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INTRODUCTION

Purpose and Scope

This process is intended to ensure the safe, coordinated, and reliable operation of generation resources interconnected to the Sacramento Municipal Utility District (SMUD) Electric System in compliance with the applicable standards, requirements and procedures established by North American Electric Reliability Corporation (NERC), Western Electricity Coordinating Council, (WECC), and the Reliability Coordinator (RC).

This coordination process provides direction to Facility Owners, SMUD Distribution System Operators (DSO), and Power System Operators (PSO), and Power Generation Outage Coordination for outage coordination and real-time operations with Generation Site Operators and is not intended to supersede applicable reliability requirements and contractual agreements. Additionally, this procedure provides general real-time operating guidance for the SMUD PSO and DSO to operate the site on an operational need, provide operating instructions to the generation resources or in coordination with Real-time Energy Traders regarding market requirements.

Review Frequency

Review annually or when required based on changes to NERC, WECC, RC, and or SMUD requirements. Review with Rate Policy and Procedure 11-01 and Interconnection Agreement updates.

Audience

Power System Operators, Distribution System Operators, Energy Trading and Contracts, and Generation Site Operators for generating resources connected to the SMUD distribution system (69 kV and below).

Assumed Conditions

Routine and emergency distribution and bulk electric system conditions. Operating conditions allow for SMUD curtailment of generation output or battery charging/discharging under the applicable PPA and IA.

General Description

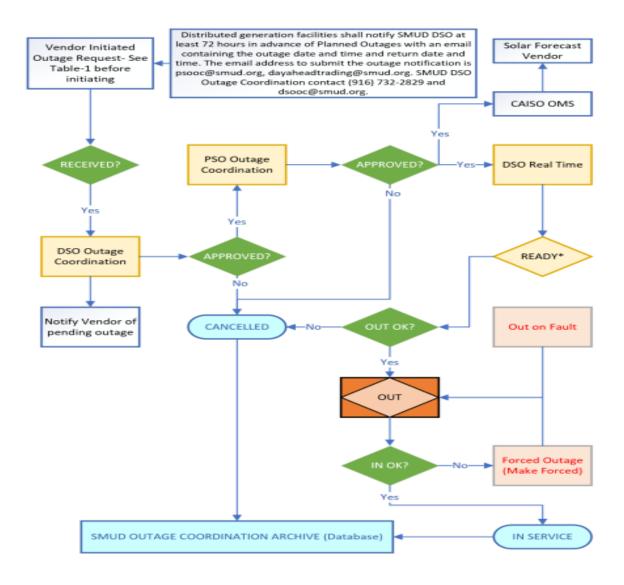
Facility Owners and Generation/BESS Site Operators interconnect and operate their facilities in parallel with the SMUD Distribution System. This outage coordination process represents Prudent Utility Practice for such parallel operation and meets applicable electric utility industry

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requirements. Unless provided under a specific energy contract or capacity contract, SMUD is not obligated to provide retail electrical service to the generation facility when offline.

FLOWCHARTS

Figure 1. Outage Coordination Process Distribution Connected Resources and Connected Resources more than 10 MW



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SMUD DSO

Short Term Notification (<30 days)

ASSET OWNER (OPERATOR)

DSO to notify PSO of outages at "generation only" facilities

SMUD COORDINATION (IF NECESSARY)

SMUD PSO (OC)

Short Term Notification (>30 days)

SMUD ASSET MANAGER

Figure 2. Outage Coordination Notification Process

Required Outage Notifications

- Maintenance on any equipment which may affect the maximum output > 5 MW
- Generation control/monitoring/communication equipment OOS
- Automatic Voltage Regulator (AVR) Exciter OOS
- Power System Stabilizer (PSS) OOS
- Voltage support equipment OOS
- Unit performance testing
- Interconnection outage
- Outage Return/Completion

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PROCESS

1. Authority and Responsibility

1.1. General

SMUD's PSO, DSO, and planning operations are responsible for the safe, reliable operation of the SMUD electrical system. SMUD DSO is responsible for the safe and reliable operation of the SMUD distribution system (69kV and below) and the connected Generation and Facility Sites to ensure changes in generation production or facility operations do not create an adverse impact on distribution system operations.

