UNITED STATES AIR FORCE
AIRCRAFT ACCIDENT INVESTIGATION
BOARD REPORT

KC-46A, T/N 18-6054

133rd AIR REFUELING SQUADRON
157th AIR REFUELING WING
PEASE AIR NATIONAL GUARD BASE, NEW HAMPSHIRE

LOCATION: FAIRBANKS INTERNATIONAL AIRPORT, ALASKA

DATE OF ACCIDENT: 16 JULY 2025

BOARD PRESIDENT: LIEUTENANT COLONEL MICHAEL T. RAYNOR

Conducted IAW Air Force Instruction 51-307

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR MOBILITY COMMAND

10 March 2026

ACTION OF THE CONVENING AUTHORITY

The report of the Accident Investigation Board, conducted under the provisions of AFI 51-307, *Aerospace and Ground Accident Investigations*, current as of 6 April 2023, that investigated the 16 July 2025 mishap at Fairbanks International Airport, involving a KC-46A, T/N 18-6054, assigned to the 157th Air Refueling Wing, Pease Air National Guard Base, New Hampshire, substantially complies with the applicable regulatory and statutory guidance and on that basis is approved.

GERALD A. DONOHUE
Major General, USAF
Deputy Commander (Convening Authority)

EXECUTIVE SUMMARY
UNITED STATES AIR FORCE
AIRCRAFT ACCIDENT INVESTIGATION

KC-46A, T/N 18-6054
FAIRBANKS INTERNATIONAL AIRPORT, ALASKA
16 JULY 2025

On 12 July 2025, the mishap aircraft (MA), a KC-46A with tail number (T/N) 18-6054, assigned to the 133rd Air Refueling Squadron, 157th Operations Group, 157th Air Refueling Wing, New Hampshire Air National Guard Base, New Hampshire, landed at Fairbanks International Airport (FIA), Alaska. While traveling from Yokota Air Base, Japan to FIA, both engines experienced abnormal engine vibration indications and required engine maintenance upon landing.

On 14 July 2025, a maintenance recovery team (MRT) from McConnell Air Force Base, Kansas arrived to perform the required engine maintenance. The team consisted of two engine propulsion specialists (EPS) and one aircraft structural maintainer (ASM). The following day, the MRT attempted to perform a series of high-power engine-runs (HPER) to balance the engines and certify them as flight-worthy. Due to winds being out of limits, the MRT was unable to perform the required maintenance on 15 July 2025.

On 16 July 2025 at approximately 1000 local time (L), the MRT started a series of HPERs. It took approximately seven HPERs, each lasting approximately twenty to thirty minutes in duration to balance the left engine. At approximately 1800L, while attempting to balance the right engine and during the tenth HPER of the day, airflow from the right engine's exhaust dislodged two blocks of asphalt directly behind the right engine. The blocks of asphalt, each approximately 25-feet-long by 25-feet-wide, lifted into the air and broke into an array of debris upon landing.

The Accident Investigation Board President found, by a preponderance of the evidence, that during the HPER sequence the consistent heat and exhaust airflow velocity emitted from the right engine critically degraded the asphalt block's sealant. This degradation ultimately led to bituminous sealant failure and caused the asphalt surface behind the right engine to separate, become airborne, and break apart behind the MA.

SUMMARY OF FACTS AND STATEMENT OF OPINION
KC-46A, T/N 18-6054
FAIRBANKS INTERNATIONAL AIRPORT, ALASKA
16 JULY 2025

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ACRONYMS AND ABBREVIATIONS

ACMC	Aircrew Member Compartment
ADIRU	Air Data and Inertial Reference Unit
AF	Air Force
AFSC	Air Force Specialty Code
AGM	Airport Ground Manager
AGL	Above Ground Level
AMC	Air Mobility Command
AMXS	Aircraft Maintenance Squadron
AFB	Air Force Base
AFI	Air Force Instruction
AFTO	Air Force Technical Order
AIB	Accident Investigation Board
ANG	Air National Guard
AOC	Air Operations Center
ASM	Aircraft Structural Maintainer
AVSM	Airborne Vibration Monitoring System
BPO	Basic Post Flight
DAFI	Department of Air Force Instruction
DAFMAN	Department of Air Force Manual
DoD	Department of Defense
ENG	Engineer
EPR	Engine Pressure Ratio
EPS1	Engine Propulsion Specialist 1
EPS2	Engine Propulsion Specialist 2
FBO	Fixed-Base Operator
FCC	Flying Crew Chief
FCC2	Flying Crew Chief 2
FIA	Fairbanks International Airport
FOD	Foreign Object Debris
GPS	Global Positioning System
HCR	Heavy Cargo Ramp
HPER	High-Power Engine-Runs
IAW	In Accordance With
LA	Legal Advisor
L	Local Time
MA	Mishap Aircraft
MAJCOM	Major Command
MIS	Maintenance Information System
MRT	Maintenance Recovery Team
MXM	Maintenance Member
MXS	Maintenance Squadron
NMC	Non-Mission Capable
PLI	Pre-Launch Inspection
QA	Quality Assurance
QT	Quick Turn
REC	Recorder
RPM	Revolutions Per Minute
TACC	Tanker Airlift Control Center
TCTO	Time Compliance Technical Order
TO	Technical Order
T/N	Tail Number

SUMMARY OF FACTS

1. AUTHORITY AND PURPOSE

a. Authority

On 11 September 2025, Lieutenant General Rebecca J. Sonkiss, Deputy Commander, Air Mobility Command (AMC), appointed Lieutenant Colonel (Lt Col) Michael T. Raynor as Board President of an Accident Investigation Board (AIB) to investigate the subject mishap under provisions of AFI 51-307, *Aerospace and Ground Accident Investigations* (Tab Y-3). Other members appointed to the AIB include a Captain (Capt) Legal Advisor (LA), an Air National Guard (ANG) Master Sergeant (MSgt) Maintenance Member (MXM), and a Staff Sergeant (SSgt) Recorder (REC) (Tab Y-3). On 18 September 2025, LA1 was relieved and LA2 was appointed (Tab Y-5). On 25 September 2025, a Government Service Civil Engineering Subject Matter Expert was added to assist with the investigation (Tab Y-7). The AIB conducted this investigation at Eielson Air Force Base (AFB), Alaska and Fairbanks International Airport, Alaska from 23 September 2025 through 3 October 2025.

b. Purpose

In accordance with AFI 51-307, *Aerospace and Ground Accident Investigations*, this Accident Investigation Board conducted a legal investigation to inquire into all the facts and circumstances surrounding this Air Force aerospace accident, prepare a publicly-releasable report, and obtain and preserve all available evidence for use in litigation, claims, disciplinary action, and adverse administrative action.

