

A Resilient Medical Examiner or Crime Lab Facility

Wed, 07/16/2014 - 8:15am by Lou Hartman

Forensic facilities and the operations they house, both Medical Examiners and Crime Laboratories, are important components of a community's infrastructure. Natural disasters have the potential to cripple or destroy the buildings that support these operations. Making sure that forensic buildings operate through or are quickly available after an event is resiliency.

Forensic facilities and the operations they house, both Medical Examiners and Crime Laboratories, are important components of a community's infrastructure. Natural disasters have the potential to cripple or destroy the buildings that support these operations. Making sure that forensic buildings operate through or are quickly available after an event is resiliency.

According to the Merriam-Webster dictionary:

Resilient

: able to become strong, healthy, or successful again after something bad happens

: able to return to an original shape after being pulled, pressed, bent, etc.

Both definitions apply, in different ways, to the operations of a forensic facility. Forensic facilities and the operations they house, both Medical Examiners and Crime Laboratories, are important components of a community's infrastructure. Natural disasters, such as super storm Sandy or many of the devastating tornados experienced every year, have the potential to cripple or destroy the buildings that support these operations. Even if the buildings are operational, the staff necessary to provide services may be unable or distracted by personal emergencies from responding. Having functioning buildings and available staff are equally important.

Since this is a facilities orientated article, let's focus on the building part of the dialogue. Making sure that forensic buildings operate through or are quickly available after an event is resiliency.

Defining building resiliency starts with a clear policy regarding service standards and expectations. How well defined existing policies have been developed is often as different as the communities that the forensic facility supports and the services they provide. By observation, the focus on these policies often peaks after an event and failure. Encouraging discussions about resiliency and service standard expectations before an event allows for proactive planning and facility preparation. Certainly if you are planning a new building or renovation of an existing building the goals for resiliency should be clearly understood.

What features make your facility more resilient are nearly all about location. Earthquakes, floods, hurricanes, and tornados are some of the natural disasters that are unique to your location. Some folks are unlucky enough to have more than one of these worries to contend with. Location also includes the utility systems supporting your building. Without functioning utility electrical power, natural gas, fresh water, and sanitary drains you either need on-site sources or your building is out of operation.

Focusing on electrical power, if your facility is in a well-developed area, the electrical grid may be supported from multiple substations and provide a high degree of reliability. Other locations could be at the far reaches of the utility network or be supported by electrical infrastructure that is antiquated and far less reliable. Knowing what the utility

infrastructure is like that serves your building may well influence how large of an emergency/standby power generator is appropriate. If you are in a well-developed area, then a minimal generator may make sense. If you are at the frazzled end of the wiring, then a system that fully supports building operation could be a wise investment. Don't forget that along with deciding what size the generator should be you also need to decide how long you want the generator to be able to operate from the fuel stored on-site. Beyond reliability, the quality of the power could influence surge protection, power conditioning, and uninterrupted power supply selection.

An example of well-planned resiliency is a West Coast medical examiner facility that already had well defined service standards that the new facility needed to meet. The client had already defined the scale of earthquake the building needed to resist and that following the earthquake the building needed to be immediately reoccupied and capable of standalone operation for 96 hours. The resiliency planning then led to structural solutions, large emergency power generators with equally large diesel tanks, on-site storage tanks for fresh water, and a separate storage tank for the fire protection system. Since there was real potential for disruption of the sanitary drains after an earthquake, the building was also equipped with the capacity to hold 96 hours of liquid waste. Beyond utilities the planning considered what effect the earthquake could have on building components. For example, the building used large overhead doors for decedent transfer. This type of door had a good chance of jamming after an earthquake so adjacent large swinging doors were provided to mitigate this risk.

Heating and cooling buildings, without connection to the utility systems, can be essential to the ability to use the facility. During super storm Sandy both the electrical distribution and the steam supply was shut down on Manhattan. Buildings with emergency generators could keep things powered up, but without steam for heating the buildings could not be kept fit for occupancy. Air conditioning can also be critical for occupancy. Air conditioning systems often (not always) use water-cooled cooling towers, which evaporate huge amounts of water to reject heat to the outdoors. An interruption in the water supply to the building means a loss of cooling and based on outdoor temperatures may mean the building quickly becomes unusable.

On a different facility in a hurricane prone area, keeping everything above the 500 year flood plain became a minimum requirement. In addition to flooding, hurricanes are also about high winds, broken glass, and driving rain. One of the simple planning strategies suggested by the chief medical examiner was locating all of the valuable lab instrumentation away from the exterior windows. It's a simple no cost strategy that builds in resiliency.

The set of solutions that make sense for you will be unique to your location, infrastructure, and the service standards that are expected by the community. Arriving at these solutions starts with a dialogue that brings together policy with operations and engineering. Good planning can prevent failures when something bad happens. Start prepping.

Lou Hartman (louh@crimelabdesign.com) is a Principal and Senior Mechanical Engineer with Crime Lab Design which provides full architectural and engineering services for forensic and medical examiner facilities worldwide.