DSO will provide information to PSO for generation and generation facility equipment outages located on the distribution system (69kV and below) that impact generation production or system operations.

SMUD Energy Trading and Contracts (ET&C) will use communicated generation and facility equipment outages to schedule resources within its reported capability and notify PSO or DSO of market requirements as part of SMUD's energy resource portfolio.

PSO is responsible for ensuring generation and generating facility data is calculating into EMS for energy and capacity purposes, to keep track of the facility equipment indicating generation status associated with after-the-fact accounting or reporting requirements.

SMUD shall operate or curtail any generation facility with or without notice in a system emergency or for any real-time operational or market requirements. SMUD can provide a written description of the event upon request.

During routine operations, the DSO will consider the generation site online and producing energy unless there is either a forced circuit outage or a planned outage.

1.2 Outage Coordination

SMUD Power Generation Outage Coordination receives all planned generator and generation facility outage requests from the Facility Owner. Power Generation Outage Coordination will communicate with DSO outage information.

1.3 SMUD DSO

The SMUD DSO is responsible for and has the authority to ensure system reliability for the distribution system (69kV and below) and its interconnected operating entities in the "Real-Time" environment. SMUD DSO has the authority to coordinate generation connected facilities,

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including switching authority and responsibility for connecting or removing the generators from the distribution system and when applicable in conjunction with PSO.

1.4 Stakeholders

Entities requesting authorization to work on facilities connected to distribution system shall request shutdown by SMUD personnel and must provide at a minimum SMUD facility Name or Resource, Start Time and Date, Estimated Return Time (date & time), description of work or impact to resource or facility. The vendor should follow their own procedures to safely conduct their work and are responsible for conducting their routine work and maintenance. Stakeholder supplemental procedures shall not conflict with this document, or the authority and responsibility established herein, nor shall they violate or cause to violate any portion of the Electric Switching Orders or instructions prepared by SMUD.

PSO will only issue authorizations to qualified SMUD personnel and Control Room Operators of the non-SMUD interconnected generation stations. SMUD only gives switching authorizations to qualified SMUD employees.

1.4.1 Generation & 69kV and below Outages Responsibilities

Planned requests:

SMUD Power Generation Outage Coordination will receive all planned generator and generation facility outage requests from the Facility Owner or Facility Operator. Power Generation will communicate with DSO Outage Coordination or PSO Outage Coordination (PSOOC) for processing.

Forced outages:

Facility Owner shall contact the DSO real-time operator. The DSO real-time operator will then process the forced outage or communicate the forced outage to PSO.

1.4.2 Planned Outages-Facility Owner

Facility Owners connected to the distribution system shall plan outages in accordance with any contractual requirements typically scheduled so that the generator or facility remains in service from 0600 through 2200 during the months of May through October. All planned outages requested shall be communicated to Power Generation Outage Coordination.

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A Facility Owner or Operator connected to the SMUD distribution (69kV and below) system is responsible for promptly notifying SMUD DSO of any active (DSO has given final approval to start) outage changes for either forced or planned outages. Planned outage changes are required to be communicated to Power Generation Outage Coordination if the outage change impacts resource operation and the expected start time or restoration time.

SMUD DSO will provide appropriate notification to PSO of any distribution generation outage changes as communicated by the Facility Owner or Operator.

2. Outage Coordination and Outage Request

2.1 Minimum Outage Information for Submittal and Notification

All requests shall at a minimum, contain the location Facility Name and the identification of the equipment to be worked on; the date and time the work is to start, estimated return time (ERT, End or stop date and time, includes switching time when required); Requestors name and phone number; the name of the on-site personnel (person doing the work) and phone number; details of work being performed; emergency return time; Requested open points (if applicable) and all details or special requirements or operational limitations associated with the work being performed and any other facilities/equipment affected by the work being done. Other relevant details, i.e., will crew perform switching or are switchmen requested and where? Use only approved abbreviations.

