

A Guide for Accident Investigation Board Chairpersons

September 2012



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Washington, D.C. 20585

Accident Investigation Day Planner: A Guide for Accident Investigation Board Chairpersons

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Office of Environmental Protection,
Sustainability Support &
Corporate Safety Analysis

Office of Corporate Safety Programs, HS-23
DOE Accident Investigation Program

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Introduction

The Accident Investigation Day Planner is a field guidance tool to facilitate an effective accident investigation conducted under DOE Order (O) 225.1B, Accident Investigations, dated March 4, 2011. This Planner is intended to help accident investigation Board Chairpersons manage the many day-to-day activities necessary to bring an accident investigation to a successful completion. Additional accident investigation tools and aids may found at <http://www.hss.doe.gov/sesa/corporatesafety/AIP/index.html>, including the source material for this planner, DOE HANDBOOK: Accident Investigation and Prevention, DOE-HDBK-1208-2012, July 2012; (referred to as “AI Handbook” elsewhere in this guide).

This Day Planner is a daily administrative tool that will help you organize your time and assist in tracking the many details required to keep an investigation on a 30-day schedule. It includes a daily actions calendar, a contact list, an action item section, a valuable tips section, and some checklists that you may find useful.

The section entitled **Starting the Accident Investigation** provides some information that you will need before you begin the investigation. It discusses your role as the Board Chairperson and the personnel needed to conduct and support the investigation.

The **Tips and Lessons Learned** section includes lessons learned and tips recommended by previous accident investigation Chairpersons. It should be reviewed as you are getting started and periodically throughout the investigation.

The **Calendar** section includes blank month and week calendar pages to plan out the work week structure of the 30 days necessary for completing the accident investigation. The dates and days of the week are blank because the 30-day investigation begins on the day the appointing official establishes the Board's authority; therefore, day 0 may fall on any day of the week.

The **Daily Planner** calendar provides information for the next 30 days, that will help you conduct the investigation and helps you track your schedule. Read ahead through the daily topics as many require planning and coordinating in advance to have resources prepared for that day's activities. The daily guidance information is keyed to the predicted progress of the investigation. For each day, you will see a brief discussion of a topic that is relevant to the investigation at that point and a to-do list of tasks that should be accomplished. Information is not presented in a strict chronology. It is impossible to predict the progress of an investigation perfectly, and the information presented is keyed to phases of the investigation rather than specific days. So, be prepared to adjust your to-do lists to the needs of your situation.

The **Checklists** section includes startup activity lists that outline Board Chairperson and administrative coordinator activities as well as a checklist of needed supplies, tools, equipment, and useful documents.

The **Action Tracking** section provides a separate area for you to list topics or items that require follow-up.

The **Investigation Report Template guide** section provides suggestions and examples for the structure and content of the final report. An example table of contents, Table A2, provides an assignment column to record writing assignments to the board members. The Chairperson is encouraged to make these assignments early and coordinate ongoing draft development of the report sections as the investigation proceeds. Don't wait to the end of the investigation to begin drafting the report.

Process Improvement. We encourage user input towards improving this tool. Please send any feedback or requests for future revisions to the address below:

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Starting the Accident Investigation

The following is a brief summary of the objectives and roles and responsibilities of investigation board team as defined in DOE HANDBOOK: Accident Investigation and Prevention, DOE-HDBK-1208-2012, Volume 1, July 2012. It is useful to review the roles of the potential board resources as the chairman selects the resources needed for the investigation.

Objective of the Accident Investigation

The objective of the accident investigation is to determine what happened, why it happened, and what can be done to prevent recurrence - not to determine individual fault or to fix blame. The results of accident investigations can help managers eliminate underlying causes and prevent similar accidents across the complex. This objective should be repeatedly made clear to all parties involved in the investigation.

The Role of the Investigation Board Chairperson

The Chairperson is the manager of the accident investigation process. The process should be managed as a complex project and should be closely controlled in order to be successful and efficient. The investigation should remain focused on meeting its objective while confronted with a significant workload, finite time constraints, sensitive issues, and a dependence on the cooperation of others. In addition to managing the investigative process, the Chairperson should skillfully manage relationships among Board members and between the Board and external organizations.

While management responsibilities may preclude the Chairperson from participating in the detailed investigative tasks, he/she should be fully informed of those activities and be the driving force behind all decisions related to the investigation in order to deliver on the extensive reporting and investigation control duties. The Chairperson represents the Department in all matters pertaining to the investigation and is the primary point of contact for status and statement communications.

Some of the Chairperson's first decisions and actions will greatly influence the entire investigation. The Chairperson should be prepared to initially:

- Establish lines of communication with the affected Department of Energy (DOE) Headquarters office, the local DOE office, site contractor(s) involved, local unions, and other governmental agencies, if appropriate.
- Assume custody and control of the accident scene and other evidence.
- Establish a preliminary accident investigation schedule, specifying milestones and deadlines, to include an initial site briefing, tour of the accident scene, and interviews.
- Make assignments and ensure that all Board members clearly understand their responsibilities.

- Establish a schedule for meetings held with the Board and site management.
- Coordinate with site management any subsequent media/press releases or inquiries.
- Acquire resources for the investigation and ensure that appropriate logistical arrangements are in progress (travel, hotel, office space, and transcription and photographic services).

Investigation Board Resources

Accident Investigation Boards require resources of many kinds to carry out their work. By identifying needed resources from the start, the Chairperson facilitates smoother team work and less delays in the investigation.

DOE Accident Investigation Program Manager. The U.S. Department of Energy (DOE), Office of Health, Safety and Security (HSS) Accident Investigation (AI) Program Manager (referred to throughout this document as "HSS AI Program Manager"), is responsible for administering the program on behalf of the Chief Health, Safety and Security Officer (HS-1). The HSS AI Program Manager maintains a list of qualified consultants, advisors, and support staff, including particular areas of expertise for potential Board members or consultants/advisors to assist the AI Board Chairperson in selecting his/her team.

Field and Program Office Points of Contact. The field point of contact is a DOE staff member assigned the role of site liaison with the HSS AI Program Manager and the AI Board Chairperson. When an accident occurs, the assigned field point of contact:

- Preserves the accident scene until examined and released to the Board,
- Obtains initial written statements from witnesses and responders,
- Collects pertinent physical evidence,
- Arranges photos and a videotape record of the accident,
- Determines the medical condition of the injured as soon as possible after the accident occurs,
- Requests, if appropriate, that an autopsy be performed,
- Arranges the briefing and the accident scene tour for the Board on the day of their arrival.
- Assists the Board in obtaining documentation pertinent to the investigation.

Board Members. DOE Accident Investigation Board members should be DOE employees who are selected on the basis of their accident investigation process training, experience, and subject matter expertise in areas related to the accident, including knowledge of the Department's Safety Management System Policy and integrated safety management system. At least one Board member, according to DOE Order 225.1B, shall be a DOE Accident Investigator. The Chairperson may assist the appointing official in selecting members. Investigative and technical expertise may be requested from the HSS AI Program Manager. Board members are responsible for collecting and analyzing information, determining causal factors, identifying judgments of need, and writing the report.

DOE Accident Investigator. The Board member designated as the DOE Accident Investigator is a DOE employee who understands DOE accident investigation techniques and has experience in conducting investigations through participation in at least one prior DOE accident investigation. DOE Accident Investigators must have attended an accident investigation course of instruction that is based on DOE Order (O) 225.1B, *Accident Investigations*, dated March 4, 2011; the current *Accident Investigation And Prevention Handbook*; and materials maintained by the DOE HSS Office of Corporate Safety Programs.

Analyst. An analyst is an individual trained in and knowledgeable of the various analytical techniques that can be used to support the accident investigation process, such as the core analytical techniques of barrier analysis, change analysis, events and causal factor analysis, and root cause analysis. Board members have the responsibility for collecting and analyzing information. However, a dedicated analyst can recommend the proper analytical tools based on the type and complexity of the accident. The analyst can organize, structure, and process the information using the tools selected, allowing the Board members to concentrate on extracting the results.

Technical Advisors. Technical experts can be used to provide specialized expertise not otherwise available to the Board. They may be DOE employees, DOE contractors or subcontractors, or outside personnel. They may be site personnel with knowledge of site processes, or the accident itself, or they may be individuals who possess expertise in specialized disciplines, such as metallurgy, chemistry, or electricity. The nature or direction of the investigation will dictate the need for technical experts. A listing of technical experts is available from the HSS AI Program Manager.

Photographer. An experienced forensic photographer can provide an accurate photographic record of evidence and the accident scene, using techniques not commonly known to investigators.

Legal Advisor. A legal advisor is helpful in dealing with legal issues that may arise, including liability issues and concerns related to the Freedom of Information Act (FOIA) and the Privacy Act (PA). DOE counsel from the operations or field office having cognizance over the site, area, or facility involved generally fulfills this role. If this is not feasible, an attorney from the Office of General Counsel can assist the Board.

Medical Advisor. In any investigation involving an injury, illness, or fatality, the medical advisor will be a key person in clarifying medical issues, obtaining information from other physicians, and producing the medical information for the investigation report.

Union Advisor. A union representative can provide information on work practices, facilitate interviews with union members, attend open meetings of the Board, and convey to workers the Board's desire to assure that the accident is thoroughly investigated.

