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.
### FAA REGULATIONS

**Code of Federal Regulations**  
**Title 14 - Aeronautics and Space**

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| §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 |
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</tr>
<tr>
<td>§25.1451</td>
<td>Fire protection for oxygen equipment</td>
<td>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</td>
</tr>
<tr>
<td>§25.1561 (b)</td>
<td>Safety equipment</td>
<td>Requirement that all locations, lockers, or compartments that carry any fire extinguishers or other life saving equipment be marked accordingly</td>
</tr>
<tr>
<td>§25.1561 (a), Safety equipment (c), (d), (e)</td>
<td>Requirements that emergency controls be marked for crew and that other emergency and survival provisions with operating instructions be identified.</td>
<td></td>
</tr>
</tbody>
</table>

**Subpart G - Operating Limitations and Information**

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<thead>
<tr>
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<tbody>
<tr>
<td>§25.1557</td>
<td>Markings</td>
<td>Requirement that each emergency exit placard meet provisions of §25.811</td>
</tr>
<tr>
<td>§25.1585 (a4)</td>
<td>Operating procedures</td>
<td>Requirement that information and instructions regarding fire, decompression and other emergencies be provided in the airplane flight manual</td>
</tr>
</tbody>
</table>

**Part 33 - Airworthiness Standards: Aircraft Engines**

**Subpart B - Design and Construction; General**

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<tbody>
<tr>
<td>§33.17</td>
<td>Fire preventi on</td>
<td>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</td>
</tr>
<tr>
<td>Citation</td>
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<tr>
<td>Subpart E - Design and Construction; Turbine Aircraft Engines</td>
<td>§33.73</td>
<td>Safety analysis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requirement that analysis show no single or multiple malfunction will cause the engine to catch fire</td>
</tr>
<tr>
<td></td>
<td>§33.77 (a-1)</td>
<td>Foreign object ingestion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requirement that ingestion of foreign objects will not cause the engine to catch fire</td>
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<tr>
<td>Subpart F - Block Tests: Turbine Aircraft Engines</td>
<td>§33.92 (a-1)</td>
<td>Windmilling tests</td>
</tr>
<tr>
<td></td>
<td></td>
<td>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</td>
</tr>
</tbody>
</table>

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
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<tr>
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<tbody>
<tr>
<td>§37.111</td>
<td>Cargo and baggage compartment smoke detection instruments</td>
<td>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.</td>
</tr>
<tr>
<td>§37.121</td>
<td>Fire detectors (thermal sensing and ionization sensing types)</td>
<td>Requirement that fire detectors of this type meet the standards specified in the FAA's &quot;Fire Detectors (Thermal Sensing and Ionization Sensing Types)&quot;</td>
</tr>
<tr>
<td>§37.127</td>
<td>Fire resistant aircraft sheet and structural material</td>
<td>Requirement that fire resistant aircraft materials must meet the standards set forth in the SAE (Society of Automotive Engineers) Specification AMS-3851A, &quot;Fire Resistant Properties for Aircraft Materials&quot;</td>
</tr>
<tr>
<td>§37.129</td>
<td>Portable water-solution type fire extinguishers</td>
<td>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</td>
</tr>
<tr>
<td>§37.130</td>
<td>Technical Standard Order C20: &quot;Combustion Heaters&quot;</td>
<td>Requirement that combustion heaters comply with SAE Aeronautical Standard AS143B: Heaters, Airplane, Internal Combustion Heat Exchanger Type (note: con-</td>
</tr>
<tr>
<td>Citation</td>
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</tr>
<tr>
<td>§37.140</td>
<td>Propeller feathering hose assemblies (rubber and wire braid construction)</td>
<td>Requirement that propeller feathering hose assemblies manufactured on or after March 1, 1957 meet the &quot;performance&quot; section of Military Specification MIL-H-8795 (ASG) or MIL-H-8790 and also meet appropriate fire tests (listed in text)</td>
</tr>
<tr>
<td>§37.152</td>
<td>Fuel and engine oil system hose assemblies (rubber or tetrafluoroethylene tube and wire braid construction)</td>
<td>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 &quot;3.3 Performance&quot; section of Specification MIL-H-8795A, Type B hoses standards of &quot;3.6 Performance&quot; section of MIL-H-25579 (USAF), Type C same as Type A and in addition must pass fire test specified in FAA &quot;Standard Fire Test Apparatus and Procedure&quot; (Power Plant Engineering Report No. 3), and Type D hoses same as Type B and in addition must pass FAA fire test mentioned above.</td>
</tr>
<tr>
<td>§37.178</td>
<td>Individual floatation devices</td>
<td>Requirement that new models of floatation devices (manufactured on or after May 1, 1972) must meet the requirements of the &quot;Federal Aviation Administration Standard, Individual Floatation Devices;&quot; contents of the standard are given in text and include testing of materials for flame resistance</td>
</tr>
<tr>
<td>§37.185</td>
<td>Fire detectors (radiation sensing type)</td>
<td>Requirement that new models, manufactured on or after the effective date of this sec-</td>
</tr>
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</table>
### Citation Subject Content

