CITY AND COUNTY OF SAN FRANCISCO **OFFICE OF THE CONTROLLER**

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M E M O R A N D U M

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SUBJECT: San Francisco Public Utilities Commission Water Enterprise 24/7 Dispatch Operations

EXECUTIVE SUMMARY

The San Francisco Public Utilities Commission (SFPUC) requested the Controller's Office map and analyze communications at three 24/7 dispatch locations: City Distribution Division (CDD), Water Supply and Treatment (WST) and Moccasin Powerhouse (MOC) to inform current operations and capacity of dispatch functions within the Water Enterprise. Dispatch (Dispatch) is considered the communication hub for all field activities throughout the Water Enterprise. Findings reveal that the SFPUC can adjust current Dispatch operational practices to increase its communications capacity and ability to take on new responsibilities:

I. Dispatchers are minimally trained and supported even as their roles and responsibilities evolve and expand.
II. Current staffing allocation does not meet the communication needs of Water Services.
III. Current communication practices are not supported by appropriate technology or protocols, creating time delays and redundancy.

BACKGROUND

The SFPUC is a department of the City and County of San Francisco that provides retail drinking water and wastewater services to San Francisco, wholesale water to three Bay Area counties, and green hydroelectric and solar power to San Francisco's municipal customers and wholesale customers. The SFPUC Water Enterprise is currently upgrading its security systems through the Water System Improvement Program (WSIP). The upgrades are specific to each site and will include video surveillance, access control, and intrusion alarm notifications. Preliminary plans for the new security system identify Dispatch as the immediate responder to the majority of alarm notifications. Currently, the Water Enterprise's existing 24/7 Dispatch centers receive and route communications from SFPUC staff, wholesale customers, power regulators, 311 and the public to maintain the SFPUC Water Enterprise facilities (see Appendices C-E for a detailed process flow map of Dispatch's current operational practices). The Controller's Office was asked to analyze current communication operating practices and procedures to/from and within Dispatch to inform how it will handle an increase in alarm notifications.

METHODOLOGY

The Controller's Office staff interviewed Communications Dispatchers (dispatchers) at WST and CDD, Power Generation Technicians (operators) at MOC, a selection of field staff supported by each location and senior management. The Controller's Office staff also reviewed background information provided by the SFPUC, including organization charts, water system maps, and job descriptions. The Controller's Office conducted SFPUC employee interviews, and tours of dispatch operations at CDD, WST and the main control room at the Moccasin Powerhouse to understand how each unit functions. Finally, Controller's Office staff performed phone interviews with dispatch operations managers from other water and power utilities, including the Los Angeles Department of Water and Power (LADWP), East Bay Municipal Utilities District (EBMUD), and Turlock Irrigation District (TID) to compare their operational choices for managing field crew communication responsibilities.

FINDINGS

I. Training and back-up: Dispatchers are minimally trained and supported even as their roles and responsibilities evolve and expand.

A. Due to time constraints, current on-the-job training does not provide complete information on tasks and responsibilities resulting in dispatcher mistakes, while scheduling practices of as-needed employees do not facilitate knowledge retention of Dispatch procedures. According to east bay field crews, WST dispatchers are unfamiliar with their territory and often call the wrong enforcement jurisdictions during a security situation.

Recommendations	CDD	MOC	WST
Develop and execute a formalized training program (including refresher trainings) on common and emergency Dispatch tasks for all full-time and as-needed dispatchers. The program should include tours and useful geographic information to familiarize dispatchers with territory-specific needs of field crews. Frequent training on all aspects of dispatch work will result in more consistent, reliable service across dispatch locations.	X		X
In order to maintain basic knowledge of tasks and responsibilities, all as-needed workers should be scheduled for a shift at least once a month.	X		X

B. Despite having similar duties, WST and CDD dispatchers perform tasks differently making it difficult to cross train or provide system-wide back-up in an emergency. For example, during the Thanksgiving weekend main break in 2011, the as-needed dispatcher at WST could not call CDD for assistance.

Recommendations	CDD	MOC	WST
Develop standard operating procedures (SOP) for common tasks or emergencies suitable to all locations for training and reference. Other water and power utilities report maintaining and utilizing up-to-date SOPs as a best practice for providing consistent service. [See Appendix B best practices summary.]	X		X
Cross train full-time and as-needed dispatchers from each location to perform tasks for both locations across all shifts to create a larger pool of back up and ensure consistent service across locations. Although dispatchers may feel resistant to learning about other location activities, it would increase their knowledge base and their mobility between locations for promotive opportunities.	X		X

C. WST and CDD lack dedicated supervisors to oversee Dispatch operations, leaving dispatchers to prioritize and perform duties according to their own interpretation of the position. Senior dispatchers at both locations manage some supervisory responsibilities, including training and scheduling, but they are constrained by the need to complete their regular dispatch responsibilities. The overall effect is uneven execution of duties with as-needed and new employees performing the worst. Field Crews cite various examples of poor communications support from as-needed employees at WST and CDD. For example, Water Quality Inspectors report incomplete information and improper support procedures as common when working with as-needed dispatchers.

Recommendations	CDD	MOC	WST
Update job descriptions to reflect current responsibilities, including location differences if possible. Develop yearly performance plans to establish priorities and goals and conduct performance evaluations against yearly plans. Updated job descriptions, performance plans and evaluations will establish job duties and set standards for dispatchers to meet, helping them gain ownership of their activities and time.	X	X	X
Hire a dispatch supervisor to oversee both CDD and WST. Focus the supervisory role on management responsibilities with some Dispatch back-up support. All utilities in best practice research had a dedicated, full-time, day shift supervisor (on-call during off hours) to oversee dispatch units. [see Appendix B]	X		X
Dispatch supervisors should work alongside dispatchers on a regular basis. Both East Bay Municipal Utilities District and The San Francisco Department of Public Works report, as a best practice, manager provided back-up support and daily check-ins with dispatchers improved overall job performance and consistency of service. [see Appendix B]	X		X

II. Staffing: Current staffing allocation does not meet the communication needs of Water Services.

A. CDD dispatcher shifts do not match field crew shifts, resulting in a discontinuity of service between dispatcher shifts due to lost knowledge of crew activities. WST Dispatch lacks on site backup to cover the day shift dispatcher during breaks. In order to cover two fifteen minutes breaks and a one hour lunch, a part-time dispatcher is called in to work the four hour minimum from 10 AM – 2 PM, Monday through Friday. This amounts to a paid part-time dispatcher to cover one and a half hours of work per weekday; at CDD dispatcher breaks are covered by a receptionist.

Recommendations	CDD	MOC	WST
Align Dispatch shifts to field crew shifts to reduce the need for extensive briefings between shifts while maintaining continuity of service. The one hour time shift may inconvenience dispatchers, but it would result in better service for field crews as illustrated through best practice research [see Appendix B].	X		
Train on site clerical staff to perform Dispatch duties during dispatcher breaks to eliminate the need for a part-time dispatcher during the day shift and realize a cost savings. CDD clerical staff is able to handle the additional dispatch back-up responsibilities, despite being as busy as WST. Best practice jurisdictions also use clerical staff to cover Dispatch duties during dispatcher breaks.			X

Consider relocating CDD Dispatch to WST (as it has two work stations) to provide dispatcher back-up at a single site. Two dispatchers at a single location means skilled back up during busy periods of the day or during an emergency. Numerous best practice jurisdictions have also consolidated their Dispatch teams into a single location. [see Appendix B]	X		X

B. Dispatchers and operators are underutilized during the swing and night shifts at all three locations. CDD and WST dispatchers report watching television, reading or studying during their swing and night shifts. MOC operators study power regulations.

Recommendations	**CDD**	**MOC**	**WST**
Assign clerical duties or additional training to night shift dispatchers to increase dispatcher productivity. Other jurisdictions report their night shift dispatchers complete documentation of Dispatch daytime activities or clerical tasks for other positions. [See Appendix B best practice summary]	X		X
Review current NERC regulations to determine if operators can perform additional tasks beyond their powerhouse duties during the night shift.		X	
Consider eliminating a dispatcher for swing and night shifts at either CDD or WST and consolidating responsibilities for those shifts into a single dispatcher at one location for cost savings and increased productivity. As a best practice, LADWP consolidates its night operations into a single location with a limited number of dispatchers. [see Appendix B best practice summary]	X		X

C. Administrative tasks and phone/radio relays during the day shift are time consuming and take away from other, more critical tasks. MOC operators report they are inundated by water services administrative duties, preventing them from focusing on newly mandated powerhouse duties.

