FUEL SYSTEM GUIDELINES
RURAL AIRPORTS – LEASING AND PROPERTY MANAGEMENT
DEPARTMENT OF TRANSPORTATION, STATE OF ALASKA

The following information should be used for tank placement or upgrade on state owned and operated airports. These requirements are contained in the National Fire Protection Association (NFPA) codes, the International Fire Code (IFC) and the State Regulatory Code (13 AAC 50.025.) **Please note, these guidelines are meant to assist you,** however each tenant **MUST contact the STATE FIRE MARSHAL and the respective Leasing Office for written approval PRIOR to the installation, upgrade or modification of a fuel system on State airports.**

Prior to placing a fuel system on a leasehold, whether a fixed above-ground fuel tank, an aircraft fueling vehicle or an alternative fueling container, the lease or permit must contain provisions authorizing fuel storage and dispensing. If the lease or permit does not, then a request for the authorization to store and dispense fuel must be forwarded to the Leasing Office for review and approval. Upon approval of the request, a supplement to the lease, permit or concession authorizing fuel storage/dispensing will be issued.

Please be advised that as landowner, the State can require more stringent standards for fuel systems than current codes require. Items such as a spill response plan; fueling requirements, environmental indemnification, and capacity of containment areas are provisions that are being added to contracts through supplements and upon lease, permit or concession renewal. These items have proved necessary over the years to safeguard the State's interests.

SECTION I

ALL FUEL SYSTEMS
Regardless of size, whether mobile, or stationary must meet the following:

A. LABELING AND SIGNAGE

13 AAC 50.025 (97). Revises IFC Chapter 34, Subsection 3403.5.1. Signs warning of the hazard of flammable liquids shall have either white lettering on a red background or red lettering on a white background, and shall read: **DANGER—FLAMMABLE LIQUIDS**.

DANGER—FLAMMABLE LIQUIDS signs must be installed on all sides of the tank. The type of fuel and the tank's capacity must be shown. The owner and the contact telephone number must be shown on at least two sides of each tank or vehicle.

IFC 3403.5.1. **Style.** Warning signs shall be of a durable material. Letters shall not be less than 3 inches in height and 0.5 inch in stroke.

IFC 2703.5. **Hazard identification signs.** Unless otherwise exempted by the code official, visible hazard identification signs as specified in NFPA 704 for the specific material contained shall be placed on stationary **containers** and above-ground **tanks** and at **entrances** to locations where hazardous materials are stored, dispensed, used or handled in quantities requiring a permit and at specific entrances and locations designated by the code official.

B. **BONDING (**more commonly referred to as grounding**)**

All fuel systems shall be bonded with a heavy duty bare or plastic coated ground cable and be stored on a reel or in a compartment provided for no other purpose. Such cable shall be metallically connected to the transfer apparatus or chassis of the aircraft-fueling vehicle on one end and shall be provided with a suitable metal clamp on the other end, to be fixed to the aircraft. Stationary fuel systems are bonded to the ground at all times. Aircraft Fueling Vehicles are bonded when fueling and when parked.

IFC 1106.2. **Airport fuel systems**. Airport fuel systems shall be designed and constructed in accordance with NFPA 407.

NFPA 407 2-1.2.1. A provision for bonding shall be incorporated in the design of fuel servicing vehicles and systems to prevent differences in electrostatic potential.

NFPA 407 2-1.2.2. Bonding cables shall be constructed of conductive, durable, and flexible material.

NFPA 407 2-1.2.3. Bonding connections shall be electrically and mechanically firm. Jacks, plugs, clamps and connecting points shall be clean, unpainted metal to provide a positive electrical connection.

NFPA 407 3-4.1. Prior to making any fueling connection to the aircraft, the fueling equipment shall be bonded to the aircraft by use of a cable. The bond shall be maintained until fueling connections have been removed.

IFC 1106.5.2.1. Conductive hose shall be used for all fueling operations.

IFC 1106.5.2.2. **Bonding conductors on transfer nozzles.** Transfer nozzles shall be equipped with approved bonding conductors which shall be clipped or otherwise positively engaged with the bonding attachment provided on the aircraft adjacent to the fuel tank cap prior to removal of the cap.

IFC 1106.3.7.2. **Bonding cable protection.** The bonding cable shall be bare or have a transparent protective sleeve and be stored on a reel or in a compartment provided for no other purpose. It shall be carried in such a manner that it will not be subjected to sharp kinks or accidental breakage under conditions of general use.

