

ALERT BULLETIN

AB 2023:4/9-1

3/2/2023

1963001, 1966272

TO: FAA (AVP-200, AFS-200)

INFO: FAA (AVP-1, AFS-900, AFS-260, AFS-100, AIR-720, AIR-780, AIR-360, SEA-AEG), A4A, ALPA, AMFA, ASAP, ATSG, CAPA, IAM, IBT, ICAO, ICASS, IFALPA, IPA, NTSB, PAMA, RAA, SWAPA, TWU

FROM: Becky L. Hooey, Director
NASA Aviation Safety Reporting System

SUBJ: Type IV De-ice Fluid Failure

We recently received ASRS reports describing a safety concern that may involve your area of operational responsibility. We do not have sufficient details to assess either the factual accuracy or possible gravity of the report. It is our policy to relay the reported information to the appropriate authority for evaluation and any necessary follow-up. We feel you should be aware of the following:

ASRS has recently received reports from air carrier pilots describing the apparent failure of the de-ice fluid used on the aircraft well before the calculated holdover time.

(ACN 1963001) Air Carrier Captain reported after they returned to the gate for a maintenance issue they observed icing on the wing even though they had been de-iced and the holdover time had not expired. Captain stated they were "...shocked at how early it failed. If we didn't return to the gate and were in line for takeoff, I would not have gone back to check the wings."

(ACN 1966272) Air carrier Captain reported an over-wing inspection prior to takeoff in light freezing rain conditions revealed de-icing fluid was no longer on the wings at a time well short of the calculated holdover time. Reporter stated he considers this a de-ice fluid failure incident and suggests researching holdover times in the interest of safety.

To properly assess the usefulness of our alert message service, we would appreciate it if you would take the time to give us your feedback on the value of the information that we have provided. Please contact Dr. Becky Hooey at (408) 541-2854 or email at becky.l.hooey@nasa.gov.



Aviation Safety Reporting System
P.O. Box 189 | Moffett Field, CA | 94035-0189



ACN 1963001

DATE / TIME

Date of Occurrence 202212
Local Time Of Day 1801 to 2400

PLACE

Locale ZZZ.Airport
State US
Altitude - AGL 0

ENVIRONMENT

Weather Rain
Weather Snow

AIRCRAFT / EQUIPMENT X

ATC / Advisory - Ramp ZZZ
Make Model Name Commercial Fixed Wing
Operating Under FAR Part 121

PERSON 1

Function - Flight Crew Captain
ASRS Report Number 1963001

EVENTS

Anomaly Aircraft Equipment Problem - Less Severe
Anomaly Deviation / Discrepancy - Procedural - Maintenance
Anomaly Deviation / Discrepancy - Procedural - Published
Material / Policy
Anomaly Ground Event / Encounter - Ground Equipment Issue
Anomaly Ground Event / Encounter - Weather / Turbulence
Detector - Person Flight Crew
Result - Flight Crew Returned To Gate

NARRATIVE 1

TYPE 4 - CRYOTECH POLAR GUARD ADVANCE DEICING FLUID FAILURE. I was in ZZZ during a snowstorm. We de-iced and on the way to the runway had a stuck brake which required a return to gate. The flight deplaned and we eventually timed out. Before leaving the aircraft I went back to the wing to see how the Type 4 was doing based on the data from the app. Based on all training we receive as pilots, the fluid looks to have failed way before the holdover time expired. I was shocked at how early it failed. If we didn't return to the gate and were in line for takeoff, I would not have gone back to check the wings.

SYNOPSIS

Air Carrier Captain reported after they returned to the gate for a maintenance issue they observed icing on the wing even though they had been de-iced and the holdover time had not expired.

ACN 1966272**DATE / TIME**

Date of Occurrence	202301
Local Time Of Day	0601 to 1200

PLACE

Locale	ZZZ.Airport
State	US

ENVIRONMENT

Flight Conditions	Marginal
-------------------	----------

AIRCRAFT / EQUIPMENT X

ATC / Advisory - Ground	ZZZ
Make Model Name	Medium Transport, Low Wing, 2 Turbojet Eng
Operating Under FAR Part	121

PERSON 1

Function - Flight Crew	Captain
Function - Flight Crew	Pilot Not Flying
ASRS Report Number	1966272

EVENTS

Anomaly	Ground Event / Encounter - Weather / Turbulence
Detector - Person	Flight Crew
Result - Flight Crew	Returned To Gate

NARRATIVE 1

This report is to document a Type IV fluid failure that occurred prior to the elapsing of the lower holdover time. The METAR read as follows: ZZZ 04KT 9SM -FZRA SCT050 BKN065 OVC080 M03/M07 A2970 RMK AO2 FZRA SLP060 P0000 60000 I1000 I3000. The Type IV fluid applied was Dow Chemical UCAR FlightGuard AD-49 at 100% concentration. The start time of the Type IV fluid application was XA05L. According to our holdover time table, in the present conditions, the holdover time is between 46 minutes and 1 hour, 5 minutes. Taxi to Runway 10 began at approximately XA15L. The airport operations crew was working through a continuous freezing rain event, applying deicing fluids onto airport surfaces. Runway 10 was unusable for approximately 20-25 minutes, beginning when we approached the hold short line ready for departure. Several Airport Operations vehicles requested and received clearance to conduct a deicing fluid application and runway assessment. At the conclusion of their assessment, 3 arrivals were on final, further delaying our departure. When the last arrival was on short final, the First Officer and I conducted a pre-takeoff check by looking at our wings to determine the condition of the anti-ice fluid. While my winglet area looked good, the surface I could see from the base of the winglet to approximately the midpoint of the wing was now clear, with no evidence of Type IV green dye anywhere. I sent the First Officer into the cabin to get a better assessment. He easily concluded that our Type IV fluid had failed and showed me a few pictures he had taken. I agreed, and we went back to the gate. This determination was made approximately 30-35 minutes following the Type IV application start time. After some coordination with our flight attendants and ATC, we began our taxi back to the gate at around XA45L and blocked back into the gate shortly thereafter. We refueled and deiced a second time.

The cause of this event was a Type IV fluid failure due to freezing rain.

The holdover time for Dow Chemical UCAR FlightGuard AD-49 may need to be lowered in consideration of actual conditions experienced during a light freezing rain event with an ambient temperature of -3 Celsius. We noted that the holdover time for the same at -2 Celsius was considerably lower, with a holdover time range of 15-19 minutes. This is a drastic difference over the 46-65 minutes of holdover permitted for the same at -3 Celsius.

CALLBACK 1

Reporter stated he has observed de-ice fluid performance issues on several other flights as well. The anomaly that is most concerning to this reporter is the big jump in holdover time calculated with just a 1-degree difference in ambient temperature, which doesn't seem logical. Reporter recommended FAA/NTSB/Industry review of de-ice holdover times with a recommendation to flight crews to be more conservative in their calculations in the interest of safety.

SYNOPSIS

Air carrier Captain reported an over-wing inspection prior to takeoff in light freezing rain conditions revealed de-icing fluid was no longer on the wings at a time well short of the calculated holdover time. Reporter stated he considers this a de-ice fluid failure incident and suggests researching holdover times in the interest of safety.