

Attachment B

MASTER FILE UPDATE PROCEDURES

B Master File Update Procedures

B.1 Master File

The Master File (MF) contains data for resources participating in CAISO markets. The data is used by CAISO market systems for bidding, operation, and settlement. The authorized Scheduling Coordinator (SC) can submit a request to update specific operating parameters for existing generator or intertie resources by submitting a revised Resource Data Template (RDT) via the Master File User Interface (UI) or the Master File Application Programming Interface (API). This can be done for Generator resources on the Generating Resource Data Template (GRDT) or Intertie resources on the Intertie Resource Data Template (IRDT). Some data elements in the RDT are updateable via the UI, while others must be updated through some other process. Details are provided in the following tables.

Once the SC has submitted a request, the Master File analyst reviews the request and determines if the updates comply with stated MF business rules. If the updates pass the initial review, the request is presented for further review and approval by affected CAISO systems. The changes must be approved prior to them being made effective within the Master File database. If there are questions regarding the requested updates, the CAISO will contact the SC to coordinate modifications to the requested updates.

Master File change requests require at least five (5) and up to eleven (11) business days, depending on the complexity of the change, from receipt of the request to implementation into the Master File database (except as otherwise prescribed, such as to accommodate a high volume of requests.) If the RDT fails a business rule or the SC chooses to recall their RDT request and make a different change, the 5-business day clock begins again upon resubmission.

B.2 Generator Resource Data Template

The GRDT is an Excel spreadsheet containing multiple worksheet tabs, which contain static resource characteristics stored in the CAISO database. The worksheet tabs listed in the table below are described in the following sections:

Spreadsheet Tab	Contents
Instruction	Contains report details
Definition-GRDT	Link to blank template on CAISO website
Code	Blank
RESOURCE	Resource data
RAMPRATE	Resource ramp rate
HEATRATE	Resource heat rate
STARTUP	Resource start-up data
FORBIDDEN OPR REGION	Resource forbidden operating region
REGULATION	Resource regulation range
REG RAMP	Resource regulation ramp rate
OP RES RAMP	Resource operating reserve ramp rate
MSG_CONFIG	MSG Configuration detail
TRANSITION	Details of transitions between configurations
CONFIG_RAMP	Configuration ramp rate
CONFIG_HEAT	Configuration heat rate
CONFIG_STRT	Configuration start-up detail
CONFIG_REG	Configuration regulation range
CONFIG_RREG	Configuration regulation ramp rate
CONFIG_ROPR	Configuration operating reserve ramp rate
GEN_RES_AGGR	Child Resources of Aggregate Resource

B.2.1 RESOURCE tab – Modifiable Data

Many of the data elements in the Resource tab are modifiable via the RDT update process, by submitting a revised RDT through the Master File User Interface. Those data elements are describe in the following table in the order they appear in the GRDT. Non-modifiable fields are described in the next section.

RDT Column Name	Unit	Definition	Business Rule
MAX_GEN (Maximum Generation Capacity)	MW	The Net Dependable Capacity (NDC or PMAX) a Generator Resource can produce on a <i>sustained basis</i> as measured at or compensated to the Generating Unit's defined point of delivery. For PDR resources - the maximum load that can be curtailed. For LESR resources - the maximum capacity when discharging at maximum sustainable rate For DDR resources - the maximum capacity (negative or zero) represents the lowest load level it can be reduced to.	<ul style="list-style-type: none"> Cannot be null Must equal the maximum output level (last segment) in the RAMP and HEAT curves Cannot be greater than the tested Pmax (if unit was tested). Must be \geq MIN_GEN + 0.01
MIN_GEN (Minimum Generation Capacity)	MW	The minimum output level at which a Generator Unit can operate on a <i>sustained basis</i> . For PDR resources - the smallest increment that can be curtailed. For LESR resources - the minimum capacity (negative) withdrawn from the grid when unit is charging at maximum sustainable rate. For DDR resources - minimum capacity (negative) represents the maximum load level at which it can consume energy.	<ul style="list-style-type: none"> Cannot be null Must be 0 or \geq 0.1 if FUEL_TYPE \neq LESR, DDR Must equal the minimum output level (segment 1) in the RAMP curve and in the HEAT curves Must be \leq MAX_GEN - 0.01
MIN_DISP_LEVEL (Minimum Dispatchable Level)	MW	The Minimum operating level at which a Generating Unit is able to readily respond to a dispatch instruction For PDR and NGR resources, this value is the same as MIN_GEN.	<ul style="list-style-type: none"> Default value is set equal to MIN_GEN Must be greater than or equal to MIN_GEN If MIN_DISP_LEVEL > MIN_GEN, a Forbidden Region should be specified between MIN_GEN and MIN_DISP_LEVEL
MIN_ON (Minimum On Time)	Minutes	The minimum amount of time that a Generating Unit must stay on-line after starting up and reaching PMin, prior to being shut down, due to physical operating constraints. In case of a Pump Storage resource, this field represents the minimum time that the resource must stay on-line in the generating mode prior to being shut down. If no constraint, then leave this field blank, or 0 if resource is Gas-fueled. For PDR resources - Minimum amount of time the PDR resource can maintain a curtailment, once called to be curtailed. For NGR resources the field is not applicable and must be set to 0.	<ul style="list-style-type: none"> Cannot be null if Fuel Type is equal to GAS; 0 is okay. For RDR, must be \leq 60

RDT Column Name	Unit	Definition	Business Rule
MAX_ON (Maximum On Time)		<i>This data element is not used - Market software does not reference this data element.</i>	
MIN_OFF (Minimum Off Time)	Minutes	The minimum amount of time that a Generating Unit must stay off-line after being shut down, due to physical operating constraints. In case of a Pump Storage resource, this field represents the minimum time that the resource must stay off-line after being shut down from the generating mode prior to being started again in the generating mode. Minimum Off Time includes Startup Time. For PDR - Minimum time after a load restoration before load can be curtailed again, includes Startup Time.	<ul style="list-style-type: none"> Must be greater than or equal to the minimum startup time (segment 1) in the startup curve
MAX_STRT (Maximum Startups Per Day)	starts/ day	The maximum number of times a Generating Unit can be started up within one day, due to environmental or physical operating constraints. For PDR, this is the maximum number of curtailments per day. For NGR resources the field is not applicable.	<ul style="list-style-type: none"> Must be an integer (whole number), 1 or greater
MKT_MAX_STRT (Market Maximum Startups Per Day)		<i>This data element is not currently used. It was created to implement the CAISO's resource characteristics proposal, which FERC rejected in Docket ER18-1169. The CAISO has sought rehearing of FERC's decision.</i>	
MIN_LOAD_COST (Minimum Load Cost)	\$/hour	The costs a Generating Unit or a Participating Load incurs operating at minimum load. The value is needed for a resource with the Cost Basis of Registered Cost (fixed value) only. For PDR - the cost to curtail at the PDR resource's MIN_GEN level per hour. For NGR resources the field is not applicable and must be set to 0.	<ul style="list-style-type: none"> Cannot be null if ML Cost Basis Type of REGC (Registered) is selected May not exceed 150% of unit's projected proxy cost for minimum load cost if ML_COST_BASIS_TYPE = REGC
ML_COST_BASIS_TYPE (Minimum Load Cost Basis Type)	Text	Election for Minimum Load Cost calculation methodology used in the bid. Options are Proxy (PRXC) or Registered (REGC). Only Use Limited resources that do not have at least twelve consecutive months of LMPs or have not reached the start of the second month after the end of the twelve months of consecutive LMPs are eligible to elect Registered methodology. If Registered Cost: Please refer to Attachment G.	<ul style="list-style-type: none"> If REGC is selected, Minimum Load Cost value must be provided For REGC to be selected, USE_LIMIT flag must be Y

RDT Column Name	Unit	Definition	Business Rule
SU_COST_BASIS_TYPE (Start-Up Cost Basis Type)	Text	Election for Startup Cost calculation methodology used in the bid. Options are Proxy (PRXC) or Registered (REGC). Only Use Limited resources that do not have at least twelve consecutive months of LMPs or have not reached the start of the second month after the end of the twelve months of consecutive LMPs are eligible to elect Registered methodology. If Registered Cost: Please refer to Attachment G	<ul style="list-style-type: none"> If REGC is selected, Startup Cost value must be provided For REGC to be selected, USE_LIMIT flag must be Y
MAX_PUMP (Maximum Pump Capacity)	MW	The Maximum Operating Level of a Pump or a Pumped-Storage-Hydro Unit operating as a hydro pump	<ul style="list-style-type: none"> Cannot be null if GEN_TECH_TYPE equals either PTUR or PUMP
MIN_PUMP_CST (Pumping Minimum Cost)	\$/hour	The hourly cost of operating a hydro pump, expressed in \$/hour	<ul style="list-style-type: none"> Cannot be null if GEN_TECH_TYPE equals either PTUR or PUMP
PUMPING_FACTOR (Pumping Factor)	numeric	The efficiency or recovering energy potential in pumping water from the lower to the upper reservoir.	<ul style="list-style-type: none"> Cannot be null if GEN_TECH_TYPE equals either PTUR or PUMP
PUMP_MAX_STRT (Pump Maximum Daily Startups)	starts/day	The maximum number of times a Pumped Storage Hydro Resource can switch into pumping mode during a Trading Day.	<ul style="list-style-type: none"> Cannot be null if GEN_TECH_TYPE equals either PTUR or PUMP
PUMP_MIN_UP_TM (Pump Minimum Up Time)	minutes	The minimum time that a Pumped Storage Hydro Resource must stay in pumping mode after switching to that mode.	<ul style="list-style-type: none"> Cannot be null if GEN_TECH_TYPE equals either PTUR or PUMP
PUMP_MIN_DWN_TM (Pump Minimum Down Time)	minutes	The minimum time that a Pumped Storage Hydro Resource must stay out of pumping mode after switching out of that mode.	<ul style="list-style-type: none"> Cannot be null if GEN_TECH_TYPE equals either PTUR or PUMP
MIN_DWN_TM_GP (Gen-to-Pump Minimum Down Time)	minutes	The Gen-to-Pump minimum down time applies to Pump Storage Resources and reflects the minimum time (in minutes) that the resource must be offline (or self-scheduled) after being de-committed from generation mode and before being dispatched in pumping mode.	
MIN_DWN_TM_PG (Pump-to-Gen Minimum Down Time)	minutes	The Pump-to-Gen minimum down time applies to Pump Storage Resources and reflects the: Minimum time (in minutes) that the resource must be offline (or self-scheduled) after being de-committed from pumping mode and before being dispatched in generation mode.	

