IS-554

FEMA

Emergency Planning for Public Works

TOOL KIT

FEDERAL EMERGENCY MANAGEMENT AGENCY
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Table of Contents

NOTE:

FEMA EMI has provided these resources to provide information that may be of interest to individuals working to develop emergency planning for public works.

EMI does not guarantee that external websites and non-government documents linked in this Toolkit comply with the accessibility requirements of Section 508 of the Rehabilitation Act.

This Toolkit may contain URLs that were valid when originally published, but now link to sites or pages that no longer exist.

This Toolkit is still in development. If you would like to contribute, please send your input, sample documents, forms, and plans (with written permission) to kholt@c2ti.com.

Resources

While not an all-inclusive list, the following websites will help when conducting emergency planning for your agency.

Lesson 1: Introduction to Emergency Planning

- National Incident Management System (NIMS) Resource Center
  https://www.fema.gov/national-incident-management-system
- Resource Management and Mutual Aid (NIMS Resource Center)
  https://www.fema.gov/resource-management-mutual-aid
- National Response Framework (NRF) Resource Center
  https://www.fema.gov/media-library/assets/documents/32230
- NIMS Typed Resource Definitions
  http://www.fema.gov/pdf/emergency/nims/508-7_public_works_resources.pdf
- FEMA's Emergency Management Institute (EMI) Independent Study (IS) Courses
  http://training.fema.gov/IS/crslist.asp

  The following courses are recommended for public works personnel:

  - IS-552 *The Public Works Role in Emergency Management*
  - IS-556 *Damage Assessment for Public Works*
  - IS-558 *Public Works and Disaster Recovery*
  - IS-700.a *NIMS, An Introduction*
  - IS-800.b *NRF, An Introduction*
  - IS-803 *Emergency Support Function (ESF) #3 Public Works and Engineering*
  - IS-100.PWb *Introduction to the Incident Command System (ICS) for Public Works*
  - IS-200.b *ICS for Single Resources and Initial Action Incidents*
- APWA Resource Center
  http://www3.apwa.net/ResourceCenter/Category/Emergency-Management

Lesson 2: Establishing a Planning Team

- ICS Resource Center
  http://training.fema.gov/EMIWeb/IS/ICSResource/index.htm
- NIMS Multiagency Coordination Systems
  https://www.fema.gov/nims-frequently-asked-questions has information on MACS

Lesson 3: Hazard Analysis

- HAZUS-MH
  https://www.fema.gov/hazus-mh-tools
- Geographic Information Systems (GIS)
  https://www.fema.gov/geographic-information-systems-data
- National Infrastructure Protection Plan (NIPP)
  https://www.dhs.gov/national-infrastructure-protection-plan
- NRF Critical Infrastructure and Key Resources (CIKR) Support Annex
  http://www.fema.gov/pdf/emergency/nrf/nrf-support-cikr.pdf
- FEMA Library http://www.fema.gov/library/index.jsp
  - Mitigation Planning How-To Guide #2 (Publication 386-2)
    https://www.fema.gov/media-library/assets/documents/4241?id=1880

Lesson 4: Plan Preparation and Development

- FEMA's E/G-202, Debris Management Course. To see the schedule for the E0202 offered at EMI, go to: https://training.fema.gov/emicourses/schedules.aspx

  To apply for the E0202, go to this site to download a screen fillable application:
  https://training.fema.gov/apply/

  Check with your State Training Officer for availability of the G0202 course in your area:
  https://training.fema.gov/programs/aps/stolist.aspx
- FEMA Library, Mitigation Planning How-To Guide #1 (Publication 386-1)
  http://www.fema.gov/library/viewRecord.do?fromSearch=fromsearch&id=1867

Lesson 5: Implementation and Maintenance

- Homeland Security Exercise and Evaluation Program (HSEEP) https://hseep.dhs.gov/
- FEMA EMI Exercise Development Independent Study Courses
  http://training.fema.gov/IS/crslist.asp
  - IS-120.a *An Introduction to Exercises*
  - IS-130 *Exercise Evaluation and Improvement Planning*
  - IS-139, *Exercise Design*
  - IS-860.a *National Infrastructure Protection Plan (NIPP)*
  - IS-821 *Critical Infrastructure and Key Resources Support Annex*
- Other Training Opportunities from EMI
  - E/L/G-146 or MGT-330, *HSEEP* Training Course and/or E147 *HSEEP Train-the-Trainer* (TTT) Check with your State Training Officer for availability in your area:
    http://www.fema.gov/about/contact/statedr.shtm or download the EMI Course Schedule:
    http://www.training.fema.gov/EMICourses/
  - Master Exercise Practitioner Program (MEPP) http://training.fema.gov/emiweb/emiopt.asp

- Other Resources
  - FEMA's Lessons Learned Information Sharing (LLIS) site
    https://www.fema.gov/media-library/assets/documents/104192
  - American Public Works Association (APWA)
    http://www.apwa.net/
  - Solid Waste Association of North America (SWANA)
    http://www.swana.org/

Sample Public Works Emergency Operations Plan

This section contains the following sample forms and documents:

- Emergency Operations Plan for Charleston County, including Public Works and Engineering Emergency Support Functions

These documents are in addition to the ones referenced in the Resource Links section of this lesson. They can be adapted to fit the needs of your community for inclusion in your public works emergency plan.

