Emergency Management and Planning (EMAP)
About Us

Our mission is to advance the science of safety to address important threats and hazards where our clients live and work.
— Paul Orzeske, CEO

JENSEN HUGHES is a global leader in specialty engineering and consulting services. We are a company of engineers, consultants, and scientists focused on evaluating risks and developing the best, most cost-effective protection, and safety solutions. We offer extensive, practical experience through numerous projects, research, and industry innovation.

With over 1,200 engineers, scientists, and consultants located in more than 70 offices globally, we can provide the expertise you need anywhere in the world.
THE FOUR PHASES OF EMAP

In its narrowest sense, emergency management is the managerial function charged with creating the framework to reduce the risk of threats to facilities and coping with disasters. At JENSEN HUGHES, we take a broader view of EMAP.

FEMA defines EMAP as occurring in four phases:

+ Mitigation
+ Preparedness
+ Response
+ Recovery

Mitigation refers to the series of up-front activities that can be performed to either prevent or lessen the impact of an emergency event. It is important to understand the hazards posed by the materials or processes involved and then evaluate the impacts of the potential threats on initiating an emergency event.

Preparedness encompasses all activities related to preparing for emergency events, including establishing emergency procedures, training emergency response personnel, and performing table-top exercises to ensure effective coordination during an incident response.

Response includes actions taken by firefighting, law enforcement, hazmat, and facility personnel to save lives and protect property during an emergency event.

Recovery is the post-event phase that addresses the physical restoration of the impacted property and the return to normal business operations.
Putting our experience to work for the protection of your property and occupants.

Mitigation

Threat and Vulnerability Assessments
During the mitigation phase, the first step is to define the potential emergencies using a Threat and Vulnerability Assessment. Ideally, a facility would take an “all hazards” approach to this assessment, but sometimes the focus is limited to fire, security threats, or natural hazards individually.

JENSEN HUGHES conducts threat and vulnerability assessments to establish the design basis threats for a facility and the appropriate mitigation measures. Our experts provide comprehensive reports that include prioritized mitigation solutions with associated costs to serve as a benchmark for the creation of a security master plan.

Our experts have the capabilities to perform multiple engineering analyses that are aimed at quantifying the severity and risk of individual events and recommending mitigation measures to lessen the impact on life safety, and to the extent possible, impacts on property and business continuity.

Evacuation Modeling
- Evacuation modeling provides the capability of predicting occupant responses when subjected to smoke movement, visual cues such as wayfinding signage, and physical barriers, such as security gates and ticket kiosks.
- We can evaluate the impact of access restrictions (i.e., security barriers/checkpoints) as well as the impact of a wide range of events such as fires, bomb threats, and active shooter scenarios.

Blast Effects
- A blast analysis is performed to assess resistance to direct pressure effects and progressive collapse. Our analysis tools range from simple engineering methods to more complex analysis codes (e.g., LS-DYNA, ABAQUS).
- Our areas of expertise include detailed blast analysis, evaluation of facilities and buried utilities to blast effects, design of vehicle barriers and gates, missile impact, and design of blast and bullet-resistant facilities and enclosures.

Severe Weather
- JENSEN HUGHES helps facility owners evaluate existing structures for the best available refuge areas (BARAs) utilizing guidance from FEMA for designating shelter areas for occupants.
- We perform a structural analysis identifying key design elements in buildings that provide the greatest amount of protection, and in some cases, we have designed cost-effective retrofit modifications to bolster the structural capacity of the building.
- We develop strategies for communicating proper severe weather protocol.

Hazardous Materials
- Often facilities are insufficiently protected and the hazardous materials pose risks to life safety, property protection and business interruption. These risks can be minimized by properly characterizing hazards and providing adequate prevention and mitigation measures, which can range from administrative controls to active fire and explosion suppression.
- We assist facilities with each step of the process, including identification, documentation, current protection measures analysis, and design and implementation of supplemental protective measures.

Mass Notification Risk Assessment
- Enabling communication of the event to people so that they can safely evacuate is the end goal of a properly designed mass notification system.
- JENSEN HUGHES conducts the risk assessment required by NFPA 72, Chapter 24 to ensure that the mass notification system includes the best suited components to respond to the design basis threats established for the facility.
During the response phase, JENSEN HUGHES performs in a support role, as this phase is largely the responsibility of staff on-site, fire department and law enforcement personnel, and specialized emergency responders. Our experts have served on industrial and municipal fire departments, emergency response teams, and in emergency management roles, and are familiar with operations during catastrophic events.

