APPENDIX D
OPERATION STANDARDS FOR GENERATING ASSET AND ENERGY STORAGE SYSTEM OWNERS

Operating Standards (OS) 1 through 28 apply to each covered GA and ESS. (*See* GO 167, §§ 3 and 7.) A separate document containing guidelines may be obtained from the Commission's Safety and Enforcement Division (or successor entity). (*See* GO 167 § 14.2.) The guidelines are intended to assist each GA and ESS owner in determining how it may comply with these OS.

1. OS 1 - Safety

The protection of life and limb for the work force is paramount. GAOs and ESSOs have a comprehensive safety program in place at each site. The company's behavior ensures that personnel at all levels of the organization consider safety as the overriding priority. This is manifested in decisions and actions based on this priority. The work environment and the policies and procedures foster such a safety culture, and the attitudes and behaviors of personnel are consistent with the policies and procedures.

2. OS 2 - Organizational Structure and Responsibilities

The organization with responsibility and accountability for establishing and implementing an operation strategy to support company objectives for reliable facility operation is clearly defined, communicated, understood, and is effectively implemented. Reporting relationships, control of resources, and individual authorities support, are clearly defined, and commensurate with responsibilities.

3. OS 3 - Operations Management and Leadership

Operations management establishes high standards of performance and aligns the operations organization to effectively implement and control operations activities.

4. OS 4 - Problem Resolution and Continuing Improvement

The GAO and ESSO value and foster an environment of continuous improvement and timely and effective problem resolution.

5. OS 5 - Operations Personnel Knowledge and Skills

Operations personnel are trained and qualified to possess and apply the knowledge and skills needed to perform operations activities that support safe and reliable facility operation.

6. OS 6 - Training Support

A systematic approach to training is used to achieve, improve, and maintain a high level of personnel knowledge, skill, and performance. Each GAO and ESSO provides a site-specific training program including on-the-job training, covering operations, including reasonably anticipated abnormal and emergency operations. Personnel are trained to ensure safe and reliable facility operation.

7. OS 7 - Operation Procedures and Documentation

Operation step wise procedures exist for critical systems and the states of those systems are necessary for the operation of the unit including startup, shutdown, charging, discharging, normal operation, failure detection, alarm response, reasonably anticipated abnormal and emergency conditions, and restoration. Operation procedures and documents are clear and technically accurate, provide appropriate directions, and are used to support safe and reliable facility operation. Procedures are current to the actual methods being employed to accomplish the task and are comprehensive to ensure reliable energy delivery to the transmission grid. Procedure shall be reviewed annually to ensure current procedures are up-to-date and OEM recommendations are implemented.

8. OS 8 - Plant Status and Configuration

Facility activities are effectively managed, so the facility status and configuration are maintained to support safe, reliable, and efficient operation.

9. OS 9 - Engineering and Technical Support

Engineering activities are conducted such that equipment performance supports reliable facility operation. Engineering provides the technical information necessary for the facility to be operated and maintained within the operating parameters defined by facility design. Software is up-to-date for cyber security and routinely backed up for safety, reliability, and operational purposes. Engineering and technical staff provide support, when needed, to operations and maintenance groups to resolve operations and maintenance problems.

10. OS 10 - Environmental Regulatory Requirements

Environmental regulatory compliance is paramount in the operation of the facility. Each regulatory event is identified, reported and appropriate action taken to prevent recurrence.

11. OS 11 - Operations Facilities, Tools, and Equipment

Facilities and equipment are adequate to effectively support operations activities, including housekeeping, tool storage, and equipment storage. Physical separation such as, but not limited to, egress requirements, clearance for electrical equipment, and ESS equipment shall be maintained.

12. OS 12 - Operations Conduct

To ensure safety and optimize facility availability, the facility conducts operations systematically, professionally, and in accordance with approved policies and procedures. The facility takes responsibility for personnel actions, assigns personnel to tasks for which they are trained, and requires personnel to follow

facility and operation procedures and instructions while taking responsibility for safety. Among other things:

a) All personnel follow approved policies and procedures. Procedures are current and include a course of action to be employed when an adopted procedure is found to be deficient.
b) All operations are performed in a professional manner. Professional conduct applies throughout the facility site at all times.
c) All personnel on duty are trained, qualified, and capable of performing their job functions. Personnel are assigned only to duties for which they are properly trained and qualified.
d) Personnel take immediate actions to prevent or correct unsafe situations. Anyone shall have the right to stop work if they see an unsafe condition.

