Chapter 2

Investigation Overview

Chapter 2—Investigation Overview

1.1 Introduction

A Forest Service serious accident is one that involves:
- A death
- Three or more persons hospitalized after treatment for reasons other than observation
- Wildland fire shelter deployments or entrapments
- Property damage, other than to aircraft, that exceeds $250,000
- Damage to aircraft that exceeds $1,000,000 or results in total destruction of the aircraft

A. Supervisors and managers at all organizational levels are responsible for identifying and abating hazards, incorporating safe operating procedures into each of our daily tasks, and refusing to accept unnecessary risk. The causes of most accidents or incidents are a result of failures to observe established policies, procedures, and controls. All too often, accident investigations reveal existing hazards that were not adequately addressed.

B. The accident investigation gathers and interprets information to help managers understand how and why an accident or incident occurred. Recommendations can then be developed for corrective actions that will mitigate hazards and prevent future injuries and property damage.

C. An investigation must be done promptly to assure that important information is not lost, misplaced, or contaminated. The agency's first priority is to aid the injured and to ensure prompt emergency medical attention. As soon as the emergency situation is over, the accident investigation begins.

D. An accident is an unplanned event involving Forest Service employees, volunteers, cooperators, contractors, emergency firefighters, special program enrollees, property, or the environment that results in an injury, illness, or material loss (chapter 6732.1 of FSM 6700).

E. An aviation accident is an occurrence associated with the operation of an aircraft that takes place between the time any person boards an aircraft with the intention of flight until all such persons have disembarked or before equipment has been unloaded.

1.2 Authority

The authority for the investigation of accidents is established in:
- Public Law 107–203
- Title 5, USC 7902
- 29 CFR 1904.2
- 41 CFR 101-37
- 49 CFR 830 NTSB
- Executive Order 12196
- FSM 5700, Aviation Management, Chapter 5720
- FSM 6700, Safety and Health Program, Chapter 6732.1

1.3 Purpose

The purpose of accident investigations is to provide manage-ment with information for accident prevention. The *Accident Investigation Guide* details information on the investigative process and associated tasks, such as gathering and main-taining custody of physical and photographic evidence, documenting witness statements, interviewing witnesses, managing records, preparing the investigation report (factual and management evaluation sections), and conducting accident review boards. The guide also includes the investiga-tion protocol for wildland fire shelter entrapments, deployments, and fatalities, and aviation accidents and incidents with potential. Because the guide is revised as needed, it is important to use the most current version.

A compact disk (CD) also is included with the guide. All exhibits that may be necessary for accident investigation teams and accident review boards are provided as Microsoft Word docu-ments.

1.4 Scope

A. The Accident Investigation Guide is designed for Washington Office Forest Service Chief's investigation teams, but region and station investigations should also follow the guide for consistency. A Chief's investigation team may also be mobilized anytime the Designated Agency Safety and Health Official (DASHO) believes an investigation is warranted, for example, an "incident with potential."

The DASHO may also delegate responsibility to conduct the investigation to the regional forester or station director in the region where the accident occurred. In these cases, the DASHO will provide a letter of delegation of authority assigning the responsibility. In these situations, the DASHO may appoint at least one member to the investigation team. The procedures outlined in this guide will be used to conduct delegated investigations.

The process in the guide should also be used—entirely or in part—for all accident and incident investigations conducted

at any unit level by individuals working under the direction and authority of the Forest Service. For example, while specific required procedures for motor vehicle accident investigations are outlined in the Manual on Uniform Traffic Control Devices, applicable information on conducting witness interviews and collecting evidence is available in this guide.

