

ACN: 1623556

Time / Day

Date : 201902

Local Time Of Day : 1201-1800

Place

Locale Reference.Airport : ZZZ.Airport

State Reference : US

Altitude.AGL.Single Value : 0

Aircraft

Reference : X

Aircraft Operator : Air Carrier

Make Model Name : A320

Crew Size.Number Of Crew : 2

Operating Under FAR Part : Part 121

Flight Plan : IFR

Mission : Passenger

Flight Phase : Initial Climb

Person : 1

Reference : 1

Location Of Person.Aircraft : X

Location In Aircraft : Flight Deck

Reporter Organization : Air Carrier

Function.Flight Crew : Pilot Flying

Function.Flight Crew : Captain

Qualification.Flight Crew : Air Transport Pilot (ATP)

Qualification.Flight Crew : Multiengine

Qualification.Flight Crew : Instrument

ASRS Report Number.Accession Number : 1623556

Person : 2

Reference : 2

Location Of Person.Aircraft : X

Location In Aircraft : Flight Deck

Reporter Organization : Air Carrier

Function.Flight Crew : Pilot Not Flying

Function.Flight Crew : First Officer

Qualification.Flight Crew : Air Transport Pilot (ATP)

Qualification.Flight Crew : Instrument

Qualification.Flight Crew : Multiengine

ASRS Report Number.Accession Number : 1623022

Events

Anomaly.Aircraft Equipment Problem : Critical

Anomaly.Flight Deck / Cabin / Aircraft Event : Smoke / Fire / Fumes / Odor

Anomaly.Flight Deck / Cabin / Aircraft Event : Illness
Anomaly.Deviation - Procedural : Published Material / Policy
Detector.Person : Flight Crew
When Detected : In-flight
Result.Flight Crew : Returned To Departure Airport
Result.Flight Crew : Requested ATC Assistance / Clarification
Result.Flight Crew : Landed in Emergency Condition

Result.Air Traffic Control : Provided Assistance

Assessments

Contributing Factors / Situations : Aircraft

Primary Problem : Aircraft

Narrative: 1

Aircraft (tail) was a RON and had been pre-deiced. The entire crew arrived early, (1 hour prior to departure) introduced ourselves, and talked about the flight. We briefed security, weather, MELs, and most importantly safety. Boarding was uneventful. The weather in ZZZ1 was a 1/4 sm and VV002. We asked Dispatch for an ALT as there wasn't one on our release. We also had to remove an additional MEL on our release that was previously cleared by Maintenance. We ended up leaving 13 minutes late waiting for a printed out 2nd release. Pushing back I asked my First Officer (FO) to start engine Number 1. He started engine Number 1 while I monitored the push and talked to the ground crew. The FO immediately brought to my attention the large plume of smoke coming from the engine during the start sequence. All engine parameters were within limits. After the start there were no unusual smells or indications. We attributed the smoke to a possible over-spray of deice fluid onto the engine (not uncommon), as well as it was the first flight of the day, and it was cold outside. We taxied out on 1 engine per suggested procedures via spot XX to runway 34R. In sequence for takeoff engine Number 2 was started and the APU was shutdown. We ran all appropriate checklist. There were no abnormal instrument indications. There were no fumes or unusual odors prior to flight. I was the Pilot Flying this particular leg. Taking off Runway XXR was uneventful until acceleration altitude. Shortly after I brought the thrust levers back from takeoff to climb detent, I noticed an unusual smell. It was very light at first. I asked my FO if he could smell anything. He initially couldn't smell anything different than normal. We were extremely busy on the departure and cleaning up the aircraft. We were handed off to Departure and were told to make a left turn which was opposite of the departure procedure. It was somewhere around this time that my First Officer told me that he could smell something as well. It was faint at first and not distinguishable. The odor grew stronger and began to irritate my throat. If I had to choose it was more chemically than the musty sock smell. I had my First Officer don his O2 mask and call the back to see if they had anything unusual to report. I continued to fly the plane and was handling the radios. I turned the AP1 on at this time to reduce the workload and focus on the fume problem. The Flight Attendants (FAs) had nothing to report. We told them to let us know if anything changed. We began to troubleshoot the problem turning the bleed fans to high. It seemed to me that the smell was dissipating as time progressed. Initially I thought it was one of those smells that come and go just as fast. A good example of this is a familiar smell flying through the thin layer going into ZZZ2. We had FA B come forward to the cockpit to give us a second opinion on whether the odor was still lingering. When she came upfront she immediately noticed the smell. I had a conversation with her I'm a bit foggy as to everything she or I said. I do remember FA B saying it hurt her throat. She left the cockpit and I donned my O2 mask. I don't recall the exact amount of time or altitude this all transpired as we were obviously busy and the aircraft was light and climbing fast. I did occasionally remove it for a few seconds to see if the smell dissipated. After FA B left, we discussed the QRH and whether or not to return to ZZZ. My throat was pretty sore, I felt light headed, and we both had O2 mask on. The safest thing to do was return to ZZZ. The First Officer made the request to ATC [and] they gave us an altitude and heading. They asked if we were requesting priority handling. My First Officer

