Emergency Responder Health Monitoring and Surveillance (ERHMS):

A Guide for Key Decision Makers

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Chair

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Member Agencies

This document is a companion document to the Emergency Responder Health Monitoring and Surveillance, National Response Team Technical Assistance Document found at: ERHMS.nrt.org

A high priority of the National Response Team (NRT) is the preparation of emergency responders and decision makers for planning and conducting effective response and recovery activities while maintaining high standards of responder safety and health. The Emergency Responder Health Monitoring and Surveillance (ERHMS) NRT Technical Assistance Document (TAD) is designed to provide the response community with a comprehensive framework for collecting important elements of responder safety and health in an organized, systematic manner and to utilize this data to optimize the health and safety of emergency responders and recovery workers prior to, during, and after their response to man-made or natural incidents. It is also intended for use by emergency response planners developing local and regional response plans in the context of the U.S. National Response Framework, the National Incident Management System, and other federal and state guidance that has been issued in recent years.

In an effort to provide a concise and practical overview of the ERHMS system for the supervisory personnel involved in emergency response planning and execution, this "Guide for Key Decision Makers" was written to serve as a companion to the complete technical assistance document. It provides a step by step summary of the components of the ERHMS system, its primary data requirements, primary recommendations, and key decision points, and it outlines the type of health and safety reports that the ERHMS system can provide to decision makers. To function optimally, the ERHMS system requires the support and involvement of senior response personnel. This companion piece will help supervisory personnel understand how they can facilitate the implementation of the ERHMS system, anticipate its safety and health data requirements, and utilize ERHMS recommendations to optimize the safety and health of emergency responders under their command.

Target Audiences

This document is intended for those organizations and individuals responsible for planning and executing an incident response that optimizes the health and safety of response, remediation and recovery workers. The intended audience is decision makers at the local, regional, state, tribal, and federal levels who are responsible for decisions affecting the occupational safety and health of responders. These decision makers include:

- Elected and appointed officials
- Incident commanders
- Planners across disciplines that support emergency response
- Leaders of emergency-response departments
- Managers of healthcare/public safety organizations
- Voluntary organizations active in disasters

Key Emergency Responder Protection Principles

When disaster strikes, the nation depends on emergency response workers who are prepared and trained to respond effectively. Response work can range from well-contained, localized efforts to massive, diffuse mobilizations and involves a broad array of activities including search, rescue, investigation, assessment, recovery, cleanup and restoration. Such work is carried out by individuals from emergency management, fire service, law enforcement, emergency medical services, public health, construction and other skilled support, disaster relief, mental health, and volunteer organizations. To ensure that emergency workers can meet the challenges of disasters, every effort must be made to protect them from the safety and health risks inherent in their work. Concerns about worker safety and health are apparent in nearly every type of response, and an effective framework of health monitoring and surveillance of workers is necessary to recognize possible health issues and bring these potentially devastating hazardous situations under control.

Previous emergency events have demonstrated that despite analyzing and applying 'lessons learned', significant gaps continue to exist in emergency response workers health monitoring and surveillance. These gaps were documented in the Government Accounting Office and Rand reports prepared following the World Trade Center response, but these problems have persisted and, despite improvements, were observed again in Hurricane Katrina and Deepwater Horizon responses.

The persistence of these gaps in emergency responder health monitoring and surveillance, despite considerable attempts to anticipate and correct them, emphasizes that there remains a need for a coherent, comprehensive

approach to protecting emergency response workers and a need for detailed, practical guidance on how to implement such an approach. Any effort to meet this need must incorporate a variety of measures, including the following:

- Medical screening that focuses on assessment of readiness and ability to safely and effectively deploy on a response
- Training regarding hazards to be anticipated and protective measures to mitigate them
- Approaches to centralized tracking or rostering of responders
- Surveillance and monitoring for exposures and adverse health effects, including supporting efforts in environmental monitoring and assessment
- Out-processing assessments on completion of response duties and deployments
- Follow-up including long-term surveillance or monitoring for potential delayed or long-term adverse effects of the deployment experience

The guidelines, recommendations, and procedures utilized to implement these protections are designed to be fully compatible with and function within the National Incident Management System (NIMS), which has been adopted as the accepted standard organizational focus for emergency response at all levels (local, state and federal) and for all incident sizes and types. Before a response occurs, it is crucial that the ERHMS system is well understood and incorporated into planning and procedures by Incident Command leadership, as well as health, safety, and medical personnel.