C. EMERGENCY SHUT-OFF

IFC 2203.2. **Emergency disconnect switches.** An approved, clearly identified and readily accessible emergency disconnect switch shall be provided at an approved location, to stop the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. An emergency disconnect switch for exterior fuel dispensers shall be located within 100 feet of, but not less than 20 feet from, the fuel dispensers. Such devices shall be distinctly labeled as**: EMERGENCY FUEL SHUTOFF**. Signs shall be provided in approved locations.

NFPA 407 2-5.9.3. Each emergency fuel shutoff station location shall be placarded "**EMERGENCY FUEL SHUTOFF**" in letters at least 2 inches high. The method of operation shall be indicated by an arrow or by the word "**PUSH**" or "**PULL**" as appropriate.

FC 1106.6.1. **Accessibility.** Emergency fuel shutoff controls shall be readily accessible at all times when the fueling system is being operated.

IFC 1106.6.2. **Notice.** The fueling-system operator shall establish a procedure by which the fire department will be notified in the event of an activation of an emergency fuel shutoff control.

IFC 1106.6.3. **Determining cause.** Prior to reestablishment of normal fuel flow, the cause of fuel shutoff conditions shall be determined and corrected.

IFC 1106.6.4. **Testing.** Emergency fuel shutoff devices shall be operationally tested at intervals not exceeding three months. The fueling-system operator shall maintain suitable records of these tests.

D. ELECTRICAL

Stationary fuel systems that use standard AC electrical current must have the electrical connection(s) hardwired to the pump and power source. Mobile fuel systems that use either a DC electrical battery, or standard AC electrical current must be hardwired at the pump, but may use clips or other approved connection

devices at the source. For either electrical system, all connections will be made with the proper explosive proof electrical connectors and the wiring will be one continuous piece of heavy electrical cable. For either electrical system, the electrical source must be at least 50 feet from the pump. When the fuel system is not in use, the electricity must be turned off. If a battery is being used for the power source, the battery shall be disconnected and not stored with the tank.

IFC 1106.14. **Electrical equipment.** Electrical equipment, including but not limited to, battery chargers, ground or auxiliary power units, fans, compressors or tools, shall not be operated, nor shall they be connected or disconnected from their power source, during fuel service operations.

IFC 1106.14.1. **Other equipment.** Electrical or other spark-producing equipment shall not be used within 10 feet of fueling equipment, aircraft fill or vent points, or spill areas unless that equipment is intrinsically safe and approved for use in an explosive atmosphere.

IFC 1106.3.4. **Protection of electrical equipment.** Electric wiring, switches, lights and other sources of ignition, when located in a compartment housing piping, pumps, air eliminators, water separators, hose reels or similar equipment, shall be enclosed in a vapor-tight housing. Electrical motors located in such a compartment shall be of a type approved for use as specified in ICC Electrical Code.

E. FIRE EXTINGUISHERS

IFC 906.2. **General requirements.** Fire extinguishers shall be selected, installed and maintained in accordance with this section and NFPA 10.

NFPA 10 4-3.1. Fire extinguishers shall be inspected when initially placed in service and thereafter at approximately 30-day intervals.

NFPA 10 4-3.2. Periodic inspection of fire extinguishers shall include a check of at least the following items:

(a) Located in designated place.
(b) No obstruction to access or visibility.
(c) Operating instructions on nameplate legible and facing outward.
(d) Safety seals and tamper indicators not broken or missing.
(e) Fullness determined by weighing or “hefting.”
(f) Examined for obvious physical damage, corrosion, leakage, or clogged nozzle.
(g) Pressure gauge reading or indicator in the operable range or position.
(h) For wheeled units, the condition of the tires, wheels, carriage, hose and nozzle checked.

NFPA 10 4-4.1. **Frequency**. Maintenance shall be perrformed on all fire extinguishers annually.

NFPA 10 4-4.3. Each fire extinguisher shall have a tag or label securely attached that indicates the month and year the maintenance was performed and that identifies the person performing the service.

IFC 1105.6. **At fuel-dispensing stations.** Portable fire extinguishers at fuel-dispensing stations shall be located such that pumps or dispensers are not more than 75 feet from one such extinguisher. Fire extinguishers shall be provided as follows:

> Where the open-hose discharge capacity of the fueling system is not more than 200 gallons per minute, a minimum of two listed portable fire extinguishers complying with IFC 906 and having a minimum rating of 20-B:C shall be provided.