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-
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<tbody>
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<td>§121.225</td>
<td>Propeller deicing fluid</td>
<td>Requirement that if combustible fluid is used, the certificate holder must comply with §121.253 (Powerplant fire protection)</td>
</tr>
<tr>
<td>§121.227</td>
<td>Pressure cross-fed arrangements</td>
<td>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 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</td>
</tr>
<tr>
<td>§121.229</td>
<td>Location of fuel tanks</td>
<td>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</td>
</tr>
<tr>
<td>§121.231</td>
<td>Fuel system lines and fittings</td>
<td>Requirement that fuel lines be flexible and able to withstand vibration</td>
</tr>
<tr>
<td>§121.235</td>
<td>Fuel lines and fittings in designated fire zones</td>
<td>Requirement that fuel lines and fittings in each designated fire zone comply with §121.259 (Lines and fittings)</td>
</tr>
<tr>
<td>§121.235</td>
<td>Fuel valves</td>
<td>Requirement that fuel valves comply with §121.257 (Shut-off means), have adequately marked &quot;on&quot; and &quot;off&quot; positions and be supported so as not to transmit stress to fuel lines</td>
</tr>
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</tr>
<tr>
<td>§121.237</td>
<td>Oil lines and fittings in designated fire zones</td>
<td>Requirement that oil lines and fittings in designated fire zones comply with §121.259 (Lines and fittings)</td>
</tr>
<tr>
<td>§121.239</td>
<td>Oil valves</td>
<td>Requirement that oil valves comply with §121.257 (Shut-off means), have adequately marked &quot;on&quot; and &quot;off&quot; positions and be supported so as not to transmit stress to fuel lines</td>
</tr>
<tr>
<td>§121.243</td>
<td>Engine breather lines</td>
<td>Requirement that engine breather lines discharge in a location that does not constitute a fire hazard in case foaming occurs</td>
</tr>
<tr>
<td>§121.245</td>
<td>Fire walls</td>
<td>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</td>
</tr>
<tr>
<td>§121.247</td>
<td>Fire-wall construction</td>
<td>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 firewalls be protected against corrosion</td>
</tr>
<tr>
<td>§121.249</td>
<td>Cowling</td>
<td>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 (fireproof in areas subject to high temperatures)</td>
</tr>
<tr>
<td>§121.251</td>
<td>Engine accessory section diaphragm</td>
<td>Requirement that a diaphragm, complying with §121.247 (Fire-wall construction), be provided on air-cooled en-</td>
</tr>
<tr>
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</tr>
<tr>
<td>§121.253</td>
<td>Powerplant fire protection</td>
<td>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.</td>
</tr>
<tr>
<td>§121.255</td>
<td>Flammable fluids</td>
<td>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.</td>
</tr>
<tr>
<td>§121.257</td>
<td>Shutoff means</td>
<td>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.</td>
</tr>
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<td>Citation</td>
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</tr>
<tr>
<td>§121.259</td>
<td>Lines and fittings</td>
<td>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</td>
</tr>
<tr>
<td>§121.261</td>
<td>Vent and drain lines</td>
<td>Requirement that all vent and drain lines carrying flammable fluids through a designed fire zone must comply with §121.259 (Lines and fittings)</td>
</tr>
<tr>
<td>§121.263</td>
<td>Fire-extinguishing systems</td>
<td>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</td>
</tr>
<tr>
<td>§121.265</td>
<td>Fire-extinguishing agents</td>
<td>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</td>
</tr>
<tr>
<td>§121.267</td>
<td>Extinguishing agent container pressure relief</td>
<td>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</td>
</tr>
<tr>
<td>§121.269</td>
<td>Extinguishing agent container compartment temperature</td>
<td>Requirement that extinguishing agent containers be located where reasonable temperatures can be maintained for effective use of the extinguishing system</td>
</tr>
<tr>
<td>§121.271</td>
<td>Fire-extinguishing system materials</td>
<td>Requirement that fire-extinguishing system components located in a designated fire zone be fire-proof and that connections</td>
</tr>
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</tr>
<tr>
<td>§121.273</td>
<td>Fire-detector systems</td>
<td>Requirement that there be enough quick-acting fire detectors in each fire zone to detect any fire within that zone</td>
</tr>
<tr>
<td>§121.275</td>
<td>Fire detectors</td>
<td>Requirement that fire detectors be designed to resist vibration and other stresses, as well as exposure to fumes, oil, water and other fluids</td>
</tr>
<tr>
<td>§121.277</td>
<td>Protection of other airplane components against fire</td>
<td>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</td>
</tr>
<tr>
<td>§121.285 (b-6)</td>
<td>Carriage of cargo in passenger compartments</td>
<td>Requirement that if cargo is carried in a passenger compartment, the cargo bin must be made of material that is at least fire resistant</td>
</tr>
<tr>
<td>§121.287</td>
<td>Carriage of cargo in cargo compartments</td>
<td>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</td>
</tr>
</tbody>
</table>