Administrative Coordinator. An experienced, trained administrative coordinator who is familiar with the administrative and logistical needs and processes for an accident investigation provides essential support to the Chairperson. The administrative coordinator should begin making administrative and logistical arrangements immediately so that start-up time is held to a

minimum once the Board arrives on site. The administrative coordinator immediately works closely with the field POC in arranging badging, personnel access, locating office space, furnishings, equipment, and supplies; scheduling required site-specific training; scheduling initial site tour and briefing; obtaining property passes for cameras, recorders, and other equipment; and arranging for after-hours access to the site and work space. Normal investigation support provided by the administrative coordinator includes reserving a block of rooms at a hotel for Board members; arranging for court reporters; coordinating interview and meeting schedules; tracking and filing evidence; managing the production of the investigation report; and providing support for the daily activities of the Board.

Technical Writer/Editor. A technical writer can facilitate the report-writing process. While Board members have primary writing responsibilities, the use of a dedicated writer focuses responsibility for assembling the report, facilitates report preparation, and results in a more cohesive and readable report.

Typist/Text Processor. A Board usually needs at least one typist to perform general secretarial and administrative tasks, such as filing, word processing, and answering phones. Often these personnel can be provided by the facility where the investigation is being conducted.

Court Reporters. Using a court reporting service enhances the interview process by increasing the timeliness and accuracy of interview transcripts. The use of court reporters gives all members of the Board the opportunity to review interviews in which they did not participate, and provides a transcript that can be used to reconstruct or develop the chronology of events preceding the accident. When an investigation requires numerous interviews, use of court reporters is essential, and can help prevent the investigation from getting behind schedule in its early stages, when most of the interviewing takes place.

Investigation and Report Quality Assurance

Formal quality control measures are necessary because of the seriousness and sensitivity of the work performed by the accident investigation Board, and the need for accuracy, thoroughness, and consistency. While the Chairperson may implement any quality assurance measures deemed necessary or helpful, the following procedures should be followed on every investigation:

- A thorough effort should be made to ensure that all facts gathered are verified, and that the analysis of those facts results in conclusions that are both consistent and logical.
- When essential portions of the draft report are complete, the Board should ensure that each section is consistent with other sections, and that the conclusions are consistent with the facts, analyses, and judgments of need.
- The facts section of the draft report should be provided to the affected DOE and contractor managers for factual accuracy review and validation.
- A quality check by staff not associated with the accident or the investigation, should provide an unbiased review.

- In addition, DOE Order (O) 225.1B, *Accident Investigations*, requires that, prior to appointing official acceptance, an electronic copy of the report be forwarded to the HSS Office of Corporate Safety Analysis for quality review. This review should be coordinated through the HSS AI Program Manager.
- Review comments are provided to the appointing official and Board Chairperson, and incorporated as appropriate in to the final report.

Tips and Lessons Learned

Organizing the Investigation Board as a Team

- Be explicit about the Board members' level of commitment when first briefing the Board. Throughout the investigation, Board members and advisors should consider the investigation to be their one and only, full time activity. Members should not expect to be able to deal with home office issues or take time off during the intense, roughly 30-day period of the investigation. The Chairperson should resolve any schedule conflicts or, if necessary, discuss possible personnel changes with the appointing official.
- Board members should be advised to assemble their own credentials and materials required to perform the investigation. Examples include security badges, training certificates and cards, and personal safety equipment.
- Inadequate or slowly developing logistical and administrative support can severely hinder an investigation. It is important to use a skilled administrative coordinator who can quickly establish and implement the Board's administrative routines.
- Working with the Field POC and the Administrative Coordinator, ensures that space is reserved early that will support securing evidence, be adequate for resources, limit distractions, and protect the integrity of the investigation.
- In the stressful situation created by the Board's intense schedule and deliberations, it is essential that the Chairperson understand group dynamics to manage the individual personalities of the Board members. Care should be taken to ensure that strong-willed personalities do not dominate and influence the objectivity of the investigation, and that all viewpoints are heard and analyzed.
- Some Board members may have never worked on an accident investigation or an evaluation team. The Chairperson should focus on developing effective team activities, because members may not immediately see their value or may be caught up on their own tasks to the exclusion of the team.
- Be aware of the potential for a conflict of interest on the part of Board members, advisors, or consultants (Federal or contractor personnel associated with the investigation) based on their past, present, or planned interests that may diminish their capacity to give impartial, technically sound, objective assistance and advice.

- It is important to designate an individual (i.e., deputy Chairperson) to act in the Chairperson's place in case of an emergency, and others involved in the investigation should be notified about the temporary delegation.
- The Chairperson may find it necessary to issue a memo authorizing costs incurred by Board members covering additional travel expenses, rates for hotels that are over per diem, and incidental expenses.
- Establish a daily routine for the Board, to include agreed-upon times for beginning and ending each workday. Establish a maximum duration for the workday (e.g., workday does not exceed 12 hours for safety, mental clarity and stress considerations).
- The Chairperson should review assignments made to individual Board members frequently to determine if additional resources or reassignments will be necessary.
- The Chairperson should use daily meetings to monitor progress and to measure performance against the schedule of activity milestones. The Chairperson should ensure that all meetings are structured and follow a predetermined agenda.
- The accident investigation Board is not directly responsible for communicating with the press and other external organizations. The Chairperson should, however, work closely with the appropriate public affairs office to discuss release of any statements regarding the completion of the Board's activities.

Administrative Coordinator Activities

- Obtain a current list of phone, fax, and cell numbers for pertinent individuals and offices at DOE Headquarters and the local operations office, and obtain copies of site and local phone directories.
- Protect all records relating to the accident until the investigation activities or analyses of those records determine that they are not relevant to the accident.
- Create a roster of Board members and advisors that includes mailing address (no P.O. box numbers), and office, fax, and home phone numbers. Include emergency contact numbers for each of the Board members.
- Mark working copies of the report as draft and date/time stamp to maintain document control.

Security, Confidentiality, and Clearance Issues

- Consider the security clearance requirements at the accident site when selecting Board advisors and consultants. Problems arise when individuals do not have the required level of security clearance for access to the facility and onsite escorts are needed.

- Arrange for a large conference room to be used by the Board members for meetings; viewing photos, videos, and other evidence; conducting analyses; and other investigation activities. This room should be off-limits to non-Board members (including janitorial staff) and locked after hours.
- Appropriate access to information should be considered during all aspects of the investigation. It is important to protect sensitive and classified information, the privacy of persons involved in the accident, and the Board members' investigation activities. Locate all pertinent investigation materials in a secured location and make sure that a shredder is available to dispose of unneeded materials.

Routine Status Meetings/Briefings/Reports

- The initial briefing to the Board should review site hazards, required personal protective equipment and training, and placing equipment in a safe configuration.
- Establishing a routine meeting schedule with the appropriate site management can provide an effective method for exchanging information, summarizing the status of the investigation, and addressing any problem encountered in a timely manner.
- Schedule a block of time on the agenda for the daily Board meeting to discuss the information obtained during the interviews conducted that day and how that information factors into the analysis of the investigation.
- Establishing a weekly conference call with managers representing DOE-HQ, the local operations office, contractors, and selected members of the Board is recommended. A written status report should be prepared and faxed to the participants the day before the conference call is scheduled.

Managing Witness Interviews

- Although interviews need to be conducted as soon as possible in the early stages of the investigation, a structured list of questions should be developed by the Board and approved by the Chairperson to ensure that all aspects of the information needed are included.
- Audio recording the interviews, with post transcription, has not been successful on past investigations. The results are unreliable as the delayed transcription loses time and the transcriber lacks the ability to verify terminology or inaudible moments. Using court reporters is a preferred method of documenting the interviews as results are more immediate and the questions can be raised about accuracy of intent. Audio/video recording as a backup can be a useful option, but are an extra security concern.
- Interview transcripts should be reviewed for accuracy by the interviewee. By using court reporters these transcripts are generally available within 24 hours and are very accurate.

- For less formal interviews, the interviewer can take notes or use a secretary with shorthand skills.
- Begin interviewing as soon as possible so that individuals realize they will be sources of information, not targets of blame. Emphasize, up front, the objective of the investigation is to find the cause and not to place blame.
- Ensure that witnesses understand follow-up interviews are routine, and are not a reflection on their statements.
- Ensure that the interviewee is at ease during the interview. Some suggestions for raising the comfort level is giving the interviewee an agenda in advance, explaining the role of the court reporter, having a portion of the interview "off the record" without the court reporter present, dressing appropriately, and interviewing senior managers in their own offices.
- The investigator should first get the overview picture of the accident, and then expand information with careful questioning.
- Having a set of photographs or sketches of the accident scene can be helpful during the interviews.
- Consider establishing a telephone "hotline," with access controls, where people can leave a voice message, request to be interviewed, or provide information in confidence.

Evidence Collection and Control

- Never discard anything - even items that appear trivial at first may prove useful later in the investigation.
- As soon as possible, determine the medical condition and fitness-for-duty status of those injured in the accident and others who are directly involved in the accident.
- If the accident occurs in an area that makes securing the accident scene difficult, the walk-through may be the sole opportunity to collect and preserve critical evidence. Be ready to take pictures or videos for later visual reference. Use digital cameras with time, date, and GPS settings to record photos. Use an experienced forensic photographer, if appropriate.
- Carefully document evidence at the time it is obtained or identified.
- Enlist the aid of technical experts when making decisions about handling or altering physical evidence.
- Intact and complete evidence is the foundation of a successful accident investigation.