CHARLESTON COUNTY GOVERNMENT

2011 EMERGENCY OPERATIONS PLAN

CHARLESTON COUNTY
SOUTH CAROLINA

EMERGENCY MANAGEMENT DEPARTMENT

TABLE OF CONTENTS

ESF-3 – PUBLIC WORKS AND ENGINEERING SERVICES

PRIMARY: Charleston County Public Works Department (PWD)

SUPPORT: Charleston County Solid Waste, Municipal PWDs, Mt. Pleasant Water Works, Charleston Water System, SC Department of Transportation (SCDOT), North Charleston Sewer District, St. Johns Water Company, Isle of Palms Water and Sewer, Folly Beach Public Works, Sullivan"s Island Water and Sewer, Kiawah Island Utilities, Seabrook Utilities, SC DHEC-Environmental Quality Control

I. INTRODUCTION

Public Works, for purposes of this ESF, refers to water and sewer services, including an emergency supply of potable water, temporary restoration of water supply systems, and providing water for firefighting. Engineering activities include emergency ice, snow and debris removal; technical expertise regarding the structural safety of damaged bridges and highways.

II. MISSION

A. To establish policy, procedures, and priorities for the control and restoration of transportation infrastructure, water resources, and sewer facilities and to provide for coordinating immediate and continued engineering resources, construction management, emergency contracting, and expertise following a disaster.

B. To provide an accurate assessment of damages, losses, and expenditures resulting from an emergency or disaster in order to determine the need for state and/or federal assistance and to conduct safety evaluations to protect the public health and welfare.

III. CONCEPT OF OPERATIONS

A. The Charleston County Public Works Director is responsible for the coordination of all ESF-3 administrative, management, planning, training, preparedness, mitigation, response, and recovery activities to include developing, coordinating, and maintaining the ESF-3 SOP. All ESF-3 supporting agencies will assist the Public Works Department in the planning and execution of the above. The Public Works Director will appoint the Public Works Service Group Supervisor(s).

B. The Public Works Service Group Supervisor has the overall responsibility for EOC mission assignments and coordination with the available engineering and construction resources in the county.

C. Coordination with all supporting and other appropriate departments /agencies and organizations will be performed to ensure continual operational readiness. Each Support Agency"s directors of Public Works or Engineering groups is primarily responsible for engineering operations within the limits of their jurisdiction. ESF-12 (Energy & Telecommunications) will coordinate with utility providers.

D. The combined agencies engineering resources should be considered by the Public Works Service Group Supervisor. They could become an integral part of the Public Works Service resources available for employment in the public interest, with due regard to respective agency needs. All forces will remain under their normal chain of command.

E. State forces used in support of this ESF will be committed on a mission type basis through the EOC.

F. County Public Works Department resources, when available, will support the South Carolina DOT operations, and the other contact/support agencies on a mission type basis through the EOC.

G. Public Works and Engineering Services

1 The Department of Health and Environmental Control will provide overall guidance concerning water supply matters and will provide guidance for sewage treatment and disposal.

2 The Department of Transportation will provide overall guidance concerning structural safety of SC DOT damaged bridges and roads and will provide guidance for the restoration of the transportation infrastructure.

3 ESF-3 will coordinate with SCEMD and other ESF-3 support agencies to assist in providing the restoration of water and sewer services, debris management, water (potable and non-potable) and ice supplies, and engineering activities as required.

4 ESF-3 will cooperate and coordinate with other ESFs to ensure that County and Municipal assets are deployed effectively and in response to appropriate priorities for the protection of the health, safety, and welfare of county citizens.

H. All ESF-3 personnel will be trained on the principles of the National Incident Management System (NIMS) and integrate those principles into all ESF-3 planning and response operations.

IV. ESF ACTIONS

The emergency operations necessary for the performance of the Public Works and Engineering Services function include but are not limited to:.

A. Preparedness/Mitigation

1. General

a. The Primary agency will be responsible for coordination with the support agencies. The individual support agencies will be responsible for their assigned items.

b. Participate in state exercises and conduct, at least annually, an ESF3 exercise to validate this annex and supporting SOPs.

c. Ensure all ESF-3 personnel integrate NIMS principles in all planning. As a minimum, primary action officers for all ESF-3 agencies will complete FEMA"s NIMS Awareness Course, or an equivalent course.