Subpart K - Instrument and Equipment Requirements

<p>| §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 |</p>
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<tr>
<td>§121.310 (a-j)</td>
<td>Emergency evacuation</td>
<td>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</td>
</tr>
<tr>
<td>§121.312</td>
<td>Materials for compartment interiors</td>
<td>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</td>
</tr>
<tr>
<td>§121.317</td>
<td>No smoking signs</td>
<td>Provision for signs prohibiting smoking that are legible to passengers, that are controlled by crew</td>
</tr>
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<td><strong>Subpart N - Training Program</strong></td>
<td></td>
</tr>
<tr>
<td>§121.417</td>
<td>Crewmember emergency training</td>
<td>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</td>
</tr>
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<td><strong>Subpart V - Records and Reports</strong></td>
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</tr>
<tr>
<td>§121.703(a-1)</td>
<td>Mechanical reliability</td>
<td>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</td>
</tr>
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<tr>
<td>Part 135</td>
<td>Air Taxi Operators and Commercial Operators of Small Aircraft</td>
<td>fire warnings in flight</td>
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<tr>
<td>SFAR 23</td>
<td>Doors and exits</td>
<td>Refers to regulation in Part 23</td>
</tr>
<tr>
<td>SFAR No.55 - Fire detector system</td>
<td></td>
<td>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</td>
</tr>
<tr>
<td>SFAR No.56 - Fire protection, cowling and nacelle skin</td>
<td></td>
<td>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</td>
</tr>
<tr>
<td>SFAR No.57 - Flammable fluid fire protection</td>
<td></td>
<td>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</td>
</tr>
<tr>
<td>§135.161 Fire extinguishers: passenger-carrying aircraft</td>
<td></td>
<td>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</td>
</tr>
<tr>
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</tr>
<tr>
<td>Part 139 - Certification and Operations: Land Airports Serving CAB-Certificated Air Carriers</td>
<td>Airport fire fighting and rescue equipment and service</td>
<td>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</td>
</tr>
<tr>
<td>§139.49</td>
<td>Handling and storing hazardous articles and materials</td>
<td>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</td>
</tr>
<tr>
<td>§139.51</td>
<td>Airport fire fighting and rescue equipment and service</td>
<td>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</td>
</tr>
<tr>
<td>§139.89</td>
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<tr>
<td>§159.121</td>
<td>Cleaning fluids</td>
<td>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</td>
</tr>
<tr>
<td>§159.123</td>
<td>Open-flame operations</td>
<td>Requirement that no open-flame operations may be conducted in the airport without permission of the manager</td>
</tr>
<tr>
<td>§159.125</td>
<td>Smoking</td>
<td>Prohibition of smoking on any airport ramp, apron, hanger, shop, aircraft or any other area prohibited by the manager</td>
</tr>
<tr>
<td>§159.127</td>
<td>Storage</td>
<td>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</td>
</tr>
<tr>
<td>§159.129</td>
<td>Apron surfaces areas and floor surfaces</td>
<td>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</td>
</tr>
<tr>
<td>§159.131</td>
<td>Doping</td>
<td>Requirement that doping operations be conducted only in a properly designed, fireproof and ventilated</td>
</tr>
</tbody>
</table>

Part 159 - National Capital Airports (includes Washington National Airport and Dulles International Airport)

Subpart E - Fire Hazards and Fueling Operations
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<tr>
<td>§159.133</td>
<td>Fueling operations</td>
<td>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.</td>
</tr>
<tr>
<td>§159.159</td>
<td>Fire apparatus</td>
<td>Requirement that each tenant or lessee of airport property supply and maintain adequate fire extinguishers that the manager considers necessary.</td>
</tr>
</tbody>
</table>

Subpart F - Obligations of Tenants
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 extended 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.
FHWA REGULATIONS

