PRISM SOLUTIONS

RESEARCH BRIEF

Research Request:

Fuel Jettison

Research Response:

Fuel Dumping—FAA AIM 6-3-5

a. Should it become necessary to dump fuel, the pilot should immediately advise ATC. Upon receipt of information that an aircraft will dump fuel, ATC will broadcast or cause to be broadcast immediately and every 3 minutes thereafter the following on appropriate ATC and FSS radio frequencies:

EXAMPLE−
Attention all aircraft − fuel dumping in progress over − (location) at (altitude) by (type aircraft) (flight direction).

b. Upon receipt of such a broadcast, pilots of aircraft affected, which are not on IFR flight plans or special VFR clearances, should clear the area specified in the advisory. Aircraft on IFR flight plans or special VFR clearances will be provided specific separation by ATC. At the termination of the fuel dumping operation, pilots should advise ATC. Upon receipt of such information, ATC will issue, on the appropriate frequencies, the following:

EXAMPLE−
ATTENTION ALL AIRCRAFT − FUEL DUMPING BY − (type aircraft) − TERMINATED.

Air Traffic Control—FAA Order JO 7110.65V

9-4-1. INFORMATION REQUIREMENTS
When information is received that an aircraft plans to dump fuel, determine the route and altitude it will fly and the weather conditions in which the operation will be conducted.

9-4-2. ROUTING
Except when it is dumping fuel for emergency reasons, an aircraft in either VFR or IFR conditions may be requested to fly a different route.

9-4-3. ALTITUDE ASSIGNMENT
If an aircraft is dumping fuel in IFR conditions, assign an altitude at least 2,000 feet above the highest obstacle within 5 miles of the route or pattern being flown.

9-4-4. SEPARATION MINIMA
Separate known aircraft from the aircraft dumping fuel as follows:

A. IFR aircraft by one of the following:
   1. *1,000 feet* above it; or in accordance with para 4-5-1, Vertical Separation Minima, whichever is greater.
   2. *2,000 feet* below it.
   3. *5 miles* radar.
   4. *5 miles* laterally.

B. VFR radar-identified aircraft by *5 miles* and in accordance with para 5-6-1, Application.

9-4-5. INFORMATION DISSEMINATION
a. If you are in contact with an aircraft when it starts dumping fuel, inform other controllers and facilities which might be concerned. Facilities concerned must broadcast an advisory on appropriate radio frequencies at 3-minute intervals until the dumping stops.

PHRASEOLOGY-
ATTENTION ALL AIRCRAFT. FUEL DUMPING IN PROGRESS OVER (location) AT (altitude) BY (type aircraft) (flight direction).

b. Broadcast a terminating advisory when the fuel dumping operation is completed.

PHRASEOLOGY-
ATTENTION ALL AIRCRAFT. FUEL DUMPING OVER (location) TERMINATED.

Boeing - Aero Magazine

Some operators have questioned whether fuel jettison is permissible when an engine or airframe fire exists. There is no restriction on fuel jettison during an in-flight fire, whether inside or outside the airplane. During airplane certification, Boeing demonstrates to the FAA in a variety of flight conditions that jettisoned fuel does not impinge or reattach to airplane surfaces. As fuel is jettisoned, it is rapidly broken up into small droplets, which then vaporize. Boeing does not recommend operator-improvised fuel jettison procedures, such as jettisoning fuel from only one side during an engine fire. Such procedures are not only unnecessary but also can increase jettison time and crew workload.

The ecological aspects of fuel jettison have been most closely studied by the United States Air Force (USAF). These studies have shown that, in general, fuel jettisoned above 5,000 to 6,000 feet will completely vaporize before reaching the ground. Therefore, Boeing's general recommendation is to jettison fuel above 5,000 to 6,000 feet whenever possible, although there is no restriction on jettisoning at lower altitudes if considered necessary by the flight crew.

Fuel jettison studies have indicated that the most significant variables related to fuel vaporization are fuel type and outside air temperature. Some studies found that temperature can have a very significant effect on the altitude needed to completely vaporize fuel. For example, one USAF study found that a 36-degree Fahrenheit (20-degree Celsius) reduction in temperature can change the amount of liquid fuel reaching the ground by as much as a factor of 10. Other factors such as fuel jettison nozzle dispersion characteristics, airplane wake, and other atmospheric conditions can affect the amount of fuel that reaches the ground.

Even though fuel is vaporized, it is still suspended in the atmosphere. The odor can be pronounced, and the fuel will eventually reach the ground. Boeing is not aware of any ecological interest promoting a prohibition on fuel jettisoning. Because of the relatively small amount of fuel that is jettisoned, the infrequency of use, and the safety issues that may require a fuel jettison, such regulations are not likely to be promulgated.