13. OS 13 - Routine Inspections

Routine inspections by facility personnel ensure that all areas and critical parameters of facility operations are continually monitored, equipment is operating normally, and that routine maintenance is being performed. Results of data collection and monitoring of parameters during routine inspections are utilized to identify and resolve problems, to improve facility operations, and to identify the need for maintenance. All personnel are trained in the routine inspection procedures relevant to their responsibilities. Among other things, each GAO or ESSO creates, maintains, and implements routine inspections by:

a) Identifying systems and components critical to system operation such as, but not limited to, those listed in the guidelines to Operating Standard 28.
b) Establishing procedures for routine inspections that define critical parameters of these systems, describe how those parameters are monitored, and delineate what action is taken when parameters meet alert or action levels.
c) Training personnel to conduct routine inspections.
d) Monitoring and conducting trend analysis from routine inspections.

14. OS 14 - Clearances

Work is performed on equipment only when safe. When necessary, equipment is taken out of service, de-energized, controlled, and locked-out and/or tagged-out in accordance with a clearance procedure. Personnel are trained in the clearance procedure and its use, and always verify that equipment is safe before any work proceeds. Among other things:

a) The GA or ESS Owner prepares and maintains a clearance procedure.
b) The clearance procedure contains requirements for removing a component from service and/or placing a component back into service.
c) The GA or ESS Owner ensures that personnel are trained in and follow the clearance procedure.

15. OS 15 - Communications and Work Order Meetings

The availability of the GA and/or ESS and safety of personnel is ensured during the execution of work orders by adequate communications and meetings, which may be scheduled or as needed, to review work plans with all affected personnel before work begins. Clear lines of communication exist between personnel responsible for operations, maintenance, and engineering groups. Among other things:

a) The GAO or ESSO prepares and maintains a procedure for review of work plans through communications and work order meetings at the facility.
b) Work is analyzed to determine what personnel, components, and systems are affected.
c) Affected personnel meet before work begins to define the work, identify safety issues, to minimize the impact on facility operation, and to determine the need for further meetings.
d) Personnel are trained in and follow the procedure.

16. OS 16 - Participation by Operations Personnel in Work Orders

Operations personnel identify potential system and equipment problems and initiate work orders necessary to correct system or equipment problems that may inhibit or prevent facility operations. Operations personnel monitor the progress of work orders affecting operations to ensure timely completion and closeout of the work orders, so that the components and systems are returned to service. Among other things:

a) Operations personnel identify problems requiring work orders, and initiate work orders to correct those problems.
b) The operations manager or other appropriate operating personnel periodically review work orders that affect operations to ensure timely completion and closeout of the work orders, so that components and systems are returned to service.
c) Personnel responsible for prioritizing work orders consult operations personnel to assure that work orders affecting the operations of the plant are properly prioritized.
d) Appropriate personnel are trained in and follow procedures applicable to work orders.

17. OS 17 - Records of Operation

The GAO or ESSO assures that data, reports, and other records reasonably necessary for ensuring proper operation and monitoring of the GA or ESS are collected by trained personnel and retained for at least five years, and longer if appropriate.

18. OS 18 - Unit Performance Testing

The GAO or ESSO conducts periodic performance tests as appropriate to identify trends and possible improvements in unit operation. The GAO or ESSO responds to test results with changes to equipment, policies, routines, or procedures necessary to maintain unit availability and the unit's ability to support grid operations consistent with the Unit Plan.

19. OS 19 - Emergency Grid Operations

The GAO or ESSO prepares for conditions that may be reasonably anticipated to occur during periods of stress or shortage on the state's electric grid. During such periods of stress or shortage, the GAO or ESSO makes operational decisions to maximize each unit's availability and ability to support grid operations. Among other things the GAO or ESSO:

a) Takes reasonable steps to maintain the ability to always communicate with the Control Area Operator.
b) In preparing for periods of stress or shortage, take steps to clarify the regulatory requirements, such as emissions, water discharge temperature, etc., which will apply during emergencies.
c) When emergencies appear imminent, seeks regulatory relief from those regulatory requirements that reduce output.
d) Assists the Control Area Operator in responding to the various kinds of possible problems on the electrical grid, including restoration of service after a disturbance.
e) ESSO prepares for periods of stress or shortage, by ensuring that availability is adequately monitored and maintained.
f) When practical, during periods of stress or shortage, consults with the Control Area Operator before derating a unit or taking a unit offline and defers outages and derates at the Control Area Operator's request when continued operation is:

    1. Possible and practical;
    2. Safe to facility personnel and to the public;
    3. In accordance with applicable law and regulations; and
    4. Will not cause major damage to the facility.

