	Cumberland County Fire Chief's Association	*REFERENCES: NFPA 1500*

Severe Weather Operations

APPROVED BY: CCFCA Board of Directors – Freddy L. Johnson Sr. 26 March 2018 | *EFFECTIVE: 1 April 2018*

1.0 SCOPE

This guideline applies to all members of the Cumberland County Fire Chief's Association (CCFCA) and shall be adhered to by all members.

2.0 PURPOSE

This guideline provides guidance on operations during severe weather conditions. This includes, but is not limited to, storms and the associated hazards as well as extreme heat and cold conditions. This can be adapted to any weather condition challenging fire departments. This creates safe best practices for fire department operations during these type events, and further intends to protect all firefighters from direct and indirect threats created by these weather conditions.

This policy also covers training and operations during extreme heat. For situations not covered by this training, experience and good judgement should prevail.

3.0 DEFINITIONS

Advisory – Information issued by the National Weather Service, which details the present location, intensity and expected movement of severe storms.

Blizzard – Considerable falling or blowing snow, winds of at least 45 MPH, temperatures 10 degrees F or lower. Unlikely in our , but possible.

Continuity of Operations Plan (COOP) – A plan developed by the fire department to ensure all critical processes can be conducted at all times regardless of weather conditions or damage to critical department infrastructure.

Drought – Extremely dry conditions caused by long periods without significant rainfall. This condition is prevalent in our area snd can lead to destructive fast-moving outdoor fires.

Extreme Heat – Temperatures 10 F or more than the average seasonal temperature lasting for several days or weeks. This situation will affect fire behavior but most importantly, extreme heat will have a detrimental effect on suppression personnel. This condition is prevalent in our area.

Flash Flood – Raging torrents of water which rip through bodies of water after heavy rains, surging well beyond the normal crest stage of lakes, streams, creeks, rivers and other tributaries.

Flood – Slow or fast rising currents of water associated with heavy reinfall or melting snow or ice.

Freezing Rain – Rain that freezes as it strikes the ground or other surfaces forming a coat of ice. This condition is prevalent in our area.

Hail – Small to very large particles of ice associated with thunderstorms.

Heat Index – An accurate measure of how hot it really feels when relative humidity is added to the actual air temperature. The wet bulb temperature is usually at least 10 degrees F higher than the actual air temperature.

Heavy Snow – Snow fall accumulations of 4 inches in a 12 hour period of 6 inches in 24 hours.

High Winds – Sustained winds of at least 40 MPH or gust of at least 50 MPH or greater expected to last for at least 1 hour.

Hurricane – Tropical storm winds reach a minimum constant speed of 74 MPH. These winds blow in a large spiral around a relatively calm center known as the eye. Around the rim of the eye, winds may gust to more than 200MPH. The entire storm dominates the ocean surface and lower atmosphere over thousands of square miles. The Atlantic Hurricane season lasts from June 1 through November 30 of each year. Because of our proximity to the coast (approximately 100 miles) the effects of a hurricane making land fall on the North Carolina coast can cause major problems in our area.

Ice Storm – See freezing rain.

Lightning – The discharge of electricity from within a storm cloud usually accompanying a thunderstorm. The current produced by lightning can be as much as 100 million volts and create temperature that can exceed 30,000 degrees F. Because of the country's topography, the majority of thunderstorms we experience create lightning strikes.

MPH – miles per hour

PFD – Personal floatation device.

SHALL - Indicates a mandatory requirement.

Severe Weather Watch – Indicates that a storm may be imminent within 36 hours.

Sleet – Small particles of ice usually mixed with rain.

Standard Operating Guidelines (SOG) - Documents that help establish how an organization will operate and how its members are expected to carry out specific duties outlined in general terms.

Target Occupancies – are occupancies with high probability of trapped victims or a structure that stores large amounts of hazardous materials or is susceptible to structural failure. Examples would be schools, hospitals, health-care facilities and factories.

