

Electrical Emergency Procedures

Reference Management Memo 04-11

Background During periods in which electrical demand puts strains on the electric systems of the state's utilities, the California Independent System Operator (CAISO) may declare an Electrical Emergency. When the CAISO declares an Electrical Emergency, the Department of General Services (DGS) will notify all departments, universities and community colleges and provide appropriate conservation information and actions to be taken as outlined in Management Memo 04-11.

Notification Notification will be sent from the [DGS Energy Info](#) via E-mail/E-Pager and other means to the "Primary Contacts" (Energy Management Teams) identified and submitted by departments to DGS. "Primary Contacts" should in turn alert personnel under their responsibility as outlined in their internal Electrical Emergency Management Plan (called for by Executive Order D-15-00). DGS Energy Info notifications may be confirmed at the DGS website www.dgs.ca.gov/energy

Primary Contacts A department's Primary Contact list should include Directors, Chief Deputy Directors, Chief Information Officers, Communication Officers, other technical staff, facility managers, plant managers, energy managers, cogeneration operators, and third party cogeneration operators. Backups and other personnel, based on each department's determination of how to alert and mobilize department employees, should also be included.

Primary Contact Changes Any changes to department contacts are to be directed to:
John Ashbee, DGS Emergency Preparedness Manager
Telephone (916) 376-1928
Email: DGSInfoEnergy@dgs.ca.gov

Emergency Stage Classifications CAISO declarations can be made in progressive steps, depending on the amount of reserve generation available to the California electrical grid. DGS requires departments to comply, to the fullest extent possible, with all direction provided by DGS at each progressive stage of Electrical Emergency. CAISO Stages are as follows:

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Electrical Emergency Procedures, Continued

Classification/ ISO Notice	Condition/Description
Standard Operations	<ul style="list-style-type: none"> No energy emergency exists
Stage 1 Emergency	<ul style="list-style-type: none"> ISO declares a Stage 1 Emergency. Emergency: Less than minimum required operating reserves forecasted in REAL TIME (operating reserve minimums fluctuate with the load being served and are typically between 6% and 7%). Customers with voluntary interruptible contracts should prepare for potential interruption.
Stage 2 Emergency	<ul style="list-style-type: none"> ISO declares a Stage 2 Emergency, but does not call on interruptible (Phase 1). ISO declares a Stage 2 Emergency and calls on interruptible and warns of a potential Stage 3 Emergency. (Phase 2). Emergency: Less than 5% operating reserves forecasted in REAL TIME. An interruption is in effect for voluntary interruptible loads only.
Stage 3 Emergency	<ul style="list-style-type: none"> ISO declares a Stage 3 Emergency; rotating outages will occur or are occurring. Emergency: The “spinning reserves” (generation synchronized to the grid and/or ready to go within 10 minutes) portion of the operating reserve total is forecasted to be between 1 ½% and 3% in REAL TIME. All available interruptible load is called for interruption. Firm service customers (customers not on interruptible tariff) will also be called for interruption.
Extended Uncontrolled Outages	<ul style="list-style-type: none"> Due to loss of system integrity or natural disaster, communication systems may be inoperable. Time to restoration of service unknown.

Procedures for Standard Operations and Stage 1 Electrical Emergencies

General

When “Standard Operations” or Stage 1 are in effect, state departments should follow the energy conservation procedures described below:

- Department Directors or their designees should appoint Energy Coordinators for each location their department occupies. Energy Coordinators should work in conjunction with the Facility Manager to carry out Standard Operations Procedures.

