
	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		

20.01 Purpose



To provide a set of procedures on responding before, during and after a declared event, incident or natural disaster. These procedures will provide guidance for Kemah Fire Department (KFD) Personnel to aid the local Law Enforcement Agencies with voluntary/mandatory evacuations and re-entry of Fire District business occupants and residents. In addition, these procedures shall assist KFD Personnel in performing their duties to our community and lessen the severity of a declared event, incident or natural disaster.

20.02 Policy

The Kemah Fire Department will strive to help, render aid if we have the equipment, personnel, and other resources that would be needed in this type of event. Call for additional assistance Mutual Aid, if needed. Realize other departments will also be pushed to their limits and we may have to improvise. KFD Personnel should read and follow this guideline to the best of their abilities. While this is a set of procedures, decisions will have to be made at each incident or scene, and these procedures will help each KFD Personnel to make decisions regarding their role.

20.03 Weather Terminology

The term “hurricane” describes a severe tropical cyclone and sustained winds of 74 miles per hour or greater that occurs in the Gulf of Mexico, along the North American coastlines of the Atlantic and Pacific Oceans and in the Caribbean. Tropical cyclones rotate counterclockwise in the Northern Hemisphere. The hurricane season runs from the first of June until the last day of November for the United States and Caribbean.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

Definitions and Terms

Gale Warning - Indicates that winds of 38-54 miles per hour are expected

Storm Warning - Indicates that winds of 55-74 miles per hour are expected

Tropical Disturbance - An area of disturbed weather in the tropics that has the potential of storm development

Tropical Depression - A closed low-pressure circulation at the surface in the tropics with winds up to 39 miles per hour.

Tropical Storm - A closed low-pressure circulation at the surface in the tropics with winds of 39-75 miles per hour.

Hurricane Watch - A watch is/are issued by the National Weather Service when a hurricane continues its advance and threatens coastal regions. This indicates that there is a real possibility within 24-36 hours that specific areas mentioned in the watch will be hit. (See also Article 15.05, Forecast Accuracy)

Hurricane Warning - The hurricane warning is the action notice. If hurricane conditions can be expected within 24 hours, a hurricane warning is/are issued by the National Weather Service. Coastal areas where winds of at least 74 miles per hour are expected to occur, and where dangerous high water is forecast will be indicated. By this time, all necessary precautions should be taken and relocating should be underway.

Storm Surge - An abnormal rise in the level of the sea produced by a hurricane, which may cause dangerous flooding in the area.

Tornado Watch - Advisory stating conditions are favorable for formation of tornadoes in a specific area. Tornadoes usually pose a threat in the hurricane area and during severe thunderstorms.

Tornado Warning - An advisory stating that a tornado has been sighted in the area

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

20.03.02 Hurricanes Categories

The Saffir-Simpson scale is a widely recognized and accepted practical tool that planners rely on to estimate the destructive forces associated with hurricanes. This scale classifies hurricanes into five categories based on wind speed and describes the destructive forces caused by wind, storm surge and wave action for each category.

Hurricanes reaching category 3 or higher are considered major hurricanes because of their potential for loss of life and damage. Category 1 and 2 storms are still very dangerous and warrant preventative measures.



The five categories of hurricanes in the SAFIR/Simpson scale, which are based on wind speed and/or storm surge are as follows:

Saffir-Simpson Hurricane

Scale Number (Category)	Sustained Winds (MPH)	Type of Damage
1	74-95	Minimal: Damage primarily to shrubbery, trees, foliage and unanchored mobile homes. No real damage to other structures. Storm surge 4–5 feet. Coastal roads flooded.
2	96-110	Moderate: Some trees blown down. Major damage to exposed mobile homes. Some damage to roofing materials, windows and doors. Storm surge 6–8 feet, with up to 12-foot waves.
3	111-130	Extensive: Large trees blown down. Mobile homes destroyed. Some structural damage to roofing materials of buildings. Some structural damage to small buildings. Storm surge 9–12 feet, with waves up to 18 feet. Flooding can occur up to 10 miles inland.