- Fluids emanating from equipment or vehicles may quickly evaporate or be absorbed by surrounding materials. Therefore, fluid samples should be taken quickly.

Conducting the Accident Analyses

- Delegating responsibility for complex analysis to one individual can produce inferior results. Analyses are strengthened by the input of a variety of individuals, trained and experienced in the core analytical techniques, who are dedicated to serve as analysts.
- A good method for displaying the facts is to list them on multi-colored notes and put them up on a wall. This method is used to develop the events and causal factors chart.
- Conduct preliminary analyses early in the investigation to help direct the facts collection process. Interaction between the analysis team and the interviewers is critical.
- In change analysis, differing events and conditions are systematically reviewed and analyzed to determine potential causes.
- The purpose of any analytic technique in an accident investigation is to answer the question - "how did it happen?"
- The process of determining causal factors seeks to answer the question - "why?"
- Root cause analysis should be conducted for every accident, regardless of severity or complexity. Minor incidents often foreshadow the occurrence of more serious events. As stated in the investigation objectives, the Board should avoid placing individual blame for an accident. The Board has an obligation to seek out and analyze deficiencies in management systems.
- In any accident, there may be a series of causal factors, one leading to another. One of the most critical responsibilities of the investigation team is to pursue each factor in the series, until the Board is assured that actual root causes are identified. Regardless of which analytical technique is used, the main focus of the Board should be finding concise and valid root causes.
- Investigators should not work independently to derive judgments of need (JON). All JONs should be derived in groups of two or more, and agreed to by the entire Board. Assure that merits and validity of each JON are openly discussed and that the JONs flow from the facts and analyses of the investigation.

Producing the Accident Report

- Draft the report outline, assigning Board members clear writing responsibilities, as soon as possible.
- Many previous Boards have conducted thorough and competent accident investigations, yet failed to communicate the results effectively in the report. As a result, the root

causes, judgments of need, and lessons learned often appear unsupported or are lost in a mass of detail.

- The prologue should interpret the accident's significance as it relates to the affected site, other relevant sites, field offices within the DOE complex, and DOE Headquarters.
- The Executive Summary should not include a long laundry list of all the facts, conclusions, and judgments of need. It should concisely summarize the most important facts, the most pertinent root causal factors, and most urgent judgments of need.
- Site and facility diagrams and organizational charts for relevant management systems may be appropriate to include either in the Introduction or in the Facts and Analysis section. However, include this information only when it is needed to clarify the role of related organizations in the context of the accident or the JONs.
- Avoid lengthy narratives. It is more important to lay out the facts in a clear, concise manner understandable to the reader. Precede the bulleted facts with a statement identifying them as such, and include facts only - not conjecture, assumptions, analysis, or opinion.
- Encourage the section authors to consult with each other often so they are familiar with the general content of each section. They can then effectively tie into the flow of the content of the sections before and after and avoid redundant or conflicting information.
- It is recommended that a Board member, and perhaps graphic consultant, begin identifying, developing, and digitizing photographs and sketches, including captions, as early as possible, as these are more time-consuming than might be anticipated.
- Reviewing reports from previous investigations can be helpful when determining report format and content. However, since each accident is different, caution should be exercised not to make assumptions based upon the results of other investigations.
- Control draft versions of the report, including during final review and briefing stages. Use "draft" or "not for public release" headers, footers, or watermarks until final release. A previous Chairperson submitted copies of a final draft report to selected officials during the out briefing, and later discovered that the report had been reproduced and widely distributed both on site and off site. The report was being referenced as official and complete before it had been accepted by the appointing official and approved for distribution.
- The Chairperson should ensure that all the materials required for final report preparation will be available wherever that report will be produced. The computer files (including backup files) of the most current report draft and appendices should be secured. Also, "print-ready" copies of original graphs, charts, the report cover graphics, and all other support materials should be compiled into an electronic folder. Any hard copy materials will need to be scanned, digitally photographed, or converted to digital files.

- The final report may require several more days of intensive effort to incorporate comments received from independent reviewers, site management, and the technical editor. The Chairperson will need to determine how these comments will be handled. If the Board members have returned home to their normal duties, it may be necessary to reconvene the Board to ensure that the comments were properly resolved.

Investigation Closeout

- The Chairperson should determine which of the Board members and advisors can be released immediately after the final draft report is signed by the Board members. The Chairperson should determine who may be needed to participate in briefings and to complete the final report. The Chairperson, with the aid of the Administrative Coordinator, should assure that all of the items provided to the Board by the site are returned; the work space evacuated; and, if necessary, formal control of the accident site is returned to the contractor(s) upon completion of the investigation activities.
- The Chairperson should write appreciation letters to be distributed to everyone assisting in the onsite investigation activities. A separate appreciation letter should be drafted for the Board members, advisors, and administrative support personnel and their managers.
- The Chairperson should ensure that the Board can be reached by overnight mail, fax, and telephone, and that members will be available, even if on travel or vacation, until the report is accepted by the appointing official.

Calendars

Monthly Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

Weekly Calendar

Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday

Daily Planner – 30 days

Day 0

The role of the Appointing Official

Authority to appoint Accident Investigation Boards (AIB) and to assign individuals to conduct accident investigations resides with the appointing official, and should be established in writing. The written authorization should include the scope of the investigation, the names of the individual Board members being appointed, a specified completion date for the final report, and any special provisions deemed appropriate.

No persons serving on the Board, according to DOE Order 225.1B, may have a conflict of interest, or have direct or line management responsibility for the facility, area, or activity involved in the accident. For example, there would be a conflict of interest if, the Board included both a supervisor and his/her subordinate. [AI Handbook: see Section 2.1.1 *Accident Investigation's Appointing Official*]

Board Chairperson To Do

- Accept the appointment letter.
- Attend the briefing by the appointing official.
- Identify all appropriate site authorities.
- Contact the site and obtain briefing from the Program Manager and field or program office point of contact.
- Assist in selecting, notifying, and briefing Board members and consultants/advisors.
- Separate accident investigation activity from usual work; assign acting person for usual work.
- Request the HSS AI Program Manager to search for information about similar accidents.
- Establish a preliminary accident investigation schedule, including milestones and deadlines.
- Travel to the accident site.

Date: _____ Day: _____

7:00 a.m.	_____

8:00 a.m.	_____

9:00 a.m.	_____

10:00 a.m.	_____

11:00 a.m.	_____

12:00 p.m.	_____

1:00 p.m.	_____

2:00 p.m.	_____

3:00 p.m.	_____

4:00 p.m.	_____

5:00 p.m.	_____

6:00 p.m.	_____

7:00 p.m.	_____

evening	_____

Day 1

Arriving at the accident scene

Date: _____ Day: _____

1. Arrange to have an in-briefing with local DOE/contractor management. In this meeting:
 - Introduce Board members, advisors, and support staff.
 - Establish a liaison with the appropriate personnel on the site to ensure that clear lines of communication and responsibility are established.
 - Request that the local DOE/contractor management present preliminary facts, witness statements, etc.
 - Assess the adequacy of access and ES&H controls at the accident scene.
 - Establish information-control protocols (including press releases) with site management.
 - Establish a regular meeting schedule with site management.
 - Determine that logistical support has been established.
2. Visit the accident scene with Board members; field or program office point of contact; and readiness team to:
 - Assume formal control of accident scene.
 - Identify any potential hazards at the accident scene.
 - Determine the need for additional photographic services.
 - Make management decisions regarding the accident site.
 - Secure the scene and all forms of evidence and maintain a chain of custody.

7:00 a.m.	_____

8:00	_____

9:00	_____

10:00	_____

11:00	_____

12:00 p.m.	_____

1:00	_____

2:00	_____

Day 1, continued

3. Conduct a closed meeting with Board members. In this meeting:
 - Introduce everyone
 - Review the data on hand.
 - Discuss observations from the accident scene.
 - Establish a formal chain-of-custody procedure for evidence.
 - Discuss the need for laboratory analysis or additional technical experts.
 - Orient Board members on the investigation process, including collection of evidence, conducting interviews, determination of judgments of need, and report writing techniques.
 - Assign board member responsibilities and work assignments based on their expertise.
 - Emphasize to Board members that to complete the investigation within schedule, they may not have time to pursue every factual lead of medium to low significance.
 - Discuss the investigation and report production schedule.
 - Define rough outline of the report and assign lead responsibilities for sections. (See Table 2 for typical report content assignment list.)
 - Draft a prioritized list and a standardized list of interview questions.
 - Verify that court reporters are available for interviews.
 - Determine the need for a telephone "hotline."
 - Establish a regular meeting schedule with the Board.
 - Finalize logistic, administration, and housekeeping processes.