Recommendations	**CDD**	**MOC**	**WST**
Sick and directory assistance calls should be redirected to reception to increase time available for additional, complex tasks such as WSIP alarm monitoring.	X		X
Watershed keeper location should be tracked by GPS. In addition to reducing dispatcher workload, GPS tracking can be more accurate than radio communications and reduces location chatter over the radio waves.			X
Establish an 8 AM – 5 PM position to perform all water services related administrative duties, including watershed keeper and plumber radio traffic, SCADA, lock-out-tag-out and water clearances. In addition to reducing powerhouse operator workload, a specialist in water services will offer knowledgeable support to field crew and management.		X	

D. CDD and WST Dispatch locations are understaffed during emergencies. For example, the as-needed employee working during the Thanksgiving weekend main break in 2011 was overwhelmed by calls and unable to perform all communication duties. Had this event occurred on a weekday, he would have been unable to perform his field staff support duties as well as those required by the emergency.

Recommendation	CDD	MOC	WST
Develop parameters and procedures detailing when it is appropriate to call additional dispatchers and who to call for back-up. Additional dispatchers will improve response time and mitigate SFPUC risk caused by delays or incomplete dispatcher tasks.	X		X

III. Communication: Current communication practices are not supported by appropriate technology or protocols, creating time delays and redundancy.

A. Dispatch and field crews are unable to clearly hear each other on current communication equipment. As a result, field crews do not always provide complete information and use a variety of competing devices to communicate with Dispatch. WST Dispatch often relays information between watershed keepers in the field via radio, tying up the radio airwaves with repetitive messages. MOC field crews are inundated with too many voices on the radio. East bay watershed keepers do not communicate details of their activity and east bay plumbers never check-in or check-out.

Recommendations	CDD	MOC	WST
Update radio system and establish radios as the primary mode of communication. Better equipment will improve communication and reduce employee time wasted utilizing various alternative methods to converse. Best practice jurisdictions currently utilize Nextel devices, but they too are looking to upgrade. [see Appendix B]	X	X	X
Assign channels to select groups of field crews to decrease the incidents of individuals talking over each other or missing crucial messages due to too many competing voices on a single channel. Best practice jurisdictions assign channels to different groups to facilitate voice clarity over the radio.		X	
Establish protocols for field staff communication. Clear guidelines for when and what field staff needs to tell Dispatch will improve overall communication and information sharing.	X	X	X
Once communication protocols are established, train field staff and include use of protocols on performance plans and evaluations to ensure field staff follow the new communication procedures.	X	X	X

B. Roam Secure Alert Network (RSAN) messages are used inconsistently across the SFPUC. Each individual dispatcher chooses if, when, and what information to send across RSAN. Numerous employees describe instances where late or incomplete RSAN messages hampered their efforts during maintenance emergencies, even as these same employees report being bombarded by excessive RSAN messages. For example, SFPUC Communications employees report they first heard about an incident at the Crystal Springs reservoir when they were contacted by a television station for comment, however, an RSAN message never went out even when the emergency was resolved.

Recommendation	CDD	MOC	WST
Refine RSAN protocols for timing, content, and use. Review and refine distribution lists to ensure they are delivered to the correct employees. Targeted, timely, and content rich RSANs will better prepare staff to perform their duties to manage or resolve emergencies quickly.	X	X	X
Train dispatchers on new RSAN protocols to ensure understanding and ability to implement standards. Proper use of RSAN will disseminate information on incidents to help mitigate their overall impact.	X	X	X

C. The 311 screening process fails to meet the needs of Water Services. Dispatchers report they are often forced to perform additional follow up on poorly screened citizen calls or need to redirect miscategorized calls back to 311. This consumes dispatcher's time and increases response time to citizen concerns. In addition, 311 bypasses Dispatch for water quality calls by routing the information directly into the Water Quality database at Burlingame.

Recommendations	CDD	MOC	WST
Refine 311 scripts for interacting with the public on water services issues. Increasing 311's screening efficiency with better scripts will result in faster resolution of consumer complaints and improve overall customer service.	X		X
Water quality calls should route through Dispatch for proper tracking.	X		X

D. Dispatch retains limited emergency contact plans, which hinders dispatchers from connecting with the right personnel in an emergency. For example, during the Thanksgiving weekend water main break in 2011, WST relied on ad hoc directions from a single employee. If he had not been reachable, WST may not have been able to handle the emergency. During a blackout at Moccasin in May, 2012 the water response to the emergency was delayed by outdated contact information.

Recommendation	CDD	MOC	WST
Refine emergency contact lists to focus on roles and responsibilities rather than individual SFPUC staff. Expand and improve contact lists. By revising the current contact plan and list, dispatchers will be better prepared for an emergency if multiple senior managers are unavailable. As a result, overall response time to an incident with decrease.	X	X	X

E. Dispatchers at CDD and WST perform redundant paper logging, but have no easy way to share information on their activities without the use of extensive staff time reviewing old logs; as a result, there are no good reporting mechanisms or information sharing.

Recommendation	CDD	MOC	WST
Explore ways to electronically track Dispatch activities through computer aided dispatch programs. Streamlined tracking frees dispatcher time and creates a new reporting function on Dispatch activities for further process improvement. Electronic logs would also allow Dispatch to quickly develop snapshots of their activities which, in the case of an emergency for example, will be needed for FEMA reimbursements. Best practice jurisdictions adapted work order tracking systems to include dispatch information and activities.	X		X

NEXT STEPS

1. Develop foundational documents and perform research that will support overall Dispatch operations
   - Update job descriptions, SOPs, emergency contacts, field staff communication protocols
   - Develop RSAN protocols
   - Explore electronic logging system options
   - Explore new duties for swing and night shift or elimination of a night and swing shift dispatcher
2. Establish training
   - Create a formalized training program based on foundational documents on Dispatch
   - Train staff and management, including back-up staff, quarterly
3. Create structural changes within Dispatch
   - Hire supervising dispatcher and reassign management duties
   - Realign shifts at CDD to match field crew needs
   - Establish training shift for MOC operators
   - Eliminate part-time position at WST (once back-up is trained)
   - Assign additional duties to swing and night shifts (once possible duties are explored)
   - Create new water services position at MOC
4. Create structural changes within SFPUC
   - Reassign administrative duties away from Dispatch to WST clerks/receptionist
   - Transition watershed keepers and other field crew to GPS tracking where available
   - Purchase new radios and upgrade radio transmission system
5. Create structural changes among external partners
   - Refine 311 scripts using foundational documents on Dispatch

Appendix A: Summary of Findings and Opportunities for Improvement

	Finding Detail	Recommendations	Impact	Next steps
I. Training and back-up: Dispatchers are minimally trained and supported even as their roles and responsibilities evolve and expand.				
A	Current training program and amount of hours scheduled for as-needed dispatchers is insufficient to maintain knowledge retention of procedures	• Create formal training program and regularly train all CDD and WST dispatchers and back-up support staff • Familiarize dispatchers with supported territory • All as-needed dispatchers should work monthly •	• Maintains solid knowledge base among all dispatchers, including as-needed and on-site back up staff • Provides consistent, reliable service across locations • Complies with WECC and NERC regulations	Once foundational documents (see below) on Dispatch are complete, develop training program and change MOC shift schedule
B	CDD and WST dispatchers perform similar duties differently making it difficult to provide system-wide back-up	• Develop operating procedures for dispatch activities suitable to all locations as per best practices • Cross-train full time and as needed dispatchers	• Creates consistency of service across dispatchers and offers a larger pool of back-up dispatchers in emergencies or as needed	Develop SOPs for dispatch activities and develop, schedule and execute training
C	CDD and WST lack dedicated Dispatch supervisors, leaving dispatchers to prioritize and perform duties as each individual self-determines	• Update job descriptions, conduct yearly performance plans and performance evaluations • Hire dispatch supervisor to oversee CDD and WST • New supervisor should act as back-up and perform daily check-ins with dispatchers as per best practices utilities	• Dispatchers will understand their responsibilities and priorities ensuring consistent service across dispatchers and locations • Dispatchers will be accountable and have direction on what their tasks should be	Develop foundational documents on Dispatch, develop position and hire supervisor
II. Staffing: Current staffing allocation does not meet the communication needs of Water Services.				
A	CDD day shift does not match field crew shift resulting in discontinuity of service; WST lack of on-site back-up results in overstaffing during the day shift	• Change CDD dispatcher shift to match crew hours • Train clerical staff to back-up WST dispatcher • Consolidate CDD and WST Dispatch operations into the WST work space	• Maintains continuity of assistance to field crews and eliminates the need for extensive briefings between shifts • Offers on-site support for dispatcher breaks while eliminating the fiscal impact of additional staff time (including the 10 AM- 2 PM as-needed shift)	Change current assignments
B	Dispatch is underutilized during swing and night shift and dispatchers use time for personal pursuits	• Assign additional clerical duties to CDD and WST for swing and night shifts as per best practices • Review NERC to determine if MOC operators can perform other duties during swing and night shifts • Consolidate swing and night shift responsibilities for CDD and WST under a single dispatcher	• Relieves busy day shift time among dispatchers and other staff by allocating tasks to swing and night shift dispatchers, improving overall productivity • Increase productivity of swing and night shift and reduces staffing costs	Change current assignments

