Draft Final Proposal

Outage Management System Replacement

December 3, 2013

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1. Executive Summary

The ISO is conducting this stakeholder process to discuss proposed changes and enhancements to outage coordination that will be achievable through the Outage Management System (OMS) Replacement Project. At a high level, the project includes:

- Usability features that will improve all facets of outage scheduling from the participant's initial outage request, through the various review and outage processing states, and to its reliable execution monitored from the real time control floor.
- Process simplifications, standardizations and automation to drive efficiency in managing generation and transmission outages, better positioning the ISO to support the growing number of generation and transmission resources in our network model.
- New technology capabilities that will provide OMS reliability, high availability, flexibility and scalability to keep pace with market and system changes.
- New data transfers, data validations and notifications that will improve data communication from the new resource planning process through the complete Settlement cycle that that will reduce manual workarounds and increase data quality corporate-wide.

Operations, market participants, participating transmission owners, and WECC agree that a more usable system for managing outages is required. According to a root cause analysis for the mitigation of price correction, the volume and complexity of outages has increased an average of 9% per year over the last four years. The Voice of the Customer feedback from external participants, including WECC, identified important usability factors that are in scope for the new OMS.

From a technology standpoint, this project will refresh the existing outage systems qualities, maintainability, and supportability. The existing Scheduling and Logging for ISO of California (SLIC) and the internally developed Outage Management System (OMS), used for managing generation and transmission outages respectively, will be decommissioned upon conclusion of this effort. Completion of this effort will also position the ISO to adopt the Integrated Outage Optimization Coordination process which balances short-term outage requests on an economic and reliability basis.

2. Introduction

2.1 Purpose

The purpose of the OMS Replacement project is to update the ISO's outage management system and practices with improvements identified through years of experience, and to modernize the supporting technologies through a single outage management system. The purpose of this document is to capture and present a design approach or straw proposal for the new OMS. This proposal details how the Business Requirements Specification (BRS) posted on June 28, 2013 at http://www.caiso.com/informed/Pages/StakeholderProcesses/OutageManagementSystemProject.aspx will be developed into an OMS design, and outlines the key changes proposed in the new OMS.

3. Business Impacts

3.1 Background of Business Issues

The ISO has experienced a dramatic increase in the number of generation and transmission outage transactions due to new market and regulatory requirements. ISO outage management and application users, and real time operations, have raised numerous concerns related to processing the volume of the outage requests received and the quality of the information they contain.

Outage management and application users have identified specific application areas of concern:

- High-degree of human interpretation required to transform free-form text into actionable data
- Lack of mapping needed due to differences in equipment naming standards and equipment relationships
- Lack of automation requiring heavy manual processing and data entry
- Continued expansion of market products (e.g., Modeling at switch level, Multi Stage Generation, Non Generation Resources) expected to increase the number and complexity of both generation and transmission outage processing.

Real Time Operations users have also identified specific application areas of concern:

- Lack of automation and application performance
- Need for user friendly interface for the ability to quickly manage and submit forced outage de-rate information
- Need for automated communication of messages to various parties
- Multiple ISO applications are being used to manage outage data which is inefficient and increases risk of error.

The OMS Project Objectives

The OMS project is designed to meet the following goals/objectives:

- Meet the requirements of the North American Electric Reliability Corporation (NERC) Outage Standard TOP-003-1 – *Planned Outage Coordination*
- Improve outage management quality, productivity, and data accuracy for the OMS and downstream systems
- Increase efficiency between systems when there are component re-rates.
- Accelerate market application reporting
- Provide a high-degree of user functionality through increased system automation and equipment identification mapping
- Automate identified manual processes (i.e., require fewer business resources through increased system automation)
- Avoid costly application maintenance through solid system design
- Generate intuitive reporting
- Increase efficiency by using a single system to process and manage all outages.
- Provide system architecture and framework flexibility

Benefits of a New OMS

General

- Increases outage processing automation; e.g., reduces manual processes.
- Increases accuracy, ease of use and report functionality.
- Integrates disparate ISO systems

Transmission

- Eliminates the use of multiple ISO systems to manage transmission outages.
- Removes user ambiguity, removes a high degree of manual workflow, and consolidates today's OMS and SLIC's transmission outage functionality into one base application with additional functionality.
- Systematically captures transmission line re-rates, which will be passed to network models and market applications for processing.
- Introduces additional market impact functionality including automation of Nomograms, Flowgates and Contingencies.

One-Line Diagrams (possible future release if required)

- Provides a visual diagram representing sub-stations (buses, lines, breakers, switches, etc.) that will allow a user to visualize the equipment affected in the given outage.
- Significantly reduces manual interpretation and removes time consuming data searches.