2. ACCIDENT SUMMARY

On 16 July 2025, at approximately 1800 local time (L), a KC-46A MRT assigned to McConnell Air Force Base (AFB), Kansas performed required engine maintenance by executing a series of high-power engine-runs (HPERs) causing damage to the asphalt surface directly behind the right engine (Tabs Z-4, V-1.5, V-2.2, V-4.1, V-4.2, and V-5.1). The aircraft, tail number (T/N) 18-6054, was operated by crew members assigned to the 133rd Air Refueling Squadron, 157th Operations Group, 157th Air Refueling Wing, Pease Air National Guard Base, New Hampshire (Tab AA-6). Total cost to the Fairbanks International Airport apron was $147,044 (Tab CC-11). There were no injuries or aircraft damage that resulted from this mishap.

3. BACKGROUND

a. Air Mobility Command (AMC)

AMC is a Major Command (MAJCOM) headquartered at Scott Air Force Base, Illinois (Tab CC-4). AMC provides unrivaled airlift, air refueling, aeromedical evacuation, global air mobility support and Global Mobility Mission Command to project, connect, maneuver and sustain the Joint Force to achieve national objectives (Tab CC-4). The command is composed of approximately 110,000 Total Force personnel and operates 13 different airframes (Tab CC-5).

b. 618th Air Operations Center (618 AOC)

The 618 AOC, located at Scott AFB, Illinois, is AMC's execution arm of providing America's Global Reach (Tab CC-7). The 618 AOC plans, schedules, and directs a fleet of nearly 1,100 mobility aircraft in support of combat delivery and strategic airlift, air refueling and aeromedical evacuation operations around the world (Tab CC-7).

c. 157th Air Refueling Wing (157 ARW)

The 157 ARW, located at Pease AFB, New Hampshire, is a unit of AMC and New Hamshire's only Air National Guard Base (Tab CC-9). The 157 ARW is capable of providing worldwide in-flight air refueling, movement of troops, supplies, equipment and medical patients (Tab CC-10).

d. 133rd Air Refueling Squadron (133 ARS)

The 133 ARS, under the 157 ARW, operates and flies the nation's newest aerial refueler, the KC-46A (Tab CC-9). They support the 157 ARW's mission of providing worldwide in-flight air refueling (Tab CC-9).

e. KC-46A - Pegasus

The KC-46A Pegasus is the first phase in recapitalizing the U.S. Air Force's aging tanker fleet (Tab CC-13). The KC-46A will provide the next generation aerial refueling support to Air Force, Navy, Marine Corps and partner-nation receivers (Tab CC-13).

f. High-Power Maintenance Run-up

A high-power engine-run is an increase of engine revolutions per minute (RPM) to a high-power setting, not to exceed take off power speed (approximately mid-80% N1, or "fan speed"), that is used for testing an engine or aircraft components and aircraft systems (Tabs BB-152 and BB-154). At high engine speeds, the exhaust can blow FOD more than a hundred feet (Tabs Z-9 and BB-162). Therefore, it is necessary to operate the engines at these power settings with caution due to the risk to personnel, property, and other aircraft (Tab BB-162). The estimated peak temperature

during engines at high-power (take off) setting is approximately 1,170 degrees Fahrenheit (Tab BB-159). The high temperature of an operating engine can be felt more than one hundred feet behind the exhaust (Tab BB-159). The intent is to operate both engines simultaneously to maintain symmetrical thrust between the left and right engines so as to not induce unnecessary asymmetric stress on the aircraft (Tab BB-155).

g. Maintenance Skill Levels

DAFMAN 36-2100, *Military Classification, Technical Training and Retraining*, dated 24 June 2025, defines maintenance skill levels. The 3-skill level (3-Level), or apprentice, are enlisted personnel who have obtained basic knowledge within an Air Force Specialty Code (AFSC) through completion of an initial skills training. Apprentices gain duty position experience and upon completion, enter a structured apprenticeship program to gain qualification and experience required of a 5-skill level (5-Level), or journeyman. The 5-skill level identifies enlisted personnel who, through experience and training, have demonstrated skilled proficiency in their AFSC. The 7-skill level (7-Level), or craftsman, identifies enlisted personnel who have gained a high degree of technical knowledge in their AFSC and who have additionally acquired supervision capability through training and experience.

4. SEQUENCE OF EVENTS

a. Mission

On Saturday, 12 July 2025, the Mishap Crew landed at Fairbanks International Airport (FIA), Alaska, after completing its mission from Yokota Air Base, Japan without incident (Tabs AA-3 and AA-4). While in transit and completing its assigned air refueling mission, both engines experienced high engine vibration indications from the Airborne Vibration Monitoring System (AVMS) (Tab U-8). AVMS monitors internal engine vibration levels and in this case the engine notification displays indicated “above 4.0” and due to meeting this threshold, required maintenance correction (Tab U-8).

The MA was parked on the airport’s West Ramp while it awaited maintenance (Tabs V-1.3, V-2.3, and Z-3). On 14 July 2025, an MRT was dispatched from McConnell Air Force Base (MAFB) to Fairbanks International Airport to perform required engine maintenance (Tabs V-1.5, V-2.2, V-4.1, V-4.2, and V-5.1).

On 15 July 2025, after consultation with the support agency responsible for aircraft parking, towing and logistics (also known as the Fixed-Base Operator (FBO)), the MA was towed to the Heavy Cargo Ramp (HCR) and positioned in “Spot 4” (Tabs V-2.3 and Z-3).

