



GOVERNMENT OF INDIA
MINISTRY OF TOURISM AND CIVIL AVIATION
(COMMISSION OF RAILWAY SAFETY)

RAILWAY ACCIDENT INVESTIGATION REPORT

ON

Outbreak of Fire in 1st Class Coach No. CR 2934 of No. 149 Up Qutab Express
between Teharka and Niwari Stations on Jhansi-Manikpur Broad Gauge Single
Line Section of Central Railway's Jhansi Division at about 03-45 hours

on

9th September, 1980

SUMMARY

1. Date : 9-9-1980.
2. Time : 03.45 hours.
3. Railway : Central.
4. Gauge : Broad (1676 mm).
5. Location : Between Teharka and Niwari stations on the Jhansi-Manikpur section.
6. Nature of Accident : Fire in FC Coach No. CR-2934.
7. (a) Train involved : No. 149 Up Qutab Express.
(b) Consisting of : 15 bogie coaches hauled by WDM-2 Diesel Locomotive No. 17520.
8. Speed : About 100 Km/hour.
9. System of Operation : Absolute Block System with 2-Aspect Lower Quadrant Signalling.
10. No. of tracks : Single.
11. Gradient : 1 in 166 falling } at the place of stoppage of the train.
12. Alignment : Straight. }
13. Weather : Clear.
14. Visibility : Very restricted, being dark night.
15. Cost of Damage : To Coach proper Rs. 4,48,400
: To Electrical Rs. 9,678
: Total (Estimated) Rs. 4,58,078
16. Casualties : Killed—1
: Injured—1 Grievous.
17. Cause : Inflammable material catching fire in "E" Compartment for reasons that could not be established for want of evidence.
18. Responsibility : None from the Railway.
19. Important Recommendations in brief : (i) Fire-resisting capability of Coaches to be improved.
: (ii) An Attendant to be invariably positioned in each FC Coach.

NO. C-10(INQ)/45

GOVERNMENT OF INDIA

MINISTRY OF TOURISM & CIVIL AVIATION

(COMMISSION OF RAILWAY SAFETY)

FROM :

The Commissioner of Railway Safety,
Central Circle,
Churchgate Station Building Annexe,
2nd floor, Maharshi Karve Road,
Bombay-400 020.

To :

The Secretary to the Government of India,
Ministry of Tourism & Civil Aviation,
Sardar Patel Bhavan, Parliament Street,
New Delhi-110 001.

THROUGH :

The Chief Commissioner of Railway Safety,
Lucknow-226 001.

SIR,

I have the honour to submit, in accordance with Rule 4 of the "Statutory Investigations into Railway Accidents Rules, 1973", issued by the Ministry of Tourism and Civil Aviation under their Notification No. RS. 13-T(8)/71, dated 19-4-1973, the Report of my Inquiry into the Outbreak of Fire in First Class Coach No. CR-2934 on the Qutab Express between Teharka and Niwari stations on the Jhansi-Manikpur Section of Central Railway's Jhansi Division at about 03.45 hours on 9-9-1980.

2. Inspection and Inquiry—

(a) Accompanied by the Divisional Railway Manager, Jhansi, the Assistant Security Officer (Fire) from Bombay and other Railway/RPF Officials, I inspected on 12-9-1980 and dates et seq the burnt coach, which was earlier brought to Jhansi. On 13-9-1980, in the company of the Divisional Railway Manager and other Railway Officers of Jhansi Division, I then inspected the site where the train came to a halt in midsection between Teharka and Niwari stations due to alarm chain pulling, subsequent to the discovery of fire in the First Class Coach. A sketch of this site was got prepared by the Railway, which appears at (Not printed) Annexure II in this Report.

(b) A Press Notification was issued on 10-9-1980 in the local Hindi Dailies "Dainik Jagaran", "Aaj" and "Dainik Bhaskar", inviting members of the public having knowledge relating to this accident to give evidence at the Inquiry which I commenced at Jhansi on 12-9-1980, or to communicate with me by post.

(c) The District Magistrate, Tikamkhar and the Superintendent of Police, Tikamkhar were also duly notified, but no Civil or Police Officials called at any stage of the Inquiry, at which the following Railway Officers were present :—

Shri Y. N. Trehan • Chief Transportation Safety Superintendent Bombay (only on 13-9-80).

Shri S. M. Vaish • Divisional Railway Manager, Jhansi.

Shri C. K. Thakkar • Additional Chief Electrical Engineer (TL), Bombay.

(d) Evidence was recorded of 41 witnesses, only one of whom was a Public Witness, who was a passenger on the ill-fated coach. In view of the paucity of first-hand information on the origin, nature and spread of fire, I sent out a questionnaire to all the other passengers who were travelling in FC 2934 at the time of the outbreak of fire, requesting them to assist me further in my Inquiry with all the pertinent information that they could provide in this context. Replies have been received from 12 out of the 14 persons to which this questionnaire was addressed.

(e) Shri K. Bhojraj, the Deputy Commissioner of Railway Safety (Electric Traction), assisted this Inquiry with his technical expertise while inspecting the heavily gutted coach and examining the witnesses, which is gratefully acknowledged.

3. The Accident, a brief description of—

(a) At about 03.45 hours on 9-9-1980, soon after No. 149 Up Qutab Express ran through Teharka station on the Jhansi-Manikpur single line Broad Gauge Section of Central Railway's Jhansi Division, fire was discovered in First Class coach No. CR 2934, marshalled the 7th from the engine. Immediately, the alarm chain was pulled at several places and the train came to a

halt across a 3 & 12 m girder bridge at Km. 1165/4-5, with the burning coach positioned between Telegraph Poles No. 1165/3 and 1165/4.

(b) As the occupants alighted from the ill-fated coach, the fire was found to be enveloping the entire coach so fast that subsequent retrieval of luggage became impossible.

4. Casualties—

(a) Before all the passengers in the ill-fated coach could detrain, trivial superficial burns were sustained by two of them, one of whom went back into the burning coach to retrieve some important documents and, in this process, contracted some further burns of a grievous nature.

(b) Lest they also catch fire, the contiguous coaches were promptly evacuated but, out of panic, some passengers jumped off from other coaches also. As the train came to a halt on a bank about 6 m high on either side of the bridge, de-training was not easy, which was rendered even more difficult because of the dark night and the "unearthly hour". As a result, besides trivial injuries sustained by 4 more passengers in the resulting melee, another female passenger, who was in an advanced state of pregnancy unfortunately fell down from one of the adjoining coaches to receive grievous injuries. It was this latter female passenger that, after aborting soon after reaching the Divisional Railway Hospital at Jhansi, subsequently expired on the same day, notwithstanding the best medical care and treatment bestowed on her.

II. RELIEF MEASURES

5. Intimation—

The very first steps taken by the crew travelling on the train were to evacuate passengers from the burning coach as well as the 2 adjacent coaches and to isolate the burning coach from the rest of the train. Thus, although the train came to a halt at about 03.45 hours, it was only at about 04.25 hours that the first intimation was received by the Section Controller at Jhansi via a "field telephone" set up by a Railway Official, who was a passenger on this train. Immediately, all concerned were alerted as also the Railway's Jhansi-based fire-brigade and ARME van ordered.

6. Medical Attention—

(a) The ARME Van arrived Niwari (the station immediately ahead of Teharka) at 06.00 hours. The injured persons could be brought to this station only by 06.10 hours, and all requisite medical relief was immediately provided by the 4 Railway doctors and their para-medical staff in attendance.

(b) It was a pity that amongst the passengers on this train itself, there were no qualified doctors

to have administered first aid, since the Guard, with his brake-van halted on the other side of the bridge, was in no position to carry his First Aid Box while he crawled underneath the train to get across the bridge. At Niwari, there was only one medical practitioner, residing some 5 Km away from the Railway station and, considering the logistics involved, the right decision was taken, viz. not to send for him. In the event, nothing more could have been achieved because the ARME Van had in fact reached Niwari a few minutes before the injured passengers could reach the station.

7. Clearance and Restoration—

(a) With the clappet valves already operated on all the coaches where alarm chain was pulled, the brakes were binding and isolation of the burning coach was rendered quite difficult. As a result, the engine and the first 6 coaches could be brought to Niwari only by about 04.45 hours, i.e. almost an hour after the train had stopped in mid-section. After some shunting to pick up the 6th coach, which was previously emptied, the train engine left Niwari at 05.05 hours to return to the site.

(b) After the injured persons and some stranded passengers were brought to Niwari by 06.10 hours, the steam engine, which had just arrived with the ARME Van at Niwari, was despatched into the section to carefully bring the burning coach to Niwari by about 07.05 hours. The train engine was then sent back into the section to collect the rear string of 8 coaches and haul them into Niwari by 07.50 hours.

(c) In this manner, the Block Section Teharka-Niwari remained blocked until 07.50 hours. Nevertheless, there was no serious interruption to the traffic streams as a result of this accident, excepting, of course, for the delay of about 4 hours and 15 minutes suffered by the Qutab Express itself and the understandable regulation of other less important trains 'en route'.

(d) The Jhansi Fire Engine had in the meanwhile reached Niwari by road at 06.40 hours and, as soon as the burning coach arrived there, fire fighting activities commenced in right earnest but, as the fire had been raging for several hours already, it could not be completely put out before 09.30 hours.

III. COMPOSITION OF TRAIN AND DAMAGE

1. Composition of train—

(a) No. 149 Up Qutab Express runs from Jabalpur to Hazrat Nizamuddin (New Delhi). At Manikpur, its direction of travel and hence its composition reverses, before the train proceeds further towards Jhansi.

(b) At the time of the outbreak of fire, the train-consist was as follows :—

Engine—No. WDM-2 17520.

