



Emergency
Management
Focused
Program Review at

Argonne National Laboratory - West



May 2001

**Office of
Independent
Oversight and
Performance
Assurance**

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Abbreviations Used in This Report

AAO-W	Argonne Area Office - West
ANL-W	Argonne National Laboratory - West
CFR	Code of Federal Regulations
CH	Chicago Operations Office
DOE	U.S. Department of Energy
EAL	Emergency Action Level
EPHA	Emergency Planning Hazards Assessment
FRAM	Functions, Responsibilities, and Authorities Manual
ID	Idaho Operations Office
INEEL	Idaho National Engineering and Environmental Laboratory
NE	DOE Office of Nuclear Energy, Science and Technology
NE-40	Office of Nuclear Facilities Management
SO-40	Office of Emergency Operations

OVERSIGHT

Executive Summary

EVALUATION:	Emergency Management Focused Program Review
SITE:	Argonne National Laboratory- West
DATE:	May 2001

Scope

The U.S. Department of Energy (DOE) Office of Emergency Management Oversight, within the Secretary of Energy's Office of Independent Oversight and Performance Assurance, conducted a focused review of the emergency management program at Argonne National Laboratory-West (ANL-W) in May 2001. A focused program review is limited in scope to a small set of emergency management programmatic elements, and the review objectives are selected to evaluate specific areas of interest. There were two primary objectives for this review: to evaluate the extent to which the emergency planning hazards assessment (EPHA) document serves as an effective foundation for the ANL-W emergency management program, and to determine whether the necessary interfaces have been established among responsible DOE and contractor entities for effective implementation of the ANL-W emergency management program.

Background

DOE Order 151.1A, *Comprehensive Emergency Management System*, provides the framework for the Department's comprehensive emergency management system. This framework includes developing, coordinating, controlling, and directing all emergency planning, preparedness, response, and recovery functions for events both at fixed facilities and during transportation. DOE

field offices and Headquarters elements are required to develop and participate in this integrated and comprehensive approach. For ANL-W, the Department's emergency management responsibilities are divided among the ANL-W site contractor, Argonne Area Office-West (AAO-W), the Chicago Operations Office (CH), and the Office of Nuclear Facilities Management (NE-40), within DOE's Office of Nuclear Energy, Science and Technology (NE). These responsibilities include identifying the spectrum of potential events that could lead to a release of hazardous materials, and conducting the planning activities needed for effective response to such events. In addition, depending on the severity of the incident, the Idaho Operations Office (ID) and Idaho National Engineering and Environmental Laboratory (INEEL) emergency response personnel can play a significant emergency response role for ANL-W events. Therefore, these organizations must ensure that the roles and responsibilities for managing and responding to ANL-W incidents are clearly defined, and that the mechanisms for their implementation are comprehensive and well integrated.

Results

The ANL-W emergency management program is currently in transition. Within the past year, after recognizing a number of significant weaknesses in the ANL-W emergency management program, the site embarked on an ambitious effort to implement major programmatic improvements. The improvements implemented to date include notable upgrades in emergency planning and preparedness. For example, the EPHA was recently revised to incorporate additional consequence assessment calculations required by DOE Order 151.1A, and extensive modifications were made to the emergency plan implementing procedures. Although outside the scope of this review, the Independent Oversight team also noted that the training, drill, and exercise program was revised to include backshift drills and additional training for

emergency response personnel with initial response, categorization/classification, and notification responsibilities. Also, to improve response capabilities, the site emergency command center was upgraded.

Beyond these specific programmatic improvements, an array of memoranda of understanding, management agreements, and organizational commitments documented in Functions, Responsibilities, and Authorities Manuals (FRAMs) and emergency plans is in place to ensure clear roles and responsibilities among the various contractor and DOE entities responsible for emergency management program implementation and line management oversight at ANL-W. Locally, these agreements have helped ensure effective integration between the ANL-W and INEEL emergency management programs; the concept of operations makes the ANL-W emergency response organization responsible for incident response, using the combined resource capability of the INEEL site. In addition, the delegation of virtually all responsibilities and authorities related to ANL-W to the AAO-W team leader is an effective mechanism for promoting active DOE line management involvement at this site, which is geographically distant from the Argonne Area Office. However, two areas require further definition and integration. The first is in the area of emergency public information, where there is confusion among INEEL, ID, ANL-W, and AAO-W emergency responders regarding roles and responsibilities for developing, reviewing, and approving news releases for an event at ANL-W. The second area needing improved integration is the process for notification of Operational Emergencies, which is a potential source of confusion for offsite agencies due to differences in the ANL-W and INEEL categorization schemes. As a compensatory measure, ANL-W has devised an appropriate approach to address this problem during the event notification process.

During this review, the Independent Oversight team identified a number of weaknesses in the EPHA area; ANL-W emergency management personnel were already aware of several, but had not yet addressed them in the emergency management upgrade program. ANL-W has not yet completed a stand-alone hazards survey, and the EPHA does not evaluate a complete set of accident initiators, all potential barrier failures, or the maximum quantity of materials at risk.

Additionally, the emergency action levels do not use specific plant indicators to facilitate timely event classification and implementation of predetermined protective actions, and these protective actions are not clearly defined and may not provide the best protection to site workers. Furthermore, the facility boundary definition for classifying Site Area Emergencies does not adequately differentiate between local and ANL-W sitewide emergencies to support development of effective protective actions.

To some extent, these weaknesses result from inconsistent implementation of assigned responsibilities among AAO-W, CH, and NE for providing programmatic guidance, direction, and assessments over the past several years. Although authority for the site's emergency management program has been delegated from NE to CH, and then to AAO-W through memoranda of understanding, management agreements, and FRAMs, AAO-W does not have in place a systematic process for overseeing the ANL-W emergency management program; CH had not provided any significant level of emergency management assistance or assessment for nearly two years; and until relatively recently, when the NE-40 Assessments Team was formed, NE had not committed the NE-40 personnel resources necessary to ensure that its responsibilities and expectations for emergency management at ANL-W were being satisfied.