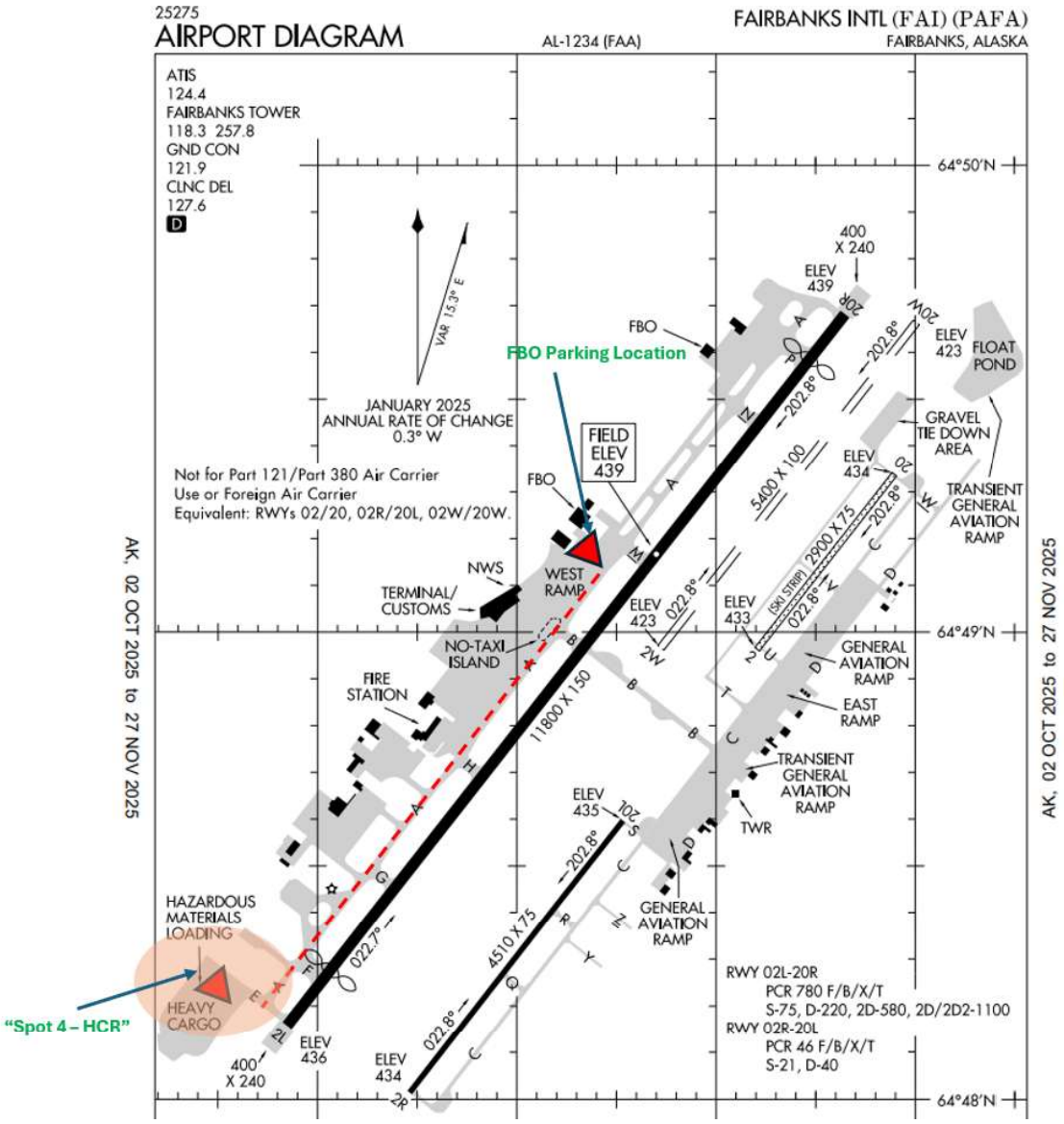

Figure 1: MA's Parking Location(s)

b. Planning

Not applicable.

c. Preflight

The pilot, co-pilot, and air refueling operator were in crew-rest and not present at the aircraft during the mishap.

d. Summary of Accident

On 16 July 2025, at approximately 1000L, the MRT began a series of HPERs to correct the previously identified engine vibration issues (Tabs R-5 and V-2.5). The MRT consisted of two

engine propulsion specialists (EPS1, EPS2), and one aircraft structural maintainer (ASM) (Tabs V-1.5, V-2.2, V-4.1, V-4.2, and V-5.1). They were assisted by the aircraft's flying crew chief (FCC1) who was responsible for aircraft ground movement, preflight inspections, and general aircraft maintenance and logistics (Tab AA-6). At approximately 1000L, the MRT began the process of balancing the engines (Tab R-5). The process included EPS1 running the engines above idle power and to a high-power setting of approximately 1.40 engine pressure ratio (EPR) (Tabs R-3 and BB-154). While increasing the thrust, EPS2 was located behind EPS1 and monitored the computer readings to identify the correct balancing solution (Tabs V-5.2 and V-5.3). This balancing process was required for each engine, and throughout the HPER sequence EPS1 increased both engines simultaneously (Tab V-5.4). At approximately 1800L, during the tenth HPER of the day, two asphalt blocks, approximately 25 feet long by 25 feet wide, directly behind the right engine lifted into the air and landed behind the MA (Tabs R-3 and Z-4). Upon landing, the blocks broke into smaller debris which spread across the parking apron and onto the MA (Figure 1) (Tabs Z-3 and Z-4).

Figure 2: Damage to the asphalt behind the right engine

The ASM and FCC1, who were outside the MA observing the high-power engine-runs, quickly informed EPS1 of the situation (Tab R-9). EPS1 brought the engines back to idle and after approximately three minutes of engine cool-down time shut down both engines without incident (Tab V-2.5). After a thorough inspection, it was determined that the MA was undamaged (Tab V-2.6). FCC1 and FIA ground handlers moved the MA to another section of the heavy cargo ramp so the MRT could complete one final engine balance check (Tab V-2.8). On 25 July 2025, the MA was declared flyable and departed FIA without incident (Tab V-2.7).

e. Impact

Not applicable.

f. Egress and Aircrew Flight Equipment

Not applicable.

g. Search and Rescue

Not applicable.

h. Recovery of Remains

Not applicable.