EXHIBIT 2–1

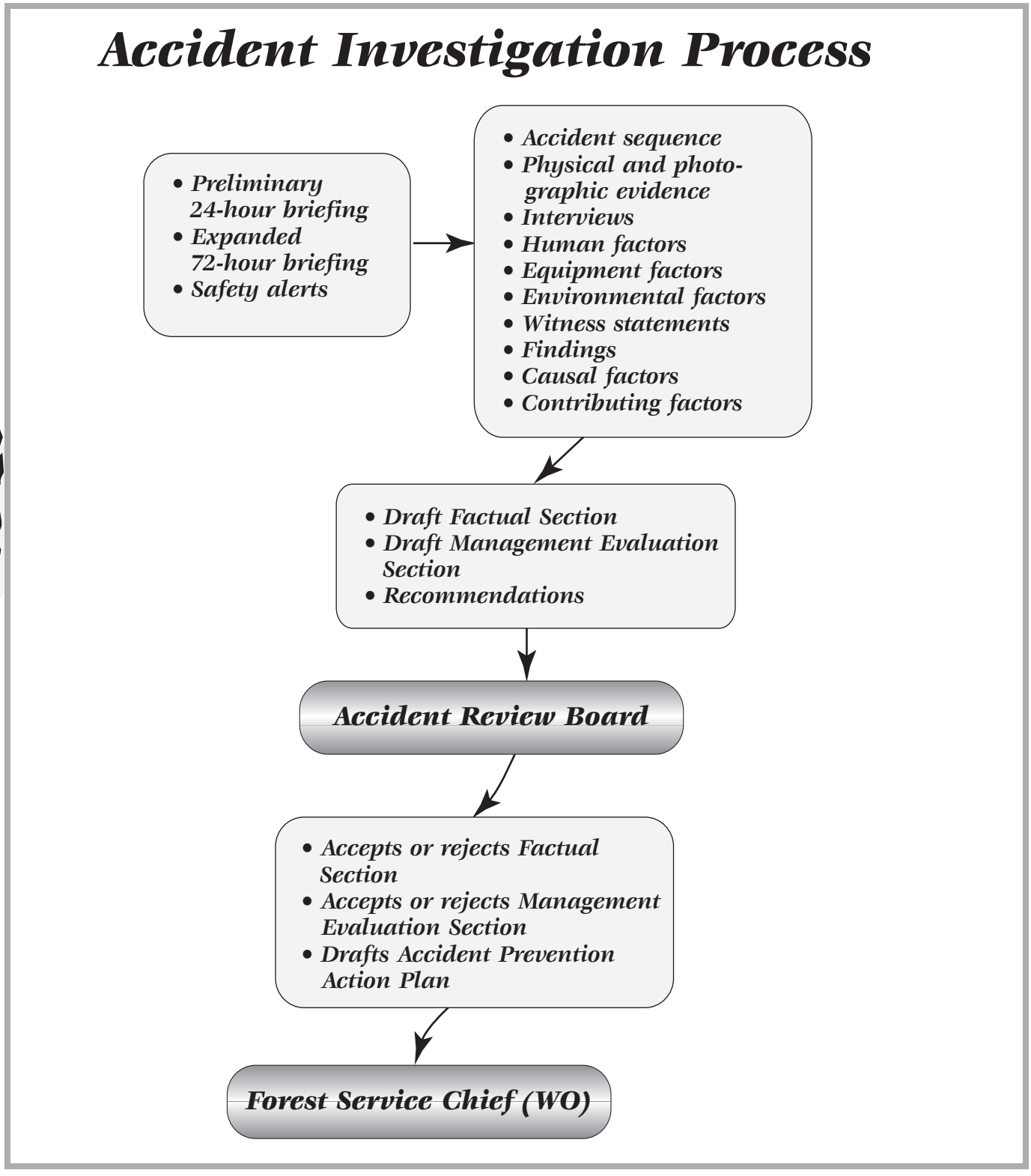


Exhibit 2–1

Exhibit 2–1—Accident investigation process.

EXHIBIT 2–2

Human Factors Accident and Incident Analysis

Sensory and Perceptual Factors

- Misjudgment of distance, clearance, speed, and so forth
- False perception caused by visual illusion. Conditions that impair visual performance:
  - —Featureless terrain (such as a desert, dry lake, water, snow).
  - —Darkness and poor visibility.
  - —Smoke and changing smoke patterns.
  - —Mountainous terrain or sloping runway.
  - —Anomalous light effects that cause flicker vertigo.
  - —Low contrast of objects to background or poor illumination.
  - —View into bright sunlight or moonlight.
  - —Shadows.
  - —Whiteout snow conditions.
- Spatial disorientation and vertigo. Conditions that affect sense of body position:
  - —Loss of visual cues.
  - —Adverse medical condition or physiological condition (alcohol and drug effects, hangover, dehydration, fatigue, and so forth).
  - —Moving head up and down, looking in and out to change radios, answering or using cell phones.
- Loss of situational awareness. Types:
  - —Geographic disorientation (such as deviation from route, loss of position awareness).
  - —General loss of situational awareness (such as failure to perceive hazardous condition).
  - —Erroneous situational assessment (misinterpretation of situation or condition).
  - —Failure to predict or anticipate changing conditions.
  - —False hypothesis confirmation bias (persistent false perception or misconception of situation).
- Attention failure (such as failure to monitor or respond when correct information is available). Types:
  - —Failure to visually scan outside the vehicle or equipment for hazards.
  - —Omission of checklist items.
  - —Failure to respond to communication or warning.
  - —Control-action error:
    - Failure to set, move, or reset control switch (lapse).
    - Unintentional activation of control switch (slip).
    - Control-substitution error (slip).
    - Control-reversal error (slip).
    - Control-adjustment or precision error (slip).
- Conditions that affect attention and situational awareness:
  - —Inattention (focus on information unrelated to tasks).
  - —Channelization, fixation (psychological narrowing of perception).
  - —Distraction (preoccupation with internal [mental] event or with external event).
  - —Task overload due to systems (such as communications).
  - —Task overload due to equipment systems assignment factors.
  - —Cognitive workload (problem-solving concentration or information overload).
  - —Habit influence or interference.
  - —Excessive crew stress or fatigue.
  - —Excessive workload or tasking.
  - —Inadequate briefing or preparation.
  - —Inadequate training or experience for assignment.
  - —Negative learning transfer (such as during transition to new assignment).
  - —Adverse meteorological conditions
  - —Tactical-situation overload or display-information overload.
  - —Inadequate crew motivation or inadequate vigilance.
  - —Inadequate equipment design.

Medical and Physiological Factors

- Carbon monoxide poisoning.
- Self-medication (without medical advice or against medical advice).
- Motion sickness.
- Incompatible physical capabilities.
- Overexertion while off duty.
- Influence of drugs or alcohol.
- Cold or flu (or other known illness).
- Excessive personal stress or fatigue.
- Inadequate nutrition (such as omitted meals).
- Hypoxia.
- Heat.
- Cold.
- Stress induced by heightened state of alertness.
- Affects of smoke.
- Dehydration.
- Other medical or physiological condition.
- Conditions that may cause adverse medical or physiological state:

(Continued)

Exhibit 2–2—Human factors accident and incident analysis.

EXHIBIT 2–2 (continued)

Human Factors Accident and Incident Analysis

—Assignment tasking or job fatigue (such as being on duty more than 14 hours, late-night or early-morning operations).
—Cumulative fatigue (such as excessive physical or mental workload, circadian disruption, or sleep loss).
—Cumulative effects of personal or occupational stress (beyond stress-coping limit).
—Emergency condition or workload transition (from normal operation to emergency operation).
—Medical or physiological preconditions (health and fitness, hangover, dehydration, and so forth).

