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AIRCRAFT ACCIDENT INVESTIGATION REPORT

QANTAS AIRWAYS FRIGHT 70
AIRBUS INDUSTRIE A330-303
REGISTRATION VH-QPE
ON TAXIWAY OF KANSAI INTERNATIONAL AIRPORT, JAPAN
AUGUST 21, 2005 AT ABOUT 00:58 JST

March 28, 2008

Aircraft and Railway Accidents Investigation Commission
Ministry of Land, Infrastructure and Transport

The investigation for this report was conducted by Aircraft and Railway Accidents Investigation Commission, ARAIC, about the aircraft accident of QANTAS AIRWAYS 70 AIRBUS INDUSTRIE A330-303 REGISTRATION VH-QPE in accordance with Aircraft and Railway Accidents Investigation Commission Establishment Law and Annex 13 to the Convention of International Civil Aviation for the purpose of determining cause of the aircraft accident and contributing to the prevention of accidents and not for the purpose of blaming responsibility of the accident.

This English version report has been published and translated by ARAIC to make its reading easier for English speaking people those who are not familiar with Japanese. Although efforts are made to translate as accurate as possible, only the Japanese version is authentic. If there is difference in meaning of the texts between the Japanese version and the English version, texts in the Japanese version are correct.

Norihiro Goto,
Chairman,
Aircraft and Railway Accidents Investigation Commission

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February 22, 2008

The Aircraft and Railway Accidents Investigation Commission

(Air Sub-committee)

Chairman	Norihiro Goto
Member	Yukio Kusuki
Member	Shinsuke Endo
Member	Noboru Toyooka
Member	Yuki Shuto
Member	Akiko Matsuo

1. PROCESS AND PROGRESS OF THE ACCIDENT INVESTIGATION

1.1 Summary of the Accident

On August 20 (Saturday), 2005, an Airbus Industrie A330-303, registration VH-QPE, operated by Qantas Airways, took off Narita International Airport at 21:38 (JST) as scheduled Flight 70 to Perth International Airport. At around 23:05, a warning was displayed on the electronic centralized aircraft monitor (ECAM) indicating the presence of smoke in the cargo compartment(s). The crew made the decision to change their destination to Kansai International Airport and, at 00:51 on August 21, the aircraft landed at the airport.

Subsequently, at around 00:58, on its way to a parking spot, a passenger emergency evacuation was conducted using escape slides on the taxiway. During the evacuation, one passenger was seriously injured and eight passengers sustained minor injuries.

There were 194 persons on board including the Captain, 12 other crewmembers and 181 passengers.

There was no damage to the aircraft.

1.2 Outline of the Accident Investigation

1.2.1 Investigation Organization

On August 21, 2005, the Aircraft and Railway Accidents Investigation Commission (ARAIC) assigned an investigator-in-charge and two other investigators for the investigation of this accident.

1.2.2 Representatives from Foreign States

Accredited representatives from the Commonwealth of Australia, the state of registry and the operator, and from the French Republic, the state of design and manufacture of the aircraft, participated in the investigation of this accident.

1.2.3 Implementation of the Investigation

August 21 and 22, 2005	Investigation of the aircraft and interviews
August 23, 2005	Investigation of the aircraft and interviews
September 7, 2005	Investigation of an aircraft of the same type

1.2.4 Investigation Status Report

On September 29, 2006, an investigation status report was submitted to the Minister of Land, Infrastructure and Transport of Japan based on the results of the fact-finding investigation conducted up until then. The report was also made public.

1.2.5 Comments from the Parties Relevant to the Cause of the Accident

Comments were collected from the parties relevant to the cause of the accident through interviews.

1.2.6 Comments from the Participating States

Comments were invited from the participating states.

2. FACTUAL INFORMATION

2.1 History of the Flight

On August 20, 2005, an Airbus Industrie A330-303, registration VH-QPE (hereinafter referred to as “the aircraft”) operated by Qantas Airways (hereinafter referred to as “the company”) took off Narita International Airport at 21:38 (hereinafter all times are written in Japanese Standard Time (JST: UTC+9h) for Perth International Airport as scheduled Flight 70 with 194 persons on board, including the Captain, 12 other crewmembers and 181 passengers.

In the cockpit, the Captain (pilot in command) occupied the left seat as pilot not flying (PNF) (primarily assuming other than aircraft control duties) and First Officer occupied the right seat as pilot flying (PF) (primarily assuming aircraft control duties). Also present on the aircraft was Second Officer, who was on duty as a replacement pilot.

The flight plan submitted to the Narita Airport Office of the Japan Civil Aviation Bureau is as outlined below:

Flight rules: IFR

Departure aerodrome: Narita International Airport

Estimated off-block time: 20:45

Cruising speed: M081

Cruising altitude: FL360

Route: PAPAS (reporting point) – APPLE (reporting point) – TANUK (reporting point) – FAIRY (reporting point) – Y86 (RNAV route) – YOSHI (reporting point) – A339 (airway) – MAKDA (reporting point)/ Cruising speed: 0477 kt/ Cruising altitude: FL360

Route: A339 (airway) – KEITH (reporting point)/ Cruising speed: M081/ Cruising altitude: FL360

Route: A339 (airway) – SHREE (reporting point)/ Cruising speed: M081/ Cruising altitude: FL360

Route: A339 (airway) – (Hereafter omitted)

Destination aerodrome: Perth International Airport

Estimated flight time: 9 h and 43 min

Estimated flight time to Naha FIR boundary (MAKDA): 1 h and 24 min

2.1.1 History of the flight based on the records of the digital flight data recorder, cockpit voice recorder, ATC radio communications, and the like.

The following outlines the history of the flight after takeoff (including the on-ground history up until the Captain commanded to commence an emergency evacuation after landed at Kansai International Airport), based on the records of the digital flight data recorder (hereinafter referred to as “DFDR”), the cockpit voice recorder (hereinafter referred to as “CVR”), ATC radio communications, and the like:

- (1) First smoke warning (around 23:05 to around 23:34)

At around 23:05, when the aircraft was approximately 760 km south (lat. 26°38'N,

long. 135°32'E) of Kushimoto, Wakayama Prefecture, while cruising on airway A339 at FL360, a warning indicating smoke in the cargo compartment(s) (hereinafter referred to as “smoke warning”) was indicated*1. The DFDR records indicate that the warning was related to both the forward cargo compartment and the aft cargo compartment including the bulk cargo compartment*2 and that it lasted for 14 sec. According to the CVR records, the Captain confirmed that the ECAM smoke warning disappeared approximately 18 sec after its indication. The master warning remained illuminated for approximately 2 sec until the Captain deactivated it by pressing the button. Both the Captain and First Officer identified the forward cargo compartment as the area related to the smoke warning from the ECAM display, but because they could not finish reading all the messages on the display before they disappeared, they did not discharge the extinguishing agent. The Captain immediately called Second Officer to the cockpit. The pilots then reviewed the event, and discussed carrying out emergency procedures and returning to Narita International Airport.

When a little more than one minute passed after the activation of the smoke warning, the Captain noticed by the indication on the CARGO AIR COND panel in the cockpit that the ventilation holes of the forward, aft and bulk cargo compartments were closed by the isolation valves.

The Captain informed all crewmembers that there appeared an indication of fire in the forward cargo compartment, but the smoke warning went out before any action was taken, that the crewmembers must inform him immediately of any sign of fire in the cabin, and that the aircraft would possibly return to Tokyo. (Tokyo means Narita International Airport. The same applies hereinafter.)

The Captain considered the possibility of smoke warning being spurious, but decided to treat it as a real warning and thus deal with it using the relevant procedure of Flight Crew Operating Manual (FCOM).

The Captain also considered Fukuoka Airport and Kansai International Airport as airports where it can land, in addition to Narita International Airport.

At around 23:16, the Captain sent out an urgency message, saying that the aircraft needed to return to Japan due to indication of cargo-compartment fire. The Naha International Ground-to-Air Radio Station (hereinafter an international ground-to-air radio station is referred to as a “Radio”) responded to the message, and after receiving ATC clearance to MAKDA from Naha radio, the aircraft started a turn back toward Japan. Subsequently, Naha Radio delivered the aircraft an ATC clearance up to Narita International Airport.

*1 Smoke warning can be confirmed through various indications and other means as described in 2.15.1 (1) ①.

*2 With regard to the smoke warning indication, the aft cargo compartment and the bulk cargo compartment are handled as a single compartment. Hereinafter where the aft cargo compartment is mentioned with regard to the smoke warning indication, it includes the bulk cargo compartment.

The Captain made an announcement to the passengers, saying that the aircraft had turned back, that non-normal procedures had been carried out as the smoke warning was indicated in the cockpit, that the aircraft was flying towards Tokyo but the landing airport was not yet decided, and that the aircraft was in a safe condition. One of the company's cabin attendants (Japanese) who was on board as a passenger (hereinafter a cabin attendant is referred to as a "CA"), following a request by the CSM^{*3}, made an announcement in Japanese for the Japanese passengers, saying that the aircraft would return to Japan as a precaution because a warning had been indicated in the cockpit.

(2) Second smoke warning (around 23:35)

At around 23:35, a second smoke warning was displayed on the ECAM. According to the DFDR records, the indication of smoke warning was, like the first one, related to the forward and aft cargo compartments and it lasted for 14 sec. Having read on the ECAM display that the smoke warning was related to the forward cargo compartment, both the Captain and First Officer immediately discharged the extinguishing agent in the forward cargo compartment.

(3) Third and subsequent smoke warnings (from around 23:36 to around 23:42)

At around 23:36 (37 sec after the second smoke warning), the third smoke warning was displayed on the ECAM. Both the ECAM display and DFDR records indicated that the warning was related only to the forward cargo compartment. According to DFDR records, the third warning remained displayed for 3 min and 34 sec. The Captain performed the procedure to discharge the fire extinguishing agent again to the forward cargo compartment.

The Captain transmitted a distress message, saying that the aircraft had another smoke indication for the forward cargo compartment. Considering to divert to Kagoshima Airport, the Captain checked with Naha Radio the weather at Kagoshima Airport.

Between 23:39 and 23:42, the fourth, fifth and sixth smoke warnings were displayed on the ECAM. According to the DFDR records, the warnings lasted for 18, 44 and 19 sec, respectively. Both the ECAM display and DFDR records indicated that the third to sixth warnings were related only to the forward cargo compartment.

(4) Flight to Kansai International Airport – 1 (from around 23:43 to around 00:06)

At around 23:43, the Captain made the decision to fly to Kansai International Airport considering the meteorological conditions, the distance from the aircraft position and his past takeoff/landing experience. He made a request to Naha Radio to fly to Kansai International Airport and received clearance from Naha Radio, first for flying to Kushimoto VORTAC and then, at around 23:47, for flying to Kansai International Airport.

^{*3} Customer Service Manager, or senior cabin crewmember.

The Captain informed all other crewmembers that the aircraft was flying at the maximum speed to Kansai International Airport and would be landing there in approximately one hour, that the fire extinguishing agent had been discharged to deal with an indication of a forward cargo compartment fire and that the fire indication had then disappeared, that he transmitted a distress message, that he did not believe there was real fire but simply an electrical problem, although he was dealing with it as if there had been a real fire, and that he was considering precautionary disembarkation *4 using mobile stairs.

Following the crew briefing, the Captain made a second announcement to the passengers, saying that the aircraft was heading for Kansai International Airport, that there was a fire indication so that the fire extinguishing agent was discharged, that he thought the fire warning was spurious and caused by computer error, although he was treating it as if it had been a real one, and that the aircraft was in a safe condition.

In addition, the Captain made a third announcement to the passengers, saying that it would be necessary to carry out emergency evacuation after landing, that the passengers were requested to follow the crew instructions and take a braced position during landing, and that the crewmembers would start to explain the procedure. Following the announcement, the CSM provided explanations and instructions to the passengers over the PA *5, and the Japanese CA did the same in Japanese.

The Captain talked with QAMW *6 over the satellite telephone and was told of the information from Airbus that there could be spurious smoke warning that would last for approximately 30 sec. The Captain responded, "It's the first that we've heard of this previous history." That was the only communication between the aircraft and QAMW.

(5) Flight to Kansai International Airport – 2 (from around 00:07 to around 00:43)

At around 00:07, the Captain started communication with Tokyo Control, requesting fire trucks to stand by at Kansai International Airport. The Captain, with First Officer, confirmed that there should be no problem in landing distance although the aircraft was going to land with weight exceeding the maximum landing weight.

The Captain made a fourth announcement to the passengers, saying that fire services would be prepared at the airport, that he had exchanged information with Qantas Engineering in Australia with the result that the smoke warning might have been due to computer error, although he was treating it as if it had been a real one, that he would assess the aircraft situation once the aircraft landed and came to a stop, and that the passengers were requested to follow the crew's instructions.

The Captain briefed all other crewmembers, saying that it would not be necessary to take a braced position because the landing would be made normally.

The aircraft started communication with Kansai Terminal Control Facility

*4 Quick disembarkation performed as per "the precautionary disembarkation checklist". (Attachment 3)

*5 Public address system on the aircraft

*6 Qantas Maintenance Watch, an aircraft operational monitoring service provided by Qantas Engineering

(hereinafter referred to as “Kansai Approach”). The Captain told Kansai Approach that he would stop the aircraft on the landing runway for the purpose of situation assessment, that he wanted all fire trucks to stand by off the runway, that if there were no signs of fire, the aircraft would clear the runway, that if mobile stairs were available, he wanted them to come to the aircraft to disembark the passengers, that if mobile stairs were not available and there was no fire, the aircraft would taxi to the terminal and in that case, fire services should be advised to stay with the aircraft, and again that he wanted mobile stairs to come to the aircraft on the taxiway if available. Kansai Approach answered to the Captain that passenger evacuation on the runway was understood and then asked the Captain if the aircraft was able to taxi to the spot in case there was no such need. However, Kansai Approach did not fully understand the Captain’s messages such as the use of mobile stairs, which caused the Captain to confirm his request several times. After a series of communications, Kansai Approach made arrangements for mobile stairs. Due to a lack of smooth communication, the Captain mentioned, “Language is a problem.” Subsequently, answering to Kansai Approach’s question about whether the aircraft had an intention of emergency fuel dump, the Captain said that he needed to land the aircraft as soon as possible and fuel dumping would not be carried out.

The Captain told First Officer that emergency evacuation using escape slides (hereinafter referred to as “slides”) could cause passengers’ injuries and that precautionary disembarkation using mobile stairs was appropriate.

At around 00:40, Kansai Approach issued clearance to the aircraft for an ILS approach to Runway 06.

The aircraft started communication with Kansai Aerodrome Control Facility (hereinafter referred to as “Kansai Tower”). Kansai Tower advised the aircraft that fire trucks were standing by on Taxiways D and E.

(6) From landing to emergency evacuation (from around 00:51 to around 00:57)

At 00:51, the aircraft landed on Runway 06.

The Captain requested Kansai Tower for stopping the aircraft on the taxiway, which was then approved. Subsequently, the Captain made an announcement to the passengers, to remain seated and await further instructions.

The Captain ordered First Officer to carry out the precautionary disembarkation checklist.

The Captain asked Kansai Tower to make fire services to approach the aircraft and report if there were any signs of fire. The Captain added that, in doing so, no doors should be opened. Kansai Tower advised the Captain that no fire was observed from the tower.

The Captain asked Kansai Tower if the parking bay (spot) in front of the aircraft was available. Kansai Tower replied that further coordination would be necessary. Kansai Tower asked the Captain if the aircraft could taxi normally. The Captain

responded that it could, and asked if mobile stairs were available. Kansai Tower told the Captain that Spot 206 was assigned by a duty officer of Kansai International Airport Co., Ltd (hereinafter referred to as “KIAC”) to the aircraft. The Captain told Kansai Tower that Bay 11 was needed for disembarkation. Kansai Tower replied the Captain to hold the present position due to the necessity of further coordination. At that moment, the Captain saw mobile stairs moving towards the aircraft, and requested Kansai Tower to confirm this. But there was no response from Kansai Tower. The Captain then said, “Language, they got no idea.” The Captain told Kansai Tower that the aircraft was going to taxi to Bay 11 and he wanted mobile stairs to stand by there. The Captain asked First Officer, “Clear on the right?” First Officer responded, “You got fire equipment.” Kansai Tower told the Captain that coordination was in progress for taxiing to Spot 11 and asked the Captain to stand by further. The Captain responded, “We want to get the passengers off, we’re not waiting any longer, we’re going straight ahead to the apron, and we want the mobile stairs to come to the aircraft.” Kansai Tower instructed the Captain to taxi to Spot 11 and the Captain acknowledged it. The Captain asked Kansai Tower to clear the fire trucks off the taxiway.

A fire truck (Call Sign “Fire 1,” the command-post vehicle) radioed Kansai Tower, “Somewhere below the pilot, around the nose, something like white smoke is visible. Confirmation is not possible before reaching in front of the aircraft.” Kansai Tower told the aircraft to hold the present position because a fire truck reported seeing smoke around the nose gear. When the Captain then requested confirmation if there was smoke from the nose gear, Kansai Tower repeated the previous message. The Captain ordered First Officer to start the evacuation checklist. The Captain sent out a message, saying, “We are evacuating the aircraft.” At around 00:57, Kansai Tower asked the Captain to repeat the message. The Captain responded, “We are evacuating the aircraft, if there is smoke, confirm there is smoke, confirm there is still smoke at the nose wheel, coming from the nose area.” Kansai Tower answered, “Affirm.” In response to this message, the Captain radioed that evacuation was going to be made using slides.

The Captain ordered First Officer to continue with the evacuation checklist.

This accident occurred at around 00:58 on August 21 at the intersection of Taxiway C and Taxiway P of Kansai International Airport.

(See Figures 1, 2 and 3, Photos 1 and 2, and Attachments 1, 2, 3 and 4.)

