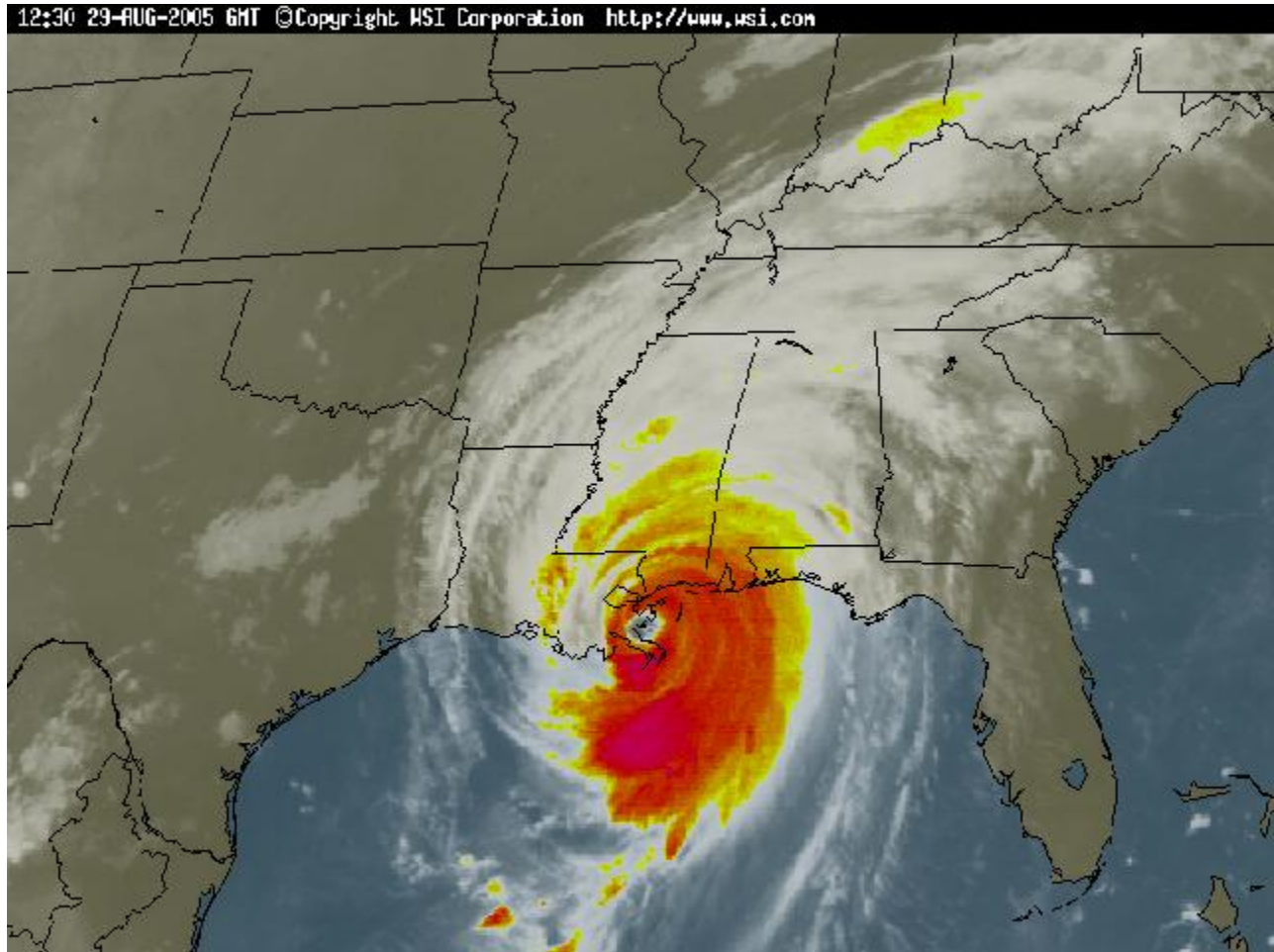


# Hurricane Katrina Final SAT Report

## Alabama, Louisiana, Mississippi



Hurricane Katrina at landfall, 29 August, 2005

**(09/01/2005 – 09/22/2005)**

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## **Executive Summary – Hurricane Katrina Safety Assistance Team 1**

### **Team Members:**

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Vince Mazzier - Bureau of Land Management, Office of Fire Aviation, Boise, ID.  
Tim Radtke – Public Health Service assigned to Department of Interior, Denver, CO.  
Valdo Calvert (Team Leader) US Fish and Wildlife Service, Regional Office, FT. Snelling MN.

### **Narrative:**

The Hurricane Katrina Fire and Aviation Safety Team (FAST) was formed on September 1, 2005 to conduct an independent assessment of operational, managerial, administrative issues and provide safety support to the Incident Management Teams (IMTs) assigned to the Hurricane Katrina recovery effort. In addition, they were to provide Regional Fire and Aviation Staff intelligence concerning the safety of interagency employees assigned to the event. It was recognized by the Regional Fire Operations Safety Manager, Larry Grimes, that the traditional role of the FAST would not meet the necessary objectives of the incident. The FAST members concurred with this decision and all mutually agreed that a team name change was necessary to convey the intent of the mission. It was agreed that the evolved role of the team would be Safety Assistance Team (SAT). The SAT was to visit Hurricane Katrina response locations such as base camp support locations, mobilization centers, staging areas, distribution centers, disaster mortuary support locations, receiving and distribution sites, evacuee support camps, and area command centers. The Objectives of the SAT when visiting these locations were as follows:

### **Objectives:**

- The SAT would be service oriented, providing assistance to the IMTs.
- The SAT would also serve as “lookouts” skilled in recognizing potentially hazardous conditions.
- The team would provide early warning where accident prone circumstances exist.
- The SAT was authorized to provide direct intervention, circumventing the normal chain of command when necessary.
- Assist IMTs develop safety procedures that contributed to a safe working environment for employees involved in “out of the box” mission tasks.
- Maintain open communications with incident management personnel at all times.
- If SAT members encountered complex interpersonal or employee performance situations they were to focus on the specific safety related facts and avoid venturing into situations beyond skill levels. Identify this situation and refer them to an appropriate official.
- SAT would be as self sufficient as possible contributing low impact to the Incident Management Teams visited.
- Provide in briefings and out briefings for Incident Commanders and agency officials as requested.
- Facilitate information exchange concerning safety issues and positive actions and examples between teams.
- Maintain liaison with Area Command Teams and IMTs to communicate current event travel itinerary to provide for the safety of the SAT.
- Report information on progress and issues to the Region 8 Safety Manager or assistant. Any issues needing immediate attention were to be reported as soon as possible.
- Facilitate the issuing of safety memorandums and briefing papers to ensure a single source of operational safety direction Incident Management Teams and support personnel.
- At the end of the assignment, develop and submit a written report for the Regional Fire Operations Safety Manager outlining the SAT findings and recommendations.