Knowledge and Skill Factors

- Inadequate knowledge of systems, procedures, and so forth (knowledge-based errors). Types:
  —Knowledge-based.
  —Inadequate knowledge of systems, procedures.
  —Used improper procedure.
  —Ill-structured decisions.
  —Failure in problem solving.
- Inadequate equipment control, or inadequate accuracy and precision of equipment maneuvering (skill-based error). Types:
  —Breakdown in visual scan.
  —Failure to see and avoid.
  —Over or under reacting.
  —Over or under controlling.
  —Inadequate experience for complexity of assignment.
- Misuse of procedures or incorrect performance tasks (rule-based error), such as:
  —Failure to perform required procedure.
  —Use of wrong procedure or rule(s).
  —Failure to conduct step(s) in prescribed sequence.
- Conditions that lead to inadequate operational performance:
  —Lack or variation of standards.
  —Loss of situational awareness in varying environment.
  —Demonstration of performance below required proficiency standards or current standards.
  —Demonstration of inadequate performance or documented deficiencies.
  —Inadequate essential training for specific task(s).
  —Inadequate recent experience or inadequate experience.
  —Lack of sensory input.
  —Limited reaction time.

Assignment Factors

- Failure of dispatch to provide correct critical information (such as frequencies, location, other equipment, or resources).
- Poor communication with other assets (such as ground or aircraft).
- Inadequate or faulty supervision from ground or tactical aircraft.
- Lack or variation of standards.
- Nonparticipant or noncommunicative equipment or resources at the scene.
- Loss of situational awareness in varying environment.
- Changing plans or tactics (change of teams on incidents).
- Unanticipated change of radio frequencies.
- Intentional deviation from procedures.
- Unintentional deviation from procedures.
- Demonstration of performance below required proficiency standards or current standards.
- Demonstration of inadequate performance or documented deficiencies.
- Inadequate essential training for specific task(s).
- Inadequate recent experience or inadequate experience for assignment.
- Transition (learning new equipment or operational systems).
- Inadequate knowledge of tactical situation.
- Lack of sensory input.
- Limited reaction time.
- Conditions that lead to inadequate assignment performance.
  —Smoke.
  —Wind shifts.
  —Changes in fire behavior.
  —Low visibility.
  —Unexpected equipment, resources, or aircraft.
  —Assignment intensity.
  —Assignment creep.
  —Assignment urgency.
  —Failure to recognize deteriorating conditions.
  —Time compression.
  —Diverts to new incidents.
  —Excessive communication demands.
  —Past assignment success based on high-risk behavior.

(Continued)

Exhibit 2–2

Exhibit 2–2—Human factors accident and incident analysis.

EXHIBIT 2–2 (continued)

Human Factors Accident and Incident Analysis

Personality and Safety Attitude

- Overconfidence.
- Excessive motivation to achieve assignment.
- Reckless operation.
- Anger or frustration on the job.
- Stress-coping failure (such as anger).
- Overly assertive or nonassertive.
- Inadequate confidence to perform tasks or activities.
- Acquiescence to social pressure (from organization or peers) to operate in hazardous situation or condition.
- Failure to report or act upon incidents of misconduct.
- Toleration of unsafe acts and behaviors.
- Poor equipment or assignment preparation.

Judgment and Risk Decision

- Acceptance of a high-risk situation or assignment.
- Misjudgment of assignment risks (complacency).
- Failure to monitor assignment progress or conditions (complacency).
- Use of incorrect task priorities.
- Intentional deviation from safe procedure (imprudence).
- Intentional violation of standard operating procedure or regulation. Types:
  - —Violation of orders, regulations, standard operating procedures (SOP).
  - —Crew rest requirements.
  - —Inadequate training.
  - —Violated agency policy or contract.
  - —Failed to comply with agency manuals.
  - —Supervisor knowingly accepted unqualified crew.
  - —Failed to obtain valid weather brief.
  - —Accepted unnecessary hazard.
  - —Lacks adequate of up-to-date qualifications for assignment.
- Intentional disregard of warnings.
- Noncompliance with personal limits.
- Noncompliance with published equipment limits.
- Noncompliance with prescribed assignment parameters.
- Acquiescence to social pressure (from organization or peers).
- Conditions leading to poor safety attitude and risky judgment:
  - —History of taking high risks (personality-driven).
  - —Pattern of overconfidence.
  - —Personal denial of wrongdoing.
  - —Documented history of marginal performance or failure.
  - —Excessive motivation (did not know limits).
  - —Reputation as a reckless individual.
  - —Failure to cope with life stress (anger or frustration).
  - —Overly assertive or nonassertive (interpersonal style).
  - —Influenced by inadequate organizational climate or safety culture (such as lack of adequate supervision).

Communication and Crew Coordination

- Inadequate assignment plan or brief.
- Inadequate or wrong assignment information conveyed to crew (dispatch or supervisor errors).
- Failure to communicate plan or intentions.
- Failure to use standard or accepted terminology.
- Failure to work as a team.
- Inability or failure to contact and coordinate with ground or aviation personnel.
- Inadequate understanding of communication or failure to acknowledge communication.
- Interpersonal conflict or crew argument during assignment.
- Conditions leading to inadequate communication or coordination:
  - —Inadequate training in communication or crew coordination.
  - —Inadequate standard operating procedures for use of crew resources.
  - —Inadequate support from organization for crew-coordination doctrine.
  - —Failure of organizational safety culture to support crew resource management.

(Continued)

Exhibit 2–2—Human factors accident and incident analysis.

EXHIBIT 2–2 (continued)

Human Factors Accident and Incident Analysis

System Design and Operation Factors

- Use of wrong switch, lever, or control.
- Misinterpretation of instrument indication.
- Inability to reach or see control.
- Inability to see or interpret instrument or indicator.
- Failure to respond to warning.
- Selection or use of incorrect system-operating mode (mode confusion).
- Overreliance on automated system (automation complacency).
- Conditions that contribute to design-induced crew errors:
  - —Inadequate primary equipment control or display arrangement.
  - —Inadequate primary display data or data format.
  - —Inadequate hazard advisory or warning display.
  - —Inadequate system instructions or documentation.
  - —Inadequate system support or facilities.
  - —Inappropriate type or level of automation, or excessive mode complexity.