Appendix A: Summary of Findings and Opportunities for Improvement

	Finding Detail	Recommendations	Impact	Next steps
II. Staffing: Current staffing allocation does not meet the communication needs of Water Services. (continued)				
C	Administrative tasks during the day shift are time consuming and take time away from other critical Dispatch tasks	• Reassign sick and directory assistance calls to receptionist • Track watershed keeper (WSK) location through GPS where available • Create water services day shift position at MOC	• Relieves busy day shift dispatchers giving them more time to perform additional, complex duties, such as WSIP alarm monitoring • Improves tracking of watershed keeper in the field	Reassign tasks, work with IT for GPS, and work with Department of Human Resources for new position
D	In the event of an emergency, both CDD and WST are understaffed and would be overwhelmed	• Develop protocols for when and who to call for dispatch back-up in an emergency	• Improves dispatcher response time in an emergency and mitigates PUC risk cause by response time delays or missed tasks	Develop emergency plan
III. Communications: Current communication practices are not supported by appropriate technology or protocols, creating time delays and redundancy.				
A	Dispatch and field crew are unable to hear each other clearly on current equipment resulting in inadequate information transfers	• Update radio transmission system and devices • Assign channels to select field crews • Establish protocols for field crew communications • Add adherence to communication protocols to field crew performance plans and evaluations	• Improves communication between field staff and dispatchers for faster completion of water services tasks	Update system, establish protocols and field crew performance plans and evaluations
B	RSAN communications are inconsistent and fail to fully inform the right staff	• Refine RSAN protocols for distribution, timing, content and use • Train dispatchers on RSAN protocols	• Decreases response time to an incident by simultaneously informing appropriate SFPUC staff quickly to mitigate impact of emergency	Update protocols
C	311 screening process results in delays in response time to citizen concerns	• Refine 311 scripts for water services calls • Review routing of water services calls	• Improves response time to citizen concerns and overall customer relations	Refine 311 scripts and procedures
D	Current emergency contact protocols are inadequate leading to slower response time in an emergency	• Develop emergency contact plans based on roles and responsibilities • Expand and improve emergency contact lists	• Improve response time to an incident by refining Dispatch's ability to contact appropriate employees in an emergency	Develop emergency contact plan
E	Redundant paper logging wastes time and limits reporting functionality	• Replace paper logging system with an electronic tracking system	• Streamlining tracking frees dispatchers to focus on their support duties and creates a new reporting function on Dispatch activities for further process improvements beyond Dispatch	Explore electronic tracking options

Appendix B: Best Practice Summary

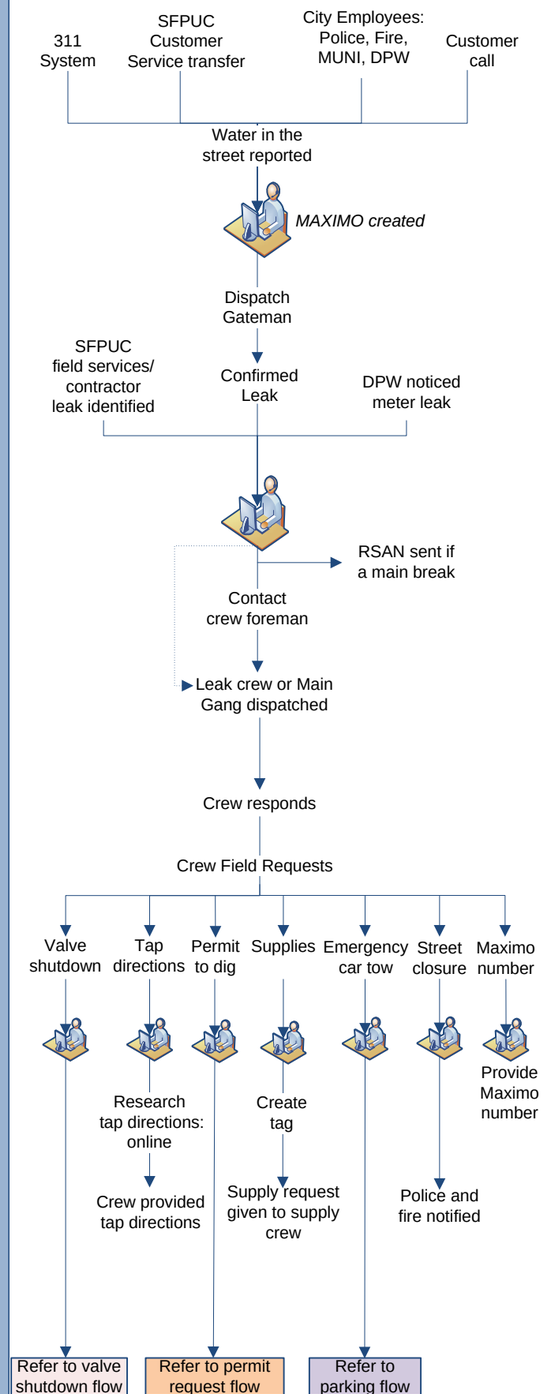
	Services	Customers	Employees	24/7 Coverage?	24/7 Dispatch Unit?	Dispatch Roles/Responsibilities	Other duties	Public calls?	Day shift field staff contacts	Night shift field staff contacts	Dispatch territory	Alarm responsibility?	Security responsibility?
Summary of Best Practices				All	Usually have one Dispatch location	Support field crews on all water service related matters	Large utilities: none Small utilities: control room (with water or power duties) also performed dispatch tasks	Mixed - some received calls only after hours, some none at all	Direct contact with field crew	Direct contact with select field crew and management	Dispatch was scaled to territory size with some slow areas covered by a clerk or back-up person as needed	None had alarm monitoring responsibility (with exception of some control room SCADA alarms)	None had security responsibility (with exception of some control room SCADA alarms back-up)
San Francisco Public Utilities Commission	Water and Power	2.5 million	2,300	Yes	Yes - 3	Dispatch and support field staff for water and power service calls and territory activity, and supply information to management	Control room - Power generation, power transmission and other powerhouse duties; LOTO	Transfer from customer service, 311 and some public calls	All field crews and supervisors	Gateman and on call supervisors	Sectioned according to location	CDD - no WST - server room alarms MOC - SCADA system	Yes - to an extent at all locations
Contra Costa Water Department	Water	500,000 for water	330	Yes	No	Dispatch and support crews for treated water system - water quality, leaks, etc. Nighttime calls forward to water operations group	Water operations group monitors pump station and water system	Public calls for service Water quality hotline	Forward calls to supervisors or to specific groups	On call supervisors	Dispatch handles main service area, but other geographic areas have staff who can perform the dispatch function if needed	Daytime alarms go directly to groups responsible for area Nighttime water distribution operators see alarms and contact on call supervisors	Canal patrol group to respond to security alarms
East Bay Municipal Utilities District	Water	1.3 million for water 650,000 waste water	1,800	Yes	Yes - 1	Dispatch crews for service calls including leaks, meters, main breaks, 2+ alarm fires, water quality, valve problems	None	Transfer from customer service	Investigator (gateman)	On-call supervisors or field crew	1 dispatch unit for 4 service yards	No Control room - SCADA	No Bay Alarm private security
Los Angeles Department of Water and Power - Large Scale	Water and Power	3.8 million for water 1.4 million for electric	9,000 (total)	Yes	Yes - 1	Monitors wells, tanks, and reservoirs through communication with water utility operators (like WSK); can track chlorine truck drivers with GPS	Monitors pump stations and regulator stations; LOTO; work with field group on scheduled maintenance and emergencies	None	Pump station field crew	Pump station field crew	Large scale system	Yes - monitors SCADA and receives calls when people enter and exit property	Water and power have a joint security team that monitor alarms and systems and have a formal patrol; Water Control Room provides monitoring back-up using SCADA
Los Angeles Department of Water and Power - Small Scale	Water and Power	3.8 million for water 1.4 million for electric	9,000 (total)	Yes	Yes - multiple	Trouble Board - dispatch and support crews for leaks, water mains, meter service, fire hydrants and valve problems	Communicate with internal groups and external entities including utilities and media; monitor news for impacts to field crews from traffic, police, etc.	None	Supervisor of field crew or senior member of field crew	Supervisor of field crew or senior member of field crew	Small scale system: 5 Trouble Boards (dispatch units) for 5 districts from 6 AM - 3:30 PM After hours one Trouble Board for City	No Control room - monitors SCADA	No Security team and Water Control back-up
Modesto Irrigation District - Control Room	Water and Power	Irrigation water to 58,000 acres 201,165 for water 111,000 for electric	400	Yes	No	Control room - after hours minimal water dispatch support, customer service and emergency calls	Power generation, power transmission and other powerhouse duties; main irrigation canal and water flows out of reservoir; LOTO	After hours customer service calls route to power house operators	Irrigation ditch tenders or on call night supervisor in an emergency	Irrigation ditch tenders or on call night supervisor in an emergency	Responsible for whole power system and select areas of water system	Dispatchers and dispatching supervisor in control room monitors SCADA alarms for transmission and distribution	No; Security contract
Turlock Irrigation District - Control Room	Water and Power	Irrigation water to150,000 acres 98,000 accounts	462	Yes	No	Customer Service manages some dispatch activity during business hours Control room - after hours dispatch, customer service and emergency calls	Power generation, power transmission and other powerhouse duties; irrigation canal; LOTO	After hours calls route to power house operators	N/A	On call list in an emergency	Responsible for whole power system and select areas of water system	Dispatchers and dispatching supervisor in control room monitors SCADA alarms for transmission and distribution	No Security contract
San Francisco Department of Public Works	Infrastructure Maintenance	800,000 - San Francisco citizens	783	Yes	Yes - 1	Load customer requests into database and assign maintenance tasks to field crew including street cleaning, graffiti, illegal dumping, and trees down	Night shift completes street sweeper clerical tasks.	70-80 calls from public/day; 200-250/day 311 database entries; 70 radio calls	All field staff	Night shift field staff and supervisors	City and County of San Francisco	N/A	N/A