Generation

- Eliminates the SLIC generation functionality and incorporates it into the OMS, thus providing a single application that will process an outage in its entirety.
- Introduces additional generation automation including the data transfer A/S Availability and Minimum Online capacity (MOC) requirements.
- New functionality will exist for resource owners to communicate outage data to the ISO.

4. Process Improvements

In early 2013, a cross-department ISO team performed a re-review of the ISO outage process that included customer feedback from previous scoping efforts. The team was challenged to evaluate the entire outage process, from outage submittal to outage completion, and develop streamlined processes and author clear requirements for the new system. The following outlines the improvements identified and detailed in the OMS Business Requirements Specification.

In addition, the ISO utilized a new outreach program called the "Voice of the Customer" to get input from our customers and ascertain how they use our systems and to collect strong user-based requirements. The first Voice of the Customer effort was a focus group specifically on how to make OMS a more useful and effective application. As a result of the Voice of the Customer effort, the ISO received valuable feedback with regard to the usability requirements early enough in the development phase to include them as requirements in the process.

This section is a high-level listing of the improvements identified to streamline the data entry, data search and data filter functions in OMS, where many of these improvements proposed came directly from the Voice of the Customer effort. The ISO will be discussing this section in more detail in future Customer Partnership workshops.

4.1 **Reduction of Manual Processes**

A primary tenet of the OMS project is to streamline the data flow between the ISO and its participants. At present, there are a significant number of manual processes performed by both ISO and participants. This is especially evident in the processing of participating transmission owners outages. At present, transmission outage switching detail is received in free-text form, and is re-input into the ISO systems that control the Network Model representations. This is a manual process called 'Augmentation', where the switching detail is converted from free form text into discrete database fields by ISO Outage Coordination personnel. There are

numerous issues with this approach including the potential for misinterpretation, inconsistency and potential human error.

The OMS project endeavors to implement the following specific improvements to the augmentation process:

- The OMS system will be designed to provide the ability for Transmission Owners to provide outage data in a structured format and for the ISO to map equipment data based on facility name. This data will directly interface with the Network Model, thus improving the completeness and accuracy of outage data.
- To assist Transmission Owners in the modeling of their transmission outages, OMS will have an intuitive User Interface, and an API to interface to their systems automatically. One-line diagrams may be implemented in the future if required.
- For outage work that requires different pieces of equipment out of service at different times, each timeframe with a different augmentation shall be required to have an individual outage card. This will promote more accurate modeling.
- OMS will provide the ability to quickly duplicate an outage, streamlining the effort of recreating outages.
- OMS will identify conflicting switch positions and provide the user a means to correct the switch position.
- OMS will store and display an outage priority date/time stamp that will assist in the tracking and prioritization of outages.
- For generation outages, all types of outage requests will be able to be submitted on the same outage card instead of the multiple types currently used in the SLIC application.

4.2 Increased Automation

Another primary goal of the OMS replacement project is to incorporate the use of automation over manual processing where possible. Automation efficiencies have been identified in the requirements as follows:

- **Automated Notifications**. Automated notifications are expected to greatly increase the quality and consistency of information between the ISO and its external participants as well as internally between ISO departments. Business rules that explicitly outline who, what and why notifications should be sent were developed with the vision that notifications need to be timely and meaningful. As business and system processes change, the OMS notification "engine" will be flexible and configurable to keep pace. Automated notifications may include:
  - Outlook integrated Automated Emails (See OMS-GOM-BRQ063)
  - OMS User system messaging (See OMS-GOM-BRQ061)
  - Automated messaging to other systems (WECC Net Messages, Market Messages (MNS))
  - Outage Processing Reminders
  - Warnings when changes occur to an outage associated in a group (OMS-GOM-BRQ017)
  - Information Only or Acknowledgment Required Pop Up Outage Notifications (See OMS-GOM-BRQ056)
  - Concise and clear System and Error notifications (See OMS-GOM-BRQ052)

- **Outage Processing Automation.** Business process automation can occur in well-defined instances where the inputs can be confirmed automatically and the resulting business action can be consistently applied. In the BRS, numerous business process automation opportunities were defined. These include:
  - Certain data elements in an outage may trigger further action.
    - For example, if a Nature of Work item is selected that is known to commonly impact AS Availability (e.g., RIG Outages), the AS Availability template will be automatically presented to the user.
  - Selected outage states may automatically transition to a new state based upon a business rule (OMS-GOM-BRQ018 and OMS-GOM-BRQ025).

