

**STANDARD OPERATING PROCEDURES,  
AIRCRAFT RESCUE AND  
FIRE FIGHTING**

**1954**



**Price: 35 cents\***

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**NATIONAL FIRE PROTECTION ASSOCIATION  
International**

**60 Batterymarch Street, Boston 10, Mass.**

# NATIONAL FIRE PROTECTION ASSOCIATION

## INTERNATIONAL

Executive Office: 60 Batterymarch St., Boston 10, Mass.

The National Fire Protection Association was organized in 1896 to promote the science and improve the methods of fire protection and prevention, to obtain and circulate information on these subjects and to secure the co-operation of its members in establishing proper safeguards against loss of life and property by fire. Its membership includes over a hundred and eighty national and regional societies and associations (list on outside back cover) and fifteen thousand individuals, corporations, and organizations. Anyone interested may become a member; membership information is available on request.

This pamphlet is one of a large number of publications on fire safety issued by the Association; a complete list is available without charge on request. The standards, prepared by the technical committees of the National Fire Protection Association and adopted in the annual meetings of the Association, are intended to prescribe reasonable measures for minimizing losses of life and property by fire. All interests concerned have opportunity through the National Fire Protection Association to participate in the development of the standards and to secure impartial consideration of matters affecting them.

NFPA standards are purely advisory as far as the Association is concerned, but are widely used by law enforcing authorities in addition to their general use as guides to fire-safety.

### Definitions

The official NFPA definitions of shall, should and approved are:

**SHALL** is intended to indicate requirements.

**SHOULD** is intended to indicate recommendations, or that which is advised but not required.

**APPROVED** refers to approval by the authority having jurisdiction.

Units of measurements used here are U. S. standard. 1 U. S. gallon = 0.83 Imperial gallons = 3.785 liters.

### Approved Equipment

The National Fire Protection Association does not "approve" individual items of fire protection equipment, materials or services. The standards are prepared, as far as practicable, in terms of required performance, avoiding specifications of materials, devices or methods so phrased as to preclude obtaining the desired results by other means. The suitability of devices and materials for installation under these standards is indicated by the listings of nationally recognized testing laboratories, whose findings are customarily used as a guide to approval by agencies applying these standards. Underwriters' Laboratories, Inc., Underwriters' Laboratories of Canada and the Factory Mutual Laboratories test devices and materials for use in accordance with the appropriate standards, and publish lists which are available on request.

# Standard Operating Procedures, Aircraft Rescue and Fire Fighting

NFPA No. 402—1954

These standard operating procedures are designed to secure maximum utilization of aircraft rescue and fire fighting equipment available at airports. The 1954 text is a revision of the 1951 version and was acted upon at the 1954 Annual Meeting of the Association held in Washington, D. C., May 17-21. The first edition of the text was adopted tentatively in 1947. The official recommendations of the National Fire Protection Association covering "Suggested Aircraft Rescue and Fire Fighting Equipment for Airports" are contained in NFPA No. 403.

This publication, like its 1951 predecessor, is drafted as a "Suggested Good Practice" rather than a "Standard" since these recommendations cannot be strictly applied internationally because of varied conditions existing at airports. The recommendations, however, are applicable to all airports and may be used as a guide for local practices.

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This Committee was reorganized in 1946 to replace the NFPA Aviation Committee (organized 1928) and the NFPA Committee on Aircraft Fire Fighting (organized 1944). The present Committee is charged with the responsibility "to develop aeronautical fire protection, including the elimination of fire hazards in aircraft design and operation, the installation of fire protective equipment in aircraft, the control of fire hazards in aircraft maintenance and storage, fire protection for airports and aircraft rescue and fire fighting."

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The following Sub-Committee as appointed in December, 1953, to revise the 1951 Edition of NFPA No. 402. The text was then submitted to the full committee for balloting and the revised text was adopted by the Association at its 1954 Annual Meeting.