Coaches (reckoned ad seriatim from behind the engine)—

S. No.	Coach No.	Type
1.	CR 9502	WGSCCLNR
2.	CR 6867	WGS
3.	CR 6205	WGS
4.	CR 6887	WGS
5.	CR 2947	FC
6.	CR 3073	WFC
7.	CR 2934	WFC (This caught fire)
8.	CR 9364	WGSCNY
9.	CR 9362	WGSCNY
10.	NFR 6992	WGSCNY
11.	CR 6952	WGSCNY
12.	CR 9365	WGSCNY
13.	CR 9366	WGSCNY
14.	CR 8881	WGS
15.	CR 9501	WGSCCLNR

9. First Class Coach No. CR 2934

(a) This is an ICF 24-berth First Class coach, first commissioned in November 1961. It received its last major 'A' Schedule over-haul in 1976, when it was in the shops for 154 days for corrosion repairs. At that stage, this coach was completely re-wired and Railway Board's instructions regarding provision of limpet asbestos below the ceiling and fire-resisting joint on battens over floor-troughing, etc. were complied with. The expected service life of wiring is 10 years.

(b) Subsequent to this major overhaul, this coach received its normal POH attention successively in November/December 1977, January 1979 and April 1980. The last occasion for dropping of the ceiling boards and opening out of the complete wire-casing for detailed examination was in 1979.

(c) As per records maintained at Matunga C & W Shops, all the following modifications had been properly carried out on this coach :—

- (i) Provision of fuses in negative circuits;
- (ii) Relocation of fuses;
- (iii) Change over from 3/.85 to 7/.85 size for unprotected portion of branch wiring;
- (iv) Use of cartridge fuses/MCBs;

(v) Insulation of fan body/light fitting from body and provision of connectors for fans/berth lights;

(vi) Re-location of fan resistance;

(vii) Use of fire-resistant paint over wooden battens, wooden troughing, etc;

(viii) Adequate clearing of wires where required; and

(ix) Troughing & underframe wiring.

(d) During the last POH of April 1980, pieces of wire casing at both ends of the coach and at the middle near the door-ways were opened and nothing abnormal was discovered. The end panels of the coach were also opened for examination of wiring near the junction box, emergency feed/termination, etc. and nothing exceptional was noticed. The Megger Test carried out at Matunga Shops on 2-5-80 on the out-going coach showed the readings uniformly between 2 and 3 milli-ohms, which is satisfactory.

10. The Damage

(a) Excepting for First Class Coach No. CR 2934, which was completely gutted by fire, there was no damage sustained by any other rolling stock. There was also no damage sustained by the Permanent Way or any other Railway assets.

(b) The cost of damage to the affected coach has been estimated as under :—

Coach proper	Rs. 4,48,400
Electrical	Rs. 9,678
Total	Rs. 4,58,078

(c) It is anticipated that claims will also be preferred by passengers from First Class Coach No. CR 2934, who have lost their entire luggage or part of it in this fire.

IV. LOCAL FEATURES

11. The Section and the Site

(a) On its run from Jabalpur to Hazrat Nizamuddin, No. 149 Up Qutab Express was travelling on the Manikpur-Jhansi Section of Central Railway's Jhansi Division when, subsequent to its scheduled halt at Mauranipur station and soon after it had passed Teharka station at 03.32 hours, fire was discovered in one of its coaches and the train came to a halt in the Teharka-Niwari Block Section with the burning coach positioned between Telegraph Pole (TP) Nos. 1165/3 and 1165/4. The engine was just ahead of TP No. 1165/2 at this stage, with the rearmost coach between TP Nos. 1165/5 and 1165/6.

(b) Reckoned from Bombay VT, the kilometrages are given below, in the direction of movement of the train :—

Manikpur	Km. 1419.04
Rora	Km. 1201.50
Mauranipur	Km. 1191.93
Ranipur Road	Km. 1181.71
Teharka	Km. 1170.84
Train stopped in mid-section at	Km. 1165.66
Niwari	Km. 1158.85
Jhansi	Km. 1127.72

(c) Trains are worked on the Absolute Block System, and 2-aspect Lower Quadrant Signalling. The last stop for No. 149 Up Qutab Express was Mauranipur and, as the next scheduled stop was Jhansi, this train ran through Ranipur Road and Teharka before coming to halt as a result of alarm chain pulling from the burning coach as well as the adjacent coaches.

(d) As mentioned earlier, the train had come to a halt with its engine and the first 9 coaches ahead of a 3 × 12 m. open-deck girder bridge across the Baira nala. Part of coach No. 10, the entire coach No. 11 and part of coach No. 12 were on the bridge, whereas coaches Nos. 13 to 15 were clear of the bridge in the rear. This bridge is not provided with a "cat-walk" clear of the moving dimensions; hence, it would not be possible to detrain from the door-ways of any coaches positioned above this bridge. Water was flowing through the middle span of this bridge, which must have initially proved a veritable deterrent for any person(s) wishing to cross the bridge, particularly during night time. Subsequently, however, when it was ascertained that the flow was only knee-deep, it was successfully forded across by wading through. The bridge approaches are on a fairly high bank of 6 metres, which circumstance rendered the de-training of passengers and their personal effects from the 2 coaches immediately adjacent to the burning coach a very difficult proposition and it must be held to the credit of the Railway Officials, who supervised this operation, that not one passenger sustained any injury in this process of de-training and being found alternative accommodation elsewhere on this train.

(e) As the track was laid on CST-9 sleepers, there was no damage whatsoever to the Permanent Way. Hence, not being germane either to the fire-outbreak or to the consequent damage, P-Way particulars are not included in this Report. The gradients traversed by the Qutab

Express from Teharka upto Km. 1165 (where the train came to a halt) are as below:—

From	To	Gradient
1170.35	1169.35	1 in 400 falling
1169.35	1166.20	1 in 500 falling
1166.20	1165.66	1 in 166 falling

(f) In this Report, unless otherwise clear from the context, the terms "right"/"left", "leading"/"trailing", "front"/"rear" where used are generally in reference to the direction of travel of the Qutab Express.

12. Other Features Relevant to this Accident

(a) There was no Coach Attendant assigned to FC Coach No. CR 2934 ex: Manikpur, although a Coach Attendant did travel earlier from Jabalpur to Manikpur.

(b) Some of the points brought out in the replies received from the passengers vide para 2(d) supra and which are not included in Annexure I are mentioned hereunder:—

(i) The corridor was entirely free of any luggage or any suspicious-looking stuff and likewise all the passages in this Coach.

(ii) Right from the time that smoke was discovered in this Coach, no passenger in it seemed to have noticed any Railway staff (whether or not such staff was rendering any help to the passengers), although 2 such Railway personnel happened to be travelling on duty in this coach at that point of time.

(iii) Excepting for the passengers in "F" Compartment, all others confirmed that all lights and fans were working satisfactorily.

(c) One passenger (named, Shri K. Iyer) travelled alone in "E" Compartment (coupe) from Jabalpur to Mauranipur, which was the last halt for the Qutab Express prior to the discovery of fire. As this passenger's contact address was not provided by the Conductor, information on this point was sought from Jabalpur Division, which expressed under letter No. DRM/Misc/ dated 17-11-80 that, Shri Iyer not being one of the passengers who had obtained advance reservation by this train, its inability to provide the address of this passenger. It appeared that this passenger obtained an "Extra Fare Ticket" issued by the Jabalpur Booking Office and that he was already occupying "E" Compartment when the Conductor came on the train.

(d) FC Coach No. CR 2934 arrived on No. 150 Dn Qutab Express to Jabalpur on 8-9-80 and its arrival condition was noted as follows

In regard to electric power supply for train lighting:—

Dynamo : Warm
 Belt : Slack
 SPG of Battery (I) : 1120
 SPG of Battery (II) : 1140

The belt, which was found slack, had to be cut by 8". As the batteries were charged from 14.00 hours to 15.30 hours on that day, improved specific gravity readings were obtained on this coach as below, when the outgoing rake (getting ready for the return trip to Hazrat Nizamudin) was tested:—

SPG of Battery (I) : 1200
 SPG of Battery (II) : 1200

The leakage test conducted on this coach at Jabalpur on 8-9-1980 did not reveal anything adverse.

(e) As mentioned earlier, this train was hauled by a diesel locomotive and not by a steam engine in order to explore the possibility of sparks induced fire of external origin, the Control Charts maintained at Jhansi Control were scrutinised to find that Quatab Express "crossed" the following steam-hauled trains:—

Station	Train
Banda	Military Special
Banda	750 Up Goods
Mataundh	107 Dn Express
Mahoba	749 Dn. Goods.

In other words, the last steam-hauled train crossed by Quatab Express was at Mahoba, with a duration of about 2½ hours having elapsed thereafter before the discovery of fire.

(f) During my inspection of the site on 13-9-1980, I found a pile of debris lying between the rails, but closer to the right-side rail, some 60 metres ahead of the Jhansi-end abutment of the bridge across Baira Nala. This debris comprised mostly chunks of molten aluminium, bits of fused glass and other bits and pieces of burnt metal, besides some pieces of wood already burnt to coal. Flakes of peeled-off paint were also seen in the vicinity, their position changing from time to time as these flakes were susceptible to shifting even in the slightest of breeze. Ahead of this bridge, the track for a distance of 200 metres was thoroughly inspected, but there was no sign of any other debris having collected.

(g) On 13-9-1980, I also noticed some small patches of dried blood on the right-side ballast-retainer at a distance of 2.5 m away from the Jhansi-end abutment of this bridge.

(h) Although the weather was clear, visibility was very restricted, the night being dark and with even pre-dawn effects not yet due, as the time was only 03.45 hours.