RDT Column Name	Unit	Definition	Business Rule
MAX_PUMP_SD_COST (Pump Maximum Shutdown Cost)	\$/shutdown	The maximum cost it would take to shut down the pump.	<ul style="list-style-type: none"> Cannot be null if GEN_TECH_TYPE equals either PTUR or PUMP
PUMP_SHTDWN_TM (Pump Shutdown Time)	minutes	The pump shutdown time	<ul style="list-style-type: none"> Cannot be null if GEN_TECH_TYPE equals either PTUR or PUMP
COST_RANK_LMPM (Variable Cost Option)	1, 2, 3	A method of calculating Default energy Bids based on fuel costs and variable operations and maintenance costs.	<ul style="list-style-type: none"> Default setting is 1 Only one of the three ranking fields (COST_RANK_LMPM, NEGO_RANK_LMPM, and PRC_RANK_LMPM) can be ranked as 1
NEGO_RANK_LMPM (Negotiated Rate Option)	1, 2, 3	A method of calculating Default energy Bids based on a negotiation with the CAISO or an Independent Entity.	<ul style="list-style-type: none"> Default setting is 2 Only one of the three ranking fields (COST_RANK_LMPM, NEGO_RANK_LMPM, and PRC_RANK_LMPM) can be ranked as 1
PRC_RANK_LMPM (LMP Option)	1, 2, 3	A method of calculating Default energy Bids based Locational Marginal Prices.	<ul style="list-style-type: none"> Default setting is 3 Only one of the three ranking fields (COST_RANK_LMPM, NEGO_RANK_LMPM, and PRC_RANK_LMPM) can be ranked as 1
RSRV_CAP_SPIN (Reserve Capacity: Spin)	MW	The portion of unloaded synchronized generating capacity that is immediately responsive to system frequency and that is capable of being loaded in ten minutes, and that is capable of running for at least two hours.	<ul style="list-style-type: none"> Must have a value if CERT_SPIN is Y. Cannot be greater than the tested Spin capacity. Must be \leq (MAX_GEN - MIN_GEN)
RSRV_CAP_NSPI (Reserve Capacity: Non-Spin)	MW	The portion of off-line generating capacity that is capable of being synchronized and Ramping to a specified load in ten minutes (or load that is capable of being interrupted in ten minutes) and that is capable of running (or being interrupted) for at least two hours.	<ul style="list-style-type: none"> Must have a value if CERT_NSPI_DAM and CERT_NSPI_RTM flags are set to Y. Cannot be greater than the tested Non-spin capacity. Must be \leq MAX_GEN
CERT_REG_DOWN (Certified for AS: Regulation Down)	Y/N	An identifier of a resource that is certified to provide Regulation Down	<ul style="list-style-type: none"> If Y, the REG and RREG curves must be defined
CERT_REG_UP (Certified for AS: Regulation Up)	Y/N	An identifier of a resource that is certified to provide Regulation Up	<ul style="list-style-type: none"> If Y, the REG and RREG curves must be defined

RDT Column Name	Unit	Definition	Business Rule
CERT_SPIN (Certified for AS: Spin)	Y/N	An identifier of a resource that is certified to provide Spinning Reserve.	<ul style="list-style-type: none"> If Y, RSRV_CAP_NSPIN must have a value and the ROPR curve must be defined
CERT_NSPIN_DAM (Certified for AS DAM: Non-Spin)	Y/N	An identifier of a resource that is certified to provide Non-Spinning Reserve in the DAM.	<ul style="list-style-type: none"> If Y, RSRV_CAP_NSPIN must have a value and the ROPR curve must be defined
CERT_NSPIN_RT M (Certified for AS RTM: Non-Spin)	Y/N	An identifier of a resource that is certified to provide Non-Spinning Reserve in the RTM. To be procured in the RTM, a unit must also have a Startup Code Type of FAST.	<ul style="list-style-type: none"> If Y, RSRV_CAP_NSPIN must have a value and the ROPR curve must be defined
REM (Regulation Energy Management)	Y/N	Indicator of a non-generator resource that participates -only- in the regulation markets.	
MIN_CONT_ENERGY_LIMIT (Minimum Continuous Energy Limit)	MWh	Minimum stored energy for an LESR. If no real physical energy limit, leave blank.	
MAX_CONT_ENERGY_LIMIT (Maximum Continuous Energy Limit)	MWh	Maximum stored energy for an LESR. If no real physical energy limit, leave blank.	
CURT_ENERGY_LIMIT (Curtailement Energy Limit)	MWh	The energy limit for curtailing the consumption of energy for NGR. If no limit, leave blank. This is a placeholder for future functionality.	
ENERGY_EFFIC (Energy Efficiency)	numeric	The percentage of charging energy that the device can store and later discharge; $0 \leq n \leq 1$	
EMISSION_RATE	mtCO2/ mmBTU	For gas-fired resources, the emission rate (mtCO2/mmBTU) used to determine a resource's greenhouse gas compliance obligation	
GHG_COMPLIANCE_OBLIG	Y / null	Indicator of a resource that has a greenhouse gas compliance obligation and is eligible to recover greenhouse gas allowance costs	
FORECAST_SELECTION	ISO or SC	Indicator for whether a resource will provide its own forecast (select 'SC') or will utilize the ISO's forecast (select 'ISO')	<ul style="list-style-type: none"> VER flag must be Y in order for this election to be made Selecting 'SC' requires certification

B.2.2 RESOURCE tab – Reference-only Data

This table contains Generator resource data that is provided in the GRDT for reference only. These values are reflective of a regulatory agreement with the ISO, or are established through a testing, certification, or registration process, or are based on the Full Network Model. Updates cannot be made through the RDT change process, but may be initiated through another business process. The fields are listed in the order they appear in the GRDT.

RDT Column Name	Unit	Definition	
PGA_NAME (Participating Generator Agreement Name)		The name of an agreement between the CAISO and a Participating Generator; a pro forma version of which is set forth in Appendix B.2 of the CAISO Tariff	A revision to this name must match the name on the agreement.
RES_ID (Resource ID)		The ISO resource identifier used for tracking each resource for market scheduling and outage coordination purposes.	
RES_NAME (Resource Name)		Descriptive Name for the Resource from the PGA or NSPGA Schedule 1, MSS Schedule 14, DR Registration, etc.	A revision to this name must match the facility name on the agreement schedule.
RES_TYPE (Resource Type)		Descriptive identifier denoting the type of resource: Generating Unit (GEN), Tie Generator (TG), Load.	
AGGREGATE_YN (Aggregate?)	Y/N	A generator resource that consists of more than one individual "child" resources as modeled in the CAISO system	
ENERGY_TYPE (Energy Type)		Energy Type If RES_TYPE = TG: <ul style="list-style-type: none"> • DYN – resource is on a Dynamic Scheduling Agreement • FIRM – import resource for scheduling of AS self-provision on ETC/TOR contracts If RES_TYPE = GEN, this field is Null	

RDT Column Name	Unit	Definition	
FUEL_TYPE (Primary Fuel Type)		Description of Primary Fuel Type of the Generator; such as, Natural Gas, Oil, Nuclear, etc. GAS – Natural Gas COAL – Coal/Coke DDR – Dispatchable Demand Response OIL – Oil NUCL – Nuclear WAST – Waste to Energy BIOM – Biomass GEOT – Geothermal LESR – Limited Energy Storage Resource SOLR – Solar WATR – Water BGAS – Bio Gas (Landfill Sewage Digester etc.) HRCV – Heat Recovery WIND – Wind OTHR – Other	A revision to fuel type must match the agreement schedule.
GEN_TECH_TYPE (Prime Mover Technology)		Description of the Prime Mover Technology associated with Generators ; such as, Hydro Turbine, Gas Turbine, Combined Cycle, etc HYDR – Hydro Turbine PTUR – Hydro Pump-Turbine GTUR – Gas Turbine STUR – Steam Turbine CCYC – Combined Cycle RECP – Reciprocating Engine PHOT – Photovoltaic WIND – Wind Turbine PUMP – Pump	A revision to technology type must match the agreement schedule.
GEN_TYPE (Generator Type)		H = Hydro resources T = Other resources	

RDT Column Name	Unit	Definition	
<p>FUEL_REGN_TYPE (Fuel Region)</p>		<p>The gas region for gas-fired Generators: CISO – if Non-Gas PGE4 PGE2 SCE1 (if gas usage is under 3 million therms/year) SCE2 (if gas usage is over 3 million therms/year) SDG1 (if gas usage is under 3 million therms/year) SDG2 (if gas usage is over 3 million therms/year) KRNP KRNS Represents the fuel region price used in the calculation of Start-up and Minimum Load costs, as well as the costvariable based option for Default Energy Bid for a resource. For a full list of the available fuel regions, see here: [http://www.caiso.com/market/Pages/NetworkandResourceModeling/Default.aspx] See Attachment C for how to request a change to fuel region.</p>	
<p>ELECTRIC_REGN (Electric Region)</p>		<p>The electric region is used forreflecting to associates the corresponding electricity price for the resource's startup auxiliary power. For a full list of the available electric regions, see here: [http://www.caiso.com/market/Pages/NetworkandResourceModeling/Default.aspx] Each fuel region has a corresponding wholesale electric region. See Attachment M for how to request a retail electric region.</p>	
<p>POWER_PRICE_HUB (Power Price Hub)</p>		<p>Power trading hub assignment to associatereflecting the wholesale power price appropriate to a resource or Multi-Stage Generator based on the power price hub location documented in Open Access Transmission Tariffs for the Balancing Authority Area where the resource is located or if unavailable then the closest trading hub to the resource location.</p> <p>PHMIDC - Mid-Columbia PHPALO - Palo Verde PHNP15 – North of Path 15 PHSP15 – South of Path 15</p>	

RDT Column Name	Unit	Definition	
AQM_DIST_TYPE (Air Quality Management District)		The Air Quality Management District or Air Pollution Control District in which the resource is located. AMAD – Amador ANTV - Antelope Valley BUTT – Butte CALA – Calaveras COLU – Colusa ELDO - El Dorado FRVR - Feather River GBUN - Great Basin Unified GLEN – Glenn IMPE – Imperial KERN – Kern LAKE – Lake LASS – Lassen MARI – Mariposa MBUN - Monterey Bay Unified MEND – Mendocino MODO – Modoc MOJD - Mojave Desert NCUN - North Coast Unified NSER - Northern Sierra NSON - Northern Sonoma OTHR - Other Region PLAC – Placer SACM - Sacramento Metro SBRB - Santa Barbara SCOA - South Coast SDIE - San Diego SFBA - San Francisco Bay Area SHAS – Shasta SISK – Siskiyou SJVU - San Joaquin Valley Unified SLUO - San Luis Obispo TEHA – Tehama TUOL – Tuolumne VENT – Ventura YOSO - Yolo/Solano	
CERT_PIRP (Certified PIRP)	Q, Y, P, I, N, or null	Q = Wind or solar resource in the process of having forecast information evaluated Y = Wind or solar resources that are flagged as Variable Energy Resources P = PIRP protective measures (without Inter-SC trade) I = PIRP protective measures (with Inter-SC trade) N or Blank = not applicable	

