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Procedure and Conduct during On-Site Investigation of Aviation Accidents

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SESSION ONE

PROCEDURE AND CONDUCT DURING ON-SITE INVESTIGATION OF AVIATION ACCIDENTS

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AT A PREVIOUS symposium sponsored by the *Journal of Air Law and Commerce*, the National Transportation Safety Board's (Board) overall procedures regarding aviation accident investigation and prevention were outlined.[1] Accordingly, this paper will provide a more in-depth look at the on-site phase of investigations.

To begin with, examine the term "investigation" as employed by the Board and its Bureau of Aviation Safety. The internationally agreed definition of the term is used as set forth in Annex 13 to the Convention on International Civil Aviation; namely, "The gathering together in an orderly manner of factual information relating to an aircraft accident." In this context, an investigation is one phase of the total processing between the time of the accident and the issuance of the accident report. The total process is known as the "inquiry" and is defined nationally and internationally as: "The process leading to determination of the cause of an aircraft accident including completion of the relevant report." Consequently, the inquiry encompasses not only the investigation phase, but also the analytical and report-writing phases. We even extend this slightly to include follow-up to recommendations that evolve from the case, which may be forthcoming at any point in the inquiry. This can be seen in Figure 1, which is a nominal schedule of major inquiry activities, showing discrete steps used in a systems approach to accident inquiry. (Further explanation of Figure 1 is available in Reference.)[2]

To return to the on-site investigation activities, however, irrespective of whether it involves one of our eleven field office locations or the central office in Washington, the initial action associated with an accident investigation is the same. One of our investigators will answer the telephone and find himself immediately involved in writing down the first known facts regarding an aircraft accident or a missing aircraft. The caller may be an FAA communicator, a police official, a member of the aviation community

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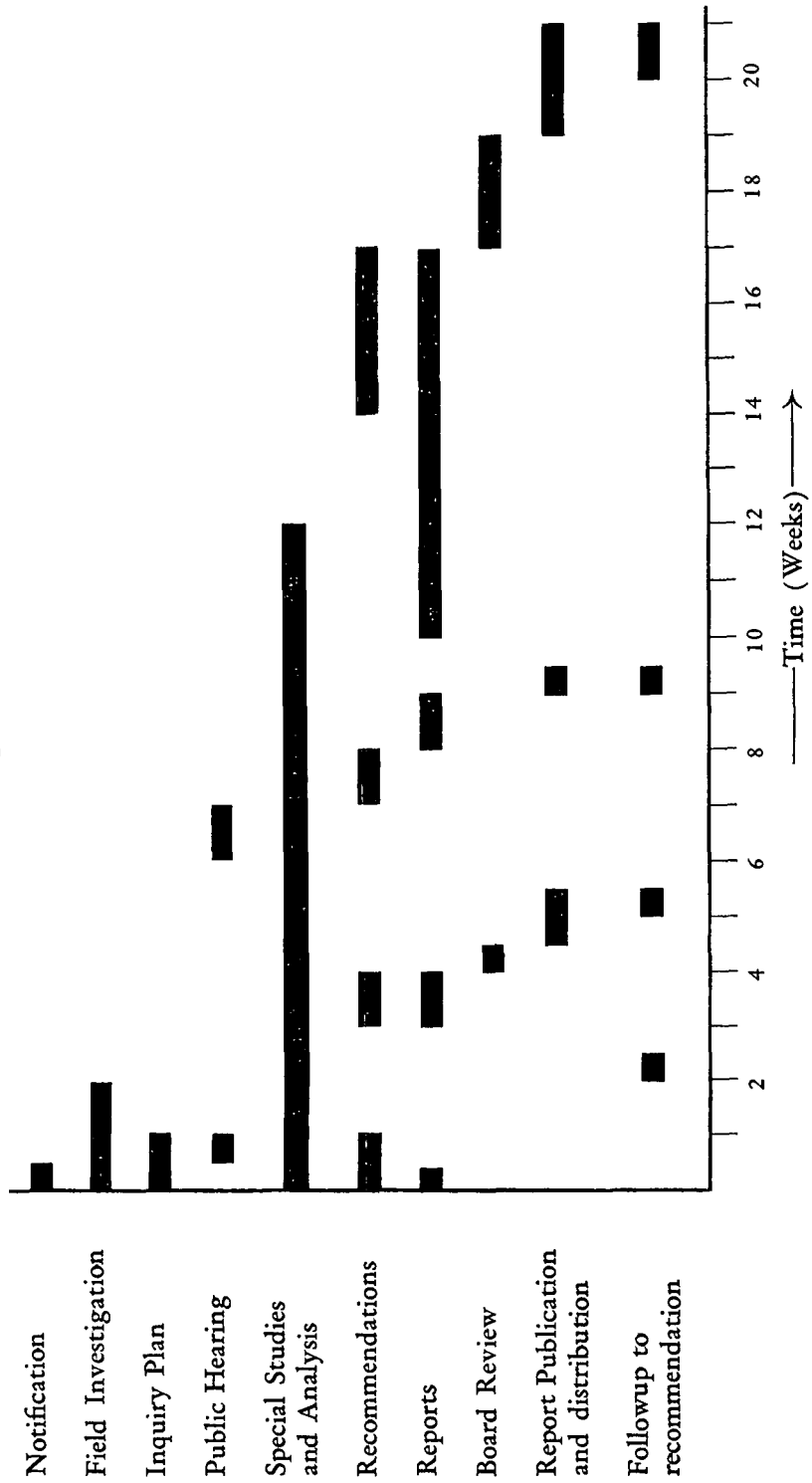
[1] Allen, B. R., *National Transportation Board Bureau of Aviation Safety*, 34 J. Air L. & Com. 399 (1968).