Supervisory and Organizational Factors

- Not adhering to rules and regulations.
- Inappropriate scheduling or crew assignment.
- Failure to monitor crew rest or duty requirements.
- Failure to establish adequate standards.
- Failure to provide adequate briefing for assignment.
- Failure to provide proper training.
- Lack of professional guidance.
- Undermining or failure to support crews.
- Failure to monitor compliance with standards.
- Failure to monitor crew training or qualifications.
- Failure to identify or remove a known high-risk employee.
- Failure to correct inappropriate behavior.
- Failure to correct a safety hazard.
- Failure to establish or monitor quality standards.
- Failure of standards, either poorly written, highly interpretable, or conflicting.
- Risk outweighs benefit.
- Poor crew pairing.
- Excessive assignment tasking or workload.
- Inadequate assignment briefing or supervision.
- Intentional violation of a standard or regulation.
- Failure to perceive or to assess (correctly) assignment risks, with respect to:
  - —Unseen or unrecognized hazards.
  - —Environmental hazards or operating conditions.
  - —Assignment tasking and crew skill level.
  - —Equipment limitations.
- Conditions leading to supervisory failures:
  - —Excessive operations or organizational workload (imposed by the organization or imposed by organizational chain).
  - —Inadequate organizational safety culture.
  - —Supervisor is over-tasked.
  - —Supervisor is untrained.
  - —Inattention to safety management (inadequate safety supervision).
  - —Inadequate work standards or low performance expectations.
  - —Inadequate or poor example set by supervisors.
  - —Inadequate safety commitment or emphasis by supervisors.
  - —Organization lacks an adequate system for monitoring and correcting hazardous conditions.
  - —Supervisors fail to promote and reward safe behavior or quickly correct unsafe behavior.
  - —Organization lacks adequate policies and procedures to ensure high quality work performance.

(Continued)

Exhibit 2–2

Exhibit 2–2—Human factors accident and incident analysis.

EXHIBIT 2–2 (continued)

Human Factors Accident and Incident Analysis

—Organization lacks adequate job-qualification standards or training program.
—Organization lacks adequate internal communication.
—Organization had no system or an inadequate system for management of high-risk employees.
—Organization lacks adequate process or procedures for operational risk management.
—Organization fails to provide adequate human factors training.
—Organization fails to ensure sufficient involvement of medical and occupational health specialists.
—Organization fails to establish or enforce acceptable medical or health standards.

Maintenance

- Procedures.
  —Unwritten.
  —Unclear, undefined, or vague.
  —Not followed.
- Records.
  —Discrepancies entered but not deferred or cleared.
  —Entries not recorded or not recorded in correct book(s).
  —Improper entries or unauthorized signature or number.
  —Falsification of entries.
- Publications, manuals, guides.
  —Not current.
  —Were unused for the procedure.
  —Incorrect manual or guide used for procedure.
  —Not available.
- Training.
  —Not trained on procedure.
  —Training not documented.
  —Falsified.
  —Not current.
- Personnel.
  —Not properly licensed.
  —Insufficient (staffing).
  —Improper or insufficient oversight.
  —Not properly rested.
- Management.
  —Nonexistent.
  —Ineffective.
  —Understaffed.
  —Ineffective organization of assigned personnel.
  —Insufficiently trained.
- Quality assurance.
  —Nonexistent.
  —Insufficiently trained.
  —Ineffective.
  —Not used when available.
- Inspection guides.
  —Unavailable.
  —Procedures not followed.
  —Insufficient.
  —Not current.
  —Not approved.
  —Not signed off.
  —Falsified.
  —Unapproved signature or number.
- Tools or equipment.
  —Improper use or procedure.
  —Uncalibrated.
  —Used improperly.
  —Not trained for the special equipment or tool.
  —Not used.
  —No tool control program.

Exhibit 2–2—Human factors accident and incident analysis.

Exhibit 2–2

Chapter 8

Witness Statements and Interviews

B. Multi-agency/Interagency Investigations. With the advent of All-Hazards Incident Management, Forest Service employees, equipment, and contract resources are now working in unfamiliar environments, such as hurricanes, floods, and biological hazard areas, in addition to wildland firefighting. National emergencies may be longlasting events that may require rotation of personnel and other resources. Many of these incidents also involve other Federal, State, county and municipal agencies. When accidents occur during these activities, it will be necessary to conduct multi-agency investigations where cooperation between agencies is paramount.

The team leader should establish cooperative relationships with the other agencies involved in the investigation to ensure that the Forest Service meets its responsibilities while recognizing each agency's need to fulfill theirs. This may involve negotiations, cooperative agreements, and coordination with the agency official who signed the delegation of authority, for example, a *Memorandum of Understanding* between the U.S. Department of the Interior (USDI) and the U.S. Department of Agriculture (USDA), to establish the basis for interagency investigations of serious fire-related accidents (exhibit 8–3).

3.1 3.2 3.3 3.4

During these types of investigations, a broader range of technical specialists than is typically used in Forest Service activities may be needed to assess risks to involved personnel or to provide the skill level needed to conduct the investigations.

C. A Forest Service firefighter fatality as a result of a burnover or entrapment requires the USDA Office of Inspector General to conduct an independent investigation. That investigation shall be independent of the Forest Service investigation (Public Law 107–203).

D. Aviation accidents and incidents with potential (mishaps) are investigated in accordance with chapter 9 and FSM 5700, chapter 5720. Smokejumping and helicopter rappelling are considered Forest Service aviation accidents if they occur before the employee has safely disembarked from the aircraft or before equipment has been unloaded.

E. The National Transportation Safety Board (NTSB) has the responsibility to investigate all Forest Service aviation accidents and certain incidents with potential (mishaps). This results in special interagency working relationships, policies, and procedures when conducting aviation accident investigations.