RDT Column Name	Unit	Definition	
MOO_QUALIFIED (Must Offer Obligation Qualified)	R_or, N, or Y	N: Resource is <u>exempt from CAISO inserting a Generated Bid</u> not Must Offer R: <u>CAISO will insert generated bids a Generated Bid if a resource has a must offer requirement and is not exempt from bid generation and has not submitted a bid, is eligible for Must Offer based on RA Capacity has not been reflected in a bid, or CPM designation subject to Tariff Section 40.6.2 in any given trading hour.</u> Y: <u>Resource is under an RMR or other backstop agreement establishing Must Offer Obligation at all times.</u>	<ul style="list-style-type: none"> • R for Generators that are not use limited, NGR, VER, or must take • N for Generators if any one of the following is true: USE_LIMIT = Y, NGR = Y, VER = Y, PRIOR_TYPE = MT
STARTUP_CD_TYP E (Startup Code Type)		Code used to determine the startup characteristics. FAST: Generating Units that have a Start Up Time less than ten minutes and are certified to provide non-spin. Blank: All other resources.	
PGA_PART (Participating Generator Agreement Flag)	Y/N	An identifier of PGA Resources.	
<u>COM_MW</u> (Commercial Operation for Market MW)	<u>MW</u>	<u>The portion of a new Generating Unit that has synchronized to the CAISO controlled grid and has completed on-site test operations and commissioning that is allowed to Bid into the CAISO markets in advance of achieving COD for the entire Electric Generating Unit.</u> <u>NOTE, once the resource declares COD, this field will become null.</u>	
COG (Constrained Output Generator Flag)	Y/N	The output of the generation resources is not variable, ie PMax = PMin. Y: output is constrained.	
CERT_BLKSTRT (Certified for Black Start)	Y/N	An identifier of a resource that holds a Black Start agreement and has been certified for Black Start capability	
CERT_DAM (Certified for Day Ahead Market)	Y/N	An identifier of a resource eligible to participate in the Day Ahead market.	<ul style="list-style-type: none"> • Y for Generators and TG resources • N for Discrete Dispatch RDR and EIM resources (participating and non-participating)

RDT Column Name	Unit	Definition	
CERT_RTM (Certified for Real Time Market)	Y/N	An identifier of a resource eligible to participate in the Real Time market	<ul style="list-style-type: none"> Y for Generators, TG resources, and participating EIM resources N for DA-only PDR resources and non-participating EIM resources
CERT_RUC (Certified for RUC)	Y/N	A setting of 'Y' allows a resource to participate in RUC market.	<ul style="list-style-type: none"> Y for Generators and TG resources N for NGR, RDR, EIM resources (participating and non-participating)
LMPM (Market Power Mitigation Participation Flag)	Y/N	An identifier of a resource that is subject to the market power mitigation process. Defined per tariff.	<ul style="list-style-type: none"> Y for Generators, TG resources, and participating EIM resources N for non-participating EIM resources
MSS_LD_FLNG_D WN (MSS Load Following Down)	Y/N	Identifier if a resource is load following down – applies to Metered Subsystem only	
MSS_LD_FLNG_UP (MSS Load Following Up)	Y/N	Identifier if a resource is load following up – applies to Metered Subsystem only	
QF (FERC Qualifying Facility Flag)	Y/N	Identifier if a resource is a qualifying cogeneration facility or small qualifying power production facility, as defined in the Code of Federal Regulations, Title 18, Part 292	
USE_LIMIT (Use Limit)	Y/N	Identifier of a resource that is energy use limited, such as limitation of energy or emission control, etc.	
OPER_MAINT_COST (Operating Maintenance Cost Adder)	\$/MWh	Variable operations and maintenance (O&M) costs. See Exhibit 4-2 in Section 4 in the body of this BPM for default values of O&M cost adders. For resources that have a negotiated O&M adder, that value will display in this field.	Contact ndeb@caiso.com to establish a negotiated O&M adder.
OPER_MAINT_ADDER_TYPE (Operating Maintenance Cost Adder Type)	D/N	This flag identifies whether the Operating Maintenance Cost Adder is the default value (D) or a negotiated (N) value.	
PRIOR_TYPE (Priority Type)		Designator of Regulatory Must-Run, Reliability Must Run, and Must Take resources	
DISP (Dispatchable)	Y/N	Designates a dispatchable resource	

RDT Column Name	Unit	Definition	
DISCRETE_DISP (Discrete Dispatch)	Y/null	Indicator of a resource that is dispatchable for a specified megawatt quantity. Applies to Reliability Demand Response only.	
RMR (Reliability Must Run)		Designates a resource that has a Reliability Must Run contract	
MAX_RR (Maximum Ramp Rate)		This is a derived field that represents the maximum ramp rate in the operational ramp rate curve.	
PRC_SET_DAM (Price Setter – DAM)		Can set Market Clearing price in Day Ahead market	
PRC_SET_RTM (Price Setter – RTM)		Can set Market Clearing price in Real Time market	
MSG_YN (Multi-Stage Generator Flag)	Y/null	Indicator of a resource that is modeled with multiple configurations under the Multi-Stage Generator (MSG) model.	
STARTUP_RAMP_TIME (Startup Ramp Time)		Represents the time it takes to physically ramp unit from zero to pmin after the closing of the breaker.	
SUPPLY_CONFIG_YN (Supplied Configuration Flag)		This is a placeholder for future functionality.	
HR_PRE_DISP (Hourly Pre-Dispatch)	Y/N/null	This flag indicates a resource that if dispatched, shall be dispatched in the next Trading Hour to operate at a constant level over the entire Trading hour Y - Hourly only N - 15-minute market or hourly Blank - 5-minute market (all Generators)	
NGR (Non Generator Resource Flag)	Y/N/null	Indicator of a non-generator resource Y = NGR N or null = not NGR	
CHP (Combined Heat and Power Resource Flag)	Y/N/null	Indicator of a combined heat and power resource Y = CHP N or null = not CHP	
RMTG_MAX_ON_P EAK (RMT Max On Peak)	MW	For CHP resources, the portion of capacity that is eligible for Reliability Must-Take scheduling priority during on-peak hours. Must be reestablished annually. For exempt QF resources, this value is set equal to the unit's pmax.	Establish this value or update it by submitting RMT Max value letter to CAISO.

RDT Column Name	Unit	Definition	
RMTG_ON_PEAK_EXPIR_DT (RMT Max On Peak)	DD/MM/YY	Expiration date of the stated RMTG-eligible capacity For exempt QF resources, no expiration date applies.	
RMTG_MAX_OFF_PEAK (RMT Max On Peak)	MW	For CHP resources, the portion of capacity that is eligible for Reliability Must-Take scheduling priority during off-peak hours. Must be reestablished annually. For exempt QF resources, this value is set equal to the unit's pmax.	Establish this value or update it by submitting RMT Max value letter to CAISO.
RMTG_OFF_PEAK_EXPIR_DT (RMT Off Peak Expiration Date)	DD/MM/YY	Expiration date of the stated RMTG-eligible capacity For exempt QF resources, no expiration date applies.	
ADDER_AMT (Minimum Load Major Maintenance Adder)	\$/hour	A resource-specific adder for major maintenance minimum load cost, if applicable, determined by the CAISO or an independent entity	Contact MMAs@caiso.com to establish this value or revise it.
VER_YN (Variable Energy Resource Flag)	Y/null	Indicator of a Variable Energy Resource, defined as "A device for the production of electricity that is characterized by an Energy source that: (1) is renewable; (2) cannot be stored by the facility owner or operator; and (3) has variability that is beyond the control of the facility owner or operator."	
Energy Imbalance Market Participating Flag EIM_PARTICIPATING	Y/N/null	Y = EIM resource that is participating N = EIM resource that is non-participating Blank for non-EIM resources	
Balancing Authority Area BAA		Balancing Authority Area the resource is located in	

B.2.3 Operational Ramp Rate Curve – RAMPRATE tab

- The Operational Ramp Rate is a staircase curve of up to four segments, defined by five points, which allows a ramp rate to be defined at different operating levels.

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Segment Type = RAMP			
Segment Number		Point number between the PMin and PMax of the Generating Unit output.	<ul style="list-style-type: none"> • First point must be 1 • Point numbering must be sequential • A minimum of 2 points is required • No more than 5 points (representing 4 segments) allowed
Operating Level	MW	The Generating Unit MW output of point i. The first point (1) of MW output must begin at the Generating Unit's PMin. The last point (n) of MW output must end at the Generating Unit's PMax.	<ul style="list-style-type: none"> • Value of the first point must equal MIN_GEN • Value of the last point must equal MAX_GEN
Worst Operational Ramp Rate (RAMP_MIN_RATE)	MW/minute	The maximum ramp rate under the worst operating condition of the Generating Unit between point (i) and the point (i+1).. A minimum of two points must be provided: the first point (1) at PMin and last point (n) at PMax.	<ul style="list-style-type: none"> • Must be <= RAMP_MAX_RATE for the same point • RAMP_MIN_RATE of the last 2 points must be the same • For RDRR, the slowest RAMP_MIN_RATE plus the fastest startup time must be 40 minutes or less.
Best Operational Ramp Rate (RAMP_MAX_RATE)	MW/minute	The maximum ramp rate under the worst operating condition of the Generating Unit between point (i) and the point (i+1). A minimum of two points must be provided: the first point (1) at PMin and last point (n) at PMax.	<ul style="list-style-type: none"> • Must be 0.1 or greater • Must be >= RAMP_MIN_RATE for the same point • Cannot be greater than the tested ramp rate (if unit was tested for Ancillary Services) • RAMP_MAX_RATE of the last 2 points must be the same
Market Ramp Rate (RAMP_MKT_RAMP_RATE)		<i>This data element is not currently used. It was created to implement the CAISO's resource characteristics proposal, which FERC rejected in Docket ER18-1169. The CAISO has sought rehearing of FERC's decision.</i>	

B.2.4 Heat Rate Curve – HEATRATE tab

This table contains data on the average Heat Rate, Emission Rate or Average Fuel Cost between segments

RDT Colun Name	Unit	Definition	Business Rule
Resource ID			
Segment Type = HEAT			
Segment Number		The point numbers between the PMin and PMax of the Generating Unit output.	<ul style="list-style-type: none"> • First point must be 1 • Point numbering must be sequential • A minimum of 2 points is required • No more than 11 points allowed
Heat Rate Operating Level	MW	The Generating Unit output of point 1. The first point (1) of MW output must start at the Generating Unit's PMin. The last point (n) of MW output must end at the Generating Unit's PMAX.	<ul style="list-style-type: none"> • Value of the first point must equal MIN_GEN • Value of the last point must equal MAX_GEN • A break-point cannot fall within a Forbidden region • A break-point cannot fall within a Regulation range
Heat Rate HEAT_HEAT_RATE	BTU / kWh	<p>For gas-fired units, the average heat rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Heat rate must be provided at the first point (1) (PMin) and the last point (n) (PMax). If not a gas-fired unit, complete the Average Heat Cost field.</p> <p>For NGR the field is not applicable and must be 0.</p> <p>For EIM, this field is used for non-gas resources to compute the GHG bid cap. Non-gas resources complete the average heat cost field as well.</p>	<p>Heat Rate must be provided if FUEL_TYPE = GAS</p> <p>Heat input must be monotonically increasing: $[(HEAT_RATE * HEAT_MW_OUTPUT / 1000)$ in segment (i+1) must be greater than $(HEAT_RATE * HEAT_MW_OUTPUT / 1000)$ in segment (i)]</p>
Emission Rate HEAT_EMISSION_RATE	lbs of NOx/MWh	<p><i>This is informational only - Market software does not reference this data element.</i></p> <p>The emission rate of the Generating Unit on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Emission rate must be provided at the first point (1) (PMin) and the last point (n) (PMax)</p>	
Average Cost HEAT_AVG_COST	\$/MWh	Use this value for fuel costs of non-gas fired units instead of Heat Rate and natural gas price indices. The average cost of the Generating Unit on point (i) in \$/MWh. If value at point (i) is not available, linear interpolation can be used to approximate the value.	These values are used to calculate the incremental fuel costs used in determining a resource's default energy bid under the Variable Cost Option for non-gas resources as described in 39.7.1.1.