Kemah Fire Department's Standard Operating Procedures

Revised by Joe Murray, Deputy Fire Marshal
Approved by Brent Hahn, Fire Chief/Fire Marshal

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		

4	131-155	Extreme: Trees blown down. Complete destruction of mobile homes. Extensive damage to roofing materials, windows and doors. Complete failure of roofs on many small residences. Storm surge 13–18 feet, with waves up to 25 feet. Flooding to 10 feet above sea level up to 30 miles inland.
5	>155	Catastrophic: Complete roof failures on many residences and industrial buildings. Extensive damage to windows and doors. Some complete building failures. Storm surge over 18 feet. Flooding



20.04 Procedure

20.04.01 Hurricanes, Floods or Special Event

20.04.02 Model Procedures for Response of Emergency Vehicles During Hurricanes and Tropical Storms

A. Model Baseline Policy¹

- During hurricanes and tropical storms, the fire department will maintain a safe work environment for its firefighters and EMS personnel and will provide essential emergency services to the public if the safety of the responders is not endangered by the storm conditions.
- KFD shall use the NIMS model for Incident Command including the use of Incident Action Plans (IAP), which will ensure proper documentation is done as the event occurs, greatly easing the post-storm recovery process, including gaining federal reimbursement in the event the incident is declared a federal disaster.



	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

B. Model Operational Guidelines

- ***Preseason Preparations***

At least two months before the start of the hurricane season, the fire department will initiate the following actions:

- Review the fire department’s standard operating guide, update as needed and review with all members. Obtain and review the most recent version of the fire department’s continuity of operations plan (COOP).
- Update target occupancies list.
 - A target occupancy may be an occupancy with a high probability of trapped victims or a structure that stores a large amount of hazardous materials or is susceptible to structural failure. (Examples: schools, hospitals, health-care facilities, factories)
- All companies familiarize themselves with the topography of their response area to become aware of flood-prone areas.
- Inventory all equipment.
- Ensure apparatus readiness.
- Check the physical condition of each fire-department building and facilitate repairs of any damaged roof areas, windows or doors that could contribute to increased damage in a hurricane. Check and service as needed any sump pumps for basement areas. Be sure all surface area drains around the exterior of buildings are free and clear of all debris to allow for proper drainage.
- Ensure all fire-department generators have been serviced and are working.
- Inventory and check batteries and chargers for portable equipment and be sure all are in working order and that there is an adequate number available.
- Maintain all apparatus fuel tanks at no less than three-quarters full.



	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

- Contact the Galveston County Office of Emergency Management to review their plans and submit the KFD plan.
- *Ensure the fire department is part of the local emergency management operations. Review flood maps to determine if any fire-department building is within the flood zone.*
- Develop plans for the relocation of apparatus, equipment, electronic devices and departmental records.

Per review of flood maps above.

- Update department and personal phone lists for call-in.
- Coordinate evacuation and special-needs shelters, including staffing requirements.
- Develop alternate communication plans for the event of a total system failure.
- Develop a post-storm food and water plan for 7–14 days.
- Update street maps due to probable loss of signage and landmarks.
- Develop and communicate emergency evacuation plans in the event a station needs to be evacuated during an incident:
 - Pre-designation of safe havens
 - Instructions on shutting off the utilities
 - Recommendations on securing (or evacuating with personnel) electronic equipment and pertinent records
- Ensure all members have a personal family plan to secure their family and property in preparation for reporting to duty.
- Establish a family contact number that family members can call to check on a department member.

The safest procedure for families is EVACUATION to friends or family outside the storm’s impact area. Encourage members to periodically contact their families.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

C. Hurricane Watch: Hurricane may become a threat within 36 hours

- Fire department command and general staff should develop and implement an incident action planning process.
- Top off station fuel tanks and apparatus, including spares, chain saws, generators, power units, portable pumps, etc.
- Test and ensure all power equipment are operational.
- Fill cascade bottles and SCBA bottles.
- Flush apparatus water tanks and refill for potential drinking water
- Secure all loose items around the exterior of stations.
- Ensure all first responder/EMS supplies are up to normal levels.
- Test all manual pumping equipment on fuel tanks.
- As needed, have additional supplies delivered.
- Develop work schedules to ensure proper sleep/rehab time.
- When the local emergency operations center (EOC) is opened, ensure the fire department is always represented at the EOC. In addition, consider establishing a fire department-specific operations center.