The NTSB will appoint an investigator in charge (IIC) to perform the NTSB factual investigation. The investigation process and direction is under the authority of the IIC. The IIC will conduct the NTSB investigation in one of the following ways:

- The IIC conducts the onsite investigation. When the IIC conducts the onsite investigation, the Qualified Technical Investigator (QTI) assists the IIC as requested in the collection of data to support the NTSB factual investigation.
- The IIC delegates the onsite investigation to the Federal Aviation Administration (FAA). When the FAA conducts the onsite investigation, they do so with the full authority of the NTSB. The QTI will be the liaison with the FAA onsite investigator and the Forest Service.
- The IIC delegates the onsite investigation to the Forest Service. When neither the NTSB nor the FAA conduct the onsite investigation, the QTI will conduct the onsite investigation and provide all data collected to the IIC.

In addition, the Forest Service investigation team will conduct their investigation of Forest Service management and policy issues following this investigation guide concurrent with the NTSB investigation.

F. Collateral Investigations. Collateral investigations are conducted independently of the accident or incident investigation and record the facts for litigation, claims, and other administrative or disciplinary actions.

1.5 Investigation Team Selection

For Washington Office-level accident investigations, the deputy chief for business operations, who serves as the DASHO, shall notify the appropriate regional forester or station director that a Chief's level investigation has been authorized and whether it will be conducted by a national level team or delegated to the region, station, or area.

1.6 Composition of the Investigation Team

The investigation team normally includes: a team leader, chief investigator, safety manager, technical specialist(s), a documentation specialist, a union representative, and a law enforcement representative. For aviation investigations, a qualified technical investigator (QTI) has the same duties as a chief investigator. Other team members may be added as needed (exhibit 1–1). The team leader, chief investigator or QTI, and all team members should be recruited from outside of the unit experiencing the accident. For fire-related investigations, investigators and technical specialists may need certification that addresses red-card requirements for unescorted investigation site visits. A delegation of authority memorandum documents the official appointment of the team leader (exhibit 1–2).

Duties and responsibilities of team members:

A. Team Leader. The team leader is normally a line officer or higher-level agency official and is selected based on the severity of the accident and the level of management representation needed. The team leader must be knowledgeable of Forest Service policy and should be appointed from outside of the region, forest, or unit that incurred the accident.

1. Qualifications. Senior management official (senior executive service level) for Washington Office investigations; Regional Office director or forest supervisor for regional office investigations.

2. Duties and Responsibilities.

   a. Organizes, conducts, and controls the Forest Service investigation effort and provides support to team activities with the assistance of the chief investigator or QTI.

   b. Establishes cooperative working relationships with other Federal, State, county, and municipal agencies involved in the investigation.

   c. Contacts the unit that had the accident to determine the status of the local investigation in progress and to obtain other pertinent information.

   d. Coordinates Critical Incident Stress Management/Critical Incident Stress Debriefing (CISM/CISD) activities planned by the unit to ensure investigation integrity is maintained while meeting the needs of affected individuals.

   e. Provides briefings for affected personnel, agency officials, and the public.

   f. Conducts investigation team meetings and coordinates information exchange between team members.

   g. Maintains liaison with regions, stations, areas, labs, forests, units, and the Washington Office.

   h. Approves requests for resources from the chief investigator and approves team members for the investigation or for release from the investigation. A team leader investigation checklist (exhibit 1–3) is provided at the end of chapter 1. It is designed to help the team leader identify other individuals who are key to the investigation.

   i. Forwards the expanded briefing to the safety manager at the organizational level that authorized the investigation. This briefing is prepared by the investigation team within 72 hours of the team's arrival (exhibit 1–5). The preliminary briefing is prepared by the home unit (unit where the accident occurs) within 24 hours after the accident has occurred (exhibit 1–4). The unit is responsible for forwarding it to the safety manager at the organizational level that authorized the investigation.

   j. Arranges local transportation, obtains a suitable local workplace, provides for the safety of the team, and ensures the security of the meeting place and the information gathered during the investigation.

   k. Arranges critical incident stress debriefing for investigation team members as needed.

   l. Coordinates with the unit information officer for all media releases. For aviation, the team leader coordinates with the NTSB before the release of information to the public.

   m. Forwards the draft factual and management evaluation sections of the investigation report to the safety manager at the organizational level that authorized the investigation.

   n. With the assistance of the chief investigator or QTI, conducts the closeout meeting for the agency administrator (the authorized official on the unit where the accident occurred) to provide information on the status of the investigation (exhibit 1–6).

   o. Helps prepare and presents the draft factual and management evaluation sections of the investigation report to the authority authorizing the investigation and to the Accident Review Board.

   p. Coordinates with the appropriate Forest Service human resources office to address death benefits, occupational workers' compensation program issues, and requirements of the public safety officers' benefit program for survivors of firefighters or law enforcement officers killed in the line of duty. Firefighter and law enforcement beneficiaries will receive a death benefit only if an autopsy is completed. The team leader should ensure that the medical examiner has a copy of FA-156 Firefighter Autopsy Protocol.

   q. The team leader should always attempt to have autopsies conducted. If an autopsy is not planned, determine whether the family would agree to one if the information gained would benefit the investigation.

   r. If information is discovered that suggests an administrative or criminal review is needed, the team leader will advise the DASHO, who will determine what further actions are required.

B. Chief Investigator. The chief investigator is responsible for

3.4
3.5
3.6

- Were any other witnesses around? Do you know the names of other witnesses?
- Do you wear glasses or other corrective lenses? Do you wear a hearing aid? What type? Were you wearing your glasses or hearing aid?
- Would you like to provide any additional information?

3.6

EXHIBIT 3–1

USDA
Forest Service

WITNESS STATEMENT

Case File Number

☐ Initial Report ☐ Follow-up

NATURE OF INVESTIGATION

PERSON MAKING STATEMENT (Last, first, middle)

HOME PHONE NO. (Area code)

( ) -

HOME ADDRESS (Street, city, state, zip code)

WORK PHONE NO. (Area code)

( ) -

EMPLOYMENT (Occupation and employer)

LOCATION STATEMENT TAKEN

NAME OF INVESTIGATOR TAKING STATEMENT

DATE TIME STARTED

STATEMENT

I have read the foregoing statement consisting of _____ pages. I fully understand this statement and declare that the foregoing is true, accurate and complete to the best of my knowledge. I have signed or initialed each and every page and have been given an opportunity to make any corrections or additions.