RDT Colun Name	Unit	Definition	Business Rule
		Average cost must be provided at the first point (1) (PMin) and the last point (n) (Pmax).	Fuel cost values do not include any greenhouse gas allowance costs, variable operating and maintenance costs or other administrative charges. Average fuel cost values may be subject to verification and require supporting documentation upon request by the ISO.

B.2.5 Start-Up Curve – STARTUP tab

Start-up Time and Start-up Cost are staircase curves reflecting the conditions for Start-up, whether hot, warm, or cold. Both are expressed as a function of Cooling Time.

For RDRR, the slowest Operational Ramp Rate and fastest Start-Up Time must be coordinated so that the resource starts up and ramps from zero to full capacity in no more than 40 minutes.

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Segment Type = STRT			
Segment Number		The segment numbers corresponding to cooling time of the unit. One segment is required. Up to 3 segments are allowed, representing a hot, warm, and cold start.	<ul style="list-style-type: none"> • First segment must be 1 • Segment numbers must be sequential
Registered Cooling Time	minutes	The amount of time the Generating Unit must be off (in minutes) within sequence (i). The first down time must be zero to account for a unit which has just shut down.	<ul style="list-style-type: none"> • Value in first segment must be 0 • Value must increase with each sequential segment (if more than one segment exists)
Start-Up Time	minutes	Startup Time is the time (in minutes) it takes a resource to achieve PMin from an off-line position given the corresponding Down Time (Registered Cooling Time). The startup time of the Generating Unit (in minutes) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup time (in minutes) from cooling time (n) to infinity. This value includes notification time. For NGR the field is not applicable and must be 0.	<ul style="list-style-type: none"> • Value must increase with each sequential segment • Value in first segment must <= MIN_OFF time • For RDRR, the slowest RAMP_MIN_RATE plus the fastest startup time must be 40 minutes or less.

RDT Column Name	Unit	Definition	Business Rule
Start-Up Cost	\$ / start	The startup cost of non-natural gas fired Generating Units (in dollars) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup cost (in dollars) from cooling time (n) to infinity. For NGR the field is not applicable and must be 0.	<ul style="list-style-type: none"> Value must increase with each sequential segment May not exceed 150% of unit's projected proxy startup cost if SU_COST_BASIS_TYPE = REGC A Startup Cost with more than 2 decimal places submitted in an RDT will be rounded to 2 decimal places
Start-Up Aux	MWh	The electrical power used by a Generating Unit during startup. The Generating Unit's startup auxiliary power (in MWh) from the down time (i) to down time (i + 1). The last sequence is the startup auxiliary power (in MWh) from current sequence to infinite. For NGR the field is not applicable and must be 0.	<ul style="list-style-type: none"> Cannot be null if Fuel_type is GAS
Start-Up Fuel	mmBTU	The fuel use (in mBTU per start) expected for the startup of a Generating Unit that has been off-line for a substantial period of time. The startup fuel of the Generating Unit (in mBTU) from the down time (i) to down time (i + 1). The last sequence is the startup fuel (in mBTU) from current sequence to infinite. For NGR the field is not applicable and must be 0.	<ul style="list-style-type: none"> Value must increase with each sequential segment
Start-Up MMA	\$ / start	A resource-specific major maintenance adder value per start-up, if applicable, agreed to by the CAISO or an Independent Entity. This field is READ-ONLY.	Contact MMAs@caiso.com to establish this value or revise it.

B.2.6 Forbidden Range Curve - FORBIDDEN OPR REGION Tab

A Forbidden Region is an output range in which a Generator cannot safely operate.

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Segment Type = FBRD			
Segment Number		This number represents a given forbidden region. Segment number 1 should be the forbidden region at the lowest level in the operating range. Segment numbers should correspond to sequential regions along the operating range, ending with segment (n) at the highest operating level.	<ul style="list-style-type: none"> First segment must be 1 Segment numbers must be sequential No more than 4 segments (representing 4 forbidden regions are allowed)
Lower MW of Forbidden Region	MW	The lower MW output of the forbidden range of the current segment. The forbidden region should be inside of segment (i); meaning a forbidden region cannot cross two segments and the segment cannot be overlapped. Note: forbidden regions cannot include nor overlap regulation ranges or heat segments.	<ul style="list-style-type: none"> Must be \geq MIN_GEN + 0.1
Upper MW of Forbidden Region	MW	The upper MW output of the forbidden region of the current segment. The forbidden region should be inside of segment (i); meaning a forbidden region cannot cross two segments and the segment cannot be overlapped. Note: Forbidden regions cannot include nor overlap regulation ranges or heat segments.	<ul style="list-style-type: none"> Must be \leq MAX_GEN - 0.1
Forbidden Region Crossing Time	minutes	The time in minutes for a generator to ramp through a Forbidden Region.	<ul style="list-style-type: none"> If FBRD segment exists, Forbidden Region Crossing Time must be \geq 1

B.2.7 Regulation Range Curve – REGULATION tab

This table describes the regulation range for a resource that is certified for Regulation Up or Regulation Down.

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Segment Type = REG			
Segment Number		Number of the regulation range. Up to two ranges are allowed where segment number 1 describes the lower range and segment number 2 describes the upper range.	<ul style="list-style-type: none"> Up to 2 segments allowed.
Lower MW for Regulation	MW	The Lower MW output of the current Regulation Range segment.	<ul style="list-style-type: none"> Must be \geq MIN_GEN
Higher MW for Regulation	MW	The Higher MW output of the current Regulation Range segment.	<ul style="list-style-type: none"> Must be $>$ Lower MW for Regulation and \leq MAX_GEN

B.2.8 Regulation Ramp Rate Curve - REG RAMP tab

This table describes the regulation ramp rate for a resource that is certified for Regulation Up or Regulation Down.

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Segment Type = RREG			
Segment Number		One regulation ramp rate is allowed per resource and applies to all defined regulation ranges for the resource.	<ul style="list-style-type: none"> 1 segment allowed
Worst Regulation Ramp Rate	MW/minute	The maximum Regulation Ramp Rate under the worst condition.	<ul style="list-style-type: none"> Must be > 0
Best Regulation Ramp Rate	MW/minute	The maximum Regulation Ramp Rate under the best condition.	<ul style="list-style-type: none"> Must be \leq Best Operating Ramp Rate (RAMP curve) Must be \leq the tested Regulation ramp rate
Market Regulation Ramp Rate		This data element is not currently used. It was created to implement the CAISO's resource characteristics proposal, which FERC rejected in Docket ER18-1169. The CAISO has sought rehearing of FERC's decision.	

B.2.9 Operating Reserve Ramp Rate Curve - OP RES RAMP tab

This table contains the data on the maximum ramp rate of the Generator certified for spin and non-spin between worst and best operating conditions between segments.

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Segment Type = ROPR			
Segment Number		One operating reserve ramp rate covers procurement of both Spinning and Non-Spinning reserve.	<ul style="list-style-type: none"> 1 segment allowed
Worst Operating Res Ramp Rate	MW/minute	The maximum Operating Reserve Ramp Rate under the worst condition	<ul style="list-style-type: none"> Must be > 0
Best Operating Res Ramp Rate	MW/minute	The maximum Operating Reserve Ramp Rate under the best condition.	<ul style="list-style-type: none"> Must be <= Best Operating Ramp Rate (RAMP curve) Must be <= the tested Spin or Non-Spin ramp rate
Market Operating Res Ramp Rate		This data element is not currently used. It was created to implement the CAISO's resource characteristics proposal, which FERC rejected in Docket ER18-1169. The CAISO has sought rehearing of FERC's decision.	

B.2.10 Multi Stage Generating Resource – MSG_CONFIG tab

This table describes the data fields that apply to configurations of Multi Stage Generating Resources

RDT Column Name	Unit	Definition	Business Rule
Resource ID		The ISO resource identifier used for tracking each resource for market scheduling and outage coordination purposes.	
Configuration ID		Identifier of the MSG configuration.	
Configuration Name		MSG configuration name	

RDT Column Name	Unit	Definition	Business Rule
Maximum Generation Capacity	MW	The maximum normal capability at the configuration level.	<ul style="list-style-type: none"> • Config's MAX_GEN <= resource's MAX_GEN • Config's MAX_GEN >= config's MIN_GEN • Must equal the maximum output level (last segment) in the config's HEAT curve • Must equal the maximum output level (last segment) in the config's RAMP curve
Minimum Generation Capacity	MW	For a configuration, the minimum sustained operating level (Pmin) at which it can operate at a continuous level.	<ul style="list-style-type: none"> • Config's MIN_GEN >= resource's MIN_GEN • Config's MIN_GEN <= config's MAX_GEN • Must equal the minimum output level (segment 1) in the config's HEAT curve • Must equal the minimum output level (segment 1) in the config's RAMP curve
Minimum On Time	minutes	The minimum amount of time that the MSG resource will operate in this configuration	
Minimum Off Time	minutes	The time that an MSG resource is operating in a different configuration or transitioning, in addition to the time the resource is off line, is the "Off" time for a given configuration.	<ul style="list-style-type: none"> • Cannot be null for a start-able configuration
Minimum Load Cost	\$ / hour	The costs a configuration incurs operating at minimum load. The value is required for a resource with the ML Cost Basis of Registered Cost (fixed value) only.	<ul style="list-style-type: none"> • Cannot be null if ML Cost Basis Type of REGC (Registered) is selected
Reserve Capacity: Spin	MW	At the configuration level, the portion of unloaded synchronized generating capacity that is immediately responsive to system frequency and that is capable of being loaded in ten minutes, and that is capable of running for at least two hours.	<ul style="list-style-type: none"> • Must have a value if CERT_SPIN is Y. • Cannot be greater than the tested Spin capacity. • Must be less than or equal to MAX_GEN - MIN_GEN of the configuration
Reserve Capacity: Non-Spin	MW	At the configuration level, the portion of off-line generating capacity that is capable of being synchronized and Ramping to a specified load in ten minutes (or load that is capable of being interrupted in ten minutes) and that is capable of running (or being interrupted.)	<ul style="list-style-type: none"> • Must have a value if CERT_NSPIN_DAM or CERT_NSPIN_RTM flags are set to Y. • Cannot be greater than the tested Non-spin capacity. • Must be less than or equal to MAX_GEN of the configuration

RDT Column Name	Unit	Definition	Business Rule
Configuration Startup	Y / N	An identifier of a configuration that is able to start-up directly from off-line	<ul style="list-style-type: none"> Must be 'Y' for at least one configuration
Configuration Shutdown	Y / N	An identifier of a configuration that can shutdown without going through another configuration.	<ul style="list-style-type: none"> Must be 'Y' for at least one configuration
Startup Ramp Time	minutes	Represents the time it takes to physically ramp from zero to pmin after the closing of the breaker.	<ul style="list-style-type: none"> Must be <= minimum startup time for this configuration in the CONFIG_STRT curve
Startup Code Type	FAST or null	Code used to determine the startup characteristics. FAST: Configuration that has a Start Up Time of ten minutes or less and can provide non-spin. Blank: All other configurations.	<ul style="list-style-type: none"> Set to 'FAST' if Startup Time in segment 1 in Startup curve is 10 minutes or less. Leave null for all others.
Certified for AS: Regulation Down	Y / N	An identifier of a configuration that is certified to provide Regulation Down Reserve.	<ul style="list-style-type: none"> Set to Y if configuration is certified for Regulation Down Must be Y for at least one configuration if resource is certified for regulation down
Certified for AS: Regulation Up	Y / N	An identifier of a configuration that is certified to provide Regulation Up Reserve.	<ul style="list-style-type: none"> Set to Y if configuration is certified for Regulation Up Must be Y for at least one configuration if resource is certified for regulation up
Certified for AS: Spin	Y / N	An identifier of a configuration that is certified to provide Spinning Reserve.	<ul style="list-style-type: none"> Set to Y if configuration is certified for Spin Must be Y for at least one configuration if resource is certified for spin
Certified for AS: Non-Spin	Y / N	An identifier of a configuration that is certified to provide Non-Spinning Reserve in the DAM.	<ul style="list-style-type: none"> Set to Y if configuration is certified for Non-Spin Must be Y for at least one configuration if resource is certified for non-spin
Minimum Load Major Maintenance Adder	\$/hour	A configuration-specific adder for minimum load cost, if applicable. This field is READ-ONLY.	Contact MMAs@caiso.com to establish this value or revise it.