Concise Overview for Incident Commanders

The ERHMS system is designed to provide real time data and recommendations on health and safety issues that arise among the responders involved in an emergency response. For example, it could potentially provide incident command with:

- A complete roster of responders involved in the response to date (including spontaneous volunteers)
- A summary of data regarding responder readiness (health status, incoming training level, receipt of on-site training, certifications, and credentials)
- A summary of occupational health and safety issues that have occurred among responders to date, with recommendations for reducing concerning trends
- Identification of responders or responder groups who have experienced hazardous exposures during the response, with recommendations for tracking of their health after the event for future health effects

To ensure that the valuable information produced by the ERHMS system is made readily available to Incident Command, the Incident Commander should identify a component of the ICS structure that will be given the responsibility for implementing ERHMS, ideally soon after the ICS command has been identified. We recommend that this function be assigned to the Safety command within the ICS structure and should act in cooperation with the medical assets involved in the response. The lead members of this "ERHMS Unit" will have several responsibilities, which include:

- Ensuring that all safety officers are given the knowledge and tools they need to carry out ERHMS functions
- Serving as the central point for the collection of data that is necessary to allow ERHMS to fulfill all its functions (A software system is being designed by NIOSH to facilitate this process.)
- Assigning qualified personnel for the analysis and interpretation of the data, and the production of updates, reports, and recommendations based on these reports

The complete ERHMS technical assistance document is designed to prepare and assist the ERHMS Unit by providing them with the knowledge and tools they will need to implement the full range of functions within the ERHMS system. The following is a brief overview of these key functions and responsibilities, the key deliverable items that the Incident Command can expect to receive from the ERHMS Unit, and the steps that the Incident Command should take to help facilitate the functioning of ERHMS.

Summary of ERHMS Functions, Decision Points, and Deliverables

Pre-deployment: There are a number of key activities that should ideally be conducted by a responder organization before they deploy their responders to an emergent event, such as medical screening, credentialing, and safety training. The responder organization should document these activities either in electronic or written format, and the data from these records should then be made available to the ERHMS Unit for utilization during and after a response. If these activities were not completed prior to the response or the data is not readily available, then such functions can be carried out, for example, through the use of responder surveys near the outset of the response.

> Decision Point: A key initial task of the ICS command structure is to determine if the activities required for ERHMS in the pre-deployment phase have in fact been completed by participating responder organizations and that the data from these activities is made available to the ERHMS Unit. If not, they should facilitate the procurement of such data by direct survey of participating responders.

The following is a brief overview of the pre-deployment activities that should ideally be conducted by responder organizations and the deliverables that the Incident Command can expect to receive based on these data:

Rostering and Credentialing: A basic tenet of safety and health in emergency response is to maintain accountability for all emergency responders. The registration and credentialing system of emergency response and recovery workers should be designed to support four interdependent, interoperable functions: (1) registration (records basic and credential information on each worker); (2) emergency credentialing (assigning a credential level based on responder certifications and education); (3) re-verification (periodically verifies responder information); and (4) emergency badging (assigning an identification badge in accordance with the credential level). Since the information requirements of each function are interdependent, these four functions should ideally be integrated within a single database.

> Deliverable: Each participating response organization should develop a complete roster of their responders that includes data on each responder's credentials.

Health Screening: Within the framework of an ERHMS system, pre-deployment health screening is intended to establish a baseline physical and emotional health status. Such information may be obtained from an entrance physical examination to determine fitness for duty, or from subsequent medical examinations. This baseline information allows for more informed interpretation of possible post-deployment adverse health effects and is particularly valuable when exposure information is difficult to obtain, interpret, or is completely absent. Baseline health status should address not only the responder's physical health status but also emotional health status and immunization status.