2. Public Works and Engineering

a. Develop and maintain procedures to implement this plan. (Maintained under separate cover)

b. Coordinate those procedures jointly affecting city/county disaster operations with each municipality PWD Director or ESF-3 representative.

c. Through coordination with the Charleston County EMD, maintain resource lists, engineering/public works assignments, and alert lists.

d. Establish operational needs for restoration of public works service during the emergency.

e. Maintain formal agreements and/or working relationships with city, state and federal agencies having mutual engineering /public works emergency responsibilities as necessary.

f. Plan engineering, contracting, and procurement assistance for emergency debris, snow or ice clearance, demolition, public works repair, and water supply, and sewer missions.

g. Coordinate with municipal, county and state agencies in the development and maintenance of a priority restoration list of all essential facilities and utilities.

h. Through coordination with EMD, develop and participate in training and periodic drills and exercises for the engineering/ public works service. And train sufficient staff in the use of WEBEOC.

i. In conjunction with ESF-19 (Military Support), plan for use of state military resources to support ESF-3 operations.

3. Water and Sewer Facilities

a. Plan for the provision of water (potable and non-potable) into the disaster area if local supplies become inadequate.

b. In coordination with the local emergency management officials, develop policy for conservation, distribution and use of potable and firefighting water.

c. Identify and locate chemicals to maintain portability of water supply.

d. Include in their individual Standard Operating Guides and Plans an alerting list, to include points-of-contact and telephone numbers, of agencies, counties, municipalities and organizations supporting public works and engineering functions.

e. Maintain a current inventory of equipment and supplies, to include points-of-contact and telephone numbers, required to sustain emergency operations, including emergency power generators.

f. Develop and maintain listings of commercial and industrial suppliers of services and products, to include points-of-contact and telephone numbers, associated with public works and engineering functions.

B. Response

1. Public Works and Engineering

a. Evaluate available information concerning the nature and extent of the disaster situation and establish a program based on priority lists for the restoration of essential facilities and utilities.

b. Establish priorities to clear roads and disposal of debris.

c. Assist in establishing priorities to repair damaged water/sewer systems and coordinate the provision of temporary, alternate or interim sources of emergency power and water/sewer services.

d. Procure equipment, specialized labor, and transportation to repair or restore public works systems.

e. Coordinate with ESF-19 (Military Support) for use of state military assets.

f. Coordinate with ESF-17 (Animal Services) for advice and assistance regarding disposal of debris containing or consisting of animal carcasses that may pose a risk to public health.

g. Coordinate with ESF-10 (Hazmat) for advice and assistance regarding disposal of hazardous materials.

h. Coordinate with ESF-9 (Search and rescue) for advice and assistance regarding support to Search and Rescue Operations.

i. Coordinate with ESF-4 (Fire Fighting) for advice and assistance regarding firefighting water supply.

j. Maintain labor, equipment and materials forms used for possible reimbursement, if authorized.

2. Water and Sewer Facilities

a. Establish priorities to repair damaged water/sewer systems and coordinate the provision of temporary, alternate or interim sources of emergency power and water/sewer services.

b. Evaluate available information concerning the nature and extent of the disaster situation and establish a program based on priority lists, for the restoration of essential facilities and utilities.

c. Based on available information establish priorities, determine manpower and equipment requirements for the particular incident.

d. Coordinate with ESF-4 (Fire Fighting) for advice and assistance regarding firefighting water supply

e. Maintain labor, equipment and materials forms used for possible reimbursement, if authorized

C. Recovery

1. Anticipate and plan for arrival of and coordination with FEMA ESF-3 personnel in the County EOC.

2. Maintain coordination with all supporting agencies and organizations on operational priorities for emergency repair and restoration of critical infrastructure. Coordinate, as needed, for debris management operations on public and private property (where authorized).

3. Continue to monitor restoration operations when and where needed as long as necessary and until all services have been restored.

4. Continue to direct Public Works Department operations.

5. Through coordination with Charleston County EOC, develop long range recovery operations and establish priority of tasks to be accomplished.

6. Develop a stand-down plan for appropriate levels of operations.

7. Provide after action reports, SITREPs, and other documentation as required and evaluate changes to improve operational SOPs.

8. Participate in CISD and other debriefings.

9. Attend critiques as may be held and submit updates for implementation into SOP as may be applicable.

10. Ensure that ESF-3 team members, their agencies, or other tasked organizations, maintain appropriate records of time and costs incurred during the event.

V. RESPONSIBILITIES

A. General: All ESF-3 primary and support agencies must maintain inventories and procedures to deploy their agency's public works and engineering assets.

B. Charleston County Public Works Department

1. The coordination of all ESF-3 administrative, management, planning, training, preparedness/mitigation, response and recovery activities.

2. Identify, train, and assign personnel to staff ESF-3 in the EOC.

3. Notify all ESF-3 supporting agencies upon activation.

4. Provide all available public works and engineering assets.

C. Charleston County Environmental Management

1. Identify, train, and assign personnel to staff ESF-3 during periods of activation.

2. Provide all available Solid Waste assets.

3. Facilitate temporary burn sites and disposal location in coordination with DHEC and or other agencies as required.

D. Municipal Public Works Departments,

1. Identify, train, and assign personnel to staff ESF-3 during periods of activation.

2. Identify and locate chemicals to maintain portability of water supply.

3. Include in their individual Standard Operating Guides and Plans an alerting list, to include points-of-contact and telephone numbers, of agencies, counties, municipalities and organizations supporting public works and engineering functions.