## Hurricane Katrina Safety Assistance Report

### Commendations:

- The Region and Incident Management Teams (IMT) did well in selecting adequate locations for mission operations. All camps are situated in the best locations available with adequate room for infrastructure such as caterers, showers, and vehicle access.
- IMT flexibility and ability to adapt to nonstandard situations allowed for mitigation of safety issues. Examples include establishment of one way traffic patterns for truck traffic, escorts for trucks to parking areas, Foreign Object and Debris removal sweeps around aviation areas.
- IMTs are preparing contingency plans for inclement weather, evacuations, and exit strategies to allow transition of operational control to National Guard or local agencies.
- IMT should be commended for facilitating briefings and meetings which bring in cooperating organizations into a unified command organization.
- Several IMTs were observed working in extremely chaotic situations where their innovation, flexibility and willingness to assume non-standard roles likely saved lives. Examples include, but are not limited to:
  - Pincha-Tulley's IMT opened a substantial airstrip and managed a complex aviation operation that included military and civilian aircraft varying from 747 jets to light helicopters.
  - Custer's IMT (Red Team) likewise managed a complex aviation operation and in addition organized and relieved medical personnel from essential but non-technical duties to enable these doctors and nurses to focus on critical medical treatments.

### Findings and Recommendations:

**Finding 01:** Traffic control systems are not operating throughout the hurricane affected areas and pose high risk to employees driving in these areas.

**Discussion:** In the storm impacted areas, many traffic signals are not operating, regulatory signs are missing, and roads are congested with debris. Emergency response personnel and residents are frequently driving with low regard to traffic safety rules emergency and law enforcement vehicles are commonly operating with full emergency lights flashing. These signals are being ignored by most vehicles operating within the impacted areas. This will increase safety problems traffic increases. Civilian vehicles are frequently operating at high speeds and some contain large quantities of gasoline in a variety of unapproved containers.

**Recommendation:** IMT operational briefing should advise employees of the "lawless" environment, stress defensive driving and provide for monitoring of travelers. All vehicles should be equipped with a cellular phone, and detailed maps of assignment areas. Use safety belts, slow speeds, give right of way, and approach all intersections with caution treating them as a four way stop. Refer to National Multi Agency Coordination Group Memo: Katrina Recovery Effort Incident Assignment—What to Expect issued September 3, 2005 for guidance.

**Finding 02:** Several IMT locations have environmental safety issues which include noise, mold, dust, and insect infestations.

**Recommendation:**

- Incident specific 215a forms should be developed addressing mitigation measures for common hazards encountered by all risk situations.
- Geographic Regional Safety Officer should ensure that safety briefing publications developed for this incident are distributed to all IMTs.
- Priority purchase of recommended safety equipment ordered by IMT Safety Officers (as identified in a Job Hazard Analysis) should be facilitated by Incident Business Advisors (IBA).

**Finding 03:** Regional IMTs are not readily equipped with critical supplies and equipment specific to initiating Hurricane or other natural disaster response operations

**Recommendation:**

- Regional or National Management should investigate the development of “hurricane / all risk” specific cache vans and strategically locate them for quick, efficient utilization by IMTs for the safety of incident personnel. Development of equipment inventories required should be developed by regional logistics and FEMA technical experts. Refer to Federal Emergency Management Agency (FEMA) remedial action issue data collection form for 2005 Hurricane Dennis – Proposal for Hurricane Mobilization Center Cache Vans.
- Acquisition of mobile command post vehicles equipped with emergency communications systems should be evaluated.

**Finding 04:** Several IMTs expressed concerns relating to fatigue management and incident stress.

**Discussion:** The mental health of team members, supporting DMORT operations, may be a concern due to the length of assignment and growing fatality counts of hurricane victims. Other sites had dynamic operations that required extensive shifts beyond 16 hour work days. This issue was not apparent at all sites due to different levels of complexities and mission tasks.

**Recommendation:**

- Personnel should be offered Critical Incident Stress Debriefing (CISD) services as needed.
- Incident commanders must be given the authority to manage fatigue. Based on the stress, workload and other factors. They must be given the discretion of determining optimal safe assignment length and work/rest cycles based on stress and fatigue management and to include the authority to extend assignments beyond the wildland fire constraints.

**Finding 05:** Occupational health and safety and Public Health Services expertise would be beneficial for “All Risk” assignments of IMTs.

**Discussion:** Many issues arise on all risk assignment that requires expertise in public and occupational safety.

**Recommendation:** Occupational Health and Safety personnel and Public Health Officers should be considered for addition to the IMT roster for “All Risk” assignments.

**Finding 06:** Security at several camps may not be adequate to ensure protection from unauthorized personnel especially at the Jackson Square camp and others within the city of New Orleans.

**Recommendation:**

- All IMTs should evaluate their security need and develop a security plan for protection of employees. This may require reevaluating the mission, the location of the camp, use of barricades or law enforcement personnel.
- Consideration should be given to include a law enforcement or security manager position with IMT mobilization.

**Finding 07:** There is pervasive and persistent misunderstanding of the health risks posed by stagnant flood waters and dust from drying silt deposited throughout the flood zone in New Orleans.

**Discussion:** Currently it has been determined by the Center for Disease Control (CDC) that stagnant flood water does have elevated bacterial counts but does not pose a large threat to humans if not ingested or contacted with open wounds. Standard hand washing and personal hygiene is an adequate preventive measure. Concerns about dust from drying silt are centered around inhalation of particulates and not toxicity. These concerns can be mitigated voluntarily through the use of N-95 dust masks

**Recommendation:**

- Safety Officers should maintain contact with Area Command in order to obtain current correct information on environmental and medical hazards posed by flood waters and dust.
- Personnel should be informed of findings.
- Regional supply cache’s should stockpile commonly used PPE for hurricane response, as determined by subject matter experts such as but not limited to N-95 dust masks, hearing protection, and puncture resistant gloves.
- Logistics and supply personnel should order quantities of N-95 dust masks to supply incident personnel.
- N-95 dust masks should be made available to personnel requesting them. Information on mask capabilities and instruction on their use should be provided upon issue. For work involving higher

prolonged levels of exposure and occupational safety and health professional should be consulted to reevaluate PPE selection.