Appendix B: Best Practice Summary

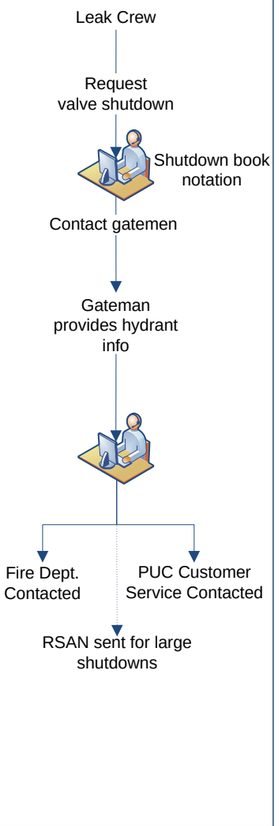
	Shifts	Busy time	Slow time	Staffing	Supervision	Communication equipment	Work area	Training	Documented Standard Operating Procedures (SOP)?	Are SOP documented/ followed?	Best practice recommendations
Summary of Best Practices	Dispatch - 3 shifts with an occasional part time shift at peak hours Control room - 2 shifts	The busy period of the day shift was often covered by 2 dispatchers or on-site clerk/receptionist back-up as needed	During the slow periods on night shift, dispatchers are always kept busy with alternate duties	Most prefer not to employee as-needed dispatchers and instead tried to give FT staff overtime to fill gaps if possible	All have single, dedicated supervisors overseeing Dispatch (even in case of multiple locations)	Mixed: radios, landline, cell Nextel is popular, but will be replaced soon (no alternate designated yet)	Single screen desktop computer	Mixed - Utilities with training programs insisted they greatly improved job performance	All maintained up-to-date documentation on SOP	All used their SOP	To-date SOP Direct and daily management Electronic activities tracking
San Francisco Public Utilities Commission	MOC - 4 operators - 6 AM - 6 PM, 6 PM - 6 AM CDD - 1 dispatcher - 6 AM - 2 PM 2 PM - 10 PM, 10 PM - 6 AM WST - 1 dispatcher - 8 AM - 4 PM 4 PM - 12 PM, 12 PM - 8 AM	Day shifts are busiest, especially between 7-10 AM	Swing and graveyard shifts are slowest; MOC staff study for NERC; CDD and WST perform paperwork and personal activities	WST and CDD each have 4 F/T and several as-needed staff; MOC has pool of 15 F/T	CDD & WST - split supervision over several units MOC - dedicated supervisor	Radios, land line, satellite, cell phone and fax machine	Desktop computer, multiple monitors and phones/radio	WST and CDD - no; MOC-yes as per regulations	Various	No for CDD and WST Yes for MOC	N/A
Contra Costa Water Department	Dispatch - 1 dispatcher - 7 AM - 3 PM 3:30 PM calls route to water service operators	Day shift	Dispatchers have other administrative duties to complete	All full-time staff - 1 water service dispatcher during daytime shift; 2 water service operators at night managing in plant	Dedicated supervisor	Nextel, radios and land line	Desktop computer, phone line	N/A	Yes	Yes	Solid SOPs and ICS
East Bay Municipal Utilities District	M and F - 2 dispatchers - 7 AM - 3 PM Tu-Th - 3 dispatchers - 7 AM - 3 PM M-F - 1 dispatcher - 3 PM - 11 PM M-F - 1 dispatcher - 11 PM - 7 AM M-F - 1 dispatcher - 11 AM - 7 PM Sat-Sun - 1 dispatcher all shifts	Tu-Th and Sat on billing weekends	Graveyard - no TV allowed; complete daytime paperwork	All full time staff; want additional staff: 2 PT and 1 extra staff on Saturday	Dedicated supervisor	Record calls on Customer Watch software - don't like it Nextel phones work well, but phasing out due to obsolescence	Desktop computer, monitors	Train as much as possible	Yes	Yes	Daily in-person check ins with staff Direct management of dispatchers
Los Angeles Department of Water and Power - Large Scale	M-F - 2 operators -6 AM - 2 PM M-F - 2 operators, except Wed 3 operators - 2 PM - 10 PM M-F - 2 operators - 10 PM - 6 AM Sat-Sun - 1 operator all shifts	Don't have many situations where 2 operators can't handle the busy times; in an emergency, can utilize mobile units	Never very quiet as operators monitor the water system and operate the pump stations - alarms are always sounding	7 full time staff - 4 operators and 3 supervisors, with everyone working in a two week period receiving four days off in a row with two of those days falling on the weekend	Dedicated supervisor	Cell phones, radio Log all calls on paper and system records any actions they take	Utilize screens to watch all of LA Room can seat three people	None	Yes	Yes	Dedicated maintenance crews help improve the reliability of system
Los Angeles Department of Water and Power - Small Scale	District yards - 5 operators total: 1 operator per yard - 6 AM - 4 PM Centrally staffed - 3 PM - 7 AM: Tu-Th - 2 operators - 3 PM - 11 PM Fri-Mon - 3 operators - 3 PM - 11 PM Th-Tu - 1 operator - 11 PM - 7 AM Wed - 2 operators - 11 PM - 7 AM Sat-Sun 2 operators - 7 AM - 3 PM	September - February leak season Day - clerical employee back up Night - 2+ employees centrally are enough, can call in other employees for emergencies	Rainy season is slow as well as certain day shift hours; fill time with administrative tasks	11 full time staff All FT, no PT or as-needed (didn't work)	Dedicated supervisor	Nextel, cell phone Will phase out and use fully automated system in three years	Desktop computer, radio headset, phone, old TV	None	Yes	Yes, especially for emergencies	Develop good relationships with field crew for improved communications
Modesto Irrigation District - Control Room	28 day rotation with a combination of 12 and 10 hour shifts On shift - scheduler, dispatcher, dispatching supervisor, apprentice and during business hours a relief shift with 2 shift supervisors and a dispatcher	Day shift is busy with relief crew as backup	Train apprentices when it is slow; the afternoons were quiet, but now winter is busy with NERC testing and maintenance and summer is busy with emergency work	15 operators on staff plus 2 apprentices in anticipation of retirements; 3-5 on shift	Dedicated supervisor	Cell phones and radio Record all incoming calls as per NERC standards	Dispatch room has three redundant desks, Scheduling room has two	Power operations training for NERC requirements; relief shift used for training or extra coverage during day	Yes - three SOP books for emergencies and NERC	Yes	Good technological back-up and documentation systems
Turlock Irrigation District - Control Room	6 AM - 6 PM and 6 PM - 6 AM Rotating shifts	8 AM - 10 PM and 2 PM- 4 PM May need a fourth person during storms when it is busy	10 AM - 2 PM weekdays and weekends Operators are encouraged to be proactive and fill their time, but they are allowed to do as they wish	15 cross functional operators 5 crews of 3 operators Rotating shifts	Dedicated supervisor	Radios and cell phone; for security purposes, can track vehicles using GPS Record all incoming calls as per NERC standards and save for five years	Small space located in an old building in Broadway Yard	Training for NERC requirements; schedule a 7 AM - 3:30 PM, week-long training shift: train on site, attend off-site trainings or conduct field trips	Yes	Yes	None
San Francisco Department of Public Works	Varies due to understaffing 2-3 dispatchers - day shift 1 dispatcher - night	M-F very busy during day shift	Night shift dispatcher fills downtime with clerical duties	5 FT dispatchers (need 10 total) 10 as-needed dispatchers (due to understaffing of FT)	Split supervision over 2 dispatch groups	Radios and landline; record all interactions through electronic database (limited paper logging)	Desktop computer, phone, multi-channel radio	4-weeks on the job training 8-9 months to learn position	Yes	Yes	Supervisor coaches in private, works alongside dispatchers during busy periods and performs daily check-ins