4. Maintain a current inventory of equipment and supplies, to include points-of-contact and telephone numbers, required to sustain emergency operations, including emergency power generators.

5. Develop and maintain listings of commercial and industrial suppliers of services and products, to include points-of-contact and telephone numbers, associated with public works and engineering functions.

6. Provide all available public works and engineering assets

E. Public and Private Water and Sewer facilities

1. Identify, train, and assign personnel to staff ESF-3 during periods of activation.

2. Identify and locate chemicals to maintain portability of water supply.

3. Include in their individual Standard Operating Guides and Plans an alerting list, to include points-of-contact and telephone numbers, of agencies, counties, municipalities and organizations supporting public works and engineering functions.

4. Maintain a current inventory of equipment and supplies, to include points-of-contact and telephone numbers, required to sustain emergency operations, including emergency power generators.

5. Develop and maintain listings of commercial and industrial suppliers of services and products, to include points-of-contact and telephone numbers, associated with public works and engineering functions.

6. Provide all available public works and engineering assets

7. Provide personnel for water testing.

F. SC Department of Transportation (DOT)

1. Identify, train, and assign personnel to maintain contact with and prepare to execute missions in support of ESF-3 during periods of activation.

2. Identify and locate chemicals to maintain portability of water supply.

3. Include in their individual Standard Operating Guides and Plans and alerting list, to include points-of-contact and telephone numbers, of agencies, counties,

municipalities and organizations supporting public works and engineering functions.

4. Maintain a current inventory of equipment and supplies, to include points-of-contact and telephone numbers, required to sustain emergency operations, including emergency power generators.

5. Develop and maintain listings of commercial and industrial suppliers of services and products, to include points-of-contact and telephone numbers, associated with public works and engineering functions.

6. Provide all available public works and engineering assets.

7. Provide legal assistance including eminent domain and emergency demolition or stabilization of damaged structures and facilities.

G. SC DHEC-Environmental Quality Control

1. Identify, train, and assign personnel to maintain contact with and prepare to execute missions in support of ESF-3 during periods of activation.

2. Provide emergency survey, surveillance, sampling, testing, and monitoring of water and sewage pumping, treatment, distribution, and collection systems to ensure public health and safety integrity of such systems.

3. Provide technical assistance concerning the disposal of waste materials, including household hazardous waste and debris containing or consisting of animal carcasses that may pose a risk to public health.

VI. LOCAL, STATE, AND FEDERAL INTERFACE

A. ESF-3 (Public Works and Engineering) supports Charleston County following a disaster. The SC Budget and Control Board, Office of General Services is the lead state agency and the United States Army Corps of Engineers (USACOE) is the lead federal agency to coordinate support regarding public works issues/needs and a full range of emergency engineering services.

B. Local ESF-3 will coordinate with State ESF-3 that will coordinate with Federal ESF-3 to obtain federal assistance as required.

C. Where practical, ESF-12 (Energy and Telecommunications) will assist ESF-3 with the interface of appropriate utility company representatives assigned to recovery operations.

Sample Hazard Analysis Forms

This section contains the following sample forms and documents:

- Hazard Vulnerability Matrix
- Hazard Vulnerability Assessment Spreadsheet
- Risk Index Worksheet for Comparing and Prioritizing Risks
- Hazard Profile Worksheet
- Community Exposure Profile
- Loss Estimation Form

These forms and documents are in addition to the ones referenced in the Resource Links section of this lesson. They can be adapted to fit the needs of your community for inclusion in your public works emergency plan.

Hazard Vulnerability Matrix

Hazard	Probability	Impact	Frequency	Distribution
List specific hazards which could occur in your community. Include natural hazards as well as adversarial or human-caused hazards.	High Moderate Low None	Major Minor None	50 years 10 years 5-10 years 2-3 years every year several times per year	Regional County-wide Localized N/A

Hazard Vulnerability Matrix – Completed Example

Hazard	Probability	Impact	Frequency	Distribution
List specific hazards which could occur in your community. Include natural hazards as well as adversarial or human-caused hazards.	High Moderate Low None	Major Minor None	50 years 10 years 5-10 years 2-3 years every year several times per year	Regional County-wide Localized N/A
Civil Disturbance	Low	Minor	50 years	Localized
Communications Failure	Medium	Minor	10 years	Regional
Drought	Low	Minor	50 years	Regional
Earthquake	None	None	N/A	N/A
Epidemic	Medium	Major	50 years	Regional
Fire	Low	Minor	10 years	Localized
Flooding	Medium	Major	5-10 years	County-wide
Gas Leak	Low	Minor	50 years	Localized
Hazardous Material Spill	Low	Minor	50 years	Localized
Hurricane	Medium	Major	50 years	County-wide
Ice Storm	Low	Minor	50 years	County-wide
Landslide	None	None	N/A	N/A
Plane/Train/Auto Crash	Low	Minor	10 years	Localized
Terrorism	Low	Minor	50 years	County-wide
Tornado	Low	Minor	10 years	County-wide
Tropical Storm	Medium	Minor	10 years	County-wide
Tsunami	None	None	N/A	N/A
Water Pipe Break	Medium	Minor	10 years	Localized
Wildfire	Low	Minor	50 years	Localized
Work Stoppage	Low	Minor	50 years	Localized

Note: This is not a comprehensive list of hazards. Be sure to identify and list hazards that could affect your community.