RDT Column Name	Unit	Definition	Business Rule
RA Range Min	MW	For each configuration, indicates the minimum level of Resource Adequacy capacity that the configuration will provide.	<ul style="list-style-type: none"> The RA range for the MSG resource must be contiguous (no gaps, no overlaps) and cover the range from MIN_GEN of the lowest configuration to MAX_GEN of the highest configuration RA Range Min of subsequent configurations must be equal to the RA Range Max of the previous configuration plus 0.01. RA Range Min for a configuration can be less than the MIN_GEN of that configuration only if it does not fall within another MSG configuration's MIN_GEN and MAX_GEN
RA Range Max	MW	For each configuration, indicates the maximum level of Resource Adequacy capacity that the configuration will provide.	<ul style="list-style-type: none"> Must be equal to or less than the MAX_GEN for that configuration
Implied Starts		<p>Indicates the number of starts of physical units within the MSG configuration. number of starts associated with moving a MSG resource from offline to online or from a lower configuration to a higher configuration that is defined implied by the use limitation plan's supporting documentation. Each implied start will contribute to the usage of the start limitation on file in the ULPDT in the 'LIMITATION' field. Implied starts registered in the GRDT should be the same resolution level on which the start limitation value is determined.</p> <p>Only use limited MSG resources with start limitation(s) can have implied starts greater than 1. MSG resources with registered start limitations have to include an implied start value in the MSG_CONFIG tab of the GRDT for every configuration of the MSG resource. For each configuration, the number of implied starts for an MSG configuration shall be measured from the MSG resource being entirely off to being started directly to that configuration. An implied start for the configuration can be set to zero. .</p>	<ul style="list-style-type: none"> Required if USE_LIMIT = Y for the MSG resource and must be 1 or greater.

B.2.11 MSG Transition Matrix – TRANSITION tab

The transition matrix defines feasible transitions for configurations of a Multi Stage Generator Resource. A transition from a particular configuration to another must be defined in this tab of the RDT for it to be allowed to perform in the market.

RDT Column Name	Unit	Definition	Business Rule
Configuration ID - From		This configuration ID is the starting point for a transition between two configurations. Each transition represents one direction.	
Configuration ID - To		This configuration ID is the ending point for a transition between two configurations. Each transition represents one direction.	
Transition Cost	\$ / transition	The cost of moving from 'Configuration ID-From' to 'Configuration ID-To'. Provide a cost here if the resource has indicated Registered Cost basis for Startup Cost. If the resource is Proxy Cost basis, the Transition Cost will be calculated in the bid as the difference in the startup cost between the 'To' and 'From' configurations when a resource is increasing from a lower configuration to a higher configuration.	<ul style="list-style-type: none"> May not exceed 150% of the difference in startup cost of the 'Configuration ID-To' minus the startup cost of the 'Configuration ID-From' if SU_COST_BASIS_TYP E = REGC Non-zero cost is not allowed for downward transition (from higher to lower configuration)
Transition Ramp Time	minutes	The time in minutes it takes to move from 'Configuration ID-From' to 'Configuration ID-To'	<ul style="list-style-type: none"> Must be <= Notification time
Notification Time	minutes	The time in minutes a configuration requires before deployment. Notification time includes transition time. For example, a configuration with a notification time of 60 minutes and a transition time of 10 minutes is expected to begin transitioning after 50 minutes.	<ul style="list-style-type: none"> Must be <= 240 minutes (the maximum time RTPD looks ahead) Must be >= Transition time
Maximum Daily Transitions		The maximum number of times this transition can be performed each day	
Market Max Daily Transitions		This data element is not currently used. It was created to implement the CAISO's resource characteristics proposal, which FERC rejected in Docket ER18-1169. The CAISO has sought rehearing of FERC's decision.	
Transition Midpoint MW		Transition profile breakpoint allows for modeling a transition with nonlinear ramping profile	
Transition Midpoint Time		Transition midpoint time allows for modeling a transition with nonlinear ramping profile	

RDT Column Name	Unit	Definition	Business Rule
Implied Starts		This is a derived value equal to the IMPLIED_STRTS of the "TO Configuration" minus the IMPLIED_STRTS of the "FROM Configuration". This field is READ-ONLY	

B.2.12 MSG Configuration Ramp Rate Curve – CONFIG_RAMP tab

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Configuration ID			
Segment Type = RAMP			
Segment Number		Point numbers between the PMin and PMax of the configuration. The point numbering starts at 1. Up to two ramp rates are allowed at the configuration (3 points)	<ul style="list-style-type: none"> • First point must be 1 • No more than 2 ramp rates allowed (3 "points")
Operating Level	MW	The configuration MW output of point. The first point of MW output must begin at the configuration's PMin. The last point of MW output must end at the configuration's PMax.	<ul style="list-style-type: none"> • Value of the first point must equal MIN_GEN of the configuration • Value of the last point must equal MAX_GEN of the configuration
Worst Operational Ramp Rate	MW / minute	The maximum ramp rate under the worst operating condition of the configuration.	<ul style="list-style-type: none"> • Must be > 0 • Cannot be greater than RAMP_MAX_RATE for the same point • RAMP_MIN_RATE of the last 2 points must be equal
Best Operational Ramp Rate (RAMP_MAX_RATE)	MW / minute	The maximum ramp rate under the best operating condition of the configuration.	<ul style="list-style-type: none"> • Must be >= 0.1 • Cannot be greater than the tested ramp rate (if unit was tested for Ancillary Services) • RAMP_MAX_RATE of the last 2 points must be equal
Market Ramp Rate (RAMP_MKT_RAMP_RATE)		<i>This data element is not currently used. It was created to implement the CAISO's resource characteristics proposal, which FERC rejected in Docket ER18-1169. The CAISO has sought rehearing of FERC's decision.</i>	

B.2.13 MSG Configuration Heat Rate Curve – CONFIG_HEAT tab

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Configuration ID			
Segment Type = HEAT			
Segment Number		<p>The point numbers between the PMin and PMax of the configuration MW output.</p> <p>The point starts at 1. Up to 11 points are allowed.</p>	<ul style="list-style-type: none"> • First point must be 1 • Point numbering must be sequential • No more than 11 points allowed
Heat Rate Operating Level	MW	The configuration MW output at point 1. The first point (1) of MW output must start at the configuration's PMIN. The last point (n) of MW output must end at the configuration's PMAX.	<ul style="list-style-type: none"> • Value of the first point must equal MIN_GEN of the configuration • Value of the last point must equal MAX_GEN of the configuration
Heat Rate	BTU/kWh	For gas-fired units only, the average heat rate of the configuration on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Heat rate must be provided at the first point (1) (Pmin) and the last point (n) (PMax). If not a gas-fired unit, leave blank and instead complete the Average Heat Cost field.	Heat Rate must be provided if resource's Fuel Type = Gas
Heat Emission Rate	lbs of NOx/MWh	<p><i>This is informational only - Market software does not reference this data element.</i></p> <p>The emission rate of the configuration on point (i). If value at point (i) is not available, linear interpolation can be used to approximate the value. Emission rate must be provided at the first point (1) (PMin) and the last point (n) (PMax).</p>	
Average Cost	\$/MWh	Use this value for non-gas fired units to represent fuel costs instead of Heat Rate and natural gas price index. The average cost of the configuration on point (i) in \$. If value at point (i) is not available, linear interpolation can be used to approximate the value. Average cost must be provided at the first point (1) (PMin) and the last point (n) (PMax).	<ul style="list-style-type: none"> • Average Cost must be provided if resource's Fuel Type is not Gas. • These values are used to calculate the incremental fuel costs used in determining a configuration's default energy bid under the Variable Cost Option for non-gas resources as described in 39.7.1.1. Fuel cost values do not include any greenhouse gas allowance costs, variable operating and maintenance costs or other administrative charges. Average fuel cost values may be subject to verification and require supporting

RDT Column Name	Unit	Definition	Business Rule
			documentation upon request by the ISO.

B.2.14 MSG Configuration Start-Up Curve – CONFIG_STRT tab

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Configuration ID			
Segment Type = STRT			
Segment Number		The segment numbers corresponding to cooling time of the configuration. The segment starts at 1. Up to 3 segments are allowed (hot, warm and cold).	<ul style="list-style-type: none"> • First segment must be 1 • Segment numbers must be sequential • 3 segments allowed
Registered Cooling Time	minutes	The amount of time the configuration must be off (in minutes) within sequence (i). The first down time must be zero to account for a configuration has just shut down.	<ul style="list-style-type: none"> • Value in first segment must be 0
Startup Time	minutes	Startup Time is the time (in minutes) it takes a configuration to achieve PMin from an off-line position given the corresponding Down Time (Registered Cooling Time). The startup time of the configuration (in minutes) from cooling time (i) to cooling time (i + 1). The last segment represents the startup time from cooling time (n) to infinity.	<ul style="list-style-type: none"> • Value must increase with each sequential segment
Startup Cost	\$ / start	The startup cost of a configuration (in dollars) from the cooling time (i) to cooling time (i + 1). The last segment represents the startup cost (in dollars) from cooling time (n) to infinity. Startup cost provided for a start-able GAS configuration under Proxy Cost, or for any "indirect" configuration, will be ignored by the software.	<ul style="list-style-type: none"> • Value must increase with each sequential segment • May not exceed 150% of configuration's projected proxy startup cost if SU_COST_BASIS_TYPE = REGC • A Startup Cost with more than 2 decimal places submitted in an RDT will be rounded to 2 decimal places
Start-Up Aux	MWh	The electrical power used by a configuration during startup, or for an "indirect" configuration to achieve pmin. The configuration's startup auxiliary power (in MWh) from the down time (i) to down time (i + 1). The last sequence is the startup auxiliary power (in MWh) from current sequence to infinity. This number provided for an "indirect" configuration will be used in the calculation for Transition Cost.	

RDT Column Name	Unit	Definition	Business Rule
Start-Up Fuel	mmBTU	The fuel use (in mBTU per start) expected for the startup of a natural gas fired configuration that has been off-line, or for an "indirect" configuration to achieve pmin. The startup fuel of the configuration (in mBTU) from the down time (i) to down time (i + 1). The last sequence is the startup fuel (in mBTU) from current sequence to infinity. This number provided for an indirect configuration will be used in the calculation for Transition Cost.	
Start-Up MMA	\$ / start	A resource configuration-specific major maintenance adder value per start-up, if applicable, agreed to by the CAISO or an Independent Entity. This field is READ-ONLY	Contact MMAs@caiso.com to establish this value or revise it.