D. Hurricane Warning: Hurricane is expected to hit within 24 hours



Additional Model Policy for Hurricane Warnings: Fire Chief/Fire Marshal and Command Staff are to use their discretion when responding, mindful of the safety of KFD Personnel as their top priority.

- Charge all batteries.
- Encourage all personnel to move personal vehicles to higher ground. *(if appropriate based on geography, flood map data, history, etc.)*
- Fire Station in flood-prone areas will relocate by Fire Chief/Fire Marshal order.
- Notify the public, if fire protection in a certain area will be compromised.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		

- KFD should issue media releases to advise the public that when certain weather conditions occur related to a hurricane, KFD response will cease (*be specific as to what those conditions are*).
- Implement recall plans, if necessary.
- Have all KFD Personnel who will be reporting for duty bring the following items:
 - 3 sets of clothes/work uniform/tee shirts
 - 1 jacket
 - 5 each of undershirts, underwear, pairs of socks
 - 1 extra pair of shoes
 - 3 bath towels
 - Sleeping bag/bedding
 - Personal flashlight and batteries
 - Personal articles for 3 days
 - Prescribed medication
 - Toothbrush and toothpaste
 - Deodorant
 - Soap
 - Shampoo
 - Razor and shaving cream
 - Mosquito repellent
 - 3 days' supply of food that does not require refrigeration or cooking
 - 3 gallons of water
 - Other personal hygiene articles

E. KFD Personnel shall make sure all trucks, equipment, generators are ready (fueled up) and in working order. The Shift Commanders' responsibility is to verify upon completion.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		

KFD Station Captain will make sure we have supplies such as water, batteries etc. in preparation for extended station operations for up to seven 24-hour shifts.

Supplies Checklist that will be kept on hand in the event of an actual emergency:

1. Food - canned or dried provisions, non-perishable foods
2. Bottled water
3. Can openers - non-electric
4. Plastic forks, spoons, knives, plates, and cups
5. Plastic garbage bags.... .
6. Ice chests - filled with ice when appropriate
7. Flashlights with fresh batteries (batteries will be stored in lock box inside refrigerator)
8. Battery-powered lamps
9. Propane Coleman stoves
10. Extra gas, diesel, and oil
11. Portable potty
12. Toilet paper
13. Dry clothes
14. Air Mattresses, Bedlinens, Blankets or sleeping bags
15. Sandbags
16. Fans
17. Pens and paper
18. Paper towels

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

Hurricane Planning Timeline*

H-120 hours (Five days prior to tropical storm-force winds reaching the Texas coast)	First conference call with Galveston County Judge and/or Mayors First conference call with regional UACC; time set for evaluation decision-makers meetings Alert all members of possible land fall
H-120 to H-96	Evaluation decisions made Call for personnel and level 1 one activation
H-96 to H-72	Request register for fuel supplies form (VENDER) Ambulances preparedness CLEMC Status of conference call(s). Representatives to be monitoring each call from OEM and State as scheduled.
H-72 to H-48	Assist local "special needs" citizens for evaluation if needed. Austin notified. Status of conference call(s) monitored.
H-60 to H-48	Mandatory evacuation of Galveston OEM.
H-48	Mandatory evacuation of Galveston County mainland begins; PIO's stress others stay put. Level 2 activation of KFD. KFD personnel assigned to apparatus and staging areas. KFD personnel placed on temporary employment status.
H-36	Shift rotation and surveying done through FD and PD's.
H-30	Mandatory evacuation survey and communication for staging areas established. Supplies replaced and refreshed as necessary. Activation of Level one of KFD Staff housed at KFD station if not evacuated. OEM and State conference call(s) continued to be monitored. Relay communication for redeployment timelines.
H-6	Shelter in place.

*Assuming a Category 4-5 hurricane with a strong probability of impacting the upper Texas Gulf Coast.

Plan is guideline for operations for the Kemah Fire Department working with local Emergency Coordinators Offices and the Galveston Office of Emergency Management.