At the end of the workday or when not needed, employees should turn off lights, computers, monitors, printers, and scanners, except for equipment designated as 24/7 or for which there is a specific need for after hours operations (e.g., e-mail, e-mail servers, fax machines or other essential equipment)

Hours of Operation

- State-owned and leased buildings will be operational from 6:00 AM through 5:30 PM. All non-essential lighting and other electrical loads shall be minimized outside of normal building hours. Agencies are expected to make a reasonable determination as to what functions must continue outside of these hours.
 - Facilities/organizations with employees on alternate workweek schedules will need to accommodate these schedules even if outside of normal hours of business.
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Building Heating and Cooling Systems

- When it will enhance energy efficiency, interior air shall not be mechanically heated above **68 degrees** F in winter nor mechanically cooled below **78 degrees** F in summer unless such a temperature in a particular job or occupation may expose employees to a health and safety risk. Employees should consider dressing appropriately in anticipation of decreasing/increasing office temperatures.
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Procedures for Standard Operations and Stage 1 Electrical Emergencies, Continued

Building Heating and Cooling Systems

- Whenever possible, building operators shall operate and adjust controls to get optimum advantage from outside temperatures for meeting cooling demand (e.g., using outside air economizers and night flush cycles). Avoid operating chillers and compressors where possible. All “pre-cooling” options for buildings shall be employed.
- Building temperatures shall be allowed to fluctuate within an acceptable range to avoid wasteful over-control patterns. Simultaneous or alternate heating and cooling operations to maintain exact temperature in work areas shall be avoided. This range may vary with each building’s control system; the target range is plus or minus four degrees F from the temperature set-point, for a total fluctuation of eight degrees F.
- Keep windows and doors closed to prevent loss of heated or cooled air. The local unit manager should retain authority to permit windows and doors being open for a reasonable time to fit individual circumstances, such as the adequacy of air circulation.
- Do not use portable electric devices (e.g., microwaves, toaster ovens, electric heaters, or fans) in state facilities without the express permission of the person responsible for energy use in the building, facility or campus.
- Consider purchasing portable fans for temperature sensitive employees or employees who work after 5:30 pm. This may allow further reductions in building ventilation rates, and will increase comfort levels during periods of elevated building temperatures. This strategy would be particularly effective if fans and other equipment are plugged into occupancy sensor power strips.

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Procedures for Standard Operations and Stage 1 Electrical Emergencies, Continued

Building Heating and Cooling Systems (continued)

- Do not set domestic hot water temperatures above 105 degrees F unless this conflicts with a Code requirement for your facility. Building operators and tenants shall take every opportunity to minimize hot water usage.¹
 - For warm weather months, close blinds and window coverings on all south and west-facing windows to reduce solar heat gain to cool the building, if needed. For cool weather months, open blinds and window coverings on all south and west-facing windows to make use of solar heat gain to warm the building, if needed.
 - Order data center operations to maintain ambient temperature settings at manufacturer specification maximums.
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Maintenance

- Inspect and maintain ducts, air filters and related hardware to maximize effectiveness at the lowest acceptable power use.
 - Tune-up all forced and induced draft gas and oil fired boilers at least twice annually. If there are automated combustion controls, verification of combustion efficiency shall be conducted at least twice annually.
 - Service heating, ventilation and air-conditioning equipment on a preventive maintenance schedule rather than “repair-as-needed.”
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¹ Facility managers concerned with the possibility of problems associated with Legionella bacteria (i.e., “Legionnaires’ Disease”) in their water systems should investigate maintenance and water treatment options to control this bacterium. Please note that simply elevating hot water temperatures alone will not control Legionella unless system temperatures are maintained at 132 degrees F or higher, which creates a high danger of scalding.

Procedures for Standard Operations and Stage 1 Electrical Emergencies, Continued

Lighting

- Hold security and safety lighting to the lowest acceptable levels. Switch off decorative lighting, inside and out.
- Turn off all lights in unoccupied rooms, computer equipment rooms, and storage areas at all times. Install occupancy sensors if possible.
- Turn off lights when not in use.
- *Reduce lamps in number and/or wattage to provide the lighting level appropriate for the activities of the area affected. Replace incandescent lighting with higher efficiency fluorescent lighting wherever possible.*
- *For fluorescent lights, make a special effort to replace older “core and coil” ballasts with newer energy-efficient electronic ballasts.*
- *Significant energy savings are possible by the selection of lower level background lighting with small-area task lighting for higher level lighting requirements – an approach particularly appropriate for computer use areas. Keep lighting fixtures clean to maintain lighting levels.*

