NAME OF SYSTEM:

Aircraft Accident Analysis

ORIGINATOR:

Bureau of Safety
Civil Aeronautics Board (CAB)
Washington, D.C. 20428

OBJECTIVE. To establish a data or fact information retrieval system that will enable the Bureau of Safety to promptly answer questions and conduct analyses on aircraft accidents. Further, to use this wealth of stored information in studies aimed at reducing civil aircraft accidents.

BACKGROUND. The Bureau of Flight Safety is responsible for promoting safety in civil aviation. The Civil Aeronautics Board (CAB) investigates accidents involving civil aircraft and holds public hearings to help determine the cause of accidents. It also conducts special studies and investigations to reduce the rate of aircraft accidents.

The growing size of the civil aviation fleet has made it necessary for the CAB to design an information system with a much wider range of storage and retrieval capabilities than former methods. More specifically, the new system had to be able to compile, store, manipulate, and update large amounts of data concerning the more than 5,000 civilian aircraft accidents occurring annually. The system also had to possess the capability for periodically producing reports and statistics on these accidents. Additionally, on individual accidents, it had to render complex accident analyses and provide precise data on demand.

The CAB study group found that the only functional category of methods and equipment that could meet these needs was a complete data or fact retrieval system. The class of equipment selected was an electronic computer using magnetic tape.

THE NEW METHOD. The source information—about 100 aircraft accident reports weekly—is received at CAB headquarters from the field investigators of the Federal Aviation Agency and the Civil Aeronautics Board. These typed unpublished accident reports range from 10 to 50 pages, depending upon the nature of the accident. Individual reports may be indexed under as many as 50 terms, such as registration of aircraft, owner of aircraft, date of accident, plus a series of terms to describe specific accident characteristics.

The Analysis Division, Bureau of Safety, converts the report information into codes representing the accident characteristics. A dictionary of approximately 3,400 terms is used jointly with the term code book as indexing tools. The codes selected to describe accident report information are keypunched into punched cards that are subsequently batched, converted to magnetic tape, and merged with the master tape record of aircraft accidents.

Search actions are usually prompted by inquiries received by mail or interoffice memorandum. Special reports are normally generated by the Board, the Federal Aviation Agency, the National Aeronautics and Space Administration, and other organizations associated with the problem of aviation safety. To conduct a search, each request for accident information is converted to magnetic tape in the same sequence and manner as the original accident data entered onto the master tape record file.

In the actual data retrieval process, the magnetic tape containing the search questions is "read" into the computer for matching against the master tape record according to the program instructions, with the retrieval of the requested information presented in printout form.

REMARKS. The initial input conversion costs of this system are relatively high when compared to noncomputer retrieval methods, due to the complex details associated with planning, programing, and refinement activities. However, once the system is in full operation both processing and storage costs recede to a marked degree.

One of the system's greatest benefits is its ability to retain a broad base of subject matter and its program flexibility, which enables it to handle a variety of search needs. The system can answer up to 100 search questions on one programed tape run. A typical report might cover a listing of all air taxi service accidents occurring in 1969 by type of aircraft, kind of flying weather, phase of flying when accident occurred, plus many other pertinent details. These features thus free Bureau of Safety personnel to handle and evaluate a broader spectrum of current information than would be possible under manual retrieval systems.

AIRCRAFT ACCIDENT ANALYSIS