PRESIDENCY of CIVIL AVIATION
JEDDAH
SAUDI ARABIA

AIRCRAFT ACCIDENT REPORT
Saudi Arabian Airlines Lockheed
L-1011, HZ-AHK Riyadh,
Saudi Arabia August 19th 1980

According to CVR information, initial system warning of the C—3 cargo compartment occurred 6:54 minutes after takeoff from Riyadh and while c1imbinq through 15,000 feet enroute to Jeddah. Four minutes and 21 seconds was spent by the crew in confirming the warning.

Saudia procedures state that in the event of a single or double smoke warning diversion to the nearest suitable airfield should be considered. Due to the complexity of electronic systems in later generation wide-bodies aircraft it is possible to have a spurious warning occur. Therefore, unless there is immediate evidence that an actual emergency exists, system checks should be accomp1ished prior to flight diversion decisions.

It should be noted, however, that about 3 minutes were spent by the crew in looking for the aft cargo smoke warning procedure. Evidence indicated that this difficulty was the result of a split of the Emergency and Abnormal procedures into Emergency, Abnormal and Additional.
The crew apparently believed that the correct procedures were in the Abnormal section while it was actually in the Emergency section. Another factor which possibly contributed to the time required to find the location of the proper procedures was that the flight Engineer was affected by “Dyslexia”. The manifestation of such a condition can cause confusion of switches actions, etc.

The Presidency believes that Saudia should revise their checklists by reducing the divisions and providing an index identifier as in a Quick Reference Handbook.

Confirmation that a fire actually existed occurred after the aircraft had begun its return to Riyadh. An expedited descent was initiated shortly thereafter and an emergency was declared by alerting Riyadh's tower and crash/fire/rescue equipment.

The flightcrews action up to the point of turnaround can be considered nominal, however, thereafter their actions began to deteriorate. During the descent,the Captain appeared to devote his entire attention to flying the aircraft. He could have reduced his workload by using the P/O to fly the aircraft in order to allow himself time to properly evaluate the situation.

During this same period, the actions of the F/E may have confused the Captain by underesti mating the seriousness of the situation. The F/E kept saying "No Problem" when a severe problem existed. The F/E may have been saying this to bolster his own confidence that all would end well but, in doing so, he presented to the Captain an incorrect view of what was actually occurring. The F/E's actions may have contributed to the Captain's apparent lack of effective and appropriate assertive action when such action was imperative.

Nothwithstanding the preceding, the Captain had numerous other warnings that there was a fire, which is one of the most critical of aviation in-flight emergencies. The Captain should have instructed his cabin crew to prepare for an evacuation immediately upon landing. He should have called for the use of oxygen by his cockpit crew and instructed his cabin crew to use oxygen when needed. The inhalation of toxic gasses, at times, is insidious and causes physical and mental impairment which would be alleviated by the proper use of oxygen.

The F/0 failed in that he was there to assist the Captain and monitor the safety of the aircraft. His limited time in the aircraft is no excuse for throughout his training he, as well as every other pilot, has been trained to act as a team member. However, in this case, it is obvious that he failed to assert himself in a manner that is so necessary of a team member when an emergency occurs.

Based on the evidence derived from the CVR and physical evidence showing non-use of 02 or smoke masks, it is concluded that the cockpit crew was not affected by the toxic gasses during the return flight and the descent into Riyadh.

In addition the positive pressure of the cockpit ventilation system would tend to prevent entry of cabin air (smoke) into the cockpit.

During this same period, all evidence indicates that the cabin crew functioned normally. In fact they acted commendably. They attacked the fire as well as they could and, at the same time did everythinq that they could to calm the passengers. They also made every attempt to keep the Captain advised of the very serious nature of events occurring in the

passenger cabin, and to extract from him the essential order to evacuate immediately upon landing.

After landing, the Captain should have stopped his aircraft as soon as possible and initiated an emergency evacuation. However, he wasted critical time in taxiing the aircraft clear of the runway.

The Captain had numerous and strong indications that a critical fire situation existed prior to his landing, yet none of his actions, at this time gave evidence of such know1edge. He appeared to reject the seriousness of the situation. The reason for such a rejection remains undetermined.

The question arises whether the aircraft could have been brouqht to a stop within minimum certification distance after touchdown. In this respect, the evidence showed that maximum brakinq capability was available and that the aircraft could have been brought to a stop on the runway with a saving of about 2 minutes time as compared to the time it took to taxi to a stop. The Presidency believes that these two minutes were significant with respect to survivability. This is especiallv so, if coupled with an immediate evacuation.

