

White Paper on Water Sustainability



Satisfying Joint Commission Requirements

Submitted by:

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Abstract

The Joint Commission has a 30 year history of providing a framework for comprehensive emergency management for hospitals. Their standards require that organizations identify the potential emergencies that could affect them and develop a plan that addresses the four phases of emergency management activities: mitigation, preparedness, response, and recovery. Emergency operation plans must also address command structures, backup communications systems, building evacuations, and coordination with other community health care organizations and emergency responders. Additionally there must be mitigation activities that have been designed to reduce the risk of, and potential damage due to, an emergency and recovery strategies in place designed to help restore the systems that are critical to resuming normal care, treatment and services.

Effective January 1, 2008, the emergency management standards (EC.4.10 and EC.4.20) for hospitals, critical access hospitals and long term care facilities have been revised to reflect an “all-hazards” approach to emergency preparedness that will permit appropriate flexible and effective responses. These revised standards emphasize a “scalable” approach that will help manage the variety, intensity and duration of the disasters that might affect an organization or an entire community.

This White Paper will focus on water sustainability as it relates to Joint Commission requirements. The discussion will delineate response efforts when the organization cannot be supported by the local community for at least 96 hours in the six critical areas required by the Commission. Through this discussion, the reader will be introduced to how First Water, and its advanced water purification technology, can help achieve the desired sustainability and recovery.

Whenever an emergency impacts the ability to have clean water for drinking, food preparation, sanitation, dialysis, bathing or a myriad of other uses, facilities are faced with the painful choices of going on diversion, evacuation and/or closure. The technology to purify available non-potable water can keep a facility operational through extended water emergencies for weeks or longer. These systems ensure cost effective continued operations for many potential threats to the hospital and community.

While the Joint Commission suggests that an acceptable response when water is unavailable or compromised would be to temporarily close or evacuate a facility, the First Water technology can help prevent such a cost sensitive and care disruptive decision. With hundreds of hospitals in the United States, and thousands internationally relying on First Water, the solutions are well suited to meet all the “all hazards” concerns of the Commission. First Water has proven to help maintain the bottom line, community services, accreditation and long-term financial health.

Operational Realities

As part of a comprehensive Emergency Operations Plan, the Commission requires addressing the following six critical areas to serve as a blueprint for managing care and safety during an emergency. With the exception of Communications, First Water functions in the remaining five areas:

1. **Resources and assets:** A must for all hospitals is a solid understanding of the scope and availability of an organization's resources and assets and, perhaps more importantly, the status of those assets during an emergency. Water is an essential resource that hospitals must know how to access in times of crisis to ensure patient safety and sustain care, treatment, and services. By using available compromised locally available water, First Water equipment will eliminate the need to replenish water supplies that will be required throughout response and recovery.
2. **Safety and security:** As the emergency situation develops and parameters of operability shift, the hospital must provide a safe and secure environment for patients and employees during an emergency. The provision of clean water ensures the safety of everyone.
3. **Staff responsibilities:** During an emergency, the probability that staff responsibilities will change is high. As new risks develop along with changing conditions, staff will need to adapt their roles to meet new demands on their ability to care for patients. Having a consistent supply of clean potable water will allow staff to anticipate how they may continue caring for their patients during an emergency.
4. **Utilities management:** A hospital depends on the uninterrupted function of its utilities during an emergency. The supply of key utilities, such as power or potable water, ventilation, and fuel, must not be disrupted or adverse events may occur as a result. Currently hospitals keep a documented inventory of the assets and resources it has on-site that would be needed during an emergency (at minimum, personal protective equipment, water, fuel, staffing, medical, and pharmaceuticals resources and assets).

Further stated in the standards, hospitals must identify an alternative means of providing for the following utilities in the event that their supply is compromised or disrupted:

- Water needed for consumption and essential care activities
- Water needed for equipment and sanitary purposes

As current mandates require sustainability of water availability for 5 days without re-supply, most facilities rely on bottle water contracts. This is an expensive solution:

- The cost of the water itself
- Delivery surcharges during emergencies
- Replacing the stock every 6 months due to plastic jugs degenerating
- Leaking plastic jugs and large storage space requirements
- Inability of water contractors to deliver upon contracts
- Inability to use bottled water for ice production, food preparation, showering, bathing, dish washing, laundering, etc.

5. **Patient clinical and support activities:** The clinical needs of patients during an emergency are of prime importance. The organization must have clear, reasonable plans to address the needs of patients during extreme conditions when the hospital's infrastructure and resources are taxed. Personal hygiene and sanitation needs of its patients must be continually met even during an emergency.

Clearly, water emergencies should be considered a primary concern because of the extensive operational, financial and legal exposures. Without the ability to have clean water it may become necessary to cancel elective surgeries, elective procedures, discharge patients, go on diversion, evacuate and/or close until clean water is available. Further, the failure to be prepared with adequate supplies of water has been repeatedly shown to lead to life and death decisions for individual facilities and their organizations during natural and manmade disasters. The Joint Commission recognizes these realities and requires individual facilities to take acceptable risk reduction measures.