Other Reductions in Electrical Demand

- Set all video monitors and personal computers for automatic power-down (“sleep”) mode after five minutes of non-operation. (All Energy Star monitors should have this feature available and can be turned on using the “Display” option of the desktop “Control Panel.”) Note that the installation of screen savers by itself does not reduce power consumption and is not a substitute.
 - Enable all copiers and printers that have an automatic power-down or “Energy Saver” feature.
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Procedures for Stage 2 Electrical Emergency

Background Under a CAISO Stage 2 declaration, utility service to interruptible loads is subject to curtailment. All state departments, universities and community colleges should adopt conservation measures to the degree possible at each state site without unduly compromising agency operations. All Standard Operations and Stage 1 procedures shall remain in place.

In addition, departments should implement the following conservation measures.

- Lighting**
- Reduce overhead lighting as much as possible without creating unsafe conditions or interfering with the performance of duties. Such reduction can be achieved by operating half-bank switches, where installed. Use task lighting, or rely on daylight, unless this results in additional solar heating of the building.
 - Have custodial personnel turn lights on only as needed and turn lights off when their work is done. Where possible, have custodial personnel work in teams to complete cleaning on each floor of multi-story buildings before turning on lights on another floor.
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- Other Reductions in Electrical Demand**
- Consolidate use of photocopiers and printers. Where possible, turn off redundant printers and copiers and direct work to nearby machines. Postpone major copy and print jobs, when possible.
 - Unplug refrigerated water coolers and drinking fountains, where feasible.
 - Minimize the use of non-essential electrical appliances (e.g., microwaves, toaster ovens, coffee machines, and personal space heaters), where appropriate.
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Procedures for Stage 2 Electrical Emergency, Continued

Operation of Onsite Generation Equipment

- State facilities that have cogeneration or distributed generation equipment should stand by to staff and operate this equipment, if it is not operating in the normal course of business. If electrical system conditions continue to deteriorate, DGS may call on you to operate the equipment on short notice. This specifically refers to equipment that (a) has a current operating permit from the local Air Quality Management District and any other interconnection and/or operating permits normally required and (b) has trained operating personnel available to run it. **Generation equipment is not included in this directive.**
 - In response to a CAISO request, DGS may direct state facilities to operate their generation equipment, as described above, to provide support to the grid.
 - State facilities that have licensed cogeneration or distributed generation equipment that is not available for operation shall take all prudent steps to ready this equipment for operation, as above. DGS is available for consultation on accomplishing this directive.
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Procedures for Stage 3 Electrical Emergency

Background Under a Stage 3 declaration, the state's electricity supply is critically short, calling for more drastic actions. The CAISO declares a Stage 3 when available resources are not sufficient to maintain between 1 ½% and 3% spinning reserves and grid stability is threatened; rotating outages will occur or are occurring.

Rotating Outages Under a Stage 3, the CAISO *will* direct the electric utilities to cut firm customer load by initiating rotating outages, in accordance with each utility's Electrical Emergency Plan. The CAISO will resort to this step only when voluntary customer conservation efforts and curtailment of interruptible load are insufficient to reduce demand to a level that can be met by the available supply of power with appropriate safety margins. (Such action may be necessary to avoid a catastrophic collapse of the interconnected electrical system.)

In a rotating outage, selected distribution circuits are sequentially shut off in a controlled fashion for a period of approximately one hour and fifteen minutes, to bring electricity demand on the system to within acceptable operational limits. Each section of the grid, once shut off and then restored to service, is placed at the bottom of the queue as the next section is turned off in the sequence.

It is crucial to note that rotating outages:

- (1) are limited in duration, lasting approximately one hour and fifteen minutes, and
- (2) will involve the minimum amount of interruption to service necessary to preserve the overall operation of the electricity system.

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Procedures for Stage 3 Electrical Emergency, Continued

Department Operations

Barring specific instructions to the contrary and to the extent possible, state departments under a Stage 3 declaration shall keep employees at their workplaces to ensure their safety and maintain normal business hours during rotating outages.

