates (e.g., the Resource Adequacy (RA) supply plan), user interface (UI), and application programming interface (API) (e.g., retrievals of new shadow settlement data).
- 9. New application/report:** Changes that cause addition/modification of market software or reports, especially when market data input is required by the market participant.
- 10. New system process:** Modification of data flow in systems, especially if the new process requires the market participant to demonstrate proficiency prior to production.
- 11. New/Modified model data:** Addition or substantial modification of model data as a market solution or export provided by the ISO.
- 12. New user role:** The addition or modification of access permissions for a user role applied to specific business units within an EIM entity or market participant organization (e.g., Load Serving Entity (LSE) as a Local Regulatory Authority (LRA) role). Scenarios are beneficial for market participants taking on a new function or process within their organization.


4.8.1 Business Requirements



ID#	Guidance on Market Participant Impacts	Source System	Sink System	Reason for Potential Scenario
MKT-003	<p>Unstructured Market Simulation:</p> <p>SC's of Hybrid resources must have the ability to submit Metered Quantities on a component ID only, which would override the current Metered Quantities.</p> <p>Note: See BRQ1307.</p>	MRI-S	MRI-S	Unstructured Market Sim, New Data type ISOME
MKT-004	<p>Unstructured Market Simulation</p> <p>Market Participants must have the capability to input Site information data into web form submission.</p> <p>Note: BU requested that Market Participants have the opportunity to practice filling out and submitting the form prior to production.</p>	N/A	RIMS	Unstructured Market Sim, New Data type
MKT – 005	<p>Unstructured Market Simulation</p> <p>Market Participant must have the capability to upload Topo Map, Sharing Agreement, Shapefile, and provide Site Info via web form.</p> <p>Note: See BRQ150, BRQ285, BRQ144, BRQ300.</p>	N/A	RIMS	Unstructured Market Sim, New Data type




ID#	Guidance on Market Participant Impacts	Source System	Sink System	Reason for Potential Scenario
MKT – 006	<p>Unstructured Market Simulation</p> <p>Market Participant must have the capability to see on UI uploaded Topo Map, Sharing Agreement, Shapefile, and provide Site Info via web form.</p> <p>Note: See BRQ150, BRQ285, BRQ144, BRQ300.</p>	N/A	RIMS	Unstructured Market Sim, New Data type
MKT – 007	<p>Unstructured Market Simulation</p> <p>Market Participants must have the capability to add Topo Map, Site Info, Shapefile, and Sharing Agreement (applicable only to Fuel Type of Solar) to Bucket 1 for any hybrid resource project created with a fuel type of Solar or Wind.</p> <p>Note: BRQ145, BRQ275.</p>	N/A	RIMS	Unstructured Market Sim, New Data type
MKT – 008	<p>Unstructured Market Simulation</p> <p>In the event Market Participant’s upload fails validation, Market Participant must receive notification of the error.</p> <p>Note: See BRQ350A, BRQ350B, BRQ205, BRQ335, BRQ325.</p>	N/A	RIMS	Unstructured Market Sim, New Data type

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5 Acronyms, Terms, and Definitions

Acronym	
ACC	Aggregate Capability Constraint
AS	Ancillary Services
CMRI	CAISO Market Results Interface
DA	Day-Ahead
DOT	Dispatch Operating Target
HSL	High Sustainable Limit
ICCP	Inter-Control Center Communications Protocol
LEL	Lower Economic Limit
MF	Master File
OASIS	Open Access Same Time Information System
PI	Plant Information
RIMS	Resource Interconnection Management System
RT	Real-Time
RTCD	Real-Time Contingency Dispatch
RTD	Real-Time Dispatch
RTPD	Real-Time Pre-Dispatch
SC	Scheduling Coordinator
STUC	Short-Term Unit Commitment
TBD	To Be Determined
TG	Tie Generator
UAT	User Acceptance Testing
UEL	Upper Economic Limit
VER	Variable Energy Resource

