



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 11, 2022
Subject: Record of Conversation with Michael Brown
NTSB Accident Number: WPR22FA094

In a conversation with Michael Brown, at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA) and Ronald Sloma (ATAC safety).
- Declined representation.
- Answered background questions on career.
- 21 maintenance personnel.
- 2 shifts; 12 first shift; 8-9 second shift.
- Talked to accident pilot; talked about flying schedule for company around 7-8 a.m.
- Pilot was in good spirits, seemed normal.
- Met at forms and watched him review forms; pilot had no questions with forms.
- Accident aircraft trends as "problem child;" sat in hanger for a while. Can not remember what exactly. Tried to get an engine. Trend is a bus cycling.
- Ground maintenance check had a TR light; they ran jet and no TR light; Could not duplicate (CND). Signed off jet and released it around 0900.
- Team meeting 0600, maintenance issues, lead techs who is going to what jet etc. FOD walk then get tools.
- Both A and B crew chief qualified to launch, no maintenance calls from aircraft.
- New maintenance manager Kyle on his first week.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 11, 2022
Subject: Record of Conversation with Gary Allen Wall Jr. (Crew Chief that launched accident airplane)
NTSB Accident Number: WPR22FA094

In a conversation with Gary Allen Wall Jr., at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA) and Ronald Sloma (ATAC safety).
- Declined representation.
- Answered background questions on career.
- Hired as an aircraft mechanic level 1, and now level 2 (as of January 2021).
- Three-Four folks do the OJT training.
- Fully qualified to launch F-1s; got full qualification after a few months of training
- Donny Cash is his lead.
- How was training? Was a “cold” start; have someone with 1-2 years on jet to folks that might or might not have fighter experience. Training did not meet expectations. Pace is pretty quick so inferred difficult to train.
- People that came out for Alliance needed work on how to instruct and teach.
- When he went to Alliance for hydraulics, was good as taught by folks with a lot of F-1 experience.
- Aircraft 633 avionics door came open in flight and took 3+ months to repair.
- Bent hinge and damaged airframe so combination of experience and scope of work for a while.
- Was last May or June.
- Getting pitot static system to work - a lot of work.
- Hydraulic lines been issues – problem with hoses and way routed.
- Had a power bus cycling issue in flight and difficult to replicate on ground
- 0600 show, first flight of airplane.
- Was crew chief assigned to airplane.
- Two guys as B-man (new guy being showed by another).

MEMORANDUM FOR RECORD

Page 1 of 2

- Was pushed by 20 minutes by squadron supporting.
- Daily inspection was normal, saw TR light written up from day prior. Other party put power on aircraft. Swing shift Tia turned the night prior.
- Showed fuel tapes normal, DETOT (fuel totalizer) set properly; nothing unusual.
- Talked to pilot issue starting day prior, but other than that normal.
- Said mood was having a good day, seemed good and was asking normal question about jet, etc.
- Ground ops normal. Was #2, timing looked normal, not rushed. No mx calls. No shutdown.
- Summation: everything went as it should, seemed normal and was surprised about the outcome.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 11, 2022
Subject: Record of Conversation with Chris Allain (Lead Pilot for formation)
NTSB Accident Number: WPR22FA094

In a conversation with Chris Allain, at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA) and Ronald Sloma (ATAC safety).
- Declined representation.
- Full-time with company.
- Full week of ground school, cockpit fam, emergency procedures, immediate action items (cockpit trainers 1-2 hours); go through third prior to first flight, high speed taxi, 4 fams flights at Alliance then 5th flight is FAA check ride, solo ride at Luke. Go with qualified flight lead till 20 hours then can go by self. During mishap flight was the 3rd flight in a 3-ride flight lead check out with 4th scheduled 2/11/2022 as final check with AB.
- Was concerned with risk mitigation prior to committing to company. Number of talks with Chim about how company mitigates risk. Was pleasantly surprised by the length of ground school and the depth that the school went through. Was impressed with the how challenging the ground school was and length instructors would stay after. Believes the pilots are humble enough to chair-fly and know limits and take steps to overcome. Without a simulator the best way to limit it. Does not believe anyone is a cowboy.
- Flight lead work-up was not pressured and was told when he was ready would start upgrade.
- 1.2 average sortie.
- Should go with full gas.
- How feel with mx: is lean, but older and experienced. Feels enough mentorship. Not uncommon for mx delays or cancels. Everyone respects the jet and no pressure from leadership to take something he feels it is not good.
- Cited experience that ran jet up on runway that was 20 degrees above EGT limit and AB directed ground abort.
- Estimate 5-10% of sorties delayed for mx issues; says was better than Marine Corp; then said about on par with what saw in military.

