

= Vnukovo Airlines Flight 2801 =

Vnukovo Airlines Flight 2801 was an international charter flight that , on 29 August 1996 at 10 : 22 : 23 Central European Summer Time , crashed in Operafjellet , Svalbard , Norway . All 141 people aboard the Tupolev Tu @-@ 154M were killed during the approach to Svalbard Airport , Longyear , making it the deadliest aviation accident ever in Norway . The accident was the result of a series of small navigational errors causing the aircraft to be 3 @.@ 7 kilometres (2 @.@ 3 mi) from the approach centerline at the time of impact . The accident was investigated by the Accident Investigation Board Norway with assistance from the Interstate Aviation Committee and became known as the Operafjell Accident (Norwegian : Operafjell @-@ ulykken) .

The Vnukovo Airlines aircraft , registration number RA @-@ 85621 , was chartered by Arktikugol , a Russian state owned coal mining company , to fly Russian and Ukrainian workers from Vnukovo International Airport in Moscow , Russia to Svalbard Airport , Longyear in Longyearbyen , Norway . The passengers all belonged to the Russian communities of Barentsburg and Pyramiden . The fatalities included 11 crew members and 130 passengers , of which 3 were children . The accident was a contributing cause for Arktikugol 's closure of Pyramiden two years later . After the accident , there were a series of lawsuits to determine the compensations to the victims ' families .

= = History = =

= = = Flight = = =

Flight 2801 was a chartered flight flown by Vnukovo Airlines on behalf of Arktikugol , which operated mines at the two company towns of Barentsburg and Pyramiden in Svalbard . The aircraft was a Tupolev Tu @-@ 154M , with registration RA @-@ 85621 , serial number 86A 742 and date of manufacture 14 January 1987 . The flight consisted of a crew of eleven , including a cockpit crew of four (two aircraft pilots , one engineer and one navigator) , a cabin crew of five and two technicians . The pilot in command (PiC) had previously landed at Svalbard Airport ; the first officer had not and was the piloting pilot .

On board were 130 passengers , of whom 3 were children , consisting of Arktikugol employees and their families . Waiting at the airport for the return flight were 120 other employees and their families . The aircraft left Vnukovo Airport at 04 : 44 Coordinated Universal Time (UTC) or 08 : 44 Moscow Summer Time . Estimated flight time was 3 hours and 30 minutes , and alternative airports were Murmansk Airport and Severomorsk @-@ 3 , both in Murmansk Oblast , Russia . The flight proceeded normally until descent , following the routing W 29 from Moscow to Padun (west of Murmansk) , before crossing to Bodø Flight Information Region over the Barents Sea cruising at FL 350 at an average airspeed of 500 kilometres per hour (310 mph) . It then proceeded over Bjørnøya non @-@ directional beacon (NDB) , Isfjord NDB and Advent NDB .

The weather at the accident area was dominated by a low pressure trough , giving rain showers and wind from 15 to 30 knots (28 to 56 km / h ; 17 to 35 mph) at 240 ? 270 ° . Visibility exceeded 10 kilometres (6 mi) . Between 08 : 00 and 09 : 00 , a weak trough passed , reducing visibility to 6 kilometres (4 mi) and a cloud base at 400 to 450 metres (1 @,@ 300 to 1 @,@ 500 ft) .

Svalbard Airport , Longyear , is the main airport serving the Svalbard archipelago . It is located on the south shore of Isfjord , with high terrain to the south , southeast and east . It has a single , 10 / 28 runway (roughly east ? west) which is 2 @,@ 140 metres (7 @,@ 020 ft) long . The airport has an elevation of 28 metres (92 ft) above mean sea level (MSL) , and has an aerodrome flight information service (AFIS) , which is subordinate Bodø Air Traffic Control Center (Bodø ATCC) . The airport is regarded as uncontrolled and does not provide approach service . On that day , all aircraft had used Runway 28 , due to favorable wind conditions , climb @-@ up conditions and short distance from the terminal .