2.1.2 Flight Crew Statements on History of the Flight

(1) Captain

About one and a half hours after taking off from Narita, there was a smoke warning lasting for as short as about 2 sec. To address the situation, I took over the PF duty from First Officer. By the smoke warning at that time, we could not confirm whether it was the forward cargo compartment or the aft cargo compartment. We did not discharge

the extinguishing agent because the agent can be used only once. We decided to return to any of Japanese airports, so I had First Officer send out an urgency message and an intention to return immediately to Japan. We then turned the aircraft around towards Japan.

A second smoke warning was displayed. It lasted a little longer than the first warning, which enabled us to determine that it was related to the forward cargo compartment. We then discharged the extinguishing agent in the forward cargo compartment. We determined that the smoke warning probably indicated a real fire and I had First Officer send out a distress message. We discussed the circumstances and decided to head for Kansai International Airport. We then received ATC clearance in answer to our request.

During our flight to Kansai International Airport, smoke warnings occurred several more times, and we took action as per the checklist.

We made a normal landing on Runway 06 at Kansai International Airport. We left the runway and stopped the aircraft at the intersection of Taxiway C and Taxiway P. We then asked Kansai Tower if they could see any smoke or flames. The answer was negative. The reason we stopped there was that the intersection was the largest flat space available, which would make it easy for us, in the event of an emergency evacuation, to evacuate the aircraft and also for fire trucks and ambulances to come near us. Also, if we could taxi down from there close to Spot 11, we would then be able to let the passengers disembark using mobile stairs. This is the way Qantas normally proceeds in situations like this, to let the passengers disembark, that is – not to use passenger boarding bridges (PBB, also called aerobridges; hereinafter referred to as “bridge”) in case a fire should start, but to stop the aircraft a little away from the bridge and use mobile stairs.

We requested Spot 11 as we had earlier declared a MAYDAY ^{*7} and our selection should be preferentially respected, but we were actually assigned Spot 206. We had some difficulty making Kansai Tower understood what we were saying, which is probably due to a language problem; initially, we requested mobile stairs to be moved to the aircraft to enable disembarkation after stopping the aircraft on the apron. After stopping the aircraft, we requested that fire trucks come around the aircraft and check for abnormal conditions, following the procedure established by Qantas. We also made checks ourselves, by looking from inside the aircraft, but we could not find any indications of fire.

We then requested clearance to taxi to the apron in front of Spot 11 and we also said that we wanted mobile stairs to be moved there.

Just when we started taxiing after receiving clearance to move to Spot 11, Kansai Tower notified us that fire trucks reported seeing white smoke coming from the nose

^{*7} MAYDAY is used at the start of a distress call, indicating the highest emergency. Here, MAYDAY stands for a distress call.

gear. I was terribly upset to hear this because we believed that the cargo compartments were safe, without any fire. As I could not believe what I heard, I asked First Officer to contact the tower for reconfirmation. Kansai Tower notified us again that fire trucks reported there was white smoke. White smoke means there is a fire. If it was true, it could lead to an extremely serious situation. That is why I asked confirmation again. Another reason for confirmation was that we experienced language difficulties about the mobile stairs.

It was not until then that we started the evacuation checklist. Following the checklist, we shut down the engines and used fire extinguishers. At the last step of the checklist, we pushed the escape slide initiator and to activate the warning. I also announced evacuation over the PA.

Soon after landing, I made an announcement to the passengers: "Remain seated and await further instructions." That should have aroused the cabin crew's attention to the possibility of emergency evacuation so that they could prepare themselves for it and could control passengers. And I think they did as such.

(2) First Officer

I sat in the right seat, normally occupied by a first officer, and was executing PF duties from takeoff to cruising.

After the occurrence of the cargo-compartment smoke warning, the Captain took over the PF duties and I assumed responsibility for communication. Following the instructions of the Captain, I sent out a "PAN-PAN *8". Soon after the warning, the Captain decided to return to Japan, which I thought was a good idea.

When the second cargo-compartment smoke warning occurred, I sent out a "MAYDAY" upon the Captain's instructions. The three of us in the cockpit discussed which airport in Japan would take the shortest time to fly to, as well as the weather and other conditions of each candidate airport. We decided to divert to Kansai International Airport. The Captain and I discussed the situation and concluded that, after landing, we would stop around Taxiway C and have fire trucks check the aircraft. Assuming a possible emergency evacuation, we thought that it would be easier for the passengers to evacuate the aircraft at the intersection of taxiways, for the crew to control the passengers, and for emergency medical services to have easy access to the aircraft.

I often visited Kansai International Airport and I know things there fairly well. I found that Spot 11 just ahead of us was vacant and I requested it because it seemed to be the safest spot for the passengers to disembark. However, we were initially assigned Spot 206.

Overall, communication with Kansai Tower was good although it appeared to me that they did not understand some of the terms that we used in our requests.

*8 PAN-PAN is used at the start of an urgency message. Here, "PAN-PAN" means an urgency message.

(3) CSM

After takeoff, when the meal service was almost finished, I received a cockpit message saying that the cargo-compartment fire warning system had been activated and instructing us to clear the cabin by quickly finishing meal and other services, adding that the cockpit crew had not yet decided the destination, but may need to return to Japan. As to the cargo-compartment fire indication, the cockpit crew was uncertain as to whether the warning was real or spurious, so I notified the other cabin crewmembers of the cockpit message, but did not make a cabin announcement for fear of panicking the passengers.

After having decided to land at Kansai International Airport, the Captain made an announcement to the passengers over the PA. Unfortunately, we had no Japanese-speaking CA on board, but there happened to be an off-duty Japanese CA of the company on board and, upon our request, the CA translated the message into Japanese for the Japanese passengers about one hour prior to landing. The Captain's message said that we were flying back to Kansai International Airport, not because of an emergency but because of the need for precautionary inspection.

Prior to landing, I made an announcement over the PA, telling the passengers to remove sharp objects from their bodies, anticipating possible emergency evacuation using slides; everything was ready in the cabin for emergency evacuation. I had the Japanese CA make the announcement in Japanese for the Japanese passengers, so I think they understood the message.

(4) Other CAs

When the aircraft landed and came to a stop, we immediately looked out through a window near each door of our responsibility but saw no smoke. We then reported as such to the Captain.

(5) Statements collected through the Australian Transport Safety Bureau (ATSB) – 1

In addition to the statements (1) and (2) above that were collected at Kansai International Airport, further statements, as outlined below, were subsequently provided by the Captain, First Officer and Second Officer through the ATSB.

- ① Neither crewmember was aware that the total air temperature (TAT) probe discharges bleed air, nor that this discharge is sometimes accompanied by visible vapor.
- ② Although the company was in the process of taking measures against problems with the SDCUs *⁹ equipped with the aircraft, the cockpit crewmembers were not aware that improvement measures had not yet been taken for the SDCU of the aircraft.
- ③ On the way to Kansai International Airport, the cockpit crew saw thunderstorms on the weather radar and maneuvered the aircraft around them.
- ④ The crew were not aware during the flight that the smoke warning for the aft cargo

*⁹ SDCU stands for Smoke Detector Control Unit.

compartment had also been activated while they were aware of the smoke warning for the forward cargo compartment being activated.

- ⑤ The crew are trained to follow the prioritized ECAM actions, starting at the top of the list, which is the highest priority action, and they were simply following the actions.

When the smoke warning was displayed, there were no ECAM actions overflowed onto a secondary page. The only message in the right memo area of the ECAM screen was “LAND ASAP *¹⁰.”

- ⑥ The Captain was not willing to rely on the metered release of fire extinguisher gas from Bottle 2 to guarantee that there was no fire, given that he was being informed of an outside observer’s comment that there was smoke around the nose of the aircraft.
- ⑦ After the aircraft cleared the runway and came to a stop, the Captain was advised by Kansai Tower that there were no signs of fire around the aircraft. The situation deteriorated when the airport fire service personnel, who are trained to respond to fire and similar situations, reported that there was smoke coming from the front of the aircraft.

The airport fire and rescue personnel have the knowledge, training, and equipment such as infra-red fire detectors to establish whether or not a fire is present, and the crew had to rely on their judgment.

- ⑧ Because of the language difficulties, and because the implications of an emergency evacuation were so significant, the Captain repeatedly asked the tower to confirm the presence of smoke.
 - ⑨ The Captain was annoyed that the safety of his crew and passengers would be at risk by an unnecessary emergency evacuation.
- (6) Statements collected through the ATSB – 2

In addition to the statements (3) and (4) above that were collected at Kansai International Airport, further statements as outlined below were subsequently provided by the CSM through the ATSB.

- ① Prior to landing at Kansai International Airport, the cabin crew followed the procedures for a precautionary disembarkation using mobile stairs. They were not expecting an emergency evacuation using slides.
- ② It is the company’s policy to request the assistance of passengers when preparing for an emergency evacuation. Assisting passengers are asked to sit near the emergency exits so they can exit the aircraft first and assist other passengers on the ground.

If no preparation has been made for an emergency evacuation, there is no time to start briefing the assisting passengers after evacuation is initiated.

Prior to landing, the CAs focused on carrying out precautionary disembarkation procedures at worst, and they did not really consider that they might have to conduct an emergency evacuation.

*¹⁰ LAND ASAP stands for “Land as soon as possible.”

- ③ There is no time after an evacuation is initiated to provide any sort of detailed instructions or briefing to passengers regarding sliding techniques, such as explaining how two passengers could go down the slides together.

The phrases used by the CAs during an evacuation include “evacuate evacuate, high heels off, unfasten your seatbelts, come this way, form two lines, jump and sit.”

- ④ The impact drill sheet, which all CAs read and use as a checklist for actions to be completed before the landing, does not include any written instructions on briefing assisting passengers. Training exercises conducted during initial and recurrent training do not include any practice at briefing assisting passengers. The CSM considers that it would have been better if the impact drill sheet had instructions on briefing assisting passengers. The CSM also considers that enlisting the aid of assisting passengers would have been of benefit, and may have prevented the serious injury.
- ⑤ No information was available to the operating crew that the person who was seriously injured during evacuation would need special assistance.
- ⑥ The CSM has not used the disabled passenger evacuation technique herself in training. She was involved in the development of a training video. The video is shown to all CAs once a year to ensure that they are all familiar with the correct technique.
- ⑦ After the engines were shut down, it became dark in the cabin, and the CSM turned on the emergency lighting system. The emergency lights are supposed to come on automatically when the engines are shut down, but she turned it on manually. The emergency lights provided a sufficient amount of light to carry out an emergency evacuation.
- ⑧ The prepared land evacuation passenger PA includes instructions regarding the use of the slides. A Japanese CA read it out loud in Japanese for the Japanese passengers. The PA includes a request for any passenger who would like additional information or assistance to ask a CA. The CAs spent a lot of time checking that all of the passengers understood what was going to happen in the near future.

The CAs were able to check this by following up on actions by the passengers, for example, removing jewelry as instructed.

The company had rostered a Japanese-speaking CA on the flight, but she had become sick at Narita and was grounded. If the Japanese CA had not been on board, the CSM would have approached a bilingual passenger to assist in translating announcements.

2.1.3 Passenger Statements

Passenger statements are described in 2.14.2.1 “Circumstances Inside and Outside the Aircraft, Before, During and After the Emergency Evacuation”, because all statements are related to the emergency evacuation even though about the circumstances in flight.

2.1.4 Air Traffic Controller Statements

(1) Controller in charge of the radar in the Kansai Approach IFR Room

I was in charge of the aircraft until I passed its control over to Kansai Tower.

I heard there was a fire in the cargo compartment, but I was not told which compartment was on fire.

Communication from the aircraft sounded normal and I did not sense any indication of an emergency.

I guided the aircraft via EDDIE point to the final approach course to ILS Runway 06 as per the aircraft's request.

(2) LCL ^{*11} controller at the Kansai Tower

- ① In reply to the request from the aircraft, prior to landing, to confirm the position of the fire trucks on stand by, I told them that the fire trucks were standing by on Taxiways D and E.

At 00:51, the aircraft landed. After turning off the runway, the crew requested permission to stop at the intersection of Taxiway C and Taxiway P.

After the aircraft came to a stop, it asked us to check for fire on the aircraft. Kansai Tower Ground Control was told by fire trucks that there was no fire, and I told that to the aircraft.

The aircraft requested to use Spot 11. I replied that we needed to coordinate with KIAC, which manages the spots, and told the aircraft to hold at the present position.

The aircraft told us that they wanted to move towards Spot 11 but fire trucks were obstructing the way.

Ground Control gave a notice to LCL saying, "Fire trucks report that smoke appears around the nose gear" and I told this to the aircraft.

Upon hearing this, the aircraft told us that they would conduct an emergency evacuation of the aircraft. After a while, evacuation started.

- ② In addition to the statements described above that were collected at Kansai International Airport, the following statements were later obtained over the telephone.
- a. According to the general knowledge of air traffic controllers, the term 'confirm' is considered to mean 'confirming the report itself.'
 - b. The word 'appears' used in the message 'smoke appears around the nose gear' sent to the aircraft was intended to mean 'seems'.

(3) Ground Controller at Kansai Tower

I did not communicate directly with the aircraft.

Upon learning that the aircraft had asked Kansai Tower LCL to advise whether a fire or something could be confirmed from outside the aircraft, I told fire trucks to report any flames that they might see while following the aircraft after it landed.

As the fire trucks that were following the aircraft after landing reported no

^{*11} Local control. Aerodrome control services consist of those provided by both Local Control (LCL) and Ground Control.

abnormalities, I advised Kansai Tower LCL that there was no fire on the aircraft.

After the aircraft came to a stop on the taxiway, fire trucks asked us if they might move closer to the aircraft. I told them to wait for a while.

Subsequently, a fire truck reported that something like white smoke could be seen around the nose gear, so I reported this to Kansai Tower LCL.

2.2 Deaths, Missing Persons and Injuries

During the evacuation of the aircraft, one passenger was seriously injured and eight other passengers sustained minor injuries. In addition, one passenger experienced hyperventilation.

2.3 Damage to the Aircraft

The opening/closing mechanism of Door L1 *¹² was very slightly damaged (scratches).

2.4 Damage to Property Other than the Aircraft

None.

2.5 Crew Information

2.5.1 Flight Crew

(1) Captain	Male, aged 44	
	Airline transport pilot certificate (airplane)	August 26, 1992
	Type rating for Airbus Industrie 330	
	1st class aviation medical certificate	
	Validity	Until March 16, 2006
	Total flight time	12,233 h 48 min
	Flight time in the last 30 days	38 h 56 min
	Flight time on the aircraft type	115 h 30 min
	Flight time in the last 30 days	38 h 56 min
(2) First Officer	Male, aged 49	
	Airline transport pilot certificate (airplane)	December 8, 1996
	Type rating for Airbus Industrie 330	
	1st class aviation medical certificate	
	Validity	Until May 10, 2006
	Total flight time	14,432 h 45 min
	Flight time in the last 30 days	52 h 36 min
	Flight time on the aircraft type	166 h 25 min
	Flight time in the last 30 days	52 h 36 min

*¹² The forward-most door on the LH side of the aircraft. There are three more doors on the LH side with the aft-most door numbered L4. Similarly, there are four doors on the RH side of the aircraft; they are R1 to R4. Escape slides are provided at all doors and numbered in the same way as the doors.

(3) Second Officer Male, aged 36	
Airline transport pilot certificate (airplane)	April 24, 2002
Type rating for Airbus Industrie 330	
1st class aviation medical certificate	
Validity	Until October 10, 2005
Total flight time	2,604 h 58 min
Flight time in the last 30 days	43 h 23 min
Flight time on the aircraft type	173 h 26 min
Flight time in the last 30 days	43 h 23 min

2.5.2 Cabin Attendants

(1) CSM Female, aged 35	
Duty position	L1P * ¹³
Total flight time on duty	13,057 h 56 min
(2) CA – A Male, aged 40	
Duty position	L1A
Total flight time on duty	3,533 h 45 min
(3) CA – B Male, aged 28	
Duty position	R1P
Total time on duty	2,861 h 06 min
(4) CA – C Female, aged 23	
Duty position	R1A
Total time on duty	967 h 06 min
(5) CA – D Male, aged 22	
Duty position	L2P
Total time on duty	1,513 h 19 min
(6) CA – E Male, aged 21	
Duty position	R2P
Total time on duty	4,552 h 15 min
(7) CA – F Female, aged 24	
Duty position	L3P
Total time on duty	466 h 26 min
(8) CA – G Female, aged 23	
Duty position	R3P
Total time on duty	1,845 h 37 min
(9) CA – H (CSM: second senior) Male, aged 33	
Duty position	L4P
Total time on duty	11,116 h 27 min

*¹³ Letter L or R and the number following it identifies a door. The letter postfixed to the door number identifies the type of duty assignment, with P representing “primary” and A “assistant.”

(10) CA – I	Male, aged 27	
	Duty position	R4P
	Total time on duty	2,071 h 57 min

2.6 Aircraft Information

2.6.1 Aircraft

Type	Airbus Industrie A330-303
Aircraft serial number	0593
Date of manufacture	April 23, 2004
Certificate of airworthiness	Issued on June 28, 2004
Airworthiness category	Airplane, Transport
Total time in service	5,500 h 29 min
Time in service since last periodical check (A4 check conducted on August 2, 2005)	247 h 44 min

(See Figure 4.)

2.6.2 Weight and Balance

At the time of occurrence of the accident, the aircraft weighed 427,960 lbs, which means the aircraft landed exceeding the maximum landing weight (396,828 lbs). The aircraft's center of gravity at the time of the accident is estimated to be 26.1% MAC, which is presumably within the allowable center of gravity range (18.3–36.9% MAC) for the aircraft's maximum takeoff weight (445,329 lbs).

As a result of inspection which was conducted after the overweight landing, the aircraft was confirmed free of abnormalities.

