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TRANSPORTATION FIRE SAFETY

SUMMARY OF REGULATIONS

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TRANSPORTATION FIRE SAFETY

SUMMARY OF REGULATIONS

As a result of the multiplicity of regulatory efforts by the Department of Transportation in the area of fire safety, it is difficult to obtain a clear sense of the scope and depth of the regulations and what commonalities or differences exist.

Federal regulations pertaining to transportation fire safety are promulgated by each of the modal agencies which form the components of the federal Department of Transportation. Within the body of regulations for a single modal agency there are often distinct categories of vehicles, aircraft, or vessels, each of which is covered by a subset of the regulations. In some cases separate regulations are issued by the various bureaus or administrative entities within one of the modal agencies. The regulations themselves appear under many different subject headings, and references to fire safety are often scattered through diverse subchapters, parts, subparts, and paragraphs.

The summaries presented here provide an overview of these regulations. They were compiled through a careful reading of the Code of Federal Regulations, extracting material that directly or indirectly refers to transportation fire safety. Certain types of references are abbreviated or are excluded from this survey; namely, those relating to military equipment or cargoes, and all hazardous materials or dangerous bulk cargoes. Throughout this compilation of regulations, the focus is on those regulations pertaining to the safety of personnel, passengers and crew, rather than on freight or cargoes. The annotations indicate the principal

matters that are covered in each citation. The actual citation, which is here condensed into a sentence or a phrase, may consist of several paragraphs or several pages, depending upon the subject matter. There may also be subordinate matters incorporated in the actual citation that are not referred to in the annotation.

FEDERAL AVIATION ADMINISTRATION

CFR TITLE 14-AERONAUTICS & SPACE

TITLE 49-TRANSPORTATION

FAA REGULATIONS

Code of Federal Regulations
Title 14 - Aeronautics and Space

Citation	Subject	Content
Subchapter A - Definitions		
Part I	Definitions	List of definitions including fireproof, fire resistant, flammable and flash resistant (see attached list)
Subchapter C - Aircraft		
Part 23 - Airworthiness Standards; Normal, Utility and Acrobatic Category Airplanes		
§SFAR No. 32	Emergency doors and exits	Must meet provisions of 23.783 and 23.807 a3, b, c, and additional specified requirements
§Subpart D - Design and Construction		
§23.783 (a)	Doors	Requirement that each passenger area in enclosed cabin must have access to at least one external door
§23.787 (d)	Cargo compartment	Requirement that construction be of flame resistant material
§23.807	Emergency Exits	Specifications for number, location, size, markings, operation, accessibility, tests as proof of compliance
§23.853	Compartment interiors	Use of fire resistant materials, regulation of smoking, and shielding of fuel lines and tanks
§23.859	Combustion heater fire protection	Construction in compliance with regulations on fuel tanks, lines and exhaust systems; automatic shutoff mechanism in case of overheating

Citation	Subject	Content
§ 23.865	Fire protection of flight controls and other flight structures	Construction using fireproof materials or using shielding to withstand effect of fire
Subpart E - Power Plant		
§ 23.903 (c), (e2), (e4)	Engines	(c)Provision that powerplants be isolated from each other so that malfunction (including due to fire) will not affect the other (e2)Provision of means to stop engine combustion and rotation, with components involved being at least fire resistant (e4)Provision that restarting engine in flight will not create a fire hazard due to accumulated fuel
§ 23.954	Fuel system lightning protection	Design of fuel system to prevent ignition of fuel vapor by lightning
§ 23.973 (b)	Fuel tank filler connection	Prevention of spilled fuel from entering fuel tank compartment or other part of airplane
§ 23.1001	Fuel jettisoning system	Provision that fuel jettisoning will not present a fire hazard
§ 23.1017	Oil lines	Provision that oil breather lines not constitute a fire hazard if foaming occurs
§ 23.1061	Radiators of engines cooled with flammable coolant	Design of air intake duct such that flames from nacelle will not strike duct
§ 23.1091 (b1), (b2), (c1)	Air induction system	Provision that air intakes be located in sheltered positions to prevent emergence of backfire flames within the cowling Provision for turbine engin that hazardous quantities of flammable fluids from drains,

Citation	Subject	Content
		vents or other components not be allowed to enter the air intake system
§23.1103 (a)	Induction system ducts	Provision that each induction system duct have a drain to prevent accumulation of fuel, with drain discharging where it will not cause a fire hazard
§23.1121 (a), (b), (c), (d)	Exhaust system	Provision that all exhaust system gases be disposed of so as not to ignite any flammable fluids, vapors or parts, including design to separate fuel system components from exhaust
§23.1123	Exhaust manifold	Provision that each exhaust manifold be fireproof
§23.1141 (f)	Powerplant	Provision that powerplant components required to operate in case of fire be at least fire resistant
§23.1157 (b)	Powerplant accessories	Provision that electrical equipment subject to sparking be located so as to minimize probability of contact with flammable fluids or vapors
§23.1182	Nacelle areas behind firewalls	Provision that components, lines and fittings located behind the engine firewall be able to withstand damage if the engine-side of the firewall is subjected to a flame temperature of not less than 2000°F for 15 minutes.
§23.1183	Powerplant lines, fittings and components	Provision that all lines, fittings and components carrying flammable fluids, gas or air to any area subject to engine fire conditions be at least fire resistant or, if part of and attached to the engine, be fire proof

Citation	Subject	Content
§23.1189 (a1), (a5)	Shutoff means	Provision that each engine have means to shutoff the flow of hazardous quantities of flammable fluids with no hazardous amount of flammable fluid flowing into the engine compartment after shutoff
§23.1191 (a-h)	Firewalls	Requirement that all combustion equipment be protected by firewalls constructed such that flammable fluids can not pass to other parts of the plane, with all openings in the firewall adequately sealed, and each firewall to be fireproof and constructed either of certain materials (listed) or able to meet certain specific test standards (listed)
§23.1192	Engine accessory. compartment diaphragm	Provision that all air-cooled engines have a firewall separating the engine power section and all portions of the exhaust system from the engine accessory compartment
§23.1193 (c), (d), (d)	Cowling	Provision that all cowling be at least fire resistant, that each part behind an opening in the engine compartment cowling be at least 24 inches and each part of the cowling subjected to high temperatures be fireproof
Subpart F - Equipment		
§23.1351 (e)	Electrical equipment	Design of electrical equipment to withstand damage if the engine-side of the firewall is subjected to a temperature of 2000° F for 5 minutes
§23.1353 (d)	Storage batteries	Design of batteries such that explosive gases will

Citation	Subject	Content
		not be emitted and allowed to accumulate in hazardous quantities
§23.1365 (b)	Electric cables and equipment	Provision that all cables and equipment that would be subjected to overheating in the case of circuit overload be at least fire resistant
§23.1385 (e)	Position light system installation	Provision that light covers and color filters be at least flame resistant
Part 25 - Airworthiness Standards: Transport Category Airplanes		
Subpart D - Design and Construction		
§25.772	Emergency Exits	Design so that either crew or passengers have access to emergency exit without using pilot-passenger separating door
§25.791	No smoking signs	Provision for signs prohibiting smoking, legible to passengers that are controlled by crew
§25.803 (a) (b) (c)	Emergency exits	Requirement that both passenger and crew areas have means for rapid evacuation in crash landing with landing gear down. Exits must meet provisions of this section, 25.807, 25.813 and show compliance by demonstration
§25.805	Emergency exits	Size and location of exits for flight crew
§25.807	Emergency exits	Type, location, accessibility and distribution of exits for passengers
§25.809	Emergency exits	Requirement that emergency door be movable with self-supporting slide, automatically deployed

Citation	Subject	Content
§25.811 (a-e)	Emergency exits	Provision that markings for exits meet specifications to indicate access, location, means of opening, and meet specifications for visibility.
§25.812 (a-j)	Emergency lighting	Requirement for independently powered emergency lighting system as well as specifications for size, location, etc.
§25.813 (a-f)	Emergency exits	Provision for access to exits from different passenger areas, no obstructions to exits and that exits have room for crew to assist passengers in evacuation. Other specifications.
§25.815	Aisles	Specifications for width of aisle
§25.817	Seating	Specifications for maximum seats abreast
§25.851 (a), (b)	Fire extinguishers	Criteria for the type of fire extinguishers to be installed
§25.853	Compartment interiors	Requirement that various materials used on interiors be self-extinguishing when tested in accordance with applicable portions of Appendix F of this part or other approved equivalent methods and that the average burn length must not exceed a certified number of inches Requirement that motion picture film be a safety film meeting the Standard Specifications for Safety Photographic Film PH 1.2 Regulations relating to smoking and the presence of hand fire extinguishers

Citation	Subject	Content
§25.855 (a)	Cargo and baggage compartments	Requirement that materials used in the construction of cargo and baggage compartments at least meet the requirements set forth in 25.853 (b). Requirement that no compartment contain any controls, wiring, lines, equipment or accessories unless these items are protected as further specified Requirement that there be means to prevent cargo and baggage from interfering with the function of fire-protection features of the cargo compartment
§25.857 (a-e)	Cargo compartment classification	Classification of cargo compartments as A,B,C or D according to the degree of fire protection that they provide
§25.859 (a-h)	Combustion heater fire protection	Specification of fire promeasures required for combustion heaters
§25.863 (a), (b), (c)	Flammable fluid fire protection	Criteria for prevention of leakage of flammable fluids and for prevention of ignition of leaked flammable fluids
§25.865	Fire protection of flight controls, engine mounts and other flight structures	Provision that flight controls, engine mounts and other flight structure located in or adjacent to fire zones be constructed of fireproof materials or shielded from the effects of fire intake system
§25.867	Fire protection: other components	Provision that surfaces to the rear of the nacelle within one nacelle diameter of the nacelle centerline be at least fire-resistant

Citation	Subject	Content
Subpart I -	Power Plant	
§25.903 (c), (d1)	Engines	Requirement that each engine have a system to stop the rotation of the engine and to restart the engine; components of this system to be at least fire resistant
§25.929 (b)	Propeller deicing	Provision that if combustion fluid if used for propeller deicing, §25.1181-25.1185 and 25.1189 are applicable
§25.954	Fuel system lightning protection	Design of fuel system to minimize the probability of ignition of fuel vapors by lightning
§25.963 (d)	Fuel tanks	Design of fuel tanks in order to prevent rupture during emergency landings and such that scraping action with the ground is unlikely
§25.965	Fuel tank tests	Specifications for testing fuel tanks with regard to pressure and vibration
§25.975 (a), (b), (i)	Fuel tank vents and carburetor vapor vents	Provision that vents and drains not end at a point which would create a fire hazard
§25.981 (b)	Fuel tank temperature	Provision that no temperature in any part of any fuel tank may be such as to allow autoignition
§25.1017(b2)	Oil lines and fittings	Provision that oil breather lines not constitute a fire hazard if foaming occurs
§25.1091(c1), (c2), (d1)	Air induction	Provision that air intakes be located in sheltered positions to prevent emergence of backfire flames within the cowling