In addition to providing baseline health information, the pre-deployment screening can serve as an opportunity to assess whether the responder has the appropriate education, training, and experience to perform assigned response duties.

> Deliverable: Each response organization's roster should include the designation of "fit for response duty" for each responder listed, as appropriate. Data related to this determination may later be needed for analysis purposes.

Training: Training is critical for the preparedness of the responder. The responder is required to be fully certified to perform duty-specific tasks, which may have federal, state or locally mandated training requirements. In addition, the ability of the responder to recognize and avoid possible health and safety risks will affect the responder's performance, survivability and resilience during and after the disaster response. Regardless of the training a responder has received prior to a disaster, there will be a need for additional training focused on site-specific hazards, operating procedures, and available resources. This training is sometimes referred to as "orientation," "just-in-time (JIT)," and "toolbox or tailgate talks" during the disaster but will be referred to as "site-specific training" in this document. The ERHMS system could provide insight into areas that may be responsive to increased responder training or require adjustment to reduce possible injuries or near misses. Additionally, the ERHMS system could provide a valuable source of post-disaster data to evaluate the impact that responder training had on minimizing responder illness and injury. The ERHMS system may be used as an evaluation tool to determine the effectiveness of preparedness training, as well as the impact of site-specific training on specific types of injuries or accidents.

> Deliverable: Each response organization's roster should include a listing of key training courses completed by each responder.

During deployment: Over the course of an emergency response, there are various health and safety functions that should be conducted by various components of the Incident Command, including the Safety, Planning, and Logistics sections. Such functions include on-site training, exposure assessment, development of health and safety plans, and surveillance for injuries and illnesses occurring to responders. The ERHMS Unit must be able to collaborate and work closely with the various command components responsible for these functions in order to obtain all the necessary data that is crucial to the functioning of the ERHMS system.

> Decision Point: Soon after an ICS Command has been identified for a given response, the command should appoint an ERHMS Unit in charge of collecting and analyzing the responder safety and health data that is required by the ERHMS system. The command should facilitate collaboration and sharing of data between this unit and other key sections of the ICS command, such as Safety, Planning, and Logistics.

The following are the list of functions that the ERHMS system recommends be conducted during a response (and their subsequent data made available to the ERHMS Unit), the deliverables that the Incident Command can expect to receive, and the considerations that the Incident Command should take to help facilitate the functioning of ERHMS during the response.

On-site Rostering: The process of personnel identification, accountability, and tracking can be referred to as the responder roster. Whenever the level of response is greater than what the first tier of local responders can handle, a roster should be used to log everyone who reports to the disaster area and is engaged in response or remediation work. The Logistics Section is responsible for collecting this information into a comprehensive rostering system, but components of accountability also include parallel and linkable procedures conducted by Planning (example– demobilization) and by Command (Safety Officer). Site-specific training (SST) should be performed prior to responders entering a designated disaster control zone and is required under 29 CFR 1910.120. Strategies for implementing SST should be pre-planned to the extent feasible with consideration given to different training materials necessary to meet expected and unexpected health and safety hazards on site. A variety of PPE may be needed by response workers and volunteers, and for many workers, this equipment will be issued to them during their SST training or during check-in procedures as they arrive at the response scene and are placed on the response roster. This central function or location for issuing PPE to responders serves as an opportunity for recording the amount, type, and condition of the PPE that is issued, allowing for documentation of these data within the ERHMS system.

> Decision Point: The Incident Command should facilitate on-site rostering by leveraging opportunities from other command functions, such as check-in procedures, badging procedures, or on-site training events.
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> Deliverable: The ERHMS Unit will compile an on-site roster of all responders who are physically present at the response event.