IFC 1105.7. **Fire extinguisher access.** Portable fire extinguishers required by this chapter shall be accessible at all times. Where necessary, provisions shall be made to clear accumulations of snow, ice and other forms of weather-induced obstructions.

IFC 1105.7.1. **Cabinets.** Cabinets and enclosed compartments used to house portable fire extinguishers shall be clearly marked with the words **FIRE EXTINGUISHER** in letters at least 2 inches high. Cabinets and compartments shall be readily accessible at all times.

F. FUEL HOSE AND NOZZLES

When not in use hoses will be coiled, either on a hose reel, or at the dispenser. All couplings must meet current standards for fuel hoses. Worm screw clamps and taped connectors are not allowed. Nozzles must be provided with a dust cap or placed into a container when not in use to avoid fuel contamination and to prevent spillage onto the ground.

IFC 1106.3.3. **Dispensing hoses and nozzles.** Hoses shall be designed for the transferring of hydrocarbon liquids and shall not be any longer than necessary to provide efficient fuel transfer operations. Hoses shall be equipped with an approved shutoff nozzle. Fuel-transfer nozzles shall be self-closing and designed to be actuated by hand pressure only. Notches and other devices shall not be used for holding a nozzle valve handle in the open position. Nozzles shall be equipped with a bonding cable complete with proper attachment for aircraft to be serviced.

IFC 1106.7. **Protection of hoses.** Before an aircraft-fueling vehicle is moved, fuel transfer hoses shall be properly placed on the approved reel or in the

compartment provided, or stored on the top decking of the fueling vehicle if proper height rail is provided for security and protection of such equipment. Fuel-transfer hose shall not be looped or draped over any part of the fueling vehicle, except as herein provided. Fuel-transfer hose shall not be dragged when such fueling vehicle is moved from one fueling position to another.

IFC 2206.7.1. **Listed equipment.** Electrical equipment, dispensers, hose, nozzles and submersible or subsurface pumps used in fuel-dispensing systems shall be listed.

IFC 1106.19. **Maintenance of aircraft-fueling hose.** Aircraft-fueling hoses shall be maintained in accordance with IFC 1106.19.1 through IFC 1106.19.4.

IFC 1106.19.1. **Inspections.** Hoses used to fuel or defuel aircraft shall be inspected periodically to ensure their serviceability and suitability for continued service. The fuel-service operator shall maintain records of all tests and inspections performed on fueling hoses. Hoses found to be defective or otherwise damaged shall be immediately removed from service.

IFC 1106.19.1.1. **Daily inspection.** Each hose shall be inspected daily. This inspection shall include a complete visual scan of the exterior for evidence of damage, blistering or leakage. Each coupling shall be inspected for evidence of leaks, slippage or misalignment.

IFC 1106.19.1.2. **Monthly inspection.** A more thorough inspection, including pressure testing, shall be accomplished for each hose on a monthly basis. This inspection shall include examination of the fuel delivery inlet screen for rubber particles, which indicates problems with the hose lining.

IFC 1106.19.2. **Damaged hose.** Hose that has been subjected to severe abuse shall be immediately removed from service. Such hoses shall be hydrostatically tested prior to being returned to service.

IFC 1106.19.3. **Repairing hose.** Hoses are allowed to be repaired by removing the damaged portion and re-coupling the undamaged end. When re-coupling hoses, only couplings designed and approved for the size and type of hose in question shall be used. Hoses repaired in this manner shall be visually inspected and hydrostatically tested prior to being placed back in service.

IFC 1106.19.4. **New hose.** New hose shall be visually inspected prior to being placed into service.

G. FUEL SPILL RESPONSE PLAN

A fuel spill prevention and response plan acceptable to the State will be located at the fuel dispensing equipment at all times. Adequate absorbent materials and tools will be available on the premises to maintain a fuel spill and response capability.

H. PASSENGERS

IFC 1106.9. **Passengers.** Passenger traffic is allowed during the time fuel transfer operations are in progress, provided the following provisions are strictly enforced by the owner of the aircraft or the owner's authorized employee:

1. Smoking and producing an open flame in the cabin of the aircraft or the outside thereof within 50 feet of such aircraft shall be prohibited.

A qualified employee of the aircraft owner shall be responsible for seeing that the passengers are not allowed to smoke when remaining aboard the aircraft or while going across the ramp from the gate to such aircraft, or vice versa.

2. Passengers shall not be permitted to linger about the plane, but shall proceed directly between the loading gate and the aircraft.