2.2 Submission and Approval

A Facility Owner or Operator connected to the SMUD distribution system 69kV and below is responsible for promptly notifying SMUD DSO of any active (DSO has given final approval to start) outages changes for either forced or planned outages. Planned outage changes are required to be communicated to Power Generation Outage Coordination if the outage change impacts resource operation, the expected start time or restoration time.

SMUD DSO will provide appropriate notification to PSO of any distribution generation outages.

2.3 Planned Outages

See Attachment A "Defined Outage Types" for definition. Requested to work on associated equipment shall be submitted as follows:

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SMUD requires planned outages to be submitted 30 days or greater from the date of the outage period start. Outages submitted less than 30 days and greater than 7 days from the date of the outage period start will be evaluated for consideration as a planned outage request. Outages submitted less than 7 days from the date of the outage period start or do not meet the RC outage submittal timelines will be considered Forced outages. Outages with less than 72-hour notice are normally not granted unless considered Forced.

Outage requests will be reviewed, accepted, and approved by SMUD outage coordination team on a first come, first served basis. If the requested schedule conflicts with other outages or to reduce adverse impacts to SMUD, SMUD may request to coordinate a mutually agreeable modification to the proposed schedule period.

Competing Outage Example: Relay Technician wants to perform calibration on one (1) of two (2) redundant primary relays. The line will remain in service with both primary and back-up relay protection, and it overlaps with emergency generation testing. SMUD Outage Coordination team will work with outage submitters to determine a mutually agreeable period to perform the maintenance to ensure outages are not impeded and consider operations and testing procedures

Routine Outage Example: Facilities wants to perform routine test, maintenance activity or requires an outage to repair equipment and it overlaps with a restricted maintenance operation. SMUD Outage Coordination team will work with outage submitter to determine a mutually agreeable period to perform the maintenance.

2.4 Facility Owner or Operator

In general, generation facilities shall notify SMUD Power Generation Outage Coordination at least 30 days in advance of the Planned Outage start date and time. SMUD may request the Facility Owner or Operator to provide a maintenance outage schedule for a period up to five years or any revisions to the schedule for outages with a duration of 1 day or greater. Outage priority is given on a first come, first served basis upon receipt of outage notification.

➤ Long Range Planning

- Upon request by SMUD contact SMUD Power Generation Outage Coordination via email
- Outage start > 30 days contact SMUD Power Generation Outage Coordination via email

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Outage Start 30 days to 7 days – contact SMUD Power Generation Outage Coordination and PSO or DSO as applicable based on the interconnection, via email

➤ Short Range Planning

- Outage start 6 days to 3 days contact SMUD Power Generation Outage
 Coordination and DSO (generation impacting outages include PSO & ET&C) via
 email with follow up phone notification to DSO
- Outage start less than 3 days contact PSO or DSO as applicable based on the interconnection by phone and follow up with email notification (generation impacting outage include PSO & ET&C

This will be a requirement for generation facility maintenance located on the distribution system or other work that curtails the energy output to SMUD. SMUD reserves the right to coordinate a mutually agreeable modification to the requested schedule period. DSO will notify PSO Outage Coordination via email of the planned outage.

See Attachment B "Contact Information" for email address and phone number

2.5 Planned Outages – DSO

DSO planned distribution circuit outages that effect generation/generation delivery, outages shall be communicated to Facility Owner, Power Generation Outage Coordination and PSO Outage Coordination (PSOOC). SMUD may require Facility Owner to interrupt or reduce deliveries of Energy: (a) when necessary to construct, install, maintain, repair, replace, remove, or investigate any of its equipment or part of SMUD's transmission system or distribution system or facilities; or (b) if SMUD determines that curtailment, interruption, or reduction is necessary because of an operational need or system emergency. SMUD reserves the right to coordinate a mutually agreeable modification to the requested schedule period.

2.6 Forced Outages – Facility Owner or Operator

Distribution generation facilities are obligated to report outages to the SMUD DSO as soon as possible with the location or facility name, start date and time of outage, ERT, and facility curtailment. The SMUD DSO will notify the SMUD PSO of the forced outage and its details. Once the facility returns, the generating facility will contact the SMUD DSO who will log the time and date of the facility return and notify the SMUD PSO of the return to service.