= = = Accident = = =

At 07 : 55 UTC (09 : 55 local Central European Summer Time , CEST) , the crew requested clearance to start descent . Because of lack of communication with Bodø ATCC , this was not obtained . At 07 : 56 , information from Longyear AFIS was given that there was no conflicting traffic , allowing a descent to 1 @, @ 800 metres (6 @, @ 000 ft) MSL . The crew tried to request use of Runway 10 , but this was , due to language problems , not understood as such by AFIS . Instead , Longyear communicated the actual weather and informed that Runway 28 was in use . An additional request for use of Runway 10 was again not understood , because of the misunderstanding of the term " runway in use " . Because of this , the crew decided to instead use Runway 28 .

The crew used Jeppesen charts dated 21 January 1994 . According to procedures , both horizontal situation indicators (HSI) were set to 283 ° , but the magnetic localizer course of 300 ° was not set . A global positioning system (GPS) was used as a back @-@ up . No requests were made for VHF direction finding . From 3 @, @ 000 metres (10 @, @ 000 ft) MSL until impact , the flight was carried out in instrument meteorological conditions (IMC) and the flight controlled by automatic stabilization mode , with lateral navigation controlled by the navigator .

At 08 : 10 UTC , the aircraft reached 1 @, @ 524 metres (5 @, @ 000 ft) MSL , which is the minimum altitude to Advent and the initial approach altitude . At 08 : 15 : 32 UTC , it reached Advent and entered a base turn , reaching a magnetic heading of 160 ° at 08 : 16 : 28 UTC . While the crew had adjusted for the wind drift , they did not attempt to intercept the magnetic course 155 ° outbound from Advent . During this turn , there was a malfunction in the electric trimming mechanism , which caused the piloting pilot to deactivate the aircraft flight control systems ' servogear in the pitch channel at 08 : 15 : 58 . This was again activated at 08 : 16 : 42 UTC .

At 08 : 17 : 08 UTC , the crew started the turn to bring the aircraft to 300 ° magnetic inbound , however , the lateral deviation from the outbound magnetic course was 155 ° , or 3 @. @ 7 kilometres (2 @. @ 3 mi) to the left . At 08 : 17 : 57 UTC , the navigator said " Ah , abeam eight miles 2801 inbound " , to which AFIS replied two seconds later " Correct " . This was the last radio communication between the crew and Longyear . At 08 : 18 : 30 UTC , the piloting pilot turned off the autopilot pitch channel . For the rest of the flight , the plane continued with autopilot only in roll .

Following the aircraft passing through the localizer centerline and having rolled out on 290 ° , there was a discussion among the crew if the turn had been made at the right time . The initial comment about this was made by the first officer at 08 : 19 : 06 UTC . This resulted in a roll out of the turn to final approach and corrective turn to magnetic heading 306 ° . At this time , the aircraft was 27 @. @ 4 nautical miles (50 @. @ 7 km ; 31 @. @ 5 mi) from the airport and 2 @. @ 8 kilometres (1 @. @ 7 mi) right of the centerline at 1 @, @ 520 metres (5 @, @ 000 ft) MSL with an airspeed of 330 kilometres per hour (210 mph) . Instead of intercepting the centerline , the crew continued to track on the right side , nearly paralleling the localizer course .

At 08 : 20 : 17 UTC , the pilot in command ordered the aircraft turned to 291 ° , which adjusted for drift resulted in a course close to 300 ° . At this time , the aircraft had a lateral deviation from the approach centerline of 3 @. @ 7 kilometres (2 @. @ 3 mi) . The aircraft started descending at 08 : 20 : 24 UTC . A corrective turn was made at 08 : 21 : 13 UTC and completed 11 seconds later at magnetic heading 300 ° . At the time , the aircraft was descending 5 to 7 metres per second (16 to 23 ft / s) . The aircraft started turning left at 08 : 22 : 05 UTC , and immediately entered an area of turbulence created by the surrounding mountains .

During initial approach , the radio altimeter warning had been activated several times , which indicated less than 750 metres (2 @, @ 460 ft) from the aircraft to the terrain . During final approach , the ground proximity warning system was activated nine seconds before impact , which lasted until impact . Six seconds before impact , the radio altimeter warning was activated . At 08 : 22 : 23 UTC (10 : 22 : 23 local CEST) the aircraft collided with the top of Operafjellet at 907 metres (2 @, @ 976 ft) elevation , located 14 @. @ 2 kilometres (8 @. @ 8 mi) from Svalbard Airport and 3 @. @ 7 kilometres (2 @. @ 3 mi) right of the approach centerline . The aircraft was destroyed and all occupants perished instantly . It is the single deadliest plane crash to have occurred on Norwegian soil .