Central to successful emergency hospital operations are your employees and their ability to function under extreme and stressful conditions. Imagine your staff working 18 hours and not being able to have a cup of coffee or being able to provide a cold drink to their patients. In addition, these personal considerations also need to be considered:

- maintaining the standard of care
- the need for unavailable additional staff
- reduced normally available resources
- concern for families at home

The Technology:

Any solution to a water related emergency needs to rely on portability, flexibility and ease of use for a successful outcome, especially in the event that the facility would need to be evacuated or if there is a requirement for alternate care sites. During nearly any imagined scenario, non-potable water such as compromised water mains, wells, pools, boilers, ponds, detention areas, etc, can be purified to supply all the water a facility needs to maintain operations. Also during the recovery process, readily available clean water from purification technology enables a facility to begin normal operations more quickly, impacting the profitability of the organization as well as reduced staff and patient stress and a positive community perspective of the facility.

Water purification technology from First Water developed to address medical requirements has been successfully used by thousands of hospitals both in the United States and around the world, as well as scores of first responders, government emergency management agencies, disaster medical assistance teams and the military. The systems from First Water are in place in virtually every country on earth, and even the US White House and Capitol Building through the US Secret Service.

With successful deployments ranging from Hurricane Katrina to local water main breaks to tsunami emergency field hospitals, the technology exceeds bottled water benefits by improved flexibility to meet all the needs for clean water - not just drinking water - and at significantly lower costs.

The water purification and distribution solutions from First Water meet US EPA/NSF protocols and WHO requirements for microbiologically safe water. In addition, they are chemical free, durable enough to meet military specifications, and eliminate contaminant threats from compromised locally available water. While powerful, they have been designed to require minimal storage space, indeed far less than pallets of bottled water.

The following are some critical locations in a hospital facility where available water purification products can provide sustainability, beyond just drinking water, through locally available water:

○ Ice and beverage machines	○ Kitchens and food preparation	○ Dialysis (when used with a de-ionizer)
○ Laundry and dish washing facilities	○ ER and equipment sterilization	○ Mobile Medical Trailers
○ Critical Care and remote clinics or facilities	○ Triage victims outside of facility	○ Rapid ad-hoc community deployment

The following Certificate of Analysis from an independent EPA certified laboratory shows the products to be excellent at producing microbiologically clean water, even for viruses. No hospital should ever give water to anyone from a system that does not have a certificate satisfying EPA/NSF P231 standards. The liabilities of dispensing water from a non-certified source can be significant. The technology from First Water achieves these great results by combining pre-filtration, sediment filtration, carbon block filtration, our proprietary Zeonic filter that has an effective pore size of just 0.2 microns, and UV disinfection.

CERTIFICATE OF ANALYSIS



Triad Forensics
Independent Service Laboratory

391 Technology Way Suite 167 Lab 1
Winston-Salem, North Carolina 27101
Tel 336-722-8963 Fax 336-722-8969
URL: www.TriadForensic.com

Reported To: First Water Systems, Inc.
6950 Brixton Place
Suwanee, GA 30024

Date Received: 05/04/2010
Date Reported: 05/24/2010
Case Number: TFL-0909A

Product Tested: Stationary 12 gallon per minute water disinfection purifier currently called "Villager"

Test Performed: USEPA NSF P248 (2008) and P231 Biological Challenge

Methodology: Protocol for evaluating the microbiological treatment capabilities of water purifiers producing water intended for human consumption

Independent Laboratory Testing Results: Independent laboratory testing found that the 12 gallon per minute water purifier unit achieved the microorganism contaminant reductions in accordance with the levels set fourth by NSF and EPA in Protocol P248 (2008) and P231 by producing microbiologically safe water. The results obtained from independent laboratory testing validate the unit as a highly dependable product for its intended use. Due to its design, ease of use, and speed of reducing waterborne pathogens, the unit is an effective system for producing microbiologically safe water for human consumption.

Target Microorganism	Targeted Reduction Efficacy	Independent Laboratory Test Results
<i>Escherichia coli</i>	99.9999%	Passed > 99.9999% Reduction
Bacteriophage ssRNA Coliphage Fr Virus	99.99% Coliphage	Passed > 99.99% Reduction
Bacteriophage ssRNA Coliphage MS2 Virus	99.99% Virus	Passed > 99.99% Reduction
<i>Cryptosporidium parvum</i>	99.9% Cyst	Passed > 99.9 % Reduction

Laboratory Statement of Qualifications (SOQ): Triad Forensics Laboratory (TFL) is compliant with ISO/IEC 17025:2005 and ASCLD-LAB International (The American Society of Crime Lab Directors Laboratory Accreditation Board) accreditation guidelines for independent testing laboratories. TFL is an approved by AOAC (the American Organization of Analytical Chemists), EPA (Environmental Protection Agency), FDA (The US Food and Drug Administration), and NELAC (National Environmental Laboratory Accreditation Conference) as an independent testing laboratory. TFL is certified, registered and operates in the State of North Carolina.