Kemah Fire Department's Standard Operating Procedures

Revised by Joe Murray, Deputy Fire Marshal
Approved by Brent Hahn, Fire Chief/Fire Marshal

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	



Hurricane Planning Event*

H-0 (Rescue, if possible)	Assessment needs Forward information to OEM (if capable)
Post Event	Reentry at tropical force winds OIC set reentry program Reentry program State-County-Local
Post 0-24	Clear roadways for emergency vehicles Ambulances preparedness (Strike Team) Status of conference call(s). Representatives to be monitoring each call from OEM and State as scheduled. Establish Fire Department Command Set operational periods IAP
Post 16-24	SAR Operation State request 213 as needed Operation with POLICE
Post 24-72	Continued SAR operations Reassessment of needs and acquirement of needed assessments IAP for continued operation Acquire authorization for finance board members Continued support first responders Support services for district
Post 72-120	Change SAR (search and rescue) to SAR (Search and Recovery) Continued operation for KFD and Relief crew Accounting for acquired assets Evaluate needs for district
Post 120 continue Needed operations	Shift rotation and surveying done through FD and PD's Operation cost analysis Projected cost of continued operations Loss analysis

***Assuming a Category 4-5 hurricane with a strong probability of impacting the upper Texas Gulf Coast.
Plan is guideline for operations for the Kemah Fire Department working with local Emergency Coordinators
Offices and the Galveston Office of Emergency Management.**

Kemah Fire Department's Standard Operating Procedures



Revised by Joe Murray, Deputy Fire Marshal
Approved by Brent Hahn, Fire Chief/Fire Marshal

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		

- F. Once the NWS has established to be on the path of the hurricane towards the KFD District, the highest-ranking fire officer should be in communications with the Emergency Management Coordinator.
- Determine which personnel will available or leaving in the event of a hurricane
 - Police Department may call for our help in evacuation of the community
 - The Fire Chief/Fire Marshal or highest-ranking fire officer will make the determination to evacuate our personnel and equipment based on hurricane strength and time remaining to do so. Do not stay if you feel it is unsafe no matter what the category of hurricane is. We cannot help people if our equipment or personnel are damaged or injured.
 - If KFD does need to evacuate, determine which personnel and equipment will go where and set up possible back-up communications. Where is it safe to be relocated to?
 - Make sure we are still going to be able to communicate with Galveston County Office of Emergency Management, Kemah Dispatch and local Police Departments.



G. Hurricane Operations

To provide Fire/EMS response until the last possible moment, when storm conditions dictate that operations cease, KFD will need to make a conscious and calculated decision that takes into account the realization that some apparatus and equipment may be vulnerable to the storm effects and may be damaged or lost.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		

- Additional Model Policies for Hurricane Operations**
1. No KFD Personnel shall ride alone during a storm. All members will operate in pairs.
 2. All KFD Personnel are to wear full bunker gear, including eye protection, for all responses in order to protect from flying debris.
 3. Aerial devices should not be operated when sustained winds are 35 mph or more.
 4. Prior to sustained wind speeds reaching 50 mph, or wind gusts over 65 mph, Fire Chief/Fire Marshal or Command Staff who feels the situations encountered are sufficiently dangerous to the safety of KFD Personnel may cease operations and return to the station. Command Staff must advise the Emergency Operations Center and the Kemah Dispatch.
 5. For the safety of the KFD Personnel, the Kemah Fire Department will discontinue response to all Fire/EMS calls when sustained wind speeds reach 50 mph or wind gusts are over 65 mph. When the order to cease response is given due to hazardous wind conditions:
 6. Units responding to or on the scene of an emergency shall continue their work until completed, at which time the units will return to the station.
 7. Units out of station but not on a call will return to the station as soon as possible.



- When responses cease due to wind conditions, all apparatus will be parked headfirst in the station causing the rear of the unit to be facing outward, thus protecting the windshield.
- Dispatch will relay all requests for service to the Emergency Operations Center which will prioritize these requests for response when conditions permit.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

- Operating KFD Personnel must notify dispatch and other responding personnel of all hazardous conditions they encounter including high water, road damage or blockage, etc.
- Before walking through water, KFD Personnel must use a pike pole or stick to ensure the ground has not washed away or collapsed.
 - o Use extreme caution when walking through water. Six inches of moving water can knock a person off their feet.
 - o Be aware of hazards in the water such as downed live electrical wires and wildlife, including snakes
- Use extreme caution and limit speed when driving. Be especially cautious where the ground is saturated or flooded—the road could be washed away.
- Generators used to supply electricity to the station must be outside and elevated while ensuring the exhaust is ventilated to the outside. Generators should not be placed on the apparatus floor. *Carbon monoxide exhaust kills.*
- If the station must be evacuated, Command Staff will ensure utilities are shut off and the station is secure and the company will report to the refuge or safe haven, all in accordance with predetermined evacuations plans.