2.7 Meteorological Information

Aviation weather observations at Kansai International Airport at around the time of the accident were as follows:

August 21 00:30	Direction of wind ... 150°; Velocity of wind ... 04 kt; Wind direction variation ... 120–190°; Prevailing visibility ... 35 km; Clouds: Amount ... 1/8, Type ... Cumulus, Ceiling ... 2,500 ft; Temperature ... 27°C; Dew point ... 23°C; Altimeter setting (QNH) ... 29.78 in.Hg
01:00	Direction of wind ... 150°; Velocity of wind ... 08 kt; Prevailing visibility ... 35 km; Clouds: Amount ... 1/8, Type ... Cumulus, Ceiling ... 2,500 ft; Temperature ... 27°C; Dew point ... 23°C; Altimeter setting (QNH) ... 29.77 in.Hg

The relative humidity as estimated from the temperature and dew point was 79%.

2.8 Communication Information

Up until the accident, radio communication conditions were satisfactory between the aircraft and the following facilities: Naha Radio, Tokyo Radio, Tokyo Control, Kansai Approach and Kansai Tower.

2.9 Aerodrome and Ground Facility Information

2.9.1 Kansai International Airport

(1) KIAC

KIAC is a special company established by the Kansai International Airport Co., Ltd. Law with the aim which includes efficient construction and management of Kansai International Airport.

The following shows a part of KIAC's organizational regulations which include assignment of responsibility.

<i>Name</i>		<i>Assignment</i>
<i>Operations Headquarters</i>	<i>Security Department</i>	<ul style="list-style-type: none"> ○ <i>Fire fighting, rescue activities and first aid and medical treatment related to aircraft accidents and other events at and around the airport</i> ○ <i>Supervising actions taken to deal with abnormal or emergency situations on and around the airport</i>
	<i>Airport Operations Department</i>	<ul style="list-style-type: none"> ○ <i>Operations of landing areas, taxiways, aprons and helipads (including actions to deal with abnormal situations)</i> ○ <i>Spot assignment</i>

(2) Ministry of Land, Infrastructure and Transport

The Ministry provides air traffic control services and aircraft operations support information services *¹⁴.

(See Figure 2.)

2.9.2 Assignment of Spots at Kansai International Airport

(1) KIAC's rules for spot assignment

The KIAC Operations and Management Manual stipulates the procedure for assigning spots to aircraft. The procedure involves different assignment standards for international passenger airlines, domestic passenger airlines and cargo airlines, and

*¹⁴ Aircraft operation support information services, which are part of the Ministry's aircraft operation information services, consist of eight categories of service such as flight-plan-dependent operation monitoring. The services involve gathering information related to aircraft search and rescue as well as necessary coordination with relevant organizations. The Ministry's aircraft operation information services encompass a wide scope of activities for safe and efficient aircraft operations, and consist of the aircraft operation support information service, aerodrome information service, airborne aircraft support service and air traffic control information service.

the requirements in each standard vary with the purpose and area. However, the manual also describes exceptions to the unavoidable cases such as irregular flight operations.

(2) KIAC's spot assignment to the aircraft on the day of the accident

Circumstances relating to spot assignment by KIAC to the aircraft are as described below.

① Statements by a duty staff of the KIAC Airport Operations Department

After hearing a 'MAYDAY' message from the aircraft, we learned from the airport office over the crash phone that the aircraft would be landing at Kansai International Airport.

After the aircraft had landed, I received information from Ground Control that there was no smoke on the aircraft, and from fire trucks that the aircraft was in normal condition. Considering these, we assumed the case to be classified as irregular operation. Since the spots around the terminal building were reserved for other aircraft, we assigned available Spot 206 to the aircraft. I heard from Kansai Tower that the aircraft was requesting Spot 11. After adjusting spot assignment, I replied Kansai Tower, "Spot 11 is available."

② Records of Communication between KIAC Airport Operations Department and Kansai Tower

At around 00:27 and 00:32, KIAC Airport Operations Department told Kansai Tower that, subject to circumstances after the aircraft landed, they had a plan to assign Spot 206 temporarily to the aircraft. From around 00:32 up until the aircraft's landing, Kansai Tower and KIAC Airport Operations Department confirmed with each other the Captain's request to stop on the runway or taxiway to disembark the passengers using mobile stairs. At around 00:53, when the aircraft came to a stop on the taxiway, Kansai Tower confirmed KIAC Airport Operations Department, "Spot 206 is assigned to the aircraft if it can taxi to there." and the KIAC's reply was "O.K."

2.10 Information on DFDR and CVR

(1) DFDR

The aircraft was equipped with an L-3 Communications DFDR (P/N: FA2100-4043-02), which retained normally recorded data.

The time data of the DFDR was compared with the NTT-broadcast time signals present in the record of communications between the aircraft and ATC. Both sets of time agreed with each other.

(2) CVR

The aircraft was equipped with an L-3 Communications CVR (P/N: FA2100-1020-02), which is capable of 120-minute recording, and the voice data retained in the recorder was recorded normally.

Time collation between the CVR and DFDR data was made by correlating the VHF

transmitter keying signals recorded in the DFDR with the ATC communication voice records in the CVR.

The portion of the CVR records that relates to the accident is shown in Attachment 4.

(See Attachment 4.)

2.11 Information on the Accident Site and Aircraft Conditions

2.11.1 Accident Site

The accident site is located at the intersection of Taxiway C and Taxiway P at Kansai International Airport. The aircraft was at a stop facing the passenger terminal complex, with its heading at 330°. Of the eight escape slides with which the aircraft is equipped, seven slides were found to have deployed normally, but the one at Door L1 had not deployed and the door was slightly opened.

An aircraft landing on Runway 06 can go to Spot 11, which the Captain of the accident aircraft requested, by taxiing straight down Taxiway C.

Spot 206, which KIAC initially assigned to the aircraft, is located at the end of the international cargo terminal and an aircraft landing on Runway 06 must taxi over a distance of approximately 2,400 m after clearing the runway to go there.

(See Figure 2.)

2.11.2 Aircraft Conditions

(1) Cargo compartments

No traces of fire and the like were found in either the forward or aft cargo compartments.

The aft cargo compartment contained eight containers (each 5 liters) of flammable liquid classified as dangerous goods (UN1993 ^{*15}) together with eight pieces of dry ice each weighing 20 kg (used to cool the flammable liquid). Post-accident investigation found nothing abnormal about the liquid or its packaging.

(2) Cabin

Newspapers, magazines, blankets and other items were found scattered across the floor and seats.

Some of the overhead stowage bins were open.

(3) Door L1

According to the SERVICE DIFFICULTY (SDR) INTERIM REPORT (23-AUG-05, SDR No.: 05/SI/613) issued by Qantas Airways, findings made by the engineers of the company are as follows:

- ① The door was found approximately 8 cm open from the closed position and was

^{*15} UN1993 is the number assigned to flammable liquid on the Dangerous Goods List of the United Nations Recommendations on the Transport of Dangerous Goods. On the cargo list of the accident aircraft, the liquid was registered as flammable liquid (hard-coating liquid).

jammed there.

- ② While the door was mechanically armed, the door arming handle was found moved to the disarmed position from the armed position.
- ③ The slide girt bar was found attached to the floor fittings on the door frame. The slide was still in the container inside the door.
- ④ The charge level of the door assist actuator was approximately 25% of the specified level. When the filling valve nut on the door assist actuator was loosened to slightly release pressure, the door automatically opened and the escape slide deployed normally.

(See Photos 3 and 4.)

2.12 Medical Information

2.12.1 Serious Injury

One passenger was seriously injured, the situation is described below.

Passenger A, Female

On the lower portion of the L3 slide, the passenger, who was until then held by her parent from behind, slid out of the parent's arms and struck her lower back against the ground, fracturing the pelvis.

2.12.2 Minor Injury

During evacuation using slides, eight passengers sustained minor injuries (bruises or abrasions) on various regions of their bodies. In addition, one passenger experienced hyperventilation.

2.13 Information on the Fire and Fire Fighting Activities

2.13.1 Fire Fighting Services at Kansai International Airport

At Kansai International Airport, fire fighting and rescue services are provided by KIAC.

KIAC has signed an agreement with the mayors of the City of Osaka and other local municipalities on mutual assistance in fire fighting and rescue activities in the event of aircraft-related disasters at Kansai International Airport and its vicinity. In addition, based on the agreement, the manager of Service Security Center of the KIAC Operations Headquarters signed a memorandum with the head of the Osaka Municipal Fire Department and others, by which assistance can be asked.

KIAC has also signed an agreement with the mayor of the City of Izumisano on fire fighting and rescue operations at Kansai International Airport and its vicinity. In addition, based on the agreement, the manager of Service Security Center of the KIAC Operations Headquarters signed a memorandum with the head of the Izumisano Fire Department for smooth activities by fire brigades and other personnel. The Izumisano Fire Department has a branch station at Kansai International Airport.

2.13.2 Fire Fighting Activities Related to the Accident

Based on the statements by KIAC Airport Operations Department staff, KIAC fire services personnel (hereinafter referred to as the “airport fire services”), airport branch station staff and Rinku fire station staff who belong to Izumisano Fire Department, as well as the materials gathered and compiled by KIAC after the accident and other data, fire fighting activities related to the accident were as follows.

At around 00:06 on August 21, Kansai Tower notified information, saying that Qantas flight 70 had a fire in the cargo compartment and might make an emergency landing at Kansai International Airport. When definite information became available, the tower would advise over the crash phone.

At around 00:20, Kansai Tower advised over the crash phone, saying that the pilots of the aircraft had declared an emergency because of a fire in the cargo compartment. According to the latest information, they had sent out a MAYDAY message.

At around 00:30, the airport fire services issued a Class 2^{*16} deployment order. Airport branch and Rinku station of Izumisano Fire Department were also mobilized for Class 2 deployment. At 00:44, the airport fire services changed to Class 3 deployment.

At around 00:51, the aircraft landed. Vehicles of the airport fire services followed the aircraft, which came to a stop on a taxiway. While following the aircraft, Fire 1, the command-post vehicle of the airport fire services, reported to Kansai Tower Ground Control twice that there were no abnormalities on the aircraft.

At around 00:55, when Fire 1 advanced up to the right forward of the aircraft, Fire 1 saw something like white smoke coming out from below the cockpit and reported that to the tower. To get a closer look, Fire 1 advanced up to the left forward of the aircraft. Then, the brigade commander got off the vehicle and walked up to the nose when the slides of the aircraft suddenly deployed.

The fire fighters near by, except those who were watching out for possible fire, assisted the evacuation using slides and guided passengers towards two temporary assembly areas, on forward and aft of the aircraft.

At around 01:02, preparation of fire fighting was completed by extension of water hoses.

Subsequently, Rinku brigade members entered the cargo compartments and, at 01:26, confirmed that there were no signs of fire. Following the Rinku brigade’s report, the airport fire services lifted the ready-to-discharge alert at 02:20. At 03:11, following the completion of counting all passengers and crewmembers, the Class 3 deployment order was lifted.

The following fire trucks and other resources were deployed.

KIAC	18 vehicles (including 6 rescue vehicles), 31 staff members
Izumisano Fire Department	10 vehicles (including 4 ambulances), 29 staff members
Medical institution	3 doctors

^{*16} There are three levels of deployment of fire services depending on the reason and situation requiring the deployment: Class 1 (stand-by), Class 2 (occurrence of dangerous situation) and Class 3 (occurrence of accident).

(See Figure 2.)

2.14 Information on Search, Rescue and Evacuation Relevant to Survival, Death or Injury

2.14.1 Search and Rescue

The Rescue Coordination Center, upon notification by Naha Radio of a distress message from the aircraft, notified relevant organizations taking actions corresponding to distress phase.

2.14.2 Evacuation

2.14.2.1 Circumstances Inside and Outside the Aircraft Before, During and After the Emergency Evacuation

Based on the statements by the Captain, CSM, other CAs and the passengers, the circumstances before, during and after the emergency evacuation were as outlined below. (The passengers' statements include the circumstances while the aircraft was airborne.)

(1) Captain

I checked the entire cabin and confirmed that there was no one else except me in the aircraft before disembarking through Door R1.

(2) CSM

After landing, while I was waiting for instructions from the Captain, he shut down the engines and the cabin went dark. When I turned on the emergency lights, the Captain ordered an evacuation and we initiated passenger evacuation procedures.

Door L1, for which I was responsible, opened only slightly and became jammed there. I could not even move the handle back, I asked a male CA to help, but he could not open the door. So, I guided the passengers to Door R1. There were only eight passengers in Zone A (business class compartment) and they could evacuate without any problems.

(3) Other CAs

The emergency evacuation alarm sounded, accompanied by the illumination of the emergency evacuation light. We each looked outside from assigned doors and confirmed that there were no obstacles to opening doors and deploying the slides, and then we opened the doors.

We blocked the passengers at our assigned doors until complete deployment of each slide was confirmed. We then instructed the passengers to evacuate ("Jump and sit." "Jump, jump."). We also instructed the passengers to leave everything behind.

In the cabin, the lights were all out except for the emergency lights. None of the passengers were yelling in panic. They were calm and they evacuated in an orderly manner.

After the passengers evacuated, we each checked our assigned cabin zones with a flashlight for any passengers remaining. Then we evacuated through our assigned doors.

(4) Statements collected through the Australian Transport Safety Bureau (ATSB)

In addition to the statements in (2) above, the following are statements extracted from those provided by the CSM through the ATSB mentioned in 2.1.2 (6) regarding the situation after start of the emergency evacuation.

- ① The CAs thought that fire fighting personnel would have been assisting passengers at the bottom of the slides and marshalling the passengers once they were clear of the slides. The CSM was the second last person off the aircraft, and she was assisted at the bottom of the slide by emergency services personnel. She thinks she may have been the only person assisted.

The CAs were surprised that there was so little assistance from the emergency service personnel.

- ② None of the CAs saw any passengers who evacuated in two together.
- ③ Quite a few bags were taken from passengers going down the slides. It is a bit difficult to stop all bags going down because the passengers are in two lines and there is generally only one attendant at each door.

(5) Passenger A (female)

I was in Seat 46D. My parent was sitting next to me, in Seat 46E.

During the flight, there were announcements in English and Japanese informing us that, because of computer error, we would be returning to an airport in Japan.

Later, there was an announcement that we were flying to Kansai International Airport. The CAs demonstrated how to take a braced position during the emergency landing. And prior to landing, I took that position.

The passengers stayed calm.

After landing normally, the aircraft came to a stop. A little later, the lights suddenly went out, and were soon replaced by the emergency lights. And next moment, the escape door opened.

I was the second one among the passengers who jumped off the escape exit. I jumped with my parent, who held me in his arms. Near the bottom of the slide, I slid out of my parent's arms and fell to the ground on my lower back. Then, we left the aircraft, with my parent carrying me on his back.

I am smaller than other people at my age, I have fragile bones since birth, and I have fractured my bones before.

(6) Passenger B (male, the parent of Passenger A)

I was worried that my daughter might get injured in the emergency evacuation. So I lifted my daughter in front of a CA and, making a sign with my eyes, I jumped off the aircraft while holding her body in front of me with my arms.

Near the bottom of the slide, my daughter slid out of my arms. She then fell on the ground on her lower back. We were the second to escape from the exit. The male passenger who escaped first left without assisting any of the following passengers at the bottom of the slide. There were no fire fighters or others providing assistance at the

bottom of the slide, either.

I left the aircraft carrying my daughter on my back and stayed at the area to where I was guided by fire fighters and others. While staying there, my daughter complained of pain. I called loudly for an ambulance many times so that my daughter could receive immediate medical attention. No one cared. It was about 40 min after our evacuation that my daughter was admitted into an ambulance.

(7) Passenger C (female)

There was a cabin announcement in English. I don't understand English, so I did not think that the announcement was about a serious situation. A little later, there was an announcement in Japanese, telling us that the aircraft had a problem and we were returning to Japan.

During the flight, the passengers appeared calm. However, I felt strong uneasiness.

Cabin announcements about landing at Kansai International Airport were, I think, made in English and Japanese. There were announcements such as 'Please remain seated after landing' and 'When the Captain says "Evac," that means an emergency evacuation. Please follow the crewmember's instructions.'

When it was decided that we would be landing at Kansai International Airport, the CAs instructed us with gestures to remove sharp objects from our bodies.

During the landing, I kept a braced position. After landing, there was spontaneous applause among the passengers and everyone appeared relieved.

A little later, the cabin went dark and all the passengers panicked. Then came a siren and a voice said 'Evac' and the CAs were pointing to the emergency exits, saying, 'Hurry up.', from which I inferred that we would use slides. I was in a panic and escaped the aircraft leaving everything behind but I saw some passengers carrying hand luggage and even carry on suitcases as they evacuated.

I went down the slide. When I was almost on the ground, a passenger behind me pushed me on the back. I landed on the ground, twisting my left foot. I saw no one helping the passengers to stand up at the end of the slide.

When I stood on the ground, I saw police officers, fire fighters and rescue squad members waiting for us at a place about 100 m away. They were guiding us, saying 'Come down here.' Because I had twisted my foot when coming down the slide, I had to lean on the shoulder of my friend, who was with me on the trip. When a Japanese lady, who was also a passenger, saw us, she also offered her shoulder to help me and I could manage to escape. She told a CA in English that I was injured.

2.14.2.2 Passenger Evacuation Exits

The passengers in Zone A (business class compartment) escaped through Door R1 because Door L1 had jammed and could not be used. There were eight passengers in Zone A.

The other passengers escaped following the guidance of the CAs responsible for their respective zones.

(See Figure 5.)