Reported By 
Lauren A. Stainback
TFL Forensic Laboratory Director
AOAC, APHA, NELAC, ASCLD-LAB International Legacy Auditor

Date Signed June 8th, 2010

TFL Federal Employer ID No. 27-2557461 D-U-N-S No. 021860821 NC DHHS Reg. No. NC-PT 0000 4037

Certificate of Analysis for the FW 720-W^{IM}



Financial Analysis:

Critical to any solution is its economic viability. In the discussion of satisfying Joint Commission requirements concerning water, there can be no question of the economic benefits of the First Water solutions. Most importantly, all products and services satisfy grant guidelines and have been approved for purchase through HRSA 1, HRSA 2, and ASPR. Entire geographic areas have made such funds available to ensure not only individual facilities can provide water sustainability, but entire geographic regions as well.

Even without grant funding, the financial benefits are obvious. If water is unavailable for a period of days, diversion is typically required, with significant financial losses associated. When subjected to prolonged water outages due to hurricanes, tornadoes, earthquakes, droughts, etc, current options require closing the facility at exceptional costs to the organization. The solutions discussed here enable a facility to stay open and maintain near-normal operations indefinitely. As such, the financial benefits are obvious. While exact numbers are organization-dependent, keeping a facility open, or even not having to cancel elective procedures for even a few days during typical water main breaks, can save organizations many tens of thousands of dollars.

This was the situation at Northside Hospital in Atlanta, GA in February, 2007. A water main break caused the facility and a neighboring hospital to boil water or use bottled water. By using one FW-720-M™ for drinking water and several FW-60's™ for ice production, beverages, dietary and ER water, Northside maintained its normal schedule and had no significant financial impact. The neighboring facility relied on bottled water and had to go on diversion, cancel elective surgeries, and take other measures that significantly impacted its ability to service the community and be profitable. This is one of many such instances.

During other disasters, it was leaned that many staff would take water home, and some non-staff persons caught in the disaster were taking precious water and leaving the facility. With this technology, abundant water is available, and staff can easily take water home to take care of family, friends and pets.

Even without major disasters, just the normal annual costs to maintain the mandated emergency water in bottles is a more costly option. Five days of bottled water for all staff, patients, and surge in plastic containers is costly to buy, must be replaced every six months due to deteriorating plastic, and requires a very large amount of physical space. The discussed technology eliminates these costs, and has no recurring costs other than inexpensive filters after extensive use.

Considering the substantial hard and soft cost savings, as well as the reality of having to shut down completely or go on diversion and the legal and public relations implications of not having the mandated water supplies, the decision to implement this approach is apparent. Appendix A of this White Paper is a table showing recommended configurations for three categories of hospitals, including all product and delivery costs anywhere in the continental United States.

The Bottom Line:

The First Water technology represents an opportunity to stay operational without re-supply through emergencies where water is a factor, provide greater care service for the community, and be paid for through available grant funds or actual hard and soft cost recoveries.

References and Contact Information:

The following provides points of contact for the leaders of the Northside Hospital Incident Management Team, the state of Georgia Fire Department Operations group, and First Water Systems, Inc.

Name	Organization	Telephone	E-mail
John McDonald	Northside Hospital	404.851.8784	john.mcdonald@northside.com
Bill Lewis	Georgia Mutual Aid Group (GMAG)	404.320.1505	blewis@gema.state.ga.us
Tom Flaim	First Water Systems, Inc.	770.844.8950	tomf@firstwaterinc.com

Appendix A, Recommended Healthcare Facility Configurations

	www.firstwaterinc.com	HEALTH CARE FACILITIES CONFIGURATIONS		
	770-442-8257			
PRODUCTS		HCF-1	HCF-2	HCF-3
<p>These recommended configurations relate to typical needs for emergencies when water is either unavailable or compromised. Additional purification or dissemination systems may be helpful to meet a particular facility's needs. Please contact First Water for assistance in the optimum configuration of any type facility.</p> <p>All product bundles include a complement of filters to ensure sustainability, spare UV and UV protective sleeve.</p>	up to 250 Beds	250 to 500 Beds	500 to 1,000 Beds	
	Facility emergency population of less than 2,000 persons	Facility emergency population of less than 4,000 persons	Facility emergency population of less than 8,000 persons. Contact First Water for larger facilities.	
FW-60-B™ Bundle, including enough spare filters for complete filter changes up to two events	3	6	9	
FW-60-S™ Bundle, including enough spare filters for complete filter changes up to two events	1	1	1	
FW-60™ Extra Filter Kits including three complete filter replacements	1	2	3	
FW-720-M™ Bundle, including enough spare filters for complete filter changes up to five events	1	2	3	
FW-720™ Extra Filter Kits including three complete filter replacements	1	1	1	
24 Hr. Water Test Kits (quantity of 100)	1	1	1	
Filling Station 4 (4 taps)	1	2	3	
Supply Station 3,000	1	2	3	
Supply Station 300	1	2	3	
AquaBags (in lots of 1,000)	2	3	4	
On-site Training and Deployment Consultation includes all travel, per diem, time and materials	<i>included</i>			