V. SUMMARY OF EVIDENCE

13. Evidence of persons travelling in the ill-fated First Class Coach No. CR 2934

When fire was discovered, there were in all 17 persons in this coach. Of these 17, 2 were Railway Staff and evidence of those 2 was taken at the Inquiry, at which only one passenger turned up and that too, after sending him a request to give his testimony. With the expectation of gaining a clearer, perspective of the circumstances leading to the outbreak of fire, a questionnaire was, therefore, sent to all the remaining 14 passengers and, as mentioned in para 2(d) supra, replies were received from 12. To facilitate convenient reference to and comparative cross-checking of the information given by all the 15 persons, whose evidence has been obtained, a precis of their statements has been made out a may be seen in Annexure I.

14. Evidence of Shri K. L. Keshwani, the Conductor

(a) He stated that he entered the coach No. CR 2934 FC at Rora station in order to alert the 'E' Compartment passenger, who was to detrain at the next halt, namely, Mauranipur. As 'G' Compartment was empty, he and Shri D. R. Yadav (Travelling Ticket Examiner 'Captain') travelled in it. It was some time after 03.30 hours that, upon completion of up-dating his charts and preparation of refreshment room (RR) messages, he became aware of some smell of burning rubber coming from the direction of 'A' Compartment. His further evidence in regard to the discovery of fire is given in Annexure I.

(b) He added that, while he was rendering assistance in de-training the passengers with whatever luggage or personal effects that they could collect, Shri Maheshwari (a passenger from 'F' Compartment) rushed back into the coach and, in the process of retrieving some important documents and a considerable sum of money in a yellowish-coloured attache case he sustained some burns on his hands and some singeing on his face. Lest the adjacent coaches may also catch fire, immediate action was taken by all concerned to evacuate Coach No. CR 3073 FC (which was immediately ahead of the burning coach and all the 18 passengers of which were accommodated in the adjacent coach No. CR 2947 FC) and the 3-Tier Sleeper Coach No. CR 9364 (which was immediately in rear of the burning coach and all the passengers of which were accommodated in the coaches further in the rear).

(c) When cross-examined, he clarified that it was only after he pulled the alarm chain (at which stage the lights went off) that he was looking back into the corridor from the front of the coach when he first noticed the flames in the corridor towards the rear of the coach at the top level. He also seemed to feel that the train took longer than normal and at least some 5 minutes to come to a halt. He also added that, ever since this train was introduced, Jhansi Division was providing only 2 attendants although the standard consist of the Qutab Express has 3 First Class coaches.

(d) Queried as to whether he received any complaints regarding electrical faults in this particular coach, he replied in the negative and added that, when he took charge of the "amended chart" from the Jabalpur Conductor, he was also not told of any such complaints. Moreover, there was nothing electrically wrong in 'G' Compartment.

15. Evidence of Shri D. R. Yadav, the TTE 'Captain'

(a) On being told that 'G' Compartment was vacant, he entered First Class Coach No. CR. 2934 at Mauranipur so that he could carry on with his paper work in relative comfort and, after completing the same, he went to the toilet in the rear, just as the train ran through Ranipur Road Station. It was as the train was passing the next Station, Teharka, that he became aware of some smell in the toilet and, as he emerged from the toilet, the lights went off and he could sense that the corridor was full of smoke to such an extent that breathing became difficult. His further evidence in regard to the fire is given in Annexure I.

(b) Queried upon the origin of the smoke, he could not say anything, as it was dark, with the lights having gone out; he, however, felt that a smoke was coming from Jhansi-end of the corridor. Asked about the braking time taken by the train, he said it took about 5 minutes for the train to stop. He added that, finding the Conductor was feeling nervous that the train did not stop even after 2 minutes, he himself checked up firstly that the clappet valve was functioning on the Coach in the rear, before going to the forward end, crouching low to avoid the smoke, to make out the sound made by the air rushing through the clappet valve on this very Coach. He also added that he became aware of flames only after he returned to the rear of the Coach and, at that stage the flames were ahead of him in the corridor, seen leaping out of the window and curling upwards.

16. Evidence of Shri Ram Bharose, the Driver

(a) He stated that his diesel loco was long-hood leading and that No. 149 Up ran through Teharka at about 03:30 hours. It was at about

03:38 hours that he became aware of the fall in the vacuum gauge and, although neither himself nor his Assistant could find anything unusual with the train when they looked back, emergent action was nevertheless taken to control the train and bring it to a halt as quickly as possible. As soon as the train stopped, he heard some passeners in the back yelling that some coach in the rear had caught fire, whereupon he switched off the locomotive and after removing its reverser, he came down to investigate. Simultaneously, he instructed his Assistant to try and put out the fire, which was, however so huge that the fire extinguisher was emptied to no avail. After the adjacent coaches were evacuated, he took charge of detaching and isolating the burning coach at both ends from the rest of the train.

(b) On cross examination, he admitted to having looked back at the train from time to time, with the last such occasion timed as the train approached the Outer of Teharka where the track-on-curve enabled a clear view of the entire train; but he did not notice anything wrong at any stage. When queried about the excess time taken in bringing the train to a halt, he stated that although he was endeavouring to "make up" time (as the train was already running late), he immediately applied the train brake as well as the dynamic brake no sooner did he discover the drop in the vacuum gauge. He added that the track being on a falling gradient after Teharka, the train may have taken slightly longer to stop.

17. Evidence of Shri Roshan Ali Khan, the Guard

(a) It was at about 03:40 hours that he noticed the drop in the vacuum in his Gauge and the train soon came to a halt with his coach in the rear of the open-deck girder bridge across the Baira Nala. Looking out, he found some black smoke coming out from one of the coaches ahead. Finding that he could not get across either up-stream of this bridge or down-stream of it, he decided that he simply had no alternative but to crawl under-neath the coaches; it was at this stage that he became aware of flames rising from one of the coaches ahead. Providentially he located 2 other Railway Staff and at once organised with one (a Telecom. Maintainer) to hook on the "field telephone" to get in touch with Jhansi Control and with other (a Guard from Gwalior) to protect the train in the rear.

(b) He also arranged for the transport of his two fire-extinguishers but, because of the girder bridge in between, this activity necessarily took some time and, in the meanwhile, the isolation of the burning coach was in hand. By that time, however, the fire had attained such proportions as to be quite beyond the capacity of these 2 portable fire-extinguishers to put out. As he was away from the scene of fire, he was not able to throw any light as to its cause or origin.

18. Evidence that nothing unusual was noticed on this train

(a) Shri Nisar Ahmed, the Rest-Giver Assistant Station Master on duty at Ranipur Road testified that, as the train ran through his Station 03-22 hours, he correctly exchanged signals with both the Driver and the Guard of 149 Up and that he didn't notice anything unusual (like fire) on the train. Nor did he see or smell any smoke. He added that neither Pointsman (Shri Pooran), who was at the 'points' at that time nor Pointsman (Shri Ram Rattan), who handed over the ball token to the Driver of 149 Up reported anything unusual with this train.

(b) Shri N. C. Gupta, the Assistant Station Master on duty at Teharka did not find anything abnormal with the Qutab Express as it ran through his station at 03-32 hours. He added that one of his Pointsmen (Shri Bans Gopal) was at that time manning the points, while another (Shri Lalaram) handed over the ball token to the Driver of the train, but that none of these 2 reported of anything unusual. When queried about the general visibility at that point of time, he replied that it was a dark night and that any fire or flames would have been distinctive enough to observe against the black background unless they were as yet confined to within the Coach itself.

(c) Shri Ram Lal Singh (Waiter No. 14 at Manikapur, who served food to passengers in FC Coach No. CR 2934), stated that he did not smell anything out of the way.

19. Evidence relating to Electrical Maintenance of Qutab Express

(a) Shri Baldeo Singh (Train Lighting Fitter based at Hazrat Nizamuddin) testified to having been on duty when the 150 Dn Qutab Express, left his Station on 7-9-80 with the same rake that subsequently left Jabalpur on 8-9-80 on the return leg of the round-trip. He had examined this rake at Hazrat Nizamuddin and found nothing abnormal with any coach that looked like a potential fire-hazard. When queried about this particular FC Coach No. 2934-CR, he consulted his records to say that, other than a few fans running slow (which defect was soon rectified by cleaning the commutators) nothing unusual was noticed. When cross-examined about any temporary connections provided (in the absence of the regular "switches") in this coach, he replied in the negative. He, however admitted that a temporary connection had, even earlier to that stage, existed between this coach and its adjacent one on one side and that he provided another TC on the other side also, as the voltage in the battery under the coach on that side was low.

(b) Shri Ram Lakhan (another Hazrat Nizamuddin-based Train Lighting Fitter) "ditto-ed" Shri Baldev Singh's statement. Queried as to the precise nature of his duties, he clarified that he dealt with only the dynamos and that, to this end, on each coach (including FC 2934 CR) he motored the dynamo to check the leakage, checked the condition of the belt, of the safety chains and the axle pulley, checked the commutator and solder etc., but found nothing unsafe. Asked if it was true that the voltage on one of the coaches which was next to the ill-fated FC was low, he verified from his own records to reply in the negative.

(c) Shri Shri Ram (the Jabalpur-based Electrical Train Lighting Fitter who attended to 149 Up at Jabalpur on 8-9-80) stated that he checked the battery cells, inter-cell connections, battery fuses, etc. and found nothing wrong with any coach, nor was there any "leakage" in the undergear. He added that the entire rake was split into 3 parts for charging. In reply to queries, he elaborated further on how the leakage tests were conducted and added that the pre-charging and post-charging specific gravity (SPG) in the batteries of FC 2934 CR were respectively 1140 and 1200.

(d) Shri Brahmchari Ram Prasad (another Jabalpur-based Electrical Train Lighting Fitter) stated that his duty was to attend to only the dynamo and its related external fittings, such as axle pulley, safety chain, link cotter pins, etc., and also perform the leakage test. When the rake was placed in the Washing Siding, he did his duties and did not notice anything unusual.