- Example: An outage that is scheduled to start within five minutes and is still in the "Approved" state will automatically transition to "Late to Start." This transition serves as a warning that an outage is scheduled to begin and has not yet been requested. This time period is configurable.

4.3 Enhanced Usability Features

- If a data input rule is violated, the system will reject the request and notify the submitter why the request was rejected.
- Data validations are proposed to ensure all required data is input completely and accurately.
- OMS will clearly identify mandatory versus optional fields as well as pre-populate default values that can be modified by the user where applicable
- OMS will provide outage templates and saved user display settings for column order, sort preferences and other settings (See OMS-GOM-BRQ040).
- Search and filtering tools will include in-line filters, summary, expanded summary and detailed views, and progressive drill downs fields (where a selected item narrows the possibilities of the next data) (See OMS-GOM-BRQ042 and OMS-GOM-BRQ044)
- OMS will also have advanced filters for more complex queries.
- Status bar and progress bars will be available for any complex and potentially long processing data requests.
- The Tab order will logically move through the outage data needed to create an outage in an efficient and timely manner.

5. Process Changes with Tariff Impact

The following section details where new requirements defined in the Business Requirements Specification (BRS) posted on June 28, 2013 directly impact the ISO Tariff and change the way outage scheduling is performed at the ISO. Upon Board of Governor approval to proceed with the new OMS Replacement Project, the ISO will draft new Tariff language to be filed at FERC for approval and will prepare BPM language and submit it through the change management process to reflect these changes.

5.1 Nature of Work

In an effort to streamline processes, capture relevant data, and provide additional automation and functionality, a new concept called Nature of Work will be introduced with OMS. Nature of Work types will replace several of the current system's resource outage types, resulting in one outage card "type" with multiple Nature of Work items to select from. This is further detailed below.

Nature of Work will be selected when creating an outage card to identify the high level scope of work or reason for the outage card, similar to the use of GADS Cause Codes in the current SLIC system. Based on the Nature of Work selection, additional templates may become available to the user to streamline the outage creation and validate input. Nature of Work types will be different for resource and transmission outages as described below. GADS Cause Codes will remain in OMS, but will become an optional field.

Transmission Nature of Work Types

When creating a transmission outage, the ISO proposes providing hierarchal drop-downs that will guide the user through the outage creation, with fields being populated or becoming available based on the previous selections. Each piece of equipment in the network model will be mapped to the OMS so that the user can select a specific substation (e.g. Station A), type of equipment (e.g. line, bank, bus), and specific equipment

name (e.g. Bus #1) that filters based on previous selections. More than one piece of equipment can be identified on each outage card to accurately report work that impacts more than one component.

A Nature of Work type will be related to each individual piece of equipment on the transmission outage card. More than one Nature of Work type can be selected for each outage card. Example provided in section 5.3.

The following Transmission Nature of Work types are being proposed:

- Out of Service
- Energized Work
- Relay Work
- Special Setup
- Test Program
- Equipment Derate
- Equipment Abnormal
- Path Limitation

Communication outage cards will also be supported, with Nature of Work types relevant to the different scopes of communication work.

Resource Nature of Work types

Resource outage templates will also follow a hierarchal drop-down approach, with the highest level being the market resource, or plant, level. Each associated child resource will populate the outage and give the user the ability to report at the child level (see section 5.2 for additional de-aggregation details).
A Nature of Work type will be selected and, based on the selection, additional fields or templates may become available. More than one Nature of Work type can be selected for each outage card.

The following resource Nature of Work types are being proposed:

- Environmental Restrictions
- Transmission Induced
- Plant Maintenance
- Plant Trouble
- Ambient Due to Temperature
- Ambient Not Due to Temperature
- Power System Stabilizer (PSS)
- AVR/Exciter
- Unit Testing
- Metering/Telemetry
- RTU/RIG
- ICCP
- Transitional Limitation
- Unit Cycling
- Unit Supporting Startup

The Ambient Derate outage card types will be removed and replaced with relevant Nature of Work types, including choices to indicate if the outage is due to temperature or not due to temperature

Pmin Re-rate and Ramp Rate Re-rate cards will also be removed, with entry for these values made available on the resource outage card template.