**Finding 08:** Centers for Disease Control and Prevention (CDC) has determined personnel involved in hurricane recovery efforts do not need to be immunized for hepatitis A or hepatitis B unless involved in direct patient care. CDC has issued advice for workers to be immunized for diphtheria/tetanus as a part of routine disease prevention.

**Recommendation:** All employees responding to Katrina should have received a diphtheria/tetanus booster within the last 10 years as part of routine medical care. Those likely to be mobilized are encouraged to be current with this recommendation or obtain the diphtheria/tetanus booster prior to being dispatched. However, mobilization should not be delayed in order to do so. Those at highest risk are employees in the process of debris cleanup, tree removal and cuts by nails or sharp objects. The CDC and U. S. Public Health Service advises that it is accepted medical protocol for a diphtheria/tetanus booster to be administered, if needed, shortly after an injury occurs for those individuals already deployed.

**Finding 09:** Aerial insect control spraying is occurring and has caused concern among incident personnel.

**Discussion:** The product being used is *Naled—Di Brom* in a much diluted mixture and is not considered to be a health hazard by EPA. An MSDS is available.

**Recommendation:** Safety Officers should maintain contact with Area Command in order to obtain current correct information on insect control issues and advise incident personnel on the safety of operations.

**Finding 10:** The availability of incident safety information is haphazard, unstructured and difficult to obtain by field safety personnel.

**Recommendation:**

- The Regional Office should establish and maintain a web site for distribution of definitive safety information, advice, and safety issues to all field safety officers.
- Region 8 should compile safety information and mitigation measures utilized by IMTs during the Katrina Incident for a “lesson learned” project. These should include safety plans, ICS-215 forms, ICS-215A forms, and Incident Action Plans (IAP) from the Katrina incident and summarize them use on subsequent incidents. Conclusion from 2004 Hurricane Response lessons learned project should be compared to other hurricane lessons learned projects and disseminated to emergency organizations.
- The Regional Fire Operations Safety Officer should consider instituting a periodic IMT Safety Officer conference call for information sharing and accident trends.
- The Regional Fire Operations Safety Officer should develop a Safety Information Packet to be distributed prior to deployment

**Finding 11:** State and other nonfederal safety officers are not aware of all federal safety policies affecting personnel.

**Recommendation:** Agencies should ensure changing federal policies are transmitted to all non-federal Safety Officers and extend invitations to regional and national safety meetings and workshops.

**Finding 12:** Incident medical personnel cannot be utilized up to their certification levels due to a lack of EMS sponsorship technicalities.

**Discussion:** Paramedics from outside the state of their licensure may only perform at the Basic Emergency Medical Technician (EMT1) level.

**Recommendation:** Interagency departmental direction and guidance should be established which permits emergency medical personnel to operate at their highest level of certification. An example would be for national emergencies, the surgeon general could be the sponsoring physician for paramedics when crossing state boundaries allowing them to operate at their certified level.

**Finding 13:** IMT configuration and limited numbers of positions for disaster response often impedes the IMT ability to function efficiently.

**Discussion:** Teams are currently limited to wildland fire configurations which may not reflect incident needs. For example, several teams would function more efficiently with multiple Logistics Section Chiefs

**Recommendation:** The composition of IMT should be discussed by Incident Commanders and regional officials to determine functional capabilities required by the incident. A minimum team compliment should include all of the command and general staff positions; all other positions should be at the discretion of the IC up to a maximum of 50 (not including rainees).

**Finding 14:** There is no common form of communications between agencies responding to disasters and this often requires the IMT to supply a central system of communication for itself and cooperators.

**Recommendation:**

- A system of communication including hardware such as scene of action radio kits should be available to all IMTs upon dispatch.
- A series of interagency (including military) compatible, radio frequencies specifically for disaster response and should be established.

**Finding 15:** Who is in charge? Lack of FEMA leadership resulted in confusion and inefficient operations.

**Discussion:** The different levels of understanding among cooperating agencies on the use of the Incident Command System (ICS) creates inefficient and confusing operations and does not provide for adequate command and control

**Recommendation:** A clear line of authority should be established for IMTs to function within a standard ICS organization.

**Finding 16:** There is no preplanned coordination between military and civilian aviation operations forcing IMT aviation personnel to mitigate safety issues.

**Discussion:** Examples include New Orleans Airport and NASA-Stennis Space Center where civilian and military aircraft were landing with no control operations in place until IMTs voluntarily interceded and managed operations.

**Recommendation:** Aviation protocols should be developed between military and agency aviation managers for emergency disaster operations

**Finding 17:** Several types of IMT organizations involved in the response effort and are often at odds, or in competition for resources.

**Discussion:** These teams include federal wildland fire IMTs, State to State agreements support teams, US Army Corps of Engineer Teams, FEMA and local officials.

**Recommendation:** Consideration should be given to the development of a new ESF category for Command and Control Management of emergency operations.

**Finding 18:** Safety Officers must develop mitigations to unfamiliar situations during “All Risk” incidents without the benefit of prior information or experience.

**Discussion:** IMTs are dispatched to “All Risk” incidents without a clear mission direction or adequate logistical preparation.

**Recommendation:** A written information packet and verbal briefing should be presented prior to deployment of IMT in order highlight specific safety situations.

**Finding 19:** FEMA supplied contractors have an indirect relationship to the IMT which causes safety issues in relation to bio hazardous waste management as well as personnel and camp hygiene.

**Discussion:** Contractors, such as Kenyon, a human remains recovery company, arrive with expectations of support from IMTs. IMTs are not aware of contract requirements until the contractor arrives and are not prepared to evaluate their contractual obligation. Other examples are contractors such as Waste Management Inc., supplier of dumpsters and port-a-potties, that are not providing adequate servicing of their units and the IMTs have no contract enforcement authority.

**Recommendations:** IMTs must be supplied contact representatives from FEMA for the management of contractors being assigned to support base camps.

**Finding 20:** One type 2 IMTs observed was tasked with a very complex mission. This required the team be spread out and develop an unconventional management structure.