APPENDIX C: CDD 24/7 DISPATCH OPERATIONS WORKFLOW

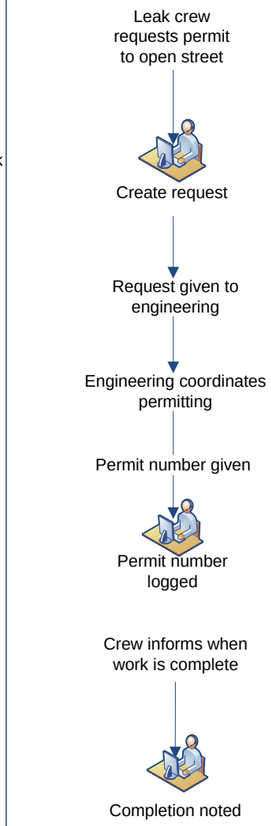
LEAK



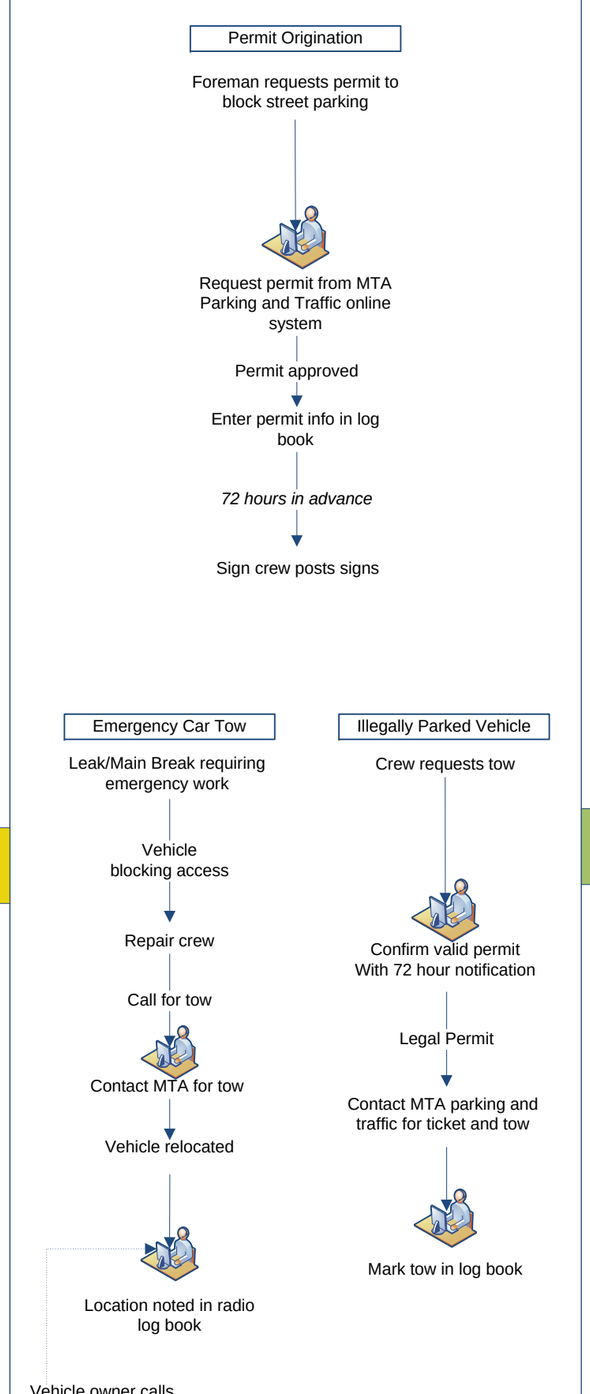
VALVE SHUTDOWN



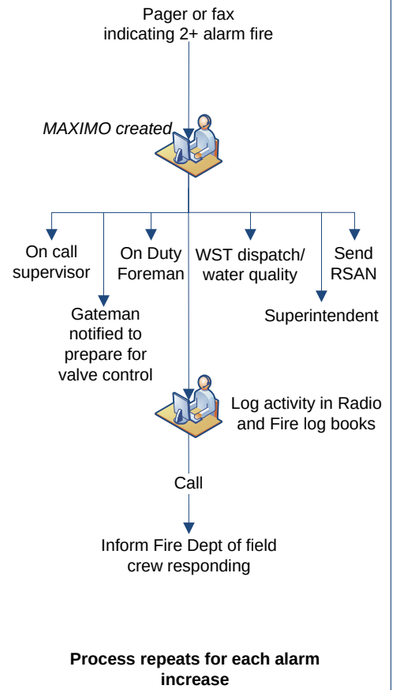
DIG PERMIT REQUEST



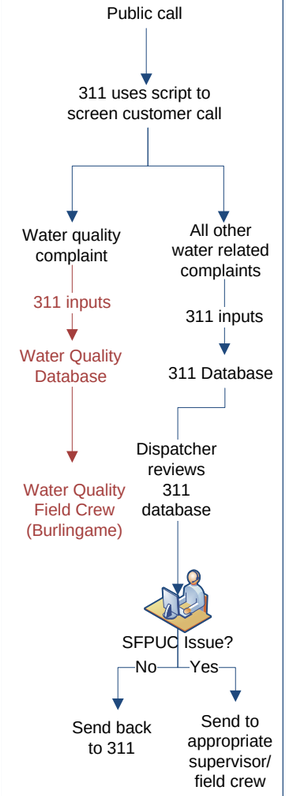
PARKING



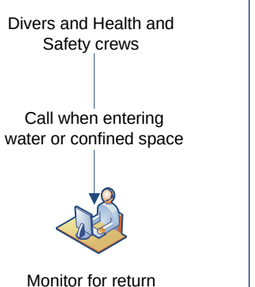
FIRE



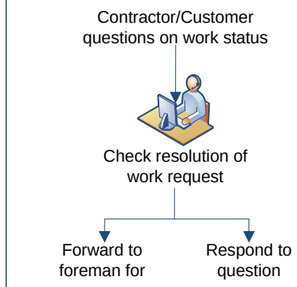
311



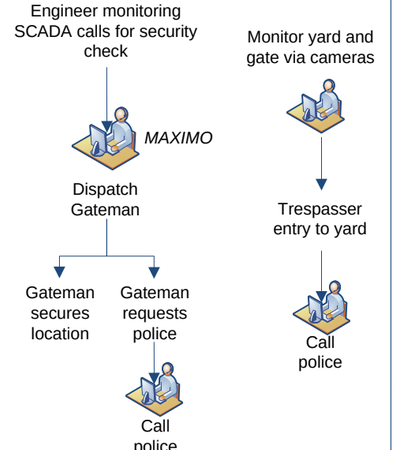
DIVERS/CONFINED SPACE



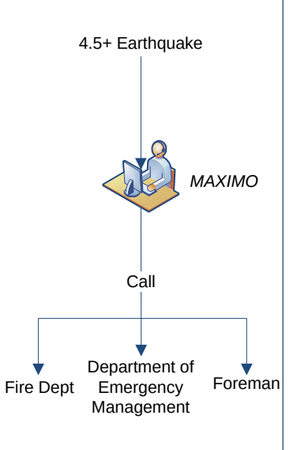
FOLLOW UP CALLS



SECURITY RESPONSIBILITIES

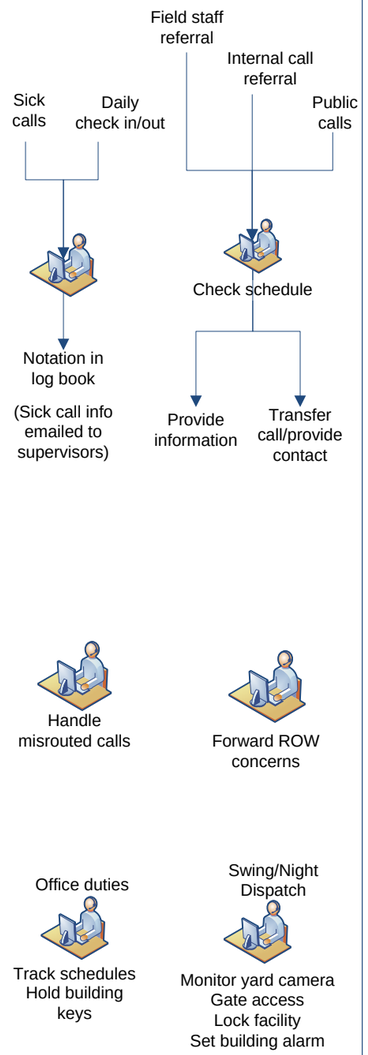


EARTHQUAKE

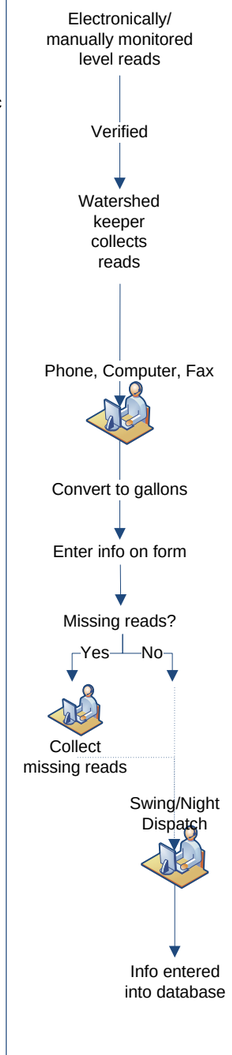


APPENDIX D: WST 24/7 DISPATCH OPERATIONS WORKFLOW

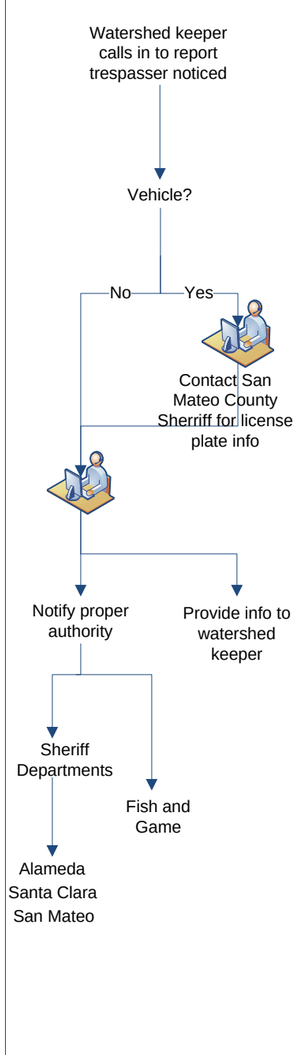
ADMINISTRATIVE



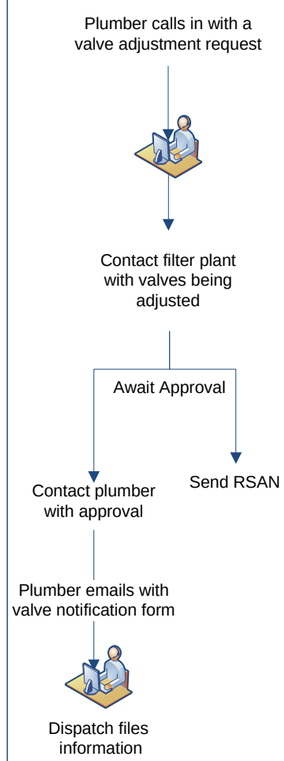
LEVEL READS



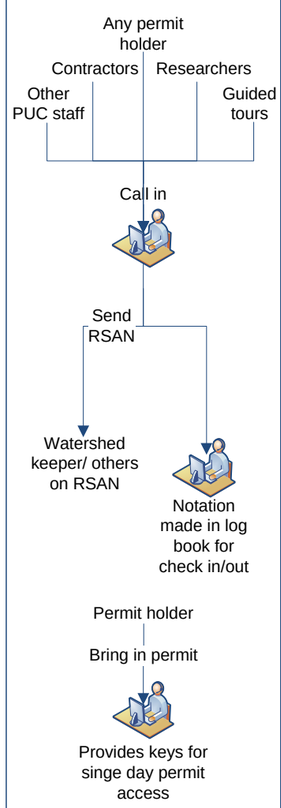
TRESPASSERS



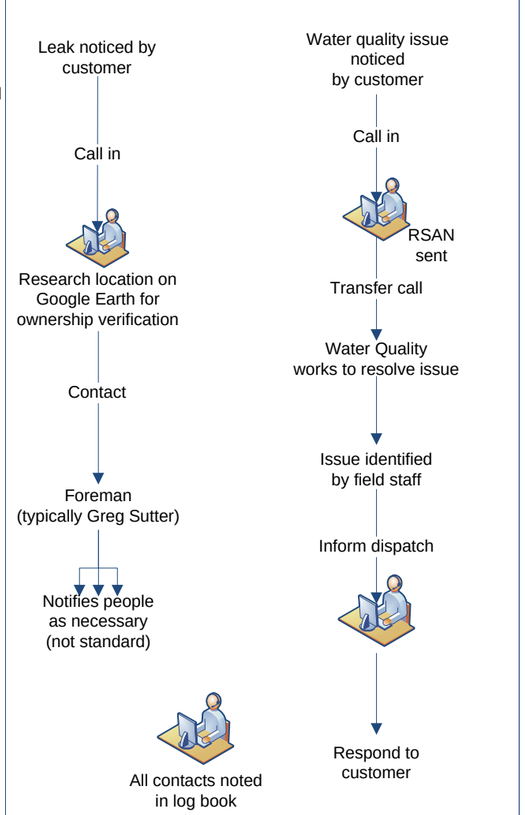
VALVE ADJUSTMENT



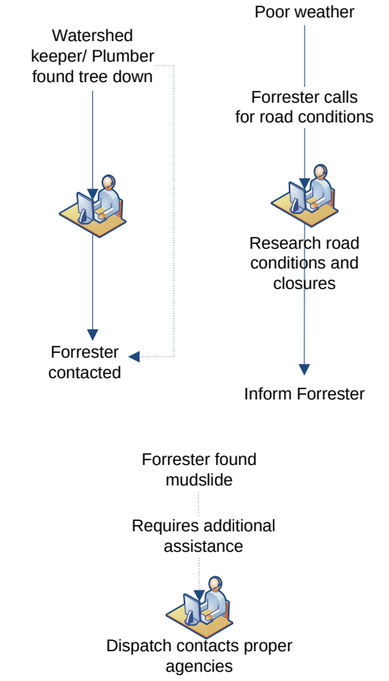
WATERSHED ACCESS



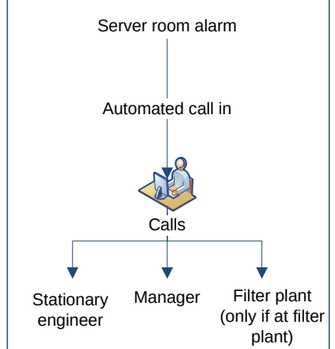
CUSTOMER CALLS



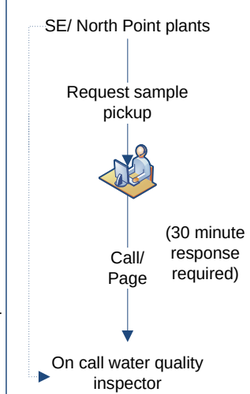
FORRESTER CALLS



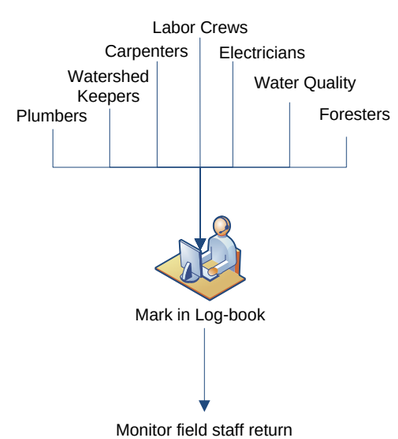
SERVER ROOM ALARMS



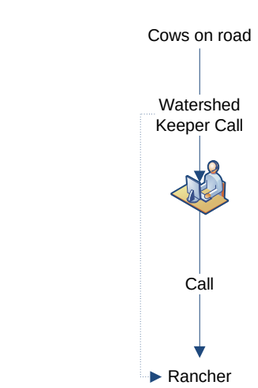
SAMPLE PICKUP



10-7, 10-8 CALLS



COW CALLS



APPENDIX E: MOC 24/7 DISPATCH OPERATIONS WORKFLOW

ADMINISTRATIVE

Line Crews notify dispatch when entering a facility

Entered into electronic log

Periodic check-ins

CalFire

Controlled burn notification

Entered into electronic log

10-7,10-8

Watershed Keepers

Arborists

Divers

Entered into electronic log

Form 11

Watershed Keeper collects reads at reservoirs

Radio

Determine power generation levels

Emergency

Line Crew/ Watershed Keepers

Call emergency services

CLEARANCES

Field Supervisor requests clearance in system

Power Clearance