Date: _____ Day: _____

3:00 p.m.	_____
_____	_____
_____	_____
4:00	_____
_____	_____
_____	_____
5:00	_____
_____	_____
_____	_____
6:00	_____
_____	_____
_____	_____
7:00	_____
_____	_____
_____	_____
evening	_____
_____	_____

Day 2

Interviewing

Human evidence can be extremely delicate. Witnesses can forget, overlook, or fail to recognize evidence of critical value to the investigation, and over time they can begin to rationalize what has happened. A witness interviewing schedule should be established as soon as possible, and interviewing should begin as soon as practical. A neutral location free from distractions should be used for these interviews. Each board member is responsible for assuring that the interviews are effective and productive. Court reporters should be used to document key interviews to ensure accuracy and quickly disseminate main points to board members.

Good interviewing techniques include planning the interview strategy ahead of time. Know what information is needed and what questions to ask. Establish a rapport before the interview starts. Ask for a narrative of the interviewee's firsthand knowledge, and ask open-ended questions. [AI Handbook: see Section 2.5.7 *Conducting Interviews*]

To Do

- Attend scheduled meetings with the site.
- Review the list of standardized interview questions.
- Begin interviews.
- Determine if additional resources are required.
- Develop an initial document request list and submit it to the site.
- Prepare the agenda for the daily board meeting.
- Review the action item log.
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Day 3

Obtain needed information

Be as specific as possible when requesting information from the site. Once received, all documents should be logged into the investigation file, and a check-in/out procedure should be established.

Board members should be encouraged to check the investigation file before making a document request and regularly exchange information they have obtained, thereby avoiding duplication of effort.

It is advisable for at least one board member or an advisor to have access to the occurrence reporting system (ORPS) to get information on other related accidents.

If deemed appropriate, issue a statement for release to all site employees that outlines the purpose and scope of the accident investigation. Solicit information pertaining to the accident and list the "hot line" phone number. [AI Handbook: see Sections 2.2.2 *Collecting Initial Site Information*; 2.3.4 *Managing Evidence, Information Collection*; and 2.5.1 *Determining Facts*]

To Do

- Attend scheduled meetings with the site.
- Make sure an investigation site point of contact has been designated.
- Arrange for a telephone "hotline" for calls regarding accident, if necessary.
- Issue a public announcement calling for information.
- Review the list of interviewees.
- Review initial facts, analyses, and findings.
- Prepare the agenda for the daily board meeting.
- Review the action item log.

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Day 4

Reviewing standards and requirements

The investigators should consider the full range of management systems and operational controls, beginning at the first-line supervisor level, up to and including organization directors, site managers, and Headquarters personnel, as appropriate, but this focus should not be directed toward individuals.

The investigators should apply the criteria for each of the principles of safety management established by the Department when deciding who to interview, what to ask, what documents to collect, and what facts are pertinent to the accident. [AI Handbook: see Sections 2.5.5 *Collecting Human Evidence* and 2.5.6 *Locating Witnesses*]

To Do

- Attend scheduled meetings with the site.
- Develop a chronology of events for the accident.
- Begin Draft I preparation of the report (Annotated outline prepared, writing assigned).
- Update the document request list as facts are obtained and analyzed.
- Prepare the agenda for the daily board meeting.
- Review the action item log.
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Day 5

Collecting evidence

All the evidence that is collected forms the basis for the investigation analyses and conclusions. Three general types of evidence will be collected:

- Human evidence (witness statements and observations).
- Physical evidence (matter related to the accident, such as equipment, parts, debris, fluids, etc.).
- Documentary evidence (paper and electronic information).

Establish a protocol and assign responsibility for control and custody of evidence that will ensure accountability and preservation. Critical evidence can be lost if it is prematurely altered or discarded. Assign a board member to closely monitor all analyses and testing of physical data. [AI Handbook: see Sections 2.5.2 *Collect and Catalog Physical Evidence*; 2.5.3 *Collect and Catalog Documentary Evidence*; and 2.5.4 *Electronic Files to Organize Evidence and Facilitate the Investigation*]

To Do

- Ensure that evidence is being handled properly.
- Continue interviews.
- Review the interview list and standardized questions.
- Attend scheduled meetings with the site.
- Review facts, analyses, and findings.
- Continue Draft 1 preparation of the report.
- Prepare the agenda for the daily board meeting.
- Review the action item log.
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Day 6

Preliminary analyses

Conducting preliminary analyses early in the investigation will help identify gaps in the information and will assist in developing questions used when conducting interviews. The analysis is also a critical prerequisite for developing and supporting conclusions, and thus its importance cannot be overstated.

The chairperson should consider the following:

- Obtaining more than one person trained in the analytical techniques, either as Board members or as advisors to the board.
- Starting the events and causal factors and the barrier and change analyses as soon as the initial facts are available.
- Consider using accident investigation tools or software as an aid in identifying information gaps and developing analyses and causal factors.

[AI Handbook: see Sections 2.6.1 *Fundamentals of Analysis*; 2.6.2 *Core Analytical Tools – Determining Cause of the Accident or Event*; and 2.6.3 *The Backbone of the Investigation – Events and Causal Factors Charting*]

To Do

- Attend scheduled meetings with the site.
- Continue interviews.
- Perform an analysis of the preliminary facts.
- Complete the first draft of the accident chronology.
- Continue Draft I preparation of the report.
- Select analytical methods.
- Prepare the agenda for the daily Board meeting.
- Review the action item log.
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Day 7

Reporting investigation status

The Chairperson should consider establishing a periodic (i.e., weekly) status meeting with the appointing official and site upper management. A conference call could provide an opportunity to discuss the status and schedule of the investigation and to report any potential problems.

A written status report may also be produced periodically and distributed to managers, followed by the scheduled conference call with the appropriate personnel participating. [AI Handbook: see Sections 2.2.7 *Establishing Information Access and Release Protocols*; 2.3.5 *Coordinating Internal and External Communication*; and 2.4.1 *Monitoring Performance and Providing Feedback*]

To Do

- Attend scheduled meetings with the site.
- Prepare and distribute the weekly status report.
- Conduct a weekly status meeting with the appointing official and site upper management.
- Review the list of interviewees.
- Review facts, analyses, and findings.
- Continue Draft I preparation of the report.
- Prepare the agenda for the daily Board meeting.
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Day 8

Team review of facts and analysis

The Chairperson should encourage board members to read interview transcripts, frequently review the facts and analyses, and brainstorm preliminary conclusions. This will ensure that all issues are addressed and that the investigation remains focused and within scope.

Frequent review of this information during report writing is considered very helpful to ensure that Board members have considered all the facts and analyses as they pertain to each individual's writing assignment. [AI Handbook: see Sections 2.3.6 *Managing the Analysis*; 2.7.1 "Conclusions"; and 2.7.2 *Judgments of Need*]

To Do

- Attend scheduled meetings with the site.
- Review facts and analyses, to include the events and causal factors chart.
- Review the list of interviews.
- Continue Draft I preparation of the report.
- Prepare the agenda for the daily Board meeting.
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Day 9

Site investigations and information requests

Site organizations or contractors may want to conduct their own internal investigation of the accident and may desire information from the board. DOE AI Board accident investigations have priority over site lead investigations and may relieve the local organization of any requirement to conduct their own investigation.

The Chairperson should ensure that internal investigations or information requests do not impede the Board from conducting a timely and independent investigation. [AI Handbook: see Sections 2.2.7 *Establishing Information Access and Release Protocols* and 2.3.1 *Taking Control of the Accident Scene*]

To Do

- Attend scheduled meetings with the site.
- Review and update the Board's protocol for controlling information.
- Review facts and analyses.
- Continue interviews, as necessary.
- Continue Draft I preparation of the report.
- Prepare the agenda for the daily Board meeting.
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Day 10

The accident investigation report

The purpose of the accident investigation report is to clearly and concisely convey the results of the investigation in a manner that will help the reader understand what happened, why it happened, and what can be done to prevent a recurrence. Investigation results are reported without attributing individual fault or proposing punitive measures. The report should constitute an accurate and objective record of the accident and should provide complete and accurate details of the investigation process, analytical methods, conclusions reached, and judgments of need to correct deficiencies that may have prevented the accident. [AI Handbook: see Sections 2.3.7 *Managing Report Writing*; 2.8.1 *Writing the Report*; and 2.8.2 *Report Format and Content*]

To Do

- Attend scheduled meetings with the site.
- Continue interviews, as necessary.
- Send Draft I of the report to Board members for review.
- Perform and document additional analyses as necessary.
- Prepare the agenda for the daily Board meeting.
- Review the action item log.
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Day 11

Validating facts

As facts are gathered and reviewed, first impressions should not guide the investigation; rather, the Board should review all facts in the totality of the accident’s circumstances to ensure that only truly factual information is considered in determining what actually occurred. Facts should be constantly reviewed for relevance and accuracy, and should be validated. Not all information can be established as factual with complete certainty. Therefore, the Board should identify areas of uncertainty in the report.

Relevant facts should not be overlooked. Investigators should examine evidence critically and establish an objective and independent account of the accident. [AI Handbook: see Sections 2.3.4 *Managing Evidence, Information Collection*; 2.5.1 *Determining Facts*; and 2.8.9 *Facts and Analysis*]

To Do

- Attend scheduled meetings with the site.
- Ensure that Draft I of the report is received by the administrative coordinator.
- Review the interview list to determine if additional interviews are necessary.
- Prepare the agenda for the daily Board meeting.
- Review the action item log.
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Day 12

Assessing the process of the investigation

The Chairperson should arrange for periodic progress reviews with board members during the investigation.