2.14.2.3 Requesting Passenger Assistance in Evacuation

The Aircrew Emergency Procedure Manual (AEPM) describes the procedures that CAs must follow in emergencies and CAs use the impact drill sheet, which summarizes the contents of the AEPM. The drill sheet includes the instructions through the PA, which the CSM gave to the passengers as described in 2.1.1 (4). The statement in 2.1.2 (6) ② is based on the description in the AEPM that those passengers sitting nearest to the emergency exits would be asked to offer assistance in an emergency evacuation. The impact drill sheet, however, does not include this procedure.

2.14.3 Evacuation and Guidance of Passengers

The airport fire service and Izumisano Fire Department deployed two vehicles to the aft left side of the aircraft and seven other vehicles to the right side of the aircraft. At 00:58, after seven slides were deployed from the aircraft, they assisted passengers at the bottom of the slides and guided them to temporary assembly areas. The passenger evacuation was completed at 01:02. Four firefighters provided assistance to passenger escape at the bottom of three slides. Seven other fire fighters at five locations around the aircraft guided passengers who had evacuated the aircraft. There was no specific procedure for assisting at the bottom of slides in case of evacuation. They could not deploy personnel to all seven slides, partly because the evacuation started suddenly without prior notification to the fire services.

After evacuating from the aircraft, the passengers were guided to two temporary assembly areas, one on the side of left wing of the aircraft where approximately 70 passengers were guided, and the other on the right side of the aircraft nose where approximately 100 passengers were guided.

Subsequently the passengers and crewmembers were moved as shown below.

Non-injured	After 01:25	Transported from the temporary assembly areas to airport lounges.
Injured	Five times between 01:38 and 02:47	Transported by ambulances to three hospitals in the city.

2.15 Fact-Finding Test and Research

2.15.1 Cargo Smoke Detection System and Cargo Fire Extinguishing System on Airbus Industrie A330-303

(1) Outline of Cargo Smoke Detection System

① System composition

A pair of smoke detectors is installed in each ceiling installation panel in the cargo compartment. There are two installation panels in the forward and two in the aft cargo compartment and one in the bulk cargo compartment. Those smoke detectors are segregated in two loops, A and B, to give the system redundancy and to increase reliability.

In case of fire, SDCU receives the smoke detection signal and sends a smoke warning signal to each system component. Smoke warning messages appear on the upper ECAM display.

The crew will be able to recognize a smoke warning by “MASTER WARNING” light illumination, the illumination of corresponding “SMOKE” light on the CARGO SMOKE panel, smoke warning representing on the upper ECAM display and continuous repetitive chime sounding.

At the same time, the isolation valves of the relevant cargo compartment are closed and air extraction fans are stopped automatically.

The smoke detection system reliability is increased by the following logic in non-accessible compartments:

ECAM displays a smoke warning for the relevant cargo compartment when both detectors at one installation panel detect smoke or if a single detector detects smoke and the second one has been seen faulty by the SDCU (during an automatic test e.g.).

② Information on SDCU

The SDCU installed in the accident aircraft had P/N RAI2811M0103 (S/N Q09450005187).

The SDCU automatically communicates with smoke detectors to check the condition of smoke detectors and loop circuits every 30 min and this is called automatic test. Detectors are divided into three “Batches” and automatic tests are done as follows. Starting from the power supply, the first batch is tested 5 min after, the second batch 10 min after and the third batch 15 min after, then this test pattern repeats at intervals of every 30 min. The test signal is transmitted on each loop to the corresponding SDCU channel (1 or 2). With SDCU P/N RAI2811M0103, when the two SDCU channels are desynchronized, the SDCU may trigger a spurious smoke warning during the automatic test sequence if the SDCU is under the condition of loop discontinuity or detector disconnection. However, even if desynchronized, the time gap between the two channels is not constant and spurious smoke warnings will be triggered only for given conditions of desynchronization.

After a spurious warning has been triggered by the SDCU malfunction during an automatic test, the SDCU performs a check of the detector status for both loops, and no more smoke signal is acquired because the automatic test sequence is finished. This check lasts between 12 to 18 sec, and then the smoke signal is self-cleared and the messages on the ECAM display disappear.

③ Information on smoke detector

The smoke detector installed in the aircraft had P/N PPA1102-00.

A smoke detector becomes activated by smoke; however, there were cases where they were activated by fire extinguishing agent which filled the cargo room.

(2) Cargo Fire Extinguishing System

Two extinguisher bottles are installed in the forward cargo compartment and each

bottle comprises two electrically operated cartridges which correspond to the forward or aft/bulk cargo compartment.

Extinguisher agent discharge is done by selecting the FWD or AFT cargo compartment, and is only applied for one cargo compartment.

When the “FWD” or “AFT” AGENT pushbutton on the “CARGO SMOKE” panel is pressed, the corresponding squibs are fired on both bottles. The agent from bottle 1 flows approximately 60 sec. The agent from bottle 2 flows through a restrictor, which control its release, in order to maintain a slow agent discharge for approximately 240 min.

The “BTL 1(2)” light comes on white when the corresponding bottle has been discharged.

2.15.2 Investigation into Cargo Fire Detection System

(1) After this accident, the following reports were released:

- ① Qantas Airways as the operator of the accident aircraft
“Service Difficulty (SDR) Interim Report” (September 22, 2005)
- ② Airbus as the design and manufacture company
“Flight diversion due to FWD & AFT LDCC smoke warnings – GSE 420.0338/06”
(August 30, 2006)
- ③ ATSB as the state of registry and operator
“Aviation Occurrence Report – 20054074” (June 2006)

(2) Technical information on smoke detector issued by Airbus

Airbus issued the following technical information including outline of malfunction and necessary countermeasures to all customers who operate aircrafts (A330, A340, A340-500, A340-600) which are equipped with the same type of SDCUs. Although this technical information is directed mainly to maintenance personnel, it requires pilots to follow FCOM procedure. Therefore, no description are made on judgments and countermeasures in the case of possible spurious smoke warning during flight.

- ① Airbus Technical Follow Up (TFU) Ref. 26.16.34.006 (M0103 deviations) (TFU Issue Date: Sep 2004, First Issue Date: Jul 2003), 26.16.00.004 (cargo smoke detection system sensitivity to outside parameters) (TFU Issue Date: Apr 2006, First Issue Date: Aug 2003) and 26.10.00.008 (detector disconnection message)
- ② Operator Information Telex (OIT) Ref. SE999.0144/04/FM dated 17 Dec 2004

Airbus recommended that its customers retrofit SDCUs with P/N RAI2811M0101 and P/N RAI2811M0103 by upgrading their software to obtain P/N RAI2811M0104 in order to avoid erroneous operations of the smoke detection system. Airbus launched this campaign in September 2004 and ended it in September 2005. The company regarded this appropriate in terms of retrofit period, judging from the fact that a total of 95 aircraft worldwide plus spare SDCUs were targeted and mandatory requirements were not imposed by the French airworthiness authorities.

Further, according to Qantas Airways, retrofit works were to be done at an approved repair station in Singapore. As for Qantas Airways' A330s, as of August 20, 2005, older SDCUs are retrofitted and obtained P/N RAI2811M0104 except 4 aircrafts including the accident aircraft. All SDCUs with P/N RAI2811M0103 were retrofitted and obtained P/N RAI2811M0104 by August 25, 2005.

(3) SDCU BITE data of the accident aircraft

According to (1) ① and ② reports, SDCU data recorded in the Central Maintenance Computer is as follows. Triggering of spurious smoke warnings is revealed to be a fault due to SDCU software deviation.

Time is written in Japanese Standard Time

Time	SDCU BITE data
19:38	Data: SMOKE AVIONICS 2WA, SMOKE FWD LDCC 2WH, SMOKE FWD LDCC 4WH, SMOKE AFT LDCC 6WH, SMOKE AFT LDCC 8WH (all channel 1 data) Meaning: Smoke detectors (2WA, 2WH, 4WH, 6WH, 8WH) send smoke signals to SDCU. Note: Retrieved data on the ground after providing electric power to the aircraft. ECAM displays SMOKE warning from smoke detectors, but erases them automatically in about 12 to 18 sec.
21:19	Data: SMOKE DET AFT LDCC (9WH)/WRG: SMOKE LOOP A Meaning: Smoke detector (9WH) in the bulk cargo compartment is seen disconnected from Loop A by the SDCU. Note: Retrieved data at engine start. It is considered that due to recording property of CMC, time was registered as 2119 although the event occurred earlier. The maintenance message can be retrieved only when mechanics access the CMC.
23:05	Data: SMOKE FWD & AFT LDCC 4WH, 6WH, 8WH, 10WH
23:35	Meaning: 4 smoke detectors installed in forward and aft cargo compartment sent smoke signals to SDCU
23:36	Data: CRG BTL 1 SQUIB (4003WX), CRG BTL 2 SQUIB (4013WX) FWD/SDCU (20WH) Meaning: Fire extinguisher material was discharged from Bottle 1 and 2

(4) Spurious smoke warning occurrence record and SDCU retrofit on all 11 Airbus Industrie A330 type aircraft of Qantas Airways

The table below quotes Qantas maintenance data (Airman Technical Event Logger) recorded during the time period one year before the accident, including data concerning the accident. The number of malfunction occurrences is less than that of the listed data because a multiple number of data items are recorded for one event.

P/N	Spurious smoke warning	Other	Total
101	11	336	347

103	26	187	213
104	9	9	18

- ① The smoke warnings concerning P/N RAI2811M0101 are all for Lavatory-visually accessible area.
 - ② The smoke warnings concerning P/N RAI2811M0103 are for Lavatory (19), Cargo compartment (6) and Avionics bay (1). Further, this data includes two smoke warnings for the forward and aft cargo compartments in the case of the accident.
 - ③ The accident aircraft experienced only one spurious smoke warning for a cargo compartment. This occurred on June 1, 2005, while the aircraft was on the ground. The warning appeared when the forward cargo door was opened, with no smoke evidence, and was attributed to condensation of water vapor.
 - ④ The number of maintenance status messages generated by SDCUs with P/N RAI2811M0104 decreased remarkably and no smoke warnings have been issued until the present. But it is described in Airbus TFU 26.10/00.009 (Jul 2005) that spurious smoke warning might be triggered on the ground only in the case of wiring discontinuity and under specific conditions with even RAI2811M0104. Airbus commenced a drive to retrofit older part-numbered SDCUs to obtain P/N RAI2811M0105 to solve this problem. Nevertheless, during development of SDCU P/N RAI2811M0105, some software issues have been identified. As a consequence, this PN has not been fitted on in-service aircraft, and development of SDCU P/N RAI2811M0106 has been initiated. Finally, Airbus commenced a one-year drive to retrofit SDCUs with P/N RAI2811M0104 to obtain RAI28M0106 starting May 2006.
- (5) The precedent of spurious smoke warning during flight

On November 19, 2004, an A340-642 aircraft equipped with an SDCU P/N RAI2811M0103 experienced a number of smoke warnings displayed on the ECAM while cruising. The Captain of the aircraft discharged fire extinguishing agent in the relevant cargo compartment and then diverted to the nearest airport for an emergency landing. After landing, there was an abnormal smell in the cabin, and the Captain ordered an emergency evacuation. During the evacuation, one passenger suffered a fractured ankle. Inspection conducted after the landing found no traces of fire. Further investigation found that the spurious smoke warnings were attributable to an SDCU operational error. (The investigation report was released to the public on March 7, 2006.)

(See Figures 6 and 7.)

2.15.3 ECAM Warning Display

For any ECAM warnings, pilots are advised to follow FCOM procedures.

According to the Airbus, the crew trained how to deal with spurious warnings may try to have the situation awareness, consequently delay necessary actions, and lead to serious result in case of actual fire. The Airbus expects the crew to respond any red warnings and follow FCOM procedure without delay.

If a warning appears on the ECAM display but disappears without any pilot actions, it means that the warnings are no longer applicable and the procedures stop there.

Further, in the case of two or more separate warnings at the same time on the ECAM display, the warning will be displayed in priority order. If both warnings such as SMOKE FWD CRG and SMOKE AFT/BULK CRG appear on the display, the former has priority.

(See Figure 3.)

2.15.4 Investigation into Jamming of Door L1

According to the report mentioned in 2.15.2 (1) ②, the findings regarding the jamming of Door L1 are as follows.

Door L1 jammed during the automatic opening cycle due to physical interference between the locking washer for door stop T3 and the fuselage side aft seal retainer. This was caused by the locking washer whose end was not having been fully bent and thus protruded approximately 1.5 mm compared to other locking washers. It was confirmed that the locking washer was not fully bent when it was fabricated. During normal opening and closing movements of the door, the door and the aft frame do not interfere with each other even with insufficient clearance between them. However, during automatic opening sequence of the door in emergency evacuation, the operation of the actuator slightly displaces (aft, approximately 1.5 mm) the door, and this resulted in the interference mentioned above.

No abnormalities were found on the other doors of the aircraft, including their locking washers.

According to Airbus , inspection which was conducted at the Airbus plant on the doors of aircraft relating to the malfunction in this accident found no similar defects. The door actuation system has been subject to the specified inspection program, and there have been no reports from any operators advising Airbus of similar malfunction.

(See Photos 3 and 4.)

2.15.5 TAT Probes on the Airbus A330-303

Two total air temperature (TAT) probes are installed on the lower part of the aircraft's nose, one on each side. The TAT probes are supplied with engine bleed air, which enables the probes to sense TAT free of error by drawing in outside air even when the aircraft is on the ground or flying at low speeds.

In addition to the TAT probes, pitot tubes and others are installed on the nose of the aircraft. Among them, only the TAT probes have structure to release gases to outside.

(See Photo(sketch) 5 and Photo 6.)

2.16 Other Relevant Information

2.16.1 Descriptions in the Airbus A330 Flight Crew Operating Manual

The A330 Flight Crew Operating Manual (FCOM) contains the SMOKE FWD CRG SMOKE procedure in the FIRE PROTECTION part of the ABNORMAL AND EMERGENCY

section, as shown in Attachment 2. Because the aircraft does not provide with means to verify a cargo compartment smoke warning, during flight, the flight crew is required to follow FCOM procedures whenever a smoke warning is issued.

2.16.2 Definition of “Confirm” in Relevant Documents

Document	Definition of “Confirm”
ANNEX 10 Vol. 2 Chapter 5. Aeronautical Service – Voice Communications	Meaning: “I request verification of (clearance, instruction, action, information).”
Part 5. Air Traffic Control Service Manual III Air Traffic Control Procedure Standards	Phrase: Please confirm.(in Japanese) Meaning: “Is the following message that we received correct?” or “Have you received the message correctly ?”

2.16.3 KIAC Actions Taken in Relation to the Accident

KIAC had been planning to take actions with the following contents before the occurrence of this accident, but it was after the accident that KIAC revised its emergency management manual to strengthen its rescue capability.

- (1) Capability of nighttime response
- (2) Capability of assistance to the people evacuating by deployed slides
- (3) Capability of transportation of primary evacuees

3. ANALYSIS

3.1 The Captain, the First Officer and the Second Officer had adequate airman licenses and valid airman medical certificates.

3.2 The aircraft had a valid airworthiness certificate and was properly maintained and inspected.

3.3 Flight crew actions from smoke warning issuance up to when the aircraft came to a stop on the taxiway

(1) First smoke warning

The first cargo compartment smoke warning was a spurious warning that was triggered as a result of desynchronization between the two channels during the automatic test sequence as described in 2.15.1 (1) while spurious disconnection of the smoke detector (9WH) persisted as described in 2.15.2 (3). As described in 2.15.1 (1) ②, above mentioned spurious smoke warnings disappear by self-clear function and the ECAM indications of smoke warning disappear too. It is estimated that the DFDR-recorded time period (14 sec) when the ECAM was displaying the smoke warning as described in 2.1.1 (1) corresponds to the self-clear function.

It is estimated that, because the smoke warning displayed on the ECAM disappeared automatically in a short period, the flight crew could not read indications other than “FWD CRG SMOKE warning.”

As described in 2.1.1, the flight crew noticed by the indication of the CARGO AIR COND panel in the cockpit that the ventilation holes for the forward and aft/bulk cargo compartments were closed. This indicates the possibility that a fire had started in the forward and aft cargo compartments as described in 2.15.1 (1) ①. It is estimated, however, that, partly because display on the ECAM was self-cleared, the Captain could not identify which cargo compartment(s) the smoke warning was issued to.

In addition, it is estimated that the Captain decided not to discharge any agent at that time, considering that fire extinguishing agent can be discharged only once to one of the compartments as described in 2.15.1 (2).

The flight crew analyzed and discussed the smoke warning for cargo compartment, and discussed possible airport in Japan to divert. The crew then concluded that the smoke warning for cargo compartment could be suspected spurious but could not be so judged and decided to take action assuming that a fire had started. Consequently, it is estimated that the flight crew sent out an urgency message and decided to turn back to Japan considering that it would be necessary to land as soon as possible at Narita International Airport, their departure point. Regarding that it took approximately 16 min from the first issuance of smoke warning to the start of turning back, it is estimated that the Captain, with the smoke warning disappeared in a short time,

reviewed the necessary subsequent actions from various angles. However, given that the Captain decided to treat the smoke warning as a real despite the disappearance of the warning display on the ECAM, it is estimated that he should have been turned back promptly.

(2) Second smoke warning

Subsequently, when the second smoke warning was issued exactly 30 min after the first smoke warning, the Captain learned from the ECAM display that the warning was related to the forward cargo compartment and he discharged fire extinguishing agent in that cargo compartment. According to the DFDR and SDCU BITE data, the smoke warning was related to the forward and aft cargo compartments, as was the first smoke warning. This disagrees with the flight crew's statements that they were not aware of any smoke warning related to the aft cargo compartment, but it was not possible to make the reason clear.

Just like the first smoke warning, the second smoke warning was spurious as a result of desynchronization between channels during the automatic test sequence, which the SDCU initiates every 30 min. As described in 2.15.1 (1) ②, the time gap between the desynchronized two channels is not constant, and it just happened that spurious warnings were triggered incidentally twice, at 23:05 and 23:35.