Citation	Subject	Content
		Provision for turbine engines that hazardous quantities of flammable fluids from drains, vents and other components not be allowed to enter the air intake system
§25.1103 (a), (b)	Induction system ducts	Provision that each induction system duct have a drain to prevent accumulation of fuel, with drain discharging where it will not cause a fire hazard Provision that each duct be fire-resistant if it is located in a fire zone for which a fire-extinguishing system is required
§25.1121 (a), (b), (c), (d), (g)	Exhaust system	Provision that all exhaust system gases be disposed of so as not to ignite any flammable fluids, vapors or parts, including design to separate fuel system components from exhaust
§25.1125 (a4)	Exhaust heat exchangers	Provision that exhaust heat exchangers not have stagnant areas which might trap flammable fluids in the case of a malfunction of components carrying flammable fluids
§25.1161	Fuel jettisoning system controls	Provision that fuel jettisoning system controls have guards to prevent inadvertent operation and that no such control be located near any fire extinguisher control
§25.1163 (b)	Powerplant accessories	Provision that electrical equipment subject to sparking be located so as to minimize probability of contact with flammable fluids or vapors

Citation	Subject	Content
§25.1165 (e)	Engine ignition systems	Provision that no ground wire for any engine be routed through a fire zone of another engine unless each part of that wire within that zone is fire-proof
§25.1181	Designated fire zones	Listing of all designated fire zones, which are all to meet the requirements of §25.1185-25.1205
§25.1182	Nacelle areas behind firewalls	Provision that nacelle areas behind firewalls meet requirements of §25.1103(b), §25.1165(d), (e), 25.1183, §25.1185(c), §25.1187, §25.1189 and §25.1195-25.1203
§25.1183	Flammable fluid-carrying components	Requirement that each line, fitting and other component carrying flammable fluid in any area subject to engine fire or in a designated fire zone be fire resistant
§25.1185	Flammable fluids	Requirement that no tank or reservoir that is part of a system containing flammable fluid may be in a designated fire zone unless the degree of safety provided equals that which would exist if the tank were outside such a zone; requirement of at least one-half inch between tank and firewall; absorbent materials next to potential flammable fluid leaks must be covered or treated to prevent absorption
§25.1187	Drainage and ventilation of fire zones	Requirement for safe drainage and ventilation of fire zones

Citation	Subject	Content
§25.1189 (a), (d), (e)	Shutoff means	Provision that each engine have means to shutoff the flow of hazardous quantities of flammable fluids, that the shutoff means be fireproof and no hazardous amount of flammable fluids flow into the engine compartment after shutoff
§25.1191	Firewalls	Requirement that all combustion equipment be isolated from the rest of the airplane by firewalls which are fireproof, impermeable to air, fluid and flame and with each opening in the firewall sealed adequately
§25.1192	Engine accessory section diaphragm	Provision that the engine power section and the exhaust system be isolated from the engine accessory section by a firewall
§25.1193 (c), (d), (e)	Cowling and nacelle skin	Requirements on fireproof properties of cowling to provent the spread of fire through cowling from fire zones to other areas
§25.1195	Fire extinguishing systems	Designation of areas required to have fire extinguishing systems and certain requirements for the design of these systems
§25.1197	Fire extinguishing agents	Requirement that extinguishing agents must be methyl bromide, carbon dioxide or any other agent with equal extinguishing action and provisions to prevent harmful concentrations of these substances
§25.1199	Extinguishing agent containers	Provisions to prevent extinguishing agent containers from bursting and discharging prematurely

Citation	Subject	Content
§25.1201	Fire extinguishing system materials	Provision that no material in any fire extinguishing system react chemically with any extinguishing agent so as to create a hazard and that each system component in an engine compartment be fireproof
§25.1203	Fire-detector system	Requirement that fire-detector systems be installed in each designated fire zone and in the combustion, turbine and tailpipe sections of turbine engine installations and that these systems be designed in specified ways
Subpart F - Equipment		
§25.1305 (a7)	Powerplant instruments	Requirement of fire-warning indicators as part of powerplant instruments
§25.1307 (h)	Miscellaneous equipment	Requirement of portable fire extinguishers, with at least one in the pilot compartment and a minimum specified number, depending on the passenger capacity
§25.1337 (a)	Powerplant instruments	Requirement that powerplant instrument lines meet the standards of §25.993(fuel system lines and fittings) and §25.1183 (flammable fluids or gases under pressure have restricted orifices or equivalent safety devices
§25.1351 (b4)	Electrical systems and equipment, general	Requirement that system transients not cause a smoke or fire hazard
§25.1353 (c3)	Electrical equipment and installations	Design of storage batteries such that explosive gases will not be emitted and allowed to accumulate in hazardous quantities

Citation	Subject	Content
§25.1359	Electrical system fire and smoke protection	Requirement that main power cables be isolated from flammable fluid lines or be shrouded by means of electrically insulated flexible conduit Requirement that the insulation of any electrical wire or cable in the fuselage be self-extinguishing when tested at an angle of 60° in accordance with the applicable portions of Appendix F of Part 23 or other approved equivalent methods. The average burn length may not exceed 3 inches and the average flame time after removal of the flame source may not exceed 30 seconds. Drippings from the test 30 specimen may not continue to flame for more than an average of 3 seconds after falling
§25.1385 (d)	Position light system installations	Provision that light covers and color filters be at least fire resistant
§25.1433 (b), (c)	Vacuum systems	Requirement that any vacuum air system line and fitting on the discharge side of the pump which might contain flammable vapors or fluids and which is located in a designated fire zone must meet the standards of §25.1183 (flammable fluid-carrying components)
§25.1435 (c)	Hydraulic systems	Requirement that hydraulic systems using flammable fluid must meet the standards of §25.863 (flammable fluid fire protection), §25.1185 (flammable fluids) and §25.1189 (shutoff means)

Citation	Subject	Content
§25.1451	Fire protection for oxygen equipment	Requirement that oxygen equipment and lines may not be in any designated fire zone, that equipment and lines be protected from heat that might escape from any designated fire zone and that equipment and lines be installed so that escaping oxygen will not ignite grease, fluid or vapor accumulations
§25.1561 (b)	Safety equipment	Requirement that all locations, lockers, or compartments that carry any fire extinguishers or other life saving equipment be marked accordingly
§25.1561 (a), (c), (d), (e)	Safety equipment	Requirements that emergency controls be marked for crew and that other emergency and survival provisions with operating instructions be identified.
Subpart G - Operating Limitations and Information		
§25.1557	Markings	Requirement that each emergency exit placard meet provisions of §25.811
§25.1585 (a4)	Operating procedures	Requirement that information and instructions regarding fire, decompression and other emergencies be provided in the airplane flight manuel
Part 33 - Airworthiness Standards: Aircraft Engines		
Subpart B - Design and Construction; General		
§33.17	Fire prevention	Requirements for the design and construction of engines to prevent fires, including use of fire resistant materials for lines, fittings and other components carrying flammable fluids (fire-proof for

Citation	Subject	Content
		turbine engines in supersonic aircraft); use of fire-proof materials or shields for flammable fluid tanks and supports and use of draining or venting to prevent accumulation of hazardous fluid and vapor.
Subpart E - Design and Construction; Turbine Aircraft Engines		
§33.73	Safety analysis	Requirement that analysis show no single or multiple malfunction will cause the engine to catch fire
§33.77 (a-1)	Foreign object ingestion	Requirement that ingestion of foreign objects will not cause the engine to catch fire
Subpart F - Block Tests: Turbine Sircraft Engines		
§33.92 (a-1)	Windmilling tests	Requirement that engine rotors must either seize or be capable or rotation for 3 hours at the limiting windmilling rotational r.p.m. with no oil without the engine catching fire
Part 35 - Airworthiness Standards: Propellers (This part contained nothing applicable to fire safety)		
Part 36 - Noise Standards: Aircraft Type and Airworthiness Certification (This part contained nothing applicable to fire safety)		
Part 37 - Technical Standard Order Authorizations		
Subpart A - General		
§37.17	Reporting of failures, malfunctions and defects	Requirement that each manufacturer holding a Technical Standard Order Authorization report any failure, article manufactured which causes any of a series of incidents to occur, including among others, fire caused by a system or equipment failure, malfunction or

Citation	Subject	Content
		defect and flammable fluid leakage in areas where an ignition source normally exists
Subpart B - Technical Standard Orders		
§37.111	Cargo and baggage compartment smoke detection instruments	Description of minimum performance standards required of smoke detection instruments in order to obtain TSO marking; testing includes such factors as minimum level of smoke concentration which system must detect, minimum response time and required performance under varying environmental conditions
§37.121	Fire detectors (thermal sensing and ionization sensing types)	Requirement that fire detectors of this type meet the standards specified in the FAA's "Fire Detectors (Thermal Sensing and Ionization Sensing Types)"
§37.127	Fire resistant aircraft sheet and structural material	Requirement that fire resistant aircraft materials must meet the standards set forth in the SAE (Society of Automotive Engineers) Specification AMS-3851A, "Fire Resistant Properties for Aircraft Materials"
§37.129	Portable water-solution type fire extinguishers	Requirement that portable water-solution type fire extinguishers manufactured on or after the effective date of this order must comply with sections 5 and 6 and subsections 4.1.1, 4.1.4, 4.1.5, 4.2.3, 4.3.1 and 4.3.2 of SAE Specification AS-245A
§37.130	Technical Standard Order C20: "Combustion Heaters"	Requirement that combustion heaters comply with SAE Aeronautical Standard AS143B: Heaters, Airplane, Internal Combustion Heat Exchanger Type (note: con-

Citation	Subject	Content
		tents of standard are included in text)
§37.140	Propeller feathering hose assemblies (rubber and wire braid construction)	Requirement that propeller feathering hose assemblies manufactured on or after March 1, 1957 meet the "performance" section of Military Specification MIL-H-8795 (ASG) or MIL-H-8790 and also meet appropriate fire tests (listed in text)
§37.152	Fuel and engine oil system hose assemblies (rubber or tetrafluoroethylene tube and wire braid construction)	Classification of hose assemblies into Types A,B,C, and D according to their location inside or outside fire zones and according to the maximum temperatures they will be subjected to. Type A hoses must meet standards set forth in "3.3 Performance" section of Specification MIL-H-8795A, Type B hoses standards of "3.6 Performance" section of MIL-H-25579 (USAF), Type C same as Type A and in addition must pass fire test specified in FAA "Standard Fire Test Apparatus and Procedure" (Power Plant Engineering Report No. 3), and Type D hoses same as Type B and n addition must pass FAA fire test mentioned above.
§37.178	Individual floation devices	Requirement that new models of floation devices (manufactured on or after May 1, 1972) must meet the requirements of the "Federal Aviation Administration Standard, Individual Floation Devices;" contents of the standard are given in text and include testing of materials for flame resistance
§37.185	Fire detectors (radiation sensing type)	Requirement that new models, manufactured on or after the effective date of this sec-