Some key questions to consider when assessing the investigation progress are:

- Is the investigation on schedule?
- Is the investigation within scope?
- Are the board members focused and effective?
- Are additional resources needed?

It is important that time constraints do not compromise the quality of the investigation or the report. [AI Handbook: see Sections 2.4.1 *Monitoring Performance and Providing Feedback*; 2.4.2 *Controlling Cost and Schedule*; and 2.4.3 *Assuring Quality*]

To Do

- Attend scheduled meetings with the site.
- Review and comment on Draft I of the report.
- Review the events and conditions and supporting facts/evidence.
- Assess the progress of the investigation.
- Prepare the agenda for the daily Board meeting.
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Day 13

Analyzing facts

Most of the analyses are done using tools such as change analysis, barrier analysis, root cause analysis, and events and causal factors analysis. The results of applying each technique should be identified in the report. If the Board arrives at different conclusions from each type of analysis, the report should explain how they fit together. Analysis organizes, correlates, and structures the facts and leads to defining causes and conclusions. The board should thoroughly document the methodology it uses to arrive at its understanding of the facts, conditions, and circumstances, and to identify inferences developed to support event conclusions, opinion of causes, and judgments of need. [AI Handbook: see Sections 2.6.4 *Barrier Analysis*; 2.6.10 *Root Causes*; and 2.8.9 *Facts and Analysis*]

To Do

- Attend scheduled meetings with the site.
- Ensure that comments on Draft 1 of the report are received by the administrative coordinator.
- Review analytical methods.
- Prepare the agenda for the daily Board meeting.
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Day 14

Report format and content

The investigation report format should include the following:

- **Executive Summary** is written for the executive or general reader who may be relatively unfamiliar with the subject matter.
- **Introduction** normally contains (1) a brief description of the accident and its results and a statement regarding the authority to conduct the investigation; (2) a brief description of the facility, area, or site; and (3) a description of the investigation's scope, its purpose, and the methodology used in conducting the investigation.
- **Facts and analysis** are logically organized into subsections according to relevant topical areas or safety management systems, stating the facts related to the accident, the analysis of those facts, and the determination of causal factors.
- **Conclusions and Judgments of Need** include conclusions in the form of statements of what was found by the board, and identified needs (actions) required to prevent future accidents.

[AI Handbook: see Sections 2.8.2 *Report Format and Content*; 2.8.7 *Executive Summary*; and 2.9.1 *Structure and Format*]

To Do

- Attend scheduled meetings with the site.
- Prepare and distribute the weekly status report.
- Conduct a weekly status meeting with the appointing official and site upper management.
- Review the interview list to determine if additional interviews are necessary.
- Prepare the agenda for the daily Board meeting.
- Review the action item log.

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Day 15

Arriving at conclusions

Conclusions are significant deductions derived from the investigation's analytical results. Conclusions are derived from and should be supported by the facts plus the results of testing and the various analyses conducted. They are statements that answer two questions the accident investigation addresses: What happened and why did it happen? Conclusions always include concise recapitulations of the causal factors (direct, contributing, and root causes) of the accident determined by the analysis of facts.

Where appropriate, conclusions may be used to highlight positive aspects of performance. [AI Handbook: see Sections 2.7.1 *Conclusions* and 2.8.10 *Conclusions and Judgments of Need*]

To Do

- Determine if scheduled meetings with the site can be discontinued.
- Review and comment on Draft 2 of the report.
- Review the preliminary conclusions.
- Prepare the agenda for the daily Board meeting.
- Review the action item log.
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Day 16

Developing judgments of need (JONs)

The JONs are the board's judgment as to the adequacy of managerial controls and safety measures necessary to prevent or minimize the probability or severity of a recurrence. This is the only reason for JONs. JONs should be stated in clear, concise, and direct language; should address each causal factor (root and contributing); and should provide the basis for corrective actions.

JONs should not include site readiness process issues (e.g., site preservation, evidence control) unless they have a direct impact on the accident. These concerns should be noted in a separate memorandum to the appointing official. [AI Handbook: see Sections 2.7.2 *Judgments of Need* and 2.8.10 *Conclusions and Judgments of Need*]

To Do

- Ensure that comments on Draft 2 of the report are received by the administrative coordinator.
- Prepare the agenda for the daily Board meeting.
- Review the action item log.
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Day 17

Exhibits and appendices

Figures, graphs, charts, and diagrams can add value to the investigation report and should be designed to promote quick and easy comprehension. Photographs should have captions and carry labels, measurements, or other marks to aid in the interpretation.

Appendices are added as required to provide supporting information. As a general rule, the amount of documentation in the appendices should be limited. The appendices should not be more comprehensive than the report itself. If there is any doubt whether there is benefit for including material as an appendix, it should probably be omitted. All appendices should be referenced in the report. [AI Handbook: see Sections 2.8.9 *Facts and Analysis* and 2.8.14 *Appendices*]

To Do

- Review and comment on Draft 3 of the report.
- Assure that graphs, charts, and appendices have been integrated into the report.
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Day 18

Factual accuracy review

When the accident investigation report has been drafted in its final form, but before it is sent to the appointing authority for acceptance, the facts portion of the report should be reviewed by the affected organizations at Headquarters and at the site, to validate the factual accuracy of the contents of the report. It may be necessary to have other sections reviewed as well. This review is important for ensuring an accurate report and enhancing acceptance by all affected parties.

Distribution of the draft report needs to be carefully controlled and labeled as “draft”. It is recommended that the factual accuracy review be held in an area where numbered copies of the report can be controlled with a check-out/check-in procedure. [AI Handbook: see Sections 2.9.4 *Classification and Privacy Review*, 2.9.5 *Factual Accuracy Review*; and 2.9.7 *Document the Reviews in the Records*]

To Do

- Ensure that comments on Draft 3 of the report are received by the administrative coordinator.
- Ensure that the draft report is reviewed for privacy.
- Ensure that a classification review is completed of the draft report.
- Conduct a factual accuracy review.
- Review conclusions and judgments of need.
- Begin preparing out briefing materials.
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Day 19

Verification analysis

The verification analysis determines whether the flow is logical from facts to analysis, conclusions, and judgments of need. The goal is to eliminate conclusions that are not based on facts. One approach is to compare the facts, analysis, conclusions, causes, and judgments of need on a wall chart, and validate the continuity of facts through the analysis and conclusions to the judgments of need. This method also identifies any misplaced facts, insufficient analyses, and unsupported conclusions or JONs. [AI Handbook: see Sections 2.4.3 *Assuring Quality* and 2.9.3 *Verification Analysis*]

To Do

- Conduct a verification analysis.
- Continue preparing out briefing materials.
- Review and comment on the draft report.
- Review factual accuracy comments with the Board.
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Day 20

Minority opinions

Date: _____ Day: _____

If a board member(s) cannot agree on the conclusions reached at the end of the investigation, it is that board member's right to prepare a minority opinion. The chairperson should make every effort to understand the logic underlying the differing opinions and consider what changes might resolve the conflict, but if the conflict cannot be resolved, the chairperson should accept the opinion and include it in the final report. The minority report should only address these points of variance. [AI Handbook: see Sections 2.7.3 *Minority Opinions*]

To Do

- Draft report comments are due to the administrative coordinator.
- Draft appreciation letters for site support.
- Send a copy of the draft final report to the Program Manager for quality review.
- Prepare and distribute the weekly status report, if necessary.
- Conduct the weekly status meeting with the appointing official, if necessary.
- Obtain board members' signatures for the report.
- Prepare to depart the site.
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Day 21

Archiving records

Permanent records should be maintained for the accident investigation, in accordance with DOE record retention requirements. Accident investigation reports do not contain all of the records and backup data associated with the investigation.

One of the final activities of the board will be to review and prepare the archive materials for long term storage. All factual material and analysis products should be included, such as logbooks, Board meeting minutes, electronic files, correspondence, field notes, sketches, witness statements (including recordings, if used), analysis charts, photographs, location and custody of physical evidence, and various forms completed during the investigation.

The chairperson should ensure that the archive files have been reviewed, purged of extraneous or duplicate materials, and made ready for shipment to the appropriate storage location. [AI Handbook: see Sections 2.3.8 *Managing Onsite Closeout Activities* and 2.3.9 *Managing Post-Investigation Activities*]

To Do

- Review the archive files and prepare for shipment.
- Finalize a report production schedule.
- Incorporate the quality review comments into the report.
- Depart the site.
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Day 22

Releasing information to the public

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The Chairperson should instruct the Board members not to communicate with the press or other external organizations regarding the investigation. This is the responsibility of the Board Chairperson until the final report is released, and he/she should work closely with a person designated by the site to provide other information, such as how to best produce and release any statement to site employees and the public. [AI Handbook: see Sections 2.2.7 *Establishing Information Access and Release Protocols* and 2.2.8 *Controlling the Release of Information to the Public*]

To Do

- Continue to incorporate comments into the final draft report.
- Draft a transmittal memo to the appointing official.
- Establish a point of contact at the site for press releases.
- Schedule final report production.
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Day 23

Draft final report preparation

The Chairperson is responsible for final editing and production of the report, with assistance from administrative support staff.