(3) Third and subsequent smoke warnings

It is recognized that as described in 2.15.1 (1) ③, the third and subsequent smoke warnings were triggered when the smoke detectors in the forward cargo compartment reacted to the fire extinguishing agent(halon gas), which filled the compartment. It is estimated that, while the flight crew was aware that the fire extinguishing agent could be used only once, they repeated the procedure to discharge the fire extinguishing agent once again to be on the safe side.

After the first cargo compartment smoke warning, no abnormal conditions other than the smoke warnings were found, and the aircraft continued flying without problems. It is estimated that the passengers could calmly accepted the situation as described in 2.14.2.1 because the Captain stated that the flight was safe when he explained to the passengers about the situation and the change of destination.

(4) Landing at Kansai International Airport and Stop on the Taxiway after Landing

It is estimated that the Captain initially intended to let the passengers disembark on the taxiway because he considered to get necessary space around the aircraft for rescue operations in case of a fire, and his decision was appropriate.

3.4 Captain's Decision on Emergency Evacuation

Just when the Captain was about to start taxiing to Spot 11, Kansai Tower sent a message to the aircraft, saying "Fire trucks reported smoke appears around nose gear, so hold present position." When the Captain asked Kansai Tower to "confirm" the content of the message, the tower made the same reply. Upon hearing the reply, the Captain immediately

started the emergency evacuation checklist. When the Captain asked Kansai Tower, “Confirm there is still smoke,” the tower replied, “affirm.” Then, the Captain made deployment of the slides.

Based on the history described above, it is estimated that the Captain, by the information from the tower, judged that a fire had started and decided to initiate emergency evacuation. Past accidents clearly show that when the Captain has judged that a fire has started, emergency evacuation should be promptly initiated to minimize anticipated damage.

However, the Captain’s judgment of fire was based solely on the information from Kansai Tower. It is therefore considered possible that the Captain could have made a more appropriate decision if he had tried to gather information about specific condition of the white smoke while keeping in mind not to prevent swift actions.

3.5 White Smoke Observed by Fire Services

As described in 2.7, relative humidity was high, according to the meteorological observations at Kansai International Airport at the time of the accident. It is estimated that the white smoke observed by fire services was made from compressed air, which was discharged from the TAT probe nozzles, cooled by adiabatic expansion, then condensed the moisture in the air into something like fog.

At the time of the accident, wind was blowing from completely opposite direction to the heading of the aircraft.

It is estimated that the foggy bleed air coming out of the TAT probes was blown forward of aircraft under this wind condition and appeared as if white smoke was coming out from the nose.

3.6 Actions by Fire Services

KIAC mobilized the required levels of fire fighting and rescue resources with the assistance from the Izumisano Fire Department in line with the agreement on mutual assistance in fire fighting at Kansai International Airport. It is estimated that the fire services actions were appropriately prepared.

3.7 Communications among ATC, KIAC and the Flight Crew

- (1) Actions by ATC and KIAC in response to the distress message from the aircraft

The airport, including related organizations, where an aircraft which sent distress message is going to land must be fully prepared to minimize possible damage, regardless of whether or not they expect it could develop to a situation with serious damage at the landing of that aircraft.

While the aircraft performed a series of procedures to deal with cargo compartment fire, the aircraft flew without any problems for about one and a half hour from the time when urgency and distress messages were sent out to the time when the aircraft landed. Therefore, it is considered difficult for the ATC and KIAC to imagine the tense situation

in the cockpit. Nevertheless, it is considered that actions by the ground side could have been better as described below.

The Captain requested permission to taxi to Spot 11 with the intention (see 2.1.1 (5)) of having the passengers disembark as soon as possible using mobile stairs, if available, even if there were no signs of fire. On the other hand, Kansai Tower, based on coordination with KIAC, assigned Spot 206 to the aircraft after confirming that the aircraft could taxi normally. It is estimated that this happened because neither Kansai Tower nor KIAC fully understood the Captain's intention, as described in (2) below, and therefore Kansai Tower judged it appropriate to assign the prearranged spot (see 2.9.2 (2) ②) if the aircraft could taxi normally.

For an aircraft that has landed after sending out a distress message, it is considered necessary to make a comprehensive check from inside and outside after landing of that aircraft, and to take actions in full consideration of judgments and requests by the Captain, which include recognition of either continuance or cancellation of the emergency situation.

It is estimated that in the background why the ATC and KIAC could not fully understand the Captain's intention, which was to perform precautionary disembarkation according to the precautionary disembarkation checklist (see Attachment 3) that is a normal procedure of the company, as stated by the Captain in 2.1.2 (1), whereas among Japanese parties concerned, precautionary disembarkation is to be performed based on mutual coordination and depending on the circumstances.

(2) The Captain's recognition about the communication of ATC

As the Captain said "Language ..." over the interphone, it is estimated that he recognized to have communication problems in the following two points:

① As to the actions after landing in the communication between the Captain and Kansai Approach

The Captain's messages are as follows:

- a. To stop on the aircraft on the runway and check the condition.
- b. If there is no sign of fire, to turn off the runway and have the passengers disembark using mobile stairs.
- c. If mobile stairs are not available and there is no sign of fire, to taxi to the terminal.

In response to these messages, Kansai Approach stated that they understood evacuation on the runway, which was not mentioned in the Captain's messages, and asked the Captain if he could taxi to the terminal if there was no such need.

It is estimated that the air traffic controller could not fully understand the Captain's intention partly because the volume of information in the Captain's messages was large (138 words).

② As to the exchange of information immediately after the aircraft came to a stop on the taxiway

The Captain again requested permission to taxi to the apron in front of the spot

located straight ahead of the aircraft and to have the passengers disembark there using mobile stairs. To this request, Kansai Tower replied that they would coordinate about assigning Spot 11. It is estimated that the Captain felt that his intention was not being understood, because he was not given taxi instruction to Spot 11, even though mobile stairs, which he had requested earlier, were moving in front of the aircraft.

(3) Recognition of the term “confirm”

The Captain asked confirmation, using the term “Confirm”, twice in response to the message “Smoke appears around nose gear” from Kansai Tower. It is estimated that the Captain’s intention was not to ask the tower to resend the message itself but to ask the tower to confirm the content of the message, because an emergency evacuation would have to be conducted if the smoke information was really a fact. On the other hand, Kansai Tower understood the term “confirm” to mean the confirmation of the message itself, saying white smoke was confirmed as described in 2.1.4 (2) ②. The tower, therefore, responded to the Captain’s first request by resending the same message and, to his second request, by saying, “Affirm.”

Apart from the official definition of the term “confirm” as cited in 2.16.2, it is estimated that confusion arose because the Captain and the air traffic controller, from respective position, understood object to “confirm” differently. To prevent confusion arising from different recognition, persons in charge of communication need to make efforts use expressions that reflect their intentions as accurate as possible.

(4) Improvement of communications

In emergencies, accurate communications between the parties concerned are an extremely important factor to make it possible to take right actions. When speaking about this accident, it is considered that there could be points to be improved on the part of fire fighters, air traffic controllers and flight crew respectively in terms of the following areas.

On the part of fire fighters, that their command post vehicle sent a message “... around the nose, something like white smoke can be seen” to Kansai Tower, as the subsequent progress of events shows, eventually triggered the Captain’s decision to conduct an emergency evacuation. When sending out important information, considering effect brought by the information, even in the tense situation that existed in this accident case, it is necessary to use non-misleading words and to send brief information in adequate timing.

There are circumstances that require preliminary information even though inaccurate, in such cases it is necessary to clarify the level of accuracy of the information. In addition, to ensure the accurate relay of information, it is necessary to ask read back of the information to be relayed by the tower.

On the part of air traffic controllers, plain language conversation which is different from defined ATC phraseology, is made quite often in emergencies. For this reason, air

traffic controllers need to further improve their proficiency in English conversations. If any message is not fully understood, it is necessary to ask sending it again in order to fully understand.

On the part of flight crew, language problems are mentioned over the interphone, it is considered necessary that all persons in charge of information exchange make efforts to achieve smooth communications. In non-English speaking countries, it can take a relatively long time for air traffic controllers to correctly understand messages such as explanations and requests about emergency. So it is necessary to be thoughtful, from the viewpoint to ensure correct and efficient communication, about the volume of message as well as simple expression using plain wording.

3.8 Evacuation and Rescue Operations

3.8.1 Evacuation Guidance On-Board

Following an emergency evacuation order by the Captain, the CAs performed the procedures specified in the manual. According to the statements by the CSM, her passengers were guided to Door R1 because Door L1 could not be opened, but there was no disorder.

With regard to the passenger who was seriously injured during the evacuation, there was no prior indication from the passenger's parent that assistance would be required. Partly because of this, it is estimated that the CAs did not brief the parent on the evacuation procedure including how to hold the passenger. It is considered that as a result, parent evacuated with difficulty in holding the passenger properly, and the passenger slid out of the parent's arms at the lower portion of the slide.

It is estimated that the CAs did not ask those who would slide down to the ground first to assist the following passengers partly because the impact drill sheet did not contain the relevant procedure, as described in 2.14.2.3.

3.8.2 Evacuation Guidance on the Ground

It is estimated that no assistance was offered by evacuated passengers to following passengers.

Fire fighters provided assistance at only three of the seven deployed slides. As stated by the CSM, she was the only one who was assisted by fire fighters and none of the other CAs, who escaped after the passengers, received assistance by them. It is estimated attributable that there was no established assistance procedures assuming situations like this, as described in 2.14.3, and there was no margin of time as an emergency evacuation was not expected.

After the evacuation, guidance to the temporary assembly areas and subsequent transport of the passengers was conducted without any disorder except in the case of transporting injured persons.

As to the transportation of injured persons, it is estimated that a delay to have occurred by the factors such as identification of the injured persons and their degree of seriousness, arrival time and numbers of ambulances, and two separated temporary assembly areas.

3.8.3 Prevention of Injuries

In this accident, one passenger was seriously injured and eight other passengers sustained minor injuries.

Reviewing evacuation using slides in the past, there are many cases which caused a certain number of injuries during evacuation. Considering such circumstances, airline conduct actual escape training not so often, usually show training videos to make effort to provide and refresh the knowledge. Considering such situations as airframe engulfed by fire in which evacuation without a moment's delay is required, the highest priority is to save lives and, if escaped successfully passengers are asked to accept sustain a certain degree of injuries.

However, it should be avoided as far as possible to cause situations in which becomes incapable of moving by themselves due to injuries during evacuation, as in the case of this accident. Crewmembers must make every effort to prevent the occurrence of such a consequence by paying attentions to those shown below, in a way most appropriate for the nature of the emergency as long as time allows.

- (1) Briefing passengers to make sure emergency evacuation procedures

Especially, in the case of a passenger needing assistance, instructing the parent(s) or caretaker(s) on correct techniques for holding the passenger

- (2) Asking able-bodied passengers sitting near emergency exits to assist the following passengers on the ground

With regard to ground rescue personnel (fire fighters), who are to guide escaping passengers, it is considered that actions are necessary with the following in mind to prevent injuries.

- (1) While the primary duty of fire services is to fight fire using its full capacity if fire started on aircraft, their duty should also include securing the safety of escaping passengers.

Although the procedure employed may vary with the nature of emergency, making efforts to confirm the Captain's intention by way of the tower, and deploying as many fire fighters as practically possible to the slides to assist escaping passengers within the limit of securing alert against fire.

3.8.4 Rescue Operation

It is estimated that the rescue operations were performed at appropriate scale by Class 3 deployment.

3.9 Factors Contributing to the Occurrence of the Accident

- (1) Actions taken by the manufacturer and the operator in response to malfunction of the smoke detection system

As described in 2.15.2, since 2003 there have been many troubles emitting spurious signal with the smoke detection system of the same model as that installed on the aircraft.

However, in line with the policy of Airbus which is the manufacturer of aircraft, the company (Qantas Airways) which is an operator, did not inform its flight crew of the trouble. This is considered acceptable when considering the possible serious consequences resulting from a delay in flight crew action as described in 2.15.3.

Considering such circumstances, and considering the fact that smoke warning event occurred as described in 2.15.2 (4) ⑤ after launching the modification program from P/N RAI2811M0103 to P/N RAI2811M0104 (September 2004) as described in 2.15.2 (2), it is estimated that the one-year retrofit period proposed by Airbus should have been shortened as much as possible.

(2) Passenger briefings by CAs

The seriously injured passenger had not indicated that she needed special attention, either at the time of check-in or during before landing briefing by CAs in the preparation of emergency-evacuation.

Consequently, not knowing about any special conditions of the passenger, it is estimated that the CA in charge, who was busy guiding other passengers, could not understand the meaning of the gesture that the passenger's parent displayed immediately before going down slide with the passenger, with the intention of evacuating in two together. Therefore, it is estimated that the CA could not have been able to give them appropriate instructions on how to evacuate safely due to lack of time in addition to the above-mentioned reason.

It is also estimated that, even if other passengers who had evacuated earlier provided assistance on the ground, it would have been difficult for them to prevent the passenger from injury when the passenger had been thrown out at the lower portion of the slide.

It is estimated that the CAs performed the procedures specified in the manual, except for requesting assistance from able-bodied passengers, which was not mentioned in the impact drill sheet as described in 2.14.2.3 and 3.8.1.

Nevertheless, it is estimated that, given the sufficient amount of time available in flight, the CAs should have made preparations appropriate for conditions of the passengers.

(3) Actions by the fire fighters

The fire fighters provided timely reports to the tower about smoke like phenomenon, which could be observed from only specific positions only when aircraft was at a stop.

However, fire fighters are asked swift, accurate and cautious response taking into account the "smoke" information emitted by fire fighting experts, has significant impact to the parties concerned as described in 3.7 (4).

(4) Actions by the air traffic controllers

The air traffic controllers relayed the information from the fire fighters to the Captain, believing them experts in fire fighting.

However, according to the records of communication between fire fighters and

Kansai Tower, the fire fighters had not definitively said that it was smoke, nevertheless Kansai Tower told the aircraft, “Smoke appears around nose gear.” It is estimated that this change in expression occurred both at the time of verbally relaying the information from Kansai Tower Ground Control to the LCL controller and then at the time of relaying the information from the LCL controller to the Captain, as described in 2.1.4 (2) ①. When the Captain requested ATC to confirm the smoke information twice, the ATC, based on their understanding of the term “confirm” as described in statement 2.1.3 (3) and 3.7 (3), passed the information without confirming with fire services.

It is necessary for air traffic controller to accurately relay important information. Especially when asked to confirm information that is not based on his/her own observation, the air traffic controller should avoid a careless reply and, instead, should be asked to confirm with the source of the information before responding.

(5) Actions by the flight crew

The flight crew took actions as specified in the established procedures. They asked Kansai Tower for reconfirmation on the information of visually recognized smoke.

It is considered necessary that the flight crew asked confirmation about exact location and condition of the smoke in a limited time that would require swift action should fire actually have existed, and with difficulties in where communication was not smooth..

It is also considered that the flight crew could have made a more appropriate judgment if they had had knowledge about the relative location of smoke-like object and the forward cargo compartment in which fire was suspected, and about the location of the air vent for the cargo compartment.

(6) Summary review

The judgments and actions described in (1) to (5) above can be summarized that the emergency evacuation, which is not necessary as a result, was conducted and it led to the accident, despite that the parties concerned almost followed the rules and procedures required to their jobs, as if a fallacy of composition^{*17} happened.

Needless to say, good communication between those concerned is extremely important for ensuring the safety of passengers and the fulfillment of flight operations. In this accident, however, communications were not sufficient between the flight crew, Kansai Tower controllers and KIAC (officers of Airport Operations Department and Security Department (fire fighting)).

Those involved in air transport must meet the trust that passengers place in them by not only following the rules and procedures, which is a prerequisite, but exercising insight from overall perspectives, which enables correct judgment and action based on reliable information.

While a number of factors contributed to the occurrence of this accident, the

^{*17} A fallacy of composition is a term used in the study of economics, meaning that what works in microeconomics does not work in macroeconomics, a composite of microeconomics. Here, this concept is used supplementary.

starting point was spurious smoke warnings that affect the reliability of the smoke detection system. The manufacturer should learn lessons from this accident and take measures to improve the reliability of the system to ensure safe and dependable flight.

4. PROBABLE CAUSE

In this accident, it is estimated that, during an emergency evacuation from the aircraft on the ground using slides, one of the passengers sustained serious injury as she fell from the bottom of the slide on her lower back.

It is estimated that the factors contributing to what led to the emergency evacuation was the false recognition of fire by the flight crew, as a consequence starting with the occurrence of spurious smoke warnings while the flight crew could not make sure that no fire was present and due to insufficient communication between the flight crew, Kansai Tower controller and Kansai International Airport Co., Ltd.(KIAC) (officers of Airport Operations Department and Security department (fire fighting)) resulting from such as language problems and inaccurate relay of information.