Currently, Normal Card codes fall into three general categories. To simplify resource reporting, the following Nature of Work types are proposed to be used in place of the current Normal Card SLIC Cause Codes:

- "Transitional Limitation" will replace the following:
  - 10000 – Warming Steam Driven Auxiliary Equipment
  - 10002 – Warming Additional Combustion Turbine
  - 10003 – Transition to/from Start-up or Bypass System
  - 10004 – Hold Due to Thermal Stress

- "Unit Cycling" will replace the following:
  - 10007 – Avoiding Equipment Cycling
  - 10009 (partial) – Resource Adequacy Resources Availability
    - To be used if a resource is being dispatched in real time beyond their DA Awards and must shut down to meet minimum down time requirements prior to starting up to meet their next day's DA Awards
    - For any other use of this code, the standard outage process shall be followed

- "Unit Supporting Startup" will replace the following:
  - 10005 – Unit in Startup

- "Transmission Induced" will replace the following:
  - 10008 (partial) – Dynamic System Resource Derate
    - To be used for a derate to a Dynamic System Resource or pseudo-tie resource due to transmission constraints
    - For any other use of this code, the standard outage process shall be followed

- "Ambient Not Due to Temperature"
  - 10010 – QF CHP Host Load Required Derate

- The following codes will no longer need to be accounted for:
  - 10001 – Changing Fuel Source
    - There are no longer any resources in the system that require this functionality
    - If a new resource required this functionality, it would fall under "Transitional Limitation"
  - 10006 - A/S Deliverability Operational Limit
    - New OMS functionality will have a mechanism for reporting A/S Availability for a resource

An additional current function that will be replaced with Nature of Work types is "Make Planned."
Currently, an outage can be changed from Forced to Planned using this functionality. This is typically used for resources that are out of service due to conditions outside of their control, such as a transmission outage resulting in interruption of the path that delivers the resource's energy to the system. The Make Planned functionality will be removed and participants will now select the Nature of Work type to reflect the reason for their outage.

Under the new functionality, an outage submitted in the forced timeframe will be identified as Forced on the outage card. Forced outages that are not subject to SCP penalties will be identified based on information found on the outage card and be identified to downstream CAISO systems for appropriate SCP processing.

Additional details concerning Nature of Work will be determined through OMS Customer Partnership Group sessions.

5.2 De-Aggregation of Resources for Outage Reporting

Modeling accuracy with only aggregated resource data does not provide the level of detail required for accurate Real Time Contingency Analysis and State Estimator solutions. In addition, WECC requires detailed outage modeling to support the west-wide model. The ISO is the only entity in the WECC that does not provide this level of granularity. Currently, resource outages are submitted to the ISO at the aggregated project or plant level with no granularity to the individual child resources. Also, availability is reported in a single value, making it difficult to identify which individual resource is contributing to the reduced availability. This issue is magnified in cases of overlapping outages.

> For example, a 300MW aggregated resource consisting of two CTs and one steam plant has submitted an outage card with an ongoing plant level ambient derate of 10MW, reducing its plant level availability to 290MW. While this ambient derate is in effect, the resource has real time trouble, requiring CT #1 to be removed from service. An additional short term outage card is submitted with a derate of 100MW. The total derate of the plant is now 110MW, resulting in total availability of 190MW.

Using the example above, the new OMS, like today, will require two outage cards. The market systems will continue to utilize the overall availability value of 190MW. The network model will now accurately reflect CT #1 out of service and an overall plant availability of 190MW.

To reduce participant impact, outage cards will continue to be managed and submitted at the aggregate or market resource level. The new OMS system will provide a pre-populated template, which will include the parent-child resource structure based on the plant level resource selected within each card. The participant will enter relevant de-aggregated data and identify each child resource availability value.

Market information will continue to be reported manually by the participant at the market resource level. This includes energy availability, ancillary service availability, Pmin re-rates, and ramp rate re-rates. Aggregate and PSP resources will continue to report at the parent resource level to provide accurate dispatchable availability values. MSG resources will report these values at the configuration level.

For further details refer to OMS-GEN-BRQ018 and OMS-GEN-BRQ025

5.3 Structured PTO Outage Data

Currently, the PTOs submit outages with clearance points and other transmission elements to the CAISO using mostly free text. Some outages are as long as twenty to thirty pages that must be read to identify critical information, risking accuracy and reliability. Other outages are submitted without enough information for the CAISO to fully understand the scope and impacts of the outage. Much of the outage information has to be interpreted by CAISO personnel, often requiring clarifying phone calls. Then outage information is manually entered into other CAISO systems, including modeling of the outage for use in Day Ahead Reliability Studies, the State Estimator, Real Time Contingency Analysis, and Market Applications. The use of structured transmission data will address two primary areas for improvement. The first is more structured and detailed modeling information, the second is more clear indication of equipment impacted by outages.