The chairperson is also responsible for presenting the draft final report to the appointing official for formal acceptance, after which the report should be finalized and distributed.

When the final report has been produced, the Chairperson should distribute a personal copy to each member of the accident investigation team with an appreciation letter attached. [AI Handbook: see Sections 2.1.1 “Accident Investigations’ Appointing Official” and 2.10 “Submitting the Report”]

To Do

- Draft final report preparation.
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Day 24

Releasing the Board members

Date: _____ Day: _____

The Chairperson should determine when each of the Board members and advisors can be released. [AI Handbook: see Sections 2.2.3 *Determining Task Assignments*; 2.3.8 *Managing Onsite Closeout Activities*; and 2.3.9 *Managing Post-Investigation Activities*]

To Do

- Draft appreciation letters for Board members, advisors, and support staff.
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Day 25

To Do

- Review and incorporate comments received on the draft final report.
- Schedule a briefing with the appointing official.
- Draft transmittal memo(s) for report distribution.
- Transmit the draft final report to the appointing official.
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Day 26

To Do

- Brief the appointing official on the results of the investigation.
- Review and incorporate comments received on the draft final report.

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Day 27

Lessons learned

The purpose of conducting accident investigations is to determine the system deficiencies that allowed the accident to occur, so that those deficiencies can be corrected and similar accidents can be prevented. Summaries of deficiencies and the recommended corrective actions are identified as "lessons learned." In the interest of preventing recurrence of accidents, lessons learned are disseminated DOE-wide through reports, workshops, newsletters, and electronic means, as appropriate, to ensure that the results of investigations have the greatest effect for continuous improvement in environment, safety and health performance.

HSS develops a twice annual accident investigation analysis report and assists in disseminating lessons learned from accident investigations. [AI Handbook: see Sections 2.3.8 *Managing Onsite Closeout Activities* and 2.3.9 *Managing Post-Investigation Activities*]

To Do

- Review and incorporate comments on the draft final report.
- Identify "lessons learned."
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Day 28

Appointing official's report acceptance

The investigation is considered complete when the appointing official accepts the report, including a minority report, if appropriate. The appointing official indicates formal acceptance by signing and dating an acceptance statement. This acceptance statement is incorporated into the final report.

The Chairperson usually drafts the acceptance statement for the appointing official. [AI Handbook: see Sections 2.8.4 *Appointing Official's Statement of Report Acceptance*; 2.9.6 *Review by the Chief Health, Safety and Security Officer*; and 2.10 *Submitting the Report*].

To Do

- Finalize the acceptance statement.
- Finalize the report.
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Day 29

Out briefing following report acceptance

Date: _____ Day: _____

The Chairperson should conduct briefings on the investigation's outcome for DOE and contractor line management at the site of the accident. Accident investigation participants may attend these briefings. The briefings should cover:

- The scope of the investigation as provided in the appointment letter.
- The investigation's participants, including any subject matter experts or other consultants.
- A brief summary of the accident (what happened).
- Direct, contributing, and root causes (why it happened).
- Judgments of need (what needs to be corrected).
- Organizations that should be responsible for corrective actions.

[AI Handbook: see Sections 2.3.8 *Managing Onsite Closeout Activities* and 2.3.9 *Managing Post-Investigation Activities*]

To Do

- Conduct the out brief with the site DOE and contractor management.
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Day 30

DOE Headquarters briefing

Date: _____ Day: _____

Upon completion of the investigation activities, the Chairperson and senior management of the site at which the accident occurred conduct a briefing to DO E Headquarters to present the Board's conclusions and judgments of need. Other briefings may be provided by the Chairperson, including briefing the appointing official. [AI Handbook: see Sections 2.3.8 *Managing Onsite Closeout Activities* and 2.3.9 *Managing Post-Investigation Activities*]

To Do

- Conduct a briefing for Headquarters.
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Checklists

Chairperson Start-Up Activities

Description of Activity	Name of Designated Lead
Attend the briefing by the appointing official.	HQ
	Site
	Other
Assist in selecting, notifying, and briefing Board members and consultants/advisors.	HQ
	Site
	Other
Identify all appropriate site authorities.	HQ
	Site
	Other
Obtain details of the accident from the site readiness team leader and other site parties.	HQ
	Site
	Other
Ensure the adequate evidence preservation and collection activities were initiated.	HQ
	Site
	Other
Begin identifying and collecting background and factual information.	HQ
	Site
	Other
Obtain a prior, one to two years, ORPS event reports and site safety program reviews. Assign a Board member to conduct an analysis of the data collected against ISM weaknesses and HPI precursors,	HQ
	Site
	Other
Review all forwarded site and Board member information.	HQ
	Site
	Other
Reassign normal business commitments.	HQ
	Site
	Other
Establish a preliminary accident investigation schedule, including milestones and deadlines.	HQ
	Site
	Other
Contact selected Board members, consultants/advisors, and site personnel.	HQ
	Site
	Other

Description of Activity	Name of Designated Lead
Arrange travel for self and expedite Board travel arrangements.	HQ
	Site
	Other
Establish administrative support/determine that logistical support for the accident investigation is established.	HQ
	Site
	Other

Administrative Coordinator Start-up Activities

Description of Activity	Name of Designated Lead
Make hotel selection and reserve a block of rooms for the Board.	HQ
	Site
	Other
Determine site/field office points of contact for administrative and logistical support.	HQ
	Site
	Other
Arrange for local court reporter support for interviews.	HQ
	Site
	Other
Arrange for office/work space and furnishings for the Board.	HQ
	Site
	Other
Arrange for a large, dedicated conference room that can be locked when not in use by the Board.	HQ
	Site
	Other
Arrange for several small, hard-walled offices to be used for conducting interviews.	HQ
	Site
	Other
Arrange for security badges/passes for members of the Board.	HQ
	Site
	Other
Arrange for property permits for personal equipment (cameras, laptops, etc.) for members of the Board.	HQ
	Site
	Other
Arrange for specific security, access, safety, and health training, as required.	HQ
	Site
	Other
Arrange for dedicated telephone services and a fax machine.	HQ
	Site
	Other
Arrange for a dedicated, high-speed copy machine that has collating and stapling capability.	HQ
	Site
	Other
Obtain office supplies and consumables for use by the Board.	HQ
	Site

Description of Activity	Name of Designated Lead
	Other
Arrange after-hours access to site and work space, and assume responsibility for all keys/cards provided by the site.	HQ
	Site
	Other
Prepare and maintain the interview schedule.	HQ
	Site
	Other
Create and maintain accident investigation files.	HQ
	Site
	Other
Arrange for an area central to work space to locate documents, lockable file cabinets, high-speed copy machine, large-volume document shredder(s), and fax machine.	HQ
	Site
	Other

Investigation Equipment Checklist

Checklist		Notes
Document Packet		
DOE Order 225.1B, <i>Accident Investigations</i>		
DOE-HDBK-1208-2012 <i>Accident Investigation and Prevention</i> , Volume 1 http://www.hss.doe.gov/nuclearsafety/techstds/docs/handbook/DOE-HDBK-1208-2012_VOL1.pdf		
DOE Accident Investigation Program Electronic Reference Tool http://www.hss.doe.gov/sesa/corporatesafety/aip/docs/AI_Electronic_Toolbox_2011.pdf		
Accident Investigation Day Planner: A Guide for Accident Investigation Board Chairpersons		
Site Documents		
Organization Charts		
Facility Maps		
Applicable blueprints and as-built drawings		
Policies and procedures manuals		
ES&H manuals		
Training manuals		
Phone books (local, facility, and HQ)		
Office Supplies		
Adhesive notes (assorted sizes and colors)		
Adhesive flags (assorted colors)		
Chart paper (1/4" grid)		
Flip charts and easel		
Note pads		
Steno pads		
2 boxes hanging file folder		
3 boxes 1/3 cut manila file folders		
6 expandable files		
Pens (red, blue, black)		
Pencils		
Markers (assorted colors)		

Checklist		Notes
Paper clips		
Binder clips (assorted sizes)		
1 box yellow highlighters		
1 heavy duty stapler with staples		
3 desk staplers with staple		
3 staple removers		
Scotch tape in dispensers		
Masking tape		
2 scissors		
Three-hole punch		
2 clipboards		
3" x 5" index cards		
Office Equipment		
Telephones		
Color printer, letter quality		
Thumb drives		
Fax machine		
Shredder (or secure shredding capability)		
High-speed copier with duplex printing		
Pencil sharpener		

Investigation Report Template Guide

This accident investigation report template is extracted from the DOE HANDBOOK: Accident Investigation and Prevention, DOE-HDBK-1208-2012, July 2012. For more guidance, explanations, or suggestions on report writing and submittal, please refer to sections 2.8 through 2.10 of Volume 1 of the handbook.