**Discussion:** The IMT was managing two widely separated base camps, two trucking distribution centers, numerous Point of Distribution sites, and had plans on developing an additional camp. It should be noted that the IC did not feel his team was overly taxed.

**Recommendation:** Area command in briefings of IMTs should stress adaptability, flexibility and provide IMTs with reasonable sideboards and guidance for disengagement. Area Command should actively monitor incident complexity and provide support or team replacement as the complexity requires.

**Finding 21:** Emergency sleeping facilities observed by the SAT were congested, did not have clear egress aisles, and could contribute to spread of infectious diseases.

**Discussion:** Cots were arranged closely together with no clear route to exits.

**Recommendation:** Arrange sleeping accommodations to provide adequate space between individuals and provide for clear emergency exit needs. Personnel exhibiting symptoms of communicable diseases should be relocated to another facility.

**Finding 22:** There this a perception by IMTs that incident employees, with valid certifications allowing operation of forklifts and vehicles but not having a Forest Service endorsement, may not be used as operators until receiving specific Forest Service training.

**Discussion:** This was a large issue during the 2004 hurricane season and caused concern in 2005.

**Recommendation:** The Forest Service should consider modifying existing policy to accept other agency or valid state certifications for vehicle operations.

**Safety Assistance Team Activity Log:**

<b>DATE</b>	<b>Location</b>	<b>Activity</b>
9/1/05		Travel - Safety Assistance Team (SAT) ordered and began traveling to Atlanta.
9/2/05	Atlanta, GA	SAT assembled and began preparation for mission.
9/3/05	Atlanta, GA	Completed preparations, Delegation of Authority and related briefings,
9/4/05	Montgomery, AL	Reviewed Prevey's Logistic Management Team activities.
9/5/05	Meridian, MS	Reviewed Quesinberry's Logistic Management Team activities.
9/6/05	Stennis NASA Center, MS	Reviewed Pincha-Tulley's Base Camp and Staging Area.
9/7/05	Gulf Port, MS St. Gabriel, LA Gautier, MS	Reviewed Thomas' Base Camp operations. Reviewed Molumby's Base Camp operations. Reviewed Gelobter's Base Camp operations.
9/8/05	New Orleans, LA	Reviewed Custer's Base Camp operations.
9/9/05	Baton Rouge, LA Hammond, LA	Received briefing from Ribar's Area Command Team. Reviewed Standsfield's Base Camp and POD management activities.
9/10/05	Stennis NASA Center, MS	Reviewed Pincha-Tulley's Stennis Airport operations.
9/11/05	New Orleans, LA	Reviewed Cable's Base Camp operations.
9/12/05	Gulf Port, MS	Reviewed Thomas' Base Camp operations.
9/13/05	Gautier, MS	Reviewed Gelobter's Base Camp operations.
9/15/05	Destin, FL	Report preparation
9/16/05	New Orleans, LA	Reviewed Cable's Base Camp operations Reviewed Molumby's Saints Field Base Camp operations Reviewed Standsfield's Staging Area
9/17/05	New Orleans, LA	Reviewed Anderson's Base Camp operation Conference with Joe Ribar
9/18/05	Destin, FL	Report preparation.
9/19/05	Atlanta, GA	Report preparation.
9/20/05	Atlanta, GA	Consultation with Regional Office Staff.
9/21/05	Atlanta, GA	Closeout with Regional Office Staff

**2004 Hurricane Response “Lessons Learned”  
Comparison to  
2005 Findings and Recommendations**

During the unprecedented 2004 hurricane season, 17 Incident Management Teams and 4 different Area Command Teams were activated over a two month period to support the logistical needs of emergency response and recovery efforts in Florida, Georgia, Mississippi, Louisiana and Alabama. This was the largest application the Incident Command System to a non-wildland fire event up to that time. During the height of activity, the Southern Region requested the Wildland Fire Lessons Learned Center to evaluate the response of wildland fire management agencies and the incident command system overall in application to a non-fire natural disaster managed by the Federal Emergency Management Agency. The Lessons Learned Center dispatched a team to interview team members, FEMA personnel, and numerous other individuals involved in the effort. The result of the interviews were summarized by a private consulting firm and consolidated in a 56 page report titled, 2004 Hurricane Response.

The following is a summary of the issues and concerns identified in this 2004 report that remain significant concerns affecting the safety of personnel involved in the 2005 disaster response. Ironically on page 2 of the 2004 Hurricane Response states that many of the respondents interviewed in 2004, *“expressed doubt that the contents of this report would make any difference. Most believed that the solutions that came out of previous report were rarely implemented as a standardized practice, or a best, were implemented by just a few individual IMTs.”*

<b>Excerpts from the 2004 Hurricane Response Remaining As Concerns in the 2005 response</b>	<b>Katrina Findings SAT</b>
<p>Nearly everywhere that success was reported, it had usually been preceded by a series of failures and frustrations. Many respondents only reported failure and frustration as differing policies, relationships, practices, doctrine, and undefined or poorly reconciled visions produced widely varying problems. In attempting to resolve them, wildland fire personnel sometimes took disparate and unpredictable actions. In most cases, most job stress and frustrations resulted from poor organizational alignment and an inability to act, rather than anything resulting directly from the disaster itself. Managing and correcting these problems, when possible, sometimes took nearly super-human efforts by agency personnel trying to provide aid and comfort to the populace. Many of the wildland personnel who did not get assigned to meaningful or productive assignments became deeply discouraged and depressed, vowing not to accept such assignments in the future. – Page 1.</p>	<p>Commendations, 02, 04, 17, 18.</p>
<p>Respondents emphasized the virtues of patience, professionalism, adaptability and flexibility as keys that kept them functional and positive throughout the experience. During the interviews, leaders continually stressed the importance of building and maintaining positive relationships as a core competency. – page 2.</p>	<p>Commendations, 04, 15, 17</p>
<p>Through the National Response Plan, the wildland agencies may be tasked with firefighting under ESF#4, but in fact that is rarely, if ever, done. In reality, ESF#4 appears to be a mechanism to bring in the USFS and other wildland agencies, which in turn are given work assignments ranging from ground-debris searches to management of relief staging areas and medical relief centers (ESF-7, 8 etc.) – page 10.</p>	<p>13, 18</p>
<p>In the eyes of FEMA respondents, the wildland fire agencies have become a new civilian army of workers available for hurricane-relief operations. For this reason, Incident Management Teams (IMTs) have been increasingly tasked during hurricane responses to manage the bottom end of the relief supply chain, managing regional staging areas and handling inventory and shipments of goods traveling to local distribution centers. The 2004 Hurricane Response effort was indicative of this focus. In addition, they may perform such diverse tasks as managing critical care centers or supporting Emergency Operations Centers. – page 10.</p>	<p>Commendations, 13, 17, 18</p>
<p>Wildland fire respondents who had worked previous hurricane assignments reported that the interface with FEMA was often rocky because FEMA and the wildland fire</p>	<p>15, 17</p>