Thunder – The crash and rumble associated with lightning, caused by the explosive expansion of air heated by lightning. The sound of thunder is sharp and explosive when lightning is nearby and more of a growl and rumble when lightning is at a distance.

Thunderstorm – Results when cold upper air sinks and warm moist air rises causing the development of storm clouds. Thunderstorms cause strong winds, lightning, hail and rain.

Tornado – A relatively short lived storm consisting of violently rotating columns of air that descend in a funnel shape from thunderstorm cloud systems. Tornados can travel up to 60 MPH with wind speeds close to 400 MPH within the tornados' center. The average path of destruction is 250 yards

wide and 15 miles in length. Typically, tornado season runs from March 1 through June 1, but can take place any time of the year.

Windshield Survey – The process of driving through a fire district to assess the amount of damage a weather event has created. Priority and target structures should be assessed during this process.

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Continuity of Operations Plan (COOP) – This is a plan developed by the fire department to ensure all critical processes can be conducted at all times regardless of weather conditions or damage to critical department infrastructure.

Wet Bulb Thermometer - This meter measures and displays Heat Stress Index (WBGT), which is how hot it feels when humidity is combined with temperature, air movement, and direct or radiant sunlight. This thermometer provides a more accurate reading then a normal thermometer.

4.0 General Guidelines

a. Fire Departments shall have a viable continuity of operations plans (COOP) that ensures uninterrupted critical service delivery during severe weather events.
b. Fire departments shall have emergency evacuations plans for relocation of apparatus and critical equipment.
c. Fire department apparatus and vehicles shall be fueled and fully functional prior to storm warnings.
d. Fire departments shall update all phone rosters and conduct a phone check prior to major weather events.
e. Fire departments should develop and check primary, alternate, contingency and emergency communications plans.
f. Fire departments shall ensure sufficient batteries for portable radios, handlights and medical tools are on hand.
g. Fire departments should encourage members to designate safe havens for their personnel.
h. Fire departments should identify facility utility shut offs, and ensure firefighters know the proper procedure for shut down.
i. Ensure firefighter families are safe and have evacuation capabilities.
j. Chief officers have discretion to alter or cease operations if they feel the safety of their personnel is compromised or in jeopardy. Company officers have discretion to cease operations whenever they deem conditions to be unsafe for their crew members.
k. Fire departments should conduct windshield surveys of their response areas to determine damage, routes of access/evacuation and areas where service cannot be provided. Report this information to dispatch as soon as possible.
l. Fire departments should not operate aerial devices in winds over 35 MPH.
m. Adaptive response
    1. During storm conditions, multiple calls can occur that quickly deplete resources. It may be prudent to respond with one apparatus versus a full assignment.
    2. This precludes resources being tied up for what may prove to be a false alarm, and allows resources to remain in service and be available for other responses
    3. This procedure reduces risk to personnel, equipment and the general public.

4. Storm Response. During storm response protocol, Cumberland Emergency Services will dispatch one unit to commercial and residential alarms.
5. Structural fires of any type (commercial or residential) will receive a full assignment in accordance with the run card for that particular building or in accordance with AVL.
6. Emergency services will not be dispatched in winds 50 MPH or greater, or winds gusting to 65 MPH. Calls will be logged and queued for response once wind conditions are safe for operations.

n. Task Force response
1. Depending upon the call, sending a task force may be the efficient response means.
2. Forming a task forces allow specialized units to be integrated with engine and truck companies for specific assignments.
3. Consideration of the available resources must be factored.
4. The task force concept can be employed for responses such as wildland fires, water rescue or technical rescue incidents requiring manpower above what the first alarm would bring.

o. If stations require evacuation, utilities should be shut off prior to departure.

p. Departments will continue operating in the adaptive response mode until a Chief Officer determines it safe to conduct normal operations.