(e) Shri Tulsī Ram (Jabalpur-based Grade I Electrical Fitter on "Train Lighting Top" duty) stated that, as soon as No. 150 Qutab Express arrived at Jabalpur, he checked the emergency lighting box and the DRS (Deficiencies in Rolling Stock-Electrical) Card and that his subsequent examination of the rake did not reveal anything abnormal regarding the electrical system. Nor was any leakage detected on the top, he added. When queried specifically about FC Coach No. CR 2934, he testified to having checked all the light fittings and found them OK, after replacing 3 bulbs; he checked all the fans and cleaned the commutators of 4 fans; he also performed the leakage test at the Junction Box and found none. He confirmed that this Coach came into Jabalpur with emergency connections at both of its ends with the adjacent coaches and that no heating was found at these connections which were tight and taped over. According to him, all the fan/light switches/controls were intact and there was therefore, no need for any temporary connections.

(f) Shri Pooranlal Chhoreylal (Amenity Fitter, Jabalpur) stated that, as he was booked by Qutab Express on 8-9-80 ex : Jabalpur to Manikpur, he reported 30 minutes before the departure time to thoroughly check the "electrical" on the under gear, top and coach interior on the entire rake jointly with the Train Lighting Staff. He did not

find anything unusual in any coach either at Jabalpur or anywhere subsequently as the Express ran upto Manikpur. He changed coaches at each halt to enquire about any complaints but found none, which feature was also attested to by the Guard of the train in his Journal. He added that Shri Shukla (the Manikpur-based Highly Skilled Grade I Fitter) also verified the same, after having examined the train at Manikpur. When queried about the alleged complaints from passengers in the "F" Compartment of FC Coach No. CR 2934, he replied that he had received no complaints either directly from any passenger himself or through the Coach Attendant.

(g) Shri N. L. Shrivastava (Attendant in FC Coach No. 2934-CR from Jabalpur to Manikpur on 8-9-1980) stated that there was nothing wrong with this Coach upto Manikpur. When cross-examined in relation to the statement of Shri Mukund Maheshwari (a passenger in 'F' Compartment), he maintained that he received no complaint at all from anyone in 'F' Compartment. He added that he did check this Coach at Jabalpur itself and found that all the fans were working properly.

(h) Shri S. R. Dev (Conductor from Jabalpur to Manikpur), also confirmed that he received no complaints regarding any electrical defect in FC Coach No. CR-2934. Replying to a question, he clarified that he did happen to talk to Shri Maheshwari when the train stopped at Satna, but that nothing was mentioned even at that stage, whereas no one would have missed such an opportunity to complain about defects.

20. Evidence relating to stoppage of the train in mid-section

(a) Shri Tekchand (Attendant in FC Coach No. 3073-CR, marshalled the 6th from the Engine and adjacent to the ill-fated Coach) stated that some 15 to 20 minutes after the train left Mauranipur, he smelt an odour of burning rubber and immediately pulled the alarm chain. The train came to halt after some time and, after evacuating his coach as a precautionary measure, he accommodated the passengers and their luggage in another FC Coach. He also assisted in isolating the burning coach from the rest of the train. In reply to a query, he said that he was seated at the forward end of his Coach. Questioned further as to whether the reason for his pulling the alarm chain was that it did not seem at that point of time that the train was already slowing down, he replied in the affirmative and added that he did feel at that stage that the train ought to have stopped sooner than the 4 minutes it actually took to stop after he pulled the alarm chain.

(b) Shri M. A. Khan (Travelling Ticket Examiner, Jhansi) stated that he was in charge of 3-Tier Sleeper Coach No. CR-9364, which was immediately in rear of the coach that got burnt down. At Mauranipur, he de-trained to accomo-

date one passenger, but did not notice anything unusual with the Coach ahead. After the train passed a few stations, he could sense some smell in his Coach and, when he peeped out, he noticed flames in the FC Coach ahead. He immediately pulled the alarm chain and, after the train came to halt, he evacuated his Coach and tried his best to accommodate the passengers in other Coaches. When cross-examined about the stoppage of the train, he admitted that the train was already slowing down when he pulled the alarm chain and that it took yet some 2 to 3 minutes further for it to stop.

21. Evidence of Shri G. A. Karve, Senior Divisional Electrical Engineer, Jhansi (the first Officer of the Electrical Department to inspect this coach)

(a) He stated that the first intimation of this accident reached him via the Railway Headquarters in Bombay at about 07.45 hours on 9-9-80. Then, immediately as the train arrived at Jhansi (without, of course, the ill-fated coach), he had got the 2 coaches (which were adjacent to the burnt coach) examined and found nothing wrong with either of them electrically. He then left by road to reach Niwari (where the burnt Coach was stabled for the time being) at 11.10 hours.

(b) The fire having already been completely put out by that time, he examined the coach carefully but found no evidence at all — electrical, or otherwise — which gave any clue as to the cause of the fire. The electrical undergear was intact, and the battery fuses had not blown off, whereas the interior was almost entirely destroyed by the fire which managed not only to reduce to ashes everything that was even remotely combustible, but also melt down even the aluminium and glass components.

22. Evidence of Shri S. K. Gupta, Divisional Electrical Engineer, Jabalpur (which is the Station for Primary Maintenance of the Qutab Express rake)—

(a) He stated that this particular FC Coach (No. CR 2934) had in fact arrived Jabalpur by 390 Up Passenger from Manikpur as a "spare coach" on 21-8-80 and that, after 2 more runs, it was lying idle for a few days in the Jabalpur Yard up to 3-9-80, when it was first attached to the Qutab Express rake. According to the records maintained at Jabalpur, there was nothing electrically subnormal or abnormal with this Coach, which could have led to the outbreak of fire.

(b) During cross-examination, he stated that as the fans were switched on at Jabalpur itself and lights were switched some-time later at Katni if at all any defect was present, it should have "surfaced" straight way; but, in fact no defect "came to light". Adding that there were, by and large, 3 areas of weakness in the circuitry (the ampere meter link, the junction box and the battery box) he further contended that his own detailed examination of this Coach showed that, firstly, the ammeter link was properly crimped,

and intact, secondly, the battery box was itself quite sound in regard to the water level, inter-cell connections, etc., and, thirdly, the junction box lugs were also in good condition in spite of the considerable fire damage sustained by it. Moreover, sparking tended to fuse-weld the naked wire to the metallic surface and a most thorough search by himself as also several others did not reveal even a single instance of such "tacked" wiring anywhere. Furthermore, even though most of the wiring got melted down, it was noteworthy that the available evidences (by way of whatever bits and pieces of wiring that still remained in position in the vents of the car-lines or at the Coach-ends) showed that the wiring used was of the proper size. He emphasised that this particular point was very important, as inadvertant use of undersized cables could give rise to over-heating.

(c) Queried about the battery fuse not "blowing" despite all the other damage caused by the fire, whereas it was actually found "blown" upon the Coach's arrival later on at Jhansi, he came up with a suggestion that although the insulation between the cables may have got burnt out, the cable ends may not have come into contact at the earlier stage (thus giving no reason for the battery fuse to blow), while the subsequent vibrations (which could have occurred during the movement of this Coach from Niwari to Jhansi) might have caused the cable ends to "short" and the battery fuses to "blow" almost immediately.

(d) He also cited sabotage as a possibility and mentioned, in support of this hypothesis, the fact that one of the passengers was reported to be carrying also a pistol, besides a large sum of money. Continuing in this vein of thought, he suggested that the broken 2-quart bottle could have contained some inflammable dangerous stuff that could have sparked the fire. Indeed, had the sabotage taken place in the "E" Compartment (which was empty after the train left Mauranipur) the fire had ample time to have reached into the ceiling of this Compartment and then spread further throughout the Coach and into the corridor. It was most significant that the lights had actually gone off 'suddenly' quite some time after the discovery of smoke/fire'.

23. Evidence of Shri K. S. Jayaraman Assistant Electrical Engineer, Matunga Workshops—

(a) He stated that the Megger test taken of the various circuits at the time of the last POH done on this coach on 2-5-80 showed a reading of at least 2 Meg. Ohms, which spoke of a satisfactory level of insulation on this Coach. He indicated the extent to which the RDSO's recommendations on the various fire prevention measures were implemented on this particular coach and added that the measures so recommended by the RDSO were quite sufficient to ensure prevention of in-service fires due to electrical reasons.

(b) When questioned specifically on the 2 crimped joints found within a matter of half metre of each other on the PM cable, he replied that the important point was that this jointing (which might have been done to make good the loss of wiring due to vandalism/theft, although it could have also been done during the last POH) showed that the crimping had been done most properly. He also supported the reasoning given by Shri Gupta (DEE, Jabalpur) to explain the circumstance that the battery fuse, which was stated to be intact at Niwari even after the fire, was subsequently found "blown" when the Coach arrived at Jhansi.

(c) Asked whether he had any suggestions to reduce the fire-hazard of such Coaches, he replied that the presently accepted policy of progressive introduction of 'End-On' Generation (EOG) and 'Mid-On' Generation (MOG) with 110-Volt AC System should be accelerated as these would have the effect of doing away with a number of weak areas in the existing system viz : the battery, the dynamo, etc. He also alluded to the ready combustibility of all the so-called fire-resistant and fire-retarding material that went into a Coach by way of interior decoration, furnishings and fittings, besides the quantity of wood that was inserted in panels, partitions, etc. It was a point to ponder about that even the wooden flooring fitted *underneath* the Oxy-chloride layer got completely burnt to charcoal.