agencies do not share a common doctrine. Further, neither a doctrine nor guidelines for managing the relationships between FEMA and the wildland fire agencies has been defined. On “typical” single incidents, this lack of definition often resulted in wildland fire personnel receiving ambiguous or inappropriate assignments, sometimes as teams and sometimes as individuals. – page 15	
The strategic thinking and planning by USFS Regional Operations was compromised by the large scope and complexity of FEMA’s requests during the first weeks of the response. These gaps produced a series of problems for IMTs and responders who were without guidance and structure during the first weeks of the incident. – page 19.	15, 17
The lack of FEMA presence in the briefings and on site left wildland fire IMTs to determine many operational parameters without direction or guidance. While USFS Regional Operations, and sometimes Area Command, assisted with these tasks, much of the initial response effort was a best guess. – page 20	15
Respondents described the tangled command and control structure that emerged when two (and sometimes three or four) command structures attempted to control the same resources and the quagmire of problems and decisional work it produced for agency management. Without structured processes for integrating IMTs and Area Command with the FEMA command structure, operations and command staff fell back into basing their command and control authorities on personal relationships, negotiated items, and ad hoc processes. – page 21.	15, 16, 17, 19
As command and control authorities and structures became confusing, personnel reverted to relying upon personal relationships and ad hoc processes to sustain operations and solve problems. – page 21	15
Problems with compatibility were not limited to command and control. Some of them stemmed from USFS agency requirements placed on other National Wildland Coordinating Group (NWCG) cooperators or new policies being implemented during the disaster. Across the response, problems with system compatibility caused duplication of effort, errors, and extra work. In most cases, wildland fire resources, FEMA, and the cooperating agencies had to reinvent, test, and revise processes and systems so that they could work together. Frequently, these changes took many days away from the response effort and caused ongoing frustration with response personnel. – page 21.	11, 18
Regional Ops, SACC, and the IBA determined it would be easier to purchase surge supplies and stage trailers for teams to alleviate the 72-hour supply ordering confusion. – page 25.	03
To many in FEMA, the wildland fire Incident Management Teams represent the largest, most capable, independent, self-supporting response organization in the U.S. As an organization with a well-established and specialized doctrine of incident management and the Incident Command System (ICS), the wildland fire community (through the National Wildfire Coordination Group) appears a specialized, well-honed tool to be used in a non-specialized, ad hoc environment. One ESF#4 respondent reported that initially FEMA regional operations thought that all IMTs could do was fight fires (true to the ESF#4 description), yet in the end IMTs are sent to accomplish a wide variety of mission assignments for FEMA. On the other end of the spectrum, some respondents commented that they felt the IMTs were being volunteered to do work by the USFS National Office and the U.S. Department of Agriculture that was neither appropriate nor well suited to IMT skill sets. Respondents questioned whether IMTs and wildland firefighters are appropriate resources to be tasked with clearing orchards, tarping houses, herding cattle, and fixing fences. – page 28.	15, 17
IMT respondents noted that the largest percentage of the workload came from the demands of managing representatives from various response agencies and organizations on site. IMT personnel had to use a wide variety of interpersonal and communication skills to be successful. –page 30	13, 15, 16, 17

<p>The lack of defined processes, procedures and command structures made for difficult days in the beginning of the assignments. – page 30.</p>	<p>13, 15, 17</p>
<p>The optimum solution for ordering, staging and fielding IMTs into these environments was not agreed upon. All groups indicated that the current methods and assumptions for assembling teams requires further development, so that the process can be more adaptive, flexible and effective. – page 32</p>	<p>13</p>
<p>The Incident Command System was used by all responding IMTs, and was considered to be an important factor in getting results. Often, IMTs were the only organization on site with any ICS skills.</p> <p>ICS and IMT organization produced a center of mass and momentum, which enabled Incident Commanders to set a direction for others to follow and provided a vision of what “right” looked like. – page 33</p>	<p>13</p>
<p>Wildland fire personnel reported wide variations in fatigue factors, depending on what they were assigned to do, but more importantly, if the work was rewarding or meaningful. – page 37</p>	<p>04</p>
<p>For those that found meaningful work, fatigue was generally not reported. Because the process of developing relationships, processes and procedures for managing a mission often took more than a week to pull together, wildland fire personnel reported frustration with the wildland fire work/rest policies. Interviewees reported disappointment at the prospect of leaving their operation once that progress was finally being made and work was becoming more rewarding. Respondents questioned if the safety factors that the wildland fire 14-day work assignment policy was intended to correct was still applicable to these all-risk logistical support assignments. – page 37</p>	<p>04</p>
<p>Respondents generally agreed that the use of the 14-day assignment restriction should be reexamining to be more applicable to these assignments – page 37</p>	<p>04</p>
<p>According to interviewees, at first the Area Command Team had difficulties trying to find its place in the command and control hierarchy. IMTs operating under the first ACT reported having difficulty with Area Command in the mix, and did not perceive much benefit from the presence of the ACT. Some saw the presence of Area Command as an extra layer of bureaucracy. They reported that USFS Regional Operations personnel would sometimes “go around” the ACT, clouding the roles and responsibilities of the ACT in the eyes of the IMTs. Another IC reported only conversing once or twice with ACT during their assignment, but felt better that they were there. – page 39.</p>	
<p>Respondents were only able to identify a handful of post-incident reports and briefing packages that contributed to doctrine for hurricane response. There is little, if any, doctrinal guidance concerning wildland firefighters participating in all-risk assignments in general, or guidance that delineates what parts of existing firefighting doctrine applies to all-risk situations.</p> <p>Some operations personnel felt that the prospect of shoehorning firefighting doctrine into a hurricane response effort, and then having to make large numbers of exceptions ad hoc, posed a risk that undermined the existing doctrine and firefighting mission. – page 52.</p>	<p>03, 05, 11, 13, 16, 17, 18.</p>
<p>Beyond meeting the needs of the workforce, the most salient and powerful outcome of doctrine development could be the smoothing and formalizing of the operations between FEMA and the wildland fire agencies. Formalized all-risk doctrine could form the base for process development and FEMA educational efforts, and potentially elevate the FEMA relationship beyond a basis of personal relationships only. – page 52</p>	<p>18</p>
<p>Several respondents posed general questions relating to what would have happened had an incident of this magnitude occurred during a busy fire season. As an all-risk player, the wildland fire agencies may soon be faced with balancing an increasing responsibility for a non-cyclical national emergency response with traditional</p>	<p>04</p>

seasonal firefighting duties. –page 53	
Several IMT respondents suggested that the S-520 Advanced Incident Management course be modified to include all-risk or hurricane scenario, however questions were raised about support requirements for personnel who do not attend this training program, including Type 2 IMT personnel. – page 52	18