3. Passenger loading stands or walkways shall be left in loading position until all fuel transfer operations are completed.

4. Fuel transfer operations shall not be performed on the main exit side of any aircraft containing passengers except when the owner of such aircraft or a capable and qualified employee of such owner remains inside the aircraft to direct and assist the escape of such passengers through regular and emergency exits in the event fire should occur during fuel transfer operations.

I. GRAVITY FEED

Gravity feed systems shall not be used for servicing any aircraft, vehicle or equipment.

SECTION II

FIXED ABOVE-GROUND FUEL TANKS
Fire Rated (Protected), Single Wall and Double Wall Tanks

On many rural airport lease lots a fire rated or “protected” fuel tank is the only type of tank that can be accommodated given the required set back distances shown on IFC Table 2206.2.3. On large lots with sufficient setbacks a non-fire

rated (either single or double wall) tank may be permitted. All fixed tanks must be protected by bollards. In using IFC Table 2206.2.3:

AV Gas 100LL is a Class 1 Flammable Liquid.
Jet A fuel is a Class II Combustible Liquid.

A. LOCATING PROTECTED AND SINGLE WALL (OR DOUBLE WALL) TANKS

All fuel tanks must be approved by the State Fire Marshal's office and the Leasing office via a plan review and a building permit certificate prior to installation on the airport.

IFC 2206.2.3. **Above-ground tanks located outside, above grade**. Above-ground tanks shall not be used for the storage of Class I, II or IIIA liquid motor fuels **except** as provided by this section.

1. Above-ground tanks used for outside, above-grade storage of liquid motor fuel shall be listed and labeled as **protected above-ground tanks** and be in accordance with IFC Chapter 34. Such tanks shall be located in accordance with IFC Table 2206.2.3.

2. Above-ground tanks used for above-grade storage of Class II or IIIA liquids are allowed to be protected above-ground tanks or, when approved by the code official, **other** above-ground **tanks** that comply with IFC Chapter 34. Tank locations shall be in accordance with IFC Table 2206.2.3. Tanks containing motor fuels shall not exceed 12,000 gallons in individual capacity or 48,000 gallons in aggregate capacity. Installations with the maximum allowable aggregate capacity shall be separated from other such installations by not less than 100 feet.

13AAC 50.025 (73). Revises IFC Chapter 22, Subsection 2206.2.3 by adding an item 3:

3. Approved above-ground atmospheric tanks may be used without a special enclosure or fire rating if the following criteria are met:

A. Tanks must be located as required for "**Other Tanks**" by IFC Table 2206.2.3;

B. Tanks must be enclosed by a six-foot high industrial type chain link fence with a minimum of two access gates located at the opposite side of the enclosure. Each gate must be at least 36 inches wide. There must be a minimum working distance of five feet between the tank and the fence.

NFPA 407 2-1.3. No Smoking Signs. Entrances to fueling areas shall be posted with "**No Smoking**" signs.

TABLE F2206.2.3
MINIMUM SEPARATION REQUIREMENTS FOR ABOVE-GROUND TANKS

CLASS OF LIOUID AND TANK TYPE	INDIVIDUAL TANK CAPACITY (Gallons)	MINIMUM DISTANCE FROM NEAREST IMPORTANT BUILDING ON SAME PROPERTY (Feet)	MINIMUM DISTANCE FROM NEAREST FUEL DISPENSER (Feet)	MINIMUM DISTANCE FROM A LOT LINE WHICH IS OR CAN BE BUILT UPON, INCLUDING THE OPPOSITE SIDE OF A PUBLIC WAY (Feet)	MINIMUM DISTANCE FROM NEAREST SIDE OF ANY PUBLIC WAY (Feet)	MINIMUM DISTANCE BETWEEN TANKS (Feet)
Class I protected above ground tanks or tanks in vaults	Less than or equal to 6,000	5	25	15	5	3
	Greater than 6,000	15	25	25	15	3
Class II and III protected above-ground or tanks in vaults	Same as Class I	Same as Class I	Same as Class I	Same as Class I	Same as Class I	Same as Class I
Other tanks Single and double walled, unprotected.	**All**	**50**	**50**	**100**	**50**	**3**

B. SINGLE WALLED TANKS – ADDITIONAL REQUIREMENTS

In addition to the fencing and increased setback requirements shown above for **other tanks** the system must be placed in a lined containment area. Minimum liner requirements are 20 mil HDPE liner with 2% black carbon fiber. If the fuel tank is within the Airport security fence no further fencing is needed.