Figure 1 Estimated Flight Route

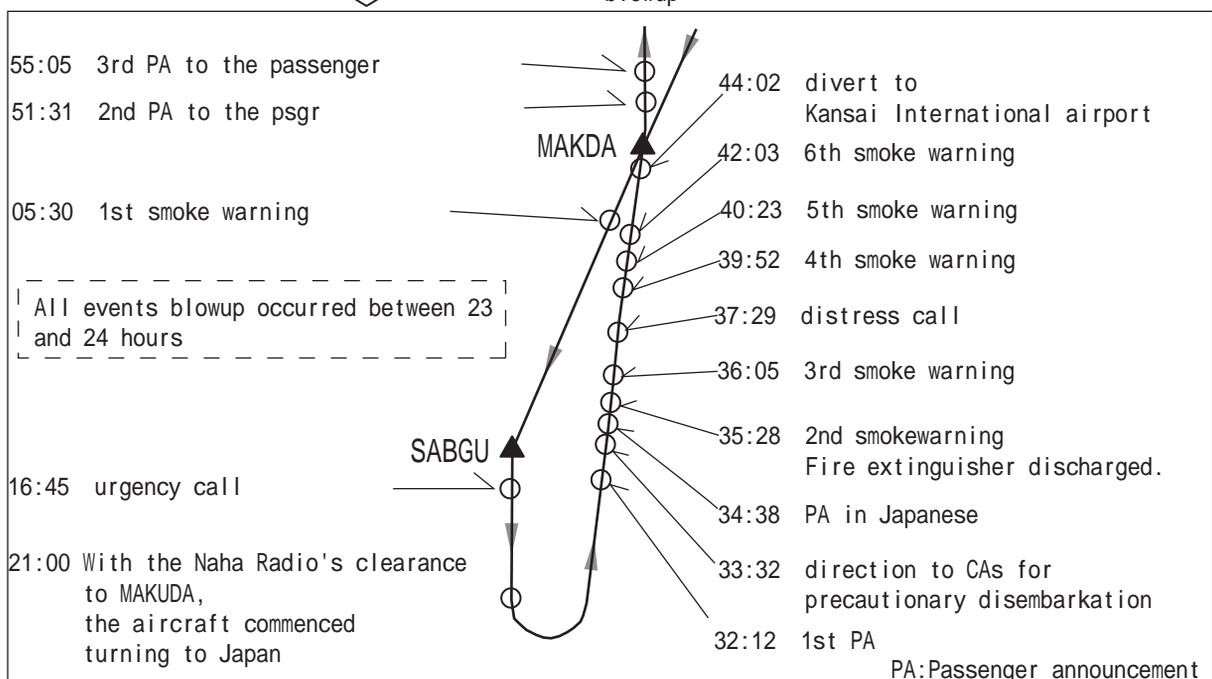
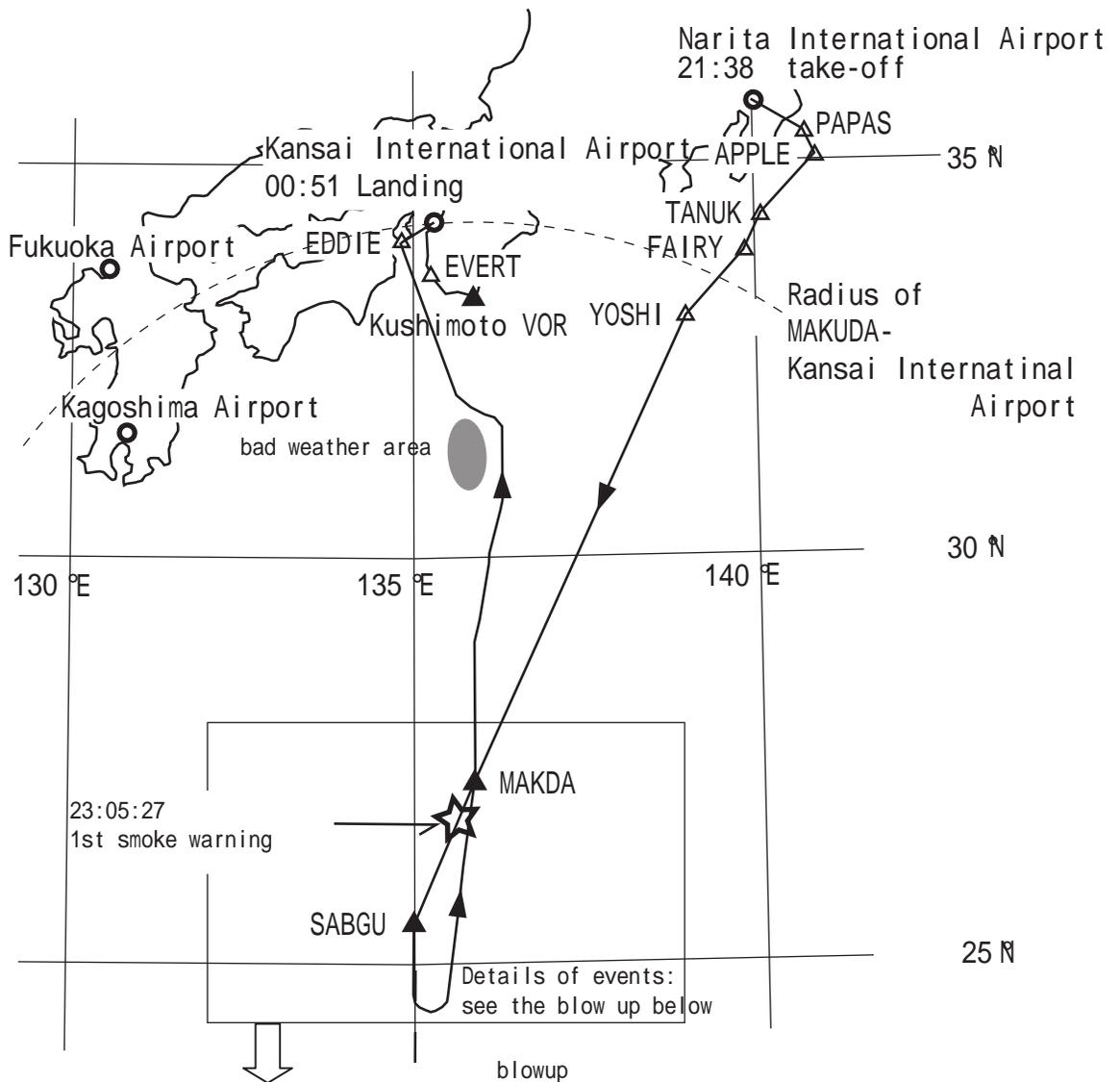


Figure 2 Accident Site

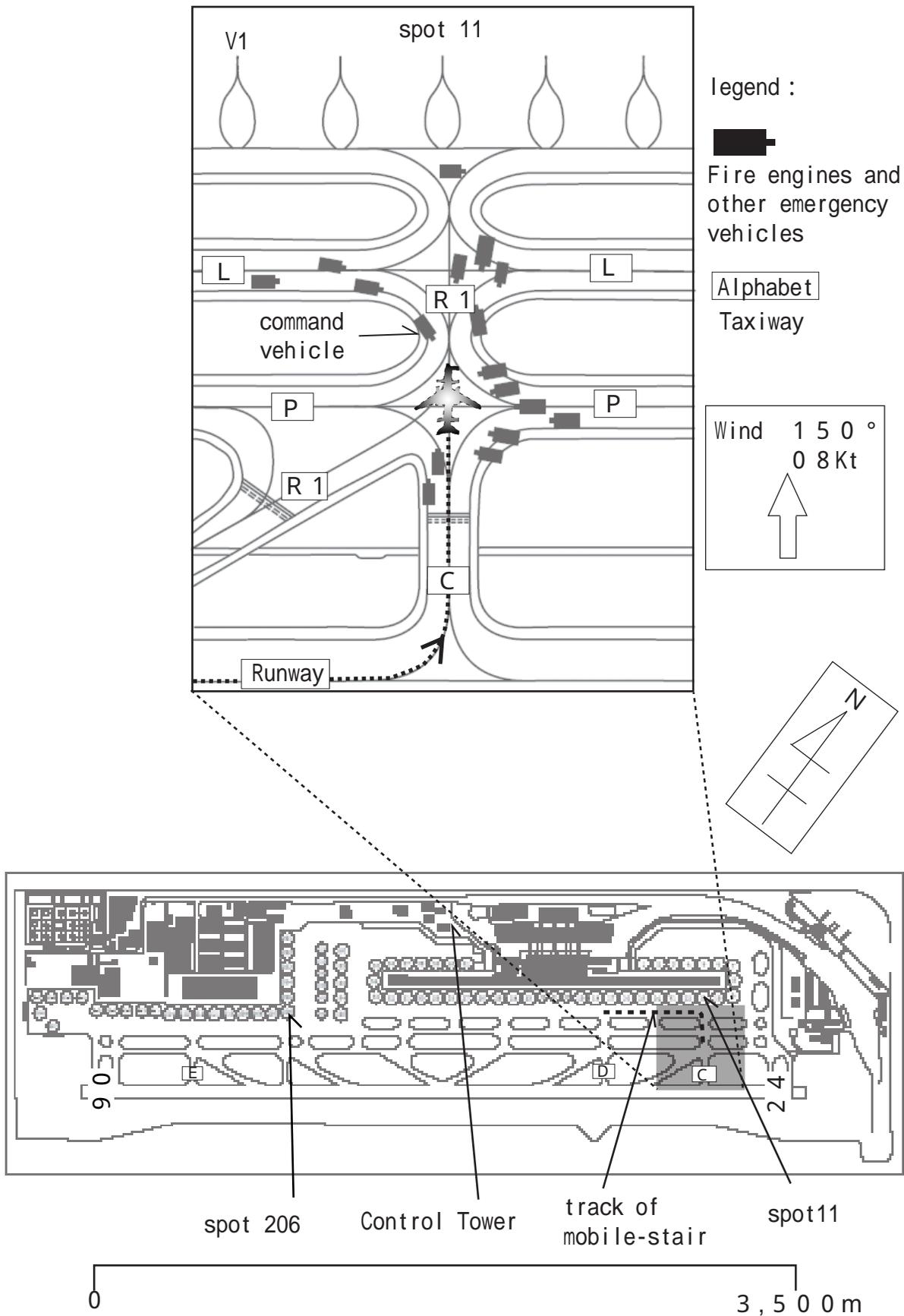
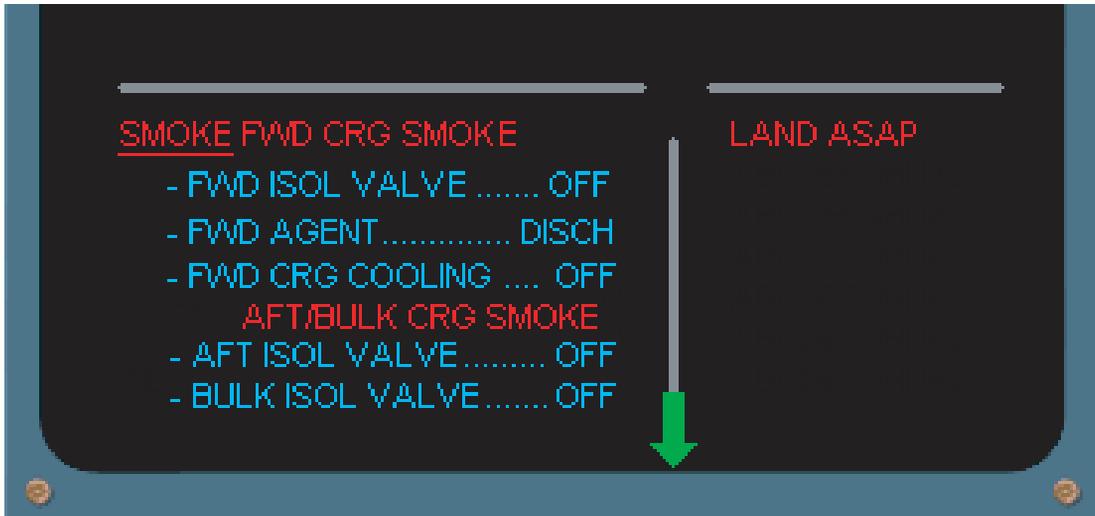


Figure 3 Indication of ECAM Display
(Smoke Warning)

page1



page2



remark:simultaneous smoke warning for forward
and aft cargo compartment
(Provided by the Airbus)

Figure 4 Airbus Industrie A330-303
Three Angle View

unit:m

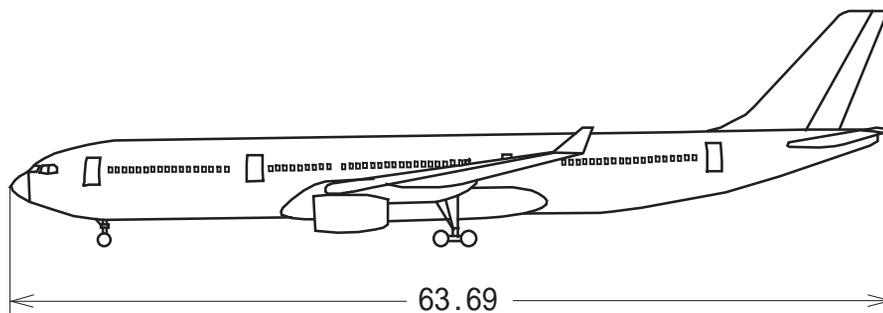
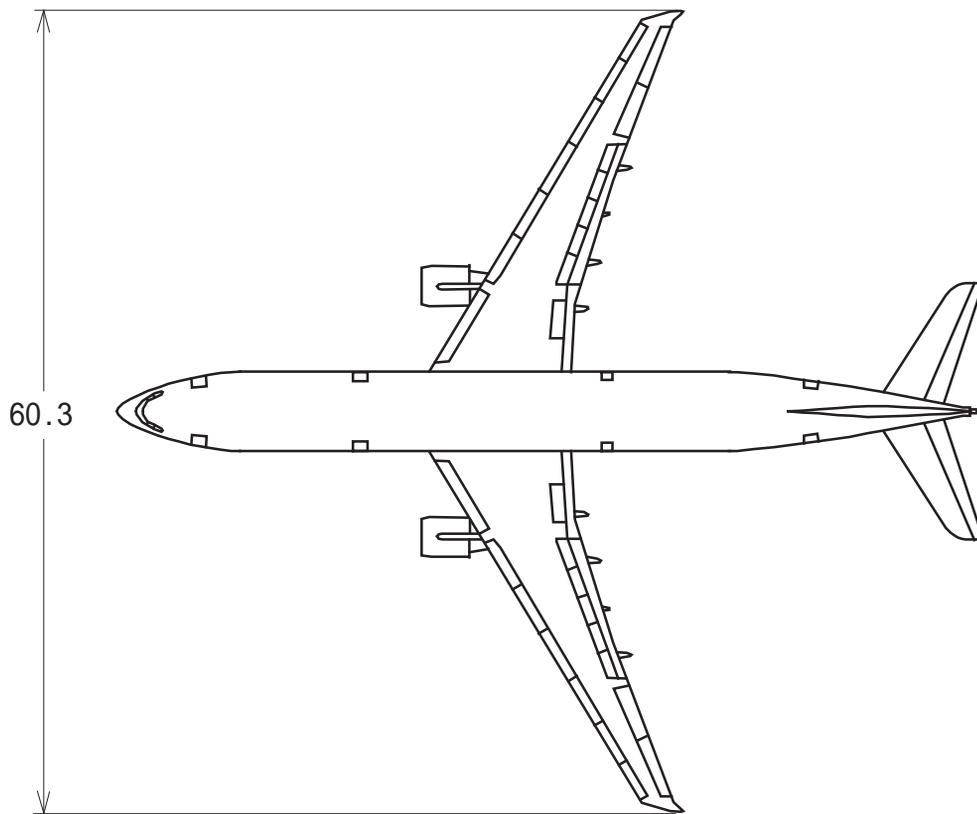
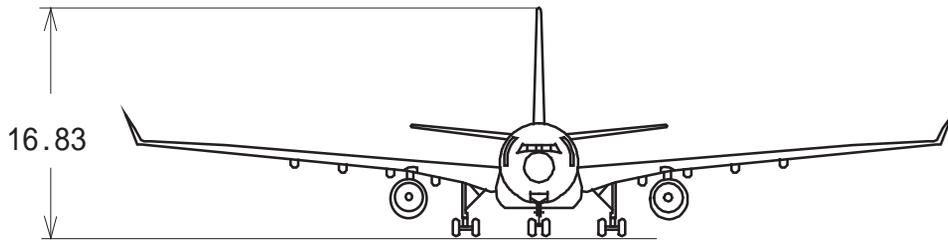


Figure 5 Escape slide deployment and Fire-fighting assistance

Legend:

Position and numbers of escape assistants

Position and numbers of escape controllers

Alphabet CAs (includes CSM)