Water Clearance

Write switching order

Submit orders for 3 signatures

Notify external agencies as necessary

California ISO
Outage Coordinator
WECC Reliability Coordinator

Approval signatures received

Execute switching orders and lock out-tag out

Coordination for power work

Line & Maintenance crews

Work complete

Verify clear power line and turn line back on

Notify WST

Execute switching orders and lock out-tag out

Coordination during work

Line & Maintenance crews

Work complete

Verify clearance
Resume services

SECURITY

Line crew

Security alarm

Watershed Keepers

National Parks Service

Moccasin resident

Security issue reported

Watershed Keeper contacted

Problem resolved?

Yes

No

Noted in log

Work through call list

Contact Reached?

Call next contact

(Large issue)

Yes

No

Provide Information

Leave Message

National Parks Service

Call list complete/ Issue resolved

Contacts/ issue resolution noted in log

FIELD RESPONSIBILITIES*

- Facility inspections – Powerhouses, intake, substations
- Response to emergency events occurring in the field – Real time response to alarms away from control room
- Transmission line switching – Switchyards and substations
- Clearing, blocking, restoring of generators – Holm, Kirkwood, Moccasin, Lower Moccasin
- Maximo work orders – various operator work requests out of control room

*40 to 50 percent of the time for one of the three powerhouse operators

WATER QUALITY

Water quality alarm

Irregular activity noticed in SCADA

Call

Stationary Engineer/ Watershed Keeper investigate

Problem resolved?

No

Yes

Begin water quality call out procedures

Noted in log

Security related?

Parks Service

Work through call list

Near powerhouse?

Powerhouses (Cherry, Intake, O'Shaughnessy)

Contact reached?