For state departments, this means we must take actions that are likely to impinge on business operations. All Stage 1 and Stage 2 procedures shall remain in place. Implement any conservation measures during this period to ease the load on the system and minimize the depth and duration of the firm service outages.

In addition, departments should implement the following conservation measures.

General

- Building Managers and Business Services Officers (BSO) should engage their Emergency Response Plan. The situation will vary building by building. Use your judgment as you would in any emergency.
 - Evaluate all remaining loads and shut down everything that is not critical to maintaining basic business operations.
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Computers and IT Equipment

- Turn off personal computers and monitors that are not essential to conducting state business. Each work place should maintain at least one computer and its e-mail server on in order to receive critical communications. The intended recipient's email address should be on the agency's e-mail contact list submitted to the DGS Energy Control Center for energy emergency information and notification.
 - Turn off monitors for file and application servers when not used.
 - Turn off test or laboratory equipment that is not essential.
 - Turn off other non-essential IT equipment, including printers, scanners, copiers, and other peripheral equipment.
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Procedures for Stage 3 Electrical Emergency, Continued

Lighting

- Reduce lighting loads in work areas to the minimum acceptable levels consistent with personal safety and security. Exercise caution to ensure that reduced lighting levels do not create an unsafe work environment. Because of the potential impact of reduced illumination levels, ensure that all walkways and corridors are free from obstructions and tripping hazards.
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Heating and Cooling Systems

- Reduce all electric heating and HVAC loads to the minimum levels required for health and safety.
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Other Electrical Loads

- Severely limit all non-essential electrical appliances (e.g., coffee machines, microwaves, toaster ovens, and personal space heaters). Do not turn off refrigerators.
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Outages/Blackout Procedures and Action

Initial Action If an outage or blackout occurs, state employees should immediately **turn off any equipment** in service (except IT equipment that operates on its own interruptible power supply). This action will help avoid power surges upon restoration of service. Use of an “on” task light is an effective alternative to determine when power is restored.

**Outages:
Building
Managers** Displayed below are **outage instructions** for Building Managers/Business Service Officers/Facility Managers:

If your facility receives ADVANCE NOTIFICATION from your utility of an impending outage at your location please send a message to DGSEnergyInfo@dgs.ca.gov advising what you were told. Please include your name, your building name, your phone number and your location (street and city). Subject Line of your message should read OUTAGE PREDICTED.

If your facility experiences an ACTUAL OUTAGE, please send a message to DGSEnergyInfo@dgs.ca.gov as soon as you can after the outage advising what happened. Please include your name, your building name, your phone number, your location (street and city), when the outage occurred and when power was restored. If an extraordinary event occurred, please describe the event and mitigation steps that should/will be taken. Subject line of your message should read OUTAGE OCCURRED.

**Safety Tips –
Outages/
Blackouts** When an outage or blackout occurs, there are numerous safety tips and recommended actions that state employees should consider. Following are safety tips during outages and blackouts:

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Outages/Blackout Procedures and Action, Continued

SAFETY TIPS DURING OUTAGES AND BLACKOUTS		
#	ISSUE	SAFETY TIPS
1.	LIGHTING	All lights will go out except the emergency lighting system. This along with lighting from the windows should provide enough light to exit the building safely if necessary. At night, the emergency lighting system will allow safe exiting of the building. Aisles, exits and entrances are to be kept clear and unobstructed to avoid tripping and falling. Building response team personnel on each floor should have flashlights available in case they are needed. DO NOT use candles for illumination; these are fire hazards. Use battery flashlights instead. Employees should keep a flashlight in their workspace and in their vehicle.
2.	ELEVATORS	Avoid using elevators. Take the stairs instead. Generally, buildings higher than four floors have at least one elevator powered by an emergency generator, so it would be available in a power outage. Elevators that are not on emergency power would typically stop where they are when the power goes out. Passengers in elevators during a power outage should follow procedures posted in the elevator; emergency phones may be used to call for help. Do not climb out!
3.	EMERGENCY EVACUATION PLAN	Employees should re-familiarize themselves with their emergency evacuation plan and make sure they know the location of their office's emergency evacuation Plan.
4.	EMERGENCY EXITS AND SUPPLIES	Employees should make sure they know where the emergency exits are located in their building and know the location of the first aid/emergency supply area.
5.	PERSONS WITH DISABILITIES	If you have a disability and need special assistance to exit the building, notify your Emergency Floor Warden of your location so assistance may be provided.
6.	PARKING STRUCTURES	State agencies/departments and employees should verify with their parking provider how to enter and exit parking lots and garages during a blackout. Most parking facilities will not have emergency power. There are emergency exit lights to direct people to pedestrian exits. Employees should travel to parking structures in pairs.
7.	COMMUNICATIONS	Phone systems may not function, depending on the setup in the building and whether the outage is widespread. Agencies/departments should verify with their phone service provider how their phone system works during a power outage.