## **Appendix**

## Appendix 1



### Information Briefing Employee Safety and Health Team Larry Grimes – Team Leader Hurricane Katrina Emergency Response

Following is a copy of a memo the team is sending to IMTs in the field.

*(NOTE: This memo has been coordinated with Tim Radtke– DOI)*

**Date** September 16, 2005

The purpose of this memo is to provide information on the proper procedures for reporting incidents of exposure to chemicals, physical, biological agents and/or blood borne pathogens. Although the primary mission of responders has been to staff distribution centers, base camps, and mobilization centers, there are occasions where activities *may* result in exposures. Examples of exposure incidents may include, but are not limited to, contact with contaminated water, contact with blood in an open cut or mucus membrane, a pesticide chemical sprayed into face/eyes/mucus membranes, excessive noise, and contact with sewage or fecal matter.

#### **Definitions**

OSHA specifically regulates employee exposure to blood borne pathogens; however, it is an agency requirement that ALL exposure events be documented. This documentation is necessary for the purposes of worker compensation in the event an employee develops a related illness.

**Blood borne pathogens** are pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV). Blood borne pathogens can also be present in urine, saliva, tears, vaginal secretions, semen, breast milk, or other body fluids that could contain blood.

**Exposure Incident** means a specific eye, mouth, other mucous membrane, non-intact (broken) skin, or piercing contact with blood (such as a needle-stick injury, human bite, cut or scrape) that results from the performance of an employee's duties.

#### **Reporting Exposure Incidents**

For exposure incidents related to the Katrina Response, employees are required to complete the attached form **ONLY** in the event of an actual exposure. This completed form documents specific information about the exposure event that may be necessary for future medical treatment purposes. This form can be used as source information for completion of a CA-1 or CA-2, and/or CA-35 at the home unit. A copy of the form should accompany the individual to their home unit for entry into their respective agency accident reporting system (i.e. SHIPS, SMIS)

**Contact:** Larry Grimes, Jeff Scussel, or Allison Good (678) 441-5125

**Hurricane Katrina Response Incident  
Occupational Exposure Form**

Complete this form in the event of an exposure incident as a result of the performance of official duties. After completion, file this form in the employee's medical folder for permanent retention. If an illness results from exposure, the appropriate CA forms should be filed.

I. Location of Exposure:

II. Occurrence:

Date (s) of Exposure:

Length of Exposure:

Amount of Exposure:

III. Exposure Type (exposure, inhalation, ingestion, absorption):

IV. Affected Groups/Individuals:

Name:

SS#:

Title, Series, Grade:

Duty Location:

V. Safety Factors:

Recommended Action:

Action Taken:

VI. Review:

Witness at time of exposure:

Supervisor at time of exposure:

Title:

Phone:

Date of Report:

Reviewed by:

Title:

## Appendix 2

From: ["Holt,Kristin" <Kristin.Holt@fsis.usda.gov>](mailto:Holt.Kristin@fsis.usda.gov)  
To: ["cao7@cdc.gov" <cao7@cdc.gov>](mailto:cao7@cdc.gov)  
cc: ["eocphs-environ@cdc.gov" <eocphs-environ@cdc.gov>](mailto:eocphs-environ@cdc.gov), ["eocfedliaison@cdc.gov" <eocfedliaison@cdc.gov>](mailto:eocfedliaison@cdc.gov), ["MYK3@CDC.GOV" <MYK3@CDC.GOV>](mailto:MYK3@CDC.GOV), [Tim Radtke/MRPS/OS/DOI@DOI](mailto:Tim.Radtke@MRPS/OS/DOI@DOI), ["Wedge,Roberta" <Roberta.Wedge@fsis.usda.gov>](mailto:Roberta.Wedge@fsis.usda.gov)  
Date: Sunday, September 11, 2005 03:47PM  
Subject: Re: Beef in German MRE?

Charles, I just spoke with Roberta Wedge with the USDA, FSIS Office of Food Defense and Emergency Response. Robbie informed me that FSIS learned that some MRE's prepared for the German Military went to the US military and were later distributed. FSIS is not particularly concerned about these MRE's as they were prepared for German military personnel and are not considered to be unsafe. FSIS did make people aware that imported food with meat or poultry, including MRE's, needs to undergo FSIS inspection upon arrival. FSIS is not aware of any shipments turned down. Robbie indicated that the US has alerted other countries that shipments of food are not needed. We have no information saying that any shipments were rejected due to concerns about BSE. I will continue to monitor what is known about imported products. FDA would be a contact if questions arise about non-meat food imports. Kristin

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Sent from my BlackBerry Wireless Handheld

-----Original Message-----

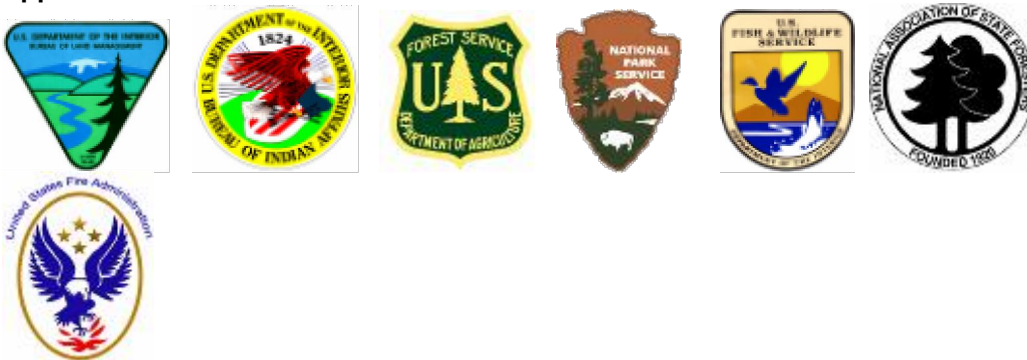
From: Otto, Charles <cao7@cdc.gov>  
To: kristin.holt@fsis.usda.gov <kristin.holt@fsis.usda.gov>  
CC: EOC PHS Environment <eocphs-environ@cdc.gov>; EOC Federal Liaison <eocfedliaison@cdc.gov>; Kiefer, Max <MYK3@CDC.GOV>; tim\_radtke@ios.doi.gov <tim\_radtke@ios.doi.gov>  
Sent: Sun Sep 11 13:26:16 2005  
Subject: Beef in German MRE?