- Three to four words he thinks of Link (accident pilot): proficient, humble, reasonable.
- One of the most experienced guys here next to AB and in the company. He is a go to guy for questions (AB, Boomer, and Link - three guys to answer questions).
- Does not know him personally. Does not know wife, kids, etc.
- Saw him day prior talking to him about schedule.
- Nothing abnormal day of flight, all there in brief, no red flags. Seemed normal, good mood.
- Brief BFM flight in 63rd, briefed in 63rd and plan was to split up. Just need 1 jet per students. F-16s were supposed to augment and fell out. Sat in coordination brief, expectations, TRs, specific questions answered. Updated the card when came back, Tong briefed card and EP of the day was ejection. Talked specifics of where if controlled and went through checklist. Bailout west of bailout. Did not have the specific radial, DME and altitude.
- Bailout near field, going to try to make field, if not make then find field, ride it to make sure hit the field then bailout (controlled).
- Safety of public, safety of pilot, then aircraft.
- Min airspeed 170 knots and 1,500agl and 250 knots for engine; 120 ft single.
- So briefed go together, then RTB based on fights and most likely different fuel states.
- Both had same BFM plans.
- From taxi, launch normal. Airborne both aircraft were inside 100L of each other around 4800 liters.
- In area was 4200ish liters at split; stayed on inter-flight.
- #1 does 3 flights with his student. #1 knocks it off at 1900 liters. Bingo was 1300 liters.
- #1 starts going home, sees #2 fighting student on ADSB- sees him go home about 15 nm in front.
- #2 I have 1200 liters but have nothing on the tapes... even keel guy but not panicked
- So, #2 points home (guesses about 35-40nm home).
- Says 140 liters for pattern.
- Starts to try to run him down, get max range; got to about 10 miles. Does not know if he declared an emergency.
- Said "Got the low fuel light" on aux at about 25 nm. "Just lost my engine, not going to make it."
- Told him to "point to clear area and get into a good body position."
- Makes jog to left (points toward the northeast); tells approach ATAC 22 just impacted ground and to clear the airspace; did not see chute to clear civil traffic; stays high and overflies. Does not see fire just dirt. Two laps at 4,500, then does final at lower sees chute with him standing next to it. Comes home and landing uneventful.
- Nothing on flight that would record.
- Statement done within 30 minutes of landing.
- 0.8 flight time; says 900 liters (should have been similar).
- Initial thought is catastrophic fuel leak.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 11, 2022
Subject: Record of Conversation with Stephen Kensick (Accident Pilot)
NTSB Accident Number: WPR22FA094

In a conversation with Stephen Kensick, at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA) and Ronald Sloma (ATAC safety).
- Declined representation.
- Background light civil aircraft in teens, Navy F-18 (1700/1800 hours) – 8 years, 115 FW Madison (16-17 yrs.) flying F-16s 2000 hrs., United Boeing/Airbus, ATAC, 2020 for 2 hours – 5000+ hours.
- 500 hours United.
- F-1 training run-down: arrive basic in-doc, admin then ground school. Primarily operating procedures and systems, cockpit simulators (so to speak) – normal/abnormal procedures with no sim. Taxi fam, walk-around, get out of chocks then high-speed taxi-abort. Followed by Fam flights 4 flights in F-1B, 5th flight check-ride. Then F-1C differences with solo flight. Learn how to flight with different systems on aircraft, with tablet on leg and how to employ. Wingman upgrade, then flight lead then check-ride with FE. Normal training with SEPTs, procedures, etc.
- He is deputy director of operations, number 2 guy in charge. Responsible flight schedule execution between customer and us. Flies as a line guy (full schedule). He is flight instructor, MC, and flight lead. Him and AB two full time instructors here.
- Instructors do good job in systems knowledge and instruction in jet. Most guys do not have experience in jet so leverage previous experience in other jets. It is efficient. Do not simulator. Have to realize this is not established program. F-16 had 40 years of experience. Have a lot of experience but not in F-1. Instructors would rely on former SMEs like South Africans with not as much depth as we thought. Relied on Rock and Rapper would get questions would go seek answers. Did felt the training covered the square, had some questions but overall systems were good. If did have question, would get answered.
- How is mx reliability since been here? Em... yeah. Says “growing pains.” ATAC would have issues like hydraulics. Reliability of jets standardized, and major systems work % of time was

less than previous experience. There were learning points and less reliability than previous experience.

- Company pressure: says obviously goal to satisfy customer but leadership emphasized safety is #1. Hydraulic issues the leadership would put effort to fix and do tiger teams. Was clear that leadership backed up safety culture. Safety and compliance are #1, leadership balance is right, and leadership listened when pilots had concerns. Just had all pilots meeting in Texas and leadership stood up to address concerns.
- What system other than talk to leadership with concerns. Can go to someone else to report. Go to Wedge Troyer would listen to inputs. Safety chain of command would then go to Brillo.
- Other guys that guest fly that do not report you can easily talk to.
- Recognize higher risk here when go through SEPT, EP of the day would be more thorough in discussing situation. If he ever had any problems would talk to Rock Pyle to answer questions. Also try to leverage connections to French and South African knowledge and experience.
- 72 hours prior: most days flying once or twice. Was usually a flight lead so go to brief, debrief. End of day try to get a workout in. Go home then finish schedule for next day. Then next day repeat. Busy days about 10 hours on average. Some days a little more, some a little less. Nothing personal. Normal sleep 3 days prior. No red flags personal side.
- Had 0820 brief. This was Tong's 3rd flight lead. Not a typical ride BFM-7s which is last ride before F-35 student leaves base. Usually, a dissimilar BFM. F-16s fell out. 3 x 2-ships with each IP observing and F-1 fighting the student. Had coordination brief then came back to Tong doing standard brief as F-1 2-ship departing together then split to fight F-35s. Expectation different fights so would come back.
- Aircraft 633 primary issue was bus cycling and uniform and due to VHF tower frequency jet had issue with manual input to Pri-radio. Tong and Link discussed bus cycling effects on instruments.
- Aircraft 633 had issues starting, had changed ignitor plugs and had already started jets earlier that morning. He felt intake warmer.
- Wait in EOR for 2 x 2-ships take-off on runway 03R. Normal departure, F-35 formations split off, and he does G-ex and then he goes to get F-35. Uses AB to burn fuel to get tank dry to increase G-available. Fights first student then next. Last engagement was defensive for student that puts offensive.
- First set AB for 3 x 360s. Fights other student and does exact same set. The with second student does high aspect which is KO earlier as student loses sight using AB go low to high. Does second high aspect and does 3 x 360s.
- This is much different than normal as most set do BVR using AB to get higher altitude. But this way more. More than 70% more towards 90% more AB usage than average sortie.
- Defensive setup this one goes 2 turns based on DETOT on where bingo. Was 1.3 with 1.3 bingo, 1.8 joker. Checking fuel between sets then checking as fighting on last sets.
- Talks state in DETOT with tank dry based on light. DETOT measure fuel going across. Tapes whether go to Feed or fuselage. EOT lights End of Transfer coming on order and a Fuel Low Light.
- DETOT stayed same with #1 the whole day. Did check during the fights.
- What are you check. DETOT and EOT lights and tapes can provide information based on lights. Once centerline and wing tanks empty, the tapes should add to DETOT.