Conclusions

ANL-W line management's commitment to improving the emergency management program is evident in the support provided to the ANL-W emergency preparedness coordinator and in the resources devoted to improving the EPHA; the training, drill, and exercise program; and the site emergency command center. This commitment, and the significant programmatic improvements realized over the past year, have contributed to an emergency management program that is well-integrated with that of INEEL. In addition, efforts currently under way within CH to ensure consistency among the CH FRAM, certain other CH and ANL-W emergency management programmatic documents, and actual line management oversight practices should eventually promote continued improvement in the ANL-W emergency management program.

Despite recent improvements in the site's emergency management program, several notable weaknesses in EPHA methodology and the EPHA output products exist, particularly in those areas intended to promote rapid, effective decision-making in implementing protective actions for collocated workers. Weaknesses in implementing an effective, integrated emergency management oversight program by AAO-W and CH are evident, and roles and responsibilities among ANL-W, INEEL, and AAO-W for reviewing and approving news releases following

an emergency at ANL-W are not clearly defined. Additionally, it was necessary for ANL-W to implement a process for notification of Operational Emergencies to compensate for differences in categorization schemes between ANL-W and INEEL. Continued line management attention to the effort to upgrade the site's emergency management program, as well as increased attention to program oversight, is warranted to sustain the current momentum to implement a fully effective emergency management program.

FINDINGS

As directed by the Office of the Secretary of Energy, DOE has established a process for recording, tracking, addressing, and resolving findings identified by the Office of Independent Oversight and Performance Assurance as defined by DOE Order 470.2A, *Security and Emergency Management Independent Oversight and Performance Assurance Program*. The DOE Director for Nuclear Energy, Science and Technology, as the cognizant secretarial officer, and the DOE field element (CH), as the cognizant line manager, are required to develop a corrective action plan to address the findings identified in this report.

1. The ANL-W emergency planning hazards assessment process lacks a completed hazards survey, does not evaluate a complete set of accident initiators, does not consider all potential barrier failures, and does not in all cases consider the maximum quantity of materials at risk, as required by DOE Order 151.1A.
2. The facility boundary definition used for classifying Site Area Emergencies does not adequately differentiate between local and ANL-W sidewise emergencies or support effective development of protection actions, as required by DOE Order 151.1A.
3. The ANL-W categorization and classification procedure does not provide adequate definition or instruction to ensure that initial emergency management decision-makers can promptly classify an emergency and formulate and implement protective actions, as required by DOE Order 151.1A.
4. The ANL-W emergency public information program and its implementing procedures are not formally documented, and roles, responsibilities, and protocols are not adequately defined, as required by DOE Order 151.1A.
5. The process by which AAO-W and CH provide guidance and direction to, and assessment of, the ANL-W emergency management program is not systematic or rigorous, and assessments are not conducted at the frequency required by DOE Order 151.1A.

The U.S. Department of Energy (DOE) Office of Emergency Management Oversight, within the Secretary of Energy's Office of Independent Oversight and Performance Assurance, conducted an emergency management focused program review at Argonne National Laboratory-West (ANL-W) in May 2001. A focused program review is limited in scope to a small set of emergency management programmatic elements, and the review objectives are selected to evaluate specific areas of interest. There were two primary objectives for this review: to evaluate the extent to which the emergency planning hazards assessment (EPhA) document serves as an effective foundation for the ANL-W emergency management program, and to determine whether the necessary interfaces have been established among responsible DOE and contractor entities for effective implementation of the ANL-W emergency management program.

Argonne National Laboratory is a non-profit research laboratory operated by the University of Chicago for DOE. The main Laboratory site is located near Chicago, Illinois; ANL-W is sited on a 900-acre plot in the southeastern section of the Idaho National Engineering and Environmental Laboratory (INEEL) reservation, about 50 miles west of Idaho Falls. The ANL-W mission includes research and testing activities in areas of national concern relating to energy; nuclear safety; disposition of spent nuclear fuel; and non-proliferation, decommissioning, and decontamination technologies. Typically, basic research is conducted at Argonne National Laboratory-East, while large-scale nuclear facility testing and development are conducted at the major nuclear reactor research facilities sited at ANL-W.

Line responsibility for the operation of ANL-W falls under the Argonne Area Office, one of five area offices managed and supported by the Chicago Operations Office (CH). The Argonne Area Office has established a small local field element at the site, referred to as Argonne Area Office-West (AAO-W), to represent the Argonne Area Office Manager. Within CH, Safeguards and Security Services, under the Assistant Manager for Technical Services, is responsible for providing emergency management guidance and oversight for CH sites. Because ANL-W is sited on the INEEL reservation and may utilize INEEL resources during an event at ANL-W, the Idaho Operations Office (ID) and the INEEL emergency response organization have certain event-specific responsibilities for responding to an ANL-W event. The DOE Office of Nuclear Energy, Science and Technology (NE) is the cognizant secretarial office for ANL-W. As such, it has overall Headquarters responsibility for programmatic direction and funding of activities at ANL-W. Within NE, the Office of Nuclear Facilities Management (NE-40) is the line organization responsible for ANL-W operations. These relationships are summarized in Figure 1.

As the ANL-W management and operating contractor, University of Chicago responsibilities include implementation of the site's emergency management program. The INEEL management and operating contractor, Bechtel BWXT Idaho, LLC (BBWI), provides key emergency response resources for ANL-W, including full-time, onsite fire protection services.