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The distributed generation facility is required to notify SMUD DSO of any forced outage that will reduce the facility capacity by more than 10% of rated full capacity in MW for more than 24 hours duration or will reduce the facility capacity by more than 5% of rated full capacity in MW during any super peak period during the months of May through October. SMUD's minimum capacity loss to report is 5 MW or more. Within 24 hours of a forced outage, the generation facility shall provide the capacity limitation and the estimated return time. DSO shall communicate with PSO, and PSO will coordinate with ET&C the status of any forced outages.

2.7 Forced Outages – SMUD

In the event of a curtailment by SMUD due to reliability or system emergency, SMUD shall, whenever possible, give vendor reasonable notice of the possibility that the interruption or reduction of deliveries may be required, and shall use commercially reasonable efforts to minimize the impact thereon on Facility operations and to minimize the duration of the curtailment period. If curtailment is required by DSO, they will notify PSO by phone or email with details after the event when the system is in a safe and stable state.

When the distribution circuit connected to the distributed generation facility experiences sustained interruption, the SMUD DSO will notify PSO when it is safe to do so with the necessary information of the forced outage. Stakeholders will be notified, and the information provided will be processed as needed.

Distributed generation facilities are more likely to be operated or curtailed by SMUD due to reliability than generation facilities connected to SMUD's transmission system. SMUD shall not be obligated to compensate Facility Owner for any loss of use of generation of electricity during any and all periods of interruption or disconnection due to reliability or System Emergency.

2.8 Manual Intervention by SMUD

If the SCADA control signal is rendered inoperative either from a SCADA problem or a Telecom issue, the SMUD DSO will need to manually intervene to dispatch, curtail, or disconnect the site.

This can be accomplished by:

- 1) Calling the Generation facility Control Room and asking for local control to dispatch, curtail, or disconnect the generation site.
- 2) Manual disconnection of circuit breaker may be required by site personnel if local control fails.
- 3) Dispatching SMUD Troubleshooter to operate the load break high side switch.

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2.9 Business Days

SMUD Outage Coordination business days are Monday thru Friday, 0500-1500, excluding SMUD Holidays. If the requestor is unable to contact SMUD Power Generation Outage Coordination or is making a notification or request outside of business hours notify SMUD Power Generation via email for Planned Outages or contact either Real-time PSO or DSO for active (final approval to start granted) outages or for emergency requests that are made outside of normal office hours. Real-time PSO or DSO, will process the work as practicable. This means the outage coordination process transitions to the PSO or DSO at 1500 Monday through Friday, and all day on Weekends and Holidays.

2.10 Extension of Work in Progress

As conditions arise during the outage and the work that is currently being performed needs to be extended beyond the scheduled request, Real-time PSO or DSO shall be notified at the earliest possible opportunity but no later than 2 hours prior to original ERT or new ERT (which ever time is closer). Studies may be required to identify any conflicts and/or extra requirements. Extension of work may require a status change; the scheduled (*Planned*) work may be *reidentified* as *Forced*, to comply with RC requirements. The extension or earlier return of current work may cause conflict(s) and require other scheduled clearance/outages previously scheduled to be postponed/rescheduled.

Requests associated with equipment forced out of service in "Real Time" shall be handled by the Real-time PSO or DSO. All Forced Outages will be returned as expeditiously as possible.

2.11 Early Return to Service of Work in Progress

As conditions arise during the outage, the resource owner or operator may desire to return to service earlier than end date and time or estimated return time (ERT). In such cases, the resource owner or operator shall notify SMUD no later than 2 hours before the new ERT. SMUD shall use reasonable efforts to accommodate the return to service as soon as practicable after such request but no later than original ERT; provided that SMUD can permit the resource to return to service.

In the case of a notice to return to service prior to the ERT, the following will occur: (i) SMUD will permit the Project to return to service, or (ii) if SMUD is not able to accommodate all or a portion of the resources Energy due to SMUD's scheduling of replacement energy prior to the

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original ERT or the anticipated resource Energy schedule may jeopardize reliable operations, SMUD may deny or reduce such Energy until the occurrence of the original ERT on a non-compensable basis; or (iii) if SMUD is not able to accommodate all or a portion of the resource's Energy due to SMUD's scheduling of replacement energy or any other economic reason at or following the new ERT, SMUD may curtail such Energy and such curtailment shall be considered a SMUD Curtailment. However, notwithstanding the prior sentence, SMUD may require resource owner or operator to interrupt or reduce deliveries of Energy pursuant to a Dispatch Down Instruction due to an event or circumstance at or following the revised (early) ERT.