4.1 Guidelines for Operations During Tropical Storms, Hurricanes and Tornados

a. Tropical storms and hurricanes create heavy rainfall and high winds. Tornados can develop sustained winds that create missiles and move objects. Fire departments operating during these events need to be cognizant of these dangers, and to plan accordingly.
b. Fire departments should not operate outdoors in sustained winds of 50 MPH or greater.
c. Flooding may result and create barriers between rescuers and patients. At no time shall rescuers wear turnout gear in flooded areas. Personal flotation devices shall be worn at all times in and around flooded areas.
d. Do not drive fire apparatus through flooded areas. Go around these areas or have other units respond from a different direction.
e. Boat work during these events:
    1. Ensure all firefighters working with boats during these conditions can swim.
    2. Personnel shall work in teams of two.
    3. All boat occupants shall wear personal flotation devices.
    4. Ensure the boat has communications with ground based units.
f. External hazards (electrical, gas and water) must be assessed.
g. Personnel may be limited due to wind conditions and visibility. High winds can create issues with controlling watercraft.

4.2 Activities during a severe weather event watch

a. A watch indicates that a storm may be imminent within 36 hours.
b. Fire department leadership should develop an incident action plan for the impending storm.
c. Top off all department vehicles and power driven equipment (chain saws, generators etc,)

d. Test run all equipment to ensure functionality.
e. Ensure all cascade systems and SCBA bottles.
f. Restock supplies as needed.
g. Ensure fuel tanks have sufficient volume to handle extended operations.
h. Develop a schedule that includes work/rest cycles for personnel.
i. Ensure all loose items in/around the station(s) are secured and will not become missiles.

4.3 Activities during a severe weather event warning

a. A warning indicates a storm may be imminent within 24 hours
b. Move all personal vehicles to high ground if needed.
c. If emergency services to certain areas may be or are compromised, notify the public. Authorized media releases by department chief officers or the department public information officer should address these situations and serve a notification means.
d. Implement recall for paid personnel (if necessary).
e. Ensure personnel have sufficient bedding, sleeping gear, uniforms and toiletries for extended operations. Personnel should have a 72-hour bag with supplies and food that does not require cooking.
f. Maintain situational awareness and brief personnel accordingly.

4.4 Guidelines for Operations During Flooding Conditions

a. Flooding conditions should not be taken lightly. Currents can be deadly and injure or kill personnel. Precautions must be taken to ensure their safety.
b. Floods can bring hazards to you. Examples are floating or submerged propane tanks, floating vehicles, poisonous reptiles and subsequent fires resulting from the flooding.
c. Firefighting during flooding conditions requires caution and risk acceptance.
    1. The use of turnout gear is at the discretion of the incident commander.
    2. Risk versus benefit must be assessed. The mode of operation (defensive versus offensive, interior versus exterior) must be determined in accordance with the risk assessment.
    3. Conditions will determine and dictate firefighting operations.
    4. Access may be hindered or prevented by flooding conditions.
    5. Water supply may be limited.
d. Before moving through water, personnel should “sound” the ground to ensure holes or washouts are not present.

4.5 Guidelines for Operations During Snow, Sleet or Ice Storms

a. Access will be the main concern during these weather events. Roads and driveways may be impassable requiring long, hand stretched hoselines. Aerial devices and ladders may not be able to be placed.
b. Run off from hose streams may create icy conditions.
c. Response will be delayed due to ice and snow conditions on the roadways. Anticipate delays and plan accordingly.
d. Visibility from windblown snow may be limited. Adjust apparatus speed accordingly.
e. Response may not be safe and viable. Chief Officers have discretion to limit or cease operations as needed.

4.6 Guidelines for Extreme Heat Conditions

a. Extreme heat is considered temperatures 80 degrees (F) or higher. High humidity coupled with temperatures 80 degrees or higher
b. Wet bulb thermometer reading of 80 degrees (F) or greater
c. Recommended procedures to follow:
    1. Create a work/rest cycle to ensure firefighters are not overworked
    2. Establish a rehabilitation sector
        a. Use EMS personnel
        b. Provide hydration
        c. Provide cooling (cab/crew compartment interiors, tents)
        d. At a minimum, take firefighter vitals
        e. Have EMS assess firefighter vitals and hydration status before allowing return to activities
d. Wet bulb readings
    1. Less than 70 degrees Fahrenheit. No special action is required. Normal firefighting hydration and rehab procedures for the training and operations should be followed.