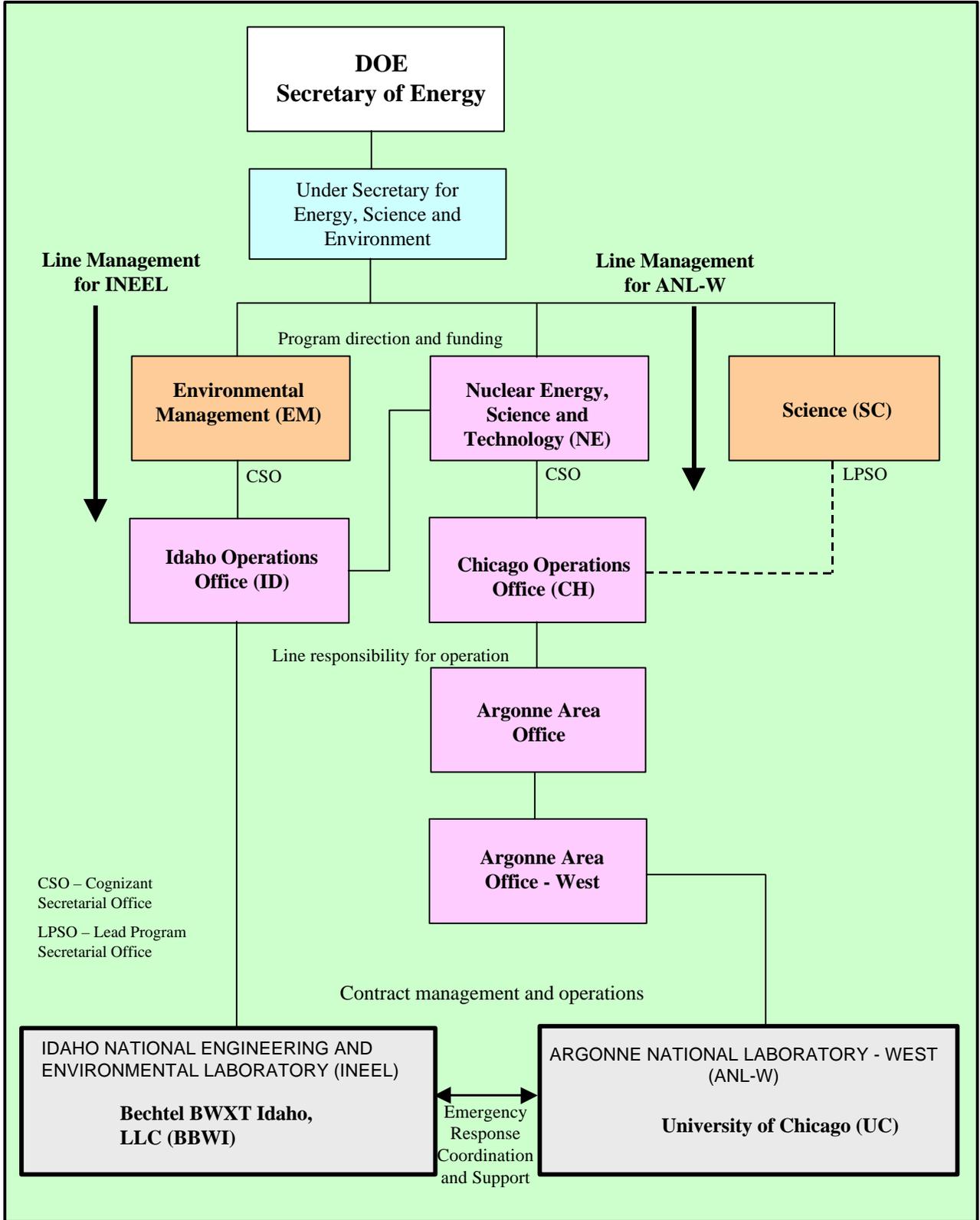


Figure 1. Organizations with Responsibility for Argonne National Laboratory - West

2.0 Results

This evaluation addresses areas included in DOE Order 151.1A and the associated Emergency Management Guide. Each report section includes key observations, conclusions, and a rating of Satisfactory, Marginal, or Unsatisfactory. These ratings are used to communicate the effectiveness of ANL-W's emergency management program and to provide a perspective on where line management attention is warranted. Appendix A provides a more detailed explanation of the rating system.

Hazards Assessment

DOE Order 151.1A requires that the scope and extent of emergency planning and preparedness at a DOE site be commensurate with the hazards. In accomplishing this graded approach, emergency management planning efforts begin with the hazards survey, which is the identification and qualitative assessment of site-specific hazards and associated emergency conditions that may require a response. If the hazards survey identifies hazardous material quantities that pose a potential serious threat to workers or public health and safety, then a quantitative EPHA is performed to estimate the severity of the impact, thereby providing the technical basis for the scope of the site's comprehensive emergency management system. This Independent Oversight review determined that the EPHA has been recently improved, as have classification and protective action procedures. However, several weaknesses in the EPHA and associated output products limit their effectiveness.

Hazards Survey and Hazards Assessment

ANL-W has not developed a hazards survey to identify hazardous materials located in each facility (including those below the screening thresholds for hazards assessments), facility occupancy, classified material storage, and applicable planning and preparedness requirements.

ANL-W fire pre-plans, building emergency plans, and industrial hygienist assessments contain much of the information that should be included in the hazards survey. However, ANL-W has not developed a comprehensive document that contains all the required information. ANL-W has initiated actions to correct this deficiency, and hazards surveys for several facilities now exist in draft form.

Even though a hazards survey was not performed, ANL-W reviewed the chemical and radioactive material inventory systems and generated a list of hazardous substances to support the EPHA development process. After assembling this data, substances not warranting further evaluation were screened out. DOE Order 151.1A specifies that the criteria to be used to screen hazardous chemicals is the lower of the threshold planning quantities listed in 29 CFR 1910.119, 40 CFR 355, or 40 CFR 68. However, the only documented criteria ANL-W used were those in 40 CFR 355. Although many of the chemicals listed in these regulations are the same, a number of chemicals listed in 29 CFR 1910.119 and 40 CFR 68 are not listed in 40 CFR 355, and some of the threshold planning quantities identified in 29 CFR 1910.119 are lower than those in 40 CFR 355. The Independent Oversight team's limited review of the chemical inventory found no hazardous materials that were inappropriately screened out, but the process used at ANL-W does not ensure that all hazardous materials have been, and will in the future be, appropriately evaluated for inclusion in the EPHA.

 The recent revision of the emergency planning hazards assessment represents a substantial improvement.

ANL-W has developed an EPHA that evaluates the potential consequences of the release of hazardous materials that are above the 40 CFR 355 criteria. In the past year, ANL-W personnel recognized that the EPHA did not address the consequences of postulated accidents at all the

distances appropriate for the development of emergency action levels (EALs). ANL-W revised the EPHA to correct this deficiency by adding consequence calculations at 30 meters and 100 meters from the release point. The resulting EPHA is a significant improvement, in particular because it better supports development of facility-specific EALs. As a result of this revision, ten additional events were identified that are now classified as an Alert.