acknowledged with FOB, SOB, and the nature of our situation. I called the back and told our Flight Attendants that we [notified ATC] and were returning to the field because of the fumes in the cockpit. I was talking through the O2 mask and I believe I said there weren't going to be any PAs explaining everything to the passengers from us. The FO called the company enlightened them on our situation and got us a gate. I was pretty foggy at this point even with the O2 mask on. My throat hurt and I was coughing. My First Officer conveyed that he felt better than I did and offered to be Flying Pilot. I transferred controls to my FO to be the Flying Pilot. ATC gave us direct ZZZ and eventually cleared us to land for Runway XXR. I ran the checklist and handled the radios. The First Officer did a flawless approach and landing. We exited the runway and taxied at a steady pace to spot XX and cleared to gate XX. Arriving at the gate we had no rampers and the spot was blocked by a row of baggage carts. I had both engines running and every light on to hopefully get everyone's attention. Still having my oxygen mask on I opened my window stuck my head out and waved rapidly at the rampers at the next gate over. They saw me and quickly came over to clear the area and parked us. We pulled in and shut down. Ran the checklist and opened the cockpit door. The emergency crews were already there. We collected our bags and followed the paramedics to the gate area where they evaluated us. The three of us all went to the hospital for further evaluation. We all tested positive for high CO levels in our blood. Looking back at the event, it seemed to me a few times that the odor was dissipating or gone. I felt that the conditions were the most toxic shortly after I reduced thrust from takeoff thrust. I realize today that I was completely acclimated to the odor and what I was sensing was inaccurate. Unlike an engine indication or a warning light there is no way for a pilot to definitely determine that the problem still exist with this particular fume event. I remember looking at the QRH saying "but the odor is decreasing." I've had several "fume events" at this airline and each one unlike the first. The Flight Attendants did an excellent job. They understood the severity of the situation and passed the necessary information along quickly. We called them several times and they were very straight to the point and factual. When the cockpit door opened on the ground and we exited the aircraft not one passenger was standing. Without a doubt they had positive control on the cabin. FA B coming forward in helping us asses the cockpit fumes was crucial. She remained calm, told us the conditions in the back, and immediately went into what she smelled and how it was affecting her. I lastly want to commend my First Officer. He offered several solutions as what he thought the problem was. My FO did all that he could to keep the workload down and assist me as well as reminded me if something was missed. We did deal with the situation together. We were lucky that we had flown with each other for the last 3 days and understood one another. We kept the cockpit communication open and flowing. Finally after deciding to return to ZZZ my First Officer realized the condition I was in and offered to assume control of the aircraft. I agreed with him as that was the best decision. He has good character, makes the right decisions under pressure, and is a pleasure to fly with. He will make an excellent Line Captain. Maintenance returned the aircraft back to service after performing the cabin air troubleshoot form. They discovered deice fluid on the APU inlet. They deactivated the APU and returned to flight where the next crew had another fume event. I disagree with Maintenance's solution to the problem. We did not have the APU running when we had the problem for one. Secondly the chemical smell that I experienced wasn't the typical deice smell. Does boiling deice fluid produce CO? I'm not sure? I've had fume events before and the air filters were replaced. I see nothing in this report that the filters were checked or replaced. I've heard countless remarks from Maintenance on the line that we are using different oil in our APU and not changing our air filters regularly. What happened to the carbon filters that we were getting? What happened to Maintenance running the bleed on the ramp to high temperatures for burn off procedures like [other airline]? This is my 3rd fume event. This is too common of an occurrence and the only way to prevent this is by actually cleaning the bleed systems, changing the air filters regularly, and tracking the aircraft fume events between airlines.

Narrative: 2

Flight was our first flight of the day and the fourth and final day of our trip. It was also the first flight for the aircraft after remaining overnight in ZZZ. The inbound flight arrived in ZZZ at approximately XA00 local the same day. Upon arriving to the aircraft, I noted a "Pre-Deicing Notification" form on

the center pedestal indicating Type I de-ice fluid had been applied to the wings and tail. I also took note that maintenance had likely been at the aircraft as both L/R engine oil quantities were indicating 18.5 quarts. All three hydraulic reservoirs were at or near the top of their respective scales as indicated on the system synopsis pages. I performed the outside pre-flight inspection and did not note any physical damage or abnormalities. I did notice a medium quantity of residual de-ice fluid on the lower portion of the main landing gear assemblies as well as the main tires.