The volumetric capacity of the diked area shall be capable of holding 110% of the total volume of all tanks within the diked area.

IFC 3404.2.10. Drainage and Diking. The area surrounding a tank or group of tanks shall be provided with drainage control or shall be diked to prevent accidental discharge of liquid from endangering adjacent tanks, adjoining property or reaching waterways.

SECTION III

AIRCRAFT FUELING VEHICLES

NFPA 407 1-3 **Definitions**. **Aircraft Fuel Servicing Tank Vehicle** (**Fueler**) – A vehicle having a cargo tank (tank truck, tank full trailer, tank semitrailer) designed for or used in the transportation and transfer of fuel into or from an aircraft.

Tank Truck – A self-propelled vehicle having a cargo tank for the transportation of aviation fuel.

Tank Full Trailer – a vehicle that is not self-propelled and that has a cargo tank for the transportation of aviation fuel mounted thereon or built as an integral part thereof. It is so constructed that its weight and load rest on its own wheels. **NOTE: TANKS ON TRAILERS ARE LIMITED TO 660 GALLONS.** Over 660-gallon capacity tanks on trailers are no longer considered to mobile and must follow the setback requirements for "**Other Tanks**" in IFC Table 2206.2.3.

Tank Semitrailer - a vehicle that is not self-propelled and that has a cargo tank for the transportation of aviation fuel mounted thereon or built as an integral part thereof. It is so constructed that, when drawn by means of a fifth wheel connection, some of its load and weight rests upon the towing vehicle.

NFPA 407 2-3. Aircraft Fuel Servicing Vehicles that are used on public highways also shall comply with NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*.

NFPA 407 2-3.11.1. Cargo tanks shall be constructed in accordance with NFPA 385, *Standard for Tank Vehicles for Flammable and Combustible Liquids*.

A. LABELING AND SIGNAGE

IFC 1106.3.8. **Smoking.** Smoking in aircraft-fueling vehicles is prohibited. Signs to this effect shall be conspicuously posted in the driver's compartment of all fueling vehicles.

IFC 1106.3.9. **Smoking equipment.** Smoking equipment, such as cigarette lighters and ash trays, shall not be provided in aircraft-fueling vehicles

NFPA 407 2-3.17. **Product Identification Signs**. Each aircraft fuel servicing vehicle shall have a sign on each side and the rear to identify the product. The sign shall have letters at least 3 in. high and shall be of a color contrasting sharply with the sign background for visibility. The word "**FLAMMABLE**" and the name of the product carried, such as "**JET A**," "**JET B**," or "**AVGAS**" shall appear on the sign.

B. BONDING

IFC 1106.5.2. **Electrical bonding.** Aircraft-fueling vehicles shall be electrically bonded to the aircraft being fueled or defueled. Bonding connections shall be made prior to making fueling connections and shall not be disconnected until the fuel-transfer operations are completed and the fueling connections have been removed.

IFC 1106.5.2.2. **Bonding conductors on transfer nozzles.** Transfer nozzles shall be equipped with approved bonding conductors which shall be clipped or otherwise positively engaged with the bonding attachment provided on the aircraft adjacent to the fuel tank cap prior to removal of the cap.

IFC 1106.3.7. **Electrical bonding provisions.** Transfer apparatus shall be metallically interconnected with tanks, chassis, axles and springs of aircraft-fueling vehicles.

IFC 1106.3.7.1. **Bonding cables.** Aircraft-fueling vehicles shall be provided and maintained with a substantial heavy-duty electrical cable of sufficient length to be bonded to the aircraft to be serviced. Such cable shall be metallically connected to the transfer apparatus or chassis of the aircraft-fueling vehicle on one end and shall be provided with a suitable metal clamp on the other end, to be fixed to the aircraft.

IFC 1106.3.7.2. **Bonding cable protection.** The bonding cable shall be bare or have a transparent protective sleeve and be stored on a reel or in a compartment provided for no other purpose. It shall be carried in such a manner that it will not be subjected to sharp kinks or accidental breakage under conditions of general use.

C. EMERGENCY SHUT-OFF

IFC 1106.5.4. **Transfer personnel.** During fuel-transfer operations, a qualified person shall be in control of each transfer nozzle and another qualified person shall be in immediate control of the fuel-pumping equipment to shut off or otherwise control the flow of fuel from the time fueling operations are begun until they are completed.