Health Monitoring and Surveillance: Health monitoring and surveillance are two different but complementary methods to protect the health and safety of incident responders during an emergency operation. Monitoring refers to the ongoing and systematic collection, analysis, interpretation, and dissemination of data related to an individual incident responder's injury and illness and exposures status. This allows for the evaluation of the occurrence of an exposure, determination of the level of exposure an individual responder might experience during duties, and assessment of how that exposure is affecting the individual responder. Surveillance refers to the ongoing and systematic collection, analysis, interpretation, and dissemination of illness and injury data related to an event's emergency responder population as a whole. This allows for the tracking of emergency responder health (illness and injury) trends within a defined population during response and recovery. A mechanism to allow surveillance should be an integral part of the response to any event.

> Decision Point: The Incident Command should facilitate the acquisition of injury and illness data from a variety of sources, including safety records, on-site medical facilities, state and local emergency departments and clinics, and federal medical resources assigned to the event.
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> Deliverable: The ERHMS Unit will compile and assess available data regarding injuries and illnesses that occur to responders over the course of the response, as well as compile and assess any health monitoring data available for those responders whose health and safety are being closely monitored.

Response Activity Documentation and Safety Controls Documentation: Response workers and volunteers may be exposed to many different chemical and environmental hazards in the course of their work. Obtaining accurate and useful worker exposure information is a crucial element in ensuring exposures are correctly characterized, risk is communicated appropriately, and sufficient information is available for making evidence-based decisions (i.e., PPE and work practice controls) to protect the health and safety of response workers. The exposures addressed in this document include chemical and physical hazards, as well as "psychological toxins", fatigue, and the factors contributing to and increasing fatigue. Psychological toxins include sights and smells of death, exposure to the wounded, and risk of becoming a casualty. There are three risk management decisions, as described later in this document that safety officers, industrial hygienists and other public health professionals ascertain from the assessment process: acceptability of exposures, unacceptability of exposures and uncertainty of exposures (which requires further information gathering).

> Decision Point: The Incident Command should facilitate the documentation of responder activities by leveraging various sources of data, including daily safety plans, check-in and out logs, and pay records
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> Deliverable: The ERHMS Unit will compile available data regarding responder activities, their use of personal protective equipment, fatigue risk factors, and pertinent data from the Health and Safety Plan.

Communication of Exposure and Health Monitoring and Surveillance Data during an Emergency Response: Communication is critical throughout the course of an emergency response. There are multiple components to communications during an emergency response, including psychology (phase-dependent), messaging (content, timing), audiences, and spokespersons. The collection of environmental exposure data and individual health and safety monitoring data, along with aggregate surveillance data, are relevant to protecting all the responders involved in an event both in the short-term and long-term, but it is not an end unto itself. This information must be communicated to workers, intra-organizationally, inter-organizationally, and inside and outside the ICS structure. Although it is common for organizations to track and report data they are collecting within their own operational structures, the need for tracking and communicating more broadly than a single organization is key to informing responders (e.g., workers, contractors, volunteers) about proactive steps they can take to protect themselves from hazardous exposures while attempting to protect the environment, identify survivors, or recover those who have died.

Decision Point: The Incident Command should assist in the development of a Communications plan early in a response that will include and accommodate the findings and recommendations arising from the ERHMS system.

Deliverable: The ERHMS Unit will provide the Incident Command with periodic reports on the health and safety of the responders involved in the event and work with the Liaison and Information Officers to develop appropriate messaging for other stakeholders and the general public.

Post-deployment: Although listed as post-deployment in nature, the following activities of the ERHMS system should be initiated while the response is ongoing. The first function assigned to this phase of ERHMS is the out-processing assessment, which captures data from the individual responder as they are completing their time spent at the response. Data and information obtained from departing responders can, on an ongoing basis, be included in analyses that might lead to identification of responders that would benefit from post-event tracking of their health. This determination may be made for certain groups of responders before the overall response has finished, and thus is really a function that begins during the event, though often may be delayed until complete exposure assessment and environmental analysis becomes available. The following is a summary of the "post-deployment" activities of the ERHMS system and the deliverables that the Incident Command can expect to receive. The ERHMS Unit conducts these functions during the timeframe of the response and may then hand off this function to appropriate authorities who are officially assigned such duties in the formal post-response phase.