Hazard Vulnerability Assessment Spreadsheet

Location/Facility:
Date Completed:
Completed by:

This table has been adapted from a Microsoft Excel spreadsheet for inclusion in this Toolkit as an example of a system your community could implement. Scoring instructions are included after the table.

Type of Hazard	Historical Occurrence	Prob. of Occurrence	Human Impact	Property Impact	Business Impact	Mitigation Activities	Internal Resources	External Resources	Total
Civil Disturbance*									
Communications Failure									
Coastal Oil Spill*									
Computer Crime/Virus/ Software Failure									
Drought*									
Epidemic									
Fire: Brush & Forest*									
Fire: Structural									
Flooding: Short Duration *									
Flooding: Freshwater*									
Flooding: Drainage*									
Flooding: Coastal Tidal*									
Freeze*									
Gas Leak									
Hazardous Material Spills: *									
a. Roadways *									
b. Air*									
d. Pipeline*									
e. Rail Systems*									
Hurricanes*									

Type of Hazard	Historical Occurrence	Prob. of Occurrence	Human Impact	Property Impact	Business Impact	Mitigation Activities	Internal Resources	External Resources	Total
Lightning									
Mass Immigration*									
Military Conflict									
Plane/Train/Auto Crash									
Power Failure									
Severe Weather/Storms *									
Sinkholes/ Subsidence*									
Terrorism									
Theft/Vandalism									
Thunderstorm									
Tornado*									
Tropical Storm *									
Water Pipe Break									
Weapons of Mass Destruction: Chemical/ Biological/Nuclear									
Wildfires									
Workplace Violence									
Work Stoppage									

Analysis Results: High Risk: Greater than 3.5 Medium Risk: 2.0 to 3.5 Low Risk: Less than 2

*** Hazards of Concern as per HVA**

Adapted from Manatee County Florida's Hazard Vulnerability Analysis

Hazard Vulnerability Assessment Spreadsheet– Completed Example

Location/Facility: Manatee County
Date Completed: 01/05/11
Completed by: EM

This table has been adapted from a Microsoft Excel spreadsheet for inclusion in this Toolkit as an example of a system your community could implement. Scoring instructions are included after the table.

Type of Hazard	Historical Occurrence	Prob. of Occurrence	Human Impact	Property Impact	Business Impact	Mitigation Activities	Internal Resources	External Resources	Total
Civil Disturbance*	1	1	1	1	1	3	3	3	0.3
Communications Failure	3	2	3	1	3	3	3	4	2.0
Coastal Oil Spill*	1	1	1	2	2	2	1	3	1.1
Computer Crime/Virus/ Software Failure	1	1	1	3	3	3	3	3	1.2
Drought*	1	1	2	3	3	3	2	3	1.6
Epidemic	1	2	3	3	3	3	3	4	2.0
Fire: Brush & Forest*	2	2	2	3	2	4	4	4	1.6
Fire: Structural	1	1	3	3	3	4	4	4	1.3
Flooding: Short Duration *	4	4	3	2	2	3	3	3	3.2
Flooding: Freshwater*	4	4	2	2	3	3	3	3	3.2
Flooding: Drainage*	3	3	2	2	2	4	3	3	2.2
Flooding: Coastal Tidal*	1	2	4	4	4	4	3	4	2.6
Freeze*	1	1	1	2	2	2	2	3	1.0
Gas Leak	1	1	2	2	2	3	3	3	1.0
Hazardous Material Spills: *									0.0
a. Roadways *	2	3	1	2	1	3	2	4	1.7
b. Air*	1	1	3	1	3	3	2	4	1.2
d. Pipeline*	1	1	2	1	2	3	3	4	0.7
e. Rail Systems*	1	1	2	1	1	2	3	4	0.6

Type of Hazard	Historical Occurrence	Prob. of Occurrence	Human Impact	Property Impact	Business Impact	Mitigation Activities	Internal Resources	External Resources	Total
Hurricanes*	1	2	4	4	4	3	3	3	2.8
Lightning	4	4	3	1	1	3	3	4	2.7
Mass Immigration*	1	1	2	1	1	3	4	4	0.3
Military Conflict	1	1	1	1	1	1	3	5	0.3
Plane/Train/Auto Crash	2	2	2	2	2	3	3	5	1.4
Power Failure	2	2	2	1	2	4	3	5	1.1
Severe Weather/Storms *	3	3	2	2	2	3	3	4	2.2
Sinkholes/ Subsidence*	1	1	1	1	1	1	1	1	1.0
Terrorism	1	1	3	2	2	4	3	5	0.9
Theft/Vandalism	2	2	3	3	3	4	4	4	2.0
Thunderstorm	3	3	1	1	1	3	3	4	1.6
Tornado*	2	2	3	3	2	4	4	4	1.8
Tropical Storm *	2	3	3	3	3	3	4	4	2.6
Water Pipe Break	3	3	2	2	2	3	3	3	2.3
Weapons of Mass Destruction: Chemical/ Biological/Nuclear	1	2	4	3	3	4	3	5	2.0
Wildfires	2	2	3	3	2	4	4	4	1.8
Workplace Violence	1	1	2	1	2	3	3	3	0.8
Work Stoppage	1	1	2	1	3	1	1	1	1.7