Requirement for CAISO Reliability Analysis

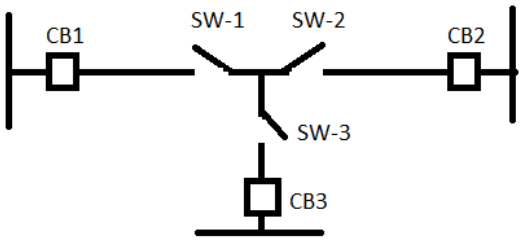
The CAISO performs a reliability analysis to ensure that in the pre-contingency state, no transmission facilities are expected to carry power flow above the normal continuous facility rating. In addition, NERC and WECC reliability standards require the CAISO to perform an N-1 contingency analysis, ensuring that no N-1

contingencies will create an overload above the emergency ratings of the facilities. To accurately perform these analyses, the power flow model reflects the following:

1. Each piece of equipment that could change the way power flows
2. Each piece of equipment that could change the way "N-1" contingencies impact the system

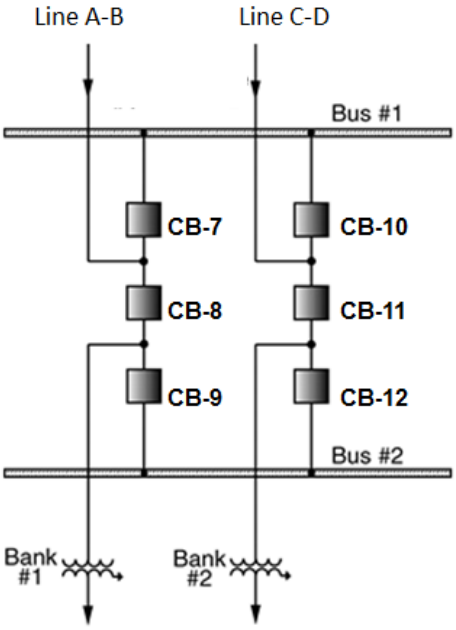
The above information is essential in performing reliability analyses to meet normal operational planning requirement under NERC and WECC standards.

Below is an example of a three-terminal line. Opening switch SW-3 would provide a different power flow as opposed to opening the entire line, which is commonly done by opening Breaker CB1, CB2, and CB3.



Below is an example of a breaker and a half scheme. Open-ending Line A-B at the remote station (leaving CB7 and CB8 closed) will be different then opening Line A-B, commonly done by opening Breaker CB7 and CB8, because the N-1 response to a fault at Bank #2 will create a very different system response:

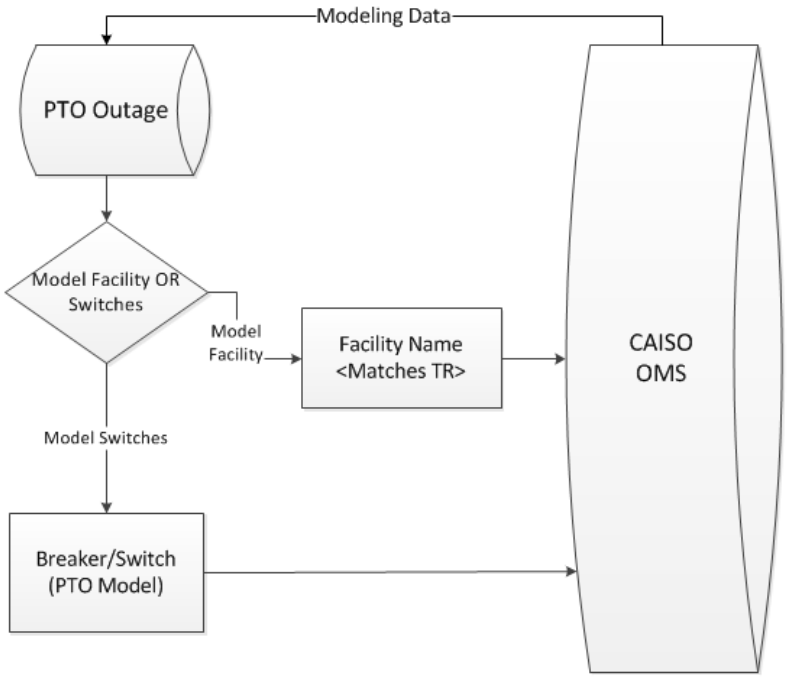
- If CB7 and CB 8 are closed there is a contiguous path between Line C-D to Bank#1 following the N-1 loss of Bank #2.
- If CB7 and CB8 are open, both Line C-D and Bank #1 will be open-ended following the N-1. In this situation, the N-1 fault at Bank #2 will leave all equipment at the bus open-ended and not carrying any power flow.



Due to the possible variations as described above, it is very important for the CAISO to understand what the exact requested outages are. For this reason the CAISO, is requesting that actual breaker positions (and switch positions, if applicable) are submitted along with the outage request.