B.2.15 MSG Configuration Regulation Range – CONFIG_REG tab

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Configuration ID			
Segment Type = REG			
Segment Number		Number of the regulation range. One regulation range is allowed for a configuration.	<ul style="list-style-type: none"> 1 Segment allowed
Lower MW for Regulation	MW	Lower level of the Regulation Range.	<ul style="list-style-type: none"> Must be >= MIN_GEN of configuration
Higher MW for Regulation	MW	Higher level of the Regulation Range.	<ul style="list-style-type: none"> Must be <= MAX_GEN of configuration

B.2.16 MSG Configuration Regulation Ramp Rate – CONFIG_RREG tab

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Configuration ID			
Segment Type = RREG			
Segment Number		One regulation ramp rate is allowed for a configuration.	<ul style="list-style-type: none"> 1 Segment allowed
Worst Regulation Ramp Rate	MW / minute	The maximum Regulation Ramp Rate for the segment under the worst condition.	<ul style="list-style-type: none"> Must be > 0

RDT Column Name	Unit	Definition	Business Rule
Best Regulation Ramp Rate	MW / minute	The maximum Regulation Ramp Rate for the segment under the best condition.	<ul style="list-style-type: none"> • Must be > 0.1 • Must be <= Best Operating Ramp Rate (RAMP curve) of the configuration
Market Regulation Ramp Rate		<i>This data element is not currently used. It was created to implement the CAISO's resource characteristics proposal, which FERC rejected in Docket ER18-1169. The CAISO has sought rehearing of FERC's decision.</i>	

B.2.17 MSG Configuration Operating Reserve Ramp Rate – CONFIG_ROPR tab

RDT Column Name	Unit	Definition	Business Rule
Resource ID			
Configuration ID			
Segment Type = ROPR			
Segment Number		One ramp rate covers procurement of both Spinning and Non-Spinning reserve.	<ul style="list-style-type: none"> • 1 Segment allowed
Worst Operating Res Ramp Rate	MW / minute	The maximum Operating Reserve Ramp Rate under the worst condition	<ul style="list-style-type: none"> • Must be > 0
Best Operating Res Ramp Rate	MW / minute	The maximum Operating Reserve Ramp Rate under the best condition.	<ul style="list-style-type: none"> • Must be > 0.1 • Must be <= Best Operating Ramp Rate (RAMP curve)
Market Operating Res Ramp Rate		<i>This data element is not currently used. It was created to implement the CAISO's resource characteristics proposal, which FERC rejected in Docket ER18-1169. The CAISO has sought rehearing of FERC's decision.</i>	

B.2.18 Child Resources of Aggregate Resource – Non Modifiable

For aggregate resources, this tab of the RDT displays the child resources that are included in the aggregate. The information is read-only and not updateable through the RDT update process.

RDT Column Name	Definition	Business Rule
Aggregate Resource ID	The ISO resource identifier used for tracking each resource for market scheduling and outage coordination purposes.	
Aggregate Resource Name	Descriptive name for the resource.	
Child Resource ID	The ISO resource identifier used for tracking each resource.	
Child Resource Name	Descriptive name for the resource.	
Maximum Child Generation Capacity	The maximum generating capability of the child unit.	

B.3 Intertie Resource Data Template

B.3.1 Intertie Resource tab – Modifiable Data

Bids at the Interties for system resources will be assigned a transaction identifier when the bid is submitted. Transaction IDs are not registered in the Master File, thus no new intertie resource IDs will be created unless they are for one of the following exceptions:

- Resource Adequacy
- Existing transmission contracts
- IBAA agreements for transmission loss adjustment
- Emergency assistance
- Marginal loss cost adjustment
- Stranded Load

This table shows the data elements where changes to the data can be initiated by the Market Participants through the RDT update process.

RDT Column Name	Definition	Business Rule
MIN_HR_BLK_LIM (Minimum Hourly Block Limit (1-24 hours))	Represents the maximum number of consecutive Trading Hours that an Intertie resource can be bid in, if a Minimum Hourly Block is specified in the Bid.	Must be a whole number from 1 to 24.
GMC_RANK_LMPM (Price Taker Option)	A method of calculating Generated Bids based on a price taker value of zero plus an estimate of the Grid Management Charge.	Rank 1 or null Only one of the three ranking fields (GMC_RANK_LMPM, NEGO_RANK_LMPM, and PRC_RANK_LMPM) can be ranked as 1
NEGO_RANK_LMPM (Negotiated Rate Option)	A method of calculating Generated Bids based on a negotiation with the CAISO or the Independent Entity.	Rank 1, 2 or null Only one of the three ranking fields (GMC_RANK_LMPM, NEGO_RANK_LMPM, and PRC_RANK_LMPM) can be ranked as 1
PRC_RANK_LMPM (LMP Option)	A method of calculating Generated Bids based on Locational Marginal Prices.	Rank 1 or null Only one of the three ranking fields (GMC_RANK_LMPM, NEGO_RANK_LMPM, and PRC_RANK_LMPM) can be ranked as 1
HR_PRE_DISP (Hourly Pre_Dispatch)	This flag indicates a resource that if dispatched, shall be dispatched in the next Trading Hour to operate at a constant level over the entire Trading hour. Y - Hourly only N - 15-minute market or hourly	

Explanation of the Generated Bids fields

The Scheduling Coordinator for each non-Resource Specific System Resource that has a Resource Adequacy obligation shall select the methodology for calculating the Generated Bids using these fields:

- NEGO_RANK_LMPM = Negotiated
- PRC_RANK_LMPM = Locational Marginal Price (LMP)
- GMC_RANK_LMPM = Price Taker plus the Grid Management Charge (Price Taker)

There are five possible scenarios for the ranking of Generated Bids fields in the Intertie Resource Data Template (IRDT).

Scenarios	NEGO_RANK_LMPM	PRC_RANK_LMPM	GMC_RANK_LMPM
1			
2			1
3	1		
4		1	2
5	2	1	

- Scenario 1, if there is nothing selected (all fields are blank or null) the default will be GMC_RANK_LMPM.
- Scenario 2, Selected GMC_RANK_LMPM. There is no second or third option.
- Scenario 3, Selected NEGO_RANK_LMPM. There is no second or third option.
- Scenario 4, Selected PRC_RANK_LMPM. A second selection is required; in this scenario it is GMC_RANK_LMPM.
- Scenario 5, Selected PRC_RANK_LMPM. A second selection is required; in this scenario it is NEGO_RANK_LMPM.

See Tariff section 40.6.8.1 that discusses the different Generated Bid options: “Price Taker”, “LMP-Based”, “Negotiated Price”.

B.3.2 Intertie Resource Reference Only

This table contains Intertie resource data that is provided in the IRDT for reference only. The fields are listed in the order they appear in the IRDT.

RDT Column Name	Definition	Business Rule
RES_ID (Resource ID)	The ISO resource identifier used for tracking each resource for market scheduling.	Once created, the resource ID cannot be changed. The resource must end-dated and a new resource ID created.
ENERGY_TYPE	An identifier of the type of Energy from an Intertie resource as it pertains to Ancillary Service Requirements, Dynamic Interchange or Wheeling.	FIRM – Firm Import/Export NFRM – Non-Firm Import/Export WHL – Wheeling UCTG – Unit Contingent
CERT_RUC (Certified for RUC)	Identifier of a resource that is eligible to participate in RUC.	This flag is set to Y if a resource has Resource Adequacy capacity for a given trade date.

RDT Column Name	Definition	Business Rule
MOO (MOO Resource)	This field is no longer used and will be removed in next version of IRDT	
MOO_QUALIFIED (Must Offer Obligation Qualified)	N - Resource is not Must Offer R - Resource is eligible for Must Offer based on RA Capacity or RCST designation in any given trading hour	<ul style="list-style-type: none"> N for all export resources R for all import resources.
WHEEL_REFERENCE_NUMBER (Wheel Reference ID)	Represents the wheeling counter resource that can be used in the Wheeling Bid Component of an Intertie resource bid. This ID is created in Master File and corresponds to the import wheel resource ID	
STRANDED_LOAD	Identifies whether or not the resource is available for stranded load.	
MLCA (Marginal Loss Cost Adjustment)	Identifier of a resource eligible to receive the marginal loss cost adjustment of LMPs.	

B.4 Grouping Constraints for Pump Storage (PS) Resource

The reference section of the Schedule 1 of the Participating Generator Agreement (PGA) should include a description of any group of two or more resources that are subject to constraints for minimum lag time between successive startups and/or shutdowns due to physical limitations. The description of these limitations may be generic if the lag time values are subject to change.

To add or update the minimum lag times for group constraints, Scheduling Coordinators should complete the Group Constraints Request Form and submit to RDT@caiso.com. Group Constraints requests will be processed within the 5 to 11 business day Master File change process.

B.5 Configuration Grouping for Multi Stage Generator (MSG) Resource

Minimum Up Time (MUT) and Minimum Down Time (MDT) constraints are enforced at the MSG resource (plant) level and at individual MSG configuration levels. MUT and MDT may also be specified for a group of MSG configurations.

For a group of configurations, MUT represents the total time that the MSG resource must stay within the group. For example, suppose a MSG resource has 6 configurations, with configurations 5 and 6 part of a group with a MUT of 6 hours. Once dispatched into either configurations 5 or 6, the resource may transit between configuration 5 and 6, but cannot move to a different configuration until the 6-hour MUT has passed. Transition time between MSG configurations within the group is considered as “ON” Time of the group

Submit a completed MSG Configuration Group Registration form to establish or update the MUT and MDT for an MSG configuration group to RDT@caiso.com.

B.6 Use Limit Plan Data Template

The ULPDT is an Excel spreadsheet containing multiple worksheet tabs, which contain static use limitations stored in the CAISO Master File database. The worksheet tabs listed in the table below are described in the following sections:

<u>Spreadsheet Tab</u>	<u>Contents</u>
Instruction	Contains report details
Definition-GRDT	Link to blank template on CAISO website
Code	Blank
Use_Limit_Plan	Use limitation data

B.6.1 Use Limit Plan tab

Many of the data elements in the Use Limit Plan tab are modifiable via the ULPDT update process, by submitting a revised ULPDT through the Master File User Interface. Those data elements are described in the following table in the order they appear in the ULPDT¹.

<u>RDT Column Name</u>	<u>Unit</u>	<u>Definition</u>	<u>Business Rule</u>
SC ID	Text	Scheduling Coordinator ID submitting the Use Limit Plan Data Template record.	<ul style="list-style-type: none"> • Cannot be null • Submitting SC must own the resource on the start date of the plan. • SC ID not valid for authenticated user.
RES ID (Resource ID)	Text	Existing, active resource provisioned to the SC ID uploading the ULPDT	<ul style="list-style-type: none"> • Cannot be null • Resource must exist and be active in RDT
CONFIG ID (Configuration ID)	Text	Configuration ID associated to MSG Resource for MSG that have configuration level limitations. If the MSG is registering a parent resource level limitation, the CONFIG ID field should be null.	<ul style="list-style-type: none"> • Configuration must exist and be active in RDT by effective start date

¹ For more information see Master File Interface User Guide version 1.8, http://www.caiso.com/Documents/MasterFileUserGuide_Mar2018.pdf.