=== Recovery ===

The Joint Rescue Coordination Centre of Northern Norway received a message about the crash at 10 : 30 CEST (8 : 30 UTC) and the search and rescue service was immediately deployed . This included seven Norwegian aircraft that were in the area . The area had bad weather with a low cloud height , resulting in difficult searching conditions . The aircraft was found at 12 : 06 CEST at Operafjellet , 14 kilometres (8 @. @ 7 mi) east of Svalbard Airport . Most of the aircraft was located on the mountain 's plateau , although some debris had slid down a vertical cliff and was scattered along the valley and partially covered by an avalanche . Rescue workers and medics from Longyearbyen Hospital arrived at 12 : 36 , and quickly established that there were no survivors .

The responsibility of the recovery was transferred to the Governor of Svalbard on 30 August , since there were no survivors . In addition , police personnel from the mainland were transferred to Svalbard to work with the investigation and recovery . The work was supplemented by local volunteers . Because of the bad weather , which included fog and snow , it was often impossible to transport workers to the plateau , and work therefore started in the valley .

Governor Ann @-@ Kristin Olsen traveled to Barentsburg on 30 August to inform the communities about the accident , and distributed ample written information in Russian about the then @-@ known details about the crash . Later in the day , a Russian aircraft arrived with Deputy Minister Aleksandr Petrovich of the Ministry of Emergency Situations along with a team of 11 rescue workers , and representatives from the Interstate Aviation Committee (IAC) , the Embassy of Ukraine in Moscow , the Federal Air Transport Agency and Vnukovo Airlines . In a meeting that evening , the Governor accepted Russia assistance , while it was confirmed by international agreement that the investigation would be led by the authorities in the country where the accident occurred , Norway . On 31 August , Minister of Justice Grete Faremo visited the Russian settlements as a representative from the Government of Norway .

The accident had a large impact on the community , with only 1 @, @ 600 people living in the two Russian settlements . The population in the communities do not speak Norwegian , and do not have a road connection to Longyearbyen . This made it difficult for the Governor to give accurate and detailed information . Issues were further complicated by erroneous reports in Russian media that there were five survivors . The Governor 's cabin in Barentsburg was manned during the aftermath , and bulletins were distributed with updated information in Russian . The accident was one of the triggers causing Aktikugol to abandon Pyramiden in 1998 .

== Investigation ==

Agreements between Norwegian and Russian authorities were made on 31 August , where Norway resumed full responsibility for the recovery and investigation , but Russian help was accepted . To allow the Russian workers access from the morning of 1 September , the crew was allowed to fly in and establish a base camp , but no work was to be done until Norwegian supervisors arrived in the morning . However , two people were observed at the wreck at about 20 : 00 CEST , who were brought to the Governor 's offices for questioning . As they were both members of the Russian team , it was decided that the base would be disbanded .

There was still fog on the plateau on 1 September , but by 15 : 00 CEST it was possible to fly a team there by helicopter . Because the fog stayed , the team retained work until 03 : 00 CEST in the night . In the following days , the fog lifted , making work and transport easier . By 5 September , all bodies had been recovered and the work at the plateau could be terminated . The recovery in the valley was completed two days later . The accident resulted in about 40 journalists staying in Svalbard to cover the story . The Norwegian authority 's costs related to the investigation and other activities related to the accident were estimated at 30 million Norwegian krone (NOK) .

All identification of people was performed in Tromsø , as a cooperation between Troms Police District , National Criminal Investigation Service and the University Hospital of North Norway . By 18 September , all people had been identified , and the bodies were transported to Russia and Ukraine on 20 September after a short memorial in Tromsøhallen . An autopsy was performed on all crew

members , without finding any abnormalities .