[2] Miller, C. O., *Systems Approach to Accident Investigation*, NTSB, Washington, D.C., October 28, 1969.

FIGURE 1

NOMINAL INQUIRY ACTIVITIES



or occasionally a private citizen. The call may come at any time of the day or night wherein a 24-hour telephone watch is maintained through the designation of telephone duty watch officers, both in our field offices and the central office.

Once the initial notification has been received it is imperative that certain decisions are made expeditiously and that the investigation is begun without delay.

At the outset, it is essential that a preliminary assessment be made as to the magnitude of the task and the probable scope of the investigation. This assessment involves the marshalling of an investigation team sufficient in size and expertise to cope with the task at hand. Generally speaking, there is a direct proportionality between the size of the aircraft and the size of the investigation team. However, one must be aware at all times that there are complex accidents involving small aircraft and relatively simple accidents involving large aircraft. Consequently, the determination of the initial team complement often involves a weighty decision which must be made without delay. Some of the factors affecting this decision are:

Accident Type
Aircraft Type
Aircraft Damage/Loss
Ground Damage/Loss
Likelihood of a "Long Form" Report
Aircraft Injuries/Fatalities
Ground Injuries/Fatalities
Public Interest
Likelihood of Formal Board Hearing

As a matter of fact, we are currently exploring a method where these factors may be subjectively rated per a numerical scale for each accident, thus providing a somewhat quantitative approach to the process of deciding how large the initial team should be.

Regardless of whether a single Board investigator or a sizeable team is launched to cover an accident investigation, there are certain prerequisites which cannot be overlooked. All of our investigators, when on standby status either in a field office or on a central office "Go Team," must have a working kit and personal items packed and available so that they may proceed without delay to the scene of the accident. Since foreign travel may also be involved at times, advance consideration has to be given to passport requirements, innoculations, etc. Furthermore, accidents may occur anywhere—on mountains, in swamps, deserts or the wreckage may sink in large bodies of water. As a consequence, the investigators must remain physically fit and must select their clothing and working gear for a particular assignment with care. Hardships and hazards are encountered at times in reaching and working at the wreckage site. (This is a consideration others must heed, too. Suffice to say, the Safety Board cannot accept responsibility for the safety of interested party representatives who work with our investigators during the course of an investigation.)

Returning to the question of actions which must be taken immediately following the initial notification of an accident, one finds several essential items on the checklist.

