

Deliberate Risk Analysis – AFI Q400 AT Simultaneous Retardant Loading and Refueling

Task:	Change Management: Conduct a risk analysis to identify the potential risks associated with simultaneous loading of fuel and retardant onto aircraft with both engines shut down, as well as how those risks will be mitigated. The simultaneous loading of fuel and retardant procedures may help facilitate delivering retardant to the fire incident in a safe and timely manner, thus reducing costs and enhancing the safety of fire crews.
Health hazards:	Static electricity generated when multiple fluids are loaded onto the aircraft at the same time may lead to shock and/or possible fire or explosion. Fuel or retardant spill may come into contact with bare skin or clothing which could lead to adverse skin reaction. Potential for increased fatigue of the flight crew with fewer opportunities to be out of the cockpit.
Safety Hazards:	Simultaneous loading of fuel and retardant on the Q400 may present hazards associated with static electricity, ramp congestion, increased potential for fuel/retardant spillage, and resistance to change in general. The severity factor for simultaneous loading of retardant and fuel on the Q400 is assessed as minor. The probability factor should remain remote provided we adhere to the conditions and provisions of our risk mitigation plan.
Risk Assessment:	Probability: 2 Remote (possible, but unlikely) Severity: C Minor (deviation from standard practice) Risk Factor: 2C Tolerable (Acceptable based on risk mitigation. It will require PIC decision on whether to pursue or not based on myriad factors)
Risk Control:	Upon determining at a Captain (PIC) level that appropriate risk mitigation measures and engineering controls are in place, the simultaneous loading of retardant and fuel may proceed. <i>Risk acceptance is required at the Captain/PIC level</i> after considering multitude of factors.
Risk:	Fueling of any aircraft is not inherently dangerous, but caution must always be exercised to account for static electricity discharge and potential spills. Additionally, loading retardant onto airtankers is also not inherently hazardous, but caution is needed because of aircraft equipment, other aircraft in the ramp movement area potential for spills making it slippery around equipment. If both operations are conducted simultaneously, however, then the risk of the operation is notably elevated. Specifically, the refueling port on the Q400 is located on aft portion of the right engine nacelle. The Q400 may be loaded with retardant from either side. Thus, depending on which side of the aircraft the retardant is loaded will dictate the proximity of ground support equipment and personnel. If both refueling and reloading of retardant take place on the same side (right), then additional precautions must be taken to account for working in this relatively confined space. Note: both engines of the Q400 must be shut down to conduct simultaneous fueling and retardant loading operations. Lastly,

Deliberate Risk Analysis – AFI Q400 AT Simultaneous Retardant Loading and Refueling

loaders/fuelers must be cognizant of the landing gear doors as they may create an overhead contact hazard when transiting through the area.

Mitigation:

All flight crews and base personnel will be briefed and trained on simultaneous fueling and loading of the Q400 airtanker before operations will proceed. Fueling personnel will be briefed prior to each operation because of inconsistent personnel operating fuel equipment. AFI has prepared a Risk Assessment for Q400 simultaneous fueling and retardant loading. The flight crew and associated Aero-Flite, Inc. ground crew will be briefed on this assessment before starting any simultaneous fueling/loading operations. Note: both engines on the Q400 will be shut down to conduct simultaneous fueling and retardant loading operations. The flight crew will request an agency ramp manager supervise the entire operation. The ramp manager has full authority to stop each operation at any time because of safety concerns. If at any time personnel are unwilling to perform simultaneous fueling and loading of retardant, those operations will be performed separately. A flight crew member or approved company ground support person must be outside and monitoring the operation for quality assurance and to help ensure all safety procedures are adhered to. All appropriate grounding/bonding procedures will be used to minimize static discharge. Loading pump pressure (pump speed) should be reduced to also minimize static discharge. Minimum personnel should be in the fueling and retardant loading area to minimize congestion (tripping overloading hoses, fueling hoses, grounding wires) and improve safety margins. There needs to be a communication link established between the fueling operation and loading of retardant personnel. If the retardant loading and fueling operation are on opposite sides of the aircraft, there should be no crossing of the centerline of the aircraft of personnel. This procedure will eliminate congestion and keep situational awareness at a maximum. If retardant loading and fueling operations are conducted on the same side (right), additional caution must be exercised to avoid over-congesting the area and degrading overall situational awareness. The Q400 refueling port is located on the aft portion of the right engine nacelle. In this situation, fuel truck placement and associated fuel hose and retardant hose routing are essential to deconflict. The retardant loading hose should run behind the right-side landing gear so as not to interfere with refueling operation. Clear lines of communication must be established between both loading parties to properly manage the risk. Care must be exercised to allow for the free movement of personnel and equipment, especially when both operations take place on the same side of aircraft. Flight crew members or associated ground support personnel will inspect loading and fueling area for spills and assure all loading and fueling compartments are closed and secured. Note: the retardant loading valve cam-lock levers that protrude external to the body of the aircraft need to be properly secured to prevent inadvertent opening in flight.