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## Table of Contents

<b>Introduction . . . . .</b>	<b>402-5</b>
<b>Condition A — Situation 1 (100 Series)</b>	
On the Airport, on Land, Anticipated Accident at Landing . . .	402-7
<b>Condition A — Situation 2 (200 Series)</b>	
On the Airport, on Land, Potential Accident During Take-off . .	402-9
<b>Condition A — Situation 3 (300 Series)</b>	
On the Airport, on Land, Unexpected Accidents and Features Common to All Airport Accidents . . . . .	402-10
<b>Condition B — Situation 4 (400 Series)</b>	
Off the Airport, on Land, Normally Within Radius of One to Five Miles or Within Reasonably Accessible Distances . . . . .	402-14
<b>Condition B — Situation 5 (500 Series)</b>	
Off the Airport, on Land, Beyond Radius Described in Situation 4	402-16
<b>Condition C (600 Series)</b>	
On or Off the Airport, In the Water . . . . .	402-17
<b>Local Public Fire Department Cooperation (700 Series) . . .</b>	<b>402-18</b>
<b>Aircraft Crew Training and Discipline (800 Series) . . . . .</b>	<b>402-19</b>
<b>Ambulance and Medical Services (900 Series) . . . . .</b>	<b>402-20</b>
<b>Appendix A</b>	
Definitions of Terms . . . . .	402-21
<b>Appendix B</b>	
Joint U. S. Army, Navy, Air Force Regulations on "Procedure for Aircraft Crash Fire Fighting and Rescue" . . . . .	402-22

## **Standard Operating Procedures, Aircraft Rescue and Fire Fighting.**

**NFPA No. 402—1954**

### **Introduction**

1. The basic premise upon which these Standard Operating Procedures are predicated is rescue of personnel involved in aircraft accidents. Control of fire incident to expeditious rescue is a necessary corollary but final extinction of fire is considered secondary to the rescue operations. Speed in response and rescue is the primary requisite.

2. The following breakdown of conditions liable to be encountered is adopted to aid in practical application of the Standards:

#### **Condition A—On the Airport—On Land.**

Situation 1: Anticipated accident at landing.

Situation 2: Potential accident during take-off.

Situation 3: Unexpected accidents and features common to all airport accidents.

#### **Condition B—Off the Airport—On Land.**

Situation 4: Normally within radius of one to five miles or within reasonably accessible distances.

Situation 5: Beyond radius described above (Situation 4).

#### **Condition C—On or off the Airport—In the Water.**

Additional Standard Operating Procedures are given to cover the following:

**Local Public Fire Department Cooperation.**

**Aircraft Crew Training and Discipline.**

**Ambulance and Medical Services.**

3. The following Standard Operating Procedures are predicated upon the provision of an aircraft rescue and fire fighting organization with adequate equipment (including radio facilities) and personnel. Aircraft rescue and fire fighting on the movement area of an airport should be under the

administrative control of airport management, whether a governmental agency, a private corporation, or an individual and irrespective of how such activities are financed and/or organized. Airport management should also have administrative duties in connection with aircraft rescue and fire fighting within the reasonably accessible environs of the airport movement area where there is no conflict with the administrative jurisdiction of suitably organized and equipped public protective agencies. A prearranged high degree of mutual aid (joint defense measures) is desirable between airport rescue and fire fighting organizations and any public protective agencies serving the immediate vicinity. An "area emergency plan" should be established and airport management should provide educational instruction on the special problems and techniques associated with aircraft rescue and fire fighting to cooperating public agencies. During an aircraft fire emergency the Chief of Emergency Crew should normally be in complete charge of operational phases of aircraft rescue and fire fighting.