During this time period, the flow of fresh air was reduced thus causinq greater depletion of oxygen with an accompanyinq increase of toxic and combustible gasses. The combi-nation of these factors resulted in a flash fire which impaired both the flight and cabin crew to the degree that they became both physically and mentally incapable of performing their evacuation duties. Their impairment evidently occurred at a point in time just after engine shutdown but prior to initiating an evacuation.

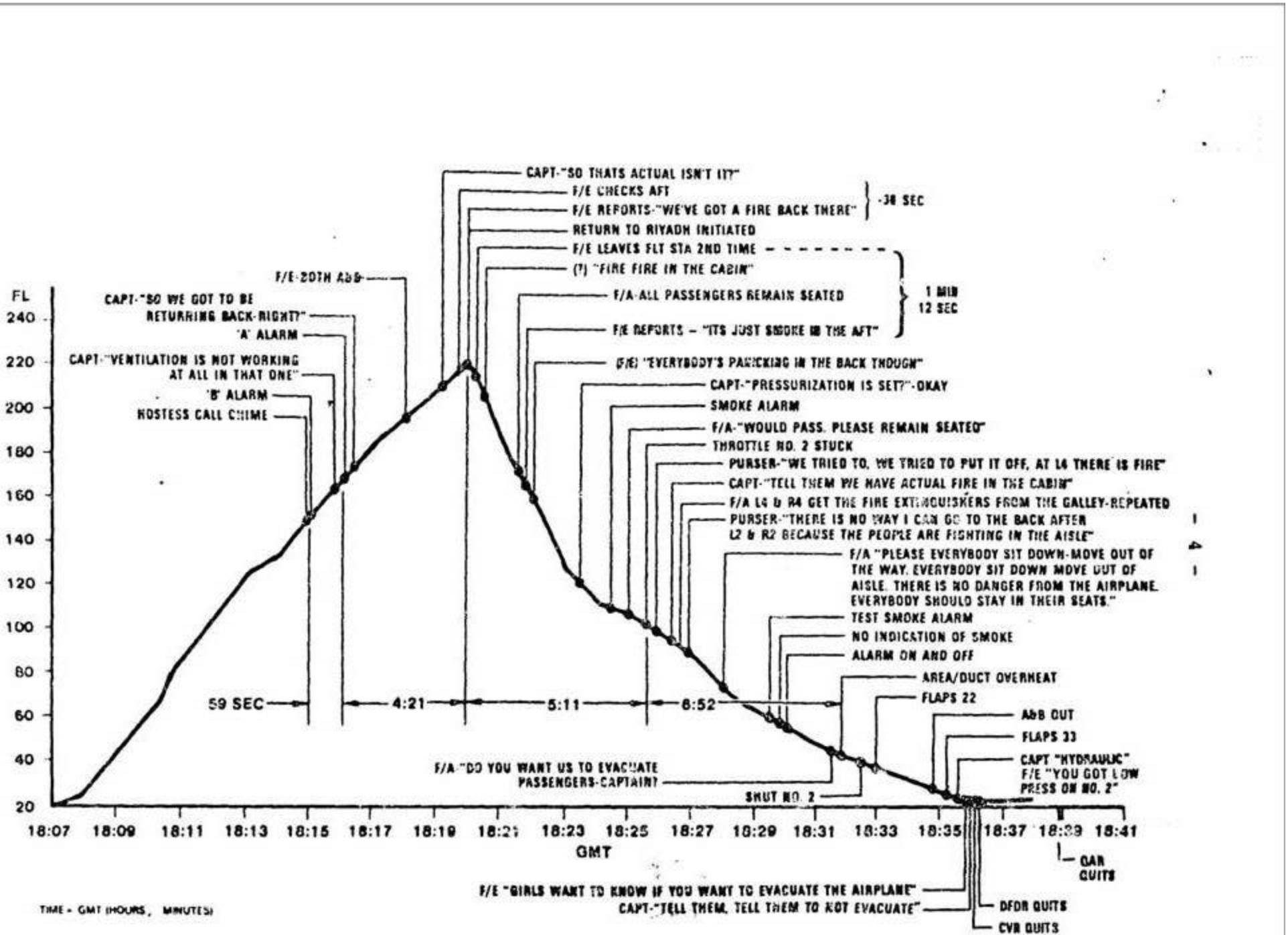
A question arose as to the possibility that a pressurization differential prevented evacuation after the aircraft came to a stop. The evidence shows that the inside emergency door handle of R-2 was never operated. It is reasonable to assume that the flight attendants who were originally stationed at exits L-3 , L-4 and R-3, R-4 had moved forward because of fire near those exits. Therefore, there is a strong possibility that exit R-2 was manned by not only its regularly assigned flight attendant but possibly one or more flight attendants who had moved forward from the rear exits. If any of these flight attendants had operated the inside emergency handle while the fuselage was pressurized, the door would have opened later when fire breached through the fuselage.

