

Medical University Earns High Marks for Low Country Lesson in Disaster Resistance

Charleston, SC: The City of Charleston is known for its genteel beauty, conveying images of horse-drawn carriages strolling along cobblestone streets, ancient oak trees clothed in evergreen Spanish moss, and corridors of antebellum homes with open-air porches all shielded by a sea wall, appropriately called The Battery.

While these images are of ease, cordiality and relative safety are what typically come to mind when thinking of Charleston, one must also consider the reality of the low-lying city's vulnerability to flooding. To this end, residents, business owners and community leaders are always looking for ways to mitigate that risk. The Medical University of South Carolina's (MUSC) Department of Risk Management is doing just that by building and implementing a Disaster-Resistant University Plan, funded by a \$75,000 Pre-Disaster Mitigation Grant (PDM) from the Federal Emergency Management Agency (FEMA). PDM grants are administered by the state and provide funding to implement hazard mitigation planning activities prior to a disaster.



Photo courtesy of Medical University of South Carolina

MUSC's new power plant upon completion

The MUSC plan takes into account vulnerabilities and strives to keep the campus community safe from the negative impact of hazards, particularly flooding. "It's looking at buildings on campus and ways to mitigate any areas for improvement," commented Jennifer Taylor, Assistant Director for Risk Management. "It's a way of figuring out what a building might need. It goes building-by-building and we essentially look at these buildings' weaknesses."

While evaluating their buildings and critical infrastructure, MUSC's Risk Management team made an important discovery – the hospital's generators, which supply the power for the entire campus, were 13 feet below sea level and in the 100 year floodplain. The 100-year flood has a 1% chance (1 in 100) of being equaled or exceeded in any given year. In the event of a power outage due to hurricane or severe storm, placement of generators in this high-risk zone meant potential loss of life for the hospital's most critical patients, and loss of employment for the academic medical center's 13,000 employees.

To remedy the situation, the team came up with the solution to build an energy plant on the back of the hospital, erecting a steel and concrete platform system on which the generators, and all auxiliary equipment, were relocated and elevated out of harm's way. "So every bit of emergency power in the hospital had to be transferred, and each individual circuit had to be moved over to the plant, one hospital unit at a time," said David Dement, Director of Facilities Maintenance, and a mechanical engineer. "Patient safety is clearly a top priority," added Dement. "But as a whole, the plan is also good for business continuity."

This effort began in 2012 and was completed in 2013. The energy plant took a year to build and the final transfer of seven generators, each the size of a tractor-trailer, took an estimated three months to relocate to their new location. "We can still flood in certain areas of the hospital," Dement said. "What this system does is provide us with the ability to maintain a certain level of operation, protect those patients that couldn't get out during a storm, and on top of that, it gives us capability of rapid recovery."

Although the university was put to the test by October 2015's Hurricane Joaquin-related storm surge and record rainfall, there were no interruptions of power or patient care. "The staff had to go on what's called an



'intermediate weather plan,' Taylor noted, "essentially ensuring that once they're here they have to stay here, because there are no staff to relieve them."

Even after the recent storm event, the Department of Risk Management continues to build on its mitigation plan, evaluating risks from both natural and man-made hazards. With risk analysis deemed central to future mitigation efforts, the Medical University of South Carolina serves as a shining example of the Disaster Resistant University. "After all," as Taylor noted, "We're called the Low country for a reason."