Another positive aspect of the recent EPHA revision is the involvement of appropriate ANL-W facility and hazardous material inventory personnel to ensure that the assessment reflects actual facility conditions. In addition, the emergency management coordinator participates in periodic fire department walkthroughs of facilities to help ensure that the EPHA is kept current. Furthermore, facility managers are responsible for notifying the emergency management coordinator of significant changes in operations that may impact the EPHA. This process for keeping the EPHA current is effective; however, it has not been formalized in a procedure.



Several concerns were identified with the revised emergency planning hazards assessment.

Although the recent revision to the EPHA represents a substantial improvement, several concerns were identified with the revised EPHA. The EPHA does not evaluate a complete set of accident initiators. For example, accidents that may occur during onsite transportation of hazardous materials have not been evaluated. ANL-W routinely transports radioactive materials between onsite facilities and has an emergency response plan for transportation accidents. However, the site's process for controlling the transportation of hazardous materials does not identify the consequences of potential transportation accidents. In addition, malevolent acts have not been formally evaluated in the EPHA. Although the potential consequences of malevolent acts were analyzed in 1994, the analysis did not evaluate moderate and extreme malevolent act scenarios as recommended in the Emergency Management Guide, nor was it subject to reviews that would be expected if it were a part of the EPHA. The 1994 analysis no longer reflects current

site conditions and would require updating prior to incorporation into the EPHA. ANL-W is currently revising its security vulnerability assessment and plans to use the results of the revision to better address malevolent act scenarios. Finally, an aircraft crash into a facility containing hazardous material was not considered as an accident initiator. An evaluation of events initiated by transportation events, malevolent acts, or an aircraft crash may indicate possible consequences beyond those calculated in the current EPHA.

The EPHA does not consider all potential barrier failures or materials at risk. For example, one of the accident initiators evaluated in the EPHA for the Fuel Conditioning Facility is a fire occurring in the argon cell due to ignition of sodium metal following air intrusion. The EPHA includes two scenarios for this accident, one in which all exhaust filters are intact and another in which one filter fails. However, unlike other scenarios analyzed in the EPHA (e.g., fire in the Fuel Manufacturing Facility), failure of both filters is not evaluated. The potential for the failure of both filters should be evaluated because significantly greater consequences will result from this event. Furthermore, the EPHA analysis of the Hot Fuels Examination Facility does not address the maximum quantity of radioactive material that may be involved in an accident. The EPHA considers a fire event (postulated in a draft revision to the 1975 safety analysis report for the Hot Fuels Examination Facility) involving four waste drums: one at the maximum plutonium loading, and three at the average loading. The EPHA does not justify why this is the maximum quantity of hazardous material that can be involved in a fire. Furthermore, numerous drums may be stored in close proximity to each other, as noted during a walkdown of the Hot Fuels Examination Facility. Damage to multiple drums by a fire, malevolent act, or aircraft crash is not considered in the EPHA. These events may result in greater consequences than any postulated accident currently evaluated in the EPHA for this facility.

FINDING: The ANL-W emergency planning hazards assessment process lacks a completed hazards survey, does not evaluate a complete set of accident initiators, does not consider all potential barrier failures, and does not in all cases consider the maximum quantity of materials at risk, as required by DOE Order 151.1A.

Hazards Assessment Output Products



New procedures have been developed to support the emergency management program.

ANL-W has recently developed several new procedures to support the site's emergency management program, including a categorization and classification procedure, a shelter-in-place procedure, and an evacuation procedure. Additionally, the site has developed very informative facility-specific emergency procedures that describe the protective actions, assembly locations, emergency personnel, and equipment within each facility. These procedures are significant improvements in the ANL-W emergency management program. In addition, the site has an effective process for notifying site workers of the need to take protective actions.

Although the addition of the categorization and classification procedure enhances the ANL emergency program, the EAL thresholds identified in the procedure do not include specific plant indicators to allow for timely classification. The EALs rely on the measurement of the dose rate at 30 meters as a necessary condition for classifying hazardous material releases. However, EALs based only on field team measurements preclude timely classification of the event and prompt implementation of predetermined protective actions because of the additional time needed to obtain these measurements. The EALs lack specific plant indicators, such as stack monitor readings and alarms, that facilitate timely classification.

Another weakness is that although ANL-W has generic EALs for safeguards and security Operational Emergencies (not requiring classification), there is no provision for declaring an operational emergency at the Alert (or higher) level for a sabotage event at a facility containing hazardous materials based on the potential for release of that material. The EAL implementing procedure does include sabotage as a potential initiator of a failure of a hazardous material release barrier. However, the EAL thresholds for sabotage are based upon identification of barrier failures, rather than identification of the sabotage. Classification procedures that include anticipatory EALs would allow more time for implementing protective actions.

Furthermore, due to the manner in which ANL-W has defined the "facility boundary," the Site Area

Emergency EAL criterion is not consistent with the Emergency Management Guide. The ANL-W site is defined by an administrative boundary within the INEEL site. This administrative boundary approximates an 1800 meter by 2000 meter rectangle that encompasses nearly 100 buildings, including 10 major facilities/buildings (e.g., the Fuel Conditioning Facility and Zero Power Physics Reactor) that have substantial quantities of hazardous materials. The EPHA defines the "facility boundary" for each of its facilities/buildings as the ANL-W administrative boundary and uses 600 meters as the distance to this boundary from each facility/building regardless of the actual location of that facility/building (600 meters represents the distance from the centrally located Fuel Conditioning Facility to the site boundary). ANL-W chose to define its facility boundary in this manner because ANL-W is totally encompassed within the INEEL site, and ANL-W can restrict public access to this area.