4. It will be noted that no differentiation is made in these Standard Operating Procedures between the various types of aircraft liable to be involved in accidents although this obviously will have a marked effect upon the type and quantity of aircraft rescue and fire fighting equipment required to handle any fire which might result. (See NFPA No. 403 for "Suggested Aircraft Rescue and Fire Fighting Equipment for Airports".\*)

5. Terminology used in this standard has been adapted for international use by employing, as far as possible, definitions from the "Lexicon" issued by the International Civil Aviation Organization. (See Appendix A.)

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\* Available from the Association (50 cents per copy).



**Condition A—Situation 1**  
**On the Airport, On Land**  
**Anticipated Accident at Landing**

101. If, prior to landing, *any* abnormal condition existing on the aircraft is reported to Airport Control, a report of this condition should be made to the Chief of Emergency Crew who may order a stand-by alert, either on the landing area (at predetermined locations judged most suitable for the type of emergency) or in the fire station, as conditions warrant.

102. The Airport Control Tower will give the Chief of Emergency Crew as much of the following information as possible.\* If this information is not volunteered by the Control Tower operators, the Chief will request the information from this or other reliable source.

- a. Type of aircraft.
- b. Number of occupants.
- c. Nature of trouble.
- d. Runway to be used.

The following additional information (as applicable) should be provided by Control Tower operators if time and conditions permit:

e. Position and injuries to occupants, or type of cargo.

f. Amount of fuel aboard at time of emergency and location of tanks.

g. Presence or absence of fire in flight, time burning, action taken to combat fire, its apparent origin and smoke conditions.

h. Condition of landing gear, brakes, wing flaps, etc. which might affect landing runs.

i. Power available and engines affected.

j. Pilot's visibility for landing.

k. Anticipated ground contact point and estimated run.

l. Position of control switches at time of landing:

1. Ignition and battery switches.

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\* Tower operators should be expected to supply *only* the information indicated in subparagraphs 102 a., b., c., and d., unless it is clear that the pilot of the disabled aircraft is not engaged in more critical duties.

2. Fuel and oil cut-off switches.
3. Throttle and propeller feathering controls.
4. Fire extinguisher control switches.

m. Anticipated use of hatches and emergency escapes:

1. Whether escapes are manned for immediate use.
2. Whether escapes are jammed or blocked.
3. Whether passengers are panicky.
4. Distribution of occupants at exits.

103. Airport Control will maintain facilities for continuous verbal or radio contact with the Chief of Emergency Crew for last-minute changes in the distressed aircraft's flight plan or emergency conditions existing. Mutual aid as may be needed to help fight any fire or accomplish rescue will be called by Airport Control according to prearrangements completed by the Chief of Emergency Crew. Where advisable, Airport Control will also notify the pilot of the distressed aircraft of the emergency action being taken to receive the aircraft.

104. The Chief of Emergency Crew will supervise placing aircraft rescue and fire fighting equipment in position to facilitate response.

a. Rescue and fire fighting equipment will be spaced so that the runs will be the minimum necessary but back of the anticipated ground contact point of the aircraft in distress. A safe distance will be maintained to avoid collision with the aircraft.

b. Rescue and fire fighting equipment will be distributed parallel to the runway or landing area to be used and grouped to afford maximum utilization.

105. The Chief of Emergency Crew will place equipment "on the roll" immediately as landing is accomplished and clearance given by Airport Control to enter the movement area even if no fire is visible and apparently a successful landing has been accomplished. The aircraft will be followed until it stops and fire prevention or fire-fighting operations will be conducted until the emergency is over. It is the Chief's duty to notify Airport Control when the fire emergency ends. Airport Control has no authority to recall rescue and fire-fighting equipment until the Chief of Emergency Crew pronounces the emergency terminated.

106. The possibility will not be overlooked that the aircraft might swerve suddenly because of faulty landing gear, improper brake action, tire failure, obscured vision of pilot, etc., or that the aircraft might overrun the landing area. Rescue and fire fighting equipment should not have to retract appreciably in any such contingency. This calls for long-range planning including analysis of topography, terrain conditions, fencing of the airport, mobility of equipment and mutual aid facilities.