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Outages/Blackout Procedures and Action, Continued

SAFETY TIPS DURING OUTAGES AND BLACKOUTS		
#	ISSUE	SAFETY TIPS
8.	VENTILATION	In a power outage, heating, ventilating, and air conditioning systems will shut down, and return when power is restored. Some computer rooms are powered by special equipment on a backup generator and will come back on when the generator starts. A lack of ventilation for the amount of time the power may be out should not pose a health or safety concern. Employees should keep a coat or sweater at their desks.
9.	SECURITY	Electronic locks will generally fail in the locked condition for entrances. Exiting from the building is always available. Cameras and alarm systems typically have battery backup and should continue to function.
10.	ACCESS	Automatic door openers may not function in all facilities during a blackout.
11.	FIRE ALARM SYSTEMS	These functions will not be interrupted, as these systems have battery backup and are on the emergency generator circuit, if there is one.
12.	EMERGENCY GENERATOR	Generally, larger facilities have emergency generators for critical building support systems such as emergency lighting, elevators, fire sprinkler pumps, and fire-life safety systems. These generators will start automatically within moments of a power loss and assume the emergency loads. Typically, there is enough fuel for these systems to operate for at least eight hours.
13.	PLUMBING	Buildings with multiple floors have booster pumps on the city water system that may not function in a power outage. This would cause a loss of water pressure on upper floors. In such situations, employees and other building occupants are cautioned to limit use of the restrooms during a power outage.
14.	TRAVEL	Avoid unnecessary travel. Remember that traffic signals may go out of service, resulting in traffic jams and unusually hazardous situations.
15.	LEAVING THE WORKPLACE	Do not leave the workplace without appropriate authorization from your supervisor. Follow the steps of your Emergency Response Plan. Although loss of electrical service may compromise state operations, it is expected that some functions can be continued, and personnel efforts should be directed towards these.

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Outages/Blackout Procedures and Action, Continued

Extended Outages and Blackouts

State personnel will usually receive advanced notification of a Stage 3 so that appropriate measures can be taken to reduce load, protect personal safety, and protect state assets (including information technology assets and data). In the event of a more extended outage, which could result from storm damage to the system, earthquake or other contingencies, state personnel should follow the steps outlined in their department's Emergency Response Plan.

Leave Policy Outage and Blackouts

As outlined in the January 23, 2001 Department of Personnel Administration memorandum to Agency Secretaries and Department Directors, the State's general policy during a declared Stage 3 Emergency will be to maintain normal work hours, including situations when management memos direct departments to reduce energy use by turning off certain office equipment and non-essential lights. The State's primary concern, however, is safety for the public, as well as employees and their families. Therefore, the following circumstances should be accommodated.

Any employee whose dependent-care arrangements have been disrupted should be allowed to leave to deal with the situation. In addition, any employee who has reason to believe that the safety of family members and/or home security is jeopardized by a blackout should be allowed to leave for a reasonable period to deal with the situation. Employees should not be charged for such leave as long as it is taken in accord with this policy. Nothing in this policy is intended to reduce normal departmental discretion in these matters.