DOE Order 151.1A requires declaration of a Site Area Emergency when consequences from an event are expected to exceed the protective action guide level beyond the facility boundary. The Emergency Management Guide recommends that the facility boundary be not less than 100 meters and not greater than 200 meters. The rationale for this recommendation is twofold: it ensures that the relationship between emergency class and event consequences is reasonably consistent across the DOE complex, and it differentiates between events that have local impacts (i.e., Alerts) and those that have sitewide impacts (i.e., Site Area Emergencies). The ANL-W EPHA determines the consequences from each of the analyzed accidents to the standard 600 meter distance discussed above for determining whether the event should be classified at the Site Area Emergency level. As a result, the ANL-W criterion for classification of events and resulting protective actions does not adequately differentiate between events that have local impacts and those with ANL-W sitewide impacts. Currently, analyzed events at ANL-W have only local impacts (consequences from the worst-case accident do not exceed protective action criteria at greater than 202 meters from the point of release). Therefore, ANL-W's use of the administrative boundary for classifying Site Area Emergencies has no effect on the site's ability to protect site workers for the currently analyzed events. However, reanalysis of current accident scenarios and future analyses for new hazards and accident initiators may result in impacts beyond a localized area.

FINDING: The facility boundary definition used for classifying Site Area Emergencies does not adequately differentiate between local and ANL-W sitewide emergencies or support effective development of protective actions, as required by DOE Order 151.1A.



The emergency action levels do not always provide appropriate protective actions.

Finally, the EALs do not provide specific, predetermined protective actions that are appropriate in all cases. The ANL-W categorization and classification procedure includes an EAL set that correlates protective actions with each of the EALs. However, with the exception of the Transient Reactor Test Facility, the predetermined protective action associated with each Alert classification is to evacuate. The EPHA results were not used to assess the relative benefits of shelter-in-place versus evacuation. As discussed in the ANL-W emergency plan, evacuation may not always be the most effective protective action. Furthermore, the categorization and classification procedure is unclear as to whether “evacuation” refers to the affected building or the entire ANL-W site. Consequently, the protective actions (in particular, predetermined protective actions) are not specific enough to support timely implementation. The site recognizes these weaknesses and believes that, in the interim until the EPHA and EALs are upgraded, the training and expertise of initial emergency response decision-makers provide adequate protection to site workers.

FINDING: The ANL-W categorization and classification procedure does not provide adequate definition or instruction to ensure that initial emergency management decision-makers can promptly classify an emergency and formulate and implement protective actions, as required by DOE Order 151.1A.

In conclusion, ANL-W personnel have made significant improvements over the past year in the emergency management program with the revision of the EPHA and development of emergency plan implementing procedures for categorizing and classifying events and implementing protective actions. However, ANL-W has not completed a stand-alone hazards survey, and the EPHA does not evaluate a complete set of accident initiators, all potential barrier

failures, or maximum quantity of materials at risk. Additionally, the EALs do not make use of specific plant indicators to facilitate prompt event classification, and the predetermined protective actions are not clearly defined and may not provide the best protection to site workers. Furthermore, the facility boundary definition for classifying Site Area Emergencies does not adequately differentiate between local and ANL-W sitewide emergencies to support effective development of protective actions. ANL-W has recognized the deficiencies in their EAL thresholds and associated predetermined protective actions, and has implemented plans to upgrade the EPHA and EALs to improve the classification and protective action process. These improvements will ensure that initial emergency response decision-makers will have the tools necessary to rapidly implement appropriate protective actions for site workers for the full spectrum of postulated emergencies.

Program Element Rating: Marginal



Emergency Management Programmatic Interfaces

The concept of line management responsibility for emergency operations at ANL-W is unique in that it is not only essentially a site within another site, it is also geographically remote from the cognizant area office and reports through an operations office that, in turn, reports to a lead program secretarial office (Office of Science) that is different from ANL-W’s cognizant secretarial office (NE). Additionally, the site in which it resides (INEEL) reports to a different DOE operations office (ID) and a different lead program secretarial office (Office of Environmental Management). In short, a number of DOE elements have cognizance over ANL-W’s emergency management program. Therefore, emergency management programmatic interfaces at ANL-W must include the coordination of resources as well as the line management oversight and guidance roles of NE, CH, ID, AAO-W, and INEEL, offsite responders, and offsite agencies. Notwithstanding weaknesses in the emergency public information and notification processes, this Independent Oversight review determined that ANL-W has developed an integrated emergency preparedness program and has addressed, documented, and effectively implemented interface support mechanisms and processes. However, a more

rigorous and comprehensive program of guidance, direction, and assessment of the ANL-W emergency management program by AAO-W and CH is required.

Interfaces between ANL-W and INEEL Emergency Management Programs and Emergency Responders

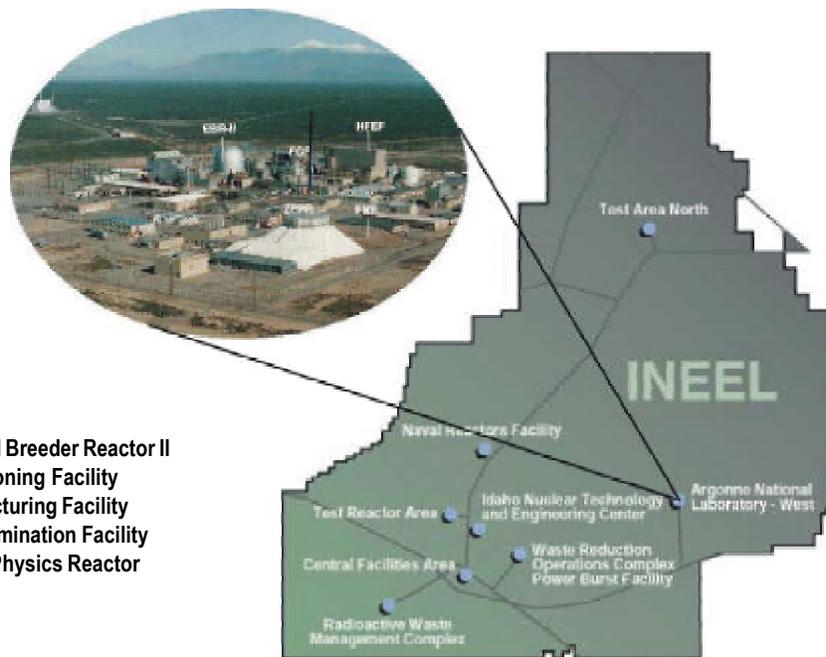
Integrated response capabilities have been developed.