107. Airport Control will be in charge of other field activities during the emergency and will be particularly alert for the possibility of simultaneous rescue or fire emergencies. Airport Control will keep the Chief of Emergency Crew fully advised by radio.

*(See also Situation 3)*

## **Condition A—Situation 2**

### **On the Airport, on Land Potential Accident During Take-off**

201. Immediately upon notification or observance of potential take-off accident, the Chief of Emergency Crew will order aircraft rescue and fire fighting equipment placed "on the roll" toward the scene keeping in radio contact with Airport Control for clearance to enter movement area.

202. Great care will be exercised in this response to avoid going out of position until the accident location is defined to a given area. Remember that while the aircraft is airborne, unexpected attitudes might suddenly change the course of flight and consequently the final accident site.

*(See also Situation 3)*

### **Condition A—Situation 3**

#### **On the Airport, on Land**

#### **Unexpected Accidents and Features Common to all Airport Accidents**

**301.** Constant observation will be maintained of flight activity from the Fire Station (advantageously located for this purpose) to supplement Airport Control personnel. This observation should be conducted by personnel familiar with aircraft, the airport operating regulations, normal air traffic patterns, and accepted principles of safe ground operation of aircraft. They should be provided with every possible visual aid including binoculars and should also have radio and telephone or loud speaker interphone communication facilities for prompt transmission of alarm and contact with Airport Control. Proper location of the Fire Station to afford maximum visibility of movement area is essential.

**302.** Emergency Crew personnel will take turns on alert duty during all hours of flight activity. Observation duties should include the following visual checks:

a. Clearance of movement area for arriving and departing aircraft.

b. Continuity of power in aircraft engines in the air and at time of take-off.

c. Clearance of structures, trees, and other obstructions.

d. Taxiing operations, ground operations of engines, security of landing gears, and aircraft maintenance operations on the flight line (including fuel servicing).

**303.** When approaching an aircraft fire, rescue and fire-fighting equipment will be placed so as to facilitate rescue. The following conditions will be particularly noted:

a. Wind direction.

b. Location of fire and its extent at time of arrival.

c. Location of fire relative to personnel involved.

d. Relation between wind, fire, personnel and fuel tanks.

e. Terrain conditions and exposures.

f. Flammable liquid spillages.

Proper training of drivers of the equipment is vital in this connection.

**304.** Emergency Crew personnel used for rescue work will be protected with appropriate agents when entering any fire zone to accomplish rescue and will wear protective clothing. Protective clothing recommended includes:

a. Bunker suit with heat insulative interliners for coat and trousers to afford full arm, body and leg protection, outer garment to be water repellent and flame resistant.

b. Protective gloves of chrome leather with heat insulative interliner and gauntlet wrist protection.

c. Standard firemen boots with wool lining.

d. Firemen helmet with plastic full vision face shield, and front and neck protective aprons.\*

**305.** All available lines will be charged for use on the fire after equipment is properly positioned irrespective of the extent of the fire at time of arrival. This will assure an immediate discharge available in case of a gasoline flash which would endanger emergency crews and equipment at the scene as well as occupants of the aircraft. If no fire is visible, all equipment will be placed in immediate readiness for service with lines laid but not charged.

**306.** All spills of flammable liquids will be neutralized or blanketed with foam as quickly as possible taking into consideration the water requirements for the primary rescue mission and the total supply available.

**307.** Since a continuous water supply is essential and usually not available at all points on an airport, pumpers will be immediately positioned at the time of alarm to relay water to the aircraft rescue and fire-fighting equipment and the lines charged upon direction of the Chief of Emergency Crew. In addition, general purpose vehicles will be available on prearranged schedules to bring additional supplies of extinguishing agents and equipment to the scene. (If the airport maintenance equipment includes a ladder truck or portable emergency lighting equipment, it is important that prearrangements include the automatic response of such mobile facilities.)