20. OS 20 - Preparedness for On-Site and Off-Site Emergencies

The GAO or ESSO plans for, prepares for, and responds to reasonably anticipated emergencies on and off the plant site, primarily to protect facility personnel and the public, and secondarily to minimize damage to maintain the reliability and availability of the facility. Among other things, the GAO or ESSO:

a) Plans for the continuity of management and communications during emergencies, both within and outside the facility;
b) Trains personnel in the emergency plan periodically;
c) Ensures provision of emergency information and materials to personnel;
d) In developing any emergency plans, the GAO and ESSO will coordinate with local emergency management agencies, unified program agencies, and local first response agencies; and
e) The owner or operator of each ESS facility shall develop and submit an emergency response and emergency action plan for the ESS that complies with Public Utilities Code, Section 761.3, subdivision (g). The owner or operator of the ESS facility shall submit the emergency response and emergency action plan to the county, local emergency management agencies, local first response agencies, and if applicable, the Authority Holding Jurisdiction (AHJ) and the city where the facility is located.

21. OS 21 - Plant Security

To ensure safe and continued operations, each GAO or ESSO provides a prudent level of security for the facility, its personnel, operating information, communications, and stepping up security measures when necessary.

22. OS 22 - Readiness

Until a change in a unit's long-term status, except during necessary maintenance or forced outages, the GAO or ESSO is prepared to operate the unit at full available power if the Control Area Operator so requests, after reasonable notice, when such operation is permitted by law and regulation. Among other things, the GAO or ESSO:

a) Maintains contingency plans to secure necessary personnel, fuel, and supplies; and
b) Prepares facilities for reasonably anticipated emergencies.

23. OS 23 - Notification of Changes in Long-Term Status of a Unit

The GAO or ESSO notifies the Commission and the Control Area Operator in writing at least 90 days prior to a change in the long-term status of a unit. The notification includes a description of the planned change.

24. OS 24 - Approval of Changes in Long-Term Status of a Unit

The GAO or ESSO maintains a unit in readiness for service in conformance with Operation Standard 22 unless the Commission, after consultation with the Control Area Operator, affirmatively declares that a generation or ESS facility is unneeded during a specified period of time. This standard is applicable only to the extent

that the regulatory body with relevant ratemaking authority has instituted a mechanism to compensate the GAO or ESSO for readiness services provided.

25. OS 25 - Transfer of Ownership

The GAO or ESSO notifies the Commission and the Control Area Operator in writing at least 90 days prior to any change in ownership.

26. OS 26 - Planning for Long-Term Unit Storage

At least 90 days before a change in the long-term status of an electric generation or ESS unit, other than permanent shutdown and/or decommissioning, the GAO or ESSO shall submit to the Commission plans and procedures for storage, reliable restart, and operation of the unit.

27. OS 27 - Corrosion Control

Where circumstances require it, the GAO or ESSO shall prepare and follow a comprehensive corrosion mitigation and control programs for all types of corrosions to identify vulnerable systems, implement appropriate corrective actions, and preventive measures to maintain facilities with designed performance condition.

28. OS 28 - Equipment and Systems

GAO or ESSO complies with these Operation Standards (1-28) considering the design bases (as defined in the Appendix) of facility equipment and critical systems. The GAO or ESSO considers the design basis of facility equipment when as required by other standards it, among other things:

a) Establishes procedures for the operation of critical systems at each unit (OS 7);
b) For each system, identifies critical parameters that require monitoring (OS 8 and 13);
c) For each critical parameter, establishes value at which to increase observation of the system or take actions to protect it (OS 8 and 13);
d) Assures that systems are monitored, and actions are taken (OS 8 and 13);
e) Establishes parameters for operation during periods of stress or shortage on the state's electric grid (OS 9 and 19); and
f) Assures that personnel operating critical systems are trained and qualified (OS 6).

(END OF APPENDIX D)