Analysis Results: High Risk: Greater than 3.5 Medium Risk: 2.0 to 3.5 Low Risk: Less than 2

*** Hazards of Concern as per HVA**

Adapted from Manatee County Florida's Hazard Vulnerability Analysis

Instructions for Using the Spreadsheet

The All Hands COOP Risk Assessment tool is an Excel spreadsheet, which is designed to measure a facility's risk from the effects of various hazards. The tool is based on a formula that weighs the probability and severity of potential impacts against preparations in place which are intended to minimize these impacts. Using a simple 1 to 5 scale, the probability of occurrence and the impact potential are tabulated along with mitigation efforts and the resources available to respond to the hazard. The score is based on a formula that weighs risk heavily but provides credit for mitigation and response and recovery resources. The higher the score, the higher the facility's risk from the hazard.

Instructions:

1. Obtain and review a copy of the county's Hazard Vulnerability Analysis (HVA.)
2. Add or delete hazards as required based on your local HVA analysis.
3. Using the guidelines shown below, score each hazard in all columns based on a scale of 1 to 5 with 5 being the highest.
4. Final Step: Sort the Total Column in descending order once scoring is completed.

Scoring Guidelines:

There are eight risk assessment factors contained in the spreadsheet. All factor scoring is done on a scale of 1-5. The formula contained in the spreadsheet calculates higher scores in the occurrence and impact columns as increasing risks, while higher scores in the mitigation and resource categories lower the overall risk score giving credit for steps taken to reduce the likely impact. Base your scoring on a "worst-case scenario." The following guidelines will assist you in scoring each hazard.

Historical Occurrence (Frequency):

Based on the number of occurrences: At least one occurrence every 1-4 years = 5; At least one occurrence every 5-10 years = 4; At least one occurrence every 11-50 years = 3; At least one occurrence every 51-100 years = 2; Has not occurred, but for planning purposes should be evaluated = 1.

Probability of Occurrence:

Based on the statistical probability of the hazard occurring in a given year. This may be obtained by scientific research or may simply be an educated guess. The higher the probability, the higher the score. Use the following guideline in determining you score. If less than 5% score 1, if 5% to 10% score 2, if 10% to 20% score 3, if 20% to 40% score 4, and score 5 if greater than 40% probability.

Human Impact:

Score based on greatest possible impact should worst-case event occur at your facility. Consider the likely number of fatalities, injuries, homeless, etc. Score 1 low - 5 highest.

Property Impact:

Score based on the economic costs of the event, including both direct and indirect property damage from the hazard. Smoke damage would be a 1 while a total loss should be a 5. Score 1 low - 5 highest.

Business Impact:

Score based on factors such as service impact, lost wages, revenues, and taxes. Consider cost of relocation, permanent damage to valuable resources, etc. Score 1 low - 5 highest.

Mitigation Activities:

Based on steps taken to mitigate the hazard such as security barriers, fire sprinklers, and redundant technical systems. The more mitigation measures taken, the higher the score. Score 1 low - 5 highest.

Internal Resources:

Base your score on the internal response and recovery resources. High scores should be given when there are a formal on-site response teams, organized fire brigades, floor wardens, continuity teams, or recovery teams. Score 1 low - 5 highest.

External Resources:

Base your score on the external resources that would be immediately available. This would include the local fire department. Give higher scores if there are specialized teams available or if contractor support such as hot sites, alternate facilities, and response teams are immediately available. Score 1 low - 5 highest.

Understanding the Scores:

Based on the weighted scoring formula hazards that are relatively high will score 3.5 or higher. The spreadsheet is programmed to change colors based on the score as follows:

Red	High Risk	Greater than 3.5
Yellow	Medium Risk	From 2.0 to 3.5
Green	Low Risk	Less than 2.0

These scores are based on subjective judgments but, nonetheless, they provide a means to quickly rate the facility's risk from various hazards. Based on this risk scoring, priorities for increased mitigation and preparedness activities can be determined.