We were cleared to push-back. At some point past the hold point, Captain asked for the #1 engine to be started. I started the #1 engine and because we were still being pushed back, I noticed a large plume of black smoke on the left side of the aircraft. I commented to Captain that it seemed larger than normal. I continued to monitor the Engine Warning Display during start and the engine start sequence completed with no abnormal indications. We proceeded to Runway XXR on one engine. While in sequence for takeoff, I started the #2 engine and shut down the APU with no abnormal indications. We ran the appropriate checklists and awaited takeoff clearance. No abnormal odors or fumes were detected before takeoff.

The initial takeoff from XXR was uneventful up until approximately 1,000 ft MSL when Captain asked if I could smell an odor. Initially I could not. Due to the cold temperature in ZZZ, I had all of my vents and the eyeball air vent on my side closed. I opened the eyeball vent on my side and adjusted it to point towards me; I immediately noticed an odd odor. The odor was not of a smoke or burning nature, so I was not overly concerned initially. We were still in the initial climb phase and my attention was quickly diverted to our ATC handoff from Tower to Approach. We had also reached acceleration altitude [and] I completed the After Takeoff checklist. Upon check-in with Approach, they gave us a left turn HDG 270 which was the opposite direction of the RNAV SID we were assigned. Captain and I confirmed the heading and at some point during the left turn I noticed he was coughing and indicated his throat was hurting. He asked that I don my oxygen mask to get some fresh air for a few seconds and then remove it to see if I noticed the odor and could gauge how strong it was. I donned my mask and took several deep breathes. I then pulled the mask a few inches away [from] my face and noticed a very strong odor. I donned the mask again and ensured it was well sealed. I then chimed the forward flight attendant (I may have even chimed both forward and aft attendants - I cannot recall) and asked if she noticed any unusual smell. She indicated she had not noticed anything. During this period we were cleared to climb to a higher altitude, I believe 15,000 ft. With less than 100 passengers and 21,000 lbs of fuel, we were climbing very quickly. Captain then suggested we get a third nose up front and get their opinion. He chimed the forward attendant and asked one of them to immediately block while the other enter the Flight Deck. [The Flight Attendant] entered the flight deck and immediately noticed the odor. While Captain and [the Flight Attendant] were talking, I was focused on the aircraft navigation and climb state. I recall her saying she used to be a Ground De-ice Coordinator and was very familiar with the smell of both liquid and burning glycol. She indicated it did not smell like glycol. After a very short period of time she indicated a burning sensation in the lower portion of her throat. The Captain asked that she return to her seat. Once [the Flight Attendant] had exited the flight deck, Captain and I briefed on the current state of the aircraft (navigation and altitude assigned). I believe it was at this point he donned his oxygen mask and we agreed a return to ZZZ was the best course of action. He called the flight attendants and indicated we were returning to ZZZ. I mentioned the "Elimination of Foul Odors in Flight Deck and Cabin" QRH checklist and Captain began to run it as I advised ATC of our intention to return to ZZZ, programmed the MCDU (Multifunction Control Display Unit) for the ILS XXL, obtained current ATIS, and sent for Landing Performance Data. ATC asked us if we were [requesting priority handling] and I acknowledged with SOB (Souls Onboard) and fuel. At this point we were at approximately FL250. ATC cleared us to descend to approximately 16,000 ft and we initiated a descent. ATC then gave us a left turn and cleared us direct to ZZZ. Since I had already