**308.** Rescue operations will be accomplished through regular doors and hatches wherever possible but emergency crews must be trained in forcible entry procedures and be provided with the necessary tools.\*

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\* See NFPA No. 403, for information on protective clothing and rescue tools.

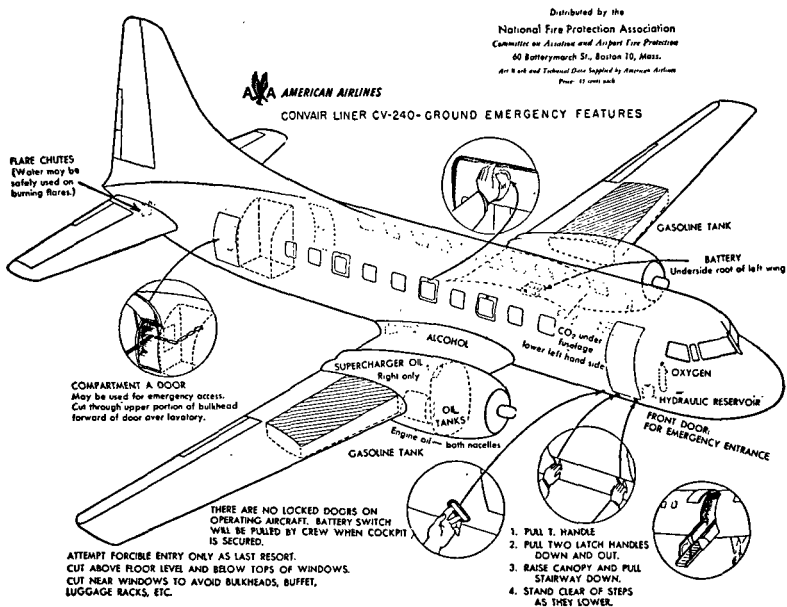


Figure 402-1

Aircraft charts such as this one of the Convair CV-240 as operated by American Airlines are useful tools for training aircraft rescue and fire fighting personnel. Copies of this and similar charts of some other aircraft are available from the NFPA for 15 cents each (8½ x 11 inches, two colors).

309. Rescue of personnel involved in aircraft accidents will proceed with the greatest possible speed. While care will be necessary in the evacuation of injured occupants so as not to aggravate such injuries, removal from the fire threatened area is the primary requirement. (See Paragraphs 901-903.)

310. One member of the Emergency Crew will be detailed to disconnect the battery and to check the ignition, fuel, and fire extinguisher cockpit control switches and fire-wall shut-off valves to limit the extent of fire whenever such action is made possible by the fire condition existing. Only fully competent fire fighters should be assigned this duty to avoid the hazard of untrained men causing further damage or upsetting critical settings on instruments that might be subject to technical investigation to determine the cause of the accident. (See Paragraphs 319 and 320.)

311. Broken fuel, hydraulic fluid (flammable type), alcohol and oil lines will be plugged or pinched to reduce the amount of spill and extent of fire.

312. If the source of heat cannot be removed and flames threaten, fuel tanks will be cooled by appropriate agents and vented to prevent explosion.

313. Where immediate rescue entrance cannot be achieved, bayonet type nozzles might be employed to distribute water spray ("water fog") in the interior of the aircraft to reduce the hazard to life of those occupants trapped inside.

314. Windows of aircraft may often be used for rescue or for ventilation. Some windows are designed as emergency exit hatches. On newer transport aircraft, these hatches are marked and have latch release facilities on the outside. Many emergency hatches open outward but some push inward. A knowledge of the design features of the exits on different aircraft is essential for the rescue crew. Plastic window panels are often heated above the "forming" temperature of the material (about 250°-300° F.) by a fire. They then become elastic and rubbery and are very difficult to shatter with an axe or sledge.\*

315. Interior portions of the aircraft will be ventilated before removing the aircraft after rescues have been accomplished and the fire extinguished. Runway and ground surfaces will be thoroughly flushed of all flammable liquid spills before moving aircraft or permitting normal traffic to resume. Gasoline tanks will be drained (approved methods followed for fire safety) prior to removing aircraft if conditions necessitate and permit. One rescue and fire-fighting unit will be retained at the site while this work is performed. If the aircraft or parts must be removed prior to completion of full investigation and safetying, a record should be made of the accident locations of all parts and care exercised to preserve any evidence available that might help determine the cause of the accident. (See also Paragraphs 319 and 320.)