Prior to departure for the scene of the accident, the investigator-in-charge must ascertain that the wreckage is being guarded effectively by appropriate law enforcement officials. Of all the early problems associated with an investigation before we arrive at the scene, the guard detail is one of the most frustrating. This phase of wreckage security is extremely important since there should be a minimum amount of disturbance of the wreckage and, of course, the way it came to rest should be documented as much as possible. The problem is one of pre-planning and providing local and/or state authorities who may be accomplishing the guard duty information regarding how you expect it to be carried out. The Procedural Regulations of the Safety Board clearly state in Part 430 that prior to the arrival of a Board investigator or authorized representative of the Board, the aircraft "wreckage, mail or cargo, may be disturbed or moved only to the extent necessary:

(1) To remove persons injured or trapped;
(2) To protect the wreckage from further damage; or
(3) To protect the public from injury;
(4) Where it is necessary to disturb or move aircraft wreckage, mail or cargo, sketches, descriptive notes and photographs shall be made, if possible, of the accident locale including original position and condition of the wreckage and any significant impact marks."

This same procedural regulation goes on to specify that only those "persons authorized by the investigator-in-charge or the Director, Bureau of Aviation Safety" may participate in examination of the wreckage, records, mail or cargo which is in the Board's custody. Basically, this involves "parties" and "observers" to the investigation as will be explained further.

At times, well-meaning guards, not knowing the reasons for our requests for complete security, may let unauthorized personnel through to the accident scene before the Board's investigators arrive. To preclude this, we usually rush an investigator to the scene from the nearest field office upon notification of an accident. He monitors the accident site security pending the arrival of the investigative team. We also pursue a continuing educational program in the interest of impressing upon law enforcement officials the reasons for strict security measures.

In addition to assuring himself regarding the adequacy of security measures, the investigator-in-charge must arrange for appropriate lodging and transportation for the team in the area of the crash scene. He may do this personally or through a designee. In any case, a well coordinated transportation effort and communications center on arrival are essential.

Arranging for autopsies is a responsibility of the investigator-in-charge in general aviation accidents. The human factors group chairman normally assumes this responsibility on major catastrophic accidents. Every effort is made to contact the coroner or medical examiner of the locale involved and request autopsies or arrange for the remains to be held until our arrival. Occasionally difficulties are encountered in this area and it is again a question of effective pre-planning and education.

While Board investigators are en route to the accident site, other inter-

ested parties (*i.e.*, FAA, the air carrier, manufacturers and trade associations) are converging on the scene also, having received notification through their own channels. The Board cannot undertake the responsibility for alerting all agencies, firms and associations which are potentially interested parties to an investigation. However, we will respond factually to all questions pertaining to a presumed accident from the time we are first advised of it.

Once the investigator-in-charge has arrived at the scene and has surveyed the security and autopsy arrangements, he turns his attention to the establishment of a base of operation and the convening of an organizational meeting.

At the organizational meeting, the investigator-in-charge may be faced with a wide variety of organizations and individuals desiring to participate in the investigation as "parties." In making his selection of participants, the investigator-in-charge must continually ask the question—"What can you contribute to the investigation?"—or, in other words, "Do you have a particular expertise for which we have a need?" The individuals selected to participate on the various investigative groups (*i.e.*, ATC, structures, systems, etc.) should be experts capable of making a significant contribution to the group activities. One of the problems associated with organizing and operating the team or the investigation group is the substitution of personnel during the progress of the investigation. In his opening statement at the organizational meeting the investigator-in-charge makes it clear that we expect those assigned to the investigation to see it through to the bitter end. Despite this, someone on the team may depart during the investigation saying: "Don't worry, Sam will be here tomorrow to take my place." This creates problems, not only in bringing Sam up to speed but also in coordinating factual reports at a later date.

Participation by governmental and industry experts in our investigations assures that some of the best expertise in the country is brought to bear on the solution of complex accidents. Furthermore, the checks and counterchecks of the interested parties help to assure that all of the relevant factual information pertaining to the accident will be disclosed and kept in proper perspective.