<u>RDT Column Name</u>	<u>Unit</u>	<u>Definition</u>	<u>Business Rule</u>
<u>USE_LIMIT_TYPE</u> (Use Limit Type)	<u>Text</u>	The type of resource operation that is impacted by the design, environmental, or qualifying contractual limitation. If the limitation restricts the energy output level of the resource, field value should be 'ENERGY'. If the limitation restricts the number of run-hours of the resource, field value should be 'RUNHOURS'. If the limitation restricts the number of starts of the resource, field value should be 'STARTS'. If the limitation restricts resource operation other than a start, run-hour, or energy output level, the field value should be 'OTHER'.	<ul style="list-style-type: none"> Cannot be null Value must be valid value of 'ENERGY', 'RUNHOURS', 'STARTS', or 'OTHER'
<u>GRANULARITY</u> (Granularity/Applicability)	<u>Text</u>	The granularity of the time period that the limitation is applicable to the resource operation. If the limitation restricts number of uses across a fixed, consecutive 12 month period, the field value should be 'ANNUALLY'. If the limitation restricts number of uses across a rolling, consecutive 12 month period, the field value should be 'ROLL_12'. If the limitation restricts number of uses across a month period, the field value should be 'MONTHLY'. If the limitation restricts number of uses across a 24 hour period, the field value should be 'DAILY'. If the limitation restricts number of uses across a period other than those available, the field value should be 'OTHER'.	<ul style="list-style-type: none"> Cannot be null Value must be valid value of 'ANNUALLY', 'ROLL_12', 'MONTHLY', 'DAILY', or 'OTHER'
<u>PLAN_STRT_DT_TM</u> (Effective Start Date)	<u>Date</u>	If the limitation number is a fixed limitation value across the registered granularity, this effective start date is the date the registered limitation becomes effective (MM/DD/YYYY). If the limitation number is a dynamic value that fluctuates across the registered granularity, this effective start date is the date the relevant granularity period becomes effective (MM/DD/YYYY).	<ul style="list-style-type: none"> Cannot be null Cannot overlap with incomplete or complete existing record with same Resource ID, Limit Type, Granularity, and Configuration Must fall within start and end date of resource and configuration, if applicable Must align with first day of month unless granularity is 'DAILY'

<u>RDT Column Name</u>	<u>Unit</u>	<u>Definition</u>	<u>Business Rule</u>
<u>PLAN_END_DT_TM</u> (Effective End Date)	<u>Date</u>	If the limitation number is a fixed value across the registered granularity, this effective end date is the date the registered limitation expires (MM/DD/YYYY). If the limitation number is a dynamic value that fluctuates across the registered granularity, this effective start date is the end date the relevant granularity period ends (MM/DD/YYYY).	<ul style="list-style-type: none"> Cannot be null Cannot overlap with incomplete or complete existing record with same Resource ID, Limit Type, Granularity, and Configuration Must fall within start and end date of resource and configuration, if applicable Must align with last day of month unless granularity is 'DAILY' Must span multiple of 12 consecutive months if granularity is 'ANNUALLY' Must span 12 or more consecutive months if granularity is 'ROLL 12' Must occur after <u>PLAN_STRT_DT_TM</u>
<u>LIMITATION</u> (Limitation Number)	<u>Numeric</u>	<p>The number or amount of the uses for the use limit type that is available for use for each granularity period (e.g. number of starts for the year). For a use limitation registered as a fixed value limitation, the same number of uses will be made available at the beginning of each granularity until the limitation type expires.</p> <p>For a use limitation registered as a dynamic value limitation or for use limitations registered with 'OTHER' granularities, the number of uses made available at the beginning of each granularity will vary and the limitation number is associated with granularity period start and end date (<u>PLAN_STRT_DT_TM</u> and <u>PLAN_END_DT_TM</u>).</p>	<ul style="list-style-type: none"> Cannot be null Cannot be negative Cannot be 0 Cannot be a fraction if use limit type is 'START'
<u>MIN_USE_LIMIT</u> (Minimum Capacity Level Subject to Use Limitation)	<u>MW</u>	<i>This data element is not used</i>	
<u>MAX_USE_LIMIT</u> (Maximum Capacity Level Subject to Use Limitation)	<u>MW</u>	<i>This data element is not used.</i>	

<u>RDT Column Name</u>	<u>Unit</u>	<u>Definition</u>	<u>Business Rule</u>
<u>DOC_NAME</u> (Supporting Documentation Details)	<u>Text</u>	<u>Each record must have a CAISO determination that the use limitation is a valid limitation to be submitted for registration in Master File User Interface. CAISO will attach to each CIDI ticket requesting registration a document identifying each limitation record accepted for registration. This field must contain in the following order: CIDI Ticket #, documentation name, page number, if LIMITATION is a fixed or dynamic limitation. Use the exact string, 'CIDI Ticket #'.</u>	<ul style="list-style-type: none"> <u>Cannot be null</u> <u>Cannot exceed 255 characters</u>

B.6.2 Daily limitations

The day-ahead market time horizon of 24 hours allows the optimization to recognize daily limitations for resources that participate in the day-ahead market. Resources with binding commitment instructions in the day-ahead time frame will not be eligible to register daily use limitations for use limit types of START. The Scheduling Coordinator should utilize the Master File operating characteristic fields to the extent possible for:

- Maximum Daily Transitions
- Maximum Startups per Day
- Pump Maximum Daily Startups
- Maximum Daily On Time
- Maximum On Time (Not Used in Market)

The SC should also reflect its daily ENERGY use limit type by submitting the maximum daily energy limit bid through SIBR.

The following example is how the SC should create the record for daily limitations.

<u>Resource with Daily Limitation with fixed limitation</u>										
<u>SC ID</u>	<u>Resource ID</u>	<u>Configuration ID</u>	<u>Use Limit Type</u>	<u>Granularity</u>	<u>Effective Start Date</u>	<u>Effective End Date</u>	<u>Limitation Number</u>	<u>Minimum Capacity Level</u>	<u>Maximum Capacity Level</u>	<u>Documentation Name</u>
<u>SC_ID</u>	<u>RES_ID</u>	<u>CONFIG_ID</u>	<u>USE_LIMIT_TYPE</u>	<u>GRANULARITY</u>	<u>PLAN_STRT_DT_TM</u>	<u>PLAN_END_DT_TM</u>	<u>LIMITATION</u>	<u>MIN_USE_LIMIT</u>	<u>MAX_USE_LIMIT</u>	<u>DOC_NAME</u>
SC_A	RES_D		RUNHOURS	DAILY	1/1/2018	12/31/2018	6			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_D		RUNHOURS	DAILY	1/1/2019	12/31/2019	6			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: Daily limitation (fixed or dynamic)

Regardless of whether the limitation is fixed or dynamic in nature, the SC should create daily records with effective ranges of 12 month increments. The value in the ULPDT should be a projected value if the limitation is of a dynamic nature.

REMINDER: Daily limitations are not eligible for Opportunity Cost adders. SC should ensure it registers its operating characteristics in the GRDT and/or bids daily energy limit. If the resource

has a validated daily use limitation, the SC will be exempt from bid generation and have access to short-term use limit reached card to ration uses within the operating day.

B.6.3 Monthly limitation

Monthly limitations may only be registered for the current or upcoming calendar year and should specify use limit type, granularity, effective period for the plan, and fixed or dynamic limitation number. Include the fixed or dynamic information in DOC NAME field. The examples below in Section B.6.2.1 show resources with monthly limitations of a fixed or dynamic nature.

The fixed examples below show resources with monthly use limitations where the plan documents specify the number of the limitation explicitly in the plan. The limitation values will be fixed for the term of the limitation (fixed values), where changes to the limitation value are not supported. If a ~~SC receives a revised use plan~~ resource has a revision to its use limitation that changes the explicit limitation number then the SC must submit a new Use-Limited Resource Registration request. Monthly limitations may only be registered for the current or upcoming calendar year.

The dynamic examples below show resources with monthly use limitations where the plan documents support that the specific limitation value will vary throughout the term of the plan. The limitation value will be dynamic for the term of the limitation (dynamic values), where changes to the limitation value are eligible ULPDT updates. If the resource has a revision to its use limitation ~~SC receives a revised use plan~~ that changes the drivers that the limitation number is a function of then the SC must submit a new Use-Limited Resource Registration request. Otherwise changes in limitation values as supported by the use plan should be reflected through updates to the Use Limit Plan Data Template with the CIDI # included for the approved limitation. Updated values are updated projections on the uses available across the granularity period – a year – based on more accurate, up-to-date information. The value remains the limitation across the period, the CAISO processing will account for prior uses. A justification for updates to the ULPDT is needed to explain the change in values.

B.6.3.1 Resource Examples

Initial submission for RES B that is defined as a fixed value in documentation. The SC should submit a single record the year and flag the granularity as ‘MONTHLY.’ The limitation number will be applied on the same level as the granularity flag. For example, the following table shows RES B with a monthly limitation on its starts where each month from 1/1/2018 through 12/31/2018~~9~~ is limited to 50 starts per month.

Resource with Monthly Limitation with fixed limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	RES_B		START	MONTHLY	1/1/2018	12/31/2018	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_B		START	MONTHLY	1/1/2019	12/31/2019	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: Monthly fixed limitation

Initial submission for RES B where the limitation is defined as dynamic (e.g. fluctuations of storage capability). If the SC projects its usage capabilities on a monthly basis based on end-of-month storage inventory targets, these limitations would apply on a granularity level and would likely need to reflect various values for each month. In this case, the SC has the ability to submit the ULPDT records in monthly profiles with the initial projects. The monthly profiles span 2018 and 2019 and reflect prior months ULPDT records effective today and future months' projections, if available. If unavailable, attach a ULPDT with blank records for those months.

Resource with Monthly Limitation with dynamic limitation (e.g. changes in storage capability)										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	RES_B		START	MONTHLY	1/1/2018	1/31/2018	50			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	2/1/2018	2/28/2018	40			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	3/1/2018	3/31/2018	30			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	4/1/2018	4/30/2018	20			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	5/1/2018	5/31/2018	20			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	6/1/2018	6/30/2018	30			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	7/1/2018	7/31/2018	30			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	8/1/2018	8/31/2018	20			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	9/1/2018	9/30/2018	20			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	10/1/2018	10/31/2018	30			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	11/1/2018	11/30/2018	40			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.
SC_A	RES_B		START	MONTHLY	12/1/2018	12/31/2018	40			CIDI Ticket #00333333 Limited storage capability documented in Energy Revenue Recovery Account Filing, Page 4, dynamic value registered.

Example: Monthly dynamic limitation

B.6.3.2 Multi-Stage Generators

Initial submission for MSG A with a plant level limitation that is defined as a fixed value limiting its use per month.

MSG with Monthly Limitation on the plant with fixed limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	MSG_A		START	MONTHLY	1/1/2018	12/31/2018	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	MSG_A		START	MONTHLY	1/1/2019	12/31/2019	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: MSG plant monthly fixed limitation

Initial submission for MSG A with a configuration level limitation on its 3rd configuration that is defined as a fixed value limiting its use per month.