Title 49 - Transportation, Code of Federal Regulations

<table>
<thead>
<tr>
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<td>§392.8</td>
<td>Inspection and use of emergency equipment</td>
<td>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</td>
</tr>
<tr>
<td>Subpart F - Fueling Precautions</td>
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<tr>
<td>§392.50</td>
<td>Prevention of fuel ignition</td>
<td>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</td>
</tr>
<tr>
<td>§392.51</td>
<td>Reserve fuel</td>
<td>Requirement that no supply of fuel be carried in the motor vehicle other than in properly mounted fuel tanks</td>
</tr>
<tr>
<td>§392.52</td>
<td>Fueling of buses</td>
<td>Provision that no bus be fueled in a closed building with passengers aboard</td>
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<tr>
<td>Subpart G - Prohibited Practices</td>
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<tr>
<td>§392.67</td>
<td>Flame-producing heater on vehicle in motion</td>
<td>Prohibition of use of open flame heaters while vehicle is in motion</td>
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<td>Part 393 - Parts and Accessories Necessary for Safe Operations</td>
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<tr>
<td>§393.28</td>
<td>Protection of wiring</td>
<td>Provision that insofar as possible, wiring not be adjacent to any part of the fuel system</td>
</tr>
<tr>
<td>Subpart E - Fuel Systems</td>
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<tr>
<td>§393.65</td>
<td>All fuel systems</td>
<td>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</td>
</tr>
<tr>
<td>§393.67</td>
<td>Liquid fuel tanks</td>
<td>Provision that fill pipe be constructed to minimize the risk of fuel spillage during fueling or in case of a crash</td>
</tr>
<tr>
<td>§393.69</td>
<td>Liquefied petroleum gas systems</td>
<td>Requirement that all liquefied petroleum gas systems conform to the &quot;Standards for the Storage and Handling of Liquefied Petroleum Gases&quot; of the National Fire Protection Association</td>
</tr>
<tr>
<td>Subpart G - Miscellaneous Parts and Accessories</td>
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<tr>
<td>§393.76 (g)</td>
<td>Sleeper berths</td>
<td>Provision that sleeper berths be located such that leaks in the fuel system will not cause fuel to enter the sleeper berth</td>
</tr>
<tr>
<td>§393.77</td>
<td>Heaters</td>
<td>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</td>
</tr>
<tr>
<td>Citation</td>
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<tr>
<td>§393.83 (a)</td>
<td>Exhaust system location</td>
<td>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</td>
</tr>
<tr>
<td>§393.84</td>
<td>Floors</td>
<td>Provision that floors be constructed to minimize entrance of fumes, exhaust gases or fire; provision that floors not be permeated with oil or gasoline</td>
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<tr>
<td>§393.91</td>
<td>Bus aisle</td>
<td>Seating in aisle prohibited</td>
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<tr>
<td>§393.91</td>
<td>Emergency doors</td>
<td>Provision for marking emergency doors on bus</td>
</tr>
<tr>
<td>§393.96</td>
<td>Emergency equipment</td>
<td>Specifications for first aide kit on bus</td>
</tr>
<tr>
<td>Subpart H - Emergency Equipment</td>
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</tbody>
</table>
| §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 |