loaded the ILS XXL approach into the MCDU, I advised ATC we were proceeding direct to ZZZZZ, a fix outside the FAF on the ILS XXL. I still had the Company Ops frequency dialed into COM2; I called Ops and advised we would be returning and requested a gate. They must have already known we were headed back as they quickly assigned XX. I also sent an ACARS message to our Flight Dispatcher indicating we were returning to ZZZ due to a strong fume/odor. We completed the approach checklist and continued our descent. We were later assigned Runway XXR, I made the change in the MCDU and we proceeded direct ZZZZZ1 on the ILS XXR. At some point, approximately 20 miles from ZZZZZ1, I could tell Captain was feeling much worse than I was. He was coughing frequently and indicated numerous times he felt light-headed and his throat was burning. I advised that I felt okay to fly and could take over as PF (Pilot Flying) if he wanted me to. He agreed that would be best and transferred aircraft control to me. The final approach and landing on XXR was uneventful and Captain proceeded to briskly taxi to the gate as I completed the after landing checklist. As we rounded the corner past Spot XY, I called out a vehicle and four baggage carts that were directly blocking our path to the jet bridge. There were a few ground service folks standing around and they did not seem to be in much of a hurry until Captain opened his side window and leaned out, with oxygen mask still on, motioning the ground service personnel to move the vehicles out of the way. The airport fire trucks following us may have also come into view and caused the ground service personnel to expeditiously move the vehicles blocking our path. This wasted a solid two to three minutes. We arrived at the gate, shut down, and completed the parking checklist. As Captain exited the flight deck to speak with the flight attendants and meet the paramedics, I ran through the after landing and parking checklists one more time to ensure I had not missed anything. As I was waiting for external power to be plugged into the aircraft, one of our mechanics entered the flight deck and advised that he would take control of the aircraft and we could leave everything as-is. One of the airport firefighters entered the flight deck with a handheld device that I assume was to take readings of gaseous components or maybe it was an infrared camera to look for a potential fire. I never heard the results of the test. We collected our bags and followed the paramedics up to the gate area where we were evaluated before being transported to the hospital.

Post Event Notes:

Knowing de-ice fluid was sprayed on the aircraft; an odor was not unexpected nor unfamiliar. I am familiar with the smell of glycol in the bleed system and have experienced it many times in the past on various aircraft. The odor on our flight was, in my opinion, not glycol related. I have also experienced the dirty sock/locker room odor in the past and while this was somewhat similar, I would not attribute what was experienced during this event to that particular odor. It also did not seem like an odor that would come from engine exhaust and certainly not the type from an electrical fire. I cannot recall ever experiencing the smell of a phosphate ester fluid, such as hydraulic fluid, coming in contact with a very hot surface; so am unsure if it was similar. The best I can describe the odor we experienced is a pungent chemical smell; and a strong one at that.

Of the three of us that were sickened by the noxious odor, I think I experienced the symptoms to the lesser degree. That can possibly be explained by donning my mask the soonest, my age, my overall fitness level, and of course the fact that everyone's body reacts differently.

I feel very lucky to have been flying with Captain when this event occurred. Having had flown together for the previous three days only helped. I feel that we exercised great CRM and were able to non-verbally read each other well. We both had an extra ear out for each other during the whole event and filled in or reminded one another when something was missed. Captain demonstrated

exceptional leadership skills throughout the entire flight and that is to be commended. Decisions were made on a joint basis, he kept our flight attendants informed, and most importantly, he was never shy about stating his overall condition. This allowed us the ability to make the best decisions with the greatest amount of information available.

TRACON was an excellent resource and gave us whatever we requested. I imagine we were on a discrete frequency at one point because I remember the radio chatter being very minimal until being handed off to the tower; that was appreciated.

One thing that surprised me a bit was how loud the audio through the speakers was from the oxygen masks. Even after turning the intercom and radio volume knobs all the way up so I could hear Captain and ATC better, it only made the extremely loud sound of the oxygen flowing worse and was distracting. I considered moving my intercom switch to the off position to silence the sound of oxygen flowing but did not want to have to move the switch every time I wanted to talk through the intercom. We were simply too busy for that.

Recommendations:

Starting both engines, and thereby shutting down the APU, after pushback could potentially reduce the likeliness of introducing any new odors into the bleed system shortly before takeoff. Not sure if this would have changed anything we experienced.

It was very frustrating arriving to the gate only to find ground service vehicles blocking the safety area with ground service personnel just standing around. I advised station operations in excess of ten minutes prior to our return and feel they could and should have ensured the safety area was clear and personnel were standing by to marshal us in expeditiously. We did have a jet bridge operator and that was appreciated.

The single most frustrating and disappointing part of this event occurred after I was released from the hospital and was working on getting myself home. I called Scheduling to ensure they were up to speed on the situation and confirm I was released from duty. I requested that they positive space me home, from ZZZ to ZZZ1. They said they could only deadhead me to my base. I then called my Chief Pilot, and asked for his help. He was happy to call Scheduling and make the request. He reported back to me that despite his best efforts, Scheduling would not do it out of fear that a grievance would be filed. I offered to state on a recorded phone line with scheduling that I would not file a grievance for the company sending me home. It is sad and disappointing the folks in Scheduling could not think big picture and consider the circumstances to "Do the Right Thing." I would like to suggest an MOU or side-letter be drafted between the company and [the union] to ensure crewmembers can be positive spaced home if certain circumstances are met. Being transported to a hospital after an inflight situation and subsequent diversion should qualify.

Synopsis

A320 flight crew reported strong fumes during initial climb and experienced health issues. Executed

a return to departure airport.