ANL-W and INEEL organizations have worked together to develop an integrated response to emergencies at ANL-W. Both organizations have based their respective emergency response programs on the incident command system. Therefore, emergency response from both entities is coordinated and conducted under the philosophy of unified command, providing some assurance of effective coordination between the response organizations. Command decisions and the flow of information among emergency response function groups are enhanced by the command and planning bridges, which directly connect

responders via telephone or radio throughout response activities.

Management for both organizations indicated that each emergency management organization would fully support the other with resources and expertise when requested. Currently, ID, through INEEL, provides ANL-W with a multi-faceted emergency communication system providing rapid initial notification and callout to ANL-W and INEEL emergency response organizations, as well as local and state agencies and DOE Headquarters. This system also supplements the on-scene and command center response organization. In the event of an emergency at ANL-W, INEEL will provide relocation areas, monitoring, and decontamination, as needed. Reciprocally, ANL-W will support an emergency at INEEL by providing relocation areas, decontamination, dosimetry, and other response activities and equipment.

Over the past few years, ANL-W and INEEL have reviewed and revised their emergency management plans and interface support processes. They have jointly tested these plans based on real emergencies, such as the wildfires that have occurred over the past several years. Administrative emergency plan implementing procedures for the core ANL-W incident



Location of Argonne National Laboratory - West on the INEEL Site

command emergency response organization positions were developed. One implementing procedure still to be developed is consequence assessment. Currently, INEEL and the National Oceanographic and Atmospheric Administration provide consequence assessment capabilities for ANL-W. INEEL's consequence assessment program is based on "Radiological Safety Analysis Computer" and "Area Locations of Hazardous Atmospheres" as the principal computer codes used for assessing radiological and hazardous chemical releases. The National Oceanographic and Atmospheric Administration provides support data and expedient assessment calculations. However, the mechanism for obtaining this support is not documented, nor has it been tested in drills. Plans are under way at ANL-W to establish a consequence assessment team, and the software, staffing, and training are scheduled to be complete by the end of this fiscal year.

ANL-W is part of an emergency preparedness coordinating committee that includes INEEL and other tenants on the INEEL site, as well as local and state agencies. The purpose of the committee is to share benchmarks and lessons learned, and provide emergency management training and information. The expected result of this outreach program is to inform all parties of emergency actions, coordinate emergency communications, and increase the understanding of each participant's role. In addition, the ANL-W Deputy Associate Laboratory Director participates in a quarterly meeting of INEEL managers, including the ID manager, and has used this forum to discuss emergency management issues common to both ANL-W and INEEL.



The emergency management program does not adequately address emergency public information.

Two interface weaknesses between the ANL-W and INEEL emergency management programs are in the areas of emergency public information and event categorization and notification. The ANL-W emergency management program does not adequately address emergency public information or include a comprehensive, coordinated plan. Fundamentally, emergency public information for ANL-W is provided by INEEL. However, the INEEL Emergency Public Information Plan is INEEL-specific and does not address ANL-W facilities, roles, or responsibilities.

There are no provisions in either the ANL-W or INEEL emergency plan or implementing procedures detailing how ANL-W representatives (such as those detailed to the INEEL emergency operations center), AAO-W, ID, or CH will integrate within the emergency operations center or public information center functions. ANL-W individuals who are responsible for review and approval of news releases are unaware of their role, and there is no procedure for or general understanding of the flow of emergency information for the development, review, and approval of news releases. ANL-W has redefined some emergency public information roles but has not formalized these changes.

FINDING: The ANL-W emergency public information program and its implementing procedures are not formally documented, and roles, responsibilities, and protocols are not adequately defined, as required by DOE Order 151.1A.

In the area of event categorization/classification, the INEEL practice of classifying all Operational Emergencies, regardless of whether or not there is an actual or potential release of airborne hazardous materials, differs from the protocols implemented at ANL-W (as well as the requirements of DOE Order 151.1A). Because ANL-W uses the INEEL notification system and associated notification form, there is the potential for significant confusion on the part of offsite agencies and the public following a declared Operational Emergency at ANL-W. The ANL-W incident commander must write in the phrase "Operational Emergency" in the appropriate block on the notification form, because this block does not contain a check box for this category of events. In addition, the site assigns a member of the emergency control center staff to the associated notification conference call to answer questions on the event category. Although this "work-around" is well conceived, ANL-W recognizes that as long as INEEL continues to classify all Operational Emergencies, a long-term training program for offsite emergency response agencies will be necessary to address potential confusion on the part of offsite agencies as a result of the event notification process.

Interfaces among NE, CH, and AAO-W

Roles and responsibilities for ensuring the implementation of an effective emergency

management program at ANL-W are defined in numerous documents, including:

- NE Functions, Responsibilities, and Authorities Manual (FRAM)
- CH FRAM
- Management agreement among NE, Office of Science, and CH for the ANL-W site (02/00)
- Management agreement between NE and CH for line management of facility operations of the ANL-W site (07/90)
- Memorandum of understanding between ID and CH (10/97)
- CH Emergency Plan
- ANL-W Emergency Plan.



Emergency management roles and responsibilities are clearly defined.

Given the number and diversity of DOE and contractor organizations having at least some emergency management responsibility at ANL-W, the above documents collectively represent an effective mechanism by which emergency management roles and responsibilities have been clearly defined and assigned. Under this arrangement, line accountability and authority for environment, safety, and health performance, which includes the emergency management function, flows from NE to CH, and then through the AAO manager to the AAO-W team leader. This last link is implemented through a delegation memorandum from the AAO manager to the AAO-W team leader that assigns virtually all AAO manager responsibilities and authority to the AAO-W team leader. Based on the significant geographic separation between the AAO manager and the site, this arrangement facilitates active involvement of AAO line management in site operations.

AAO-W personnel function as direct representatives of NE for purposes of providing broad program policy, direction, and oversight to ANL-W. The NE-40 program manager assigned as the Headquarters “facilities manager” for ANL-W has cognizance of environment, safety, and health issues at ANL-W and, through frequent interactions with AAO-W personnel, generally maintains awareness of operational issues. Within NE-40, the relatively new Assessments Team, which should enhance NE involvement in the ANL-W emergency management

program, has among its responsibilities the emergency management program administrator/coordinator function for NE as a whole. These responsibilities include participating in all emergency management policy and program activities relating to NE facilities, such as the review of emergency management documents.