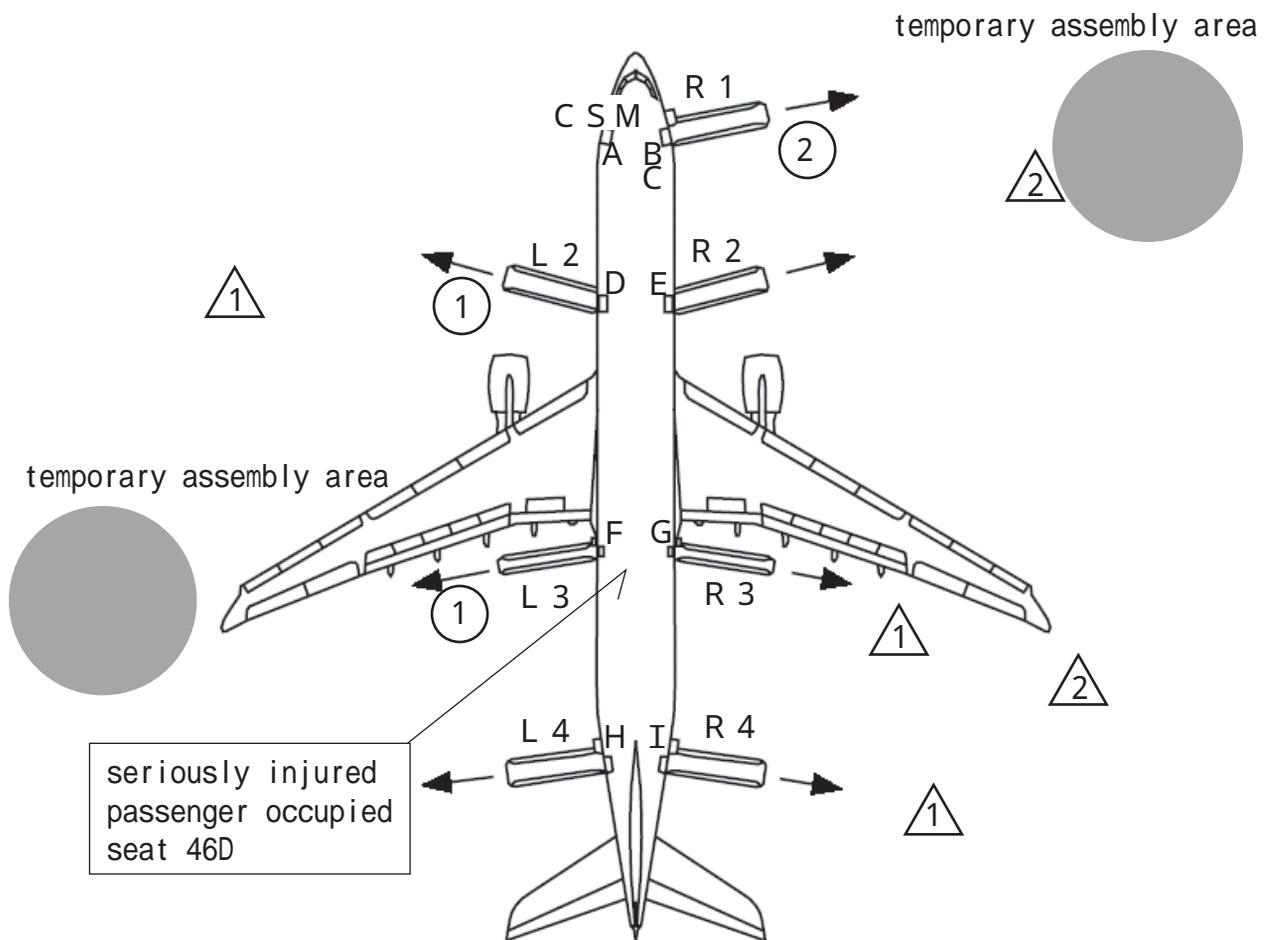


Figure 6 Smoke Detection/Extinguishing Operatic

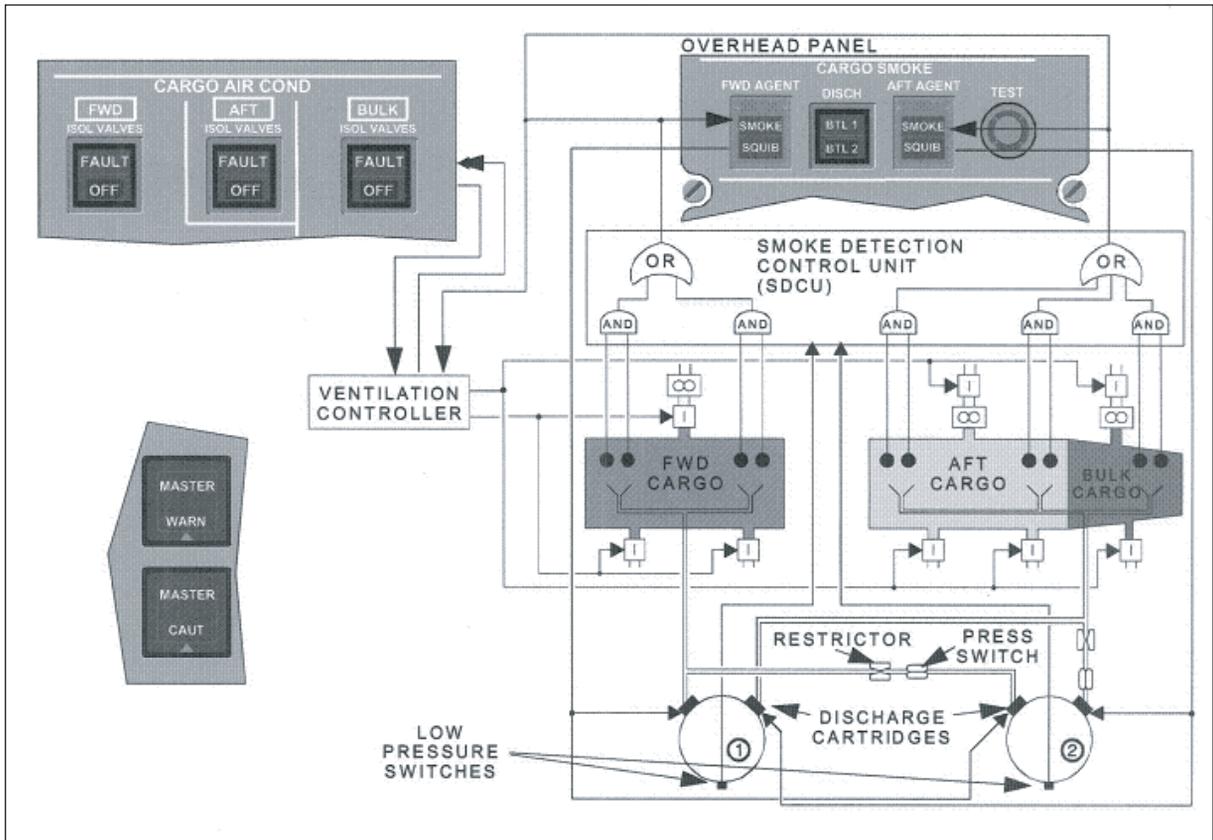


Figure 7 Overview of Dual loop system

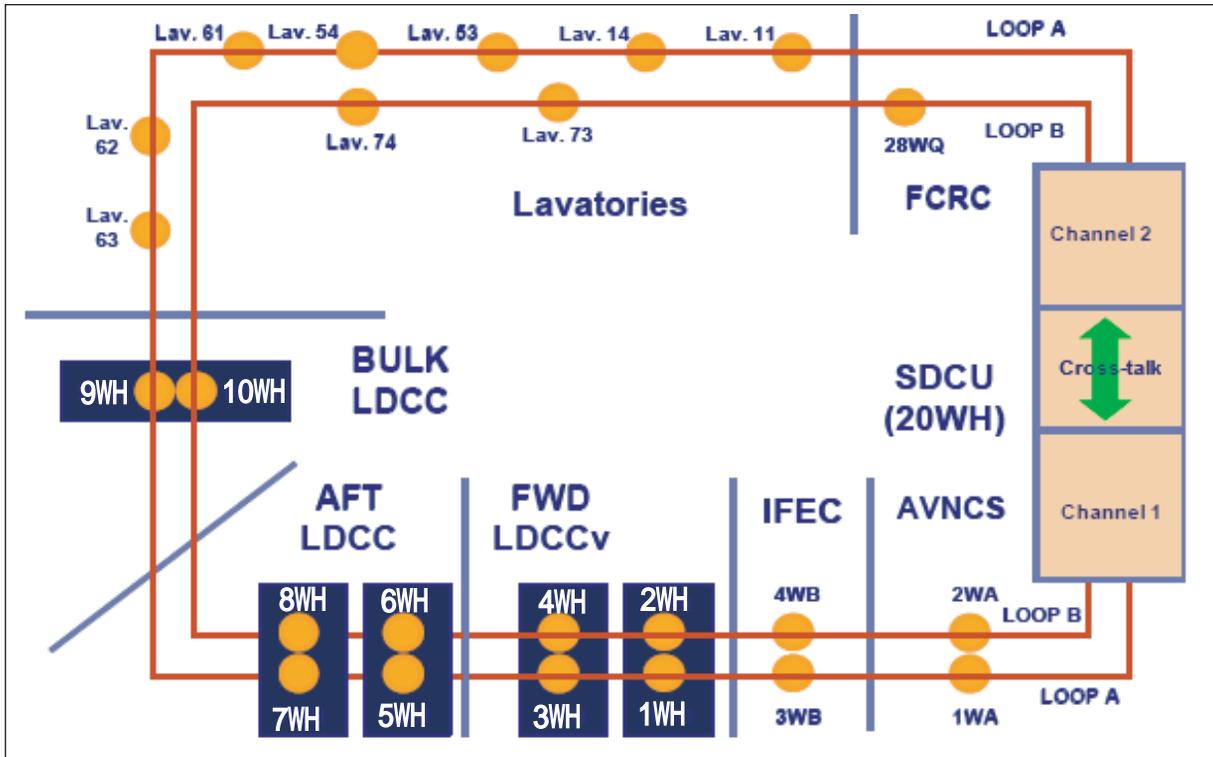


Photo 1 The Aircraft(whole view)



Photo 2 The Aircraft (deployed emergency escape slides)

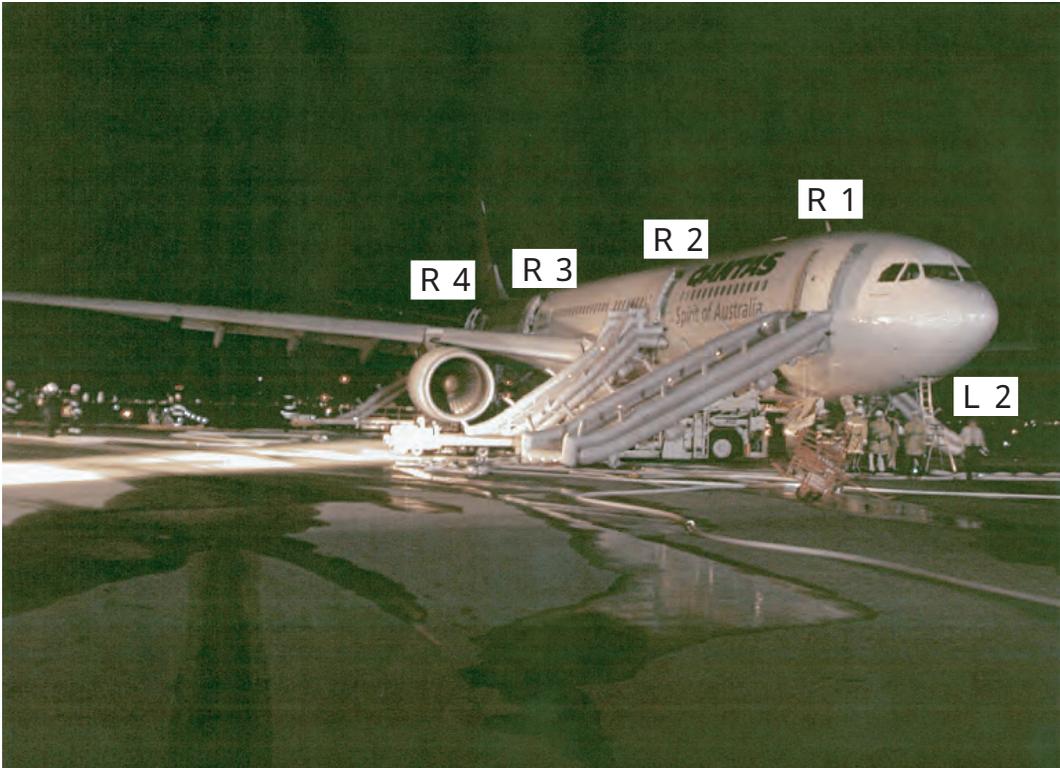


Photo 3 View of L1 door jammed within the frame
 (Two small pictures depicting contact damages
 are quoted from Airbus investigation report)

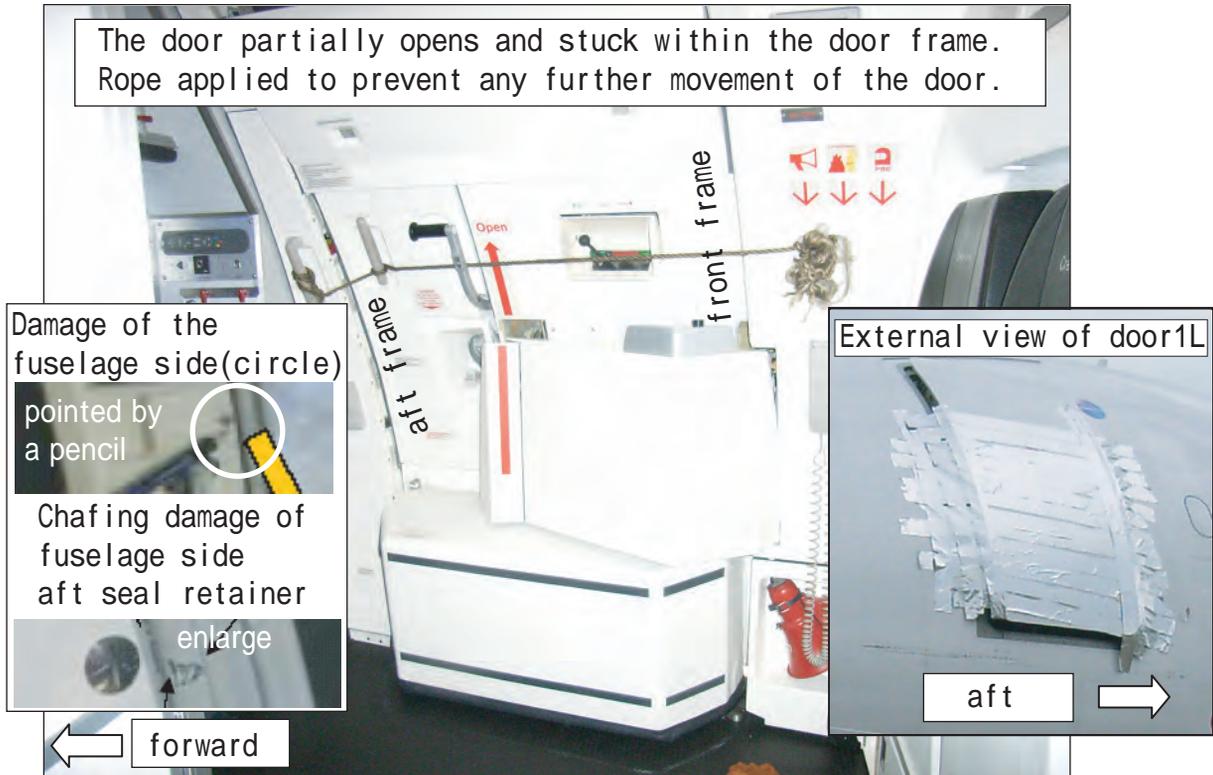
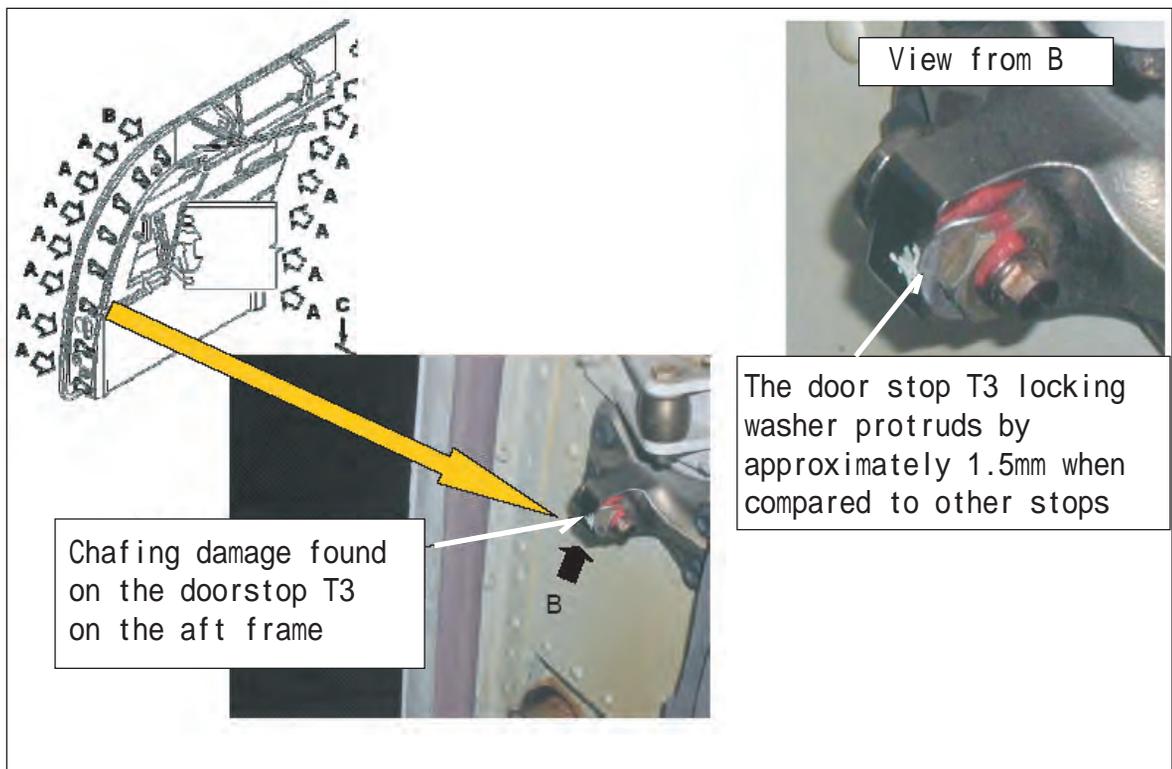


Photo 4 Washer caused door jamming

(photos and drawing are quoted from Airbus investigation report)