316. Assure that the "No Smoking" rule is enforced at the scene of the accident and in the immediate vicinity.

317. Where the use of grappling hooks or tow chains

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\* Experiments have shown that cooling the panels to below the forming temperature with carbon dioxide to facilitate shattering is not practical.

must be used to expedite rescue or to assist in controlling fires, exercise discretion lest such a procedure result in strains which might release quantities of fuel from partially damaged tanks or cause greater injuries to entrapped personnel.

318. Burning magnesium parts should be covered with dirt, sand, or special powder extinguishing agents to prevent reflashes.

319. Emergency crews should avoid operation of any controls on a damaged aircraft (post fire) other than absolutely necessary.

320. Emergency crews should be prepared to present a record of exactly what controls were handled in which manner and what damage to the aircraft was caused in gaining access or in otherwise carrying out their rescue, fire fighting or fire prevention responsibilities.

#### **Condition B—Situation 4**

##### **Off the Airport, on Land**

##### **Normally Within Radius of One to Five Miles or Within Reasonably Accessible Distances**

*(See also Situation 3 and Appendix B)*

401. Despite any delay in transmission of alarm, pre-designated aircraft rescue and fire-fighting equipment will be dispatched by the Chief of Emergency Crew to all accidents within the radius described or a similar radius where response is adjudged necessary because of factors surrounding the particular accident or life hazards presented.

402. Aircraft rescue and fire-fighting equipment held in reserve will be only auxiliaries capable of handling incipient fires. Airport control will be immediately advised of the substandard fire defense facilities available and will be in constant radio contact with the emergency units off the airport attending the accident.

403. All off-airport areas within the radius described will be plotted on a grid or azimuth map and the exact location of any accident will be spotted by coordinates as soon as established. Copies of this map will be mounted in every piece of aircraft rescue and fire-fighting equipment, in the Fire Station, and in the Airport Control Tower. It is



recommended that this map also be circulated widely within the geographical vicinity of the airport with copies made available to such agencies as: local public fire departments and equipment, police stations and cruiser cars, hospitals and ambulance services, telephone exchanges, gasoline stations, and selected citizens. One or more local aircraft should also possess copies for possible use in spotting accident sites from the air. Prearrangements with all available fire protection agencies in the area are essential.

404. Response by aircraft rescue and fire-fighting equipment will be organized to avoid delays en route. Local police cooperation will be prearranged. Radio equipment will keep the major equipment, the Fire Station, and Airport Control within constant communication. Wherever possible, local fire departments will also be tied into this radio network.

405. The fastest and most mobile aircraft rescue and fire-fighting equipment will proceed independently of slower heavier units, but the former will direct the latter by radio, supplying route information wherever necessary.

406. Auxiliary water tank trucks and pumpers with auxiliary water tanks will be dispatched wherever there is an indication of their possible utilization and especially when the accident site is known to be beyond normal fire-protected zones (underground water mains and hydrants) or where water relays may be required.

407. Special aircraft rescue tools will be arranged in a kit for manual transportation to accident sites when circumstances prevent close approach by motorized units (i.e. marshy land, heavily wooded areas, high structures, etc.).

408. Judicious utilization of agents supplied is particularly important in unprotected off-airport locations and techniques of employment must be carefully selected to permit most advantageous use.

409. Prior surveys of off-airport terrain and traffic conditions will be made to prevent delays at time of emergency. Significant factors will be charted on the grid maps supplied to aircraft rescue and fire-fighting equipment.