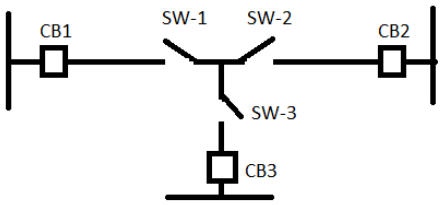
To address the first concern of structured and detailed outage modeling information, the CAISO will use the Transmission Registry (TR) names, and perform a mapping process of each PTO's network model to the ISO's network model at the facility (bus, bank, line, etc.) and at the switch level. The CAISO will start with contingency modeling definitions that are already utilized and will work with the PTOs to validate and pre-model any additional facilities' normal isolation points to increase efficiency during the outage creation process.

When creating an outage, the PTO will select either the pre-modeled facility or individual isolation points associated with the outage. For outages that are not pre-modeled or outages with other than normal isolation points, the PTO will model their outage at the appropriate facility level, which could include switches. The modeled points will be presented to the PTO for validation or modification if required. This will ensure that the outage is modeled accurately based on the PTO input and reduce the need for manual interpretation. The structured modeling format will allow for direct integration with downstream systems needed for accurate State Estimator, Contingency Analysis, and Market Application results. See diagram below.



Outage Submission Examples – Option 1

In the three-terminal line example as follows:

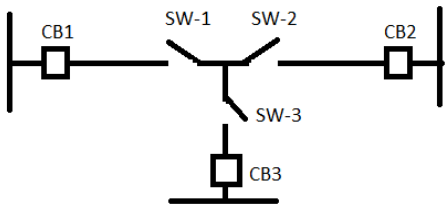


A PTO may do one of the following:

- If the entire three-terminal line will be out of service, the PTO may submit one line outage for the whole three-terminal line using its line name as defined in the CAISO TR:
    - ISO OMS will then assume that CB1, CB2, CB3 will be opened as isolation points during the outage.
    - ISO OMS will also record the opening of CB1, CB2, and CB3 as part of the outage. These records will be made available to the PTO. If there are any changes needed, the PTO may provide updated switch/breaker positions.
    - All reliability analyses and the Day Ahead market will be ran with CB1, CB2, and CB3 open for the duration of the outage
- If one of the line segments will be out of service, the PTO may submit one line-segment outage for the line segment that will be out using its line segment as defined in the CAISO TR. For example, if segment 3 will be out:
    - ISO OMS will then assume that CB3 and SW-3 will be opened as isolation points during the outage.
    - ISO OMS will also record the opening of CB3 and SW-3 as part of the outage. These records will be made available to the PTO. If there are any changes needed, the PTO may provide updated switch/breaker positions.
    - All reliability analyses and the Day Ahead market will be ran with CB3 and SW-3 open for the duration of the outage

Outage Submission Examples – Option 2

In the three-terminal line example as follows:



The PTO may submit any combination of breakers and switches and designate the correct positions for each to reflect the state of the system during the outage. The PTO will use their network model names to submit to the CAISO. For example:

- If the entire three-terminal line will be out of service the PTO might submit CB1, CB2, and CB3 in the open position as part of the outage.
- If one of the line segments will be out of service, the PTO may submit breaker and switch positions to indicate that. For example, if segment 3 will be out of service the PTO might submit CB3 and SW-3 in the open position as part of the outage.

The second area of improvement is to clearly and consistently identify equipment associated with an outage. Currently, free text is used in the outage card short description to identify the specific equipment that work will be conducted on. This is sometimes incomplete and doesn't always give a clear indication of the type of work being performed, requiring the user to search outage notes for critical information. In addition, because the current system only contains components to the station level, it is cumbersome to research past outages on specific components such as transformer banks or buses for research and reporting.

The new OMS will contain each bank, bus, and line in a structured format with a mechanism to identify the type of work being done on each (Nature of Work). It will also allow for the association of more than one piece of equipment to be identified on one outage card, making it easier to see the full scope of work for jobs that impact more than one component. This level of detail will clearly identify relevant transmission outage data in a summary view to remove ambiguity and provide more efficient referencing.

For example, an outage is submitted for a job at Substation A that removes Bus #1, Bank #1 and Line #1 from service.

Current SLIC:
The resource name will be either Substation A or Line #1, depending on which component is selected at time of outage creation. The remaining equipment will be identified in either the short description or the main text of the outage card. The summary view of this outage might look something like this:

BA Code	Outage ID	Resource Name	Short Description	
PTO – A	ID # 12345	Station A	Equipment out of service at Station A for...	

This view does not give the user an overall picture of the scope of work without opening the outage card and reading all of the free text. It is also not possible to perform a search to find outages on Bank #1, Bus #1, or Line #1 without searching for all work done at Station A and opening and reading the free text in each.