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Attachment A - Defined Outage Types

Outage types in alphabetical order: Forced, Informational, Operational, Opportunity, Planned, and Urgent. The Outage types and their priorities are described in the sections below.

1.1. Outage Type Descriptions

1.1.1. Forced Outage

<u>Forced Outage</u> – Facility/equipment that is removed from service real-time with limited or no notice that impact SMUD transmission operations, import/export capacity, SMUD interconnected resources capability or contracted capacity.

Submission requirements for Forced outages:

- 1. Submit to WebOMS as soon as possible, the expectation is no later than 30 minutes after the Forced outage began; however, a System Operator's first priority is to address the operating issue. There may be instances where outages cannot be submitted within 30 minutes due to prevailing emergency conditions.
- 2. Forced outages that have (or are expected to have) a continuous duration of less than 30 minutes do not require submission to WebOMS. Forced outages that have a continuous duration of 30 minutes, or more are required to be submitted to WebOMS even if they are submitted after the fact.
- 3. Submissions are required to have a scheduled end time based on the best information available at the time. It is expected that submitters update the scheduled end time of a Forced outage as information becomes available.

1.1.2. Informational Outage

<u>Informational Outage</u> – Facility/equipment outage that is entered for informational reasons including increased situational awareness, for BA/TOP internal purposes or to satisfy the RC Data Specification where WebOMS is the mechanism for communicating the information.

Submission requirements for Informational outages:

- 1. No specific requirements for the Outage Coordination Process. Reference the RC Data Specification where WebOMS is the mechanism for communicating the information.
- 2. No specific requirement to include these outages within engineering studies.

1.1.3. Operational Outage

<u>Operational Outage</u> – Transmission Facility/equipment that is removed from service in the normal course of maintaining optimal or reliable system conditions but remains available if needed upon short notice. (This outage type may be either planned or real-

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time. Work is not being performed on the equipment/facility but may be part of an operating plan.)

Submission requirements for *Operational outages*:

- 1. No work is being performed on this equipment/facility. It remains ready to return to service with short notice.
- 2. Submit to WebOMS as soon as possible. Submitters should attempt to submit *Operational* outages within 30 minutes after the Operational outage is identified if in real- time. Reference the Same-Day and Real-Time Outage Update Requirements section for more information.
- 3. If an *Operational* request is needed as a mitigation, impacted TOPs should coordinate with one another to submit the request. Note: If part of a planned outage, it should be included with that request; not separately if possible. (If not, still need to link/group outage cards in WebOMS or include a reference in the work description.)

1.1.4. Opportunity Outage

<u>Opportunity Outage</u> – A Facility/equipment outage that can be taken due to a change in system conditions, weather, or availability of field personnel.

Opportunity outages did not meet the short-range window requirements.

Special requirements for *Opportunity outages*:

- 1. *Opportunity* outages must be studied/evaluated by the TOP, BA and/or RC as required against other existing *Submitted* and *Confirmed* outages.
- 2. *Opportunity* outages that cause reliability issues or conflict with other *Submitted* or *Confirmed* outages of a higher priority cannot be implemented.
- 3. Opportunity outages should have an emergency return time of 8 hours or less. This allows for unforeseen conflict resolution during the OPA process and avoids cancelling planned work.
- 4. Same-day and real-time *Opportunity* outages may be allowed at the discretion of the RCSO. These outages must be coordinated and studied by the TOP and the RCSO prior to implementation.
- 5. Opportunity outages may include an operating plan at the discretion of the RC.

Submission requirements for *Opportunity* outages:

1. Should be submitted to WebOMS with as much advance notice as possible and before OPA lock-down time, or their allowance will be at the discretion of the RCSO. Reference the OPA Window Process section for more information on the OPA process.

