SOURCES of INFORMATION
Operational Aspects

OPERATIONS GROUP
Operations
Air Traffic Control
Weather
Witness
Human Factors
Cockpit Voice Recorder

AIRWORTHINESS GROUP
Structures
Systems
Power Plants
Maintenance
Flight Recorder

FIELD OFFICE INVESTIGATIONS

About Ten Major aircraft accidents occur each year where a full investigation is conducted. Other accidents and incidents are investigated by the N.T.S.B. and the F.A.A. at N.T.S.B. direction.
The N.T.S.B. actually conducts about 25 % of the total.

FEDERAL AIR REGULATIONS OF MAJOR IMPORT

1. AIRWORTHINESS STANDARD part 23 for small aircraft
2. AIRWORTHINESS STANDARD, part 25 for large aircraft.
3. Part 91, operating and flight rules-general
4. Part 121, Rules for transport category aircraft and air carriers.
5. Part 135, Air Taxi, and commercial operators of small aircraft.

AIRLINES
1. Are required to keep copies of all information used in planning and dispatching a flight
2. They must have manuals for flight and ground personnel on the conduct of their operations to include crewmembers, flight dispatch, operational control, weight and balance, maintenance, pilot training records, and dispatcher qualifications.

Dispatch Forms include: identification, trip number, departure point, intermediate stops, route of flight, destination, alternates if required, minimum fuel loads and weather

Flight Plans include: time enroute, route of flight, fuel burn, altitude, time to climb,

cruise time, time to descend, and flight progress.

Load Manifest includes takeoff weight, max allowable weights, AWABS data, cg information, and more.

Company records include: retention of the data for a period of time (90) days and in some cases (30) days.

GENERAL AVIATION SOURCES OF INFORMAYTION
Information about a Type aircraft

1. The aircraft approved flight manual.
2. The manufacturer's Aircraft Specification and Data Sheet
3. F.A.A. Required Type Data sheets
4. The Manufacturer's Owners Manual

INFORMATION about a flight plan:
1. if filed it can be obtained from F.A.A.
2. Ground control, Tower, Flight service stations enroute, line boys and F.B.O. may all have some information concerning the accident airplane they should be queried.

Weight and Balance Information:
1. An investigator should compute this information any time the limits for an individual aircraft are approached.

Supplemental Type Certificates (form 337) Information:

1. Any time a change is made to a General Aviation airplane that effects form, fit or function it must be made in accordance with (I.A.W.) an approved S.T.C. and recorded in the aircraft or engine or propeller logbook. Modifications to light airplanes that effect weight, cg or drag can be critically important.

Crew Qualifications and experience:
1. Pilots logbooks.
2. School records.
3. Military experience and records.
4. F.A.A. license and ratings.
5. F.A.A. and Company flight checks.
6. Biennial flight reviews.
7. Verification of experience.
8. Currency of experience.
9. Question relatives.

Crew medical Qualifications:
1. F.A.A. flight physical history.

2. Waivers and Deviations to medical requirements.
3. Local and family doctor.
4. Military records of flight surgeon.
5. Prescription medicine.
6. Question relatives.

HISTORY of FLIGHT information.

1. Start in pre planning (at least 24 hours before)
2. How complete was the planning?
3. Preflight
4. Flight planning, weather briefing, light plan filed.
5. In flight conduct.
6. Warm up and checks completed.
7. Radio discipline, voiceprint for impairment
8. Flight conduct, disciplined or shabby
9. Enroute conduct and interface with F.A.A. controllers. A.T.C., Unicom, F.S.S. radios
10. A.T.C. radar reconstruction of flight path
11. F.A.A. Radio tapes
12. Cockpit voice recorder.
13. Aircraft flight data recorder.
14. Witnesses
15. Survivor statements
16. Aircraft impact data

AIR TRAFFIC CONTROL information:

1. What aircraft equipments were installed.
2. What aircraft equipments were working.
3. What aircraft equipments were required.
4. Was suitable redundant equipment available.
5. Was pilot capable of using the equipment.
6. Were F.A.A. facilities working properly.
7. Were facility NOTAMS posted for inoperative equipments?
8. Do F.A.A. facility logbooks show systems were operating normally
9. Obtain an F.A.A. Air Traffic Service accident report when a Navaid or Facility is suspect.
10. What was ground Navaid or facility status at time of accident? Get facility logbooks.
11. When was last F.A.A. check of Navaid done by F.A.A. ?
12. Get Facility flight check report for Navaid.
13. Get : site evaluation, commissioning flight check, periodic checks and post accident Navaid or facility check and compare.
14. Get tape recording of conversation to airplane.
15. Get facility tapes of controller station all modes (radio, conversation and

telephone)
16. Get radar reconstruction data.
17. Get ATIS information.
18. Get weather Radar depiction from Center as well as from National weather service and compare.
19. Get Pireps, Airmets and Sigmets transmitted by Center to pilots if any.
20. Were any gear problems reported?

WEATHER

A Pilot **must** receive a weather briefing. It may be obtained from the following:
1. U.S. Weather Bureau
2. F.A.A. Flight Service Stations
3. His own Company
4. Private or commercial weather services
5. Military organizations

This creates a job for an investigator to find out if the pilot got a briefing and from whom.

SUFFICIENCEY and CONTENT

A full weather brief should include:
1. Weather synopsis
2. Current weather (Takeoff, route, destination, alternates)
3. Forecast weather (Takeoff, route, destination, alternates)
4. Alternate routes
5. Hazardous weather, Airmets, Sigmets
6. Winds Aloft
7. Pireps

SIGMETS are significant meteorological events such as :
1. Tornadoes
2. Squall lines
3. Embedded thunderstorms
4. Large hail
5. Severe turbulence or worse
6. Severe icing
7. Dust storms -low visibility

Airmets are less severe, they are:
1. Moderate icing
2. Moderate turbulence over large areas
3. Winds sustained at ground over 40 kts.
4. Large areas of low visibility

TERMINAL FORECASTS should include:
1. Height above ground of ceiling (first broken layer)

2. Amount of sky cover, clear, scattered, broken, overcast
3. Visibility
4. Obstruction to visibility and weather.
5. Surface winds
6. Remarks

ICING is reported as to its variety (Rime or Clear) and as to its severity ranging from:

1. Trace
2. Light
3. Moderate
4. Severe

TURBULENCE is reported as to its severity:

1. Light - slight changes in attitude or altitude- food service may be continued
2. Moderate - Aircraft remains in control -unsecured objects are dislodged
3. Severe- Large changes in attitude and altitude- food service and walking are impossible.
4. Extreme- aircraft is tossed around -structural damage and loss of control can occur.

(High Level Turbulence not associated with cloud formations is to be reported as CAT [clear air turbulence]) (turbulence that is rhythmic and of short term may be called CHOP)

WEATHER DOCUMENTATION exists and can be obtained by the investigator. Some documentation of weather will be found in the N.T.S.B. weather package furnished by the F.A.A. still more can be obtained from The Climatic Center in Asheville N.C. The documents available includes:

1. Weather radar reports
2. Weather radar photographs
3. Hourly sequences
4. Surface weather Observations
5. PIREPS
6. Surface Synoptic charts
7. Upper air charts
8. Adiabatic Charts
9. Winds aloft
10. Ceiling reports
11. RVR reports (runway visual range)
12. Barograph traces
13. Weather satellite photos
14. Area forecasts
15. Terminal Forecasts
16. Sigmets
17. Airmets
18. Severe weather Bulletins

19. Winds aloft forecasts:

AIRCRAFTAIRWORTHINESS INVESTIGATION

Aircraft Airworthiness is the capability of an aircraft and its systems to operate in all environments for which it was designed .Airworthiness design is accomplished through a "conservative approach ",redundancy, proper operation and continued maintenance.

STRUCTURES, An investigator must determine :

1. Which structural part failed first?
2. What kind of failure was it?
3. Why did it fail?

A Structure may fail because of STATIC LOADS. These may be of short term or long term

A structure may fail because of repeated loadings. These will cause fatigue failures.

A Structure may fail because of dynamic loading. There are two varieties “sudden loading and Impact loading"