If it is determined that an urgent situation exists that poses a health and safety risk for employees to remain at work, DGS will issue a notice revising this general policy to Agency Secretaries, Department Directors, and Personnel Officers. Each agency/department will be responsible for advising its employees of the leave policy in effect.

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Outages/Blackout Procedures and Action, Continued

Leave Policy Outage and Blackouts (continued)

If and when DGS issues such notice, departments should allow employees to leave for whatever time period is deemed necessary to ensure their safety, based on site-specific determinations by the individual facilities. These site-specific determinations should take into account whether employees will be able to move about safely, including exiting the facility, if there is a blackout affecting that facility.

Departments are encouraged to prepare a strategy for informing employees of the leave policy in effect during a blackout. This may include phone “trees” or recorded phone messages where employees may call for further information.

Emergency Prepared- ness Planning

State departments should use the information in these procedures to incorporate outages and blackouts in their emergency preparedness plans. Responsibility for emergency planning usually depends on whether a department resides in a state building or a leased building:

State Buildings

- Building Managers are responsible for handling electrical disruptions within state-owned facilities

Leased Buildings

- Business Services Officer (BSO) should work with the responsible person (s) in each leased facility

Please note, however, that Agency Secretaries and Department Directors are ultimately responsible for the conduct of their employees; it is their responsibility to determine what actions are appropriate for their own employees. This also applies to decisions regarding whether it is appropriate for the public to leave the facility during a blackout.

Outage/ Blackout Issues

There are specific outage/blackout issues that departments should address when updating their emergency preparedness plans. Consideration of the following issues will help protect employees and the public who are in state facilities during an electrical outage.

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Outages/Blackout Procedures and Action, Continued

EMERGENCY PREPAREDNESS: OUTAGES AND BLACKOUTS		
#	ISSUE	SAFETY TIPS
1.	LOCATION OF EMPLOYEES	Each department or tenant should assess where employees should relocate, or whether employees should stay put, if a blackout occurs. Generally, areas with the most natural light are best. It is State policy that employees remain at work to ensure their safety. If the building is experiencing a power outage, it is likely that the immediate area around the building has also; relocating to areas outside of the building could be less desirable. Remember that rolling blackouts are intended to be temporary situations, lasting roughly 1 hour and fifteen minutes.
2.	ACCESSIBILITY	Plan for accommodating employees who have limited mobility to ensure they will be able to safely move about or exit the building in the event of a blackout. This may include allowing them to leave early to avoid the risk associated with exiting the facility during a blackout, or relocating their workspace to an area where such risk can be avoided.
3.	BACKUP GENERATION	Building Manager or BSO shall ensure that any backup generator sources (e.g., UPS, electrical emergency generators) are tested and readily available to power critical life-safety functions of the building. In the case of battery-operated devices, batteries should be checked and fully charged; in the case of diesel generators, tanks should be topped off and testing scheduled. Back-up radios should also be tested.
4.	ELECTRICAL OUTAGE CONTACT LISTS	The Building Manager/BSO/Facility Manager and Agency Secretaries/Department Directors should ensure that their phone trees are current and that a complete and continuously updated list of emergency contacts and people who regularly work after normal business hours is distributed, as appropriate.
5.	BUILDING SECURITY	Each agency and department needs to ensure the local number of the appropriate law enforcement agency is readily available to staff, to assist, if necessary, during a rotating outage and when power is restored or to report on conditions and the safety of employees. Security plans should also include provisions for the safety of employees who are responsible for handling cash in public areas, as well as plans for securing the cash.
6.	ELECTRICAL OUTAGE SUPPLIES	Supply areas should be fully stocked and the room locations published and accessible to staffs who require access. Recommended supplies include flashlights, battery powered radios, extra batteries, warm blankets, and some drinking water. If these supplies currently are stocked, their expiration dates should be checked.
7.	24-7 OPERATIONS	Special considerations may be required for State operations that run 24 hours a day, 7 days a week. Building Managers and BSOs should ensure that this notice goes to all tenants and staff.