Out-processing Assessment: The out-processing assessment is the minimum post-deployment evaluation that should be conducted for responders. Out-processing assessments are conducted to determine the extent, if any, to which individual responders have been adversely affected by their work during deployment and to assess trends within the population of workers for the purpose of identifying potential risks to others. Responders often encounter complex, uncontrolled environments which can involve multiple or mixed chemical exposures, hazardous substances, microbial agents, physical agents (temperature, noise, etc.), long work shifts, or stressful experiences. Therefore, all responders should receive an out-processing assessment as part of the demobilization process or as soon as possible after demobilization. Out-processing assessment should be simple, concise, and standardized. Ideally, the out-processing assessment would be a face-to-face interview in the field as responders are preparing to depart back to their routine duty station; however, other good options could include different formats (paper, website, or phone interview) or conducting the assessment 1 to 2 weeks before or after demobilization.

Decision Point: The Incident Command should facilitate the participation of all responders in an out-processing assessment. The assessment can be conducted using a variety of formats, including paper forms, oral surveys, and online surveys. Employing a combination of formats will likely lead to increased participation.

Deliverable: The ERHMS Unit will create an out-processing assessment survey that is conducted for all responders at or near the completion of their duties for the event.

Tracking of Emergency Responder Health and Function: Because of potential health and safety risks inherent in emergency response work, post-event tracking of responder health may be appropriate. The goal is to identify adverse health or functional consequences potentially associated with response work (e.g., exposure, illness, injury, or disability–including emotional trauma), to intervene early to maximize the chances for recovery, and to stop further exposure for workers remaining on-scene (i.e., through exposure control or medical treatment). The decision to opt for further tracking should be based on a wide variety of factors, including information regarding the responders' hazardous work exposures, hazardous work activities, concerns expressed by the responder or safety and health personnel, the adequacy of control measures (and adherence), and injuries and illnesses incurred during their deployment. Such information should be viewed in the context of the workers' prior physical and mental health status and the extent of their prior knowledge and experience with disaster work. Post-event tracking of health may be difficult or costly to conduct on a case-by-case basis, and it is often more suitable for such decisions to be made for categories of responders with similar exposure histories. High-priority worker groups for post-event health tracking would include those most likely to have exposures to hazardous agents or conditions and those reporting similar adverse health outcomes.

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Decision Point: The Incident Command should assist in identifying the most appropriate organization for implementing post-event health tracking recommended by the ERHMS Unit. Note that this tracking recommendation may range from short, informal health surveys mailed to responders to long-term intensive monitoring of responder health under the supervision of a physician.

Deliverable: The ERHMS Unit will identify those responders or responder groups whose health would benefit from periodic tracking after the event, make recommendations regarding the most suitable method of tracking, and suggest an appropriate duration for health tracking.

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Lessons-learned and After-action Assessments: At the conclusion of an event, there is a need to assess how the emergency response has been conducted through the pre-deployment, deployment, and post-deployment phases and try to identify ways to improve during each of these periods. This ensures that best practices are used and that mistakes are identified and measures taken so that they are not repeated the next time. Often this is accomplished through a document called an After-Action Report (AAR). It is essential that ERHMS be included in the general after action report or similar document. Practices such as identifying deficiencies in communications of safety and health protocols; examining when and where there were exposures; and noting any difficulties involved in compiling a complete, accurate, and timely roster; all help organizers improve the safety environment and better protect emergency responder safety and health during the next emergency.

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Decision Point: The Incident Command should incorporate the After-Action Report from the ERHMS Unit into the overall After-Action Report that is developed for the response as a whole.

Deliverable: The ERHMS Unit will compile an After-Action Report for ICS leadership that should be made available to all responder organizations involved in the response, so they can benefit from these insights.

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