24. Evidence of Shri V. S. Chouhan (Executive Engineer, Central Railway, who was travelling by this train in FC Coach No. CR 3073, the Coach that was immediately ahead of the ill-fated Coach—

(a) It was during the early hours of 9-9-80 that he woke up to the shouts of "Fire"; the train had already stopped by that time. He immediately rushed out to find that the Coach immediately in the rear was on fire, with flames emerging through the ventilators in the roof as well as windows on both sides. It appeared to him that flames were of greater intensity around the middle of the Coach as compared to its ends, where door-ways were located.

(b) Asked specifically about Railway staff in attendance at that crucial juncture when the train stopped in mid-section, he replied that he found the Assistant Guard supervising the shunting operations, whereas the Guard (who was in the rear of the bridge) could not come to the front for that very reason until after some time. He did not particularly notice anyone else.

(c) Queried about the cause for this fire, he said that it was surprising that none of the passengers from that Coach had simply any idea that anything untoward was happening, until it became too late to save the Coach. It could, therefore, be inferred that the fire did spread very fast in reply to another question, he said that there

was no talk amongst the passengers either of sabotage or of dacoity. He clarified that, although about a hundred passengers had to de-train at night time (from the burning coach as well as the 2 adjacent coaches) under very trying circumstances, like the poor visibility and only the narrow "cess" available for them to walk on (the track in that region being on an embankment about 6 metres high), yet no one lost even a piece of his luggage while thus getting accommodated elsewhere on the train.

VI. TESTS AND OBSERVATIONS

25. Inspection of the Gutted Coach—

(a) As regards the "under gear", there was hardly any damage to the mechanical/structural systems. The bogies and their components including the trollies as well as all fittings pertaining to the running gear, the brake gear, the buffing gear and the draw gear were all quite intact. There was no sign of any overheating of the roller bearings at the axle-box level. Upon examination, no wheel-flat was found.

(b) There was also no damage to the electrical system underneath, excepting for battery fuses blown off (with sprayed metal still visible on the cover over the battery compartment.) It was immediately checked up that the wire used for the battery fuse was of the correct size (gauge). The battery sets were, however, undamaged (and, when the battery covers were removed, the cells were found to be neat and clean, with all inter-cell connections intact); likewise, the rectifier (which was also tested in my presence) as well as the dynamo and its belt and electrical connections (including field fuses of 35 SWG and main fuses of 18 SWG) were all found to be quite proper and sound. The underframe cables (within the conduit) also seemed to be unaffected by the fire. The blistering of protective paint noticed (right opposite of where the coils were actually positioned) on the inside of the cover over the lamp resistance box was not considered abnormal.

(c) The inside of the coach, however, presented quite a different sight : all the electrical cables melted down, with bits of wiring still loosely resting over the openings in the roof section of the "car-lines" and every bit of these naked pieces of wire was checked to discover that no part of the wire was stuck, tacked-on or fused to the metal, as would surely have been the case, had any sparking been caused by shorting. There was simply nothing left of fan or light MCB connections, fuses, switches, etc. Whereas the 14 nos. of 16" dia fans (which were bolted to the shell) remained in position (although considerably damaged), the 10 nos. of 12" dia fans (supported by brackets connected to "interior coach-work") fell down, as their supporting structure got reduced to ashes.

(d) At the ends of the coach, however, a lot of naked wiring was hanging about, with the insulation having completely burnt out. All loose ends were in a molten state, with a few showing some oxidation. 2 crimped joints could be seen within 1/2 metre of each other in the PM cable at one end. Even the 24-way Junction Box got extensively damaged by fire, with main supply fuses burnt and not a vestige of any insulation visible anywhere around, but there was evidence of some temporary connection (single core wire found twisted over the bolt) having been taken off the Junction Box, possibly to couple to the adjacent coach.

(e) As regards the interior fittings, upholstery and furnishings, everything was reduced "in toto" to ashes, with even the timber decking underlying the oxy-chloride layer (which was surprisingly destroyed, too) burnt for the most part into wood charcoal. There was simply no sign left of the upper/lower berths, nor of luggage racks, folding tables, coat hooks, ash-trys, bulb-globes, etc. and not even of mirrors. Likewise, nothing was left of any panelling in the side/top/corridors or of the inter-cabin partitions. Due to severe thermal stresses and weakening of metal, the corridor struts had buckled and, whereas the steel elements supporting the top berths fell off, the heavily sagged rectangular steel frames (which supported the bottom berths) told their own story. At windows and elsewhere, all glass and aluminium melted off and chunks of molten stuff could be seen in the debris, while indeed nothing, but truly nothing, survived the fire, excepting for the steel shell, its ribbing and the alarm-chain apparatus. In fact, even the stanchions (body pillars) and car-lines showed evidence of distortion with "free" edges distorted towards the rear of the coach.. a natural enough phenomenon, caused by the draft-induced backward-flow of heat and flames.

(f) There being no troughing at the lavatory section, here the entire flooring was destroyed leaving gaping holes. Even the water tanks atop the laboratories did not escape damage: indeed, those on the leading right-side and the trailing left-side melted down completely, whereas the other two suffered distortion as well as some holes torn out of them. Lavatory fittings had all got completely destroyed.

(g) As regards the exterior, the top of the roof was unaffected, although the shell itself sagged longitudinally with the lowest portion (trough) in line with the "E" Compartment. In fact, the vertical weld in the central seam on the corridor side had given way, causing a wide-open crack to appear at the bottom. The rear right-side door was firmly jammed in the closed position, with molten aluminium and glass blocking any movement. All paint got burnt out on either side, excepting at the bottom, where the paint was still adhering for about 30 cm. (1 ft.) height, with

its upper edge blistered and peeling off; this phenomenon is only to be expected, with convection currents directing the heat upwards and aeration via the air spaces at the bottom-sides tending to cool the metal by absorbing all the heat radiated out. Superficially, there was no evidence to show that ingress of fire could have been from anywhere in the outside.

26. Inspection of articles carefully sifted from the debris—

(a) In an effort to locate a pistol (the loss of which was reported by Shri M. Maheshwari, a passenger in 'F' Compartment), examination of the debris by the Railway Police Officials commenced straightaway, immediately after the fire was put out on 9-9-80. One pistol (bearing No. 665573 and No. 765 M/1 on the barrel) was recovered at Niwari itself.

(b) With scouring of the debris for any clue continued further, a list of identifiable articles was made out by the Police, which contained the usual assortment of metallic things that people are wont to carry (and, which could not entirely perish in the fire), such as, keys, scissors, kitchen-ware, torch-light, water-bottles, etc. Whereas nothing suspicious was recovered, the only piece of evidence which could even remotely be regarded as such was a broken 2-quart bottle (its cap was intact, its label said 'Diplomat Whisky' and it was wrapped up in burnt cloth and burnt towel).

(c) The Forensic Science Laboratory (of the Maharashtra State, Bombay), to which this latter bottle was sent for analysis in order to establish or otherwise rule out arson and sabotage, stated in its Report No. B-15878-1980 of 10-11-1980 that "nothing of note was detected in the exhibit".

27. Tests by the RDSO on the likelihood of fire breaking out in Coaches through repeated sparking—

(a) As their report on an earlier test could not be readily located, the Electrical Design Directorate of the Research, Designs & Standards Organisation (RDSO), carried out fresh tests on 24-10-80 at my request, using FC Coach No. 1347 of 1970 construction from the ICF (with POH on 11/79). The test was conducted at Charbagh Railway Station and standard 35 SWG fuse wire was used for the 'distribution Boards', 18 SWG for all 'Junction Boxes' (excepting for the Junction Box for the Negative Main, the fuse for which was of 16 SWG wire).

(b) In the 1st Series of Tests, the branch wiring was short-circuited at lamp-holder/fan-connector level in 3 different cabins and the fusing time was found to be instantaneous in all cases, while the cables remained unaffected.

(c) In the 2nd Series of Tests, the Negative and Positive Main (light) cables were shorted twice

a little distance away from the Junction Box, and the "fusing time" noted at L I and L II was 8.6 seconds in either case, with the Field Positive fuse not blown off. The cables remained unaffected.

(d) In the 3rd Series of Tests, the Negative and Positive Main cables were shorted at the Emergency Field and at the Terminal Board and "fusing time" noted at S I and S II were respectively 0.8 seconds and 1.0 seconds for both the tests. Once again, the cables remained unaffected.

28. Braking Time for the Qutab Express—

Under their letter No. M. 381 D. 103. Vol II of 21-1-81, the Central Railway have advised that the Emergency Braking Distance (EBD) for a WDM-2 loco hauling 15 coaches at a speed of 100 Km/h on a 1 in 166 falling gradient would be 1,014 metres, as per RDSO's standard charts for braking distances. Assuming a linear variation in the speed (in other words, with an average speed of $100 \div 2 = 50$ Km/h), this distance of 1,014 metres would be covered in a matter of 73 seconds.

VII. DISCUSSION

29. As to the Time of the Accident—

(a) As, from the available evidence, it is difficult to even surmise with any degree of accuracy as to precisely when the fire broke out in FC Coach No. CR 2934, I shall reckon the time of accident, for the purposes of this Report, as the time when the Qutab Express came to halt in the mid-section between Teharka and Niwari.

(b) The Assistant Station Master on duty at Teharka stated [para 18(b)] that the train ran through his Station at 03.32 hours of 9-9-1980; the Driver himself stated [para 16(a)] that he ran through Teharka at about 03.30 hours. However, according to the Assistant Station Master on duty at Ranipur Road [para 18(a)], the Qutab Express ran through his Station at 03.22 hours. Vide page 79 of the Jhansi Division's Working Time Table No. 55, the minimum running time for 149 Up Qutab Express between Ranipur Road and Teharka is 14 minutes and, there being no reason to assume that the Driver was actually overspeeding, it could be held that this train ran through Teharka at about 03.36 hours.