Photo(sketch) 5 Compressed air discharged from TAT probe

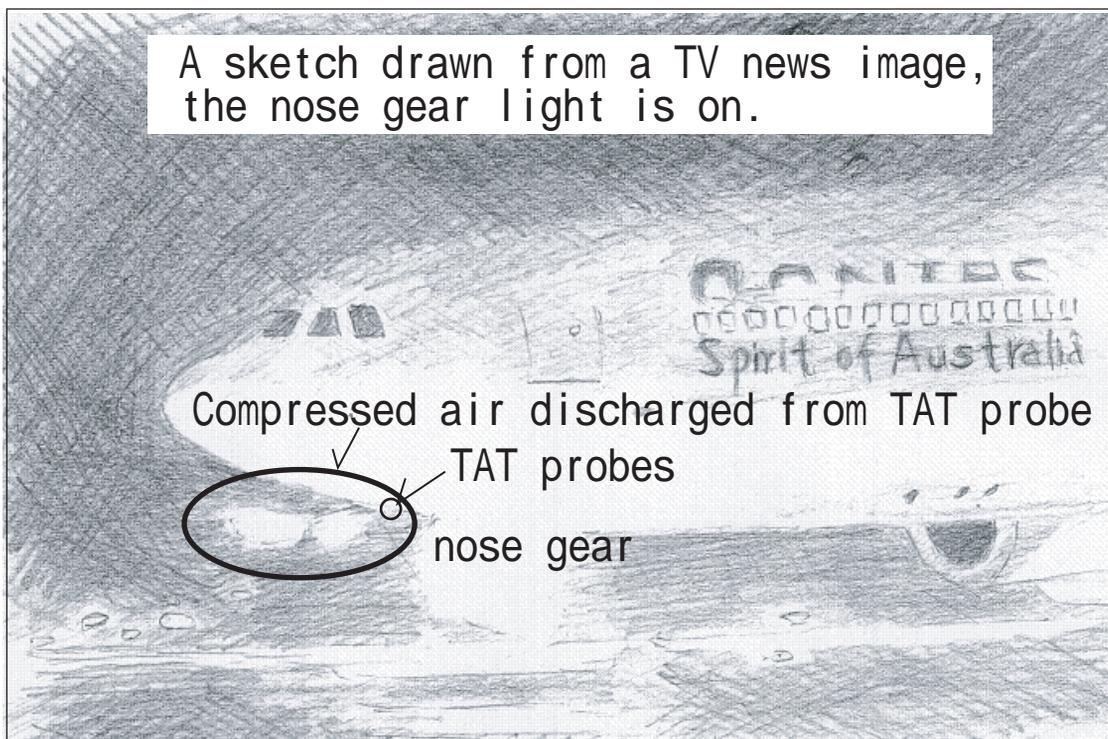


Photo 6 Location of TAT probes



Attachment 1 Communication between fire-fighting and Kansai Tower

Note:time was recorded by minute (Communication was made in Japanese)

0055	Fire1	Tower, Tower. This is Fire1 go ahead.
	Gnd	Fire1. Go ahead.
	Fire1	Right now, white smoke can be seen somewhere below the pilot.
	Gnd	Fire1. Pardon, Say again please. Fire1. This is ground. Say again please.
	Fire1	Somewhere below the pilot, around the nose, something like white smoke can be seen. Will you relay this information to the pilot. Over.
	Gnd	Yes. You can see white smoke around nose gear, can't you?
	Fire1	Something like that. Confirmation is,..I haven't reached the front side of the aircraft. Go ahead.
	0056	Gnd
Op5		Kansai Ground. This is operation 5.
Gnd		Operation 5, go ahead.
Op5		About the Qantas, I heard that it would park on spot 11. It's present position is on T2. Near spot 11, after it park on spot 11, we are going to conduct unscheduled inspection.
Gnd		Yes. Understand. Where is your position, spot 11?
Op5		We are approaching V1 from SW.
Gnd		Yes. I understood.
0057		Gnd
	Fire1	Go ahead.

0058	Gnd	Fire1. About the Qantas, I heard that passengers are going to make evacuation.
	Fire1	Ah ? Go ahead.
	Gnd	Operation 5, this is ground.
	Op5	Yes. Ground, this is operation 5.
	Gnd	Opertion 5. As I informed them that smoke was coming out from the nose gear, they are going to evacuate, and I think that they will do that at present position.
	Op5	Yes. Understood. KIAC will confirm that.
	Gnd	Roger.

Attachment 2 Fire Protection checklist

	ABNORMAL AND EMERGENCY	3.02.26	P 6
	FIRE PROTECTION	SEQ 001	REV 14

SMOKE FWD CRG SMOKE

Note : If the warning has been temporarily displayed and no crew action has been taken, normal cargo ventilation may be recovered when ventilation is required for livestock transportation, by a reset of both ventilation controller channels.

Land Asap

- FWD ISOL VALVE (if not automatically closed) OFF ◀
- FWD AGENT DISCH
- FWD CRG COOLING OFF ◀

Note : • Expect the SMOKE warning to remain after agent discharge, even if the smoke source is extinguished. Gases from the smoke source are not evacuated, and smoke detectors are also sensitive to the extinguishing agent. Once isolation valves are closed, the cargo is not ventilated, thus the cargo temperature is unreliable.

Order the ground crew not to open the door of affected cargo compartment, unless the passengers have disembarked and fire services are present.

- If SMOKE warning is displayed on ground with the cargo compartment door open, do not initiate AGENT DISCHARGE. Request the ground crew to investigate and eliminate the smoke source.
- On ground, the warning may be triggered due to a high level of humidity. Provided the smoke is not visually confirmed :
 - Deactivate the smoke detection system by pulling the SDCU 1 and 2 reset buttons.
 - Reset the cargo ventilation system using the VENT CONT 1 and 2 reset buttons.
 - At cargo doors closure, reactivate SDCU 1 and 2.

STATUS

INOP SYS
FWD CRG
VENT ◀ FWD CRG
HEAT ◀
FWD CRG TEMP ◀
FWD CRG COOL ◀

SMOKE FWD (AFT) CRG BTL 1(2) FAULT

Crew awareness.

	ABNORMAL PROCEDURES	REV 01	2.46
		SEQ 001	

PRECAUTIONARY DISEMBARKATION

Condition: The situation requires the orderly but rapid disembarkation of the passengers and crew.

Note: Time permitting, consider starting the APU and establishing electrical power before proceeding.

- ALERT ORDER PA ANNOUNCE
 "Attention! All passengers remain seated and await further instructions."

■ If Precautionary Disembarkation is required:

- AIRCRAFT/PARKING BRK STOP/ON

- ATC (VHF 1) NOTIFY
 Notify ATC of the nature of the emergency, and state intentions.
 Only VHF 1 is available on batteries.

- Δ P CHECK ZERO
 If ΔP is not at zero, select manual mode and V/S CTL FULL UP, in order to fully open the outflow valves.

- ENG MASTER (all) OFF
 Associated LP and HP valves close.

- PRECAUTIONARY DISEMBARKATION PA ANNOUNCE

● When Steps are Available:

"Ladies and Gentlemen, it is necessary to disembark the aircraft as a precaution. Steps are available. Leave all cabin baggage on the aircraft and follow your crew members' instructions. Cabin Crew DISARM Doors (nominate which door(s)), check doors safe to open and then open those doors. When steps are in position, disembark the passengers through Doors (repeat door positions)."

● When Steps are NOT Available:

"Ladies and Gentlemen, it is necessary to disembark the aircraft as a precaution. Steps are not available, so it will be necessary to use escape slides (nominate which door(s)). Leave all cabin baggage on the aircraft and follow your crew members' instructions. Cabin Crew check doors safe to open and open those doors. Cabin Crew now disembark the passengers through Doors (repeat door positions)."

■ If upgrade to Passenger Evacuation is required:

- ENG (all) and APU FIRE pushbutton PUSH

- AGENT (ENG and APU) AS RQRD

- EVACUATION INITIATE
 Using the Passenger Address system, announce "EVACUATE - EVACUATE - EVACUATE", and press the EVAC COMMAND pushbutton.

- ALL BATS OFF

■ If conditions now safe, and disembarkation is NOT required:

- ALERT CANCELLATION PA ANNOUNCE
 "Ladies and Gentlemen, thank you for your cooperation. Remain seated. Cabin Crew resume normal duties."

Attachment 4 CVR transcript

Legend:

HOT – Voice or sound sourced from crewmember hot microphone

RDO – Radio transmission from accident aircraft

CAM – Voice or sound sourced from the cockpit area microphone

INT – Voice or sound sourced from the aircraft interphone system

TWR – Radio transmission from the Kansai Tower Controller

-1 – Voice identified as pilot in command

-2 – Voice identified as co-pilot

-3 – Voice identified as second officer

-? – Voice from unidentified source

* – Unintelligible word

– Expletive

() – Questionable insertion

[] – Editorial insertion

... – Pause (one dot is equivalent to approximately one second)

<name> Name of crew

Notes:

1. This CVR transcript has been completed by the ATSB on behalf of ARAIC Japan.
2. All times are JST (Japan Standard Time) in the format hh:mm:ss.
3. Words written in boldface type were communication between the aircraft crew and Kansai tower.

<i>00:50:37</i> CAM	Fifty, thirty, twenty, ten, retard, reet [radalt]
<i>00:50:46</i> HOT-2	Ground spoilers ... reverse green
<i>00:50:50</i> HOT-1	Disconnecting
<i>00:50:51</i> HOT-2	De-cell
<i>00:51:04</i> HOT-1	Brakes out
<i>00:51:05</i> HOT-2	Understood, seventy knots
<i>00:51:18</i> HOT-1	Get ready for that um precautionary disembarkation checklist please (<name>)
<i>00:51:21</i> CAM-3	I have it, right here
<i>00:51:22</i> HOT-2	Got it right here
<i>00:51:38</i> HOT-1	'Kay, no indication of fire,
<i>00:51:39</i> HOT-2	Negative
<i>00:51:39</i> HOT-1	I'm just going to turn off the runway
<i>00:51:48</i> RDO-2	Qantas seven zero is clearing the runway
<i>00:51:51</i> TWR	Roger
<i>00:52:01</i> TWR	Qantas seven zero, you want hold any taxiway
<i>00:52:07</i> HOT-1	Just want to stop here
<i>00:52:09</i> RDO-2	Qantas seven zero, request stop present position
<i>00:52:11</i> HOT-1	I'm going to stop right in the middle
<i>00:52:12</i> TWR	Stop present position roger ah any taxiway approved
<i>00:52:16</i> RDO-2	Qantas seven zero will advise, stopping present position
<i>00:52:17</i> HOT-1	OK, there's lots of room for them all to manoeuvre around us here
<i>00:52:20</i> CAM-3	Just here?
<i>00:52:20</i> TWR	Roger present position approved

00::52:21 HOT-1	Yep
00::52:22 RDO-2	Seven zero
00::52:25 HOT-2	Alert PA?
00::52:27 HOT-1	Yes please, I'll do that, no, my job
00::52:28 HOT-2	You gonna do it?
00::52:32 HOT-1	So, my aircraft, (just ah)
00::52:33 HOT-2	Yes
00::52:37 HOT-1	Attention all, #
00::52:41 INT	Attention, all passengers remain seated and await further instructions
00::52:46 HOT-1	'Kay, that went out
00::52:47 CAM-3	Precautionary disembarkation
00::52:49 HOT-1	OK, and ah non-normal checklist, precautionary disembarkation
00::52:51 HOT-2	Non-normal checklist, precautionary disembarkation, (condition) situation that requires orderly rapid disembarkation of passengers and crew, note time (for) consider starting the APU *, alert PA
00::52:53 INT	This is <name> at right four, there's nothing to report out my door
00::52:56 INT	Thanks <name>
00::52:57 INT	And <name> left four all clear out here
00::52:59 INT	<name> (right)
00::53:00 INT	OK, standby one, standby one, um
00::53:05 RDO-1	Qantas ah seven zero we'd like the fire services to come near the aircraft and report if there is any sign of fire
00::53:13 HOT-2	And, do not open doors
00::53:15 CAM-3	Yes *
00::53:15 RDO-1	And do not obstruct the doors, ah do not ah open any doors but just ah check to see if there is any sign of fire and report to us on ground frequency
00::53:24 TWR	Qantas seven zero confirm ah normal landing you say

<i>00:53:29</i> RDO-1	Yeah, is there any sign of fire, the fire services report any sign of fire?
<i>00:53:36</i> TWR	Qantas seven zero tower observation no fire, no fire, we observed
<i>00:53:42</i> RDO-1	Qantas seven zero ah and um OK then, ah is the parking bay straight ahead available the parking bay straight ahead available for us
<i>00:53:54</i> TWR	Qantas seven zero, we need coordination stand by please
<i>00:53:58</i> HOT-2	Need to coordinate
<i>00:54:00</i> TWR	Qantas seven zero, and confirm can you make normal taxi
<i>00:54:05</i> RDO-1	Yes, just confirm, no stairs do you have stairs available?
<i>00:54:09</i> HOT-2	Don't think so, don't think you're going to get em
<i>00:54:12</i> TWR	Qantas seven zero your spot is two zero six
<i>00:54:15</i> HOT-2	Two zero six
<i>00:54:16</i> HOT-1	OK, well tell em we want to get the passengers off, we want to get em off on eleven straight ahead this is # stupid, tell em we're going to bay eleven
<i>00:54:18</i> CAM-3	Yeah, bay eleven
<i>00:54:23</i> RDO-2	Qantas seven zero require bay eleven for our disembarkation require bay eleven
<i>00:54:30</i> TWR	Qantas seven zero, confirm your request spot eleven spot eleven
<i>00:54:35</i> RDO-2	Affirm, affirm request spot eleven straight ahead to disembark
<i>00:54:36</i> HOT-2	We got
<i>00:54:39</i> TWR	Roger, we need coordination stand by please hold present position
<i>00:54:42</i> HOT-1	Yeah, now these are # stairs coming here
<i>00:54:45</i> HOT-2	They're coming up
<i>00:54:46</i> RDO-1	OK, tower, ground, please listen, ah, wait, ah we see stairs, we see mobile stairs approaching the aircraft confirm?
<i>00:54:58</i> HOT-1	# language, they got no idea
<i>00:55:02</i> RDO-1	Qantas um seven zero, we are going to taxi to the apron area, straight ahead at bay one one, and we would like the mobile stairs to stand by the aircraft, stand by the aircraft, we are going to bay one one straight ahead
<i>00:55:17</i> HOT-1	OK, clear on the right?

<i>00:55:18</i> HOT-2	Ah, not really no, you got fire equipment
<i>00:55:18</i> CAM-3	Negative
<i>00:55:18</i> TWR	Qantas seven zero, understand your request, But we are still coordination sorry stand by please
<i>00:55:25</i> RDO-1	No, we want to get the passengers off, we're not waiting any longer, we're going straight ahead to the apron, and we want the mobile stairs to come to the aircraft
<i>00:55:26</i> HOT-2	There's no-one to drive
<i>00:55:29</i> HOT-2	Here come the stairs
<i>00:55:32</i> TWR	Qantas seven zero, now er taxi to spot eleven, taxi to spot eleven
<i>00:55:37</i> RDO-2	Taxi to spot eleven, Qantas seven zero
<i>00:55:38</i> HOT-1	'S there a # fire truck there
<i>00:55:40</i> HOT-2	There's a fire truck right here
<i>00:55:40</i> CAM-3	Yeah, there's a fire truck right next to us
<i>00:55:41</i> RDO-1	And can the fire trucks please get out of the road
<i>00:55:47</i> TWR	Qantas seven zero roger ah stand by please
<i>00:55:50</i> HOT-2	Gonna have to watch these stairs
<i>00:55:56</i> HOT-2	Two of the fires out having a look to see if they can see anything, but they've gone back to their car, they haven't done anything since then, starting to move off now
<i>00:56:07</i> HOT-1	# it
<i>00:56:08</i> TWR	Qantas seven zero Qantas seven zero tower observation fire trucks reported smoke smoke appears around nose gear so hold present position
<i>00:56:17</i> HOT-2	Smoke appears around the nose gear
<i>00:56:19</i> HOT-1	Smoke appears round nose gear?
<i>00:56:20</i> HOT-2	Nose gear
<i>00:56:21</i> HOT-1	OK
<i>00:56:22</i> RDO-1	Confirm smoke at the nose gear?
<i>00:56:24</i>	Qantas seven zero fire trucks reported white white smoke around your nose

TWR	gear, so hold present position
<i>00::56:34</i> HOT-1	#, OK, ah, on fire?
<i>00::56:36</i> CAM-3	We're on fire
<i>00::56:37</i> HOT-2	We got it
<i>00::56:37</i> HOT-1	OK, evacuation checklist
<i>00::56:39</i> HOT-2	Evacuation checklist, evacua(tion), on ground emergency evacuation, aircraft park brake, stop, on, ATC VHF one, notify
<i>00::56:49</i> RDO-1	We are evacuating the aircraft, we are evacuating the aircraft
<i>00::56:54</i> HOT-1	Yep, go ahead
<i>00::56:54</i> HOT-2	Go ahead, delta (press)[ure], only manual
<i>00::56:56</i> TWR	Qantas seven zero, say again please
<i>00::56:58</i> RDO-1	We are evacuating the aircraft, if there is smoke, confirm there is smoke, confirm there is still smoke at the nose wheel, coming from the nose area
<i>00::57:00</i> HOT-2	Confirm there is still smoke, still smoke
<i>00::57:06</i> TWR	Qantas seven zero, affirm
<i>00::57:08</i> RDO-1	OK, we are evacuating the aircraft using slides, all fire services stand by
<i>00::57:13</i> HOT-1	OK, go ahead
<i>00::57:14</i> HOT-2	Delta pressure, only if manual cabin pressure has been used
<i>00::57:16</i> TWR	Roger
<i>00::57:16</i> HOT-2	check zero, delta pressure was in manual, engine masters, all, off
<i>00::57:23</i> HOT-1	OK, where's the evacuation emergency evac, OK yep
<i>00::57:29</i> HOT-2	Got it?
<i>00::57:30</i> HOT-1	yep
<i>00::57:32</i> HOT-2	Cabin crew PA, notify
<i>00::57:34</i> HOT-1	Confirmed, keep going <name>
<i>00::57:35</i> HOT-2	Engine fire, fire push buttons, engine APU, push

<i>00:57:41</i> HOT-1	Come on, keep going
<i>00:57:42</i> HOT-2	Engine fire push buttons, fire, push