As the event progresses, our experts can provide feedback as to the extent of developing hazards. We can assess the potential for explosions as a function of temperature and pressure conditions, the potential for fire spread, and risk posed by hazardous materials that may be involved.

We can also provide several valuable services post-event, incorporating our forensic teams and other subject matter experts to perform post-event reconstructions, root-cause analyses, and catastrophic response services.

**Preparedness**

The preparedness phase consists of two key steps: Development of the Emergency Response Plan, and Training based on that plan. Our experts provide consultation for emergency response plan development that includes emergency response team organization and training, pre-incident planning, developing programmatic and emergency action procedures, program evaluation, and capabilities assessments. JENSEN HUGHES’ team includes experienced engineers, former facility emergency managers, fire department personnel, and emergency responders skilled in the development of emergency response plans. We work with municipal and industrial operations groups, emergency response teams, and municipal fire departments to perform and document pre-incident planning.

Training is an important aspect of making sure facility personnel can respond to events. We can facilitate table-top training exercises and mock events to enhance the training. On-line coursework is available through JENSEN HUGHES Academy.

**Emergency Response Plans**

- JENSEN HUGHES ensures that a hazard and risk assessment has been performed to identify the threats for which response plans need to be developed. Standard operating procedures and emergency action procedures are developed to respond to each threat.
- Emergency response plans outline the necessary pre-incident planning actions and time critical actions that must be taken during the emergency event.
- Post-event planning may also be evaluated to determine the necessary actions to document and learn from the event as well as identify the resources needed for clean-up and recovery.

**Program Development**

- Our experts assist local emergency operations groups, response teams, and fire departments in evaluating staff organization, on-site and off-site response capabilities, programmatic procedures, and equipment needs.
- We review program elements for staff to implement and develop training requirements as necessary to ensure the success of the staff in meeting the goals of the program.

**Training**

- JENSEN HUGHES can develop customized training programs that will meet the specific needs of an organization.
- Our training programs are specific to each type of environment and include critical information on a variety of security topics including awareness, communication, incident response, emergency/crisis planning, business continuity, and risk assessment.
- Information is presented to the client using a variety of methods such as train-the-trainer, on-site and off-site class instruction, and on-line instruction utilizing our JENSEN HUGHES Academy platform.

**Drills and Exercises**

- Our staff are experienced in running a wide variety of drills and exercises to validate elements of the emergency planning process.
- We have the capability of running limited table-top exercises for emergency managers as well as full-scale exercises involving emergency responders.
- Our firm provides a full suite of data acquisition options.
Build your road to recovery on a solid foundation.

Catastrophic Recovery

Catastrophic Response and Recovery

Following a catastrophe, critical post-event activities include the catastrophic response actions aimed at facilitating recovery.

Our experts stand ready to assist you in assessing the impact of your catastrophic (CAT) event. We assess and evaluate business interruption, structural damage (caused by seismic forces, wind, hail, or snow loading), equipment damage (mechanical, electrical, or fire protection), and whether damage was pre-existing or caused by wind, storm surge / flood, or seismic damage. Our team is on the ground collecting data, documenting physical evidence, and coordinating repair and remediation work through all phases of disaster recovery.

JENSEN HUGHES professionals are licensed in nearly every State and Province throughout the United States and Canada, to ensure timely responses during a CAT event. When disaster strikes, a timely response is critical. Our experts are available 24/7 and have responded to hundreds of storm events, earthquakes, tsunamis, tornados, hail storms, wildland fires, and other natural disasters world-wide.

Structural Damage Assessments

+ JENSEN HUGHES helps facility owners and insurance carriers determine whether it is safe to use a structure after a significant event and how to repair relevant damage.
+ Our team of civil and structural engineers, architects, historic preservationists, and other experts assess the extent of damage and assist with future seismic mitigation to bring structures and equipment up to code and help limit future issues. We can determine feasibility, scope, the estimated cost of repairs and monitor construction progress.

Wind vs Surge / Flood Damage Determination

+ Determining the root cause of reported damage provides key information to facilitate the path to repair and recovery. Catastrophe response support includes an experienced and efficient analysis of the root cause of reported damage to distinguish between wind damage and water damage.
+ This task can be dauntingly complex, demanding expertise in structural engineering, historic building codes, construction practices, wind forces, and water/wave forces. Our staff has performed hundreds of wind vs surge or flood damage assessments and given presentations at various conferences on the topic.