I have made this statement freely and voluntarily, without threats or rewards, or promises of rewards having been made to me in return for it.

DATE TIME SIGNED

SIGNATURE OF PERSON GIVING STATEMENT

INVESTIGATOR'S SIGNATURE

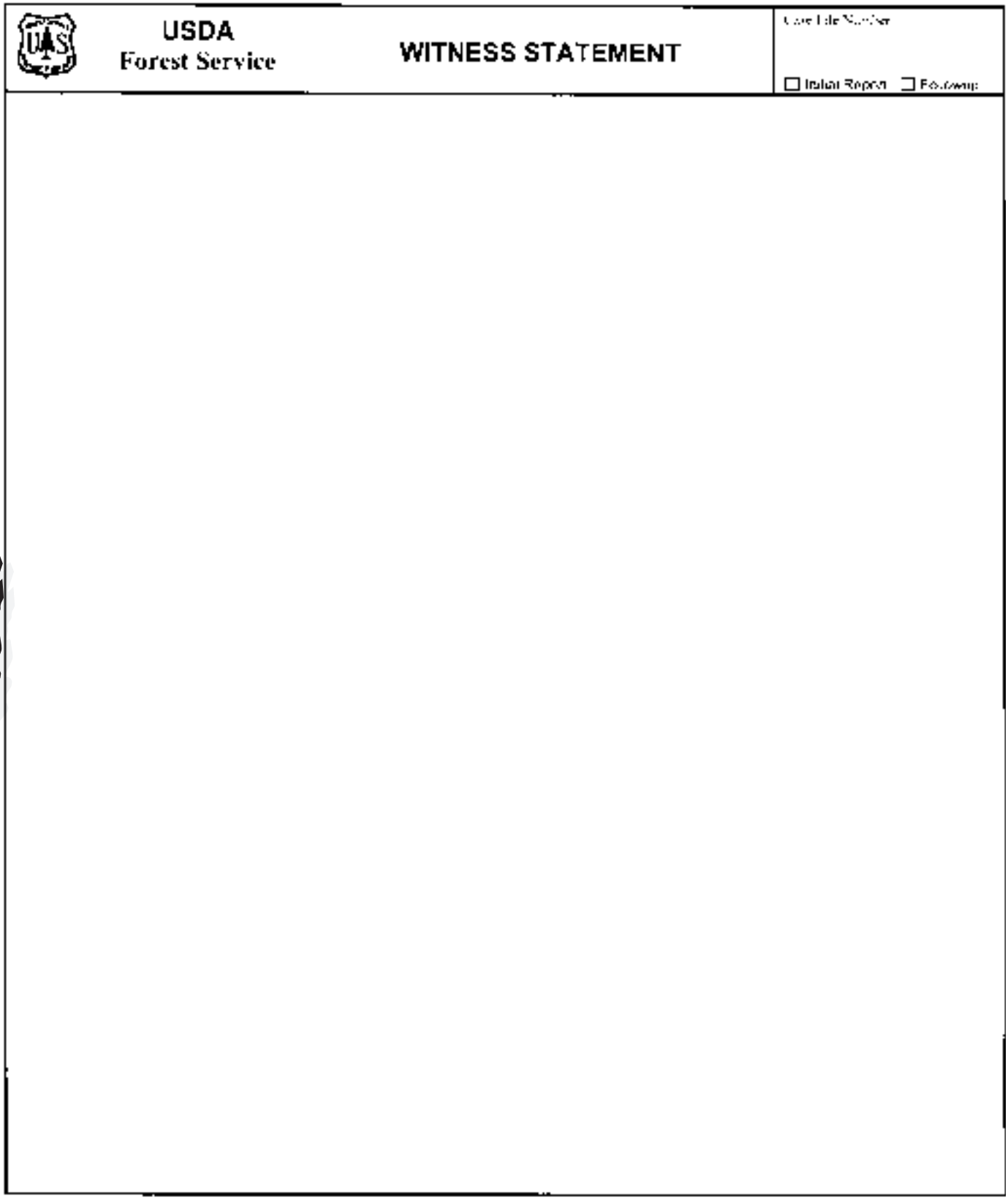
WITNESS SIGNATURE (If applicable)

NOTE: This statement is for OFFICIAL USE ONLY

Exhibit 3–1

Exhibit 3–1—Witness statement.

EXHIBIT 3–1 (continued)


USDA
Forest Service

WITNESS STATEMENT

Case File Number

☐ Initial Report ☐ Follow-up

Exhibit 3–1

Exhibit 3–1—Witness statement.

EXHIBIT 3–2

USDA
Forest Service

MEMORANDUM OF INTERVIEW

CASE NUMBER

NATURE OF INVESTIGATION

NAME OF PERSON INTERVIEWED (Last, first, middle)

OFFICIAL PHONE NUMBER

HOME ADDRESS (Street, city, state, zip code)

WORK PHONE NUMBER

EMPLOYMENT (Occupation and location)

LOCATION OF INTERVIEW

NAME OF INVESTIGATOR CONDUCTING INTERVIEW

OTHERS PRESENT

STARTED — Date / Time

ENDED — Date / Time

REMARKS

INVESTIGATOR'S SIGNATURE

WITNESS' SIGNATURE (Place initials)

NOTE: This document is for OFFICIAL USE ONLY

Exhibit 3–2—Memorandum of interview.

Exhibit 3–2

Chapter 4

Physical and Photographic Evidence

Chapter 4—Physical and Photographic Evidence

4.1 Physical Evidence—General

Evidence is gathered for three primary reasons:
- To establish accident sequence
- To provide documentation to support the investigation facts, findings, and recommendations
- To identify causal and contributing factors

NOTE: Physical and photographic evidence gathered during accident investigations may be used in other official proceedings (administrative, civil, and criminal) and must be collected and processed correctly to maintain the integrity of the evidence. Generally the team's law enforcement representative is the most qualified individual to do this.