> EXCEPTIONS: For underwing refueling, the person stationed at the point of fuel intake is not required.
>
> For overwing refueling, the person stationed at the fuel pumping equipment shall not be required where the person at the fuel dispensing device is within 75 feet of the emergency shutoff device, is not on the wing of the aircraft and has a clear and unencumbered path to the fuel pumping equipment; and, the fuel dispensing line does not exceed 50 feet in length.

The fueling operator shall monitor the panel of the fueling equipment and the aircraft control panel during pressure fueling or shall monitor the fill port during overwing fueling.

D. ELECTRICAL

IFC 1106.3.4. **Protection of electrical equipment**. Electric wiring, switches, lights and other sources of ignition, when located in a compartment housing piping, pumps, air eliminators, water separators, hose reels or similar equipment, shall be enclosed in a vapor-tight housing. Electrical motors located in such a compartment shall be of a type approved for use as specified in Electrical Code as adopted by 8 AAC 70.025.

E. FIRE EXTINGUISHERS

IFC 1105.4. **On aircraft fuel-servicing tank vehicles.** Aircraft fuel-servicing tank vehicles shall be equipped with a minimum of two listed portable fire extinguishers complying with IFC 906, each having a minimum rating of 20-B:C. A portable fire extinguisher shall be readily accessible from either side of the vehicle.

IFC 1106.5.3.2.1. **Fire extinguisher training.** Fuel-servicing personnel shall receive approved training in the operation of fire-extinguishing equipment.

F. OPERATIONS

IFC 1106.3. **Construction of aircraft-fueling vehicles and accessories**. Aircraft fueling vehicles shall comply with this section and shall be designed and constructed in accordance with NFPA 407.

IFC 1106.3.1. **Transfer apparatus**. Aircraft-fueling vehicles shall be equipped and maintained with an approved transfer apparatus.

IFC 1106.3.1.1. **Internal combustion type**. Where such transfer apparatus is operated by an individual unit of the internal-combustion-motor type, such power unit shall be located as remotely as practicable from pumps, piping, meters, air eliminators, water separators, hose reels, and similar equipment, and shall be housed in a separate compartment from any of the aforementioned items. The fuel tank in connection therewith shall be suitably designed and installed, and the maximum fuel capacity shall not exceed 5 gallons where the tank is installed on the engine. The exhaust pipe, muffler and tail pipe shall be shielded.

IFC 1106.3.1.2. **Gear operated**. Where operated by gears or chains, the gears, chains, shafts, bearings, housing and all parts thereof shall be of an approved design and shall be installed and maintained in an approved manner.

IFC 1106.3.6. **Accessory equipment.** Ladders, hose reels and similar accessory equipment shall be of an approved type and constructed substantially as follows:

1. Ladders constructed of noncombustible material are allowed to be used with, or attached to, aircraft-fueling vehicles, provided the manner of attachment or use of such ladders is approved and does not constitute an additional fire or accident hazard in the operation of such fueling vehicles.

2. Hose reels used in connection with fueling vehicles shall be constructed of noncombustible materials and shall be provided with a packing gland or other device which will preclude fuel leakage between reels and fuel manifolds.

IFC 1106.4. **Operation, maintenance and use of aircraft-fueling vehicles.** The operation, maintenance and use of aircraft-fueling vehicles shall be in accordance with IFC 1106.4 through IFC 1106.4.4 and other applicable provisions of this chapter.

IFC 1106.4.1. **Proper maintenance.** Aircraft-fueling vehicles and all related equipment shall be properly maintained and kept in good repair. Accumulations of oil, grease, fuel and other flammable or combustible materials is prohibited. Maintenance and servicing of such equipment shall be accomplished in approved areas.

IFC 1106.4.2. **Vehicle integrity.** Tanks, pipes, hoses, valves and other fuel delivery equipment shall be maintained leak free at all times.

IFC 1106.4.3. **Removal from service.** Aircraft-fueling vehicles and related equipment which are in violation of IFC 1106.4.1 or IFC 1106.4.2 shall be immediately defueled and removed from service and shall not be returned to service until proper repairs have been made.

IFC 1106.4.4. **Operators.** Aircraft-fueling vehicles that are operated by a person, firm or corporation other than the permittee or the permittee's authorized employee shall be provided with a legible sign visible from outside the vehicle showing the name of the person, firm or corporation operating such unit.

IFC 1106.5.1.3. **Parking.** Prior to leaving the cab, the aircraft-fueling vehicle operator shall ensure that the parking brake has been set. At least two chock blocks not less than 5 inches by 5 inches by 12 inches in size and dished to fit the contour of the tires shall be utilized and positioned in such a manner as to preclude movement of the vehicle in any direction.