    2. 71 to 80 degrees Fahrenheit. Training and operations continue without limitation, but conditions and all personnel will be monitored closely by EMS, and the IC will increase rehab time and hydration opportunities for all personnel.

    3. 81 to 85 degrees Fahrenheit. Training and operational conditions are considered hazardous if mitigation steps are not taken. The IC will ensure the following steps to;
        a. Initiate active cooling measures with all personnel ASAP
        b. Ensure persons not required to be in PPE are not in PPE
        c. Plan for;
            i. Increased rehab time
            ii. Increased time between drills
            iii. Increased hydration opportunities for all personnel
            iv. Aggressively monitor all personnel closely

    4. 86 to 90 degrees Fahrenheit. Training should cease**.** Additional mitigation steps (above and beyond the mitigation implemented at 81 - 85 degrees) must be taken to allow training to continue. Firefighters operating at incidents must be more closely monitored and assessed. Increase mitigation steps.
        a. Ensure adequate hydration
        b. Increase EMS monitoring

    5. Consider additional alarms to bring fresh firefighters to the incident.
    6.

4.7 Guidelines for Extreme Cold Conditions

a. Extreme cold conditions will affect fireground operations as rapidly as extreme heat conditions.
b. Incident commanders must plan for these conditions and prepare accordingly.
c. Frost nip and frost bite can damage firefighters permanently, and must be prevented.
d. Exposure to extreme cold may result in hypothermia.
e. Provide heated rest areas for personnel.

5.0 Extreme weather decision matrix.

a. The accompanying matrix provides incident commanders and dispatch a management tool to safely formulate decision on resource management. The intent is to prompt the incident commander on potential resources he/she may need that may become overlooked in the heat of battle, or to automatically dispatch resources in accordance with agreed upon policies.
b. Weather conditions are indicated on the left axis which are normally experienced in our county during firefighting operations.
c. The top axis identifies resources normally used during fireground operations.
d. A color coded box system indicates the following:

1. Green – this color indicates that the incident commander makes this decision and requests the additional resources on his own accord.
2. Orange – this color indicates a situation where the dispatcher will call the incident commander and remind him/her to request additional resources. The incident commander will consider the prompting, and make his/her decision accordingly.
3. Red – this color indicates resources that will automatically be dispatched to the fireground by the dispatcher.

e. The matrix does not limit the incident commander to just these resources. The incident command may request additional resource when and where he/she decides.

Condition	Cease Response	Additional Engine	Additional Truck	Additional Manpower	EMS QRV	EMS Trans	Warm/ Cool Tents	Additional Hydration	Extended Rehab
> 32 F									
71-80 WB									
81-85 WB									
86-90 WB									
Extended Operations									
Extreme Weather									

IC determines need and requests same from dispatch

Dispatch queries IC to remind/determine need

Dispatch automatically sends these assets or executes this task

Extreme Weather Decision Matrix

5.1 Cold Weather Operations

a. Care must be taken to ensure apparatus and equipment does not freeze when exposed to cold weather.

1. Pumps should be churned, at a minimum, every thirty minutes.
2. For extended exposure (parking, outside storage), booster tanks, pumps and all plumbing should be drained.
3. Ensure fuel tanks are topped off and antifreeze is appropriate for the anticipate temperatures when storms are predicted or impending.
4. See procedures for general guidelines (4.0), a weather event watch (4.2) and a weather event warning (4.3) for applicable guidance.
5. Have hot beverages available on the fireground to ensure hydration and for warm up. Avoid caffeinated beverages as they are restrict blood carrying vessels.
    a. Limit exposure through crew rotation.
    b. Provide a warm area for rehabilitation.
    c. Increase EMS monitoring of all operating personnel.
    d. Pay particular attention to apparatus operators and other firefighters that are sedimentary and not actively moving.

b. Use the wet bulb thermometer to monitor temperatures.

5.3 Wet Bulb Thermometer