- Some of the jets have finicky lights, did see centerline come on then go off – during one of fights he thinks it did come off (the light was off). Do not have the fidelity that the lights come on.
- Perception the lights were finicky on the jet, cannot say that the centerline tank was on at that jet.
- Tapes were 1,700 had lights, 1's on and in upper 3,000 liters. Do not remember tapes. Was not seeing the tapes like normally do. Does not remember see lights. Seen some of jets that do not come on in proper order but resolve themselves. Sometimes they do not, and the jet is Code 3.
- Between sets primarily looking at DETOT, saw tapes but was not registered. One check made sense.
- Did not press the 7 G limit. Has fought the jet quite a bit. Has gotten to 7 but difficult. Do not recall on G meter, did not look.
- Through the DETOT looking between student and him he is confident he was looking at every set-up between him and F-35 student. Last set-up just underneath on DETOT. As fighting was glancing at DETOT and KIO at 1,380 liters and started RTB. Was at about 12,000' MSL. Started fight at 18,000' MSL.
- Do climb in MIL, average time 1 to 1:30 to climb up to 18'k.
- He had beat-up kid, so he had enough around 2'k liters to give him another and had noted joker. Knew he was at joker fuel based on DETOT.
- Aircraft 633 had cycling buses. Did cycle get master warning with AP light. Came on 2/3s to 3/4's through fight when it came on in climb. You lose TAS and the cycle lasts about 30 seconds. After he paddles off AP. Believes it happened just once.
- On eastern part of MOA via the arc to VFR back to Luke for full-stop. He is telling the Flight Lead (FL) what he is doing, then Snakeye. Starts talking to approach and FL is RTB too. FL asks for fuel state and then he sees fuel low light flickers then goes out. He sees nothing on tapes. Says he has nothing, thinks maybe electrical issue but then sees low fuel light. States does not know what he has for gas. Asks for base to 03 and starts a climb. Does not know how long 30 seconds, 60 seconds. Get LP pump, within 10 seconds fuel pressure light. 10 seconds hears engine winding down and sees RPM winding down. Bunts and trims to 250 kts heading towards Luke so jinks east away from town... tries air start it goes 30 seconds to nothing. Tries air start again and makes emergency call and knows is going to eject. Removes century, tighten straps, levels off sees going for uninhabited area and ejects.
- Going south to north and tries to be as gummy as possible, feet, head, back. Stands up does inventory and unstraps. Minor scratches and bruises, minor sprain ankle.
- Only thing remember when tapes done the DETOT had counted down to 1,050. Cannot remember exact number on tapes. Not able to get into low fuel checklist.
- Trying to fly as efficiently as possible to get to left base.
- #1 light came on, the #3 came on, #2 came on. Some of will not come on the same time. When he looked at them the tapes made sense to the tapes.
- Was primarily looking at DETOT but not doing the analysis on the tapes.
- Low fuel came on light in the MOA is what he thinks... difficult to recall (right on the border).
- Fuselage and feeds were at zero. Both LPs lights came on simultaneously. No time for checklist.
- States policy is to eject with flameout. If at initial that is a more complicated. Hydraulic pumps big thing.
- Knew definitively that he was going to eject.