410. Prearrangements with police agencies will be made to handle crowds, to enforce "No Smoking" regulations, and to preserve property and evidence useful in determining the cause of the accident.

411. Damaged aircraft will be tethered for protection against wind damage wherever possible and necessary to preserve evidence as investigations may be prolonged. Souvenir collection will be prohibited and firemen will be instructed in restricting unnecessary damage to the aircraft. (See also Paragraphs 310, 319 and 320.)

### Condition B—Situation 5

#### Off the Airport, on Land Beyond Radius Described in Situation 4

*(See also Situations 3 and 4)*

501. Only one unit of aircraft rescue and fire-fighting equipment will *normally* respond to crashes over five miles from the airport. This unit will be the most mobile and self-contained available, possessing a combination of agents and equipment for employment as the individual situation warrants. The airport protection will not be unjustly jeopardized by prolonged absence of emergency equipment unless the airport can be closed to air traffic during the period of the emergency.

502. Response to these distant accidents will be in cognizance of the danger that, in some, ignition is a delayed result of impact, that only trained aircraft rescue and fire-fighting crews are capable of safeying damaged aircraft to eliminate potential fire hazards, and that removal of any trapped occupants from the danger zone may require special equipment.

503. Aimless wandering to fix exact location of the accident will be forestalled as much as possible by coordination of effort between local police, fire department, and spotter aircraft. Radio communication is essential in this regard.

### Condition C—On or Off the Airport, In the Water

601. All available aircraft rescue and fire-fighting boats will be immediately dispatched, equipped with standard facilities and adequate crews.

602. Coast Guard, Naval, and municipal or similar fire and rescue units (as might be available) will be immediately notified and requested to assist in the emergency. This request will normally be made irrespective of the apparent seriousness of the accident and according to pre-arrangements.

603. Normally sweeping fire away from the aircraft with hose streams is the best practice in aircraft fires on water, but ample foam and water fog should be available for suppression purposes and rescue entry in case of extensive flammable liquid spills which might cover wide areas. It should be appreciated that calm waters produce worse surface fires than rough seas. Rescue boats should approach from the windward side and the fire attacked off the quarter and from broadside as the rescue boat maneuvers. (It is very difficult to maintain a stationary position in this type of fire fighting and excellent maneuverability is the primary operating requirement of boats used for this service. Turrets should be capable of 360° rotation.) Land rescue and fire-fighting equipment will be mobilized to bring additional supplies of required agents to the nearest docking facilities.

604. Immediate attention must be given to occupants injured or trapped inside the aircraft particularly when fire is involved or the buoyancy of the damaged aircraft is in question. Those who have escaped unassisted and can swim in fire-free areas should be encouraged to help themselves until trapped persons and non-swimmers can be removed to safety by rescue forces. Life preservers should be standard equipment on rescue launches. Any apparent flammable liquid spills which have not been ignited should be swept away from the danger zone with hose streams as quickly as possible. The aircraft battery should be disconnected promptly. Ignition switches, fuel switches and firewall fluid shut-off valves should be closed. Motor launch backfires should be prevented.

## Local Public Fire Department Cooperation

701. Local public fire departments will be periodically included in aircraft rescue and fire-fighting training activities conducted at the airport by participating in drills, tests, and aircraft familiarization programs. Such activities will be specifically pointed toward increasing the utility of local fire defense personnel in handling off-airport accidents and assisting in a mutual aid capacity for serious airport accidents. Municipal and rural fire departments may refer to NFPA Pamphlet No. 406 for information on "Aircraft Rescue and Fire Fighting Techniques Using Conventional Fire Apparatus and Equipment". (See also Appendix B, Paragraph 6 thereof.)