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1.1.5. Planned Outage

<u>Planned Outage</u> – Facility/equipment outage with enough advance notice to meet the minimum short range submittal requirements, but typically greater than 30-days from start of outage activity.

Submission requirements for *Planned outages*:

1. Reference Study Window Process section for submission requirements of *Planned* outages.

1.1.6. Urgent Outage

<u>Urgent Outage</u> – Facility/equipment that is known to be operable yet carries an increased risk of a *Forced* outage occurring. Facility/equipment remains in service until personnel, equipment and/or system conditions allow the outage to occur.

Urgent outages allow Facilities to be removed from service at an optimal time for overall system reliability. For *Urgent* outages, the work may or may not be able to wait for the Short-Range outage window.

Submission requirements for *Urgent* outages:

- 1. *Urgent* outages should be submitted to WebOMS with as much advance notice as possible.
- 2. An *Urgent* outage must have a justification of its urgency documented in the BA/TOP comments section of the outage submission.

1.2. Outage Type Priority

The outage types are listed below in their order of priority for conflict resolution purposes from top to bottom. Reasonable attempts should be made to accommodate and allow for planned outages.

- 1. Forced Outage Urgent Outage
- 3. Operational Outage
- 4. Planned Outage
- 5. Opportunity Outage
- 6. Informational Outage

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Attachment B: Contact Information

SMUD Distribution System Operations (DSO):

Phone: (916)-455-1671

<u>SMUD DSO – Outage Coordination:</u>

Phone: (916) 732-2829 Email: DSOOC@smud.org

<u>SMUD ET&C – Resource Optimization (RO)</u>

Email: resourceoptimization@smud.org

SMUD ET&C – Real-Time Traders

Phone: (916) 732-5177

Email: rtt1@smud.org, rtt2@smud.org, RealTimeTrading@smud.org

SMUD ET&C – Day-Ahead Traders

Phone: (916) 732-5669

Email: dayaheadtrading@smud.org

SMUD Power Generation Outage Coordination (PGOC)

Phone: 916-732-4882

Email: PGOutageCoord@smud.org

SMUD Real-time Power System Operations (PSO)

Phone: 916-732-6225 (generation desk), or 916-732-6730 (back-up)

SMUD PSO Outage Coordination (PSOOC)

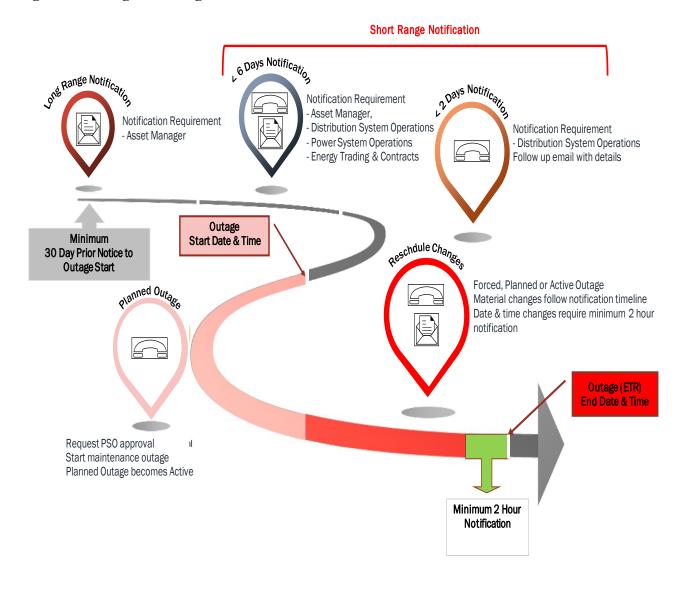
Phone: 916-732-5242

Email: PSOOC@smud.org

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Attachment C: Time of Notification Periods

Figure 1. Outage Planning Notification



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Monday **Tuesday** Wednesday Friday Saturday Sunday Planned outages in red below need to be submitted Mon prior by 00:01 **Planned Outage Planned Outage Planned Outage Planned Outage Planned Outage Planned Outage Planned Outage** Start Date (Monday) (Tuesday) (Wednesday) (Thursday) (Friday) (Saturday) (Sunday)

Figure 2. RC Short-range Timeline (Monday Submission)

For example, using the Figure 3 above, any work scheduled during the week (Monday 8th – Sunday 14^{th)} must be submitted to the RC by 0001 Monday 1st. Therefore, the iTOA must be submitted to PSOOC **prior to 0800 on Thursday of the previous week.**

When submitting requests, the requestor shall consider any holidays that may fall between the date of the request(s) submission and the date the work is to begin. The requestor shall submit the request for the outage 2 or more days ahead of the stated requirements in the timeline. If the requestor has any questions, contact PSOOC at 916-732-5242.