5. MAINTENANCE

a. Forms Documentation

Air Force Technical Order (AFTO) 781 series forms provide real-time maintenance, inspection, service, configuration, and flight record for Air Force (AF) aerospace vehicles (Tab BB-42). The AF also uses automated Maintenance Information Systems (MIS), most referred to as G081, to support and enable maintenance processes, document maintenance actions, and track fleet health (Tab BB-42). The common forms used for all KC-46s are as follows:

(1) AFTO Form 781A, Maintenance Discrepancy and Work Document (Tab BB-47)
(2) AFTO Form 781H, Aerospace Vehicle Flight Status and Maintenance (Tab BB-70)
(3) AFTO Form 781J, Aerospace Vehicle Engine Flight Document (Tab BB-76)
(4) AFTO Form 781K, Aerospace Vehicle Inspection, Engine Data, Calendar Inspections and Delayed Discrepancy Document (Tab BB-80)

The AIB reviewed all applicable AFTO 781 series forms in G081 for the 90 days preceding the mishap and it revealed no overdue inspections or open Time Compliance Technical Orders (TCTO) (Tab BB-686). The aircraft was Non-Mission Capable due to High Vibration readings from both engines at the time of the mishap (Tab BB-157).

b. Inspections

Maintenance inspections for the KC-46A are directed by the KC-46A Technical Orders (TO) and undergo progressive inspection requirements at intervals that lead to more extensive inspections (Tab BB-20). The most common KC-46A inspections are listed and defined as:

(1) Pre- and post-flight inspections (Tabs BB-21 to BB-22)
(2) Pre-Launch inspection - an inspection completed before each flight (Tab BB-22)
(3) Quick Turn (QT) - a post flight inspection required when an aircraft resumes flight within 8 hours of initial flight (Tab BB-22)
(4) Thru Flight - mandatory inspection required when a QT inspection is not applicable (Tab BB-22)

(5) Preflight (PR) - required prior to the first flight of the flying period. Validity period will not exceed a 72-hour period (Tab BB-21)
(6) Basic Post-Flight that must be completed every 14 days (Tab BB-22)
(7) Combined Basic Post-Flight a combination of a Preflight and Basic Post-flight (Tab BB-23)

The board reviewed the MA's records and documentation; all inspections and TCTOs were up to date and complied with (Tabs U-3 to U-8). Additionally, the last inspection completed was a PR signed off by the maintenance team (Tabs U-3 to U-8).

c. Maintenance Procedures

On 12 July 2025, the MA landed at Fairbanks International Airport after experiencing high engine vibrations at 83% N1 (fan speed) during aerial refueling operations (Tabs V-2.5 and V-2.7). After landing, the MA was parked at the FBO (Tabs V-2.3 and Z-3). FCC1 informed FBO that the MRT would need to run both engines at a high-power setting to troubleshoot and correct the issue (Tab V-5.3). The Director of Operations for Omni Logistics FBO then spoke with Airfield Operations to locate a spot suitable for the maintenance activities (Tab V-9.3).

A few days later, on 15 July 2025, the FCC team along with the assistance of the Airport Ground Manager (AGM) towed the aircraft to the HCR (Tabs V-2.3 and V-2.4). The spots designated for aircraft parking at FIA, with the exclusion of the main gate terminal parking locations, were structured with concrete in a "T" shape for the placement of the aircraft's nose and main landing gear, whereas the surrounding pavement consisted of asphalt (Tab Z-3).

The MRT, with the assistance of the FCC, began preparations for the Vibrations Survey test by connecting a diagnostic computer to the Airborne Vibration Monitor and performed the Prepare for Engine Operations task (Tabs V-1.2 and BB-155). The Vibration Survey test provides data in which to make necessary adjustments within the engine and to make sure that the engine vibration is at a satisfactory value after system repair, or component replacement (Tab BB-155). The Preparation and Engine Start procedure directed the MRT to calculate the local windspeeds and direction (Tab BB-158). The MRT determined the wind direction and speed to be out of limits and therefore decided not to complete the maintenance until a change in direction and speed would allow safe completion of their tasks (Tab V-2.3).

Figure 3: Right Main Landing Gear Located on Concrete "T" Structure

(1) **Left Engine Maintenance**

The following day, on 16 July 2025, and with winds now within limits, EPS1 and EPS2 began the Left Engine Trim and Balance process (Tabs R-3, W-3, V-2.5, and BB-164 to BB-166). They started with the first HPER to obtain baseline data (Tab V-2.5). As part of the process, they operated both engines simultaneously at high-power for the duration of each Functional Test (Tab V-2.6). EPS1 was the Engine Operation qualified member and therefore sat in the pilot's seat (Tabs R-3 and T-25). EPS2 was located behind the flight deck in the Aircrew Member Compartment (ACMC); EPS2 operated the diagnostic computer and obtained vibration readings during the procedure (Tabs R-7 and V-5.2).

The second HPER's purpose was to obtain the appropriate readings and possible solutions from the diagnostic computer which then would allow the ASM to install trial weights and balance the engine (Tab BB-155). The trial weight placement is done by gaining access to the low-pressure compressor section behind the inlet cone of the engine, locating the placement directed by the diagnostic computer, marking the placement and installing the weight (Tab BB-164). It is then required to operate the engines in accordance with the vibration survey test to assess the engines readings and determine if the proper corrections were made (Tab BB-165). After maintaining idle for five minutes, EPS1 began to slowly increase thrust, stopping at designated percentages approximately every 5% N1 after 57% until the engines reached 83% N1 (Tabs R-3 and BB-155). After the second data run, the trial weight was installed on the fan hub (Tab BB-165). EPS1 began the Engine Operation Procedure (Tabs V-2.5 and BB-154). EPS1 then performed the necessary follow-up engine runs according to the Vibration Survey Functional Test to test the trial weight

placement accuracy and adjust the weight to lower the engine vibration to an acceptable level (Tabs V-2.5, BB-155, BB-157). EPS1 and EPS2 operated both engines at idle for approximately five minutes before proceeding to slowly increase thrust until 83% N1 was reached (Tab R-3). EPS1 and EPS2 performed this process an estimated eight times before reducing the engine vibration readings to the appropriate limits of 1.5 N1 vibration at 83% N1 or approximately 1.34 EPR (Tab R-3). With the left engine within operating limits, EPS1 and EPS2 proceeded to balance the right engine (Tab V-2.5).