4.2 Physical Evidence Preservation and Collection

The chief investigator or QTI must determine what evidence is fragile or perishable and may be destroyed or lost due to weather or theft, or moved, in order to protect valuable equipment or evidence. This may require increasing the security personnel, expanding the site security perimeter, covering the site with plastic, obtaining a secured facility, or carefully packaging and removing evidence.

The chief investigator or QTI will, with cooperation from the law enforcement representative, establish:

- What evidence needs to be gathered.
- Procedures to be used.
- Who will gather the evidence.
- The evidence and chain-of-custody logs.
- Where evidence should be stored.

Physical evidence, such as equipment and parts, need to be "bagged and tagged" at the time of collection. Large items, such as vehicles or construction items, should be secured.

The law enforcement representative will establish logs for all ground accident evidence. It is imperative that all evidence be cataloged and accounted for at all times (exhibits 4–1 and 4–2). Some evidence may be perishable if not collected as soon as possible. The originals or a copy of important documents (evidence, potential evidence) should be placed in the investigation case file.

All aviation accident evidence gathered during aviation accident investigations will be maintained by the NTSB.

4.3 Types of Physical Evidence

There are three principal types of physical evidence: Human, material, and environmental.

Human evidence includes:

- Training records
- Qualifications and certifications
- Time and attendance records
- Dispatch logs
- Risk assessments (JHAs)
- Briefings
- Witness statements
- Policies and procedures
- Medical records and test results
- Autopsy and toxicology reports
  - —Autopsies can provide valuable information to the accident investigation team. The rules for autopsies vary from State to State. Most States require an autopsy if the death was not attended by a physician.
  - —The team leader or the law enforcement representative should determine if an autopsy will be conducted. If so, request analysis of samples of body fluids.
  - —If an autopsy is not planned, determine whether the family would agree to one if the information gained would benefit the investigation.
  - —Firefighter Autopsy Protocol: Firefighter beneficiaries will normally receive a death benefit only if an autopsy is completed. A waiver may be given on a case-by-case basis. The team leader should ensure that the medical examiner has a copy of this protocol.

Material evidence includes:
- Equipment
- Tools
- Machinery
- Vehicles

Environmental evidence includes:
- Weather reports
- Weather damage analysis
- Terrain analysis
- Environmental hazards
- River volume and flow

4.4 Photographic Evidence—General

A. One of the most useful tools the investigator can bring to the accident scene is a camera. The camera shows the view seen by a witness and can record documents. Digital cameras (3 or 4 megapixels) and cameras that process

their own film are ideal for this application. Film from 35 millimeter cameras can be converted to digital format if developed correctly.

B. While videocameras have their uses, photographs may be more useful because they can be enlarged, printed in multiple copies, and placed in the factual section.

C. Depending on the accident's complexity, a professional photographer may be needed.

4.5 Photographic Documentation

A. Photographs do not have to be taken in the order the investigator intends to look at them. Shoot all the distant and medium shots first. Those shots can be taken with a hand-held camera without extra equipment. Afterward, take closeup shots with a tripod, flash, or cable release. This method saves time because you do not have to switch back and forth between the two types of photography.

B. Basic Types of Documentary Photographs.

1. Perishable Evidence. These photographs document things that are likely to change or disappear if not photographed immediately. Such photographs may include shots of an accident's aftermath or a rescue in progress, gauge readings, ground scars, radio settings, fire damage, and the positions of switches on equipment.

2. Aerial Views. When performing aerial photography, photographers need an aviation plan, approved by the unit aviation officer. If possible, photograph aerial views early. The appearance of the accident site from the air will change rapidly as investigators move through it. Important locations on the ground can be marked with yellow flagging or other suitable material (for example, a yellow fire shirt). Shoot from different angles and at different altitudes.

3. Overviews of the Scene. Photograph the equipment wreckage at the accident site from the eight points of the compass (N., NE., E., SE., S., SW., W., NW.). If the accident scene is spread out, try a series of overlapping pictures. The prints can be matched at their edges to create a panoramic view.

4. Significant Scene Elements. Try to establish the terrain gradient through photographs. Photograph ground scars to record information that will allow their size and depth to be analyzed in the future.

5. Site Inventory. Photographs can help inventory the accident site and document personal protective clothing equipment and other safety equipment, including the victim's personal effects and clothing. The location of each item may be plotted on a scaled map using a fixed point of reference.

6. Closeups. Bracket exposures for closeups by taking two photographs with slightly different exposure adjustments (f-stop and shutter speed). Use a tripod or monopod, as appropriate.

7. Documents. Photographs can be used to record documents that cannot be retained. Such documents include licenses and logbooks, or maps and charts.

8. Witnesses' Views. It may be important to document the witnesses' views of the accident. Because the witnesses may have had wide-angle views, use a tripod and the panoramic technique to duplicate the views with photographs.

9. Exemplars. An exemplar is a model or a pattern for an actual object. Sometimes it is difficult to tell from a wreckage photograph what the part or component is supposed to look like. In some investigations, it is important to have pictures of an identical undamaged part or component for comparison.

10. Wildland Fire Photos. In addition to the types of photographs previously discussed, the following photographs are needed for fire management accidents:

- Final resting position of victims, equipment, trees, and other relevant items.
- Fireline construction at the accident site.
- Equipment carried or worn by personnel (personal and official gear).
- Firefighters' personal protective clothing and equipment.
- Safety equipment.
- Vegetative conditions (before and after, if possible).
- Surrounding terrain, structures, and orientation.
- Fire origin and buildup.
- Shelter deployment—shelter, packaging, and the position (side, back) where it was carried.
- Incident command post facilities or equipment.

