PUBLIC ACCOUNTS COMMITTEE

(2001-2002)

TWENTY-NINTH REPORT

(THIRTEENTH LOK SABHA)

AIRCRAFT ACCIDENTS IN INDIAN AIR FORCE

Ministry of Defence

Presented to Lok Sabha on 21 March, 2002

Laid in Rajya Sabha 21 March, 2002

L O K S A B H A S E C R E T A R I A T

N E W D E L H I

March, 2002 / Phalguna, 1923 (Saka)

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CONTENTS

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(2001 - 2002)

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 # Appointed as Chairman of the Committee w.e.f. 15.3.2002 vice Shri Narayan Datt Tiwari

resigned from Chairmanship of Committee consequent upon his appointment as Chief Minister.

** Elected w.e.f. 29 November, 2001 vice Shri Vijay Goel ceased to be member on his appointment as a Minister.*

*** Elected w.e.f. 29 November, 2001 vice Shri Annasaheb M.K. Patil ceased to be member on his appointment as*

a Minister.

INTRODUCTION

I, the Chairman, Public Accounts Committee having been authorised by the Committee to present the Report on their behalf, do present this Twenty-Ninth Report on Paragraph 7 of the Report of C&AG of India for the year ended 31 March 1997, (No. 8 of 1998), Union Government (Defence Services – Air Force & Navy) relating to "Aircraft Accidents in Indian Air Force".

2. The Report of the C&AG for the year ended 31 March, 1997 (No. 8 of 1998), Union Government (Civil) was laid on the Table of the House on 9 June, 1998.

3. The Committee took the evidence of the representatives of the Ministry of Defence (Departments of Defence and Defence Production & Supplies) and HAL on the subject at their sittings held on 22nd August, 2000 and 6th September, 2000. The Committee considered and finalised this Report at their sitting held on 8 January, 2002. Minutes of the sittings form Part II of the Report.

4. For facility of reference and convenience, the observations and recommendations of the Committee have been printed in thick type in the body of the Report and have also been reproduced in a consolidated form in Appendix* to the Report.

5. The Committee during their sitting held on 8 January, 2002 authorised the then Chairman, PAC (Shri Narayan Datt Tiwari, M.P.) to present the said Report to Parliament. The Report which was slated for presentation on 1st March, 2002 (as appeared in the revised List of Business dated 1st March, 2002) could not be presented due to the adjournment of the House. Subsequently, Shri Narayan Datt Tiwari, M.P. tendered his resignation from the Chairmanship of the Committee consequent upon his appointment as Chief Minister of Uttaranchal Pradesh.

6. The Committee would like to express their thanks to the Public Accounts Committee (2000-2001) for taking evidence on the subject and obtaining information thereon.

7. The Committee would like to express their thanks to the Officers of the Ministry of Defence (Departments of Defence and Defence Production & Supplies) and HAL for the cooperation extended by them in furnishing information and tendering evidence before the Committee.

8. The Committee place on record their appreciation of the assistance rendered to them in the matter by the Office of the Comptroller and Auditor General of India.

N. Janardhana Reddy,

Chairman, Public Accounts Committee

NEW DELHI;

19 March, 2002 (*28 Phalguna 1923 (Saka))*

REPORT

Introduction

An aircraft accident is an occurrence not directly caused by enemy action which involves one or more aircraft resulting in injury to persons and/or damage to aircraft and property. Accidents are categorised as 'major' or 'minor' depending upon the extent of damage sustained. Each accident or incident is investigated by an independent Court of Inquiry (COI) consisting of specialists from various fields. The determination of causes of accidents and incidents and the timely introduction of preventive measures together with their implementation constitute the core of the Indian Air Force's (IAF) flight safety programme.

2. *Audit Paragraph*

The Report is based on paragraph 7 of the Report of the Comptroller and Auditor General of India for the year ended 31 March 1997 (No.8 of 1998), Union Government (Defence Services – Air Force & Navy) relating to "Aircraft accidents in Indian Air Force. The Audit Review addressed the issues pertaining to the investigations of accidents and follow up measures taken by the IAF during the period 1991-97.