Pre-existing vs Storm Damage Determinations

+ Understanding whether reported damage on any structure or piece of equipment requires a consistent approach and experience in a broad range of areas.
+ Our team reviews available evidence and determine the timeline and root cause of issues.
+ We have experience in this area, whether it's leveraging a meteorologist to model a weather event, a civil engineer evaluating suspected hail damage, or a structural engineer inspecting a tree strike.

Post-Event Mitigation

+ JENSEN HUGHES is uniquely positioned to help evaluate options and get back to business as usual after a severe or catastrophic event.
+ Following the event, our seasoned team of experts evaluate and recommend next steps to mitigate downtime, business interruption and costs. Examples of mitigation services include determining whether to recommend the repair of a structure or a tear down, understanding the code implications of all options, and evaluating whether storm-damaged equipment be safely reused or repaired.

Wildland Fire Investigations

+ We investigate wildland and urban interface fires, from duff to trees, shrubs, grass and dense forests. Our investigations range in scale from a single acre to thousands of acres.
+ Our experts can isolate an area of origin based on fire damage indicators, and determine causal factors based on remaining evidence.
Project Experience

Rutgers University
New Brunswick, NJ, USA

JENSEN HUGHES provided evacuation modeling services to evaluate the emergency evacuation of the Rutgers football stadium (Highpoint Solutions Stadium) and basketball arena (Louis Brown Athletic Center). Both facilities comply with the building codes governing their design and construction. However, given the demand for heightened security, the susceptibility of stadium / arena events to terror threats, possible blocked means of egress during an emergency, and the need to prioritize the public’s safety when using these facilities, the University authorized the Emergency Egress Studies to be completed. Occupant evacuation and / or relocation was evaluated for several different scenarios, including:

- Active shooter
- Bomb threat
- Extreme weather
- Loss of power

The modeling was intended to inform Rutgers University facilities management, police, and emergency responders about potential variations in egress time and to evaluate improvements that could be made to existing conditions. This project included the following aspects of the scope of work:

- Survey of the building and grounds
- 2D and 3D computer modeling
- Population calculations
- Video and real-time analysis of occupant movement
- Training on the evacuation modeling program

Model scenarios evaluated loss of exits due to the conditions of an event and resulting areas of high congestion. Model scenarios were run to simulate the impact of operational improvements, occupant notification, and wayfinding to evaluate which improvements would be recommended for capital expenditure.

Pentagon Shield
Washington, DC, USA

As part of the overall Pentagon Shield program, JENSEN HUGHES developed a model of the Pentagon building and immediate Pentagon Reservation to model a wide variety of scenarios, including evacuation during fire events, active shooter events, and aircraft impact scenarios. A stand-alone version of the model was developed that operated in a real-time mode to predict optimum routing of occupants during an emergency event using dynamic egress signage.

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Over the course of the multi-year project, we recorded observations of occupant fire drills and viewed security videos to calibrate the model. Our staff also employed the unique approach of “shadowing” individual occupants from the moment they left their offices in the building until they reached their designated rallying point at the exterior of the building to record individual variations in behavior at various decision points during exiting.

Our responsibilities included developing performance criteria for the proposed dynamic egress signage systems and evaluating manufacturer hardware. We developed concept designs, a prototype installation installed at the building, and worked on procedures for using lighting to improve exiting in emergency events.
JENSEN HUGHES worked directly for Harvard Planning and Project Management to evaluate the hazardous material loads for numerous principal investigators moving to the new Allston campus. Chemical inventories were quantified and integrated into the programming to ensure that the building’s design appropriately allocated space (and the associated chemical loads) for each user.

Harvard University, Allston Science & Engineering Complex
Cambridge, MA, USA

JENSEN HUGHES worked with the Town of Grafton (Massachusetts) to develop and implement emergency response procedures for various hypothetical fire, explosion and security scenarios associated with a new liquefied propane gas (LPG) rail/truck transfer and storage station.

Grafton and Upton Railroad Liquefied Propane Gas (LPG) Terminal, Grafton, MA, USA

Our firm was engaged to provide forensic evaluation of a fire that occurred within a laboratory fume hood. Our evaluation identified deficiencies in the operational controls (including operator training) and with the equipment used to process hazardous materials.