Citation	Subject	Content
		tion, must meet the FAA's Standard "Fire Detectors Radiation Sensing Type)"
Subchapter F - Air Traffic and General Operating Rules		
Part 91 - General Operating and Flight Rules		
Subpart D - Large and Turbine-Powered Multiengine Airplanes		
§91.193 (c)	Emergency equipment	Requirement that fire extinguishers be provided which are suitable for the type of fire likely to occur in a compartment; at least one hand extinguisher must be provided for the flight crew, and at least one hand extinguisher must be located in the passenger compartment (two extinguishers if the airplane carries over 30 passengers)
§91.197	Smoking and safety belt signs	Requirement that airplane be equipped with signs, visible to passengers and cabin attendants, notifying them when smoking is prohibited; crew must be able to turn signs off and on
Subchapter G - Air Carriers, Air Travel Clubs and Operations for Compensation or Hire: Certification and Operations		
Subpart J - Special Airworthiness Requirements		
§121.221	Fire precautions	Classification of cargo and baggage compartments as A,B, C,D or E according to ease of access to a fire in compartment in aircraft and other factors; required precautions are listed for each compartment classification
§121.223	Proof of compliance with §121.221	Requirement that compartment accessibility, the entry of hazardous quantities of smoke or extinguishing agents into compartments occupied by crew or pas-

Citation	Subject	Content
		sengers and the dissipation of the extinguishing agent must be shown in tests in flight
§121.225	Propeller deicing fluid	Requirement that if combustible fluid is used, the certificate holder must comply with §121.253 (Powerplant fire protection)
§121.227	Pressure cross-fed arrangements	Requirement that cross-fed lines not pass through parts of the airplane used for carrying persons or cargo unless there is a means to allow the crewmembers to shut off the fuel supply to to these lines or the lines are enclosed in a fuel and fume-proof enclosure that is ventilated and drained to the exterior of the airplane
§121.229	Location of fuel tanks	Requirement that fuel tanks be located in accordance with §121.255 (Flammable fluids), that the engine nacelle skin not be used as a fuel tank wall, and that fuel tanks be isolated from personnel compartments by means of fume- and fuel-proof enclosures
§121.231	Fuel system lines and fittings	Requirement that fuel lines be flexible and able to withstand vibration
§121.235	Fuel lines and fittings in designated fire zones	Requirement that fuel lines and fittings in each designated fire zone comply with §121.259 (Lines and fittings)
§121.235	Fuel valves	Requirement that fuel valves comply with §121.257 (Shut-off means), have adequately marked "on" and "off" positions and be supported so as not to transmit stress to fuel lines

Citation	Subject	Content
§121.237	Oil lines and fittings in designated fire zones	Requirement that oil lines and fittings in designated fire zones comply with §121. 259 (Lines and fittings)
§121.239	Oil valves	Requirement that oil valves comply with §121.257 (Shut-off means), have adequately marked "on" and "off" positions and be supported so as not to transmit stress to fuel lines
§121.243	Engine breather lines	Requirement that engine breather lines discharge in a location that does not constitute a fire hazard in case foaming occurs
§121.245	Fire walls	Requirement that each engine, auxiliary power unit, fuel-burning heater or other combustion equipment be isolated from the rest of the airplane by fire-walls or shrouds
§121.247	Fire-wall construction	Requirement that fire walls and shrouds prevent the passage of hazardous quantities of air, fluids or flames, that all openings in the firewalls be adequately sealed, that fireproof materials be used and that fire-walls be protected against corrosion
§121.249	Cowling	Requirement that cowling be constructed to withstand vibration, that cowling be adequately drained in a manner that does not create a fire hazard, and that materials used in cowling be fire resistant (fire-proof in areas subject to high temperatures)
§121.251	Engine accessory section diaphragm	Requirement that a diaphragm, complying with §121.247 (Fire-wall construction), be provided on air-cooled en-

Citation	Subject	Content
		gines to isolate the engine power section and all parts of the exhaust system from the engine accessory compartment
§121.253	Powerplant fire protection	Requirement that designated fire zones comply with §121.255 thru §121.261; that designated fire zones include engine accessory sections, installations where there is no isolation between the engine and accessory compartment and areas that contain auxiliary power units, fuel-burning heaters and other combustion equipment
§121.255	Flammable fluids	Requirement that no tanks or reservoirs that are part of a system containing flammable fluids may be located in designated fire zones unless the design of the system, the materials used in the tank, the shutoff means, and the connections, lines and controls provide equivalent safety; requirement that there be at least one-half inch clear airspace between any tank or reservoir and a firewall or shroud isolating a designated fire zone
§121.257	Shutoff means	Requirement that each engine have a shutoff means to prevent the flow of fuel or other flammable fluids into any designated fire zone; such shutoff means must be compatible with the emergency operation of other equipment, must be located outside designated fire zones and must be safeguarded against inadvertent operation

Citation	Subject	Content
§121.259	Lines and fittings	Requirement that lines and fittings carrying flammable fluids through fire zones, directly attached to engine or subject to relative motion must be flexible and fire resistant
§121.261	Vent and drain lines	Requirement that all vent and drain lines carrying flammable fluids through a designed fire zone must comply with §121.259 (Lines and fittings)
§121.263	Fire-extinguishing systems	Requirement that fire-extinguishing systems must be provided for all designated fire zones unless equivalent protection can be provided through the use of fireproof materials
§121.265	Fire-extinguishing agents	Requirement that only methyl bromide, carbon dioxide or other proven extinguishing agent may be used; requirement that precaution be taken to prevent toxic or suffocating agents from endangering passengers
§121.267	Extinguishing agent container pressure relief	Requirement that extinguishing agent containers be provided with a pressure relief system, which discharges outside the airplane, to prevent bursting of the container due to excessive internal pressures
§121.269	Extinguishing agent container compartment temperature	Requirement that extinguishing agent containers be located where reasonable temperatures can be maintained for effective use of the extinguishing system
§121.271	Fire-extinguishing system materials	Requirement that fire-extinguishing system components located in a designated fire zone be fireproof and that connections

Citation	Subject	Content
		between components subject to relative motion be flexible and fire resistant
§ 121.273	Fire-detector systems	Requirement that there be enough quick-acting fire detectors in each fire zone to detect any fire within that zone
§ 121.275	Fire detectors	Requirement that fire detectors be designed to resist vibration and other stresses, as well as exposure to fumes, oil, water and other fluids
§ 121.277	Protection of other airplane components against fire	Requirement that airplane surfaces aft of the nacelles in the area of one nacelle diameter on both sides of the nacelle center line must be made of material that is at least fire resistant
§121.285 (b-6)	Carriage of cargo in passenger compartments	Requirement that if cargo is carried in a passenger compartment, the cargo bin must be made of material that is at least fire resistant
§121.287	Carriage of cargo in cargo compartments	Requirement that when cargo compartments are designed to allow crewmembers to enter and extinguish fires, cargo must be loaded so as to allow a crew-member to effectively reach parts of the compartment with a hand fire extinguisher
Subpart K - Instrument and Equipment Requirements		
§121.309	Emergency equipment	Requirement that all airplanes carry readily accessible regularly inspected emergency equipment including hand fire extinguishers for use in crew, passenger and cargo compartments

Citation	Subject	Content
§121.310 (a-j)	Emergency evacuation	Specifications for exits that are marked with signs, emergency lighting for exits and operation thereof, marking on exterior exit, by type of exit, marking of handles and access route
§121.312	Materials for compartment interiors	Requirement that materials used in crew and passenger compartments must meet the standards of §25.853 of this chapter for airplanes with type certificates filed prior to May 1, 1972; for airplanes with type certificates filed on or after this date, materials are specified under the type certificate
§121.317	No smoking signs	Provision for signs prohibiting smoking that are legible to passengers, that are controlled by crew
Subpart N - Training Program		
§121.417	Crewmember emergency training	Requirement that crewmembers be trained in the use of portable fire extinguishers with emphasis on the type of extinguisher suitable for different types of fires, that crewmembers be instructed in handling the situation of fire in flight and on the surface and that crewmember participate in fire extinguishing and smoke control drills
Subpart V - Records and Reports		
§121.703(a-1) (a-2) (a-3)	Mechanical reliability	Requirement that each certificate holder report the following events: fire in flight and whether appropriate fire-warning systems functioned properly, fires in flight not protected by a warning system and false

Citation	Subject	Content
		fire warnings in flight
Part 135	Air Taxi Operators and Commercial Operators of Small Aircraft	
SFAR 23	Doors and exits	Refers to regulation in Part 23
SFAR No.55 -	Fire detector system	Requirement that for turbo-propeller-powered airplanes there be a means for prompt detection of fire in the engine compartment, that each fire detector be capable of withstanding vibrations and other stresses, as well as fumes and fluids which might be present, that the crew be able to check the functioning of detectors in flight and that detector wiring be at least fire resistant
SFAR No.56 -	Fire protection, cowling and nacelle skin	Requirement for reciprocating engine-powered airplanes that engine cowling be designed so as to prevent the spread of any fire from the engine compartment to an area where it would cause additional hazard
SFAR No.57 -	Flammable fluid fire protection	Requirement that if flammable fluids might escape to areas other than the engine compartment there must be a means to prevent the ignition of these fluids or control any fire resulting from their ignition
§135.161	Fire extinguishers: passenger-carying aircraft	Requirement that no aircraft carrying passengers be operated unless equipped with a hand fire extinguisher accessible to the pilot and passengers or two extinguishers, one accessible to the pilot and the other

Citation	Subject	Content
		to the passengers
Part 139 - Certification and Operations: Land Airports Serving CAB-Certificated Air Carriers		
§139.49	Airport fire fighting and rescue equipment and service	Requirement that certain airport fire fighting and rescue equipment be provided based on the size of the aircraft served and the number of daily departures; description of the requirements for each category, including types of fire fighting vehicles, types of extinguishing agents and minimum response times
§139.51	Handling and storing hazardous articles and materials	Requirement that applicant for airport operating certificate show adequate controls and procedures to protect property and persons in the airport during the handling and storage of hazardous materials, including flammable liquids and solids; requirement that as a fueling agent applicant show sufficient number of trained personnel and procedures for safely storing, dispensing and otherwise handling fuel, lubricants and oxygen in the airport
§139.89	Airport fire fighting and rescue equipment and service	Requirement that the operator of each certificated airport provide the fire-fighting and rescue equipment required under §139.49 during all periods of scheduled aircraft operations, that equipment be adequately protected against cold temperatures and that in case of equipment failure, replacement equipment be provided in 8 hours or service must be cut back to a level that can be protected by remaining operable equipment