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<thead>
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<tbody>
<tr>
<td>§397.11</td>
<td>Fires</td>
<td>Requirement that a motor vehicle containing hazardous materials not be operated or parked near an open fire</td>
</tr>
<tr>
<td>§397.13</td>
<td>Smoking</td>
<td>Requirement that smoking not be allowed within 25 feet of any motor vehicle containing hazardous materials</td>
</tr>
<tr>
<td>§397.15</td>
<td>Fueling</td>
<td>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</td>
</tr>
</tbody>
</table>
### NHTSA REGULATIONS

**Code of Federal Regulations**  
**Title 49 - Transportation**  

<table>
<thead>
<tr>
<th>Citation</th>
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<tbody>
<tr>
<td><strong>CHAPTER 5 - NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION</strong></td>
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<tr>
<td>§571.217</td>
<td>Emergency exit</td>
<td>Provisions for window retention and release identification and type for emergency use (school bus)</td>
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<tr>
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<tr>
<td>§571.301-75</td>
<td>Standard No.301-75; Fuel System Integrity</td>
<td>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</td>
</tr>
<tr>
<td>§571.302</td>
<td>Standard No. 302; Flammability of Interior Materials</td>
<td>Specifications for flammability testing of all materials used in occupant compartments of motor vehicles</td>
</tr>
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</tr>
<tr>
<td>§225.5(b)</td>
<td>Definition of accident/incident</td>
<td>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.</td>
</tr>
<tr>
<td>§225.11(a)</td>
<td>Reports of accidents/incidents</td>
<td>Requirement that each railroad must submit to FRA a monthly report of all railroad accidents/incidents</td>
</tr>
<tr>
<td>§230.221(b)</td>
<td>Frames and parts</td>
<td>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</td>
</tr>
<tr>
<td>§230.255(a),(b)</td>
<td>Fuel tanks and piping; safety cut-out valve</td>
<td>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.</td>
</tr>
<tr>
<td>§230.257</td>
<td>Ground fuel tanks</td>
<td>Requirement that fuel tanks and related piping be electrically grounded</td>
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<tr>
<td>§230.327</td>
<td>Oil burning fire boxes</td>
<td>Provision of means for expelling accumulated gases from fire box of oil-burning boilers before fire is lighted.</td>
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</table>
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
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<tr>
<td>§2.20-65</td>
<td>Immediate notice of certain hazardous materials incidents</td>
<td>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</td>
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<tr>
<td>§2.20-70</td>
<td>Detailed hazardous materials incident reports</td>
<td>Description of the types of incidents to be reported and the form for reporting such incidents</td>
</tr>
<tr>
<td>§2.75-25</td>
<td>Portable fire extinguishers</td>
<td>Requirement that portable fire extinguishers be labeled as &quot;marine type&quot; 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 &quot;recognized&quot;</td>
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SUBCHAPTER B - MERCHANT MARINE OFFICERS AND SEAMEN