(c) Around this time, the train must have been decelerating because of the alarm chainpulling and the distance of 5 kilometres plus (from Teharka to the place where the train actually came to a halt in the mid-section) could be covered in about 7 or 8 minutes, including the time taken in braking. In other words, assuming (on the basis of the timing recorded at Ranipur Road station) that the train ran through Teharka at 03.36 hours, the train must have come to halt at about 03.44 hours. The Guard had deposed [para 17 (a)]

that it was at about 03.40 hours when he noticed a drop in the vacuum gauge and that the train soon came to a halt. The Driver had stated [para 16(a)] that it was at about 03.38 hours that he became aware of the drop in his vacuum-gauge and that he brought the train to a halt as quickly as possible.

(d) Time not really being the crucial factor in the determination of the cause for this fire, it would suffice the needs of this Report to conclude, after due consideration of all pertinent factors, that the accident took place at about 03.45 hours during the early morning hours of 9-9-1980.

30. As to the speed of the train—

The maximum and the booked speeds for the Quatab Express are respectively 90 Km/h and 100 Km/h. The Driver himself admitted [para 16(b)] to trying to make up the time, as the train was already running late. To this end, the train must have obviously been driven at the maximum permissible speed. I, therefore, conclude that the speed of the train was 100 Km/h when fire broke out in FC Coach No. CR 2934.

31. As to the state of maintenance of FC Coach No. CR-2934—

(a) Reference to Annexure I would show that S/Sri M. L. Soni, R. Madan and M. K. Singhai had all remarked that this was an old, out-dated, patched-up and poorly maintained Coach. This comment was, of course a reflection on the state of upkeep of the interior of the cabins and the various appurtenant fittings appropriate to the context of a First Class Coach that this ill-fated Coach indeed was. As this Coach had its last POH done in April 1980, such carping criticism made in writing by some of the passengers travelling in it can only imply that proper attention was not paid, while completing the said POH repairs, either to the quality control in the "finishing" of all visible surfaces or to the workmanship in the fitment of the various fixtures. It could also have been, of course, that this Coach, while it was lying idle in the yard at Jabalpur and/or elsewhere, may have suffered damage through pilferage/theft needing it to be locally patched up. However, as brought out in para 25(e) supra, the interior of the Coach was so thoroughly gutted by the fire that there remained simply nothing in the post-fire situation from the inspection of which could any comments be made on this particular aspect independently by myself.

(b) As regards the electrical items in this Coach, records maintained by the Railway [para 9(c)] showed that all the fire-prevention measures which were enunciated by the RDSO had been properly carried out on it. The evidenced presented in paras 19(a) to 19(e) is also indicative of proper upkeep of the electrical connections. Whereas

it could be seen from Annexure I that the 3 passengers in 'F' Compartment had a complaint to make about the lights and fans in that Compartment, other evidence tendered on the other hand [paras 19(f) to 19(h)] ran counter to this complaint. I have no reason to doubt the "bona fides" or genuineness of any of the evidence summarised in para 19 supra and, on the basis of the preponderance of evidence, therefore, I am inclined to conclude that there could have been nothing seriously wrong with the electrical wiring or the electrical connections in this Coach, notwithstanding the fact that its post-fire inspection did reveal 2 joints (which were indeed properly crimped with open ferrules) in the PM cable within 1/2 metre of each other.

32. As to the Circumstances relating to the Discovery of Fire—

(a) As mentioned in para 13, only 3 persons out of the 17 (who were occupying the ill-fated coach when it caught fire) deposed before me. As reflected in Annexure I, whereas both the Railway Staff (Shri Keshwani, the Conductor and Shri Yadav, the TTE 'Captain' stated that the fire/smoke was first spotted towards the front end of the coach, Shri Bhikhari Lal stated to the contrary that the fire/smoke was first spotted towards the rear end. It was primarily to clear up this puzzling discrepancy that I had sought further information from the remaining 14 passengers, a precis of whose evidence appears in Annexure I.

(b) Perusal of Annexure I shows that the presence of smoke in the corridor was independently discovered almost simultaneously by several persons Shri Keshwani (the Conductor), Shri Yadav, (the TTE 'Captain'), Shri Bhikhari Lal and Shri Anil Patel. The first 3 of these 4 had seen the smoke in the corridor, whereas Shri Anil Patel actually determined that the smoke emanated from the then empty 'E' compartment.

(c) Annexure I, clearly establishes the noteworthy feature that the lights were working OK at that point of time, because some of the passengers (aroused from their sleep by the others, pursuant upon the discovery of smoke) could clearly recall the working of the "night lights" which were left 'ON' before they retired for the night.

(d) It was only slightly later, according to their evidence, that the lights had suddenly gone 'off', whereas the lights went out, according to Shri Yadav (the TTE 'Captain'), just as he emerged from the toilet [para 15(a) supra] just after he train ran through Teharka. This evidence provides the necessary time-frame for the proper juxtaposition of events within and without, wherefrom it can be concluded that the train was still on its way to Teharka when the passengers inside the FC Coach No. 2934 discovered smoke/ fire.

(e) Yet, as brought out in para 18 *supra*, nothing unusual was noticed by Station Staff on duty either at Ranipur Road or Teharka. When the train ran through these 2 stations, it was past 0320 hours on a dark night and, against the dark background, the striking contrast of fire, if at all visible outside of that coach, could never have escaped the notice of Station Staff engaged on trainpassing duties.

33. As to the location of the fire's origin—

(a) *Prima facie*, there are several possibilities, which could be classified broadly into 2 categories; fire of extraneous origin and fire erupting within the Coach. External sources could include sparks from outside igniting an inflammable item (any wooden piece/liner/packing would do, provided that continuity by way of firesupporting media existed for the propagation of fire to within the Coach) or fire generated by either the running gear (friction-induced sparks caused by binding of brake-blocks) or electrical under-gear (fire from dynamo or battery assemblies). Similarly, fire could originate within the Coach in any of the 4 distinct areas: corridor and passage-ways; toilets; cabins and, lastly, the ceiling. The likelihood of the fire having started in any of these areas is now discussed in the light of available evidence.

(b) As brought out in para 12(e) *supra*, the last steam engine-hauled train to cross the Qutab Express was No. 749 Down Goods train at Mahoba Station and the Qutab Express had a run of about 2 1/2 hours afterwards before the fire was discovered, during which period it stopped at no less than 3 Stations. In the context of the dark night, any fire starting from outside of the Coach could not have, by any stretch of imagination, escaped the notice of the Station Staff at these 3 Stations and unbeknownst to any other(s) on these Station Platforms, whereas nothing unusual was in fact noticed, vide para 18 *supra*. Also, inasmuch as all the cabins were occupied at one time or the other upto Mauranipur, there was not the least question of any spark-induced fire breaking out in any of the cabins.

(c) Although it is not unknown for diesel locos to emit sparks (quite visible at night), for reasons mentioned in para 32(d) the fire could not start from outside of the coach. The only other possibility to consider is of a spark-induced fire in the 'E' compartment (the only empty cabin from Mauranipur onwards), which would imply an open window in this compartment as an essential condition precedent, but then this very circumstance of an open window would not have failed to provide a view of "something unusual" to one or the other of the Station Staff at Teharka as the train passed by.

(d) Similarly, as explained in paras 25(a) and 25(b), even a thorough examination of the under-gear of this Coach failed to reveal any fire damage

to any mechanical/structural/electrical component. Hence, there is no longer any question of fire having started below the Coach and subsequently spreading into its body. Having regard also to what has been brought out in para 25(g), fire of external origin is logically ruled out.

(e) As regards the toilets, coincidentally at least 3 persons had visited the toilet (at the leading as well as trailing end of the Coach) immediately prior to the discovery of fire and, according to Annexure I, neither Shri Bhikhari Lal (who was in the toilet ahead) nor Shri Yadav (who was in a 'rear' toilet) found the toilet area as the origin for the fire.

(f) As regards the corridor and passage-ways no luggage (let alone anything suspicious) was found [para 12(b) (i) *supra*] in them, nor did any witness testify (Annexure I) to having seen the fire/smoke start from anywhere in this region. It is to be appreciated in this context that, what with persons moving in and out of the corridor on their way to the toilets and back, outbreak of fire here could have been immediately detected and identified as such without even the least bit of difficulty.

(g) Reference to Annexure I shows that, barring the couple in the Coupe 'E', every other witness saw the flames in the corridor at the roof level, which naturally raises the question as to whether the fire did start in the ceiling. Now, were this the case, because of the many vents that facilitate the free circulation of air within the ceiling area, it was far more likely that either all the cabins should have got affected in a more or less similar manner almost simultaneously, or the rear-most cabins (say, 'F' and 'G') should have been adversely affected at first, the latter alternative depending on the heaviness of draft produced by the motion of the train itself. In actual fact, however, neither was the case, as no passenger in his cabin felt anything abnormal until he woke up and even then the smoke was found to be thicker in the corridor. Finally that Shri Anil Patel felt the blast of smoke upon briefly opening the door to the 'E' compartment is a factor that weighs against the possibility of fire having originated in the ceiling.

(h) Annexure I reveals, that, whereas all persons from Cabins 'A' to 'D' saw the fire/smoke in the corridor towards the rear of the Coach (indeed Shri M. L. Soni could pin-point the location as near the 'E' Cabin), persons from Cabins 'F' to 'G' seemed to see the fire/smoke in the corridor ahead. That this evidence is not anomalous becomes patently clear when the correct inference is drawn therefrom : namely, that fire/smoke was the thickest in the corridor in front of 'E' Cabin. This could be so, only if the fire had originated in the 'E' cabin for whatever reason and then spread both into the ceiling right above this cabin as the flames licked upwards rapidly (due to the

inherent property of fire burning upwards through the convection of hot currents) as well as sideways into the top of the corridor right opposite this cabin. This hypothesis is further strengthened by Shri Anil Patel's evidence that he firstly saw (as he peered out of the window in his 'D' cabin) some light (as if thrown by some flames at the roof level) near the wheels under the 'E' Compartment and that (when he investigated further by opening the 'E' Compartment door) he was hit by such a strong blast of smoke that he was compelled to close that door at once. Moreover that Shri Chouhan, who saw this Coach after the train halted in mid-section, also felt [para 24(a) *supra*] that the flames were the thickest around the middle of the Coach, supports the view that fire could have originated in the 'E' Cabin.