Model Procedures for Response of Emergency Vehicles During Hurricanes and Tropical Storms

Hurricane Eye Operations Additional Model Policy for Hurricane Eye Operations: Operations during the period the eye of the hurricane passes by should be limited to re-securing the fire station. No KFD Personnel will be dispatched during the eye of the hurricane. All operations during the eye of the hurricane will only be performed if they can be done safely. KFD Personnel should help citizens who come to the station when it would be a danger to release them.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		



Even though the skies appear clear, storm conditions will return suddenly. The safety of KFD Personnel will remain the primary consideration during these operations.

H. Resuming Operations After the Hurricane

Additional Model Policies for Resuming Operations

1. The Fire Chief/Fire Marshal or designee shall make the determination when the department can resume response operations. This decision will be announced by dispatch as a resume-response order.
2. Fire Chief/Fire Marshal and Command Staff who believe it is safe to resume operations before receiving this order shall contact command and state the conditions at their location and their need to begin operations. Fire Chief/Fire Marshal and Command Staff shall order accordingly.
3. If these Command Staff Personnel are unable to contact command, the decision to begin operations will be the responsibility of the highest-ranking officer on scene. Operations shall be undertaken only if such operations can be performed in a safe manner.
4. KFD Personnel conducting emergency operations must realize that their own safety and well-being is their first priority. Many hazards will be encountered after a hurricane, including but not limited to live wires down, gas leaks, building fires, unsafe structures, flooding, hazardous materials, heat stress, traumatized victims, civil disturbance and displaced animals.

- Command Staff shall conduct an immediate survey to give command an assessment of the following:

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		



- Personnel
 - Does any member require medical assistance?
 - Does adequate staffing exist?
 - Are there any other personnel problems?
- Equipment
 - Report on damage to windshield, body, tires, aerial, equipment and pump.
 - Is the apparatus and related equipment operational?
 - Can the unit be dispatched?
- Facilities
 - Is the station operational?
 - Do any hazards exist in or immediately adjacent to the station?
 - What significant repairs must be made?

Fig. 1. Model matrix to report the condition of a station

Damage Level →	None	Light	Moderate	Heavy	Notes
Bay Doors					
Roof					
Windows					
Doors					
Flooding (note the depth)					
Electric					
Water					
Gas					
Sewer					
Telephone/Cell Phones					
Radio					
Computer Network					

Kemah Fire Department's Standard Operating Procedures



Revised by Joe Murray, Deputy Fire Marshal
 Approved by Brent Hahn, Fire Chief/Fire Marshal

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

- Command Staff are to conduct a neighborhood survey immediately surrounding the station (that which can be observed from the station property) and report conditions to command.
- KFD Personnel are to conduct a “windshield survey” of their first-due area, including all target hazards identified in the preseason planning, and report conditions to command so they may get a full assessment of the incident and deploy resources in an efficient manner to where they are most needed.
- While life-saving assistance remains the top priority, a search of predetermined target occupancies will be conducted as soon as possible.
- Due to the lack of communications, the chief or company officer may have to determine the company’s need to self-dispatch based on the situation at hand.
- No KFD Personnel shall ride alone immediately following the storm. All members will operate in pairs or teams.
- KFD Personnel shall utilize all safety equipment available, work in teams and keep well hydrated. Every attempt should be made in order to abate the after-storm hazards in a safe manner.
- Survey the area for any electric wires before cutting any trees or debris.
- If wires are present, assume they are live and contact the electric company to determine the status of the wires. Make sure members are aware that generators used by civilians may back feed into the system, thereby energizing downed wires.
- Use chain saws for their appropriate use and use the appropriate care and protective gear.
- Fire Chief/Fire Marshal and Command Staff will establish and strictly enforce periodic rehabilitation times for Fire/EMS personnel, as well as a relief program for all KFD Personnel.
- Additional health and safety considerations include:
 - Ensure all exposures to personnel are properly documented.
- Provide vaccinations as necessary.