Citation	Subject	Content
Part 159 - National Capital Airports (includes Washington National Airport and Dulles International Airport		
Subpart E - Fire Hazards and Fueling Operations		
§159.121	Cleaning fluids	Requirement that volatile liquids having a flashpoint of less than 110° F may not be used in a hangar or other airport building unless special precautions are taken
§159.123	Open-flame operations	Requirement that no open-flame operations may be conducted in the airport without permission of the manager
§159.125	Smoking	Prohibition of smoking on any airport ramp, apron, hanger, shop, aircraft or any other area prohibited by the manager
§159.127	Storage	Prohibition of the storage of materials or equipment in a manner which creates a fire hazard; prohibition of storage of flammable liquid, gas, flares or other similar material in hangers or other airport buildings unless authorized by the manager; prohibition of storage of lubricating oil except in specially designed rooms; requirement that metal rubbish containers be provided and emptied daily
§159.129	Apron surfaces areas and floor surfaces	Requirement that each person leasing space in the airport keep the space free of oil, grease or other materials that could cause a fire hazard
§159.131	Doping	Requirement that doping operations be conducted only in a properly designed, fireproof and ventilated

Citation	Subject	Content
		room or building and that no person engage in this operation unless wearing spark-proof shoes
§159.133	Fueling operations	Prohibition of fueling or defueling operations while the engine is running or is being warmed by applying external heat; prohibition of fueling in a hanger or enclosed space or within 50 ft. of any hangar or other building; prohibition of fueling with passengers on the airplane unless the door is open and the ramp is in place; prohibition of any person other than those fueling (and passengers) being within 100 ft. of the airplane; prohibition of starting the airplane if there is any fuel on the ground beneath it; prohibition of smoking within 50 ft. of a fueling operation; requirement that aircraft and dispensing apparatus be grounded during fueling; requirement that care be taken during fueling to prevent overflow of fuel; requirement that hoses, funnels or appurtenances used in fueling operations be maintained in safe, nonleaking condition and be properly grounded
Subpart F - Obligations of Tenants		
§159.159	Fire apparatus	Requirement that each tenant or lessee of airport property supply and maintain adequate fire extinguishers that the manager considers necessary

FAA Definition of Terms (from Subchapter A, Part I)

Fireproof - (1) With respect to materials and parts used to confine fire in a designated fire zone, fireproof means the capacity to withstand at least as well as steel in dimensions appropriate for the purpose for which they are used, the heat produced when there is a severe fire of estended duration in that zone; and

(2) With respect to other materials and parts fireproof means the capacity to withstand the heat associated with fire at least as well as steel in dimensions appropriate for the purpose for which they are used.

Fire resistant - (1) With respect to sheet or structural members means the capacity to withstand the heat associated with fire at least as well as aluminum alloy in dimensions appropriate for the purpose for which they are used; and

(2) With respect to fluid-carrying lines, fluid system parts, wiring, air ducts, fittings, and powerplant controls, means the capacity to perform the intended functions under the heat and other conditions likely to occur when there is a fire at the place concerned

Flame resistant - Means not susceptible to combustion to the point of propagating a flame, beyond safe limits, after the ignition source is removed

Flammable - With respect to a fluid or gas, flammable means susceptible to igniting readily or to exploding

Flash resistant - Means not susceptible to burning violently when ignited

FEDERAL HIGHWAY ADMINISTRATION

CFR TITLE 49-TRANSPORTATION

FHWA REGULATIONS

Title 49 - Transportation, Code of Federal Regulations

Citation	Subject	Content
CHAPTER 3 - FEDERAL HIGHWAY ADMINISTRATION		
SUBCHAPTER B - FEDERAL MOTOR CARRIER SAFETY REGULATIONS		
Part 329 - Driving of Motor Vehicle		
Subpart A - General		
§392.8	Inspection and use of emergency equipment	Provision that no motor vehicle shall be driven unless the driver has satisfied himself that all emergency equipment, including fire extinguishers are in place and ready for use
Subpart F - Fueling Precautions		
§392.50	Prevention of fuel ignition	Requirement that when fueling a vehicle, the engine may not be running, no smoking or open flame be allowed in the vicinity and the nozzle of the hose must be in continuous contact with the intake pipe
§392.51	Reserve fuel	Requirement that no supply of fuel be carried in the motor vehicle other than in properly mounted fuel tanks
§392.52	Fueling of buses	Provision that no bus be fueled in a closed building with passengers aboard
Subpart G - Prohibited Practices		
§392.67	Flame-producing heater on vehicle in motion	Prohibition of use of open flame heaters while vehicle is in motion

Citation	Subject	Content
Part 393 - Parts and Accessories Necessary for Safe Operations		
§393.28	Protection of wiring	Provision that insofar as possible, wiring not be adjacent to any part of the fuel system
Subpart E - Fuel Systems		
§393.65	All fuel systems	Specifications for design of fuel system including provision that fuel spilled vertically from tank while it is being filled will not contact any part of the exhaust or electrical system and that fill pipe openings be located outside of passenger and cargo compartments
§393.67	Liquid fuel tanks	Provision that fill pipe be constructed to minimize the risk of fuel spillage during fueling or in case of a crash
§393.69	Liquefied petroleum gas systems	Requirement that all liquefied petroleum gas systems conform to the "Standards for the Storage and Handling of Liquefied Petroleum Gases" of the National Fire Protection Association
Subpart G - Miscellaneous Parts and Accessories		
§393.76 (g)	Sleeper berths	Provision that sleeper berths be located such that leaks in the fuel system will not cause fuel to enter the sleeper berth
§393.77	Heaters	Prohibition of use of unenclosed flame heaters except to heat cargo of tank motor vehicles; prohibition of any heaters likely to spill or leak fuel; requirement of protective enclosures to prevent ignition of parts of vehicle; provision that electric heaters be designed

Citation	Subject	Content
		to prevent overheating; requirement that heater fuel tanks be located outside of and lower than the passenger space; requirement that heaters be equipped with automatic fuel shutoff means in case of overturn of vehicle
§393.83 (a)	Exhaust system location	Provision that no part of the exhaust system be located where it might ignite the fuel supply or burn any combustible part of the vehicle
§393.84	Floors	Provision that floors be constructed to minimize entrance of fumes, exhaust gases or fire; provision that floors not be permeated with oil or gasoline
§393.91	Bus aisle	Seating in aisle prohibited
§393.91	Emergency doors	Provision for marking emergency doors on bus
§393.96	Emergency equipment	Specifications for first aide kit on bus
Subpart H - Emergency Equipment		
§393.95 (a), (g)	Emergency Equipment	Provision that all buses, trucks, truck-tractors and all vehicles involved in driveaway-towaway operations carry a fire extinguisher in operating order; vehicles must carry one extinguisher with an Underwriters' Laboratories rating of 5 B:C or two extinguishers with a 4 B:C rating or more Provision that vehicles transporting liquids or flammable compressed gas or using flammable compressed gas as a fuel not carry any flame producing devices such as flares, fuses or oil lanterns

Citation	Subject	Content
Part 397 - Transportation of Hazardous Materials; Driving and Parking Rules		
§397.11	Fires	Requirement that a motor vehicle containing hazardous materials not be operated or parked near an open fire
§397.13	Smoking	Requirement that smoking not be allowed within 25 feet of any motor vehicle containing hazardous materials
§397.15	Fueling	Requirement that when fueling a motor vehicle containing hazardous materials, its engine not be operating and the person fueling the vehicle remain at the point where fuel is entering the tank

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

CFR TITLE 49-TRANSPORTATION

NHTSA REGULATIONS

Code of Federal Regulations
Title 49 - Transportation

Citation	Subject	Content
CHAPTER 5 - NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION		
Part 571 - Federal Motor Vehicle Safety Standards		
§571.217 §571.217-76	Emergency exit	Provisions for window retention and release identification and type for emergency use (school bus)
§571.301-75	Standard No.301-75; Fuel System Integrity	Specification for testing of vehicles to ensure a minimum amount of fuel spillage under a variety of test conditions: barrier crash, rollover, frontal barrier crash, rear moving barrier crash, lateral moving barrier crash, static rollover, and moving contoured barrier crash
§571.302	Standard No. 302; Flammability of Interior Materials	Specifications for flammability testing of all materials used in occupant compartments of motor vehicles

FEDERAL RAILROAD ADMINISTRATION

CFR TITLE 49-TRANSPORTATION

FRA REGULATIONS

Code of Federal Regulations
Title 49 - Transportation

Part 225 - Railroad Accidents/Incidents: Reports, Classification and Investigations

Citation	Subject	Content
§225.5(b)	Definition of accident/incident	Defined as any collision, derailment, fire, explosion, act of God or other event involving operation of railroad on-track equipment (standing or moving) which results in more than $1750 in damages to railroad on-track equipment, signals, track, track structures and roadbed.
§225.11(a)	Reports of accidents/ incidents	Requirement that each railroad must submit to FRA a monthly report of all railroad accidents/incidents

Part 230 - Locomotive Inspection

§230.221(b)	Frames and parts	Requirement that underframe, trucks, fuel tanks and brake rigging be kept free of accumulations of oil, grease and debris that would constitute a fire hazard
§230.255(a), (b)	Fuel tanks and piping; safety cut-out valve	Requirement that fuel tanks and related piping be maintained free from leaks Requirement of a safety cut-out valve which will automatically close when tripped
§230.257	Ground fuel tanks	Requirement that fuel tanks and related piping be electrically grounded
§230.327	Oil burning fire boxes	Provision of means for expelling accumulated gases from fire box of oil-burning boilers before fire is lighted

URBAN MASS TRANSPORTATION

ADMINISTRATION

UMTA REGULATIONS

In the past each rail rapid transit system had regulated and enforced its own safety program. On April 6, 1978 the federal Department of Transportation approved four recommendations concerning rapid rail transit (RRT) as follows:

1. UMTA is to be given complete program responsibility for RRT safety. Adjustments in current delegations of authority and controls on the exercise of that authority are to be made as necessary and properly coordinated.

2. UMTA is to immediately require RRT systems receiving federal financial assistance to submit accident reports in accordance with current FRA regulations.

3. A task force is to be established to review RRT accident data, make recommendations on a RRT safety program plan to UMTA, and design new RRT accident reporting requirements.

4. The UMTA administrator is to report the task force recommendations and the final RRT safety program plan to the Secretary.

Current assignments of other transit modes, such as light rail, commuter rail or intracity bases are not affected by the approval of these recommendations.

*Memorandum of Chester Davenport, Assistant Secretary for Policy and International Affairs, February 2, 1978, with attachment, and memorandum of Alan Butchman, Deputy Secretary.