Risk Index Worksheet for Comparing and Prioritizing Risks

Hazard	Frequency	Magnitude	Warning Time	Severity	Special Characteristics and Planning Considerations	Risk Priority
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		
	Highly likely Likely Possible Unlikely	Catastrophic Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical Limited Negligible		

Adapted from FEMA's EMI course *IS-1 Emergency Manager: An Orientation to the Position*

Risk Index Worksheet for Comparing and Prioritizing Risks– Completed Example

Hazard	Frequency	Magnitude	Warning Time	Severity	Special Characteristics and Planning Considerations	Risk Priority
Civil Disturbance	Highly likely Likely Possible **Unlikely**	Catastrophic Critical **Limited** Negligible	**Minimal** 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical **Limited** Negligible		Low
Drought	Highly likely Likely Possible **Unlikely**	Catastrophic Critical **Limited** Negligible	Minimal 6 – 12 hours 12 – 24 hours **24+ hours**	Catastrophic **Critical** Limited Negligible		Low
Epidemic	Highly likely Likely Possible **Unlikely**	Catastrophic Critical **Limited** Negligible	Minimal 6 – 12 hours 12 – 24 hours **24+ hours**	Catastrophic **Critical** Limited Negligible		Low
Flooding	Highly likely Likely **Possible** Unlikely	Catastrophic Critical **Limited** Negligible	Minimal **6 – 12 hours** 12 – 24 hours 24+ hours	Catastrophic **Critical** Limited Negligible		High
Hazardous Material Spill	Highly likely Likely **Possible** Unlikely	Catastrophic Critical **Limited** Negligible	**Minimal** 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic **Critical** Limited Negligible		Low
Hurricane	Highly likely **Likely** Possible Unlikely	**Catastrophic** Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours **24+ hours**	**Catastrophic** Critical Limited Negligible		Low
Terrorism	Highly likely Likely **Possible** Unlikely	**Catastrophic** Critical Limited Negligible	**Minimal** 6 – 12 hours 12 – 24 hours 24+ hours	**Catastrophic** Critical Limited Negligible		Low
Tropical Storm	**Highly likely** Likely Possible Unlikely	**Catastrophic** Critical Limited Negligible	Minimal 6 – 12 hours 12 – 24 hours **24+ hours**	**Catastrophic** Critical Limited Negligible		High
Water Pipe Break	Highly likely Likely **Possible** Unlikely	Catastrophic Critical **Limited** Negligible	**Minimal** 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic Critical **Limited** Negligible		Low
Wildfire	Highly likely Likely **Possible** Unlikely	Catastrophic Critical **Limited** Negligible	**Minimal** 6 – 12 hours 12 – 24 hours 24+ hours	Catastrophic **Critical** Limited Negligible		Low

Adapted from FEMA's EMI course *IS-1 Emergency Manager: An Orientation to the Position*

Hazard Profile Worksheet

HAZARD:

Potential Magnitude (Percentage of the jurisdiction that can be affected):

- ☐ **Catastrophic:** More than 50%
- ☐ **Critical:** 25 to 50%
- ☐ **Limited:** 10 to 25%
- ☐ **Negligible:** Less than 10%

Frequency of Occurrence:

- ☐ **Highly Likely:** Near 100% probability in next year
- ☐ **Likely:** 10-100% probability in next year, or at least one chance in 10 years
- ☐ **Possible:** 1-10% probability in next year, or at least one chance in next 100 years
- ☐ **Unlikely:** Less than 1% probability in next 100 years

Seasonal Pattern (if applicable):

Areas Likely To Be Affected Most (by Sector):

Probable Duration:

Potential Speed of Onset (Probable amount of warning time):

- ☐ Minimal (or no) warning
- ☐ 6 to 12 hours warning
- ☐ 12 to 24 hours warning
- ☐ More than 24 hours warning

Existing Warning Systems:

Complete Vulnerability Analysis:

- ☐ Yes
- ☐ No

Adapted from FEMA's EMI course *IS-1 Emergency Manager: An Orientation to the Position*

Hazard Profile Worksheet– Completed Example

HAZARD: Earthquake

Potential Magnitude (Percentage of the jurisdiction that can be affected):

- ☐ **Catastrophic:** More than 50%
- ✓ **Critical:** 25 to 50%
- ☐ **Limited:** 10 to 25%
- ☐ **Negligible:** Less than 10%

Frequency of Occurrence:

- ☐ **Highly Likely:** Near 100% probability in next year
- ☐ **Likely:** 10-100% probability in next year, or at least one chance in 10 years
- ☐ **Possible:** 1-10% probability in next year, or at least one chance in next 100 years
- ✓ **Unlikely:** Less than 1% probability in next 100 years

Seasonal Pattern (if applicable):
N/A

Areas Likely To Be Affected Most (by Sector):
County-wide

Probable Duration:
The earthquake itself is not likely to last long.

Potential Speed of Onset (Probable amount of warning time):

- ✓ Minimal (or no) warning
- ☐ 6 to 12 hours warning
- ☐ 12 to 24 hours warning
- ☐ More than 24 hours warning

Existing Warning Systems:
None

Complete Vulnerability Analysis:

- ✓ Yes
- ☐ No

Adapted from FEMA's EMI course *IS-1 Emergency Manager: An Orientation to the Position*

Community Exposure Profile

Hazard Event _____

Name or Description of Asset	Sources of Information	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historical/Other Considerations	Size of Building (sq ft)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($ per day)	Occupancy or Capacity (#)	Other Hazard Specific Information

Adapted from FEMA *386-2: Understanding Your Risks: Identifying Hazards and Estimating Losses*