- Last 30 days 20 hours, averaging 6 sorties per week.
- Date last check-ride month ago: sometime in January 2022; monthly SEPT last week.
- No vision problems, no corrective lenses. September of last year FAA medical.
- Cycling bus issue: it is ultimately up to pilot to code the jet. Guys will get together and talk to make a decision after trouble shoot and fly the jet. The jet has been flying for a bit. Did not fly during night.
- Was in back in mind when looking at the lights and trying to reconcile what was happening.
- AB does good job trying to adjudicate issues and go most conservative.
- In training there is some real-world known issues to take real-world problems.
- Saw light come on and at fuel state that said tank dry at 3800 (high 3's).
- Next fight #1s came on then the #3s came on. Lights would flicker on and off. (dynamic maneuvering).
- Flickering come on and go off a number of times... and seen dynamic maneuvering.
- Initially a lot of that and then come.
- Cannot say it is during dynamic sorties or more static maneuvering.
- One specific time did do, but not so on this. Flying with student, different. After first time not analysis after.
- Saw the light, did not notice tapes, look at DETOT look at tapes and see nothing. Went to feed could not see white.
- Had mag heading, oxygen and fuel.
- LP Pumps and fuel pressure next event. Other lights, etc.
- Ambers looking at him but could not tell which ones.
- Start to pull stick back, do not move throttle 270 knots. Gentle turn to preserve.
- Air-start sounded normal and as expected, could hear ignitors.
- Have written up fuel lights and tape issues.
- Check the forms. Test the lights and fuel test lights, get all lights, make sure switches correct, DETOT correct.
- Look at last flight and do the gallons, never exact but it made sense.
- Did not know if conned.
- Only thing that heard, can hear electrical hmm.
- More fighting than he has done than in past.
- Think training was good.
- Looking back: lesson learned more attention to detail on tapes, use fuselage tapes left plus right should equal DETOT.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 12, 2022
Subject: Record of Conversation with Kyle Ammirata (Maintenance Manager)
NTSB Accident Number: WPR22FA094

In a conversation with Kyle Ammirata, at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA), Ronald Sloma (ATAC safety), and Jeremy Ulman (ATAC Deputy Director of Maintenance).
- Declined representation.
- Background AMP for 8 years worked Erickson Air Crane, mechanic, and became an assistant crew chief overseeing daily aircraft operations.
- Component changes, aircraft repairs, blade repair, change and tracking.
- In 2021, came here with Concurrence Group as advisor then came in as ATAC employee looking at inspections, engine removals, etc. Became a QAR, went to Alliance for aircraft run training for 40 hours training. Engine trainer, cockpit fam, performed engine runs.
- Based at Luke.
- Just an AMP.
- Full-time starting as Maintenance Manager as of this past Monday. Was aircraft mechanic 1.
- Perry Sablan on swing shift is the other individual engine run qualified. Usually have 2 others with them qualified in cockpit with crew chief outside.
- At Alliance only there for Engine Run. They would not be doing AB runs. Only doing to full Mil power. Perry only other person qualified.
- Two outside: crew chief at nose doing hand signals and the other acts as fire guard looking for tail pipe fire.
- Nothing hooked up to talk, just hand signals. Will have to shut down to talk.
- Use standardize procedure same as pilot at launch. Do general look at area, call MOC to get engine run clearance, MOC clears, then do walk-around starting on left side of aircraft and perform looking at wings, intakes, gear wells, nose and do same thing right side, make sure doors closed in front of intakes, go to main gear check first stage door, open and check first stage good, close, look hydraulics via hydraulics door, tail is good. Do FOD check on intakes and ground.

- Got qualified October of 2021.
- Perry qualified at the same time.
- Takes about 10 minutes from radio to start.
- Aircraft forms stay at desk, check forms to make sure all is good.
- Start and check what is needed then shut down. Go through procedure, sweep cockpit, and make sure what turned on is turned off, check O2 CB pulled, go to idle stabilized for 1 minute, make eye contact with crew chief, signal shutdown, crew chief checks and clears then shuts down.
- Lead technician call for MOC and maybe make call for top-off.
- Procedure normally will ask for top-off. Exceptions, there should not be an exception.
- After engine run verbal procedure to ask for top-off from supervision.
- Have done 30+ engine runs. Have not gotten topped off every time... have further maintenance or have to pull in they would not top-off.
- Depending on further maintenance might not top off.
- If jet going to spare or other flight? need clarification.
- Jet refueled night before. Then Kyle did engine run next morning, morning of accident.
- Ground crew during ground power noticed they had a TR light; crew was not sure. Kyle determines needs to do an engine run to determine if it needed more investigation. Went with lead at about 8:05 am went through procedures as discussed and started jet. Start-up was normal for about 25 seconds, nothing abnormal. EGT normal, caution light did not have TR and reset INV. Idled for 2-3 minutes everything was normal, no lights on caution/advisory panel. Went for a few minutes to make sure nothing popped. Gave a thumbs up and signaled to shut down. Uneventful engine run.
- Went up to 4,000 rpm for about minute and back to idle. Guess was less than a 5-minute process.
- He was not on the radio and did not know if top off was called in. He went in for maintenance manager duties. As engine run guy, he would not call in for top off.
- Flight line lead and pro sup were not out on flight line. Normally would be out.
- Under assumption that the crew chief would call lead to get top off.
- Did not sign off in forms. Was no write-up as this was a ground check so nothing to sign-off.
- Once done with engine run, would procedurally not write-up as manager made determination to do this engine run to make sure the ground power unit was not creating the TR light.
- If for a write-up, would do a write-up in the form for the discrepancy sheet.
- Normally for a ground run, 30-minute run would be estimated maximum of 30 gallons. Roughly 100 liters or less.
- On day, nothing logged. Best of his knowledge in morning meeting said 633 performed fine on engine run. His assumption was engine run called to MOC and fuel was called.
- Saw mishap pilot and noted he was "his happy, chipper self."
- Was in building during step and start next to radio and at computer. Nothing abnormal about that day with operation.
- DETOT 5,280 liters at start and 5,250 liters.
- No movement at the tapes.
- No amber during course of run.
- No lights LP pumps, fuel pressure, etc.
- Fuel pressure light out after 4-5 seconds of start pump.
- Did not look at forms.