Despite this comprehensive and documented arrangement, there have been significant lapses in the quality and frequency of guidance, direction, and assessment provided to the site’s emergency management program over the past several years:

- CH (Safeguards and Security Services) has not formally concurred on ANL-W emergency plans, as required by both the CH FRAM and the ANL-W emergency plan.
- The AAO-W team leader (as the AAO manager’s representative) or the AAO manager has not consistently approved the ANL-W emergency plan and EPHA, as required by the CH emergency plan.
- The CH emergency management program manager has not reviewed the ANL-W emergency plan and EPHA and has not performed assessment activities for the ANL-W emergency management program, as required by the CH emergency plan.
- NE was not generally aware of the limited status of emergency management oversight efforts by CH.



Oversight of the emergency management program has had only limited effectiveness.

In addition, although AAO-W has provided oversight of selected emergency management program elements through the review of the ANL-W emergency plan, EPHA, and drill/exercise results, no systematic oversight process is in place that ensures a complete programmatic review every three years, as required by DOE Order 151.1A. This process weakness has been exacerbated by CH’s reluctance to proactively offer its expertise in the emergency management arena to assist in assessments and provide guidance. As a result of this interface breakdown, oversight of the ANL-W emergency management program over the past several years has had only limited effectiveness, as indicated by the EPHA and EPHA output product weaknesses identified by the Independent Oversight team.

The CH FRAM is currently being revised to clarify and redefine emergency management roles and responsibilities.

FINDING: The process by which AAO-W and CH provide guidance and direction to, and assessment of, the ANL-W emergency management program is not systematic or rigorous, and assessments are not conducted at the frequency required by DOE Order 151.1A.

Overall, the ANL-W emergency management program effectively integrates response and support

roles, responsibilities, and authorities among the responsible DOE and contractor organizations. NE, CH, and AAO-W roles and responsibilities for guiding, directing, and assessing the emergency management program are clearly assigned. However, as a result of weaknesses in implementing these roles and responsibilities, the emergency public information process is not coordinated with INEEL, and it was necessary for ANL-W to implement a “work-around” for notification of Operational Emergencies.

Program Element Rating: Satisfactory 

3.0 Conclusions and Ratings

The recent initiative by ANL-W line management to upgrade the site emergency management program has resulted in noteworthy improvements in the EPHA process. The EPHA now appropriately identifies events that meet the “Alert” threshold, and facility managers and other appropriate disciplines are closely involved in EPHA development. The tools provided to emergency response decision-makers to facilitate rapid event categorization/classification, notification, and response have been improved as well. However, several weaknesses were evident in the EPHA and its associated output products. These include an incomplete set of accident initiators and potential barrier failures, and potentially non-conservative assumptions were used regarding the amount of material at risk for release. In addition, the facility boundary definition does not support the intent of the Department’s emergency classification system. Furthermore, the EAL set lacks the necessary specificity in thresholds and predetermined protective actions to adequately support timely event classification and implementation of appropriate protective actions for site workers. ANL-W has also not completed a stand-alone hazards survey to serve as the basis for the Operational Emergency base program.

In the interface area, ANL-W and INEEL have implemented emergency management programs that, with few exceptions, are well integrated. Consistency in roles, responsibilities, and authorities among the responsible parties at the site level is evident, and the INEEL role of providing operational support to the ANL-W emergency response organization is both well conceived and supported by INEEL protocols and infrastructure. Also positive is the mechanism that is in place to identify and assign roles and responsibilities among the various DOE line management elements responsible for providing guidance and oversight to the ANL-W emergency management program. However, there is significant uncertainty among ANL-W, INEEL, and AAO-W emergency responders regarding roles and responsibilities for

developing, reviewing, and approving emergency news releases following an ANL-W event. In addition, breakdowns in the ANL-W emergency management interfaces between CH, and AAO-W impede early identification and resolution of weaknesses within the ANL-W emergency management program, such as the implementation of a “work-around” for notification of Operational Emergencies.

ANL-W line management’s commitment to improving the emergency management program is evident, and because many of the weaknesses in the EPHA and related response tools were already recognized, plans are in place to continue improvements in this area. These improvements will ensure that initial response decision-makers will have the tools necessary to rapidly implement appropriate protective actions for site workers for the full spectrum of postulated emergencies. Initiatives are under way within NE to increase their involvement with site emergency management programs, and within CH to clarify and redefine, as necessary, roles and responsibilities for providing emergency management guidance and support for ANL-W. Nonetheless, continued line management attention to the effort to upgrade the site’s emergency management program, as well as increased line management attention to the assessment of the program, is warranted to sustain the momentum to implement a fully effective emergency management program.

This focused program review was limited to a detailed assessment of two key emergency management programmatic elements. Consequently, no overall program rating has been assigned. The individual element ratings reflect the current status of the respective ANL-W emergency management program elements.

Hazards Assessment: Marginal 

Emergency Management Programmatic Interfaces: Satisfactory 

Opportunities for Improvement

The emergency management review conducted by the Independent Oversight team identified several opportunities for improvement. These potential enhancements are not intended to be prescriptive. Rather, they are intended to be reviewed and evaluated by the responsible DOE and contractor line managers and prioritized and modified as appropriate, in accordance with site-specific programmatic and emergency management objectives.

Argonne National Laboratory - West

1. Improve the quality and accuracy of the hazards survey and hazards assessment.

- Solicit assistance and guidance from the Office of Emergency Operations (SO-40) as an integral part of the process.
- Formalize and institutionalize the chemical screening process used for EPHA maintenance and revise the process to include all applicable screening criteria.
- Engage AAO-W, CH, NE, INEEL, ID, and SO-40, as appropriate, in a process to define an appropriate ANL-W “facility boundary” for emergency classification purposes.
- Determine consequences at the emergency control center for postulated accidents.

2. Establish or enhance emergency program procedures for the following:

- Building-specific emergency response procedure precautions for securing ventilation systems that should be considered when implementing shelter-in-place protective actions
- Consequence assessment using INEEL and National Oceanographic and Atmospheric Administration capabilities

- Press release development, review, and approval following an event at ANL-W (a flow chart to depict the approval process that reflects every activity by cognizant DOE and contractor entities is recommended)
- ANL-W emergency public information plan and document within the ANL-W emergency preparedness program
- The management point of contact role in the ANL-W emergency command center and INEEL emergency operations center
- Keeping memoranda of agreement current.