MSG with Monthly Limitation on the 3rd configuration with fixed limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	RES_A	CONFIG_3	START	MONTHLY	1/1/2018	12/31/2018	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_A	CONFIG_3	START	MONTHLY	1/1/2019	12/31/2019	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: MSG configuration monthly fixed limitation

MSG C has both a plant level monthly limitation and a configuration level monthly limitation on its third configuration. Note – Example not intended to imply plant and configuration level combinations on a MSG should be on same granularity.

MSG with Monthly Limitation on the plant and 3rd configuration with fixed limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	RES_A		START	MONTHLY	1/1/2018	12/31/2018	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_A	CONFIG_3	START	MONTHLY	1/1/2018	12/31/2018	10			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_A		START	MONTHLY	1/1/2019	12/31/2020	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_A	CONFIG_3	START	MONTHLY	1/1/2019	12/31/2020	10			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: MSG plant and configuration monthly fixed limitations

B.6.4 Annual limitation

Annual limitations may only be registered for the current or upcoming calendar year and should specify use limit type, granularity, effective period for the plan, fixed or dynamic limitation, and limitation number. Include the fixed or dynamic information in DOC NAME field. The examples below in Section B.6.4.1 show resources and Multi-Stage Generators with annual limitations of a fixed or dynamic nature.

The example below shows resource with annual use limitations where the plan documents specify the numbers of the limitation explicitly in the plan. The limitation values will be fixed for the term of the limitation (fixed values), where changes to the limitation value are not supported. If the resource has a revision to its use limitation ~~SC receives a revised use plan~~

that changes the explicit limitation number then the SC must submit a new Use-Limited Resource Registration request.

The examples below show resources with annual use limitation where the plan documents support that the specific limitation values will vary throughout the term of the plan. The limitation values will be dynamic for the term of the limitation (dynamic values), where changes to the limitation values are eligible ULPDT updates. If the resource has a revision to its use limitation SC receives a revised use plan that changes the drivers that the limitation number is a function of, then the SC must submit a new Use-Limited Resource Registration request. Otherwise changes in limitation values as supported by the use plan should be reflected through updates to the Use Limit Plan Data Template with the CIDI # included for the approved limitation. Updated values are updated projections on the uses available across the granularity period – a year – based on more accurate, up-to-date information. The value remains the limitation across the period, the ISO processing will account for prior uses. A justification for updates to the ULPDT is needed to explain the change in values.

B.6.4.1 Resource Examples

Initial submission for RES A that is defined as a fixed value in documentation where the 12 month increment begins in January as stated in the use plan.

Resource with annual limitation that begins in January every year with fixed limitation values											
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name	
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME	
SC_A	RES_A		START	ANNUALLY	1/1/2018	12/31/2018	300			CIDI Ticket #0002890 Air quality management district permit, page 10, fixed value registered.	
SC_A	RES_A		START	ANNUALLY	1/1/2019	12/31/2019	300			CIDI Ticket #0002890 Air quality management district permit, page 10, fixed value registered.	

Example: Annual fixed limitation beginning in January

Initial submission for RES B that is defined as a fixed value in documentation where the 12 month increment begins in March as stated in the use plan. ISO understands annual plans (plans that span 12 months before the use is available) can begin the first day of any month in the calendar year. ISO does not anticipate any will begin on a day different than the first day of a month.

Resource with Annual Limitation that begins in March every year with fixed limitation											
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name	
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME	
SC_A	RES_B		START	ANNUALLY	3/1/2017	2/28/2018	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.	
SC_A	RES_B		START	ANNUALLY	3/1/2018	2/28/2019	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.	
SC_A	RES_B		START	ANNUALLY	3/1/2019	2/28/2020	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.	

Example: Annual fixed limitation beginning in March

Initial submission for RES C that is defined as a dynamic value in documentation, most likely as a result of a limitation for limited storage capability (gas or hydro). CAISO anticipates resource is likely to update values during the effective period of the limitation. Updates should note reason for update.

Resource with Annual Limitation that begins in January every year with dynamic limitation (e.g. changes in storage capability)										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation	Minimum Capacity	Maximum Capacity	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STR_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	RES_C		ENERGY	ANNUALLY	1/1/2018	12/31/2018	200000			CIDI Ticket #00444444 Limited storage capability and reliability requirement for load documented in PUC Order, Page 4, dynamic value registered.
SC_A	RES_C		ENERGY	ANNUALLY	1/1/2019	12/31/2019	200000			CIDI Ticket #00444444 Limited storage capability and reliability requirement for load documented in PUC Order, Page 4, dynamic value registered.

Example: Annual dynamic limitation beginning in January

Update submission during the year for limitations registered as having values that can vary throughout period: SCID ABCD, submits an updated ULPDT for RES C on 11/1/2018 for the effective period previously registered. This is backdating the effective limitation. Note: Now that the SC has an annual projection for 2019, the ULPDT record for 2019 should be submitted through the Master File UI.

Resource with Annual Limitation that begins in January every year with dynamic limitation (e.g. changes in storage capability)										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STR_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	RES_C		ENERGY	ANNUALLY	1/1/2018	12/31/2018	150000			CIDI Ticket #00444444 Limited storage capability and reliability requirement for load documented in PUC Order, Page 4, dynamic value registered.
SC_A	RES_C		ENERGY	ANNUALLY	1/1/2019	12/31/2019	150000			CIDI Ticket #00444444 Limited storage capability and reliability requirement for load documented in PUC Order, Page 4, dynamic value registered.

Example: Update to annual dynamic limitation beginning in January

B.6.4.2 Multi-Stage Generator Examples

Initial submission for MSG A with a plant level limitation that is defined as a fixed value in documentation where the 12-month increment begins in January as stated in the use plan.

MSG with Annual Limitation on the plant that begins in January every year with fixed limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STR_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	MSG_A		START	ANNUALLY	1/1/2018	12/31/2018	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	MSG_A		START	ANNUALLY	1/1/2019	12/31/2019	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: MSG plant annual fixed Limitation beginning in January

Initial submission for MSG B where the configuration level limitation on the 3rd configuration is defined as a fixed value in documentation where the 12-month increment begins in March as stated in the use plan. CAISO understands annual plans (plans that span 12 months before the use is available) can begin the first day of any month in the calendar year. CAISO does not anticipate any will begin on a day different than the first day of a month.

MSG with Annual Limitation on the configuration that begins in January every year with fixed limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STR_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	MSG_B	CONFIG_3	START	ANNUALLY	1/1/2018	12/31/2018	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	MSG_B	CONFIG_3	START	ANNUALLY	1/1/2019	12/31/2019	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: MSG configuration annual fixed limitation beginning in March

Initial submission for MSG C that is defined as a fixed value in documentation where the 12-month increment begins in January as stated in the use plan. MSG C has both a plant level annual limitation and a configuration level annual limitation on its third configuration. Note – Example not intended to imply plant and configuration level combinations on a MSG should be on same granularity.

MSG with Annual Limitation on the plant and configuration that begins in January every year with fixed limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	MSG_C		START	ANNUALLY	1/1/2018	12/31/2018	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	MSG_C	CONFIG_3	START	ANNUALLY	1/1/2018	12/31/2018	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	MSG_C		START	ANNUALLY	1/1/2019	12/31/2020	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	MSG_C	CONFIG_3	START	ANNUALLY	1/1/2019	12/31/2020	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: MSG plant and configuration annual fixed limitations

Initial submission for MSG B with a configuration level limitation that is defined as a dynamic value in documentation. The limitation is on the multi-stage generator for a start into its 3rd configuration. See Section 4 for more details examples.

MSG with Annual Limitation on the configuration that begins in January every year with dynamic limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	MSG_B	CONFIG_3	START	ANNUALLY	1/1/2018	12/31/2018	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	MSG_B	CONFIG_3	START	ANNUALLY	1/1/2019	12/31/2019	50			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: MSG annual dynamic limitation beginning in January

Update submission during the year for limitations registered as having values that can vary throughout period: SCID ABCD, submits an updated ULPDT for MSG B on 11/1/2018 for the effective period previously registered. This is backdating the effective limitation. Note: Now that the SC has an annual projection for 2019, the ULPDT record for 2019 should be submitted through the Master File UI.

MSG with Annual Limitation on the configuration that begins in January every year with dynamic limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STRT_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	MSG_B	CONFIG_3	START	ANNUALLY	1/1/2018	12/31/2018	45			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	MSG_B	CONFIG_3	START	ANNUALLY	1/1/2019	12/31/2019	55			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: Update to MSG annual dynamic limitation beginning in January

B.6.5 Rolling 12 limitation

The Scheduling Coordinator should submit ULPDT tab with a rolling 12 limitation with effective dates that represent the effective period of the rolling 12 limitation. For example, if the supporting documentation states the limitation is effective for 4 years, the plan end date To support the CAISO ability to model opportunity cost for the rolling 12 limitations, the Scheduling Coordinator must have a ULPDT record with effective dates that span at least 11 months prior and 11 months after the effective month of the opportunity cost calculation. For example, if the opportunity costs are to be calculated for effective month of May 2019, the plan end date in the ULPDT should be at least through April 2020.

B.6.6 Other limitation

The CAISO understands that a resource ~~use plans~~ may specify a limitation that is applied on a basis greater than one month but that does not fall into either ANNUALLY or ROLL 12 granularity. The OTHER granularity can be used to submit ULPDT records that provide the granularity of the limitation using the effective start and effective end dates. The limitation value is associated with the entire effective period.

The limitations may only be registered for the current or upcoming calendar year and should specify use limit type, granularity, effective period for the plan, fixed or dynamic limitation, limitation number. Include the fixed or dynamic information in DOC NAME field. The examples below show resources and Multi-Stage Generators with monthly limitations of a fixed or dynamic nature.

The fixed example below shows resource with quarterly use limitation where the plan documents specify the number of the limitation explicitly in the plan. The limitation value will be fixed for the term of the limitation (fixed values), where changes to the limitation value are not supported. If a SC receives a revised use plan that changes the explicit limitation number then the SC must submit a new Use-Limited Resource Registration request. Monthly limitations may only be registered for the current or upcoming calendar year.

If the nature of the limitation is dynamic, the limitation would be registered similarly to the other examples of dynamic limitations. The initial submission is based on a projection and updated as up-to-date information is available. The effective period does not change with updates only the limitation number.

Resource with Quarterly Limitation with fixed limitation										
SC ID	Resource ID	Configuration ID	Use Limit Type	Granularity	Effective Start Date	Effective End Date	Limitation Number	Minimum Capacity Level	Maximum Capacity Level	Documentation Name
SC_ID	RES_ID	CONFIG_ID	USE_LIMIT_TYPE	GRANULARITY	PLAN_STR_DT_TM	PLAN_END_DT_TM	LIMITATION	MIN_USE_LIMIT	MAX_USE_LIMIT	DOC_NAME
SC_A	RES_B		START	OTHER	1/1/2018	3/31/2018	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_B		START	OTHER	4/1/2018	6/30/2018	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_B		START	OTHER	7/1/2018	9/30/2018	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_B		START	OTHER	10/1/2018	12/31/2018	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_B		START	OTHER	1/1/2019	3/31/2019	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_B		START	OTHER	4/1/2019	6/30/2019	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_B		START	OTHER	7/1/2019	9/30/2019	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.
SC_A	RES_B		START	OTHER	10/1/2019	12/31/2019	300			CIDI Ticket #00204555 Air quality management district permit, page 10, fixed value registered.

Example: Other fixed limitation on quarterly granularity