Call next contact

Yes

No

Provide information

Leave message

Contacts logged

Call list complete

Result noted

Affects water deliveries

WST notified

Affects power deliveries

Info relayed to WECC/NERC, PG&E, TID, MID

Refer to scheduling

Reschedule as necessary

SCHEDULING

Water

Receive demand levels from WST

Balance with reservoir reads

Check the day's clearances for water and power

WST notified

Power

Cherry

Intake

Kirkwood

Call in level reads and power needs

Pre-schedule power deliveries for following day

Email

PG&E
WECC
NERC
MID
TID
SMUD

Following day

Real time schedule power deliveries

Email

PG&E
WECC
NERC
MID
TID
SMUD

TREASURE/ YERBA BUENA ISLAND

CDD dispatch

Treasure Island residents

Treasure Island Development Agency

311 received report

Power outage reported

24/7

Business hours

Chuck Rowles

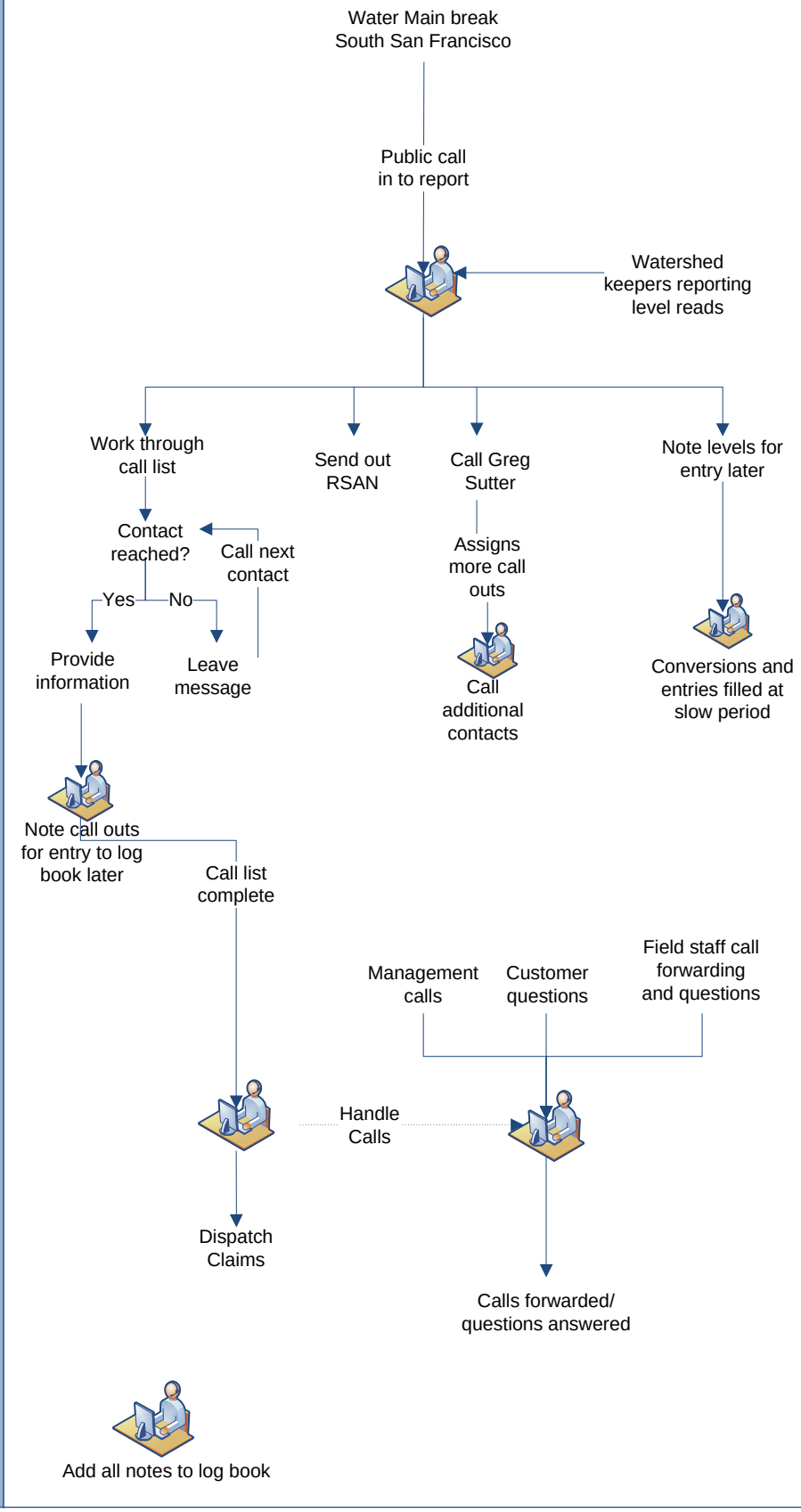
Power Enterprise Line Crew

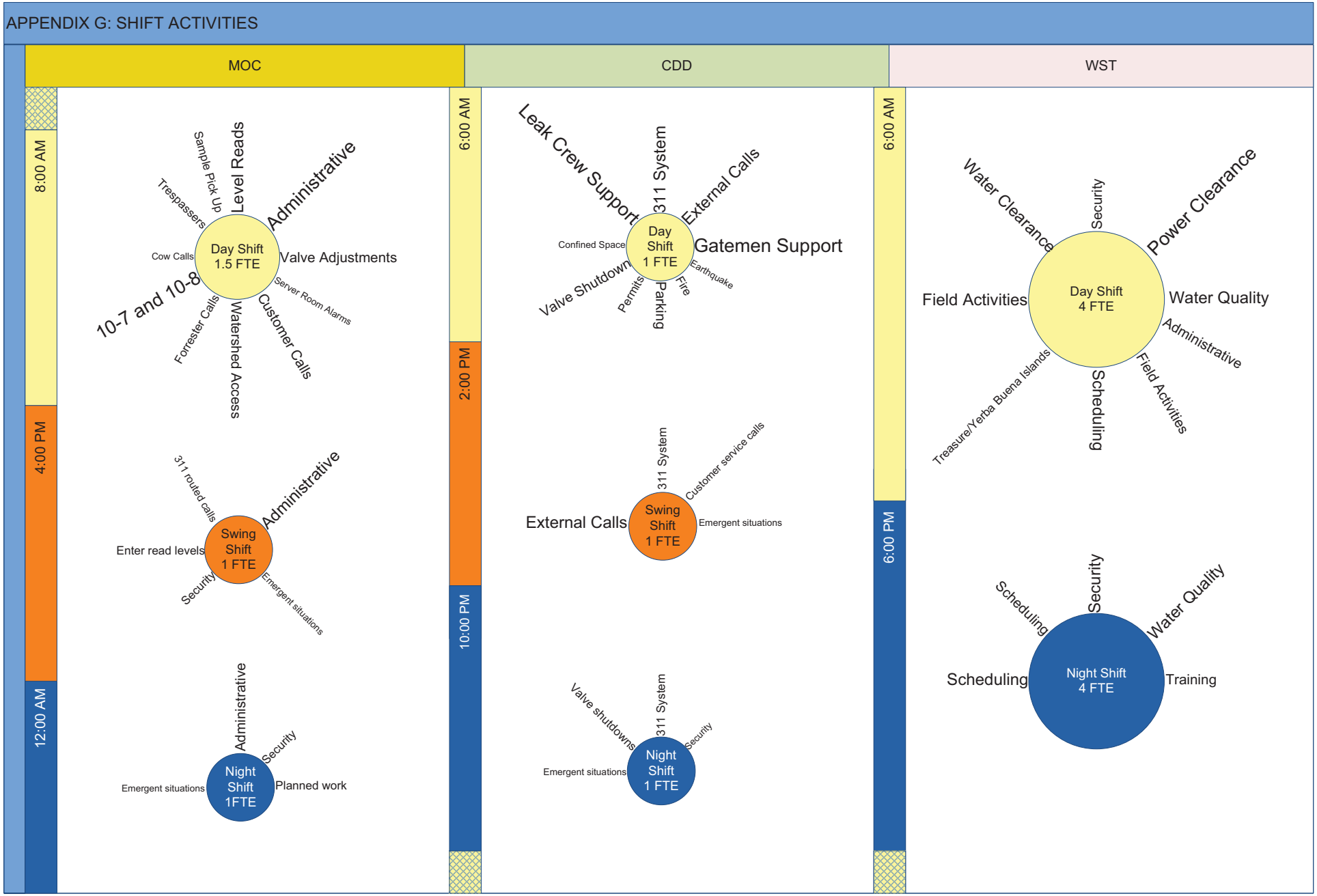
Update status of work

Updates and completion noted

APPENDIX F: 24/7 DISPATCH OPERATIONS WORKFLOW THANKSGIVING MAIN BREAK

Emergency (Thanksgiving Main Break)




APPENDIX G: SHIFT ACTIVITIES
MOC
CDD
WST
8:00 AM
4:00 PM
12:00 AM
6:00 AM
2:00 PM
10:00 PM
6:00 AM
6:00 PM
Day Shift 1.5 FTE
Level Reads
Administrative
Valve Adjustments
Customer Calls
Watershed Access
Forrester Calls
10-7 and 10-8
Cow Calls
Trespassers
Sample Pick Up
Server Room Alarms
Swing Shift 1 FTE
Administrative
Enter read levels
Security
Emergent situations
311 routed calls
Night Shift 1FTE
Administrative
Security
Planned work
Emergent situations
Day Shift 1 FTE
Leak Crew Support
311 System
External Calls
Gatemen Support
Valve Shutdown
Parking
Confined Space
Permits
Fire
Earthquake
Swing Shift 1 FTE
311 System
Customer service calls
External Calls
Emergent situations
Night Shift 1 FTE
Valve shutdowns
311 System
Security
Emergent situations
Day Shift 4 FTE
Water Clearance
Security
Power Clearance
Field Activities
Water Quality
Administrative
Scheduling
Field Activities
Treasure/Yerba Buena Islands
Night Shift 4 FTE
Security
Water Quality
Scheduling
Scheduling
Training

Appendix H: Interview List

Name	Position	Title	Work Location
Dispatchers/Operators			
Janice Giles	1705	Communications Dispatcher 2	CDD
Ruth Jordan	1705	As Needed Communications Dispatcher	CDD
Armando Casco	1705	Communications Dispatcher 2	CDD
Mark Ashworth	7482	Power Generation Technician	MOC
Bruce Davis	7482	Power Generation Technician	MOC
John Klein Jr.	7482	Power Generation Technician	MOC