3. Validate, through performance testing, the emergency response implementing procedures for the following emergency management elements to ensure that they can be performed as written and efficiently accomplish the desired actions in a high-stress, time-urgent environment:

- Protective actions for site workers
- Consequence assessment process using INEEL and National Oceanographic and Atmospheric Administration capabilities
- Notification process for an Operational Emergency at ANL-W using the INEEL process and involving external stakeholders
- Accountability of personnel, including transient workers, following a building evacuation
- Emergency public information and Public Information Center plan and procedures for all organizational roles, responsibilities, and requirements (ANL-W, AAO-W, INEEL, ID, DOE Headquarters).

4. Utilize the emergency planning coordinating committee and the quarterly INEEL managers’ meetings to address ANL-W’s use of the INEEL notification process for an Operational Emergency at ANL-W.

Chicago Operations Office

5. Partner with ID and SO-40 to address ANL-W's use of the INEEL notification process for an Operational Emergency at ANL-W.
6. Develop a CH standard operating procedure that defines CH and AAO-W responsibilities for the ANL-W emergency management program.

Argonne Area Office - West

7. Proactively engage CH as necessary to provide outside expertise, guidance, and direction for the ANL-W emergency management program.

APPENDIX A

EVALUATION PROCESS AND TEAM COMPOSITION

The evaluation was conducted under the direction of the Secretary of Energy's Office of Independent Oversight and Performance Assurance. The evaluation was performed according to formal protocols and procedures, including an Appraisal Process Guide, which provides the general procedures used by Independent Oversight to conduct inspections and reviews, and the evaluation plan that was developed specifically for this activity, which outlines the scope and conduct of the process. Planning discussions were conducted to ensure that all team members were informed of the review objectives, procedures, and methods.

Explanation of Rating System

The Office of Independent Oversight and Performance Assurance normally assigns an overall rating to the emergency management program; ratings are also assigned to selected individual elements of the program. The rating process involves the critical consideration of all evaluation results, particularly the identified strengths and weaknesses. In the case of weaknesses, the importance and impact of those conditions are analyzed both individually and collectively, and balanced against any strengths and mitigating factors to determine their impact on the overall goal of protecting emergency responders, site workers, and the public. The Office of Independent Oversight and Performance Assurance uses three rating categories—Satisfactory, Marginal, and Unsatisfactory—which are also depicted by colors as Green, Yellow, and Red, respectively.

 **Satisfactory** (Green): An overall rating of *Satisfactory* is assigned when the emergency management program being evaluated provides reasonable assurance that all of the site's emergency responders are ready to respond promptly and effectively to an emergency event or condition.

An emergency management element being evaluated would normally be rated Satisfactory if the emergency management function were effectively implemented. An element would also normally be rated as Satisfactory if, for any applicable standards that are not met, other compensatory factors exist that provide equivalent protection to workers and the public, or the impact is minimal and does not significantly degrade the response.

 **Marginal** (Yellow): An overall rating of *Marginal* is assigned when the emergency management program being evaluated provides questionable assurance that site workers and the public can be protected following an emergency event or condition.

An emergency management element being evaluated would normally be rated Marginal if one or more applicable standards are not met and are only partially compensated for by other measures, and the resulting deficiencies in the emergency management function degrade the ability of the emergency responders to protect site workers and the public.

 **Unsatisfactory** (Red): An overall rating of *Unsatisfactory* is assigned when the emergency management program being evaluated does not provide adequate assurance that site workers and the public can be protected following an emergency event or condition.

An emergency management element being evaluated would normally be rated Unsatisfactory if one or more applicable standards are not met, there are no compensating factors, and the resulting deficiencies in the emergency management function seriously degrade the ability of the emergency responders to protect site workers and the public.

Team Composition

Director, Independent Oversight and Performance Assurance

Glenn Podonsky
Michael A. Kilpatrick, Deputy

Director, Office of Emergency Management Oversight

Charles Lewis

Team Leader

Steven Simonson

Team Members

J.R. Dillenback
James O'Brien
Thomas Rogers
Jeffrey Robertson

Quality Review Board

Michael A. Kilpatrick
Charles Lewis
Dean Hickman
Bob Nelson

APPENDIX B

FINDINGS FOR CORRECTIVE ACTION AND FOLLOW-UP

This appendix summarizes the significant findings identified during the Office of Independent Oversight and Performance Assurance focused review of the Argonne National Laboratory-West emergency management program. The findings identified in this appendix will be formally tracked in accordance with DOE Order 470.2A, *Security and Emergency Management Independent Oversight and*

Performance Assurance Program, and will require a formal corrective action plan. The DOE Director for Nuclear Energy, Science and Technology and the Chicago Operations Office need to specifically address these findings in the corrective action plan. Other weaknesses and/or deficiencies identified in this report should be addressed by line management but need not be included in the formal corrective action plan.

FINDING STATEMENT	REFER TO PAGES:
1. The ANL-W emergency planning hazards assessment process lacks a completed hazards survey, does not evaluate a complete set of accident initiators, does not consider all potential barrier failures, and does not in all cases consider the maximum quantity of materials at risk, as required by DOE Order 151.1A.	7
2. The facility boundary definition used for classifying Site Area Emergencies does not adequately differentiate between local and ANL-W sitewide emergencies or support effective development of protective actions, as required by DOE Order 151.1A.	8-9
3. The ANL-W categorization and classification procedure does not provide adequate definition or instruction to ensure that initial emergency management decision-makers can promptly classify an emergency and formulate and implement protective actions, as required by DOE Order 151.1A.	9
4. The ANL-W emergency public information program and its implementing procedures are not formally documented, and roles, responsibilities, and protocols are not adequately defined, as required by DOE Order 151.1A.	11
5. The process by which AAO-W and CH provide guidance and direction to, and assessment of, the ANL-W emergency management program is not systematic or rigorous, and assessments are not conducted at the frequency required by DOE Order 151.1A.	12-13