Community Exposure Profile – Completed Example

Hazard Event Flood

Name or Description of Asset	Sources of Information	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historical/Other Considerations	Size of Building (sq ft)	Replacement Value ($)	Contents Value ($)	Function Use or Value ($)	Displacement Cost ($ per day)	Occupancy or Capacity (#)	Other Hazard Specific Information
Historic Lighthouse	Lighthouse Preservation Society					✓	3,000	$150,000	$1.5M	$0.5M	$500	1	
Bridge	Public Works	✓					250ft long	$750,000	NA	$31,750	$12,000	20	
Sewage Treatment Plant	Public Works	✓					75,000	$2.5M	$2.5M	$30M	$200,000	10	
STP Outbuilding	Public Works	✓					10,000	$1M	$1.5M	$0.25M	$5,000	---	
STP Outbuilding	Public Works	✓					7,500	$75,000	$1.5M	$0.5M	$1,000	---	
Water Treatment Plant	Public Works	✓					3,000	$250,000	$1.25M	$1M	$2,000	5	
Hospital	Hospital	✓					45,000	$2.5M	$3.75M	$0.75M	$2,500	100	
Police/Fire Station	Police Dept.	✓					10,000	$2M	$3M	$0.35M	$2,000	150	

Adapted from FEMA *386-2: Understanding Your Risks: Identifying Hazards and Estimating Losses*

Loss Estimation Form

Hazard Event _____

Structure Loss						Content Loss				
Name/Description of Structure	Structure Replacement Value ($)	X	Percent Damage (%)	=	Loss to Structure ($)	Replacement Value of Contents ($)	X	Percent Damage (%)	=	Loss to Contents
		X		=			X		=	
		X		=			X		=	
		X		=			X		=	
		X		=			X		=	
		X		=			X		=	
		X		=			X		=	
		X		=			X		=	
		X		=			X		=	
Total Loss to Structure						**Total Loss to Contents**				

Structure Use and Function Loss									
Name/Description of Structure	Average Daily Operating Budget ($)	X	Functional Downtime (# of days)	+	Displacement Cost per Day ($)	X	Displacement Time (# of days)	=	Structure Use & Function Loss ($)
		X		+		X		=	
		X		+		X		=	
		X		+		X		=	
		X		+		X		=	
		X		+		X		=	
		X		+		X		=	
		X		+		X		=	
		X		+		X		=	
Total Loss to Structure Use & Function									

Structure Loss	+	Content Loss	+	Function Loss	=	Total Loss for Hazard Event
	+		+		=	

Adapted from FEMA *386-2: Understanding Your Risks: Identifying Hazards and Estimating Losses*

Loss Estimation Form – Completed Example

Hazard Event Flood

Structure Loss						Content Loss				
Name/Description of Structure	Structure Replacement Value ($)	X	Percent Damage (%)	=	Loss to Structure ($)	Replacement Value of Contents ($)	X	Percent Damage (%)	=	Loss to Contents
Historic Lighthouse	1,500,000	X	18	=	270,000	50,000	X	27	=	13,500
Bridge	750,000	X	20	=	150,000	N/A	X	N/A	=	N/A
Sewage Treatment Plant	2,500,000	X	13	=	325,000	2,500,000	X	19.5	=	487,500
STP Outbuilding	1,000,000	X	13	=	130,000	1,500,000	X	19.5	=	292,500
STP Outbuilding	750,000	X	13	=	97,500	1,500,000	X	19.5	=	292,500
Water Treatment Plant	250,000	X	5	=	12,500	250,000	X	7.5	=	18,750
Hospital	2,500,000	X	5	=	125,000	3,750,000	X	7.5	=	281,250
Police/Fire Station	2,000,000	X	5	=	100,000	3,000,000	X	7.5	=	225,000
Total Loss to Structure					$1,210,000	**Total Loss to Contents**				$1,611,000

Structure Use and Function Loss									
Name/Description of Structure	Average Daily Operating Budget ($)	X	Functional Downtime (# of days)	+	Displacement Cost per Day ($)	X	Displacement Time (# of days)	=	Structure Use & Function Loss ($)
Historic Lighthouse	2,191	X	7	+	500	X	2	=	16,337
Bridge	31,740	X	4	+	12,000	X	4	=	174,960
Sewage Treatment Plant	82,191	X	3	+	200,000	X	3	=	846,573
STP Outbuilding	384	X	2	+	5,000	X	2	=	11,368
STP Outbuilding	384	X	2	+	1,000	X	2	=	3,368
Water Treatment Plant	2,740	X	1	+	2,000	X	0	=	2,740
Hospital	2,055	X	0	+	2,500	X	0	=	0
Police/Fire Station	960	X	1	+	2,000	X	0	=	960
Total Loss to Structure Use & Function									$1,056,306

Structure Loss	+	Content Loss	+	Function Loss	=	Total Loss for Hazard Event
$1,210,000	+	$1,611,000	+	$1,056,306	=	$3,877,306

Adapted from FEMA *386-2: Understanding Your Risks: Identifying Hazards and Estimating Losses*