If an aircraft fueling vehicle is not parked within a containment area, drip pans will be placed under the tank to avoid ground contamination. When not actively fueling, vehicles will be parked behind the Building Restriction Line, unless otherwise approved and will also follow:

IFC 1106.20. **Aircraft fuel-servicing vehicles parking.** Unattended aircraft fuel-servicing vehicles shall be parked in areas that provide for both the unencumbered dispersal of vehicles in the event of an emergency and the control of leakage such that adjacent buildings and storm drains are not contaminated by leaking fuel.

IFC 1106.20.1. **Parking area design.** Parking areas for tank vehicles shall be designed and utilized such that a clearance of 10 feet is maintained between each parked vehicle for fire department access. In addition, a minimum clearance of 50 feet shall be maintained between tank vehicles and parked aircraft and structures other than those used for the maintenance and/or garaging of aircraft fuel-servicing vehicles.

IFC 1106.5.2.3. **Funnels.** Where required, metal funnels are allowed to be used during fueling operations. Direct contact between the fueling receptacle, the funnel and the fueling nozzle shall be maintained during the fueling operation.

IFC 1106.5.3. **Training.** Aircraft-fueling vehicles shall be attended and operated only by persons instructed in methods of proper use and operation and who are qualified to use such fueling vehicles in accordance with minimum safety requirements.

IFC 1106.5.3.1. **Fueling hazards.** Fuel-servicing personnel shall know and understand the hazards associated with each type of fuel dispensed by the airport fueling-system operator.

IFC 1106.5.3.2. **Fire safety training.** Employees of fuel agents who fuel aircraft, accept fuel shipments or otherwise handle fuel shall receive approved fire safety training.

IFC 1106.5.3.2.2. **Documentation.** The airport fueling-system operator shall maintain records of all training administered to its employees. These records shall be made available to the code official upon request.

IFC 1106.7. **Protection of hoses.** Before an aircraft-fueling vehicle is moved, fuel transfer hoses shall be properly placed on the approved reel or in the compartment provided, or stored on the top decking of the fueling vehicle if proper height rail is provided for security and protection of such equipment. Fuel-transfer hose shall not be looped or draped over any part of the fueling vehicle, except as herein provided. Fuel-transfer hose shall not be dragged when such fueling vehicle is moved from one fueling position to another.

IFC 1106.8. **Loading and unloading.** Aircraft-fueling vehicles shall be loaded only at an approved loading rack. Such loading racks shall be in accordance with IFC 3406.5.1.12.

EXCEPTIONS:

1. Aircraft-refueling units may be loaded from the fuel tanks of an aircraft during defueling operations.

2. Fuel transfer between tank vehicles is allowed to be performed in accordance with IFC 3406.6 when the operation is at least 200 feet from an aircraft.

The fuel cargo of such units shall be unloaded only by approved transfer apparatus into the fuel tanks of aircraft, underground storage tanks or approved gravity storage tanks.

IFC 1106.10. **Sources of ignition.** Smoking and producing open flames within 50 feet of a point where fuel is being transferred shall be prohibited. Electrical and motor-driven devices shall not be connected to or disconnected from an aircraft at any time fueling operations are in progress on such aircraft.

IFC 1106.11. **Fuel spill prevention and procedures.** Fuel spill prevention and the procedures for handling spills shall comply with IFC 1106.11.1 through IFC 1106.11.7.

IFC 1106.11.1. **Fuel-service equipment maintenance.** Aircraft fuel-servicing equipment shall be maintained and kept free from leaks. Fuel-servicing equipment that malfunctions or leaks shall not be continued in service.

IFC 1106.11.2. **Transporting fuel nozzles.** Fuel nozzles shall be carried utilizing appropriate handles. Dragging fuel nozzles along the ground shall be prohibited.

IFC 1106.11.3. **Drum fueling**. Fueling from drums or other containers having a capacity greater than 5 gallons shall be accomplished with the use of an approved pump.

IFC 1106.11.4. **Fuel spill procedures.** The fueling-system operator shall establish procedures to follow in the event of a fuel spill. These procedures shall be comprehensive and shall provide for at least all of the following:

1. Upon observation of a fuel spill, the aircraft-fueling operator shall immediately stop the delivery of fuel by releasing hand pressure from the fuel flow-control valve.

2. Failure of the fuel control valve to stop the continued spillage of fuel shall be cause for the activation of the appropriate emergency fuel shutoff device.