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Term	Definition
Co-located Resource	<p>A Generating Unit with a unique Resource ID that is part of a Generating Facility with other Generating Units.</p> <p>An EIM Participating Resource with a unique Resource ID that is part of a single resource with other EIM Participating Resources.</p>
Forecasting Fee	Settlements will consume the hybrid component meter data, evaluate whether it is using an ISO forecast, and if so it will assess a forecast fee on the summed meter for the hybrid resource that the component is a part of.
Hybrid Resource	A Generating Unit, with a unique Resource ID at a single Point of Interconnection, with components that use different fuel sources or technologies ¹ .
Meteorological Station Sharing	Resource is pulling meteorological data from another resource that is within 10 miles of the shared resource. Only solar resources are allowed to share data.
Plant Type	The type of power that the solar is derived from. Photovoltaic, Concentrator Photovoltaic, Thermal, Hybrid, or Co-Located.
VER Component	<p>A VER component is the renewable part of a hybrid resource.</p> <p><i>For example</i>, for a hybrid resource ID made up of a solar component and a battery underneath it, the VER component is only the solar portion, not the entire hybrid resource with the battery.</p>
Wind Protection	Protection on the panel from strong winds.
Wind/Solar Panel Group Number	The grouping of panels that have identical technical specifications.



Appendix: Component Table Example

RES_ID	RES_NAME	PGA_NAME	SC ID	RES_TYPE	CERT_PIR P_FF	NGR_FF	VER_FF	COMPONENT ID	LATITUDE_FF	LONGITUDE_ FF	FUEL_TYPE	GEN_TECH_TYPE	QF_FF	PI_MW_TAG_FF	MAX_GE N_FF	VER_NGR_FF	FORECAST_SEL ECTION_FF	MIN_GE N_FF	COD_FF	DISP_FF
XYZ_Hybrid	XYZ Hybrid	Hybrid Co., LLC	XYZ1	GEN	NULL	Y	NULL		38.6434709	-121.1476939	HYBD	OTHR	N	XYZ_Tag	65.20	V/Q	ISO	0	10/29/2021	Y
XYZ_Hybrid				COMP				XYZ_VER1	38.6434709	-121.1476939	WIND	WIND/OTHR		XYZ_VER1_Tag	19.55	V/Q	ISO	0		N
XYZ_Hybrid				COMP				XYZ_VER2	38.4434709	-121.1476939	WIND	WIND/OTHR		XYZ_VER2_Tag	17.2	V/Q	ISO	0		N
XYZ_Hybrid				COMP				XYZ_VER3	38.7434709	-121.1476939	SOLR	PHOT/STUR/OTHR		XYZ_VER3_Tag	25	Y	ISO	0		N
XYZ_Hybrid				COMP				XYZ_BATTERY1	38.3334121	-121.1476939	LESR	OTHR		XYZ_BATTERY1_Tag	5	N		0		Y
ABC_Hybrid	ABC Hybrid	Hybrid Co., LLC	ABC3	GEN	NULL	Y	NULL		42.8434709	-121.1476939	HYBD	OTHR	N	ABC_Tag	32.15	V/Q	SC	0	10/29/2023	N
ABC_Hybrid				COMP				ABC_VER1	42.1434909	-121.2476939	WIND	WIND/OTHR		ABC_VER1_Tag	30.2	V/Q	SC	0		N
DEF_Hybrid	DEF Hybrid	Hybrid Co., LLC	DEF2	GEN	NULL	Y	NULL		23.2614702	-121.1476939	HYBD	OTHR	N	DEF_Tag	59.86	V/Q	ISO	0	3/25/2023	Y
DEF_Hybrid				COMP				DEF_VER1	23.1634601	-121.2976632	SOLR	PHOT/STUR/OTHR		DEF_VER1_Tag	53.14	V/Q	ISO	0		Y

Columns in RED are viewable on the RDT
Columns in GREEN are viewable and editable on the RDT