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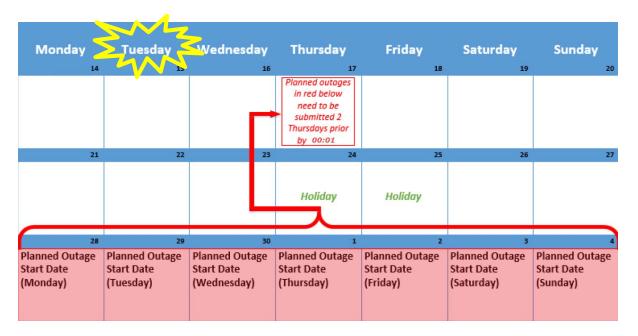
Saturday Wednesday Thursday Friday Monday Tuesday Sunday in red below need to be submitted 2 Fridays prior by Holiday Planned Outage Start Date (Monday) (Tuesday) (Wednesday) (Thursday) (Friday) (Saturday) (Sunday)

Figure 3. RC Short-range Timeline – Monday Submission (Monday Holiday Example)

For example, using the Figure 4 above, any work scheduled during the week of Monday 8th – Sunday 14th (with Monday 1st being a holiday) must be submitted to the RC by 0001 Friday 29th. Therefore, the iTOA must be submitted to PSOOC **prior to 0800 on Wednesday 27th**.

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Figure 4. RC Short-range Timeline - Monday Submission (Thursday & Friday Holiday Example)



For example, using the Figure 5 above, any work scheduled during the week Mon 28th – Sunday 4th (with Thursday 24th & Friday 25th being a holiday) must be submitted to the RC by 0001 Thursday 17th. Therefore, the iTOA must be submitted to PSOOC **prior to 0800 on Tuesday 15th**.

Note: Per RC Outage Coordination process, week is defined as Monday – Sunday.

SMUD PSOOC shall acknowledge the request within two (2) business days prior to the start of the outage.

All requests shall at a minimum, contain the location and the identification of the equipment to be worked on; the date and time the work is to start and stop, (include switching time when required); Requestors name and phone number; the name of the Authorization holder (person doing the work) and phone number; details of work being performed; emergency return time; Clearance points (if applicable) and all details or special requirements associated with the work being performed and any other facilities/equipment affected by the work being done. Other details, i.e., will the work crew perform switching or are SMUD switchmen requested and where? Use only approved abbreviations.

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If the SMUD does not receive sufficient or complete information within the times outlined, the approval of a request may be delayed or denied.

- SMUD PSOOC shall determine the need for additional information associated with the work such as schematics and diagrams.
- SMUD PSOOC shall determine the impact of the request on system operations from a "System Reliability" perspective.
- SMUD PSOOC shall coordinate all requests with adjacent BAs and other entities as applicable.
- SMUD integrated Tools for Operations Application (iTOA) will be used to submit all requests for authorization to work.
- SMUD PSOOC shall inform SMUD operations engineering and Energy Trading and Contracts (ET&C) via email if the requested outage is changed as soon as possible (e.g., outage duration, or starting/ending dates, or affected facilities, etc.).
- Email psooc@smud.org; FAX 916-732-6313; Telephone 916-732-5242
- SMUD PSOOC shall notify the RC, affected Balancing Authorities (BA) and Transmission Operators (TOP) in accordance with NERC Standard TOP-003, the RC OC Process and Guidelines for IRO-010 RC Data Specification and Collection (RC0120).

<u>Note</u>: SMUD PSOOC utilizes iTOA/webOMS to make these notifications.

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