UNITED STATES COAST GUARD

CFR TITLE 46-SHIPPING

CFR TITLE 33-NAVIGATION AND NAVIGABLE WATERS

USCG REGULATIONS

Code of Federal Regulations
Title 46 - Shipping

Citation	Subject	Content
SUBCHAPTER A - PROCEDURES APPLICABLE TO THE PUBLIC		
Part 2 - Vessel Inspections		
§2.20-65	Immediate notice of certain hazardous materials incidents	Requirement that the owner of any vessel transporting hazardous materials, including explosives, flammable liquids, combustible liquids, liquid flammable gases, flammable solids, report immediately to the USCG any incidents involving such materials
§2.20-70	Detailed hazardous materials incident reports	Description of the types of incidents to be reported and the form for reporting such incidents
§2.75-25	Portable fire extinguishers	Requirement that portable fire extinguishers be labeled as "marine type" by a recognized laboratory as provided in Subpart 162.028 of Part 162 of Subchapter Q (Specifications) and description of the process for laboratory to qualify as "recognized"
SUBCHAPTER B - MERCHANT MARINE OFFICERS AND SEAMEN		
Part 10 - Licensing of Officers and Motorboat Operators and Registration of Staff Officers		
§10.20-5	Professional examinations	Requirement that as part of the examination for licensing, the applicant be questioned regarding fire protection and extinguishment

SUBCHAPTER C - UNINSPECTED VESSELS

Part 25 - Requirements

Subpart 25.30	Fire Extinguishing	Specifications for the type of portable fire extinguishers required and specifications for the type of fixed ire extinguishing systems required for different types of vessels

Citation	Subject	Content
Subpart 25.35	Backfire Flame Control	Requirement of backfire flame arresters in accordance with Subpart 162.042 of Subchapter Q (Specifications)
Subpart 25.40	Ventilation	Prohibition of the use of ventilating system required on all motorboats or motor vessels, except open boats
Subpart 25.45	Liquefied Petroleum Gas	Prohibition of the use of liquefied petroleum gases and certain flammable liquids for cooking, heating or lighting (specifications in Parts 146 and 147 of Subchapter N) on vessels carrying passengers for hire

SUBCHAPTER D - TANK VESSELS

Part 30 - General Provisions

Citation	Subject	Centent
§30.10	Definition of terms used in regulations	Definition of flammable/ inflammable, flammable liquid, flame arrester, flame screen, flashpoint and liquefied flammable gas (see attached list)
§30.25-1	Commodities regulated by Subchapter D	Alphabetized list of all regulated commodities

Part 32 - Special Equipment, Machinery and Hull Requirements

§32.20-10	Flame arresters	Requirement that flame arresters meet that standards set by subpart 162.016 (Flame Arresters for Tank Vessels) of Subchapter Q (Specifications) of this chapter
§32.53	Inert Gas System	Requirement that certain tankships have an efficient ventilating system to remove sources of vapor ignition Description of the ventilation system to be installed for tankships carrying different kinds of liquid cargo
	Structural Fire Protection for Tank Ships With a Keel Laying Data On or After January 1. 1975	Detailed specifications for the construction of tankships of this vintage
§Subpart 32.57	Structural Fire Protection for Tank Vessels Contracted for On or After January 1. 1963	Detailed specifications for the construction of tankships of this vintage
§Part 33 - Lifesaving Equipment		This section contains various and details specifications for type and contents of lifeboats, including number of fire extinguishers; other requirements for life rafts and preservers etc.
Part 34 - Firefighting Equipment		
§34.01 through §34.60	Firefighting Equipment	Detailed descriptions of the various component systems including fire main system, steam smothering system, carbon dioxide extinguishing system, fixed foam extinguishing system, deck foam system, water spray extinguishing system, protable extinguishers, sand and fire axes.

Citation	Subject	Content
Part 35 - Operations		
§35.01-1	Inspection and testing required when making alterations, repairs or other such operations involving riveting, welding, burning, or like fire-producing actions	Requirements that no such actions shall be taken until an inspection has been made and a certificate has been issued by the Officer in Charge, Marine Inspection using as guidelines the provisions of "Standards for the Control of Gas Hazards on Vessels to be Repaired" NFPA No, 306
§35.01-35	Repairs and alterations to fire fighting equipment	Requirement that no extensive repairs be made to any fire-extinguishing apparatus without advance notice to the Officer in Charge, Marine Inspection
Subpart 35.10	Fire and Emergency Requirements	
§35.10-1	Station bills, muster lists and line-throwing appliance drills	Requirement that before vessel sails, special duties be assigned to the crew for emergency situations
§35.10-3	Display of plans	Requirement that general arrangement plans for fire emergencies be permanently exhibited
§35.10-5	Emergency signals; fire and lifeboat drills	Specification of procedures for fire and lifeboat drills
Subpart 35.30	General Safety Rules	
§35.30-1(b)	Warning signals and signs	Requirement of warning sign at gangway stating: No open lights No smoking No visitors
§35.30-5	Fires, matches and smoking	Restrictions on permission to light boiler fires, to light galley fires, to smoke and to use matches other than safety matches

Citation	Subject	Content
§35.30-10	Cargo tank hatches, ullage holes and Butterworth plates	Requirement that no cargo tank hatches,ullage holes or Butterworth plates remain open without the protection of flame screens unless the tank open is gas free
§35.30-15	Combustible gas indicator	Requirement that tankships carrying Grade A.B.C or D liquids at any temperature or Grade E liquids at elevated temperatures shall have a combustible gas indicator certified by the Underwriters Laboratories, Inc. or other organizations acceptable to the Commandant
§35.30-20	Emergency equipment	Description of required emergency equipment, including, among others, fire axes and fire protective clothing
§35.30-25	Explosives	Requirement that materials with certain explosive qualities not be accepted, stored, stowed or transported aboard tank vessels
§35.30-35	Spark-producing devices	Specification of conditions under which spark-producing devices may be used on vessels carrying Grade A,B, C and D liquid cargoes
§35.30-40	Flammable liquid and gas fuels as ship's stores	Specifications for the storage and labelling of flammable liquids and gases
§35.30-45	Motion picture film	Requirement that only acetate or slow-burning film may be used. Nitrocelulose film is prohibited

Citation	Subject	Content
Subpart 35.35 Cargo Handling		
§35.35-1(c)	Men on duty	Requirement that certified tankerman in charge of an unmanned barge shall insure that approved protable extinguishers as required by Table 34.50-10 (a) of this chapter are on board prior to transfer of cargo
§35.35-20	Inspection prior to transfer of cargo	Requirement for safe transfer of cargo including such precautions as that in loading Grades A,B, and C cargoes that there be no fires or open flames, that an inspection verify that boiler fires, galley fires, and smoking can be maintained with reasonable safety
§35.35-25	Approval of start transfer of cargo	Requirement that senior deck officer approve transfer only after conditions of §35.35.20 and §35.35-20 have been met
§35.35-30	"Declaration of Independence" for tankships	Requirement that a "Declaration of Independence" relating to the regulations of §35.35-20 be filled out and signed by the senior deck officer
§35.35-35	Duties of senior deck officer during transfer operations	Specification of duties relating to safe transfer of cargo
§35.35-40	Conditions under which transfer operations shall not be commenced	Requirement that such operations not be commenced during electrical storms or in case of fire on the wharf, on the tanker or in the vicinity
§35.35-45 through §35.35-75	Additional regulations relating to safe transfer of cargo	

Citation	Subject	Content
Subpart 35.40	Marking of fire and emergency equipment	Description of markings required for general alarm contact markers, general alarm contact makers, general alarm bells, carbon dioxide alarms, steam, foam or CO_2 fire smothering apparatus, fire hose stations, foam hose/monitor stations, water spray systems, emergency equipment and fire extinguishers
Part 36 - Elevated Temperature Cargoes		
§36.01-1 through §36.30-1	Elevated temperature cargoes	Regulations pertaining to the transport of materials considered to be Grade E liquids when shipped in molten form at elevated temperatures
Part 38 - Liquefied Flammable Gases		
§38.01-1 through §38.25-10	Liquefied flammable gases	Regulations relating to the design and construction of vessels and tanks used in carrying liquefied flammable gases
Part 39 - Flammable or Conbustible Liquids Having Lethal Characteristics		
§39.01-1 through §39.25-10	Flammable or combustible liquids having lethal characteristics	Regulations pertaining to the design and construction of vessels and tanks used in carrying flammable or combustible liquids having lethal characteristics
Part 40 - Special Construction, Arrangement, and Other Provisions for Carrying Certain Flammable or Combustible Dangerous Cargoes in Bulk		

Citation	Subject	Content
§40.01-1 through §40.15-1	Provisions for carrying certain flammable or combustible dangerous cargoes in bulk	Regulations pertaining to the design and construction of vessels carrying ethylene oxide, propylene oxide and vinyl chloride

SUBCHAPTER E - LOAD LINES - This subchapter contained nothing applicable to fire safety.

SUBCHAPTER F - MARINE ENGINEERING

Subpart 58.01-General Requirements

§58.01-10	Fuel for internal conbustion engines on passenger vessels	Requirement that all internal combustion engines on passenger vessels use fuel with a flashpoint exceeding 110° F (Pensky-Martens Closed Cup Method, ASTM-D93)
§58.01-15	Fuel oil for boilers	Requirement that oil used as fuel to be burned under boilers shall have a flashpoint of not less than 140° F (Pensky-Martens Closed Cup Method, ASTM-D93)

Subpart 58.03 - Adoption of Standards and Specifications

§58.03-20	National Fire Protection Association	Provision that the standards of the NFPA are adopted and form part of this subchapter (Marine-Engineering)
Subpart 58.10	Internal Combustion Engine Installations	Design of internal combustion engines to include fire safety-related elements such as fuel drip collectors in the carburetor and backfire flame control for all gasoline engines; and dampers to prevent backflow of exhaust gases through the turbine, an automatic shutdown mechanism in case of overheating and a local fire extinguishing system for all gas turbine engines

Citation	Subject	Content
Subpart 58.16	Liquefied Petroleum Gases for Cooking and Heating	Requirement that all gas-consuming appliances, gas cylinders, safety relief devices, valves, regulators and vaporizers be tested and approved at an acceptable laboratory; that leak tests be conducted periodically; that certain procedures be followed in operating cylinders and that cylinders be marked in specified ways
Subpart 58.30 -	Fluid Power and control	systems
§58.30-10	Hydraulic fluid	Requirement that fluid used in hydraulic power transmission systems have a flashpoint of not less than 200° F for pressures below 150 pounds per square inch and 315°F for pressures 150 pounds per square inch and above as determined by ASTM D92-57, Cleveland "Open Cup" test method and that the recommendations of the system component manufacturers and ANSI-B93.5 (Recommended Practice for The Use of Fire Resistant Fluids for Fluid Power Systems) be considered in the selection and use of hydraulic fluid
Subpart 58.50 -	Independent Fuel Tanks	
58.50-1	General Requirements	Provision that passenger vessels may not carry more than 40 gallons of gasoline and that the fuel must have a flashpoint exceeding 110° F