- Personally top off refuel. Open fuel door, flip all the switches to see what light illuminate. Hook up hose and secure. Lights show what is low. As light extinguished would flip to normal to move to next light/tank, flip switches down to last. Centerline is the last tank to fuel.
- Nothing to add.
- Appreciated the time.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 12, 2022

Subject: Record of Conversation with Ryan Allen Mitchell (Crew Chief on N633AX engine run)

NTSB Accident Number: WPR22FA094

In a conversation with Ryan Allen Mitchell, at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA), Ronald Sloma (ATAC safety), and Jeremy Ulman (ATAC Deputy Director of Maintenance).
- Declined representation.
- Reserve retired with 56 CMS engine back-shop was at 6 or 7 different bases, Canon, Hill. Traveled here from Fairbanks and here at Luke. Had not made E-6 so forced out and then went to Reserves on A-10 at DM. F-16s and A-10 (PW and F100-100s and then A-10).
- Went to Airsale, driving cement trucks got a house in Goodyear and came to ATAC in 13 December.
- Aircraft worker was hired. (aircraft worker, mech 1,2,3).
- Training was on swing shift with Jay, was able to switch to days from swings with guy that wanted to go swings.
- Was with Donny working 623 with Derrick. Primarily OJT as never crew chief as was engine guy. At AIRSALE working big aircraft.
- Got here in June, as KG (Kurrent Group) that are temps that assist. Most start as temps then transition. Difference is who pays them.
- All OJT here not travel to Alliance. They sign off in training book. As work on certain tasks, he gets with trainer or someone that is signed off. Able to launch and recover solo (signed off a while ago while on swing shift).
- As solo been crew chief on probably 50 to 60 launches or more.
- During check out has made mistakes, forgotten things. Maybe complacent and tries to learn from those. Usually out with Derrick and he has explained to him what could have done better.

- Training program maybe a little lax, things he does not do daily has difficulty get signed off. Feels that trainers are knowledgeable to answer questions, feel open to feedback and will answer questions.
- Does not feel undue pressure, but with the turn of launching 10 aircraft and in charge of tools with different walks of life creates pressure. Different ways of doing business that comes from other OLs and Alliance makes pressure with being in charge of tools. Not having barcode system that he is used to. Some of programs can become stressful, not as good turnover hurts.
- Knows pilot, has flown plane he works a few times. Nice guy, never any issues. Glad he made it safe.
- Had not talked to mishap pilot that morning.
- Was crew chief for engine run. Was back in hanger and Donnie told him Kyle was doing engine run and that they needed a crew chief (A man) to do engine run. Caleb was B-man.
- Started up was normal, did not notice anything wrong. Was testing thrust reverser. Was testing TR light.
- Was not very long. 10-15 minutes. Believes he did go above idle. Cannot remember how long
- Did not see flight sup on ramp. Was Kyle on further end of run... one of further stalls.
- 10-15 minutes and slight engine increase momentarily. Kyle doing his own thing, TR.
- No discussion doing a top-off. Asked if needed to bleed tank, was told slowly as a lot of pressure. Did slowly but was finicky and slowly vented, it was slow. Does not remember tightening the plug. When doing daily supposed to check that is tightened.
- Is procedure to vent, can take a few minutes to vent, 3-4 minutes, maybe 5 minutes worst case.
- Done 40 or 50 engine runs at a minimum.
- Trained to vent and secure. Vent is on GOPs, daily task card. Want to make sure alignment marks.
- Do not believe he had tightened plug, not sure.
- Day of accident after wrote statement and talked to Mr. Brown and Kyle and he thought he had not tightened. It was not completely unthreaded.
- Other times when start to unscrew cap you hear the pressure relieving, this one he could not hear it venting. So just barely backed off and hearing it venting. Had to tap with key to hear. Did not hear the whole gas cap vent, was so slow. Vent to not hear anymore. Ended up getting distracted. Had to get the launch for 623. Not necessarily after but had to immediately get it ready.
- Remembers after engine run would be topped off. Would be one of the leads.
- No real conversation with Kyle, recalls everything ran fine.
- Did not look at cockpit.
- Did not look at forms.
- Not normal to do engine runs on other aircraft.
- Do not know why he was crew chief to do engine run on 633. Was just asked quickly to get that.
- Is refueling qualified. Ground aircraft. Go to centerline to open valve to centerline. Hook hose on. Top one centerline. All switches to left. Move down lights. Top would be centerline and as lights go out until done refueling. Once done then push switches right. Then check centerline and close valve.
- OJT for refueling is go to aircraft and show how to do. Least amount of refueling and give feedback.
- Not sure required reading prior to OJT.

- A concern was not believing that he tightened cap and that the refuel was accomplished.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 12, 2022

Subject: Record of Conversation with Tia Marie Amos (Refueled N633AX night prior)
NTSB Accident Number: WPR22FA094

In a conversation with Tia Marie Amos, at Luke Air Force Base, the following is a summary of what she stated:

- Others participating were Frank Waterhouse (FAA), Ronald Sloma (ATAC safety), and Jeremy Ulman (ATAC Deputy Director of Maintenance).
- Declined representation.
- Background started AC-130U crew chief then did engines and hydraulics. 2011, went to Charleston and did C-17s engines, avionics, and general crew chief.
- Hired end of October and came in November, 2021.
- Quals for F-1: no previous quals, now a crew chief and fire watch. Currently general maintenance, servicing, general inspections, launch, and recovery.
- Training was interesting. Not as in-depth as Air Force. Try to explain like how to use fasteners but more important things would have to get into manuals. She is more aggressive and have to explain things to trainers. It is all OJT, but the GOPs are made available to read. She still has a lot of quals to work on.
- Sign-off process not thorough and different per person. Some are asked if good on it they sign off, others will ask if good then make them show. Example 623 and 610 not comfortable because of different straps. One crew chief took her out to show her. Feels program has room for improvement. In military has trainer program but here more anybody can sign off... not a formal way to qualify who signs off. Feels should be more regulated on who can sign off and take more time to sign off.
- Anticipate 20 minutes pilot step before launch, she likes to go out 1 hour prior as jet leak hyd/fuel/etc. Check tires, fuel with tapes, etc. 633 is her jet. Not assigned but she made it her. She checks board. If 633 going, then she knows assigned. Checks book and engine run. Engine runs not necessarily recorded. If jet sat might do run. Just spool up and shut down... about 15 minutes.

- What is procedure for top-off? No procedure, depends on flying. If 0.5 mission will not top off. Usually lead tech. that makes decision on whether top-off or not. Kyle was lead tech. and engine run.
- After run will look inside cockpit. Authorized to look at panel. Doing top-off make sure collection underneath for vent. Will then purge tank, release valve, and hear air coming out. Two marking on purge valve, take part way to purge. Her technique it to take cap off to make sure, has popped off before and then re-secure cap after before refueling.
- If after engine run then she will go purge anyway to just make sure. After a weekend will tap to make sure on and will check marks (O and F) to be secure. Not requirement to purge after engine run.
- 610 would read locked when was not, she would hear it hissing. Was walking past and heard it hissing after had been closed up. Think was something in valve, looked secure but was hissing.
- Was last person saw on board, met Gary checked tools, Gary went into ops for forms. Went to left checked tank, hydraulics because she bleeds hydraulics down, checked fins, exhaust and same on other side. Set switches and ensured panel good switches right position and checked cockpit switches good. Checked straps and leg straps on ladder and hung properly then waited for pilots to step. 617 was taking her line as she did not have fuel. 23 minutes after 4-ship launched fuel truck showed. Did not have cards as they were on the jets that launched. Used picture of old credit card. Refueled at 50 psi with new guy and had to stop have way through as she does not take well. Have to refuel at 20 psi. Fuel vented (estimate gallon) and had to stop. Cleaned up and told to stop. Fuselage tank flashed but turned on and off. Went normal and turned single point switch. POL troop was distracted with phone. Put receipt in pouch. Turned on battery and reset tapes, tested all the way and reset DETOT to 5,280 liters because odd number jet. Did walk around to make sure not leaking fuel.
- Sabre drain last couple weeks would leak fuel, was not leaking when refueled. Checked hydraulics as it had blown hydraulic lines before. Verified doors latched, closed doors, did not have key to close canopy. Secured ladder and secured key in door. Went out to put key. Documented fuel in forms. Scale does not go to 2000's and so googled conversion and checked.
- Always check the tank and checked on walk around and Mitch checked centerline
- Just put the fuel load in forms. Put 5,280 liters in DETOT. The refueler does, manual reset. Does tapes twice. Everything looked normal on panel.
- This was night prior to flying.
- Does not remember conversion, 500 and 46.
- Did twice, cannot remember feeds. Gary just went from turn around to recovery inspection.
- Close vent when refuel. Has to be closed as 633 will leak. Some aircraft can. Centerline is first. Just learned that the 3 switches they are top off switches according to the French. Found via google.
- Automatically set DETOT to configuration. Do not predetermine before, just looks after to check.
- 610 had issues with getting tanks in centerline. If math does not work, then readjust totalizer. Did not have to do this. Totalizer reads liters then looks at gallons. Chart stops at 1,200 - shutdown.
- OJT training not required to read GOPs, but she just did. It is just OJT. No checklist, just watch me. She would ask them to watch her do it.
- Do not use the 3 switches to do. Just started use the switches, when hit button then vent air to get more fuel. She just started last few weeks. She has notes that reminds her to convert.

- Says 540 gallons to liters.
- Every crew chief a trainer.
- Had hit the button on this refueling but did not turn on the lights.
- Was surprised looking back only 3 days.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 12, 2022

Subject: Record of Conversation with Gary Allen Wall Jr. (Crew chief that launched accident airplane)

NTSB Accident Number: WPR22FA094

In a conversation with Gary Allen Wall Jr., at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA), Ronald Sloma (ATAC safety), and Jeremy Ulman (ATAC Deputy Director of Maintenance).
- Declined representation.
- Role was assigned to be crew chief on launch. Daily inspection at 0640, serviced, tires, etc. Checked fuel detent at 5280 and was there, checked tapes and was working. Lights blinked and went out. TR 1 light and compare doing trouble shoot. Went in signed off paperwork. Was working on GOP, they did engine run on aircraft for about 10 minutes.
- After engine run, walked out 10 minutes and did walk around, checked seat. Did not hear top off. Left DETOT and saw right side down 100-200 liters.
- Lead will do top off who calls and sometimes they will direct. No one asked whether needing top off.
- After engine run don't check centerline, final checks make sure alignment marks look right on cap on centerline. Not lose. Checked cap via alignment marks was good and tapped to make sure not loose.
- TR was in the forms.
- Looked at book in forms. Looked prior to walk out. Look for changes, look for gripes. Looked to see it was refueled, receipt number. They are supposed to convert. Checks to see what was shut down and took 546 gallons. He does the conversion. Uses phone and conversion in book.
- 5,280 liters were set on DETOT and tapes all the way up.
- Heard engine run. Thinks 5 to 10 minutes. Ran up once, temporarily, and then down. Mainly idle.
- Done 50 to 100 launches. Has done engine runs.
- There is no specific procedure... 15 minutes is long and top off probably should be done.