Part 10 - Licensing of Officers and Motorboat Operators and Registration of Staff Officers

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<td>§10.20-5</td>
<td>Professional examinations</td>
<td>Requirement that as part of the examination for licensing, the applicant be questioned regarding fire protection and extinguishment</td>
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</table>
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 fire extinguishing systems required for different types of vessels

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<td>Subpart 25.35</td>
<td>Backfire Flame Control</td>
<td>Requirement of backfire flame arresters in accordance with Subpart 162.042 of Subchapter Q (Specifications)</td>
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<tr>
<td>Subpart 25.40</td>
<td>Ventilation</td>
<td>Prohibition of the use of ventilating system required on all motorboats or motor vessels, except open boats</td>
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<tr>
<td>Subpart 25.45</td>
<td>Liquefied Petroleum Gas</td>
<td>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</td>
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SUBCHAPTER D - TANK VESSELS

Part 30 - General Provisions

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<tr>
<td>§30.10</td>
<td>Definition of terms used in regulations</td>
<td>Definition of flammable/inflammable, flammable liquid, flame arrester, flame screen, flashpoint and liquefied flammable gas (see attached list)</td>
</tr>
<tr>
<td>§30.25-1</td>
<td>Commodities regulated by Subchapter D</td>
<td>Alphabetized list of all regulated commodities</td>
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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, portable extinguishers, sand and fire axes.
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<td>Part 35 -</td>
<td>Operations</td>
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<tr>
<td>§35.01-1</td>
<td>Inspection and testing required when making alterations, repairs or other such operations involving riveting, welding, burning, or like fire-producing actions</td>
<td>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 &quot;Standards for the Control of Gas Hazards on Vessels to be Repaired&quot; NFPA No. 306</td>
</tr>
<tr>
<td>§35.01-35</td>
<td>Repairs and alterations to fire fighting equipment</td>
<td>Requirement that no extensive repairs be made to any fire-extinguishing apparatus without advance notice to the Officer in Charge, Marine Inspection</td>
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<td>Subpart 35.10</td>
<td>Fire and Emergency Requirements</td>
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<td>§35.10-1</td>
<td>Station bills, muster lists and line-throwing appliance drills</td>
<td>Requirement that before vessel sails, special duties be assigned to the crew for emergency situations</td>
</tr>
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<td>§35.10-3</td>
<td>Display of plans</td>
<td>Requirement that general arrangement plans for fire emergencies be permanently exhibited</td>
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<td>§35.10-5</td>
<td>Emergency signals; fire and lifeboat drills</td>
<td>Specification of procedures for fire and lifeboat drills</td>
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<tr>
<td>Subpart 35.30</td>
<td>General Safety Rules</td>
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</table>
| §35.30-1(b)| Warning signals and signs                                                 | Requirement of warning sign at gangway stating:  
No open lights  
No smoking  
No visitors                                                                                                                                 |
<p>| §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                                                                             |</p>
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<tr>
<td>§35.30-10</td>
<td>Cargo tank hatches, ullage holes and Butterworth plates</td>
<td>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</td>
</tr>
<tr>
<td>§35.30-15</td>
<td>Combustible gas indicator</td>
<td>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</td>
</tr>
<tr>
<td>§35.30-20</td>
<td>Emergency equipment</td>