Kristin -- We have gotten a couple of inquiries from the recovery worker camps about German MRE's. The rumors in the camps are that they were recalled/embargoed due to BSE concerns? Have you heard anything on this matter?

Thanks,

Charles

### Appendix 3



National Interagency Fire Center  
3838 S. Development Avenue  
Boise, Idaho 83705

September 3, 2005

To: All Personnel  
From: National Multi Agency Coordinating Group  
Subject: Katrina Recovery Effort Incident Assignments – What to Expect

The purpose of this memo is to provide advance notice to personnel of what to expect when mobilized to assist in the Katrina recovery effort. Under the National Response Plan, wildland fire resources may assist in response to national emergencies. To date, the primary job of our responders has been to staff distribution centers, base camps, and mobilization centers; however there are occasions where activities may expose personnel to a variety of hazards.

#### **Conditions**

With few exceptions, dispatched resources will be working for established Type 1 or Type 2 Incident Management Teams (IMTs), and the organizational structure will be similar to that of a wildland fire assignment. Most Incident Command Posts (ICPS) are located some distance from the center of the hurricane destruction; however there is no assurance that community infrastructures are intact. Attached to this memo is a two page summary developed by the safety and health coordination team on site. It provides a preliminary listing of the conditions responders might expect, and some advice on how best to prepare for them in advance. We advise that all responders familiarize themselves with this briefing before their departure.

#### **Immunizations**

The Fire, Aviation Safety Team consulted with Centers for Disease Control and Prevention and U.S. Public Health Service resulting in the following direction for all Wildland fire agencies responding to the hurricane disaster:

1. Diphtheria/Tetanus: All employees responding to Katrina should have received a Diphtheria/Tetanus booster within the last 10 years as part of routine medical care. Those likely to be mobilized are encouraged to be current with this recommendation or obtain the diphtheria/tetanus booster prior to being dispatched. However, mobilization should not be delayed in order to do so. Those at highest risk are employees in the process of debris cleanup, tree removal and cuts by nails or sharp objects. The Centers for Disease Control and Prevention and U. S.

Public Health Service advises that it is accepted medical protocol for a diphtheria/tetanus booster to be administered, if needed, shortly after an injury occurs for those individuals already deployed.

2. Hepatitis A: The CDC does not believe responders to Katrina are at high risk for hepatitis A, and therefore are not recommending hepatitis A vaccinations. Good personal hygiene, ingesting clean food and water, and hand washing will prevent hepatitis A.
3. Hepatitis B: Most responders do not need hepatitis B. Only personnel providing direct patient care require this vaccine. Incident management teams will coordinate with medical providers on site to determine if this vaccination is considered necessary.

When resources obtain a pre-mobilization tetanus booster at their home unit, the cost will be borne by that unit. It is important that receipts and other records be kept so that reimbursement can occur if authorization is received.

The Federal Fire and Aviation Safety Team (FFAST) is providing direct liaison between NMAC and the health and safety coordinating team on site. Should you have any questions, or require further information, please contact your member of that team. They are

John Gould – B IA

Michelle Ryerson – BLM

Al King – NPS

Rod Bloms – USFWL

Ed Hollenshead - FS

/s/ Don Artley  
Chair, NMAC

## Appendix 3

### **Hurricane Katrina Relief Safety Considerations for Incoming Support Personnel**

The mission of the Forest Service and cooperating agencies under the National Response Plan is to support the federal government's effort to bring emergency relief supplies to the storm damaged areas. As requested by the Federal Emergency Management Agency (FEMA), our mission is to provide logistical support such as managing base camps for field hospitals, receiving and distributing equipment and relief supplies, managing the care, feeding and logistical support of thousands of relief workers and volunteers, for elderly and the infirm, and for other persons unable to evacuate. This is life-sustaining work in support of the hundreds of thousands of Americans impacted by the recent storm.

Much of the work tasked is novel to the Forest Service and our partner agencies that have expertise in forest and range "wildland" management. Due to the novelty of the work, special safety considerations must be given.

#### **Prior to Departure from your Home Unit:**

It is recommended you obtain a tetanus booster if not received within the past 10 years. Get as much information as possible concerning expected living conditions. If you are ordered to a coordination center you will likely have access to telephone service, restaurants and hotel lodging. If you are ordered to a logistical support center or other "field assignment" you may be living and working under primitive conditions.

#### **Safety Considerations for Persons Ordered to Field Assignments:**

Expect that you are going into a desperate situation. For the duration of your tour, plan on no electricity, no refrigeration and no telephone communications. In contrast to a "fire camp" you should assume that there will be no Supply Unit available. Therefore bring with you the following:

- ✓ fresh refill of any necessary prescriptions
- ✓ three MREs or other non-perishable meals
- ✓ a tent
- ✓ rain gear
- ✓ insect repellent
- ✓ light sleeping bag
- ✓ flashlight and extra batteries
- ✓ hard hat
- ✓ gloves
- ✓ first-aid kit with aspirin, Band-Aids, etc.
- ✓ sleeping pad if you have room.
- ✓ cash – (credit cards require phone lines)
- ✓ portable water purifier, if available

If you are driving, bring a few cases of water with you. If flying in, purchase extra water when you have the opportunity.

#### **Hazards, Threats, and Mitigation Measures:**

The following is a listing of the most common threats to your safety, and recommended mitigations.

