

Safety Recommendations  
Boeing 707-121, N709PA accident  
Elkton, Maryland  
December 8, 1963

1. Install static discharge wicks on those turbine powered aircraft not so equipped. Author Note: this airplane was the 6<sup>th</sup> aircraft off the assembly line. The first 6 did not have static discharge wicks. Airplane number 6 and beyond left the factory with this feature.
2. Reevaluate problems associated with incorporation of flame arrestors in fuel tank vent outlets. We believe positive protection against fuel tank explosion from static discharge ignited fuel/air mixtures at fuel tank vent outlets can be provided by flame arrestors having sufficient depth
3. a possible alternate to No. 2 that may be considered is to render the mixture emitting from the vent outlet non-ignitable by the introduction of air into the vent tube
4. We believe the surge tanks located just outboard of the reserve tank, by virtue of their location near the wing tip, are vulnerable with respect to lightning strikes. Burn marks on the skin in the tip area of N709PA substantiates this belief. This being the case it is believed a measure of protection will be attained if the wing skin is not utilized as part of the surge tank walls. This could be accomplished by providing an inner wall with an air gap between it and the wing skin to form the surge tank. It is recommended that this concept be considered. Another alternate appears to provide sufficient thickness of the skin in this area to prevent burning through by lightning strikes
5. suggest for consideration is the requirement that only Jet A fuel be used commercially. Vapor flammability temperature limits charts provided by ESSO show that much less of the operations would occur with the vapor in the flammability range while using Jet A fuel as compared with Jet B fuel
6. Finally, it is recommended that every effort be expanded to arrive at a practical means by which flammable air/vapor mixtures are eliminated from the fuel tanks. There appears to be at least two approaches to accomplish this. There is the possibility of inerting the space above the fuel by introduction of an inert gas. An alternate approach is to introduce sufficient air circulation into the tanks to maintain a fuel/air ratio too lean for combustion. There may well be other approaches to attain this goal; if so, they should be explored. Other problems of like complexity have been resolved and we feel the resolution of this problem is likewise attainable at a cost commensurate with the benefits. We recommend that FAA/CAB solicit the aid of the aviation and petroleum industry as well as government and defense agencies to provide a solution to this problem that is applicable to aircraft in service as well as new aircraft.