(2) **Right Engine Maintenance**

After successfully balancing the left engine, EPS1 and EPS2 began the Right Engine Trim and Balance process (Tabs R-3, V-2.5, and BB-164 to BB-166). They continued the same procedures utilized in balancing the left engine to obtain baseline data (Tab BB-155). After the second data run, the trial weight was installed on the fan hub (Low Pressure Compressor – Adjustment/Test) (Tab BB-164). EPS1 began the Engine Operation Procedure (Tabs V-2.5 and BB-154). ASM again installed the trial weights and then EPS1 executed the trial engine operation run-up (Tab BB-165). After maintaining idle power for five minutes, EPS1 began to slowly increase thrust, stopping at designated percentages approximately every 5% N1 after 57% until the engines reached 83% N1 (Tab R-3). After hitting the 80% threshold, and receiving a reading of 0.9 N1 Vibration, EPS1 was about to bring the aircraft to 83% to test the maximum vibration when ASM informed EPS1 that the pavement behind the right engine dislodged from the ground, lifted into the air and broke apart behind the MA (Tab V-1.3).

Upon notification, EPS1 promptly executed Engine Shutdown Procedures (Tab V-2.5). FCC1 was stationed in an adjacent vehicle at the time of the incident (Tab V-1.3). FCC1 called the AGM to report the incident to the appropriate channels (Tab R-5). EPS1 and EPS2 inspected the inlet and exhaust of both engines for evidence of FOD; they found no evidence of damage to the engines (Tab R-3). The MRT stopped all maintenance procedures and spoke with the airport ground personnel about the incident (Tab R-5).

On 17 July 2025, the FCC team and airfield ground operators towed the aircraft to the FBO parking area so the airport could clean the HCR (Tab V-2.8). After the debris was cleared, the FCC team towed the aircraft back to the HCR to a spot next to the original designated location but parked roughly at a 45-degree angle facing the runway (Tab V-1.5). The MRT completed the final balancing weight installation as well as the final engine functional check (Tab V-1.5). EPS1 performed one last HPER and found the readings to be within an acceptable range (Tab V-1.5).

(3) **Engine Shutdown**

Standard procedure to shut down a KC-46A PW4000 series engine is to bring both engines thrust levers to idle for approximately five minutes to cool down the engine prior to shutoff (Tab BB-167). Upon notification, EPS1 brought both engines to idle to begin the shutdown process (Tabs V-2.5 and BB-167). The ASM described what they saw to EPS1 about the damage to the pavement and potential FOD around the engines and aircraft flight control surfaces (Tab R-9). Due to unclear intercom transmissions and psychological shock related to the event, EPS1 shut down both aircraft engines after approximately three minutes rather than waiting until the recommended cool down time (five minutes) elapsed (Tab V-2.5). During the interview, EPS1 mentioned they were

concerned about FOD being ingested into the engines and, therefore, did not wait the full five minutes to cool down the engines as recommended by procedure (Tabs V-2.5 and BB-167).

(4) Damage to Asphalt

To complete the required engine maintenance, FCC1, FCC2 and airport ground personnel towed the MA from the FBO parking area to the HCR (illustrated as the "south cargo apron" in Figure 4 (Tab Z-6). According to interviews, FCC1, FCC2, and the MRT communicated to the AGM that high power settings were to be utilized during the engine run process (Tab V-9.2). Additionally, they informed the AGM that they would have to complete multiple engine runs, and each would last approximately fifteen to twenty minutes in duration (Tab V-9.2).