(i) On the basis of the foregoing rationale I conclude that the fire broke out in the 'E' Compartment. Indeed, had the fire's origin been in any other cabin (each of which was actually occupied at that point of time), the manner of its discovery (which ought to have been immediately sensed by the in-mats), the tenor of the evidence deposed and the description of the turn of events would all have been far different to what has been presented in Chapter V and Annexure I.

34. As to whether this Fire could have arisen due to an Electrical Fault—

(a) As regards the electrical system, it is designed with built-in safety features by way of fuses and MCBs (Miniature Circuit Breakers) which constitute the best possible protection against fire, simply because these fuses/MCBs are expected to blow off long before any potentially dangerous situation can develop. Because of separate cables for the negative and the positive "shorting" (or, short-circuits) can occur only when the insulation fails together in both the cables/wiring. Moreover, any spark is instantaneously accompanied by the fuse blowing off, as amply shown [para 27 *supra*] in a recent RDSO test. Thus, persistent sparking, which is necessary to activate a fire that was triggered off by the initial spark can occur only if the fuse is so heavily over-rated that it does not 'fuse'.

(b) In this case, the records show that along with the major 'A' Schedule for POH, this Coach was completely rewired and the PVC insulated positive and negative cables were set apart by separated cleated connections. The records also showed that (it being well-known that loose joints lead to heating) solder-less end connectors/terminals were properly crimped and that branch wiring was jointed to main cables with open-type ferrules duly hand-crimped afterwards. Moreover, examination of the coach did show that all the dynamo fuses (which were intact) as well as the ends of the 'blown' fuses of the batteries were of the proper size/gauge. Accordingly, there is no reason to doubt that all the other fuses which were all destroyed with the rest of the wiring (cables, etc.) were not of the correct specification.

(c) It is appropriate at this stage to recall the two worthwhile points made by Shri Gupta in Paras 22(b) and 22(d). One was about all the various bits of wiring (which had survived the fire) being of the correct size, whereby any tendency to over heating is ruled out. His other point was that there was some appreciably tangible time-gap between the discovery of the fire and the lights going off whereas had the fire been of electrical origin, the normal expectation was that the lights should have gone off almost immediately as the fire broke out.

(d) Furthermore, there is also the time-gap between the actual outbreak of fire and its discovery and, considering the rapidity with which the whole coach got enveloped in flames within minutes of the discovery of fire, this time-interval cannot be ignored, indeed, the logical conclusion would be that, for it to have attained the scale and magnitude that it in fact did, the fire must have broken out immediately as the train was leaving Mauranipur.

(e) Taking into account what has also been brought out earlier in paras 27 and 31, the evidence summarised in paras 21 to 23, and the "phenomenal time-lag" that occurred between the outbreak of fire and the lights going off, I conclude that it has been fairly well established that the cause for this fire has to be found elsewhere, other than any electrical fault.

35. As to the Probable Cause for this Fire—

(a) External factors having already been contraindicated via the reasoning propounded in paras 33(b) to 33 (d) *supra* and with persistent sparks caused by electrical shorting or electrical fault ruled out, the origin of the fire (which must have started within the 'E' cabin) can but be traced now, by the due process of having eliminated other feasible scenarios, to a naked fire-inducing device.

(b) Despite any claims to the contrary, the extent of fire damage suffered by this Coach leaves hardly any room to doubt that a tremendous quantity of fire-supporting and fire-excitable material is contained in it by way of rexine, foam latex, timber, artificial materials, etc. Whence did the fire initiate is the only question that remains to be answered. Sabotage (or, arson) was alluded to in para 22(d) but, as pointed out in para 26(c), there was no evidence whatsoever to support this hypothesis. Thus, although sabotage is not clearly outside the realms of probability (for, stranger events have indeed happened on this earth!), it does seem rather far-fetched to suggest such a pre-meditated incendiary exercise merely because one of the passengers carried with him a large sum of money plus a pistol.

(c) The only postulate remaining for consideration is the accidental or inadvertent outbreak of fire within the empty 'E' compartment, and one may visualise the following scenario:—

- (i) Shri K. Iyer is asleep in the coupe 'E';
- (ii) Qutab Express halts at Rora and Shri Keshwani (the Conductor), upon entering the Coach, wakes Shri Iyer up and cautions him that the next stop is Mauranipur, his destination.
- (iii) Unable to go back to sleep, Shri Iyer proceeds to pack up his luggage and, to "kill the time" until the train arrives at Mauranipur, he starts smoking;
- (iv) As the train comes to halt at Mauranipur, Shri Iyer impatiently drops the cigarette stub in the ash-tray omitting, however, to snuff out the burning end completely. The ash-tray is chock-ful of bits and pieces of paper (passengers are wont to tear off their unwanted papers, and stuff the pieces sometimes in ash-cans), and the bits of paper caught fire, and one or more of them fell on-to the turned-down lower berth, leading to a conflagration;

OR

The train arrives at Mauranipur and Shri Iyer, (perhaps already feeling exasperated at having selected this particular train to travel by and also gnawed by doubts as to whether he would be able to secure at that unearthly hour any porter on the platform or any conveyance outside the station) restlessly throws his cigarette away, without snuffing it out completely, which starts off a fire;

OR

Shri Iyer in the meantime having "dozed off", the burning cigarette drops off his fingers and, startled as the train comes to a halt, he rushes out of his Compartment with his luggage, forgetting to check up about what had happened to the cigarette that he had been smoking. The burning cigarette now triggers off a fire;

- (v) The flames soon rise into the ceiling, the reflection of which is noticed by Shri Anil Patel as it falls on the fast receding ground outside the Coach.
- (vi) Tremendous amount of smoke gets generated as the fire starts consuming the huge quantity of fire-supporting material which is present in the coupe by way of furnishings/partitions, etc., and the smoke soon starts billowing into the corridor via the window and also via the gaps all-round the door-way, leading to the discovery of the calamitous situation.

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(d) As already mentioned in para 12(c), the Railway was unable to provide Shri Iyer's address, which precluded any opportunity to verify the above hypothesis nor indeed is there any evidence that Shri Iyer does "smoke". In any case, it could scarcely be expected, even with hopeful serendipity, that anyone would care to admit to having left behind, however unwitting and inadvertent his action might have been, an unsnuffed burning cigarette.

(e) It is thus a great pity really that such a devastating fire does consume all evidence within itself, leaving nay a shred of clue to draw any inference from. Still, on the basis of all available evidence and having also eliminated the various other possibilities thereto, I conclude, on the balance of probabilities, that this accident was caused by some inflammable material in 'E' Compartment of FC Coach No. CR 2934 catching fire due to having come into contact with some naked fire-inducing material, such as a burning cigarette-end or burning match-stick, which was left unintentionally behind by a passenger as he vacated that Compartment to de-train at Mauranipur.

36. As to whether this Fire could have been Averted—

(a) From the foregoing analysis, it become clear that this was case of an "accidental fire" that was triggered off in all probability by the negligence of an un-alert passenger. Notwithstanding the argument that the outbreak of such an accidental fire could not 'ipso facto' be averted it must nevertheless not be ignored that it was certainly a feasible proposition for it to have been quickly put out before it had a chance to attain unmanageable dimensions. For one thing, had a Coach Attendant been positioned in this particular FC Coach also (as was the case with the other 2 FC Coaches on this train), it should be regarded as more than a mere conjecture that he would in all probability have acted as follows, and in that process he could hardly have failed to notice the incipient fire and put it out quickly all by himself or, as is more likely, with the collective assistance of the others in this Coach, whom he would have roused up by raising an alarm;

- (i) Carefully check up that the passenger was not leaving behind in the compartment any of his personal effects ;

and/or

- (ii) render whatever help that appeared necessary to the de-training passenger ;

and/or

- (iii) later, after seeing the passenger safely on the platform, return to that Compartment in order to put up the pulled-down berth or may be to enjoy a brief respite of "forty winks" himself in the now empty Compartment, or simply to close the door.

(b) Most regrettably, there was no Attendant in this Coach [Para 12(a) supra] and it is perhaps unreasonable to expect similar action from a Conductor, who had already done his duty in waking the passenger up and who was himself quite comfortably settled at that stage in the 'G' Compartment attending to official paper-work along with another fellow Railwayman.

37. As to whether the Damage could have been less severe—

(a) No doubt, certain apparently cost-effective fire-prevention measures had been formulated by the RDSO, which are being implemented by the Railway to its own time-bound programme that is consistent with its resource-availability profile budget-wise, manpower-wise and material-wise. That this planned introduction of the so-called fire-resistant or fire-retardant measures and/or materials as well as the fire-proofing efforts has totally belied the Nation's hopeful expectations is quite clear from the extent of damage suffered by this Coach [Para 25].

(b) Incidentally, there has also been another decent case on this very Jhansi Division, which was inquired into by the Railway Central Railway's File No. T. 102.P.W2/80-81] and where also the entire interior of a SLR Coach (which does not have foam-rubber/retene furnishings) was totally destroyed alongwith 47 packages in the Luggage Compartment, as even the incipient fire could not be put out by the "on-train" portable fire-extinguishers, even though the fire was discovered (it being morning time, when passengers were fully alert) almost at once.