Kemah Fire Department’s Standard Operating Procedures

Revised by Joe Murray, Deputy Fire Marshal
Approved by Brent Hahn, Fire Chief/Fire Marshal

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		

- Provide post-storm follow-up care as needed.

20.04.03 Flooding

1. If time permits, the same steps as outlined above need to be followed.
2. Flash flooding can occur at any time, so it is very important that all equipment is always ready and operational.

20.05 Rationale



KFD strives to respond in our community using whatever resources we have and those from other departments to lessen the severity of the incident on our personnel. KFD should always use another department's equipment if needed and do not have it ourselves. KFD should always think of the safety of our community and to KFD Personnel. KFD should strive to always be prepared for any foreseeable declared event, incident or natural disaster.

Appendix A: Hazard Agents

The primary hazard agents associated with a hurricane are the high sustained winds, flooding from storm surge or heavy rains, battering from heavy waves and secondary hazards.

High Sustained Winds – The high winds impose significant loads on structures—both direct wind pressure and drag—and tend to propel loose objects at high velocity.

Flooding – A hurricane can cause many different types of flooding. Along the coast, the flooding may occur from storm surge, wind-driven water in estuaries and rivers or torrential rain. The flooding can be still-water flooding or velocity flooding caused by wave action associated with wind-driven water along the coast.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
	Approved By: Fire Chief/Fire Marshal Brent Hahn	

The rainfall associated with a hurricane can be from 6–12 inches or higher. The rain may precede landfall by hours and may persist for many hours after landfall, causing severe flooding.

Heavy Waves – The storm may generate waves with heights of 25 feet or more. These waves can batter the coastline, causing devastating damage to the shoreline itself and to structures near the shore.



The velocity of the water moving back and forth undermines the foundations of buildings and piers by removing the soil from around them. Debris driven inland by the waves can cause severe structural damage. Persons exposed to the moving water and debris are likely to receive severe injuries.

Secondary Hazards – Hurricanes can also cause numerous secondary hazards. Tornadoes and electrical power outages are common, as are downed live power lines, broken gas lines and exposure to wildlife. Contamination of water supplies, flooding of sewage treatment facilities and even levee failures may occur.

Appendix B: National Weather Service Warnings

The National Weather Service (NWS) is responsible for issuing warnings of hurricanes and tropical storms. As soon as definite indications that a hurricane or tropical storm is forming exist, the storm is given a name and the NWS begins issuing advisories. The advisories are issued frequently throughout the day and night and provide information on where the storm is, how intense it is and its speed and direction of movement. If the hurricane moves toward land, hurricane watch, or warning notices are included. Bulletins for the media are issued at frequent intervals to keep the public informed of the storm’s progress.

Hurricane/Tropical Storm Watch: Hurricane/tropical storm conditions are possible in the specified area of the watch within 36 hours.

	Standard Operating Procedures	
	SOP 20	
	Subject: Hurricane, Flood, and Declared or Special Event	
	Approval Date: 05/2019	
	Date Created: 03/2009	
	Next Review: 05/2020	
Approved By: Fire Chief/Fire Marshal Brent Hahn		

Hurricane/Tropical Storm Warning: Hurricane/tropical storm conditions are expected in the specified areas of the warning within 24 hours.

Short Term Watches and Warnings: These items provide detailed information on specific threats, such as floods and tornadoes.

Flood Watch: This product informs the public and cooperating agencies of possible flooding.

Flood/Flash-Flood Warning: A flood/flash-flood warning is issued for specific communities, streams or areas where flooding is imminent or in progress. Persons in the warning area should take precautions immediately.

Embedded Attachments:

- Hurricane Map
- Evacuation Timetable

Suggested Internet Sites

- WWW.SRH.NOAA.GOV/HGX
- WWW.NWS.NOAA.GOV
- WWW.WEATHER.COM

END OF SECTION