Downed Power Lines	If you're not sure, treat all power lines as if they are live.
Contaminated Drinking Water	Assume all water is contaminated unless you saw the bottle it came from. Municipal water supplies in severely storm damaged areas are also likely contaminated.
Lightning	Take shelter in building or vehicle. Don't operate land-line phones, machinery, or electric motors. Get away from standing water. Do not use an umbrella Observe the "30~30" rule
Snags, broken tree tops and weakened trees.	Weakened trees, bent trees, and broken trees are everywhere. Secure your working area using certified fallers. Be wary of broken tops and limbs that haven't yet fallen.
Hydration and Heat Stress	Stay hydrated! You may need to drink up to a gallon of water per day to avoid dehydration in this tropical environment, even if you're not performing any physical work! Two to three gallons, supplemented with Gatorade or other electrolyte replacement drink, is necessary if performing arduous work. Monitor yourself and others for symptoms of heat stress. Cool down in an air-conditioned building or automobile if necessary. People not acclimated to high humidity are especially vulnerable to the southern heat.
Snakes/Insects/Animals	Avoid snakes, insects and stray animals. There are 6 varieties of poisonous snakes in the area. Cottonmouths will be exploring new pools and rattlesnakes will be searching for dry ground. Poisonous spiders and yellow jackets will be looking for dry areas to establish a new residence. Be sure to use insect repellent on all exposed skin, socks, and pant legs.

Travel hazards including driving/collision with other vehicles, inoperable traffic lights, blown down street signs including stop signs, downed trees, loose livestock, high water, washed out roads, mud, gasoline shortages, and lack of communications.	In storm impacted areas do not depend on cell or land-line coverage. If you get lost, stuck in mud or high water, or trapped by fallen power lines or trees, it may be a very long time before you are found. Expect gasoline shortages or pumps not working in storm impacted areas. Daily travel should be conducted under the following constraints. ➤ When traveling alone, establish a travel route and make it known (map and description) to a
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	<p>responsible person that will initiate a search along that route if you don't show up within a pre-determined time.</p> <ul style="list-style-type: none"> <li>➤ Keep gasoline tanks at least ½ full.</li> <li>➤ Carry rain gear and enough personal supplies (water, food, prescriptions, etc.) to be entirely self sufficient for 48 hours in the event you get stuck or lost, and have no communications.</li> <li>➤ Listen to LOCAL radio stations while driving for information pertaining to weather, road closures, flood alerts, evacuation orders, tornado alerts, and gasoline shortages.</li> <li>➤ Avoid travel on rural roads at night.</li> <li>➤ Be wary of confused and stressed deer on roads.</li> <li>➤ Be wary of livestock on roads due to downed fences.</li> <li>➤ Be wary of traffic lights not operating and stop signs blown away. Treat uncontrolled intersections as 4-way stops.</li> <li>➤ Heavy fog, especially along coastal areas, is common. The locals know where all the curves in the road are and may be driving much faster than is safe under foggy conditions.</li> </ul>
Desperate Survivors	<p>Avoid stopping except in secure locations. If forced to stop, remain calm and be compliant with requests. Do not put yourself in danger by trying to defend your belongings or vehicle. Get out of the situation as quickly as possible.</p>

## Appendix 4



**Safety Fax**  
**IMT Safety Officers**  
**Larry Grimes – Safety Team Leader**  
**Hurricane Katrina Emergency Response**  
**Date: September 14, 2005**

### PPE Fact Sheet for Flood Response Work

The Safety Assistance Team in consultation with the Center for Disease Control, and the National Institute for Occupational Safety and Health (NIOSH) provides the following interim guidelines and warnings to flood cleanup workers. The hazards in flood waters are likely variable and can include sewage, household chemicals and cleaning solutions, petroleum products, hazardous industrial chemicals, pesticides, and flammable liquids. Workers must also be aware of dangers from physical hazards such as obstacles covered by flood waters (storm debris, depressions, drainage openings, ground erosion) and from displaced reptiles or other animals.

Workers and volunteers involved with flood cleanup should avoid direct skin contact with flood waters if possible and through the use of appropriate PPE and clothing. In most instances, the selection of PPE will be dependent on site-specific conditions, hazards, and tasks. The list below provides interim guidance on PPE and clothing for flood response workers responding to Hurricane Katrina:

- Workers who must walk through debris and building material should wear serviceable workboots. Tennis shoes or sneakers should *not* be worn because they will transfer contamination and will not prevent punctures, bites, or crush injuries. Hip waders may be appropriate to help prevent contact with flood waters.
- Heavy, waterproof, cut-resistant work gloves or other types of protective gloves may be required if handling identified material hazards; gloves not disposed of after use should be cleaned with soap and water and dried between uses.
- Wear goggles, safety glasses with side shields or full face shields. Sun/glare-protective lenses may be needed in some work settings.
- Wear soft hat or other protective head cover. Wear an American National Standards Institute (ANSI) rated hardhat if there is any danger of falling debris or electrical hazards.
- Hearing protection is needed (when working in an environment with any noise that you must shout over to be heard).
- Comfortable, light weight clothing including long pants and a long-sleeved shirt or coveralls should be the standard dress unless otherwise indicated by a hazard assessment.
- Cleanup operations involving incidental exposure to airborne dust produced by drying silt or mist from pumping floodwater should include the use of NIOSH approved, N-95 dust masks. Those given the N-95 dust masks should be instructed on the proper donning

and use. For work involving higher, prolonged level of exposures, an occupational safety and health professional should be consulted to reevaluate PPE selection for particular tasks.

- In the event of skin contact with the contaminated water or debris, employees should wash thoroughly with soap and water as soon as possible.

In all instances, workers are advised to wash their hands with soap and clean water, especially before eating or drinking. Workers should be encouraged to carry and use liquid hand sanitizer. Protect any cuts or abrasions with waterproof gloves and dressings.

Flood waters are associated with strong odors but these odors do not indicate the need for use of respirators. However, additional PPE, respiratory protection, or clothing may be required when specific exposure hazards are identified or expected at the work site. In some instances, the protective ensemble components (garment, boots and gloves) may need to be resistant to contaminated flood or other site-specific chemical, physical, or biological hazards.

The use of insect repellent, sun block and lip balm may also be required for some work environments. Drink plenty of bottled water and take frequent rest breaks to avoid overexertion. Updated vaccinations (within the last 10 years) for Tetanus-Diphtheria are recommended but not required for workers involved in hurricane response.

**Contact: Larry Grimes or Allison Good (678) 441-5125**