11. Presentation. Photographs used in the factual section should be mounted and have captions attached. An example of a documentary caption would be: "View of damaged driver's door looking north." Each photo should include the name of the photographer and the date the photo was taken (exhibit 4–3).

Physical Evidence Log

Accident identification:_____

Evidence custodian:_____

Date collected	Name of person who collected the evidence	Name of person logging the evidence	Description of evidence	Remarks (location found, and so forth)	Evidence identification number	Sign in (signature required)	Date signed in

Exhibit 4–1—Physical evidence log.

EXHIBIT 4–2

Chain-of-Custody Log

Accident identification:_____

Evidence custodian:_____

Description of item	Evidence identification number	Name of person logging item out	Name and signature of person receiving item	Date item received	Name and signature of person receiving item back in	Date item received

Exhibit 4–2—Chain-of-custody log.

EXHIBIT 4–3

PHOTOGRAPHIC EVIDENCE

Accident	Location
Name of photographer	Date and time photograph was taken

Camera type	Film	ASA	Photograph number

Description of photograph:

Mount 4- by 6-inch photo here.

Remarks:

Exhibit 4–3—Photographic evidence.

Chapter 5

Guidelines for Establishing Findings, Identifying Causal Factors and Contributing Factors, and Developing Recommendations

Chapter 5—Guidelines for Establishing Findings, Identifying Causal Factors and Contributing Factors, and Developing Recommendations

The accident investigation should conclude with the team accomplishing five key tasks:

1. Agreeing on the accident sequence based upon the facts gathered

2. Establishing the findings of the investigation

3. Identifying causal factors

4. Identifying contributing factors

5. Developing recommendations

5.1 Establishing Findings

A. Findings are the conclusions of the investigation team based on the chronology of events and factual data, weight of evidence, professional knowledge, and good judgment.

- Each finding is an essential step in the accident sequence, but each finding is not necessarily the cause of the accident. Do not include any more information in each finding than is necessary to explain the event occurrence.
- Findings can refer to events which occurred months or years prior to the accident. Lack of training and poor equipment maintenance are examples.
- Where possible, findings should be supported by two or more facts discovered during the investigation.
- Findings are grouped by category (human, material, and environmental) in the findings section of the investigation report. Number each finding consecutively. Precede each number with the word “finding.” For example: Finding 01, Finding 02, Finding 03.
- At the end of each finding, reference the supporting documentation/evidence that supports it.
- Ensure critical events required to sustain the accident sequence have not been omitted.

B. Categories of findings—The following three categories can help organize findings during an accident investigation:

- Human (personnel involved or contributing to the accident or incident)
- Material (equipment involved or contributing to the accident or incident)
- Environmental (location of the accident or incident, geographic features, and weather conditions)

C. Developing findings—Write findings as full sentences, not bullet points. Use the past tense since the events have occurred in the past. For example: Due to lack of station maintenance, weather observations from remote automated weather stations were of questionable accuracy and provided potentially erroneous National Fire Danger Rating System indices.

5.2 Identifying Causal Factors

A. A causal factor is any behavior, omission, or deficiency that if corrected, eliminated, or avoided probably would have prevented the accident.

- Findings (events or conditions) that started or sustained the accident sequence are the basis of causal factors.
- Each causal factor must be supported by a finding. Although all findings are significant, not all of them relate to the accident sequence.

Occasionally, an investigator may not be able to conclusively determine a specific causal factor. In these special cases, the investigator may choose to list two or three most probable causal factors. In rare instances, the causal factors may remain unknown.

B. Developing causal factors—Write causal factors in the active voice, clearly identifying the actor(s) and causal action, along with any necessary explanation. For example: Active voice–The vehicle operator did not use wheel chocks

as required by policy. Passive voice–No wheel chocks were used by the vehicle operator.

If it is not obvious, indicate which finding(s) was used to determine the causal factor(s)

Apply the reasonable person concept. If a person's performance or judgment was reasonable considering the accident's circumstances, it is not appropriate to expect extraordinary or uniquely superior performance in such cases.

5.3 Identifying Contributing Factors

A. A contributing factor is any behavior, omission, or deficiency that sets the stage for an accident, or increases the severity of injuries or extent of property damage.

Examples of contributing factors are fatigue, conflicting resource priorities, delay in taking appropriate action, or environmental conditions, such as rain or poor illumination. Contributing factors may be present during an accident but may not have prevented or mitigated the accident if they had not been present.

B. Developing contributing factors— Base contributory factors on the findings discovered during the investigation. Indicate which findings were used to determine the contributing factors.

5.4 Developing Recommendations

A. Recommendations are reasonable courses of action, based on the identified causal factors that have the best potential for preventing or reducing the risk of similar accidents.

• The team leader and the chief investigator (or QTI) will lead the team in the development of recommendations.

B. Recommendations could include review of current policy, new policy, re-training personnel on existing requirements, or additional training needs. A recommendation is not needed for every causal factor. If an event was caused by failure to follow an existing policy, the recommendation may only require the people involved to be re-trained. Broad recommendations, such as to change the safety culture of the agency, are not appropriate.

C. The organization assigned responsibility for the corrective action should have authority commensurate with the nature of the recommendation. In some cases, more than one level in the agency or even other agencies will have action responsibilities.

D. Number recommendations consecutively, precede each number by the word "recommendation." For example: Recommendation 01, Recommendation 02, Recommendation 03.

E. If a recommendation depends on test results or analyses that are incomplete when the factual section of the investigation report is sent, explain this and reference the test or analysis. If such information is critical to the completion of the factual section, the team leader should request an extension from the individual authorizing the investigation (failure to incorporate critical information could result in having to reconvene the team at a later date.)

5.2
5.3
5.4

Recommendations Should Not:

- Propose any punitive actions.
- Propose briefing unit personnel on the accident. Such briefings are basic management responsibility and a normal function of safety managers and supervisors at all organizational levels.
- Recommend that a new policy, regulation, or standard operating procedure is needed when established guidelines exist but are not followed.

5.2
5.3
5.4