<td>Description of required emergency equipment, including, among others, fire axes and fire protective clothing</td>
</tr>
<tr>
<td>§35.30-25</td>
<td>Explosives</td>
<td>Requirement that materials with certain explosive qualities not be accepted, stored, stowed or transported aboard tank vessels</td>
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<tr>
<td>§35.30-35</td>
<td>Spark-producing devices</td>
<td>Specification of conditions under which spark-producing devices may be used on vessels carrying Grade A, B, C and D liquid cargoes</td>
</tr>
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<td>§35.30-40</td>
<td>Flammable liquid and gas fuels as ship's stores</td>
<td>Specifications for the storage and labelling of flammable liquids and gases</td>
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<tr>
<td>§35.30-45</td>
<td>Motion picture film</td>
<td>Requirement that only acetate or slow-burning film may be used. Nitrocelulose film is prohibited</td>
</tr>
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<tr>
<td><strong>Subpart 35.35 Cargo Handling</strong></td>
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<tr>
<td>§35.35-1(c)</td>
<td>Men on duty</td>
<td>Requirement that certified tankerman in charge of an unmanned barge shall insure that approved portable extinguishers as required by Table 34.50-10 (a) of this chapter are on board prior to transfer of cargo</td>
</tr>
<tr>
<td>§35.35-20</td>
<td>Inspection prior to transfer of cargo</td>
<td>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</td>
</tr>
<tr>
<td>§35.35-25</td>
<td>Approval of start transfer of cargo</td>
<td>Requirement that senior deck officer approve transfer only after conditions of §35.35-20 and §35.35-20 have been met</td>
</tr>
<tr>
<td>§35.35-30</td>
<td>&quot;Declaration of Independence&quot; for tankships</td>
<td>Requirement that a &quot;Declaration of Independence&quot; relating to the regulations of §35.35-20 be filled out and signed by the senior deck officer</td>
</tr>
<tr>
<td>§35.35-35</td>
<td>Duties of senior deck officer during transfer operations</td>
<td>Specification of duties relating to safe transfer of cargo</td>
</tr>
<tr>
<td>§35.35-40</td>
<td>Conditions under which transfer operations shall not be commenced</td>
<td>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</td>
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<tr>
<td>§35.35-45 through §35.35-75</td>
<td>Additional regulations relating to safe transfer of cargo</td>
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<tr>
<td>Subpart 35.40</td>
<td>Marking of fire and emergency equipment</td>
<td>Description of markings required for general alarm contact markers, general alarm contact makers, general alarm bells, carbon dioxide alarms, steam, foam or CO2 fire smothering apparatus, fire hose stations, foam hose/monitor stations, water spray systems, emergency equipment and fire extinguishers</td>
</tr>
</tbody>
</table>

**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 Combustible 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**
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<tbody>
<tr>
<td>§40.01-1 through §40.15-1</td>
<td>Provisions for carrying certain flammable or combustible dangerous cargoes in bulk</td>
<td>Regulations pertaining to the design and construction of vessels carrying ethylene oxide, propylene oxide and vinyl chloride</td>
</tr>
</tbody>
</table>

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

**SUBCHAPTER F - MARINE ENGINEERING**

**Subpart 58.01 - General Requirements**

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<tr>
<th>§58.01-10</th>
<th>Fuel for internal combustion engines on passenger vessels</th>
<th>Requirement that all internal combustion engines on passenger vessels use fuel with a flashpoint exceeding 110° F (Pensky-Martens Closed Cup Method, ASTM-D93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>§58.01-15</td>
<td>Fuel oil for boilers</td>
<td>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)</td>
</tr>
</tbody>
</table>

**Subpart 58.03 - Adoption of Standards and Specifications**

<table>
<thead>
<tr>
<th>§58.03-20</th>
<th>National Fire Protection Association</th>
<th>Provision that the standards of the NFPA are adopted and form part of this subchapter (Marine-Engineering)</th>
</tr>
</thead>
</table>