Table 1: Useful Strategies for Drafting the Investigation Report

- Establish clear responsibilities for writing each section of the report.
- Establish deadlines for writing, quality review, and production, working back from the scheduled final draft report due date.
- Use an established format (as described in Section 2.8.2). Devise a consistent method for referencing titles, acronyms, appendices, and footnotes to avoid last-minute production problems.
- Use a single point of contact, such as the administrative coordinator, to control all electronic versions of the report, including editing input, and to coordinate overall report production.
- Start writing as soon as possible. Write the facts as bulleted statements as they are documented. Write the accident chronology as soon as possible to minimize the potential for forgetting the events and to save time when generating the first draft.
- Begin developing illustrations and photograph captions early. These processes take more time than generally anticipated.
- Allow time for regular editorial and Board member review and input. Don't wait until the last few days on site for the Board to review each other's writing and the entire draft report. This step is important for assuring that primary issues are addressed and the investigation remains focused and within scope.
- Use a zip drive to save the report during text processing — the file is extremely large.
- Use a technical writer or editor early in the process to edit the draft report for readability, grammar, content, logic, and flow.
- Share information with other Board members.
- Plan for several revisions.

**Table 2: The Accident Investigation Report Should Include These Items
(Make Report Writing Assignments Early)**

EXAMPLE: TABLE OF CONTENTS	ASSIGNMENTS
Table of Contents	
Acronyms and Abbreviations	
Executive Summary	
1.0 Introduction	
1.1. Background	
1.2. Facility Description	
1.3. Scope, Conduct, and Methodology	
2.0 The Accident	
2.1. Background	
2.2. Accident Description	
2.3. Accident Response	
2.4. Medical Report Summary	
2.5. Event Chronology	
3.0 Facts and Analysis	
3.1 Emergency Response	
3.2. Post-Event Accident Scene Preservation and Management Response	
3.6. Assessment of Prior Events and Accident Pre-cursors	
3.7. Integrated Safety Management Analysis	
3.3. Conduct of Operations, Work Planning and Controls	
3.4. Supervision and Oversight of Work	
3.5. 10 CFR Part 851 DOE Worker Safety and Health Program	
3.8. Human Performance Analysis	
3.9. Department of Energy Programs and Oversight	
3.10. Summary of Causal Factor Analyses	
3.11. Barrier Analysis	
3.12. Change Analysis	
3.13. Events and Causal Factors Analysis	
4.0 Conclusions and Judgments of Need	

EXAMPLE: TABLE OF CONTENTS	ASSIGNMENTS
5.0 Board Signatures	
6.0 Board Members, Advisors, Consultants, and Staff	
Appendix A: Board Letter of Appointment	
Appendix B: Barrier Analysis	
Appendix C: Change Analyses	
Appendix D: Events and Causal Factors Analysis	
Appendix E: Human Performance and Management Systems Analysis	
Appendix F: Detailed Summary of Causal Factors	
EXAMPLE: EXHIBITS, FIGURES AND TABLES	
Exhibit 1-1 Area Enclosure	
Exhibit 2-1 View Looking South	
Figure 2-1 Summary Events Chart and Accident Chronology	
Figure 2-2 Barrier Analysis Summary	
Figure 2-3 Events and Causal Factors Chart	
Table 3-1 Conclusions and Judgments of Need	

DISCLAIMER

This report is an independent product of the Federal Accident Investigation Board appointed by [Name], Chief Health, Safety and Security Officer.

The Board was appointed to perform a Federal investigation of this accident and to prepare an investigation report in accordance with DOE Order 225.1B, *Accident Investigations*.

The discussion of facts, as determined by the Board, and the views expressed in the report do not assume and are not intended to establish the existence of any duty at law on the part of the U.S. Government, its employees or agents, contractors, their employees or agents, or subcontractors at any tier, or any other party.

This report neither determines nor implies liability.

Figure 1: Example of a Disclaimer Statement

APPOINTING OFFICIAL'S ACCEPTANCE STATEMENT

On [Date], I established a Federal Accident Investigation Board to investigate the [Fall] at the [Facility] at the [Site] that resulted in the [Fatality of a construction worker]. The Board's responsibilities have been completed with respect to this investigation. The analyses, identification of direct, contributing, and root causes, and Judgments of Need reached during the investigation were performed in accordance with DOE Order 225.1B, *Accident Investigations*. I accept the findings of the Board and authorize the release of this report for general distribution.

Signed,

[Name]

Title

Office

Figure 2: Example of the Appointing Official's Report Acceptance Statement

ACRONYMS AND INITIALISMS

CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EM	DOE Office of Environmental Management
ES&H	Environment, Safety and Health
HSS	Office of Health, Safety and Security
M&O	Management and Operating
OSHA	Occupational Safety and Health Administration

Figure 3: Example of an Acronyms and Initialisms List

PROLOGUE

INTERPRETATION OF SIGNIFICANCE

The fatality at the [Site] on [Date] resulted from failures of Department of Energy (DOE), contractor, and subcontractor management, and the fatally injured worker. The subcontractor, the employer of the fatally injured worker, had a poor record of serious safety deficiencies and had never accepted the higher levels of safety performance required by the Department's safe work ethic.

Although all the appropriate contractual and procedural requirements were in place, the subcontractor failed to implement them and continued to allow violations of Occupational Safety and Health Administration regulations invoked by DOE orders. These serious deficiencies were recognized by the prime contractor, which was instituting progressively stronger sanctions against the subcontractor. However, because of the subcontractor's recalcitrance and the imminent danger conditions represented by the subcontractor's frequent violations of fall protection requirements, more aggressive measures, such as contract cancellation, could have been taken earlier.

The prime contractor's oversight was narrowly focused on selected aspects of the subcontractor's safety performance and did not identify the subcontractor's failure to implement its own procedures, or institute appropriate fall protection measures. Thus, the implications and frequency of imminent danger hazards were not fully appreciated. Departmental oversight focused on the subcontractor's performance and did not identify the gaps in the prime contractor's oversight focus. As a result, hazards were not identified and barriers were not in place to prevent the accident, which could have been avoided.

This fatality highlights the importance of a complete approach to safety that stresses individual and line management responsibility and accountability, implementation of requirements and procedures, and thorough and systematic oversight by contractor and Department line management. All levels of line management should be involved. Contractual requirements and procedures, implementation of these requirements, and line management oversight are all necessary to mitigate the dangers of hazards that arise in the workplace. Particular attention should be paid to individual performance and changes in the workplace. Sound judgment, constant vigilance, and attention to detail are necessary to deal with hazards of immediate concern. When serious performance deficiencies are identified, there should be strong, aggressive action to mitigate the hazards and re-establish a safe working environment. Aggressive actions up to and including swift removal of organizations that exhibit truculence toward safety, are appropriate and should be taken.

Figure 4: Example Prologue

EXECUTIVE SUMMARY

INTRODUCTION

A fatality was investigated in which a construction subcontractor fell from a temporary platform in the [Facility] at the [Site]. In conducting its investigation, the Accident Investigation Board used various analysis techniques, including events and causal factors charting and analysis, barrier analysis, change analysis, and root cause analysis. The Board inspected and videotaped the accident site, reviewed events surrounding the accident, conducted extensive interviews and document reviews, and performed analyses to determine the causal factors that contributed to the accident, including any management system deficiencies. Relevant management systems and factors that could have contributed to the accident were evaluated using with the components of the Department's integrated safety management system, as described in DOE Policy 450.4A.

ACCIDENT DESCRIPTION

The accident occurred at approximately [Time] on [Date] at the [Facility], when a construction worker, employed by [Subcontractor], fell from a temporary platform. The platform had been installed to catch falling tools and parts, but it was also used as a work platform for personnel activities when 100 percent fall protection was used. The worker was transported by helicopter to the medical center, where he died at [Time] from severe head and neck injuries.

DIRECT AND ROOT CAUSES

The **direct cause** of the accident was the fall from an unprotected platform.

The **contributing causes** of the accident were: (1) the absence of signs and barricades in the vicinity of the platform, (2) visibility problems created by poor illumination in the area of the platform, and (3) lack of implementation of job safety analysis, work controls, and the medical surveillance program.

The **root causes** of the accident were: (1) failure by [Subcontractor] to implement requirements and procedures that would have mitigated the hazards, and (2) failure by [Subcontractor] to effectively implement components of the Department's integrated safety management policy mandating line management responsibility and accountability for safety performance.

CONCLUSIONS AND JUDGMENTS OF NEED

Conclusions of the Board and Judgments of Need as to managerial controls and safety measures necessary to prevent or mitigate the probability of a recurrence are summarized in Table 1.

Table 1. Conclusions and Judgments of Need	
Conclusions	Judgments of Need
<ul style="list-style-type: none"> Comprehensive safety requirements existed, were contractually invoked, and were appropriate for the nature of [Facility] construction work. 	None
<ul style="list-style-type: none"> [Subcontractor] failed to follow procedures required by its contract and by its ES&H Program Plan, including: [Subcontractor] failed to adequately implement fall protection requirements contained in its ES&H Program Plan for the [Facility] project, including enforcement of a three-tiered approach to fall protection. The third tier (choice of last resort) requires anchor points, lanyards, shock absorbers, and full-body harness. The worker was not wearing any fall protection equipment and did not obtain a direct reading dosimeter before entering the radiological control area. 	[Subcontractor] line management and safety personnel need to implement existing safety requirements and procedures.
<ul style="list-style-type: none"> [Subcontractor] and [Contractor] did not fully implement the hazard inspection requirements of the [Facility] contract and [Subcontractor's] ES&H Program Plan, and therefore did not sufficiently identify or analyze hazards and institute protective measures necessary due to changing conditions. 	[Subcontractor] and [Contractor] need to ensure that an adequate hazard analysis is performed prior to changes in work tasks that affect the safety and health of personnel.