Citation	Subject	Content
§58.50-5	Gasoline fuel tanks	Specifications for the construction, installation and testing of gasoline fuel tanks
58.50-10	Diesel fuel tanks	Specifications for the construction, installation and testing of diesel fuel tanks
Subpart 63.05	Large automatic auxiliary heating system	Specifications for the construction of auxiliary heating systems including fire safety-related features such as automatic shutoff mechanisms, flame safe guard controls and fuel supply controls
Subpart 63.10	Small automatic auxiliary heating systems	Specifications for the construction of auxiliary heating systems including fire safety-related features such as flame safe guard controls and fuel supply controls Requirement that unit be inspected during construction and tested during operation
SUBCHAPTER H - PASSENGER VESSELS		
Part 70 - General Provisions		
Subpart 70.05 - Applications		
§70.05-30	Combustile liquid cargo in bulk	Provision that vessels certified under this subchapter may carry limited quantities of combustible liquid cargo provided the tanks are of a type approved under this chapter
Part 71 - Inspection and Certification		
§71.25-20	Fire-detecting and extinguishing equipment	Requirement that at each annual inspection protable and fixed fire extinguishers be checked using specific tests (listed) and all fire detecting and extin-

		guishing systems be checked to ascertain that they are in operating conditions (testing conditions specified)
§71.25-45	Fire hazards	Requirement that at each annual inspection tank tons and bilges in machinery spaces be checked to ascertain that there is no hazardous accumulation of oil which might present a fire hazard
§71.60-1	Inspection required for repairs	Provision that no alterations, repairs or other such operations involving riveting, welding, burning or like fire-producing actions shall be made around fuel tanks unless an inspection is first made and a certificate issued using as a guide National Fire Protection Association publication No. 306
§71.65-5	Plans and specifications required for new construction	Requirements that plans include diagrams of fire screen insulation, ventilation systems, alarm systems, detecting systems, extinguishing systems and supervised patrol route
§72.01-10	Vessel using fuel having a flashpoint of 110°F or lower	Provision that when such fuel is carried to supply machinery on board that such machinery and fuel tanks be separated from each other and from the remainder of the vessel in vapor tight containers
Subpart 72.03	General Fire Protection	Provisions for general fire safety including insulation of woodwork from heated surfaces and metal construction of lamp, paint and oil lockers

Citation	Subject	Content
Subpart 72.02	Structural Fire Protection	
§72.05-10	Type, location and construction	Classification of bulkheads accoridng to degree of fire safety provided with table specifying which class bulkheads must be used in each area Specification of materials to be used in certain deck areas
§72.05-15	Ceilings, linings, trim and decorations in accommodation spaces and safety areas	Description of the kind of surface materials permitted for ceilings, linings, trim and decorations
§72.05-20	Stairways, ladders and elevators	Detailed specification for the construction of stairways, ladders and elevators to promote fire safety
§72.05-25	Doors, other than watertight	Specifications for the construction of doors to promote fire safety and facilitate escape in case of a fire
§72.05-30	Windows and airports	Requirement that glass of a certain thickness and wire inserted glass be used in specified areas
§72.05-35	Hatch covers and shifting boards	Specifications for types of hatch covers and shifting boards to be used to promote fire safety
§72.05-40	Insulation, other than for structural fire protection	Requirement that all insulation be of approved Incombustible Materials
§72.05-45	Paint	Requirements that certain highly flammable paints not be used and that excessive layers of paint be discouraged

Citation	Subject	Content
§72.05-50	Ventilation	Requirement that dampers be used in ventilation ducts for fire safety purposes
§72.05-55	Furniture and furnishings	Requirement that furniture and furnishings be constructed of fire resistant or incombustible materials
§Subpart 72.10	Means of Escape	Requirement that at least two means of escape be provided from all general areas with specification of what constitutes a means of escape
§Subpart 72.15 - Ventilation		
§72.15-10	Vessels using fuel having a flashpoint of 110°F or lower	Detailed specification of ventilation system required for vessels carrying fuel of this type
§72.15-15 (b)	Ventilation for closed spaces	Requirement of means to stop all ventilation fans in case of fire
§Part 75 - Life Saving Equipment		This section contains various and detailed specifications for type and contents of lifeboats, including number of fire extinguishers; other requirements for liferafts and preservers etc.
Part 76 - Fire Protection Equipment		Specification of types of fire protection equipment to be used in which areas and detailed description of the following systems: fire main, steam smothering, carbon dioxide extinguishing, foam extinguishing, manual sprinkling, automatic sprinkling, electric fire detecting, pneumatic fire detecting, smoke detecting, manual alarm and hand portable and semi-portable fire extinguishers
§76.01 - §76.60		

Citation	Subject	Content
Part 77 - Vessel Control and Miscellaneous Systems and Equipment		
§77.35-10	Fireman's Outfit	Required contents of fireman's outfit plus minimum number of outfits required based on gross tonnage of vessel
Part 78 - Operations		
§78.13-10 (b)	Emergency signals, fire alarm stations	Description of fire alarm signals
§78.13-15	Emergency squad	Provision that for crews above a certain size an emergency squad must be formed and specially trained in the use of all emergency equipment
Subpart 78.17 - Test, Drills and Inspections		
§78.17-50	Fire and boat drills	Requirement that fire and boat drills be conducted periodically with a description of drill procedure
§78.17-65	Smoke detecting systems	Requirement that tests of smoke detecting systems be conducted every 3 months
§78.17-80	Firefighting equipment, general	Requirement that owner be responsible for maintaining of all firefighting equipment and that at least every 12 months all equipment be tested and inspected
§78.33-10	Notice required before repairs	Requirement that no repairs or alterations to any fire detecting or extinguishing equipment be made without advance notice to the Officer in Charge, Marine Inspection

Citation	Subject	Content
§78.40-10	No smoking permitted	Provision that "No smoking" signs be posted in deck areas assigned to automobiles or other vehicles
§Subpart 78.47	Markings for fire and emergency equipment	Provision for the marking of fire and emergency equipment
Subpart 78.47-37, 40	Marking of exits and doors	Provision for marking of emergency exits and doors
§Subpart 78.75	Motion picture film and equipment	Provision that only acetate or slow-burning film may be used. Nitrocellulose film is prohibited.
§78.80-10 (b), (c)	Use of power-operated industrial trucks in various locations	Provision that only approved power-operated industrial trucks may be used for handling cargo in areas where flammable liquids flammable solids or oxidizing materials are stored
§78.80-15 (h), (j), (k)	Special operating conditions	Conditions relating to fire safety under which power-operated industiral trucks may be used aboard the vessel
§78.80-20	Refueling	Conditions relating to fire safety under which power-operated industrial trucks may be refueled in the hold of a vessel or on the deck

SUBCHAPTER I - CARGO AND MISCELLANEOUS VESSELS

Part 90 - General Provisions

§90.05-35	Flammable and combustible liquid cargo in bulk	Conditions under which vessels inspected and certified under this chapter may carry limited quantities of flammable and combustible liquid cargo in bulk

Citation	Subject	Content
Part 91 - Inspection and Certification		
§91.25-20	Fire-extinguishing equipment	Provision that at each inspection for certification all hand portable and fixed fire-extinguishing systems shall undergo tests specified
§91.25-45	Fire hazards	Provision that at each inspection for certification tank tops and bilges in the machinery spaces shall be examined for possible oil accumulation
§91.50-1	Inspection and testing required when making alterations, repairs or other such operations involving riveting, welding, burning or like fire-producing actions	Requirement that no such actions shall be taken until an inspection has been made and a certificate has been issued by the Officer in Charge, Marine Inspection, using as guidelines the provisions of "Standards for the Control of Gas Hazards on Vessel to be Repaired. NFPA No. 306
§91.55-5	Plans and specifications required for new construction	Plans and specifications for fire control systems are to be included in overall plans and specifications for new construction
Part 92 - Construction and Arrangement		
§Subpart 92.05	General Fire Protection	Provisions for general fire safety including insulation of woodwork from heated surfaces, metal construction of lamp, pain and oil lockers and insulation of spaces containing the emergency sources of electric power
Subpart 92.07 - Structural Fire Protection		

Citation	Subject	Content
§92.07-5	Definitions	Definition of standard fire test and classification of bulkheads according to the degree of fire protection they provide
§92.07-10	Construction	Specification of types of materials permitted in various parts of the vessel
§Subpart 92,10	Means of escape	Requirement that at least two means of escape be provided from all general areas and specification of what constitutes an adequate means of escape
Subpart 92.15 - Ventilation		
§92.15-5(a)	Vessels using fuel having a flashpoint of 110° or lower	Requirement that spaces where fuel with a flashpoint of 110° or lower is being used be ventilated as specified
§92.15-10(b)	Ventilation for closed spaces	Requirement of means to stop all ventilation fans in case of fire
§Part 94 - Lifesaving Equipment		This section contains various and detailed specifications and type and contents of lifeboats, including number of fire extinguishers; other requirements for life rafts and preservers etc.
Part 95 - Fire Protection Equipment		
§95.01-§95.60		Specification of types of fire protection equipment to be used in which areas and detailed description of the following systems: fire main, steam smothering, carbon dioxide extinguishing, foam extinguishing and hand portable fire extinguishers, axes, pumps

Citation	Subject	Content
Part 96 - Vessel Control and Miscellaneous Systems and Equipment		
§96.35-10	Fireman's outfit	Requirement that each vessel carry at least two firemen's outfits with specified contents
Part 97 - Operations		
§Subpart 97.15 - Tests, drills and inspections		
97.15-35	Fire and boat drills	Requirement that a fire and boat drill must be conducted on board at least once every week; procedures for fire and boat drills specified
§97.15-60	Firefighting equipment, general	Requirement that vessel's owner be responsible for maintenance of all firefighting equipment and that all equipment be tested and inspected at least every 12 months
§Subpart 97.37	Marking for fire and emergency equipment, etc.	Provisions for the marking of fire and emergency equipment
§Subpart 97.60	Motion picture film	Provision that only acetate or slow-burning film may be used. Nitrocellulose film is prohibited.
Subpart 97.70 - Power-operated industrial trucks		
§97.70010	Use of power-operated industrial trucks in various locations	Provision that only approved power-operated industrial trucks may be used for handling cargo in areas where flammable liquids, flammable solids or oxidizing materials are stored
§97.70-15	Special operating conditions	Conditions relating to fire safety under which power-operated industrial trucks may be used aboard the vessel

Citation	Subject	Content
§97.70-15	Special operating conditions	Conditions relating to fire safety under which power-operated industrial trucks may be used aboard the vessel
§97.70-20	Refueling	Conditions relating to fire safety under which power-operated industrial trucks may be refueled in the hold of a vessel or on the deck

SUBCHAPTER J - ELECTRICAL ENGINEERING

Part 111 - Electrical System; General Requirements

§111.05-10	Testing and inspection	Requirement that fire detecting systems be tested as specified on a regular basis (at least 25 percent of those installed should be tested annually)
§111.05-15(a-2)	General considerations	Provision that apparatus likely to arc should be ventilated to prevent the accumulation of hazardous vapors
§111.10-15(h)	Generator construction	Provision that propulsion generators be fitted with suitable fire extinguishers
§Subpart §111.60-25(o-2)	Ship's service cables	Requirement that distribution systems be such that fire in any main fire zone will not interfere with essential services in any other main fire zone