**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.
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Subpart 58.16</td>
<td>Liquefied Petroleum Gases for Cooking and Heating</td>
<td>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</td>
</tr>
<tr>
<td>Subpart 58.30 - Fluid Power and control systems</td>
<td>§58.30-10 Hydraulic fluid</td>
<td>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 &quot;Open Cup&quot; 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</td>
</tr>
<tr>
<td>Subpart 58.50 - Independent Fuel Tanks</td>
<td>58.50-1 General Requirements</td>
<td>Provision that passenger vessels may not carry more than 40 gallons of gasoline and that the fuel must have a flashpoint exceeding 110°F</td>
</tr>
<tr>
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**SUBCHAPTER H - PASSENGER VESSELS**

**Part 70 - General Provisions**

**Subpart 70.05 - Applications**

| §70.05-30       | Combustible 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 portable and fixed fire extinguishers be checked using specific tests (listed) and all fire detecting and extin- |
§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.
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SUBCHAPTER I - CARGO AND MISCELLANEOUS VESSELS

Part 90 - General Provisions

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**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     | 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**

<p>| §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- |</p>
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<td>§111.85-90</td>
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<td>Special requirements include fire safety measures such as prohibition of portable electrical equipment in and around bulk cargo tanks</td>
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**§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**

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**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 explosibility 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.
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<td>§ Subpart 162.043</td>
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<td>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</td>
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<tr>
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<td>Bulkhead panels</td>
<td>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</td>
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<td>§ Subpart 164.009</td>
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<td>Specifications for non-combustible materials allowed for use in merchant vessel construction and required testing of such materials</td>
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<td>§ Subpart 164.012</td>
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**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-
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<td>§Subpart 167.45</td>
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<td>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</td>
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<td>§Subpart 167.55</td>
<td>Special markings required</td>
<td>Requirements for marking of general alarm bell switch and bells; steam foam and CO₂ fire smothering apparatus, fire hose stations, emergency squad equipment and fire extinguishers</td>
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<td>Any liquid whose flash-point, as determined by an open cup tester is above 80°F</td>
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<td>§188.10-43 Liquified flammable gas</td>
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<td>Inspection and testing required when making alterations, repairs or other such operations involving riveting, welding, burning or like fire-producing actions</td>
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<td>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</td>
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<td>Requirement of means to stop all ventilation fans in case of fire</td>
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<td>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.</td>
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<td>Part 194 - Handling, Use and Control of Explosives and Other Dangerous Articles (§194.01 - §194.90)</td>
<td>Provision for storage and labeling of explosive and dangerous articles, including flammable liquids, flammable solids and combustible liquids</td>
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<td>§196.15-60 Firefighting equipment, general</td>
<td>Requirement that the owner be responsible for maintaining of all firefighting equipment and that at least every 12 months all equipment be tested and inspected</td>
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<td>§196.30-10 Notice required before repair</td>
<td>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</td>
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<td>§Subject 196.60 Motion picture film and equipment</td>
<td>Provision that only acetate or slow-burning film may be used; nitrocellulose film is prohibited</td>
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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 Reid¹ vapor pressure of 14 pounds or more
(b) Grade B. Any flammable liquid having a Reid¹ vapor pressure under 14 pounds and over 8 1/2 pounds
(c) Grade C. Any flammable liquid having a Reid¹ 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:

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<td>Tab closed-cup</td>
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<tr>
<td>°F</td>
<td>°F</td>
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<tr>
<td>80</td>
<td>75</td>
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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 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.
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**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
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<td>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</td>
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<td>Requirement that each PPC have at least 8 fire axes distributed so as to be readily available</td>
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<td>Requirement that each PPC have at least 2 fireman's outfits with description of required contents</td>
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<td>Requirement that one fire pump be kept ready for use at all times</td>
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