New OMS:
The resource names will be Bus #1, Bank #1, and Line #1, with Nature of Work associated with each one. The summary view of this outage might look something like this:

BA Code	Outage ID	Resource Name	Nature of Work	Short Description
PTO – A	ID # 12345	Station A Bus #1	Out of Service	Equipment out of service..
		Station A Bank #1	Out of Service	
		Line #1	Out of Service	

This view gives the user an overall picture of the scope of the work. Each component is identified in the summary view, as well as the “Out of Service” Nature of Work type for each component. This structure also makes it possible to perform a search to find work on any one of the three pieces of equipment included on the outage.

To further promote network model accuracy, each outage request will only have a single set of outage augmentation (or configuration), which is associated with the start and end times of the outage. For work that requires switches to change position during the job, the outage submitter will submit separate outages for each configuration.

Technical details regarding UI and API requirements will be discussed through the Customer Partnership Group sessions.

5.4 PTO Outage Processing Efficiencies

Currently, PTOs request a final approval to begin and end transmission work from the CAISO real time transmission dispatcher prior to commencing the outage. This results in numerous phone calls throughout the day to process numerous outages, including outages with low risk and low impact. As the number of outages and workload increase, dispatchers are spending more and more time manually processing and managing outages, taking their attention away from other responsibilities. The CAISO proposes a new process to streamline real time outage processing.

To facilitate this new process, outages submitted to the CAISO will be separated into two categories, dependent upon the expected impact to the system. Based upon CAISO configurable business rules and PTO input, outages are categorized as either Final Approval Required (FAR) or Final Approval Not Required (FAN).

- Final Approval Not Required (FAN) – For an outage that has been previously approved, work may be started at the planned time without requesting a final approval
- Final Approval Required (FAR) – For an outage that has been previously approved, a final approval must be obtained (electronically or verbally) from the CAISO before commencing work

A majority of the outages that are processed by real time operators have been through the standard outage lifecycle. This includes review by outage coordinators and engineers at both companies. Assuming that these planned outages are going to proceed as planned in real time, many of them will not require a final approval by the CAISO in real time prior to commencing work. The PTO will report the start and end times of the outages electronically to directly update the OMS outage card. These outages will be designated as Final Approval Not Required (FAN). This means that in real time, the ISO does not need to issue an additional approval unless there is a change to the outage.

For some outages, the CAISO real time operator may have additional responsibilities at the start and end of an outage. These outages will be designated Final Approval Required (FAR) and the PTO will contact the CAISO to receive approval to begin and end the outage. The final approval can be requested and given electronically through the OMS system. The current proposed Transmission FAR outages are:

- 500kV work
- Equipment out of service that impacts a path rating
- Outages with generation requirements
- Outages with flow limits associated
- Work that impacts relays

The ISO will prominently display if an outage is designated as FAR or FAN on each outage card.

For the small percentage of outages that are initiated in real time, outages will be electronically submitted by the PTO. Business processes will be established around communication requirements for these types of outages during workshops with PTOs.

PTO Outage Coordination groups are currently submitting and managing outages through electronic submissions to the CAISO in the pre-real time timeframe. Electronic processing in this timeframe has resulted in a reduction of manual work for PTO's and the CAISO, as well as the ability to electronically update outages without having to resend the entire outage manually. The CAISO would like to extend these efficiencies to real time.

The CAISO expects that the introduction of Final Approval Required and Final Approval Not Required criteria, as well as electronic processing of outages, will greatly reduce the volume of phone calls between control rooms concerning routine outages, allowing operators to regain the time to devote to other reliability related tasks. The CAISO continues to encourage the use of phone communication when necessary; however, the CAISO would like to encourage the use of electronic processing when possible.

As today, per CAISO Business Practice Manual for Outage Management and Operating Procedure 3210, the PTOs will be responsible for maintaining their scheduled outage start and end times accurate at all times. All changes to transmission outages must be approved by the ISO.

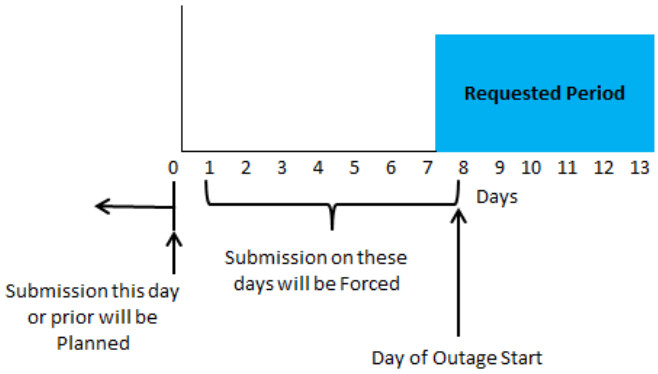
Generation real time outage processing will remain the same as it currently is in SLIC.

