



Interagency Aviation Accident Prevention Bulletin



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Subject: SEAT Retardant Loading

Area of Concern: SEAT Overloading/Flight Safety

Distribution: All Wildland Fire Aviation Operations

Discussion: Recently, several Single Engine Airtankers (SEATs) have been overloaded or overfilled with retardant, with many incidents occurring at large airtanker bases.

Below are recent SAFECOMs related to overloading:

- [#23-0410](#) Pilot distracted
- [#24-1091](#) Pilot distracted
- [#25-0788](#) Pump running at too high RPM
- [#25-0976](#) Loaders not watching pilot
- [#25-1067](#) Out-of-spec retardant
- [#26-0372](#) Mixmaster looked away as pilot raised hand



Why SEATs Are at Higher Risk of Overloading

Loading SEATs at large airtanker bases often requires a change in tactics during the loading process. Most large airtanker bases utilize a large loading pump which can pump over 500 gallons per minute (gpm). This ensures that the large airtankers (LATs) can be loaded with thousands of gallons of retardant quickly and efficiently.

Most SEATs have a maximum tank capacity of 800 gallons, meaning a SEAT can potentially be loaded in less than two minutes. This requires greater attention to prevent overloading. Depending on weight & balance and performance limitations, the aircraft may need to carry less, particularly when operating with full fuel loads.

A gallon of retardant weighs approximately 9 pounds, which adds up quickly, especially when the aircraft is limited in the quantity and weight it can hold.

Best Practices for Loading SEATs at Large Airtanker Bases

Large airtanker bases must use caution when SEATs enter the loading pit. The following are best practices for loading SEATs:

- Prior to loading the first SEAT conduct a briefing with all loaders, mixmasters, pilots, parking tenders, and any other personnel involved in the SEAT loading operations. Re-brief as needed throughout the season to ensure everyone remains aware of key procedures and indicators.

- Ensure the pilot provides the number of gallons they would like to receive for each load prior to starting the loading process.
- Utilize lower pump speeds (300-350 gpm) or a smaller pump dedicated to SEAT loading.
- Use a mass flow meter to ensure an overload does not occur.
- A chart of equivalent pounds per gallon for the smaller loads that SEATs carry can help the mixmaster shut down the pump when getting close to the requested amount.
- Reduce the flow rate approximately 100 gallons before the requested load amount is reached, as retardant will still be flowing into the aircraft until complete shutoff.
- Always pay attention to the pilot for indications of when to stop loading.

Pilot Hand Signals

All loading personnel need to monitor both the mass flow meter and the pilot's signals throughout the loading process. Pilots use hand signals to indicate loading status:

- **Hand raised:** Approaching the requested amount — prepare to stop.
- **Hand lowered:** Requested amount reached — stop loading, shut off the pump, and close valves.

In several recent SAFECOMs, missing or misinterpreting these hand signals were noted as a primary cause of SEAT overloading.

Consequences of Overloading

Overfilling a SEAT can cause significant aircraft damage. Excess retardant may erupt from the hopper, potentially resulting in:

- Damage to bolts and hopper doors
- Structural stress
- Impaired visibility
- Reduced aircraft performance

Any of these issues could contribute to an in-flight mishap.

Summary

Preventing SEAT overloading requires clear communication, attention to pilot signals, careful flow-rate management, and awareness of how quickly SEAT tanks fill. Reducing distractions and maintaining focus during this critical phase ensures safe and efficient operations.

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