Figure 5: Example Executive Summary including CONs and JONs Table

INTRODUCTION:**1.0 INTRODUCTION****1.1 BACKGROUND**

On [Date], at approximately [Time], a construction subcontractor working at the [Site] fell approximately 17 feet from a temporary platform. The platform was built to catch falling tools and parts in the [Facility]. The worker was transported by helicopter to the medical center, where he died from severe head and neck injuries.

On [Date], [Appointing Official Name and Title] appointed an Accident Investigation Board to investigate the accident, in accordance with DOE Order 225.1B, *Accident Investigations*.

1.2 FACILITY DESCRIPTION

Contractor activities at [Site] are managed by the DOE XXX Operations Office. The facility in which this accident occurred is under the programmatic direction of the Office of Environmental Management (EM).

[Provide a brief discussion of site, facility, or area operations and descriptive background that sheds light on the environment or location where the accident occurred.]

1.3 SCOPE, CONDUCT, AND METHODOLOGY

The Board commenced its investigation on [Date], completed the investigation on [Date], and submitted its findings to the Assistant Secretary for Environment, Safety and Health on [Date].

The **scope** of the Board's investigation was to review and analyze the circumstances to determine the accident's causes. During the investigation, the Board inspected and videotaped the accident site, reviewed events surrounding the accident, conducted interviews and document reviews, and performed analyses to determine causes.

The **purposes** of this investigation were to determine the nature, extent, and causation of the accident and any programmatic impact, and to assist in the improvement of policies and practices, with emphasis on safety management systems.

The Board conducted its investigation, focusing on management systems at all levels, using the following **methodology**:

- Facts relevant to the accident were gathered
- Relevant management systems and factors that could have contributed to the accident were evaluated in accordance with the components of DOE's integrated safety management system, as described in DOE Policy 450.4A.
- Events and causal factors charting and analysis, along with barrier analysis and change analysis, was used to provide supportive correlation and identification of the causes of the accident.

Figure 6: Example Report Introduction

DESCRIPTION AND ANALYSIS OF FACTS**3.0 FACTS AND ANALYSIS****3.3 PHYSICAL HAZARDS, CONTROLS, AND RELATED FACTORS****3.3.1 Physical Barriers**

Facts related to physical barriers on the day of the accident are as follows:

- There were no general barriers, warning lines, or signs to alert personnel on top of the construction materials to the fall hazards in the area. There were no other safety barriers for the platform.
- The platform was intended to catch falling tools or parts, but it was also used as a work platform for personnel with 100 percent fall protection.
- There were no static lines or designated (i.e., engineered) anchor points for personnel to connect fall protection equipment in the vicinity of the platform.
- Lighting in the area of the platform was measured at 2 foot-candles.

Following is the analysis of these facts.

Occupational Safety and Health Standards for the Construction Industry (29 CFR 1926) requires that, when working from an area greater than six feet in height or near unprotected edges or sides, personal protection in the form of a fall protection system be in place during all stages of active work. Violations of fall protection requirements usually constitute an imminent danger situation. Lighting in the area was less than the minimum of 5 foot-candles prescribed by the OSHA standards (29 CFR 1925.56). This level of illumination may have contributed to the accident, taking into consideration the visual adjustment when moving from a brighter area to a progressively darker area, as was the case in the area where the accident occurred. There were no permanently installed fall protection systems, barriers, or warnings; each sub-tier contractor was expected to identify the fall hazards and provide its own fall protection system as they saw fit. The combination of these circumstances was a contributing cause of the accident.

3.12 CHANGE ANALYSIS

Change analysis was performed to determine points where changes are needed to correct deficiencies in the safety management system and to pinpoint changes and differences that may have had an effect on the accident.

Changes directly contributing to the accident were failure to execute established procedures for fall protection, signs and barricades, and Job Safety Analysis/Construction Safe Work Permit; unsafe use of the temporary platform; insufficient lighting in the platform area; and unenforced work restrictions for the construction worker. No job safety analysis was performed and/or Construction Safe Work Permit obtained for work on the platform, leading to a failure in the hazard analysis process and unidentified and uncorrected hazards in the workplace. Deficiencies in the management of the safety program within [Subcontractor] are also related to failures in the medical surveillance program.

Changes brought about by [Subcontractor] management failures resulted in a deficient worker safety program. Management failed to implement the contractual safety requirements necessary to prevent the accident and avoid deficiencies in the worker safety program.

[Contractor's] progressive approach to improving [Subcontractor's] compliance with safety requirements was successful to a degree, but failed to prevent recurrence of imminent danger situations.

3.13 EVENTS AND CASUAL FACTORS ANALYSIS

3.13.1 Direct Cause of the accident: fall from an unprotected platform. However, there were also contributing causes and root causes.

3.13.2 Contributing causes for the accident:

- Job safety analysis, work controls, and medical surveillance program not implemented
- Insufficient illumination in the area of the temporary platform
- Failure to remove the temporary platform
- Absence of warning signs and barricades.
- Another possible contributing factor was impaired judgment of the worker who fell from the platform. This cause could not be substantiated.

3.13.3 Root Causes of the accident:

- **Failure by [Subcontractor] to implement requirements and procedures that would have mitigated the hazards.** The implementation of comprehensive and appropriate requirements is part of the third of DOE's safety management principles. [Subcontractor] failed to implement its medical surveillance program and to enforce work restrictions for the worker. A hazard analysis, required by the Industrial Hygiene Program Plan, was not conducted; consequently, the hazards associated with the platform were not identified, and no countermeasures were implemented. The absence of fall protection, physical barriers, and warning signs in the vicinity of the platform, along with inadequate lighting, violated DOE requirements that invoke Federal safety standards. Finally, failure to ensure that comprehensive requirements are fully implemented represents a fundamental flaw in the safety management program of [Subcontractor] and exhibits failure to meet part of the management requisites for the fifth of DOE's safety management principles requiring that comprehensive and appropriate requirements be established and effectively implemented to counteract hazards and assure safety.

Figure 7: Example of the Accident Description and Analysis of Facts

CONCLUSIONS AND JUDGMENTS OF NEED:	
4.0 CONCLUSIONS AND JUDGMENTS OF NEED	
<p>This section of the report identifies the conclusions and Judgments of Need determined by the Board, as a result of using the analysis methods described in Section 3.0. Conclusions of the Board consider significant facts, causal factors, and pertinent analytical results. Judgments of Need are managerial controls and safety measures believed necessary to prevent or mitigate the probability or severity of a recurrence. They flow from the causal factors and are directed at guiding managers in developing follow-up actions. Table 4-11 identifies the conclusions and the corresponding Judgments of Need identified by the Board.</p>	
Table 4-1. Conclusions and Judgments of Need	
CONCLUSIONS	JUDGMENTS OF NEED
<ul style="list-style-type: none"> Comprehensive safety requirements existed, were contractually invoked, and were appropriate for the nature of construction work. 	None
<ul style="list-style-type: none"> [Subcontractor] failed to follow procedures required by its contract and by its ES&H Program Plan, including: [Subcontractor] failed to adequately implement fall protection requirements contained in its ES&H Program Plan for the project, including enforcement of a three-tiered approach to fall protection. The third tier (choice of last resort) requires anchor points, lanyards, shock absorbers, and full-body harness. 	[Subcontractor] line management and safety personnel need to implement existing safety requirements and procedures.
A temporary platform, used as a work surface for personnel activities when employing 100 percent fall protection, did not have guardrails and was left in place without barriers or other warning devices.	[Subcontractor] and [Contractor] need to ensure that safety personnel inspect changing work conditions for previously unidentified safety and health hazards, and implement protective measures.

Figure 8: Example of the Conclusions and Judgments of Need Table

BOARD MEMBERS SIGNATURE PAGE:

5.0 BOARD SIGNATURES

Signed _____ [Name], Board Chairperson U.S. Department of Energy, HQ	Date	Dated _____
Signed _____ [Name], Board Member DOE Accident Investigator U.S. Department of Energy, Savannah River Site Office	Date	Dated _____
Signed _____ [Name], Board Member DOE Accident Investigator U.S. Department of Energy, Oak Ridge Operations Office	Date	Dated _____
Signed _____ [Name], Board Member Accident Investigator U.S. Department of Energy, Idaho Operations Office	Date	Dated _____
Signed _____ [Name], Board Member U.S. Department of Energy, Idaho Operations Office	Date	Dated _____

Figure 9: Example of the Board Members Signature Page

LIST OF INVESTIGATION TEAM:

6.0 BOARD MEMBERS, ADVISORS, CONSULTANTS, AND STAFF

Chairperson [Name], DOE
Member [Name], DOE
Member [Name], DOE
Member [Name], DOE
Member [Name], DOE

Advisor [Name], DOE
Advisor [Name], DOE
Advisor [Name], DOE
Advisor [Name], DOE
Advisor [Name], Consultant

Medical Advisor [Name], M.D., Consultant
Legal Advisor [Name], DOE

Administrative Coordinator [Name], XYZ Corporation

Technical Writer [Name], XYZ Corporation

Technical Writer [Name], XYZ Corporation

Administrative Support [Name], DOE

Figure 10: Example of the Acknowledgment of the Entire Investigation Team