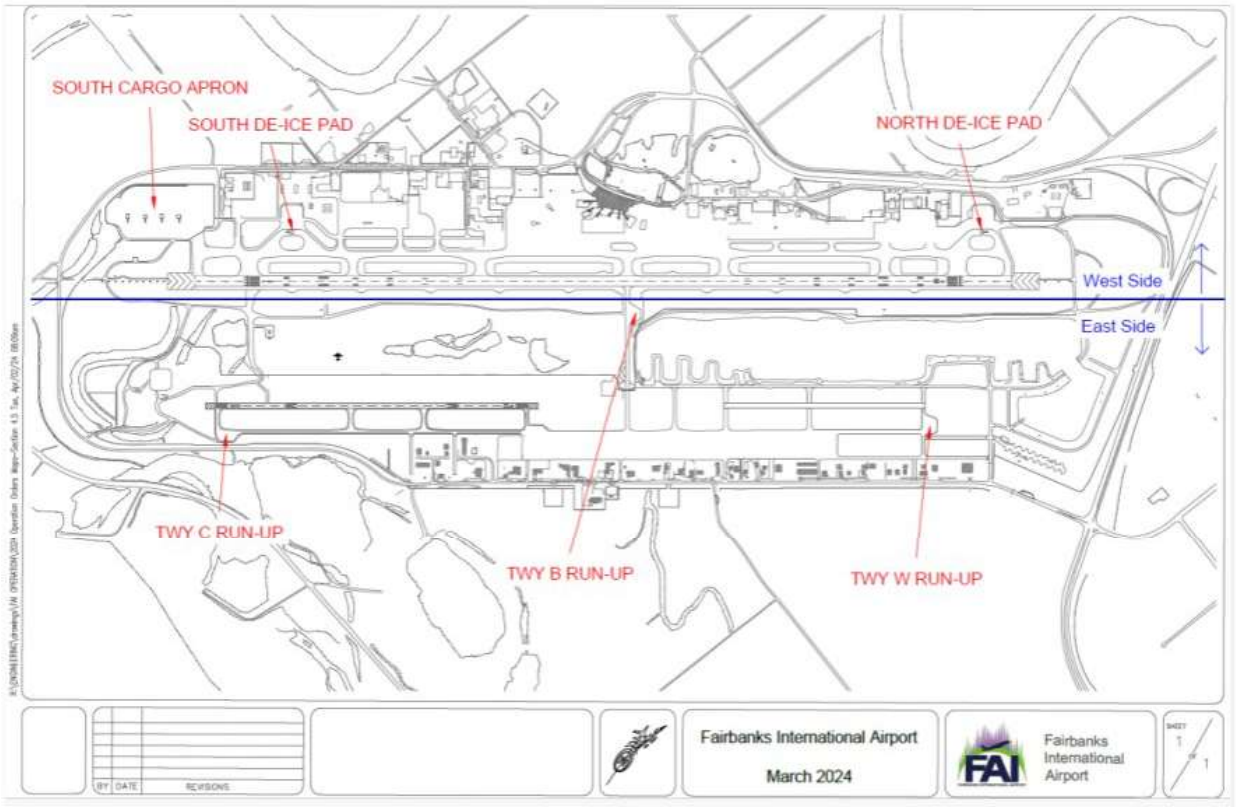

Figure 4: Alaska DOT Operations Order Depicting Engine Run-up Locations

In accordance with established procedures, the MRT completed approximately ten HPERs between 1000L and 1800L on 16 July 2025 (Tab R-3). For reference and context, Figure 5 shows an asphalt seal behind the left engine following the asphalt dislodging behind the right engine (Tab Z-7).

Figure 5: Noticeable Heat Damage to Asphalt Sealant Behind the Left Engine

Ultimately, due to consistent heat and exhaust velocity from the engines, the seals securing the asphalt blocks failed and the pavement lifted into the air (Tabs Z-8, BB-159, BB-161-162). The repair area covered approximately 3,200 square feet (Tabs CC-15-16).

Figure 6: Damage to Heavy Cargo Ramp Following Multiple KC-46A Engine-runs

During the investigation, the board reviewed the original apron planning documents as well as the 2024 pavement inspection results (Tabs O-1-81 and Z-11-13). Additionally, the board interviewed the FIA Engineer (ENG) and reviewed the airport's 2024 pavement inspection results (Tabs V-8.2 and Z-11-13). According to the FIA ENG, there is a surface inspection completed every two years (Tab V-8.2). Neither the FIA ENG nor the inspection results data suggested that there were any significant surface concerns (Tabs V-8.2 and Z-11-13). While investigating the parking area, the

board noticed minor sealant imperfections that, to the untrained eye, resembled normal and expected wear due to weather and general ramp use (Tab Z-7).

d. Maintenance Personnel and Supervision

The board reviewed EPS1, EPS2, ASM, FCC1 and FCC2's training records and determined that all personnel were properly qualified for all tasks performed prior to the incident (Tabs T-3-42). EPS1, 22d Aircraft Maintenance Squadron (AMXS), was the engine operation qualified personnel (Tab T-38). Additionally, all appropriate testing and training was completed prior to the MRT request, as shown in G081 9119, personal training records and AF Form IMT 2426 (Tab T-38). No anomalies were found in the individual training records and all were signed off by the appropriate supervisor (Tabs T-3-5, T-7-8, T-27, T-31-32, T-36).

FCC1 and FCC2's 157th Aircraft Maintenance Squadron (AMXS) training records reflected their qualifications for aircraft towing and preflight inspects; no issues were noted (Tabs T-4 and T-8).

ASM's 22d Maintenance Squadron (MXS) records show the ASM was qualified for major engine component hardware installation (Tab T-20).

Overall, there were no records of deficiencies found, and all maintenance personnel were current and qualified to perform their tasks (Tabs T-3-42).

e. Fuel, Hydraulic, Oil, and Oxygen Inspection Analyses

Not applicable.

f. Unscheduled Maintenance

The last scheduled inspection performed on the MA was a PR inspection, performed on 12 July 2025 by FCC1 and FCC2 (Tab U-3). The inspection was completed at FIA (Tab U-3).

Upon landing at FIA on 12 July 2025, FCC1 and FCC2 performed unscheduled maintenance to correct a fault within the aircraft Air Data and Inertial Reference Unit (ADIRU) (Tab U-3). The Left ADIRU displayed 10 miles off Global Positioning System (GPS) tolerance and Flight Management Computer positions (Tab U-3). To correct the fault in the system, the maintenance team swapped the Left and Center Air Data and Inertial Reference Units to test if the fault followed the unit (Tab U-3). The maintenance team confirmed the faulty unit and documented it as requiring replacement (Tab U-3). This discrepancy was unrelated to the mishap (Tab U-3).

The second unscheduled maintenance task was the required inspection of applied speed-tape to the aircraft for wear, damage, and replacement if required (Tab U-4). The fault itself, inspections, and the maintenance performed were unrelated to the mishap (Tabs U-3-4).

6. AIRFRAME, MISSILE, OR SPACE VEHICLE SYSTEMS

a. Structures and Systems

After the mishap, the maintenance teams did an extensive inspection of the exterior of the aircraft for evidence of damage (Tabs V-2.6 and U-5-7). An inspection of the aircraft engines, to include an in-depth inspection of both the inlet and exhaust areas, was also completed (Tabs V-2.6 and U-5-7). No evidence of damage was found on either the exterior of the aircraft or within either engine (Tabs V-2.6 and U-5-7).

(1) Engine (Pratt & Whitney PW4062/F139)

The KC-46A has two Pratt & Whitney PW4062/F139 High-Bypass engines capable of 62,000 pounds of takeoff thrust each, allowing for a maximum takeoff weight of 415,000 pounds and has a fuel capacity of 212,299 pounds (Tab CC-17). These engines provide enough power and fuel efficiency to the aircraft to fly a distance of 7,350 miles without aerial refueling at maximum speed of 637 mile per hour. (Tab CC-17).