3. A supervisor for the fueling-system operator shall respond to the fuel spill area immediately.

IFC 1106.15.2. **Matches and lighters.** Personnel assigned to and engaged in fuel-servicing operations shall not carry matches or lighters on or about their person. Matches or lighters shall be prohibited in, on or about aircraft-fueling equipment.

G. MOBILE TANKS UNDER 250 GALLONS AND PRIVATELY USED

Truck bed liners or drip pans are recommended for containment of the fuel system.

13 AAC 50.025 (58). Revises IFC Chapter 11, Subsection 1106.3 by the addition of an exception to read: "Exception: A vehicle or trailer tank with a capacity of 250 gallons or less may be used for non-commercial refueling of private noncommercial aircraft if the following requirements are met:

1. The tank is placarded with no smoking signs, the type of fuel contained in the tank, and the tank capacity;
2. The tank and all appurtenances used in the fueling operation are listed and approved for the specific purpose;
3. Electrical bonding is provided as required under Section 1106.3.7."

SECTION IV

ALTERNATIVE FUELING CONTAINERS

Fueling from a hand held container or fuel drum is discouraged. However, the State will allow alternative methods of fueling for individual aircraft, if the proper fuel container is used and the procedures for fueling are followed. Fuel barrels (drums) are allowed on a case-by-case basis, as approved by the Leasing Office. Gravity feed from a fuel barrel or tank is prohibited. Each barrel/drum must be bonded.

When not in use, all fuel barrels/drums, whether empty or with product, must be stored on pallets, inside a lined bermed containment area and be banded together. The containment dike must be capable of holding 110% of the total volume of all barrels/drums within the diked area. Minimum liner requirements are 20 mil HDPE liner with 2% black carbon fiber.

The containment area where the barrels/drums are stored must be placarded with "**NO SMOKING**" signs, and a sign with the owner's name and phone number. The signs must be placed on each side of the storage area and be highly visible.

The pump, hose and dispensing system for fuel barrels/drums must be approved and designed for use with flammable liquids and used in a manner consistent with these guidelines.

IFC 1106.5.2.3. **Funnels**. Where required, metal funnels are allowed to be used during fueling operations. Direct contact between the fueling receptacle, the funnel and the fueling nozzle shall be maintained during the fueling operation.

IFC 1106.11.3. **Drum fueling**. Fueling from drums or other containers having a capacity greater than 5 gallons shall be accomplished with the use of an approved pump.

IFC 3405.2.3. **Piping, hoses and valves.** Piping, hoses and valves used in liquid transfer operations shall be approved or listed for the intended use.

IFC 3405.2.4. **Class I and II liquids.** Class I (AV Gas 100LL) and II (Jet A) liquids shall be transferred by one of the following methods:

1. From safety cans complying with UL 30.

2. Through an approved closed piping system.

3. From containers or tanks by an approved pump taking suction through an opening in the top of the container or tank.

IFC 3405.2.5. **Manual container filling operations for Class I liquids.** Class I liquids and Class II or III liquids heated to, or above, their flash points shall not be transferred into containers unless the nozzle and containers are electrically interconnected. Acceptable methods of electrical interconnection include:

1. Metallic floor plates on which containers stand while filling, when such floor plates are electrically connected to the fill stem; or

2. Where the fill stem is bonded to the container during filling by means of a bond wire.

IFC 3404.4.2. **Location on property.** Outdoor storage of liquids in containers and portable tanks shall be in accordance with Table F3404.4.2. Storage of liquids near buildings located on the same property shall be in accordance with this section.

TABLE F3404.4.2
OUTDOOR LIQUID STORAGE IN CONTAINERS AND PORTABLE TANKS

CLASS OF LIQUID	MINIMUM DISTANCE TO A LOT LINE OF PROPERTY THAT CAN BE BUILT UPON (Feet)	MINIMUM DISTANCE TO STREET, ALLEY OR A PUBLIC WAY (Feet)
I	50	10
II	25	5
III	10	5

NFPA 30 4-7.2. **Outdoor Storage**. A maximum of 1100 gallons of liquids in closed containers and portable tanks shall be permitted to be stored adjacent to a building under the same management provided that:

(a) The adjacent building wall has an exterior fire resistance rating of 2 hours,
(b) there are no openings at grade or above grade that are within 10 feet horizontally of the storage,
(c) there are no openings directly above the storage, and
(d) there are no openings below grade within 50 feet horizontally of the storage.