Confidential Laboratory Client

In this capacity, we designed the primary and secondary alarm stations to withstand:

- Bomb blasts
- Vehicle impacts
- Tactical forces armed with 50mm rounds

We created a prescreening personnel access station designed to detect small amounts of concealed explosives. We were also responsible for the protective design of the emergency power system, starting with the new security emergency diesel generator facility building. Our firm held complete design responsibilities of the entire detection, CCTV and alarm system throughout the site.

Palo Verde Nuclear Site
Tonopah, AZ, USA

JENSEN HUGHES undertook the entire security design for the Palo Verde nuclear site. The project involved perimeter control that might be vulnerable to malevolent blast or gate ramming as a means of gaining access to protection of buildings, as well as protective design for selected vital equipment and buildings from the effects of blast and ballistic ordinance.

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JENSEN HUGHES performed an assessment of the Grand Lucayan Resort on Grand Bahamas Island.

Twenty-one zones (including buildings, swimming pools and infrastructure) were included in the assessment with a focus on the damage caused in October 2016 by Hurricane Matthew. The buildings throughout the Grand Lucayan Resort sustained cosmetic and structural damage to the roofs, envelopes, and structural systems.

All zones were assessed in accordance with ASTM E 2018 “Standard Guide for Property Conditions Assessments” for:

+ Architectural
+ Structural
+ MEP
+ Life Safety

A team of three assessors mobilized on short notice to validate previous assessments performed by others. Other reports reviewed in preparation for our survey detailed numerous cosmetic envelope issues. They did not, however, focus on items that would be considered structural in nature. We began our summary with a discussion of these as they represented considerable potential costs regarding repairs or replacement.

This project included the following aspects of the scope of work:

+ Facilities Condition Assessment
+ Third Party Peer Review
+ Pre-Existing vs Storm Damage Determinations
+ Post Event Mitigation
+ Assessment Report
+ Repair and Remediation Recommendations

The result of our survey, completed under the extremely restricted time frame of two weeks, was the identification of numerous issues that were in need of replacement or repair, that were not noted in previous reports by others.
Our firm performed fire safety inspections for over 1,500 garment factories in Bangladesh in support of the Accord for Bangladesh Fire and Building Safety. We identified major life safety deficiencies and fire safety hazards in the factories based on recognized standards and developed appropriate recommendations for corrective actions. JENSEN HUGHES has worked with the Accord to provide follow-up inspections to confirm proper implementation of upgrades, assisted with commissioning of fire safety systems, and training of local staff to continue remediation efforts.

We were responsible for scheduling of all fire safety (and electrical) inspections, report generation including full, summary and Bengali translated reports, coordination with factory management, all travel, local transportation, housing and office accommodations, meetings with Accord, government and factory representatives, and addressing questions and comments regarding the inspection reports.

JENSEN HUGHES worked with an expert team for a high winds analysis for WUSTL. The project took place from December 2015 to July 2017. Our firm designated severe weather refuge areas in the event of a high winds event. We assessed the vulnerability of selected buildings on the university campus to every weather event. Our team of experts also identified all locations, if any, within campus buildings which could be designated as the safest area(s) of refuge during a tornado/severe weather/wind event.

The final deliverables included a series of drawings and map files (using both AutoCAD and ArcGIS) which were then used by the client to create emergency maps throughout the campus. A report was also provided to the client summarizing the areas designated areas of refuge.

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JENSEN HUGHES provided the Census Bureau with a comprehensive ‘Situational Awareness’ tool that included evacuation, shelter-in-place, and response plans, as well as decision scenarios. Other MNS elements included:

- Wide area exterior paging systems
- Expansion of the voice evacuation system
- Improvements to the radio-controlled paging systems on and off campus
- The ability to launch digital voice and text messages

In addition to Emergency Preparedness Services, our firm also provided fire protection engineering and code consulting services for the design team. We performed an engineering study regarding the use of exterior wood sun screening and its potential fire hazard to the building.

Located in a 1.5 million square foot, boomerang-shaped office building, the Bureau's headquarters contains a credit union, medical offices, a gymnasium, and 1 million square feet of parking on campus for its 6,000 plus employees. The eight-story building is Silver LEED Certified and is located on the Suitland Federal Center Campus.

The Bureau’s campus-wide mass notification system (MNS) reduces the risk of mass casualties by providing a timely means to notify building occupants, visitors or service personnel of threats and instruct them how to respond.

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Contact us for your evaluation

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