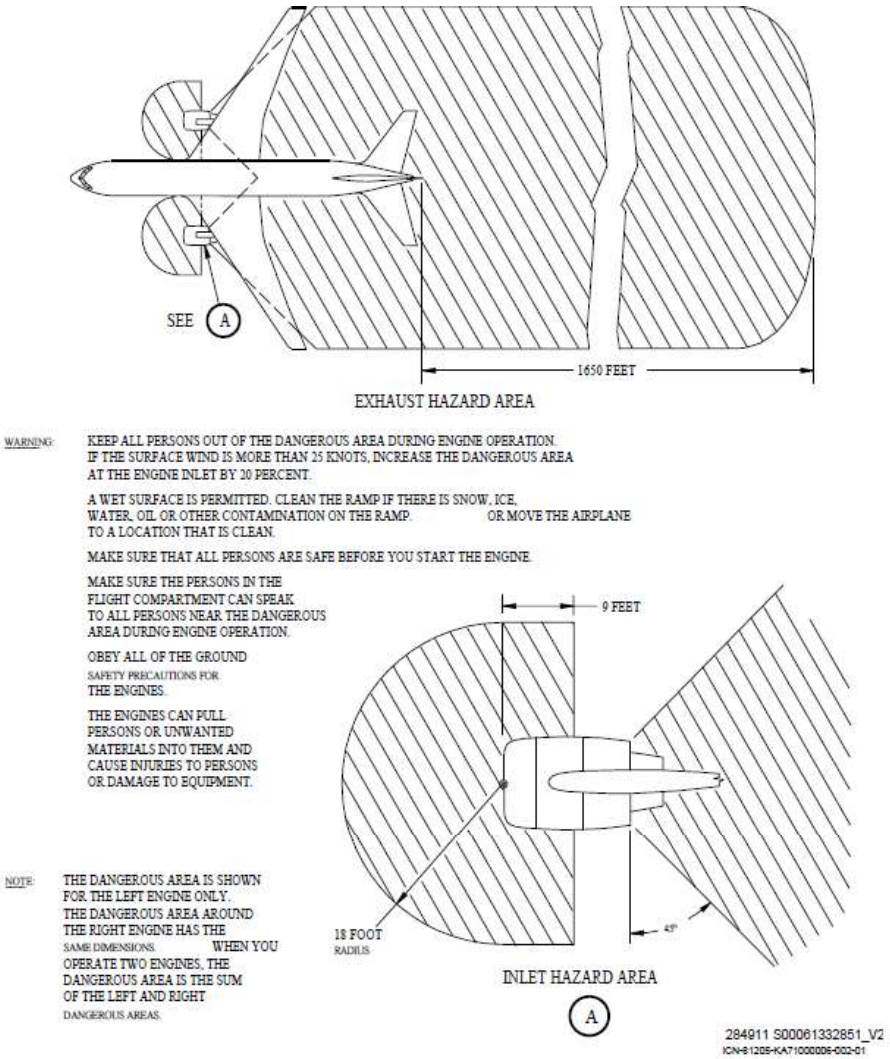

Figure 7: Inlet and Exhaust Engine Danger Area at Takeoff Rated Thrust

7. WEATHER

a. Forecast Weather

Due to the nature of the mishap, there was no forecast weather data obtained by the board.

b. Observed Weather

FIA observed weather on 16 July 2025 was light winds from the east at between five to eight knots with few clouds at 1,000 feet above ground level (AGL), a ceiling at approximately 7,000 AGL and visibility of 10 statute miles (Tab W-3). The temperature reached a high of approximately 72 degrees Fahrenheit during the engine-run sequence (Tab W-3) All observed weather during the mishap was within high-power engine-run operating limits (Tabs W-3, BB-158-159).

c. Space Environment

Not applicable.

d. Operations

There is no evidence to suggest that EPS1 or EPS2 operated outside prescribed operational limits (Tab BB-156-159).

8. CREW QUALIFICATIONS

a. Aircrew

Not applicable.

b. Engine Propulsions Specialist 1 (EPS1)

EPS1 is a qualified KC-46A Engine Propulsion Systems Mechanic with 4 years of mechanical experience on the aircraft (Tab V-2.2). EPS1 was initially qualified as an Engine Propulsion Mechanic on the KC-135 within 2 years prior to the transition to the KC-46A (Tab V-2.4). As of 2 April 2025, EPS1 was upgraded to a 7-level Craftsmen for KC-46A Engine Propulsion Systems and as of 16 July 2025, was current for all training and testing for engine run operations at the time of the mishap (Tabs T-23 and V-2.2).

c. Engine Propulsion Specialist 2 (EPS2)

EPS2 is a qualified 5 skill level KC-46A Engine Propulsion Systems Mechanic with 1.5 years of mechanical experience on the aircraft (Tabs V-5.1-5.2). As of December 2024, EPS2 was upgraded to a 5-level Journeyman for KC-46A Engine Propulsion Systems and was current in training to assist EPS1 in all maintenance activities and operations at the time of the mishap (Tab T-41).

d. Aircraft Structural Maintainer (ASM)

The ASM is a qualified KC-46A and KC-135 Aircraft Structural Maintainer with 3 years of experience as an aircraft structural maintainer (Tab V4.2). As of 2 January 2025, ASM was upgraded to a 5-level Journeyman for the KC-46A and was current for structural maintenance at the time of the mishap (Tabs T-16-22).

e. Flying Crew Chief 1 (FCC1)

FCC1 is a qualified KC-46A Flying Crew Chief, also known as a Crew Chief or Airframe Powerplant General Maintainer, with over 11 years of experience in Aircraft Maintenance (Tab V-1.1). FCC1 was previously qualified on the KC-135 prior to the conversion to the KC-46A (Tab V-1.1). FCC1 was fully qualified as of 5 August 2024 to perform KC-46A towing and preflight inspection operations at the time of the mishap (Tabs T-3-4).

f. Flying Crew Chief 2 (FCC2)

FCC2 is a qualified KC-46A Flying Crew Chief, also known as a Crew Chief or Airframe Powerplant General Maintainer, with 4 years of KC-46A maintenance experience (Tab V-3.2). FCC2 was initially qualified as a KC-46A Crew Chief on 23 March 2024 and was current for KC-46A towing and preflight inspection operations at the time of the mishap (Tabs T-7-8).