Date/Time : 08.03 hours on 15-5-1980.

Coach No. : SLR No. CR 6128.

Train : 108 Up Bundelkhand Express.

Location : Km. 1182/11, between Mauranipur and Ranipur Road Stations on the same Jhansi-Manikpur Section.

Estimated Cost of damage : Rs. 1,03,000, despite the furnishings free Luggage Compartment and the austere furnishings elsewhere in that SLR Coach.

Remarks : The fire, alleged to have got ignited by the live burning matter in an iron "chillam" getting into contact with timber in the Coach-work of the Second Class Compartment was eventually extinguished only after the Jhansi-based Fire Brigades (Railway as well as Civil) arrived at Ranipur Road Station.

(c) The inescapable inference to be drawn from the above is that, unless the inputs by way of fur-

nishings/fittings are metallised or otherwise rendered much more effectively fire resistant than at present, any fire that is not put out promptly will really "get going", with simply no hope then of salvaging the interior of the Coach.

38. As to the effect of the "delayed" stoppage of the Train—

(a) The adverse comment of several witnesses [Annexure I and paras 14(c), 15(b), 20(a) and 20(b)] on the unusually long time taken for the Qutab Express to stop appeared 'prima facie' to be simply the effect of the well-known psychological phenomenon of stress-induced time-dilation effect, when people under emotional strain often feel that the time passes far too slowly, as it were. Following the logic contained in para 32(d), however, it does appear that the alarm chain must have been for the first time pulled in FC No. CR 2934 even before the train reached Teharka, whereas it travelled some 5 Km plus beyond teharka before halting.

(b) The first and foremost point to note in this context is that the outbreak of fire and its escalation into a conflagration within the Coach on the one hand and the passage of the train on the other hand were events which were not mutually interrelated. Whereas it is doubtless significant that, had the fire been discovered sooner, the results would have been less damaging, there was no complaint or insinuation from any witness that the unduly long time taken by the train to halt contributed to any specific loss, other than giving some anxious moments of fright to the passengers. For instance this particular factor had no effect on the salvage of luggage and belongings by passengers.

(c) It is true, of course, that the sooner a train stops, the sooner will be the commencement of any fire-fighting measures. But, in this case, the fire was raging so fast that it was already quite beyond the capacity of the 2 portable fire-extinguishers in the rear Brake Van plus the single portable fire-extinguisher in the Locomotive to combat. In the event, the Jhansi fire fighting unit arrived at Niwari [para 7(d)] by 06.40 hours whereas the burning Coach was brought to this Station [para 7(b)] at 07.05 hours. As the fire had almost virtually spent itself by the time the fire fighting activities started, it may be taken that a few minutes saved in braking the train to a halt with the utmost expedition would have made scarcely any difference to the final outcome.

(d) Albeit only of "academic interest", the question still arises as to why indeed the Driver took so long to stop the train and, albeit that it was not asked of the Driver, I had had informal discussions with a few Diesel-Drivers as to how they would tackle such a situation in the face of a

known background that the Jhansi-Manikpur Section has long been notorious for the alarming frequency of alarm-chain pulling as well as dacoity. The replies I got followed an uniform pattern: the Driver, having felt the slight jerk and noticed the drop in the vacuum gauge, would at once look back to see if anything was really wrong with his train and, provided that nothing seemed amiss, he would very gradually control his train by easing off the throttle to "OFF" and gently applying the brakes, which would have the desired effect of frustrating the alarm-chain-pullers, because the train would actually halt quite a few kilometers away from where it would otherwise have stopped, has he straightway taken emergent braking action as per the expectation of these anti-social elements.

39. As to the role of the Conductor and the TTE 'Captain'—

(a) After establishing [para 33] that the fire could have broken out only in 'E' Cabin (with thick black smoke spilling out into the corridor from it), it is easy to see in retrospect that both the Conductor (Shri Keshwani) and the TTE 'Captain' (Shri Yadav) sought to confuse the issues by testifying not only to having seen the smoke emanating from the front end of the Coach [Annexure I] but also to having "heroically risen to the occasion by waking up the occupants of cabins 'A' to 'D' and doing several other things as well. It now becomes readily apparent that, had they indeed performed all the actions that they said they did they would have certainly become aware of the real source of the fire.

(b) Whereas, had these two Railway Staff adhered to the simple truth, they could not, in all fairness, be taken up for their failure to awaken the passengers occupying the cabins 'A' to 'C', particularly if the apprehended any danger to their life and limb in venturing across the "smoke barrier" to the front of the corridor, they chose instead to mislead by creating a 'smoke screen' of their own, behind which they fabricated a hypothetical scenario.

(c) It is no wonder then, that most of the passengers wrote critically [Annexure I and Para 12 (b) (ii)] that, conspicuous only by their absence, Railway Staff rendered no assistance whatsoever. The same TTE 'Captain' (Shri D.R. Yadav) was co-incidentally travelling on duty by 108 Up Bundelkhand Express the SLR No. CR 6128 of which caught fire on 15-5-1980 [para 37(b)], and he was rewarded by the Division for the services rendered on that occasion. One wonders, therefore, whether that reward had any influence on the concoction of their own versions by Shri Yadav and Shri Keshwani on what transpired after the discovery of fire in the subject FC Coach No. CR 2934.

VIII. CONCLUSIONS

40. Cause of the Accident—

(a) Upon full consideration of the factual, material and circumstantial evidence at my disposal I have come to the conclusion that the outbreak of Fire in FC Coach No. CR 2934 at about 03.45 hours on 9-9-1980 was in all probability due to the ignition of some inflammable material in its 'E' Compartment which came into contact with some naked fire-inducing material, such as a burning cigarette-end or burning match-stick, which was inadvertently left behind by an un-alert passenger as he vacated this compartment to de-train at Mauranipur Station.

(b) This Accident is accordingly to be classified under the category of "Failure of persons other than Railway Staff".

41. Responsibility—

(a) The responsibility for this Accident lies with an unknown outsider, who in all probability was the passenger who was travelling in the 'E' Compartment of FC Coach No. CR 2934 up to Mauranipur Station.

(b) Minor infractions, such as those referred to in para 38 and 39 supra, which came to light during my Inquiry, have been separately referred to the Railway for action.

IX REMARKS AND RECOMMENDATIONS

42. Improvement in the fire-resisting capability of Coaches—

(a) As brought out earlier [para 37(c)], any fire-retardent or fire-resistant measures so far taken have actually proved to be of little avail, once a fire gets going. Also, the description of the gutted Coach [para 25] is proof enough to the presence of substantial quantities of fire-excitable, fire-supporting and fire-propagating substances that variously go into a Coach by way of furnishings/fittings. It is, of course, economically meaningless to think in terms of fire-proofing a Coach. Indeed, even protection against fire, once it has gone beyond a certain point, cannot be regarded as an economically practicable proposition, however desirable and laudable the idea may be. Hence, the only pragmatic solution would lie in the improvement and upgradation of the inherent or intrinsic resistivity of the various inputs into coach-building to withstand a limited fire-attack, which might be expected to occur within the first few minutes of its outbreak. It is accordingly recommended that the Railway Board should take a long term perspective of this vexing problem and accord high priority to the development, through the expertise available in the RDSO, of appropriate surface-treatment techniques and of fire-resistant products, not only for the purposes of manufacturing new Coaches at the ICF, Perambur, but also

for their progressive incorporation into the existing Coaches on a programmed basis, giving preference initially to the more expensive FC and AC Coaches.

(b) In this context, reference is also invited to Railway Board's Case No. 76 /Safety (A&R)/1/6 on the Inquiry into the Fire in Coach No. 746 A on 433 Down Local at Western Railway's Jogeshwari Station on 7-3-76, and the correspondence resting with letter No. RX. 23-T (3)/76 dated 28th August 1980 from the Chief Commissioner of Railway Safety, wherein attention was drawn to certain products recently developed in the USA.

43. An Attendant to be invariably positioned in each FC Coach—According to the extant directives [Railway Board's letter No. 67-TGI/146 dated 25-4-67], excepting in the case of vestibuled trains, an Attendant is to be posted in *each* First Class Corridor-type Coach for the convenience of passengers therein. As compliance with this policy would have [para 36] in all probability averted this disaster, it is strongly recommended that the deployment of an Attendant in each and every First Class Coach shall be regarded as a mandatory essential and that the Central Railway should urgently take suitable steps to ensure the same.

Yours faithfully,

sd/-

(N.P. Vithal)

27-1-81.

Commissioner of Railway Safety,
Central Circle, Bombay.

Bombay,

Dated 27th January, 1981.

Railway Boards comments on various paras of the Report :-

Para 42(a) & (b) : The following fire preventive measures, as recommended by RDSO, have been implemented by the Railway Administration :

- (i) Replacement of combustible ceiling material by lumpet asbestos sheets.
- (ii) Application of fire resistant paint over wooden batten troughing.
- (iii) Metallising the fitting of the coaches except the seats and berths.

The question of finding suitable fire resistant material for interior furnishing of the coaches is receiving attention of the RDSO. As for correspondence resting with Commission of Railway

Safety's letter No. RS. 23-T(3)/76, dated 28-8-80, attention is invited to RDSO's letter No. MC/CB/Cushion, dated 27-4-81, wherefrom it would be seen that the RDSO is in touch with M/s. Craftex Mills, Philadelphia (U.S.A.) for obtaining relevant information on the fire resistant material, the Commission had referred to.

Para 43: As advised by the Railway Administration, an attendant is provided in each of the first class coaches on Qutab Express with effect from 1-8-81. Necessary instructions are being issued to the the Railways to ensure compliance of the directive contained in Board's letter No. 67/TG-I/146, dated 25-4-67.

Price : (Inland) Rs. 13.00 (Foreign) £ 1.52 or \$ 4 68 Cents.