5.5 Planned Resource Outage Submittal Timeline

In an effort to increase network model accuracy and provide sufficient time for outage processing and analysis, the ISO is proposing to align the resource outage submittal timeline with the transmission outage timeline of seven calendar days.

Receiving resource outage data seven days in advance is critical to providing the ISO with the ability to analyze transmission and generation outages together, thereby improving study results and providing additional time to identify and resolve potential areas of conflict. To be considered Planned, an outage request must be submitted to the CAISO no later than Seven Days prior to the start date of the proposed Outage. The determination of seven day prior notice excludes the date of submission and the date of the outage.

Any resource outages that are submitted after the deadline will be considered forced.



Opportunity Outage Submittal

If system conditions permit, a resource may be granted an ISO approved Short Notice Opportunity Outage in the seven day forced timeframe. If approved, it will not be subject to SCP penalties. Short Notice Opportunity Outages will no longer be evaluated prior to the forced timeframe.

Off-Peak Opportunity Outages will continue to be accepted and evaluated consistent with today's current business practices.

RA Unit Substitution

In response to stakeholder comments, the CAISO proposes to change the RA unit substitution requirements that would otherwise apply to the seven-day forced outage period. The changes will reduce implementation complexity and eliminate the potential financial impact of SCP during calendar days 4–7 of the new forced outage period. Under this proposal, a resource will be subject to SCP if an outage is submitted within three calendar days of the start date of the outage, not to include the date of the request and the date of the outage, rather than the current three business day rule. SCP will not apply to forced outages requested 4-7 calendar days in advance of the outage. All other SCP rules remain the same as today.

Outages submitted 4-7 calendar days prior to the outage start date will be classified as forced outages but the resource will permitted to replace the unavailable capacity under the current RA Replacement Rules.

In addition, Many-to-Many SCP Substitution functionality will give Market Participants the capability to use one substitute unit to cover multiple forced RA outages. Please refer to the ISO Release Schedule for information on when the Many-to-Many SCP Substitution functionality will be available.

5.6 Accounting for "Partial Forced" Resource Outages

Partial forced functionality will be postponed to a future phase due to stakeholder concerns and complexity of implementation. An automated process for partial forced will be considered as part of a future phase of the OMS Project.

A change to a Planned outage in the forced timeframe will require a new Forced outage card only if the request is denied due to reliability concerns.

5.7 Elimination of the Forced Outage Report

The ISO proposes to eliminate the requirement to submit a Forced Outage Report Based on the ISO's review of its process and input obtained through the Voice of the Customer, the ISO has determined that Forced Outage Report is no longer necessary and can be eliminated. The elimination of this report will reduce the workload for scheduling coordinators and streamline the outage management process.

5.8 A/S Availability Reporting

Current "Regulation Outage" functionality in SLIC allows for the scheduling coordinator of a resource to identify when that resource is not available to supply Regulation due to an outage. This limited functionality does not allow for the scheduling coordinator to differentiate between Regulation Up or Down, or to identify if there are limitations on other Ancillary Service commodities. Free text must be used to communicate this additional level of information and an ISO operator must manually provide the input to the Market systems about the limitations.

The new OMS will provide an A/S Availability template for scheduling coordinators to report limitations in a structured format for each ancillary service type. The data will be automatically utilized by the market systems with no need for ISO interpretation or manual intervention. For specified Nature of Work types that commonly impact a resource's ability to provide one or more Ancillary Services, this template will automatically become available and contain additional validation rules. This will reduce the amount of manual interpretation and allow the scheduling coordinators to clearly identify their resource's ancillary service limitations.

6. Next Steps

6.1 Plan for Stakeholder Engagement

The following are the "next steps" in the Stakeholder process toward presenting this proposal to the ISO Board of Governors.

Item	Date
Post Revised Straw Proposal (*This document*)	October 18, 2013
Stakeholder WebConference Call	October 31, 2013
Stakeholder Comments on Straw Proposal Due	November 7, 2013
Post Draft Final Proposal	December 3, 2013
Stakeholder WebConference Call	December 10, 2013
Stakeholder Comments on Final Proposal Due	December 17, 2013
Board of Governors	February 2013

Note that additional Customer Focus Groups will also be scheduled to collect further input on the user interface and system-to-system interactions. Exact dates and times to be announced through an ISO Market Notice.