- 15 minutes at idle, does not know consumption.
- Usually maintenance done, engine run then get fuel.
- Sometimes have enough fuel so do not refuel. Does not touch DETOT unless refueled.
- Refuel. Ground jet, flip valve switch 1 or 2, all switches go left. Know tanked filled when light goes out. 3 switches right. They are to test lights. They are bars... buttons. Does not normally use. If get cross feed have to go to cockpit to turn off. Centerline last to fuel. Vent it prior to fuel then close prior to fuel otherwise make a mess.
- Some caps do not vent quickly. Other that the caps open easily. Never had a failure.
- Sometimes the feeder tank will flicker then go out. Pretty much all of them.
- Did not look at DETOT, and did not change.
- 546 gallons.
- Using phone demo = 2,066 liters.
- Wait to all lights go out then move toggles over. Only one is valve stick that move. Then set 5,280 after refueling then go do forms. Do calculations in room.
- Training, in GOP is there training guide, checklist? There is a chart for max fuel load. Never seen a checklist but just OJT training.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 14, 2022
Subject: Record of Conversation with Caleb Allan Hackett (Fire Guard)
NTSB Accident Number: WPR22FA094

In a conversation with Caleb Allan Hackett, at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA) and Ronald Sloma (ATAC safety).
- Declined representation.
- 5 years military in Marines on Ospreys, 13 months 737s, at Bombardier Tucson 1 year and on jet logistic service. Hired on as Air Aviation as a vendor (been here 3 weeks).
- Position as solutions tech. with avionics. Work mainly Garmin mods as company is putting on Garmins.
- Had familiarization with Garmin and F-1 through ATAC and Air Aviation.
- Does not have to go through any more training processes.
- Was on 633 checking the primary UHF. Tried to duplicate gripe on lower HF frequencies (do not remember the date).
- Was a light on #2 TR (transformer rectifier) looking at power cycling. Gone out put a power cart after hitting inverter and verified it was cleared.
- Was observing on the outside. Took responsibility for flagging when engine run and watching for B-man in back. Trained for fire signal and run-up. That was it.
- Does not have responsibility, B-man was in the back but do not remember who.
- Was not any excessive in running up, was not that long. About 4-5 minutes for engine run.
- It might have gone above idle but do not remember 100%.
- After shut-down verified that TR light was gone, nothing eventful.
- Estimate that engine run was an hour or two before launch.
- Was on plane when launched. Did tailpipe, verified light off. Verified no flame. Assisted pulling carts, drip pads. Light off was good.
- Was clean start and taxi, noted there was very little drips (was noticeable very little).
- Time to taxi seemed typical (not short or long).

- Familiarization training was 2 weeks at Alliance, joint effort on mostly what he would be dealing with. Primarily Garmin mod and as will be responsible for radios would be that; also did air data ops check.
- Engine run training was here. Was just watching folks, did not see or know of checklist.
- Been doing shadowing but pushing to be mechanic and helping on flight line. Not a line tech. and does not take on responsibilities. Not assigned but more volunteer. Donnie (day shift lead) is the one telling him to assist. But typically, with Bruno.
- Gary was the crew chief during the engine run.
- Ryan was in the area. Cannot remember but was close by. Was at the spot by the pole.
- Did not go into cockpit after the engine run? Does not know what the DETOT.
- Not sure if can sign ATAC documents, is an AMP, no 100% sure if can. Did not sign any documents and does not recall. Does not stick around to see.
- Got a familiarization with aircraft documents with QA when at Alliance training. Is a technician and does not know everything 100%. Became familiar with GOPs but has not read through them but wants to.
- He has a training jacket, but questions what he can perform and what he cannot? Example if he has to pull an actuator, does he has to be a level 3? He does not know. Pretty much shadow and he jumps in where he is needed. Not assigned duties at beginning. If radio issue him and Bruno would go get it.
- Only thing he has signed off for FOM installs for electrical amplifier and gyro.
- This was first as guy in front and has done 3 or 4; he has never done a launch. Never refueled an aircraft.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 16, 2022
Subject: Record of Conversation with Alex Capen Allison (POL Driver that refueled accident airplane)
NTSB Accident Number: WPR22FA094

In a conversation with Alex Capen Allison, at Luke Air Force Base, the following is a summary of what he stated:

- Others participating were Frank Waterhouse (FAA) and Ronald Sloma (ATAC safety).
- Declined representation.
- Currently fuel distribution system worker.
- Been here over 9 years, 3 civilian and 6 Active Duty. Exact same job as military.
- Been doing same thing for 9 years.
- Air Force training counted and transferred to civilian DoD WG job.
- On 9 February 2022, cannot remember specific time, believed was late model. Followed checklist, stopped 25 feet, and followed checklist. Was female, thought maybe new as he had not seen her before. Can not remember name.
- Was trying to get card information, crew chief was trying to find a card as they had launched with aircraft.
- She asked him to stop one time. Normally keep nozzle pressure at 20 psi, normally will leak fuel and has cones setup to catch. Normally keep 20 psi to not leak. He said started to leak a lot. Was like a waterfall, maybe no more than 5 gallons (estimate). Went on for about 5 seconds. Cut off fuel, then gave a signal to keep it slow. She went to aircraft to check pressure and went as slow as truck would allow, did not leak at all. He holds "dead man" for basic fuel flow and uses throttle of engine to increase fuel flow. He did not throttle at all after the leak. Having pressure that low was very slow, about 200 gallons per minute.
- Had older fuel truck does not have fuel flow meter, he has to count to 6, multiply to estimate fuel flow.
- Was a few minutes, about 3 minutes to finish fuel. Could see her move the cone to catch fuel and then went to nozzle and then went to switches. Could not see her moving switches. Was at nozzle for about 10 seconds.
- Whole refueling time about 10 minutes. From stop was about 7 minutes.

- When aircraft full will get a spike in back pressure and will slow. Did see a spike in back pressure.
- Has seen overflow before but not this much. Was the most overflow he has seen.
- Observing the nozzle pressure will rise as aircraft gets full. It will go slow and sometimes it is sudden. He recalls it slowly raised and then spiked. Was normal compared to other aircraft.
- Once complete they will disconnect, get grounding unlatched and reeled hose. Does paperwork and thinks fueled 600 gallons worth of fuel.
- Turns logs in at end of shift. The receipt is ghost paper and writes down amount and crew chief signs it. The amount is a converted amount. Calls in gauge amount to call center and they do the conversion amount. The center does a volume correction factor that is taken from the giant fuel tanks and use the number to multiply with the gauge amount.
- No issues with F-1s, just 633 having waterfall leak.
- Normal known issue is that F-1s take fuel very slow.
- Refuelers known issues, will have nozzle seal issues. Will observe truck pipe leaks. Immediately stop operation and get fixed.
- There was another man there with her. Just came into help when it started spilling. Recognizes him. Went with her to the collection container. Did not see him do anything, he was there briefly to help with waterfall.
- Did not see her go into cockpit.
- Normally, crew chief stand about 5 to 10 feet away from aircraft and generally walk around to inspect aircraft. Some will be standing at the poles. Will only be up close if nozzle leaking, etc.
- She was standing about 10 feet away majority of time, standing there waiting.
- It is common on F-1's to lower pressure. When a lot of leaking, he will go lowest possible until told to stop. When lower engine rpms will typically stop leak. At idle the lowest psi is typically 18 psi with engine at idle.
- When first started F-1 he would ask has been told 18 psi, 20 psi and 25 psi.
- F-16 and F-35 crew chief they would give maximum of 60 psi but will give max of 55 psi so gives a little tolerance for 45 psi.
- Clarify 3 minutes, stopped for about 2 minutes, about another 7 minutes. Took about 600 gallons, have seen 1,000 gallons.
- Based on experience did not feel this was an abnormal load.
- Did you notice anything atypical on aircraft which he did not. Did not have any other questions or concerns.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 12, 2022
Subject: Record of Conversation with Ronald Sloma (ATAC Safety/F-1 Pilot)
NTSB Accident Number: WPR22FA094

In a conversation with Ronald Sloma, the following is a summary of what he stated:

- The accident pilot was drug tested and the results were negative.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Feb 16, 2022
Subject: Record of Email with Ronald Sloma (ATAC Safety)
NTSB Accident Number: WPR22FA094

In an email from Ronald Sloma, the following is a summary of what was stated:

- A check of the fuel service center system of the 56th Logistics Readiness Squadron revealed that the last fuel truck to refuel aircraft N633AX was on Feb 9, 2023. 456 gallons were issued by Mr. Allison at 1353.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Dec 19, 2022
Subject: Record of Email with Nancy McAtee (NTSB Senior Chemist)
NTSB Accident Number: WPR22FA094

In an email from Nancy McAtee, the following is a summary of what was stated:

- Samples of an unknown brown, slightly tacky material removed from the fuel tanks of several aircraft were submitted to the Materials Laboratory.
- The samples were each examined by a Fourier Transform Infrared (FIR) spectrometer with diamond attenuated total reflectance (ATR) accessory in accordance with ASTM E2353-98.
- The spectra for all the submitted material matched each other, indicating the samples were all the same material.
- The spectrum was consistent with an aromatic polysulfide. A spectral search found similarities with several polysulfide sealants.



MEMORANDUM FOR RECORD

Albert Nixon
Senior Aviation Accident Investigator
Western Pacific Region-Aviation Safety

Date: Mar 21, 2023
Subject: Record of Email with Ronald Sloma (ATAC Safety/F-1 Pilot)
NTSB Accident Number: WPR22FA094

In an email from Ronald Sloma, the following is a summary of what was stated:

- Company completed One Time Inspection (OTI) of their F-1 fleet fuel system and found Foreign Object Debris (FOD) throughout their operation locations.
- 5 aircraft at Luke AFB, were found with FOD and fixed by removing the FOD.
- Found FOD issues impacting refueling and aircraft fuel imbalances.
- Numerous incidents of 5 jets not taking fuel (up to 1,000 liters).
- By removing FOD, fuel systems are now perfect.
- Company revised fuel calculation cards for all fuel loads and already have caught 4 incomplete refuelings.
- Other mitigations of restraining were completed on maintenance personnel and pilot.