An additional category of personnel at the scene of an accident is that of "observer." This is not delineated in any of the formal rules of the Board at this time but has been a matter of internal Bureau instruction and practice for many years. An "observer," in simplest terms, is a person who has been authorized to be present and observe the accident scene during the field phase of the investigation. Observers would include newsmen, local VIP's and others who have a need to observe the wreckage in a more comprehensive manner than the general public, but still under the guidance of Board personnel and not in the detailed investigative sense.

The investigator-in-charge must exercise full control over the on-site investigation. The only execption to this precept would be if a board member or the Bureau Director were present at the scene and elected to

employ their obvious higher authority. This has never been done in recent history, however, and would be expected to occur only very rarely.

The investigator-in-charge must maintain a good balance of qualified manpower throughout the various groups that comprise the investigative team. Each interested party to the investigation is asked to designate a "coordinator" to represent his organization and work directly with the investigator-in-charge. It is through these coordinators that he receives information from and transmits information to the organizations involved.

Board investigators, serving as group chairmen, have management problems identical to those of the investigator-in-charge, only on a smaller scale. The conditions surrounding aircraft accidents vary widely so that no completely fixed pattern of investigation can be followed. As a consequence, the ingenuity of the group chairman, as well as that of the investigator-in-charge, is put to the test. In dealing with the individuals assigned to his group, the group chairman endeavors to delegate specific assignments; thereby, he maintains a higher level of interest and enables the group to broaden its scope of activities. Throughout all of the group's activities, the chairman must guard against the normal tendency to jump to premature conclusions; he must be alert for the emergence of any indication of self-serving activities and gross loss of objectivity on the part of members of his group. In essence, the group chairman is conducting an investigation within an investigation and shares the headaches of the investigator-in-charge.

In a major investigation, many groups may be formed covering such specialty areas as:

AIRCRAFT STRUCTURES	AIR TRAFFIC CONTROL
POWERPLANTS	WEATHER
SYSTEMS	WITNESSES
MAINTENANCE RECORDS	HUMAN FACTORS
OPERATIONS	FLIGHT DATA RECORDER

To describe in detail the specific responsibilities of each group goes beyond the scope of this paper; however, the titles are reasonably self-explanatory.

As the investigation progresses, attention usually begins to focus upon particular areas in light of the facts disclosed. This does not mean that thereafter we conduct the investigation only in particular areas at the expense of other phases of the investigation. It does mean that we are able to concentrate resources and document all areas to the degree warranted.

The effective management of people is only a part of the total management problem facing an investigator-in-charge and his group chairmen at the scene of the accident. They must also devote continuing attention to the most efficient use of allotted funds. This entails the procurement of services from various agencies for wreckage recovery, movement and storage of wreckage, detailed examination of structures, systems or powerplants.

Throughout the course of an on-site investigation, the investigator-in-charge convenes progress meetings. Typically, these meetings are held in the late afternoon or early evening at the conclusion of the day's activities. Each group chairman is called upon to summarize the activities of his group that day and a coordinated plan of action is formulated for the day ahead.

Also, the practice has been established of having a daily conference call each morning between the investigator-in-charge at field headquarters and the central office in Washington. During this call he summarizes the current status of the investigation and future plans and receives administrative and technical guidance from supervisory and technical personnel in Washington.

Once a group chairman concludes that his group has completed their phase of the on-site investigation, he so advises the investigator-in-charge. After they review the situation, the group chairman generally returns to his home base.

After all of the group chairmen have left the scene, the investigator-in-charge "secures"—making certain that all wreckage still in our custody is properly stored, all bills are in hand, etc.

Upon return to headquarters, the investigator-in-charge and the group chairmen begin the tedious task of assembling all the factual information, writing their reports and preparing for the hearing.

In summary, the on-site investigation of an aviation accident, especially one of major proportions, is a complex, sometimes dangerous, operation which takes place in an emotion-charged atmosphere that tragedy invariably breeds. The processes followed by NTSB today are not new, but they are not static either. They have proven themselves to the point that most other countries copy them at least in principle. Yet, we will change them if suggestions are made that provide a better accident prevention job for the public.

We are not oblivious to other derivatives of the on-site work we do, such as providing factual information for litigants, which also is in the public interest. However, occasional conflicts in purpose do occur, and when they do, the accident prevention purpose will be given priority.