Heath Webster	7484	Senior Power Generation Technician	MOC
Wendy Gerrish	7484	Senior Power Generation Technician	MOC
Constance Susoeff	1705	Communications Dispatcher 2	WST
Glenn Maralit	1705	As Needed Communications Dispatcher	WST
Richard (RIC) Airey	1705	Communications Dispatcher 2	WST
Field Crew			
Dennis McCarthy	7250	Gateman, Acting Foreman	CDD
Frank Marovich	7250	Foreman, Contruction & Maintenance Plumbers	CDD
John Mercurio	7250	Foreman, Leak Truck	CDD
Andy Geddes	7250	Foreman, AWSS	CDD
Rich Gonzales	7284	Oversees Foremen, Plumbers, Leak Detection	CDD
Sean Duffy	7284	Automated Water Meter Program Supervisor II	CDD
Jim Blue	7316	Senior Water Quality	WST
Dennis Edwards	7316	Water Quality, Inspector	WST
Fernando Jimenez	7316	Water Quality, Inspector	WST
Sue Soteriou	7316	Water Quality, Inspector	WST
Jim Avant	7270	Watershed Supervisor	WST
Rick Duffey	7470	Watershed Supervisor	WST
Tim Koopmann	3426	Forester	WST
Mike Burns	7470	Watershed Keeper	WST
Brian Sak	2485	Supervising Biologist	WST
Gayle Ciardi	7470	Watershed Keeper	WST
Guido Ciardi	3426	Forester	WST
Jason Bielski	2485	Supervising Biologist	WST
Mike Horvath	2483	Biologist	WST
Mike Kellog	2485	Supervising Biologist	WST
Mark Christianson		Line Crew Foreman	WST
Sheila Garret	2481	Water Quality Technician	WST
Mike Patterson	7270	Watershed Keeper Supervisor	MOC
John Nelson	7229	Transmission Line Supervisor	MOC
Aric Lemke	7350	Line Worker	MOC
Mike Williams	5211	Water Operations and Maintenance Manager	MOC
Phil Lefman	7373	Sr. Stationary Engineer	MOC
Joe Casteel	7259	Water and Power Maint Supv, ROW Vegetation Mgmt	MOC
Scott Riley	#0931	Comm & Systems Controls Maint Manager	MOC
Steve Meier	7284	Utility Plumber Supervisor II	MOC
Chuck Rowles	7338	Electric Line Worker	MOC
Management/Other Divisions			
John Cretan	1824	Administrative Services	CDD
Bill Teahan	7134	Construction and Maintenance Superintendent	CDD
Patrick Griffin	7488	Power Generation Supervisor	MOC
Dan Lehr	#0932	Facilities Systems Maintenance Manager	MOC
Margaret Hannaford	#0942	Division Manager	MOC
John Klein	#0931	Power System, Maintenance and Operations Manager	MOC
Dan Mason	5602	WECC Compliance Officer/Utility Specialist	MOC
Kent Nelson	#0933	Operations and Maintenance Manager	CDD & WST
David Briggs		WST Division Manager	CDD & WST
Mary Ellen Carroll	#0932	Emergency Planning Director	GM
Betsy Rhodes Lauppe	5408	Regional Communications Manager	COMM
Maureen Barry	5408	WSIP Communications	COMM
Scott Oswald		311 Customer Service Manager	311