Subpart 111.80 - Special Requirements for Certain Locations and Systems

§111.80-5	Wiring methods and materials for hazardous locations	Listing of hazardous materials and classification of locations based on the kind and condition of hazardous materials present; description of the kinds of equipment permit-

Citation	Subject	Content
		ted in each classification area
§111.80-10	Ventilation systems	Requirement of means to stop ventilation fans in case of fire
§111.80-13	Remote shutdown requirements	Requirement of remote shutdown controls for fans and fuel pumps in case of fire
§111.80-20	Hospital operating rooms	Standards for use of electrical equipment in locations where combustible anesthetic or disinfecting agents are present (refers to NFPA standards)
§111.80-25	Locations where gasoline or other highly volatile motor fuel is carried in vehicles	Requirement for type of electrical equipment installed in locations where such fuel is present
§111.80-30	Motion picture projection	Requirement that only certain kinds of motion picture equipment be used and that only acetate or slow-burning film may be used
§111.80-50	Firescreen door holding and release system	Description of required firescreen door holding and release systems
§111.80-60(b)	Electric air heaters	Required design of electric air heaters including measures to reduce the risk of fire
§111.80-65(a-6)	Electric cooking equipment and motor-driven commissary equipment	Requirement that each equipment unit have a disconnecting means which will be accessible in case of fire on the cooking surface
§111.85-10	Special requirements for tank vessels contracted for on or after November 19, 1955	Special requirements include fire safety measures such as prohibition of storage batteries in cargo handling rooms

Citation	Subject	Content
§111.85-90	Special requirements for tank vessels constructed prior to November 19, 1955	Special requirements include fire safety measures such as prohibition of portable electrical equipment in and around bulk cargo tanks
§Part 112 - Emergency Lighting and Power System		Various specifications providing for automatic operation of system, sources of power, levels of illumination Requirement that rooms containing emergency generators be made fire resistant by lining them with asbestos board
Part 113 - Communication and Alarm Systems and Equipment		
§Subpart 113.10	Automatic fire detecting and alarm systems	Electrical standards for automatic fire detecting and alarm systems
§Subpart 113.15	Manual fire alarm systems	Electrical standards for manual fire alarm systems
§Subpart 113.20	Automatic sprinkler systems	Electrical standards for automatic sprinkler systems
§Subpart 113.70	Smoke detector systems	Electrical standards for smoke detector systems

SUBCHAPTER N - DANGEROUS CARGOES - This subchapter deals with safety in the handling, stowage, storage and transportation of military explosives; it was not included because the emphasis was on explosives rather than flammability and because it dealt only with military vessels.

SUBCHAPTER O - CERTAIN BULK DANGEROUS CARGOES - This subchapter deals with safety regulations for unmanned tank barges transporting dangerous bulk cargoes; it was not included because there were no personnel involved.

SUBCHAPTER P - MANNING OF VESSELS - This subchapter contained nothing applicable to fire safety.

Citation	Subject	Content
SUBCHAPTER Q - SPECIFICATIONS		
Part 160 - Lifesaving equipment		
§Subpart 160.021	Signals, distress, hand red flare, for merchant vessels	Specifications for manufacture and performance of flares including provision that they not ignite spontaneously when held at 75°C for 48 consecutive hours
§Subpart 160.022	Signals, distress, floating orange smoke (5 minutes) for merchant vessels	Same as for Subpart 160.021
§Subpart 160.024	Signals, distress, pistol-projected parachute red flare, for merchant vessels	Same as for Subpart 160.021
§Subpart 160.036	Signals, distress, hand-held roacket-propelled parachute red flare, for merchant vessels	Same as for Subpart 160.021
§Subpart 160.037	Signals, distress, hand, orange smoke, for merchant vessels	Same as for Subpart 160.021
§Subpart 160.057	Signals, distress, orange smoke (15 minutes), for merchant vessels	Same as for Subpart 160.021
§Subpart 161.002	Fire-protective systems	Specifications for automatic fire detecting systems, fire detecting thermostats, manual fire alarms, witchman's supervisory systems and smoke detecting systems
§Subpart 162.016	Flame arreaters for tank vessels	Specifications for design and construction of flame arresters for use in venting systems on tank vessels
§Subpart 162.017	Valves, pressure-vacuum relief and spill, for tank vessels	Specifications for design and construction of pressure-vacuum relief valves and spill valves for use

Citation	Subject	Content
		in venting systems on tank vessels
§ Subpart 162.018	Safety relief valves, liquefied compressed gas	Specifications for design, construction and testing of safety relief valves for use on unfired pressure vessels containing liquefied compressed gases
§ Subpart 162.027	Nozzles, firehose combination solid stream and water spray	Specifications for design, construction and testing of combination solid stream and water spray fire hose nozzles
§ Subpart 162.039	Fire extinguishers, semi-portable, marine type	Specifications for design, construction and testing of semi-portable, marine fire extinguishers
§ Subpart 152.041	Backfire flame control, gasoline engines; flame arresters for merchant vessels and motorboats	Specifications for design and construction of backfire flame arresters intended for installation on carburetor air intakes of internal combustion engines
§ Subpart 162.042	Backfire flame control, gasoline engines; engine air and fuel induction systems, for merchant vessels and motorboats	Specifications for design and construction of those engines whose method of introducing air and fuel into the engine provides protection equivalent to that of an effective backfire flame arrester as specified in Subpart 162.041 above
§ Subpart 162.043	Backfire flame control, gasoline engines; engine air induction system, for merchant vessels and motorboats	Specifications for design and construction of backfire flame control measures in those vessels with an integrated engine-vessel design; such engines utilize carburetor attachments or air intake ducts to disperse engine backfire to the atmosphere outside the vessel

Citation	Subject	Content
§ Subpart 164.006	Deck coverings for merchant vessels	Specifications for materials used as deck coverings to ensure incombustibility and low smoke emission when subjected to high temperatures
§ Subpart 164.007	Structural insulations	Specifications of testing procedures for structural insulations to insure that average temperature rise of a steel bulkhead will not exceed 139°C (250°F) at the end of a 60-minute standard fire test
§ Subpart 164.008	Bulkhead panels	Specifications for materials to be used for bulkhead panels and testing required to ensure that a standard temperature curve is followed with temperatures not rising above 927°C (1700°F) at the end of 60 minutes
§ Subpart 164.009	Noncombustible materials for merchant vessels	Specifications fo noncombustible materials allowed for use in merchant vessel construction and required testing of such materials
§ Subpart 164.012	Interior finishes for merchant vessels	Specifications for type and thickness of materials which may be used as coating, overlay or veneer to any bulkhead surface
§ Subpart 164.015	Plastic foam, unicellular, buoyant, sheet and molded shapes	Specifications for testing of such materials for various properties, including fire retardance

SUBCHAPTER R - NAUTICAL SCHOOLS

Part 116 - Designation and Approval of Nautical School Ships

§116.15	Training for maintenance of discipline;	Requirement that all students be trained in opera-

Citation	Subject	Content
	ship sanitation; fire and lifeboat drills	tions incident to fire drills in port and at sea
Part 167 - Public Nautical School Ships		
§Subpart 167.45	Special firefighting and fire prevention requirements	Specifications of type and design of fire extinguishing systems and equipment required on nautical school ships, including steam and inert-gas extinguishing systems, foam smothering systems, fixed water spray systems, emergency breathing apparatus and flame safety lamps, portable fire extinguishers, fire extinguishers for emergency powerplants and fire axes
§Subpart 167.55	Special markings required	Requirements for marking of general alarm bell switch and bells; steam foam and CO_2 fire smothering apparatus, fire hose stations, emergency squad equipment and fire extinguishers
SUBCHAPTER T - SMALL PASSENGER VESSELS (UNDER 100 GROSS TONS)		
§Subpart 176.25 - Material Inspections		
§176.25-10(b)	Machinery	Provision that all inspections shall insure that no fire hazards exist
§176.25-15(a-6)	Electrical	Provision that at each inspection for certification, the electrical component of fire protection devices be tested for proper operation
§176.25-25	Fire extinguishing equipment	Provision that at each inspection for certification al fire extinguishing equipment shall undergo specified tests

Citation	Subject	Content
Part 177 - Construction and Arrangement		
§177.10-5	Fire protection for hull structure	Provision that fiberglass construction be of a type fabricated with fire retardant resins; that sources of ignition be kept clear of woodwork and other combustible materials and that lamp, paint and oil lockers be of metal construction
§Subpart 177.15	Means of escape	Requirement that at least two means of escape be provided from all general areas with specification of what constitutes a means of escape
§177.30-1 (b), (c)	Seating	Provision that seating be arranged to facilitate escape in case of fire
Part 181 - Fire Protection Equipment		Detailed description of required fire protection devices including fire pumps, fire main system, fixed fire extinguishing system, manual sprinkling system and portable fire extinguishers, axes; description of where these devices are required
§181.01-§181.35		
§183.415	Grounding	Requirement for a boat with more than one gasoline engine that the grounded cranking motor circuit be connected with each other
§183.420	Batteries	Provisions to insure proper grounding of battery and to prevent contact with the fuel system
§183.425- 183.460	Conductors	Provisions to insure proper brounding and insulation of conductors

Citation	Subject	Content
Subpart J - Fuel Systems		
§183.510	Fuel tanks	Provisions to insure that fuel tanks will not leak
§183.512	Fuel tanks: prohibited materials	Prohibition of the use of specific materials and specific combinations of materials in the construction of fuel tanks
§183.514	Fuel tanks: labels	Requirement that each fuel tank be labelled with manufacturer's name, date of manufacture, capacity, material of construction, maximum pressure, model number and statement, "This tank has been tested under 33 CFR 183.580"
§183.516	Cellular plastic used to encase fuel tanks	Specific performance requirement for metallic fuel tanks encased in cellular plastic
§183.518	Fuel tank opening	Requirement that each opening into a fuel tank must be at or above the topmost surface of the tank
§183.520	Fuel tank vent systems	Requirement that each fuel tank have a vent system to prevent pressure from exceeding 80 percent of pressure marked on the tank label and requirement that each vent have a flame arrester and that it not allow a fuel overflow over and above a certain rate
Part 182 - Machinery Installation		
§Subpart 182.15	Machinery using gasoline as fuel	Details of machinery installation and maintenance including fire safety measures, such as carburetor fuel drip collectors, backfire flame arresters on air intake, etc.