The official responsibility for investigating the incident lay with the Air Accident Investigation Board / Norway (AAIB / N) , although the investigation and report was a close cooperation with the Interstate Aviation Committee and to a lesser extent , the Federal Air Transport Agency . AAIB / N had the primary responsibility for investigations at the crash site , cooperation with the Norwegian police and the Norwegian Civil Aviation Administration , and writing the report . IAC was responsible for handling the investigations in Russia , the reading of the cockpit voice recorder , the flight data recorder , the relationship with Vnukovo Airlines and a test flight . Both agencies agreed that English was to be the language of the final report ; English is one of the ICAO languages .

= = = Cause = = =

The official investigation concluded that the flight , regarded as a controlled flight into terrain , was caused by pilot errors and that there was no fault with the aircraft . Contributing factors causing the accident were lack of a procedure for offset localizer approach for setting approach course on the HSI's . Thus , both HSI's were set incorrectly , which along with the course deviation indicator hinted that the plane was being blown to the left and needed to adjust course to the right . Because he was in a stressed situation , the navigator set the GPS in the wrong mode . He also did not have sufficient time to recheck his work , allowing mistakes to happen , and his work was not monitored by the pilots . As the navigator was overworked , it was inappropriate for the first officer to transfer the responsibility of lateral control to him .

The AFIS air controller has a different role in Norway than in Russia , and the crew were not aware that they were being given information and advice , rather than orders . Communication with AFIS was left with the navigator , which is a breach of norms . Communication between air control and the crew was problematic , since the crew lacked sufficient English skills . The pilot in command had insufficient crew resource management . After the crew decided to carry out the approach to Runway 28 , a new approach briefing was not accomplished . The aircraft overshot the approach centerline when turning inbound , because they did not try to intercept the outbound track from Advent . The crew showed a lack of situational awareness following their uncertainty of the aircraft position in relation to LLZ 28 , caused by indications on the HSI's .

Situational awareness was also reduced because the pilots did not have a chart in front of them at all times . The crew was not aware that they could check the aircraft location in relation to the centerline with a VDF . The crew probably put too much emphasis on the indications displayed by the GPS . The aircraft descended into mountainous terrain without control over the lateral navigation . Despite uncertainty and disagreement in the group , the approach was not abandoned , as the aircraft should have climbed to a safe altitude while the problem was solved .

= = Aftermath = =

On 20 September , the surviving relatives of each decedent received 2 million Russian rubles about US \$ 40 @, @ 000 for each person who died in the accident . Ukrainian relatives stated to Norwegian media that they had not received information about the cause and other issues surrounding the accident . At the time , Ukraine was experiencing very high unemployment , and Arktikugol offered wages many times what was then offered in mainland Ukraine . Many miners not only had to support their immediate family , but also relatives . Vnukovo Airlines stated on Ukrainian television that the relatives would receive US \$ 20 @, @ 000 per deceased person . About a year after the accident , all relatives had been offered US \$ 20 @, @ 000 , but about two @-@ thirds of them chose not to accept the amount , and instead started a process to sue the insurance company . Their lawyer , Gunnar Nerdrum , stated that according to both Norwegian and Russian law , they could demand at least US \$ 140 @, @ 000 .

In February 1998 , the Norwegian Ministry of Justice stated that the relatives did not have a right to occupational injury compensation from the Norwegian National Insurance . Because of the Svalbard Treaty , the archipelago is an economic free zone and Arktikugol is exempt from paying social

insurance , so its employees did not have a right to Norwegian benefits . Had this been the case , widows would have received about NOK 600 @, @ 000 per worker . By 1998 , a few of the relatives had accepted the US \$ 20 @, @ 000 compensation , while the rest of them were planning to sue both the airline 's insurance company and Arktikugol . Among the issues in the case , which took place at Nord @-@ Troms District Court , was whether the accident was to be considered a working accident , and thus result in injury compensation from the mining company . In November , it was decided that the Ukrainians needed to make a guarantee for NOK 2 @. @ 5 million to run the case , which they could not afford . They therefore had no alternative than to accept the proposal from the insurance company . In June 1999 , the parties agreed on a settlement , where the compensation was not disclosed to the public . It was later disclosed that the settlement was about three times the initial offer from the insurance company . In 1999 , the Norwegian Ministry of Foreign Affairs established a scholarship to help children who lost a parent in the accident to take senior secondary and tertiary education .