702. Confidence in handling aircraft fires can only result from actual aircraft fire experience or training in *realistic* simulated accidents. Local fire department crews which arrive at the scene of an aircraft fire first will be instructed to proceed with the rescue and fire suppression work. Upon arrival of specialized airport equipment, the Chief of the Airport Emergency Crew will consult with the public Fire Department Chief on what rescue efforts have not been successfully completed and will direct the combined crews to assist in the furtherance of this aspect of the accident. After rescues are completed, both agencies will concentrate on final extinguishment, the division of responsibilities being a matter for individual determination by those in charge in accordance with previous arrangements.

703. Local public fire departments will be tied in closely with the airport emergency alarm service, preferably by radio or direct line telephone. They will be supplied with grid maps used for spotting accident locations. They will be encouraged to carry special equipment for aircraft rescue and fire suppression purposes (not uncommon to equipment which might be carried for gasoline tank truck or other flammable liquid fire-fighting work).

704. Local public fire departments will be offered schooling in aircraft fire hazards and physical structures of the types commonly operating out of the airport involved.

## Aircraft Crew Training and Discipline

801. Since many emergency landings are caused by fires sustained in flight, it is vitally important that aircraft crews be well trained and disciplined in fire prevention and what to do in such an emergency. Knowledge of proper operation of installed fire protection systems in aircraft is the first essential. Important points for engine fires in multi-engine aircraft are:

- a. Warn other aircraft crew members.
- b. Place mixture control at idle cut-off.
- c. Feather propeller, affected power plant.
- d. Turn-off fuel to affected power plant.
- e. Close firewall fluid shut-off valves (fuel, oil, hydraulic fluid) of affected power plant.
- f. Switch-off ignition to affected power plant.
- g. Check position of cowl flaps, affected power plant.
- h. Select extinguisher position and operate system.

This procedure presupposes sufficient altitude to avoid ground collision from loss of power. Aircraft crews will also be familiar with hand fire extinguishers on board the aircraft and how they are properly operated. Cabin and cargo section fires must be promptly and effectively blanketed to avoid danger of asphyxiation of crew and passengers.

802. Aircraft crews will be instructed in the air flow configurations and methods which can be taken to prevent spread of fire and smoke throughout the aircraft. The dangers of opening doors and windows will be thoroughly understood.

803. Radio notification of emergency landings from the pilot will include information on:

- a. Type of aircraft.
- b. Number of occupants.
- c. Nature of trouble.
- d. Runway to be used.

{ See Paragraph 102 for possible supplementary information which might be volunteered if time and conditions permit. }

804. The aircraft crew can also be of great assistance to the ground aircraft rescue and fire-fighting crews by taking as many of the following steps as possible to prevent or limit the amount of fire after landing:

- a. Switch-off ignition and battery.
- b. Stop flow of fuel and oil by operating cut-off switches.
- c. Activate the installed fire protection systems at time of ground impact (if not done for control of fire in flight) even if no fire exists.
- d. Open emergency hatches just before landing to prevent entrapment caused by jamming of escapes by impact stresses. (This is not recommended where an airborne fire is in progress affecting cabin or crew compartments or where flames might enter cabins from power-plant fires through such openings.)
- e. In some cases, especially with wing fires, it is possible to shift the position of the aircraft after landing by braking in such a manner that the wind will carry flames away from the fuselage and main fuel cells.
- f. When circumstances permit, bring aircraft to rest on paved surfaces to permit easy approach by aircraft rescue and fire-fighting equipment.
- g. Maintain as much discipline as possible among passengers to prevent panic. Organize escape routes to prevent "bottlenecks" at certain exits. Enforce the use of safety belts during the landing.
- h. Provide technical information to the Chief of Emergency Crew but do not attempt to direct the Emergency Crews in the performance of their duties.

### **Ambulance and Medical Services**

901. Ambulance and medical services, like rescue and fire-fighting services, will be provided to administer aid to those involved and in need of medical assistance. Response of ambulances to the emergency will be automatic regardless of whether or not it is apparent that medical services are required.