Citation	Subject	Content
§Subpart 182.20	Machinery using dies diesel fuel	Details of machinery installation and maintenance including fire safety measures
Part 183 - Electrical Installation §183.01-§183.10		Details of electrical installation and equipment to provide minimum standards for the prevention of electrical fires and electrical shock to personnel, including measures such as separation of batteries from gasoline tanks, adequate insulation of wiring, etc.
Part 184 - Vessel Control and Miscellaneous Systems and Equipment		
§184.05-1	Restrictions	Prohibition of use of liquefied petroleum gas and gasoline for cooking, heating and other purposes on all vessels
§Subpart 184.30-1,5	Emergency lighting	Provision for portable battery powered lights and the automatic operation of emergency lighting in lounge areas and routes leading to escape
Part 185 - Operations		
§185.20-20	Vessels carrying vehicles	Provision that vehicles be stored in a manner to allow escape of passengers and operators in case of fire and that no smoking be allowed in the area
§185.20-25	Fueling of vessels	Provision that vessels using fuel having a flashpoint of 110°F or lower shall not take on fuel when passengers are on board
§Subpart 185-25 (c)	Preparations for emergencies	Required emergency procedures for fire at sea

Citation	Subject	Content
Subpart 185.30 - Markings Required		
§185.30-20	Fuel shutoff valves	Required markings of all fuel shutoff stations in 1-inch letters
Subpart 187.20 - Specific Requirements of Operators on Other Than Ocean and Coastwise Waters		
§187.20-20, §187.20-15, §187.20-17	Examination for operators	Requirement that exams for the following positions contain questions on fire protection and extinguishment: operators of machanically-propelled vessels, sailboat operators and barge operators
Subpart 187.25 - Specific Requirements for Ocean Operators		
§187.25-15, §187.25-20, §187.25-21	Examination for operators	Requirement that exams for the following positions contain questions of fire protection and extinguishment: operators of ocean mechanically-propelled vessels, sail-propelled vessels and auxiliary sailing vessels
SUBCHAPTER U - OCEANOGRAPHIC VESSELS		
Part 188 - General Provisions		
§Subpart 188.10 - Definition of Terms Used in this Subchapter		
§188.10-17	Combustible liquid	Any liquid whose flash-point, as determined by an open cup tester is above 80°F
§188.10-27	Flammable liquid	Any liquid whose flash-point, as detetmined by an open cup tester is 80°F or below
§188.10-43	Liquified flammable gas	Any flammable gas having a Reid vapor pressure exceeding p.s.i. which has been liquified

Citation	Subject	Content
Part 189 - Inspection and Certification		
Subpart 189.25 - Inspection for Certification		
§189.25-20	Fire-extinguishing equipment	Provision that at each inspection for certification all hand portable and fixed fire extinguishing systems shall undergo tests specified
§189.25-45	Fire hazards	Provision that at each inspection for certification all tank tops and bilges in the machinery spaces shall be examined for possible oil accumulation
§189.50-1	Inspection and testing required when making alterations, repairs or other such operations involving riveting, welding, burning or like fire-producing actions	Requirement that no such actions shall be taken until an inspection has been made and a certificate has been issued by the Officer in Charge, Marine Inspection using as guidelines the provisions of "Standards for the Control of Gas Hazards on Vessel to be Repaired," NFPA No. 306
§189.55-5	Plans and specifications required for new construction	Plans and specifications for fire control systems are to be included as part of overall plans for new construction
Part 190 - Construction and Arrangement		
§Subpart 190. 05	General fire protection	Provision for general fire safety including insulation of woodwork from heated surfaces, metal construction of lamp, paint and oil lockers and insulation of spaces containing the emergency sources of electric power

Citation	Subject	Content
Subpart 190.07 - Structural Fire Protection		
§190.07-5	Definitions	Definition of Standard fire test and classification of bulkheads according to the degree of fire protection they provide
§190.07-10	Construction	Specification of types of materials permitted in various parts of the vessels
Subpart 190.10	Means of escape	Requirement that at least two means of escape be provided from all general areas and specification of what constitutes an adequate means of escape
Subpart 190.15 - Ventilation		
§190.15-5	Vessels using fuel having a flashpoint of 110 degrees or lower	Requirement that spaces where fuel with a flashpoint of 110° for lower is being used by ventilated as specified
§190.15-10	Ventilation for closed spaces	Requirement of means to stop all ventilation fans in case of fire
Part 192 - Lifesaving Equipment		This section contains various and detailed specifications for type and content of lifeboats, including number of fire extinguishers; other requirements for life rafts and preservers, etc.
Part 193 - Fire Protection Equipment		
(§193.01-§193.60)		Specification of types of fire protection equipment to be used in which areas and detailed descriptions of the following systems: fire main, carbon dioxide extinguishing, hand portable extinguishers and fire axes

Citation	Subject	Content
Part 194 -	Handling, Use and Control of Explosives and Other Dangerous Articles (§194.01 - §194.90)	Provision for storage and labeling of explosive and dangerous articles, including flammable liquids, flammable solids and combustible liquids
Part 195 -	Vessel Control and Miscellaneous Systems and Equipment	
§196.11-30 (b)	Emergency signals	Description of required fire alarm signals
§196.15-35	Fire and boat drills	Requirement that fire and boat drills be conducted periodically with a description of required drill procedure
§196.15-55	Requirements for fuel oil	Requirement that each supply of fuel oil taken aboard be logged as to quantity, vendor, producer and flashpoint and a half-pint sample taken of each lot
§196.15-60	Firefighting equipment, general	Requirement that the owner be responsible for maintaining of all firefighting euqipment and that at least every 12 months all equipment be tested and inspected
§196.30-10	Notice required before repair	Requirement that no repairs or alterations to any fire detecting or extinguishing equipment be made without advance notice to the Officer in Charge, Marine Inspection
§Subpart 196.37	Markings for fire and emergency equipment	Provision for the marking of fire and emergency equipment

Citation	Subject	Content
§Subject 196.60	Motion picture film and equipment	Provision that only acetate or slow-burning film may be used; nitrocellulose film is prohibited

USCG Definition of Terms (from §30.10)

Flammable'inflammable - The words "flammable" and "inflammable" are interchangeable or synonymous terms for the purpose of the regulations in this chapter

Flammable liquids - Any liquid which gives off flammable vapors (as determined by flashpoint from an open-cup tester, as used for test of burning oils) at or below a temperature of 80°F. Flammable liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in §146,25-10 and §146.25-15, of Subchapter N (Dangerous Cargoes) of this chapter. Flammable liquids are referred to by grades as follows:

(a) Grade A. Any flammable liquid having a Reid[1] vapor pressure of 14 pounds or more

(b) Grade B. Any flammable liquid having a Reid[1] vapor pressure under 14 pounds and over 8 1/2 pounds

(c) Grade C. Any flammable liquid having a Reid[1] vapor pressure of 8 1/2 pounds or less and a flashpoint of 80° F. or below

Flame arrester - Any device or assembly of a cellular, tubular, pressure, or other type used for preventing the passage of flames into enclosed spaces

Flame screen - A fitted single screen of corrosion-resistant wire of at least 30 by 30 mesh, or two fitted screens, both of corrosion resistant wire, of at least 20 by 20 mesh, spaced not less than 1/2 inch or more than 1 1/2 inches apart

Flashpoint - The temperature in degrees Fahrenheit at which a liquid gives off a flammable vapor when heated in an open-cup tester. For the purpose of the regulations in this subchapter, flashpoints determined by other testing methods will be equivalent to those determined with an open-cup tester, as follows:

Table 30.10-27

Equivalent Flashpoints

Open-cup tester	Tab closed-cup	Pensky-Martens closed tester
°F	°F	°F
80	75	--
150	--	140

[1]American Society for Testing Materials Standard D-323 (most recent). Method for test for Vapor Pressure of Petroleum Products (Reid Methos).

USGC REGULATIONS

Code of Federal Regulations
Title 33 - Navigation and Navigable Waters

Citation	Subject	Content
SUBCHAPTER B - MILITARY PERSONNEL		
Part 33 - Appointment of Civilians as Commissioned Officers, Chief Warrant Officers and Warrant Officers		
Subpart 33.05 - Appointments of Licensed Officers of the United States Merchant Marine as Commissioned Officers		
§33.05 - 15	Written examinations	Requirement that all applicants take a written examination and that the exam include a section of fire prevention and safety, including use of fire equipment, methods of fire fighting and fire prevention and required equipment for merchant vessels.
SUBCHAPTER N - ARTIFICIAL ISLANDS AND FIXED STRUCTURES ON THE OUTER CONTINENTAL SHELF		
Part 145 - Fire-fighting Equipment		
§145.01	Portable and semi-portable equipment	Requirement that approved able and/or semi-portable fire extinguishers be installed and maintained on all platforms where crews are regularly working.
§145.05	Classification of fire extinguishers	Classification of portable and semi-portable fire extinguishers using letters to indicate the type of fire the unit will extinguish and numbers to indicate the relative size of the unit. Requirement that all extinguishers can be labelled as to type, capacity, approving firm or individual and manufacturing firm

Citation	Subject	Content
§145.10	Locations and number of fire extinguishers required	Specification of type, quantity and location of fire extinguishers required in various parts of the vessel

SUBCHAPTER NN - DEEPWATER PORTS

Part 149 - Design, Construction and Equipment

§149.451 - §149.479	Fixed Fire Main System for Water	
		Requirement that each PPC (pumping platform complex) have a fixed fire main system
		Specifications for components of fire main system including fire pumps, fire hydrants, fire hoses spray applicators and international shore connections
§149.481	Other fire extinguishing systems	Requirement that each PPC must have, in addition to the fire main system, a manually or automatically operated fire extinguishing system which meets National Fire Protection Association Standards
		Specification of the locations where extinguishers are required and the type of systems required
§149.483	Firefighting systems for helicopter pads	Requirement that each PPC helicopter landing pad have a foam producing fire extinguishing system and specifications for the performance of such a system
§149.491	Fire detection and alarm system	Requirement that each PPC have various fire detecting systems for various locations within the vessel

Citation	Subject	Content
§149.501	Portable and semi-portable fire extinguishers	Requirement that each PPC have portable and semi-portable fire extinguishers approved by the coast Guard undet CFR 162.028 or 162.039
§149.503	Location of extinguishers	Requirement that fire extinguishers be installed in accordance with Table 145.10 in §145.10
§149.505	Sapre charges	Requirement that spare charges be carried for at least 50 percent of each size and variety of hand portable fire extinguishers required in Table 145.10
§149.507	Marking	Requirement that each hand portable extinguisher and its station be numbered in accordance with 46 CFR 97.37-23.
§149.511	Landing area with no fueling facility	Requirement that each helicopter landing area with no fueling facility have at least two USCG type B:C, size IV dry chemical extinguishers
§149.515	Fire axes	Requirement that each PPC have at least 8 fire axes distributed so as to be readily available
§149.517	Fireman's outfit	Requirement that each PPC have at least 2 fireman's outfits with description of required contents

Citation	Subject	Content
Part 150 - Operations		
§150.504	Firemain system	Requirement that fire main system be used only for firefighting and deck-washing
§150.505	Fire pump	Requirement that one fire pump be kept ready for use at all times
§150.507	Firehouse: connection and storage	Requirements for the stowage of firehoses, including the requirement that at least one length of fire-hose in combination with nozzle be connected to each fire hydrant at all times
Part 183 - Boats and Associated Equipment		
Subpart I - Electrical Systems		
§183.410	Ignition protection	Provisions to insure that electrical components when operated will not ignite a propane gas and air mixture unless it is isolated from fuel sources