9. MEDICAL

Not applicable.

a. Qualifications

The pilot, co-pilot, and air refueling operator were all in crew-rest and not present at the aircraft during the mishap (Tabs V-1.2-1.3).

b. Health

The pilot, co-pilot, and air refueling operator were all in crew-rest and not present at the aircraft during the mishap (Tabs V-1.2-1.3).

c. Pathology

Not applicable.

d. Lifestyle

There is no evidence to suggest lifestyle was a factor in the mishap (Tabs V-1.1-5.5).

e. Crew Rest and Crew Duty Time

The pilot, co-pilot, and air refueling operator were all in crew-rest and not present at the aircraft during the mishap (Tabs V-1.2-1.3).

10. OPERATIONS AND SUPERVISION

a. Operations

Not applicable.

b. Supervision

The MRT was dispatched in accordance with 618 AOC standard operating procedures (Tabs V-1.4 and BB-857-859). The maintenance operations were conducted in accordance with AMCI 21-108 (Tabs BB-857-859). FCC1 coordinated the request through the TACC where it was routed in accordance with AFI 11-207 for processing and channeling to direct the MRT to the required location (Tab V-1.4). Supervision from the 22 AMXS and 22 MXS designated EPS1, EPS2 and ASM as current in their respective training and qualified to perform the required tasks as the requested MRT (Tab V-1.4).

11. HUMAN FACTORS ANALYSIS

Not Applicable.

12. GOVERNING DIRECTIVES AND PUBLICATIONS

a. Publicly Available Directives and Publications Relevant to the Mishap

(1) AFI 51-307, *Aerospace and Ground Accident Investigations*, dated 18 March 2019
(2) DAFI 21-101_AMCSUP, *Aircraft Equipment and Maintenance Management*, dated 16 January 2020
(3) Fairbanks International Airport Operational Order, Section 4.5, *Engine Run-Ups*, dated April 2024

NOTICE: All Air Force directives and publications listed above are available digitally on the Air Force Departmental Publishing Office website at: https://www.e-publishing.af.mil.

b. Other Directives and Publications Relevant to the Mishap

(1) TO 00-20-1-AMC-WA-1*, Aerospace Equipment Management Inspection, Documentation, Policies, and Procedure (AMC Supplement Merged),* dated July 2024
(2) AMCI 21-108, *Logistics Support Operations,* dated March 2023
(3) AFI 11-207, *Fighter Aircraft Delivery,* dated August 2023
(4) TO 00-20-2*, Maintenance Data Documentation,* dated August 2023
(5) TO 00-5-15, *Air Force Time Compliance Technical Order Process*, dated July 2023
(6) https://kc46.onesource.oneil.com/

c. Known or Suspected Deviations from Directives or Publications

This board found no evidence of known or suspected deviations from Air Force or Department of Defense directives or publications.

RAYNOR.MICHAEL.T.[redacted] Digitally signed by RAYNOR.MICHAEL.T[redacted]8 Date: 2026.02.26 08:27:21 -05'00'

26 FEBRUARY 2026

MICHAEL T. RAYNOR, Lt Col, USAF
President, Accident Investigation Board

STATEMENT OF OPINION

KC-46A, T/N 18-6054
FAIRBANKS INTERNATIONAL AIRPORT, ALASKA
16 JULY 2025

Under 10 U.S.C. § 2254(d) the opinion of the accident investigator as to the cause of, or the factors contributing to, the accident set forth in the accident investigation report, if any, may not be considered as evidence in any civil or criminal proceeding arising from the accident, nor may such information be considered an admission of liability of the United States or by any person referred to in those conclusions or statements.

1. OPINION SUMMARY

On 16 July 2025, at approximately 1800 local time (L), a maintenance recovery team (MRT) assigned to McConnell Air Force Base (AFB) performed engine maintenance on two KC-46A engines at Fairbanks International Airport, Alaska (FIA). The maintenance process required multiple high-power engine-runs (HPER) each lasting between twenty and thirty minutes in duration. After approximately ten HPERs, high temperatures and engine exhaust velocity critically degraded the asphalt sealant behind the right engine. Following material failure, the two asphalt blocks dislodged, lifted into the air and broke apart behind the mishap aircraft (MA). The total cost for the FIA parking apron was $147,044. No injuries or aircraft damage resulted from this mishap.

2. CAUSE

I find, by a preponderance of evidence, that the mishap was caused by persistent high temperatures in combination with repeated high-speed exhaust from the MA's right engine. These conditions severely degraded the bituminous sealant behind the MA and ultimately dislodged two 25-foot-long by 25-foot-wide asphalt blocks.

3. SUBSTANTIALLY CONTRIBUTING FACTOR

I find by a preponderance of evidence that one factor substantially contributed to the mishap: (a) asphalt and sealant condition.

a. The Heavy Cargo Ramp's Overall Asphalt and Sealant Condition

I find by a preponderance of evidence that parking spot 4's asphalt sealant on the Heavy Cargo Ramp (HCR) was, while within inspection standards, unable to endure numerous hours of high temperature and engine exhaust airflow velocity.

Furthermore, it is important to note the significance that both engines operated simultaneously during the engine-run process. The sealant behind the left engine showed signs of heat damage, while the area behind the right engine ultimately failed. It could not be determined why the sealant

failed (ie. structural imperfections, environmental impact, etc.), but it most likely failed due to the consistent harsh conditions imposed during multiple engine-runs.

4. CONCLUSION

After a comprehensive investigation into this mishap, I find by a preponderance of the evidence the cause of the mishap was persistent high temperatures in combination with repeated high engine exhaust from the MA's right engine. These conditions severely affected the sealant holding the asphalt together behind the MA; the sealant ultimately failed, allowing the blocks to lift into the air and break apart upon impact with the ground. I further find by a preponderance of evidence that the following factor substantially contributed to the mishap:

- The Heavy Cargo Ramp's Overall Asphalt and Sealant Condition

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26 FEBRUARY 2026

MICHAEL T. RAYNOR, Lt Col, USAF
President, Accident Investigation Board

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