A pressure profile was made which depicted the crew following normal pressurization procedures during the climb out of Riyadh and during the initial part of the return and descent.
However, during descent a cabin altitude of 2,000 feet had been selected to correspond to the field elevation of 2082 feet at Riyadh. For Saudia, the usual descent rate is 240 f.p.m. In this instance a higher than usual rate was selected to ensure zero differential pressure at touchdown. This was necessary since the descent time was reduced due to the altitude versus the distance to go to touchdown.

The condition of the aircraft found by the investigating team leads to the most probable conclusion that the aircraft was not pressurized after it landed at Riyadh.

Just prior to landing, the Captain told the cockpit crew not to evacuate; however, it is not clear if such information was relayed to the cabin crew. Saudia cabin crews have the authority to initiate an evacuation should the situation dictate it. Even if the cabin crew had decided that the situation warranted breaking their procedures, they were prevented from doing so by the Captain. The Captain by allowing the engines to continue to operate after he stopped the aircraft effectively prevented the cabin crew from initiating the evacuation on their own. There was no evidence that shows that an evacuation procedure was initiated.

Based on information obtained during the investigation, there is no evidence obtained to indicate that the doors were not fully operational at the time the aircraft was brought to a stop. There was no evidence to indicate any of the door interior emergency handles had been pulled. This lack of action by the cabin crew may have been that the order by the Captain not to evacuate had been received by the cabin crew. A second and possible factor in the failure of anyone of the crew to open the doors was the fact that by the time the aircraft came to a stop the passengers were in total panic and had rushed to and against the doors which would have prevented the doors from moving inboard the necessary few inches prior to opening. However, It is more likely that the cabin crew were physically impaired by the flash fire which occurred. Since the flight crew were found still at their duty stations, it is doubtful that the evacuation command was ever issued.


CAPT-"SO THATS ACTUAL ISN'T IT?"
F/E CHECKS AFT
F/E REPORTS-"WE'VE GOT A FIRE BACK THERE"
-38 SEC
RETURN TO RIYADH INITIATED
F/E LEAVES FLT STA 2ND TIME
(?) "FIRE FIRE IN THE CABIN"
F/A-ALL PASSENGERS REMAIN SEATED
1 MIN 12 SEC
F/E REPORTS – "ITS JUST SMOKE IN THE AFT"
F/E "EVERYBODY'S PANICKING IN THE BACK THOUGH"
CAPT-"PRESSURIZATION IS SET?"-OKAY
SMOKE ALARM
F/A-"WOULD PASS. PLEASE REMAIN SEATED"
THROTTLE NO. 2 STUCK
PURSER-"WE TRIED TO, WE TRIED TO PUT IT OFF, AT L4 THERE IS FIRE"
CAPT-"TELL THEM WE HAVE ACTUAL FIRE IN THE CABIN"
F/A L4 & R4 GET THE FIRE EXTINGUISHERS FROM THE GALLEY-REPEATED
PURSER-"THERE IS NO WAY I CAN GO TO THE BACK AFTER L2 & R2 BECAUSE THE PEOPLE ARE FIGHTING IN THE AISLE"
F/A "PLEASE EVERYBODY SIT DOWN-MOVE OUT OF THE WAY. EVERYBODY SIT DOWN MOVE OUT OF AISLE. THERE IS NO DANGER FROM THE AIRPLANE. EVERYBODY SHOULD STAY IN THEIR SEATS."
TEST SMOKE ALARM
NO INDICATION OF SMOKE
ALARM ON AND OFF
AREA/DUCT OVERHEAT
FLAPS 22
A&B OUT
FLAPS 33
CAPT "HYDRAULIC"
F/E "YOU GOT LOW PRESS ON NO. 2"
F/E-20TH A&B
CAPT-"SO WE GOT TO BE RETURNING BACK-RIGHT?"
'A' ALARM
CAPT-"VENTILATION IS NOT WORKING AT ALL IN THAT ONE"
'B' ALARM
HOSTESS CALL CHIME
59 SEC
4:21
5:11
6:52
F/A "DO YOU WANT US TO EVACUATE PASSENGERS-CAPTAIN?
SHUT NO. 2
F/E "GIRLS WANT TO KNOW IF YOU WANT TO EVACUATE THE AIRPLANE"
CAPT-"TELL THEM, TELL THEM TO NOT EVACUATE"
CAR QUITS
DFDR QUITS
CVR QUITS
FL
240
220
200
180
160
140
120
100
80
60
40
20
18:07
18:09
18:11
18:13
18:15
18:17
18:19
18:21
18:23
18:25
18:27
18:29
18:31
18:33
18:35
18:37
18:39
18:41
GMT
TIME - GMT (HOURS, MINUTES)