3. *Aircraft mishaps*

Audit paragraph highlighted that 187 accidents and 2729 incidents of Indian Air Force (IAF) aircraft took place during the six year period April 1991 to March 1997. In 147 accidents, the aircraft were totally destroyed and the IAF lost 63 pilots in accidents during this period.

3.1 *Rate of accidents*

3.1.1 According to the Audit paragraph, overall rate of accidents in IAF calculated with reference to number of accidents for every 10,000 hours of flying ranged between 0.89 and 1.52 during the period 1991-97. Audit scrutiny revealed that the rate of accidents in respect of fighter stream was high and ranged between 1.89 and 3.53. The rate of accidents in MIG-21 variants was still higher and ranged between 2.29 and 3.99. The Committee desired to know the specific reasons for high rate of accidents in MIG variants. The Ministry of Defence furnished the following reasons in this regard:

i. "The MiG variants (21, 23 & 27) account for 74% of the fighter aircraft of the IAF. Consequently, they also account for the bulk of flying effort and thereby are exposed to the risk inherent in the conduct of fighter flying.

ii. Technology has today helped to reduce the overall accident rate on modern aircraft. Mirage 2000 aircraft is a live example. Comparatively, the Mig-21 aircraft is a dated technology, making it more demanding on the pilot and maintenance crew to fly and maintain this technology aircraft. A comparison is therefore not justified. In this context, it would be pertinent to highlight that, the accident rate on Mig-21 variants during the period 1991-97 is similar, if not better than the period of the 70s & 80s, when the aircraft was being pressed into service at its peak. This indicates that the efforts put in for flight safety have yielded results.

iii. Quality control on spares and rotables has, to some extent, being compromised with the breaking up of the erstwhile USSR."

3.1.2 On being asked about the accident rate prevalent in other advanced countries, the Ministry in a note *inter-alia* stated that from the limited information available, the accident rates of advanced countries, the USA and other European nations, were considerably low-approximately 0.38 for the USA and 0.57 for the UK. According to the Ministry, the European aircraft fleet in the IAF compared quite favorably. It was further stated that higher accident rate in IAF was

attributable to the medium or low technology segment of the fighter aircraft fleet of non-western origin.

3.1.3 The Committee desired to know about the number of accidents and incidents that took place including total loss in these accidents during 1997-2000. According to the Ministry, during this period, 84 accidents and 1516 incidents took place. This resulted in a loss of 67 aircraft and 28 pilots. Updating the figure of total accidents upto August 2001, the representative of Air Headquarters (HQrs.) intimated the Committee in evidence that during 1991-2000, there had been 283 accidents and 4,418 incidents in the IAF. Of these 283 accidents, 221 aircraft were totally destroyed and 100 IAF pilots lost their lives. In their vetting comments on the information furnished by the Ministry, Audit pointed out that out of 84 accidents reported, 32 accidents occurred in 1999-2000 only. The rate of accident had also shown a steady rise during the past three years.

3.2 *Stream-wise accidents*

3.2.1 Audit paragraph highlighted that most of the accidents involved fighter aircraft and ranged between 63 and 79 percent of total accidents whereas that of the trainer aircraft ranged between 8 and 23 per cent. Audit pointed out that even though there was decline in total number of accidents during 1996-97, the accidents involving fighter aircraft remained as high as 75 per cent of the total accidents. Besides, in nearly 62 per cent of fighter aircraft accidents, the aircraft involved were MIG-21 variants of 1960's vintage.

3.2.2 The Committee enquired about the rate of accidents involving MIG-21 aircraft during the period 1991-97 as well as the comparative statistics in respect of other fighter aircraft held on inventory of IAF. The Ministry stated that the rate of accidents on MiG-21 aicrcraft was lesser than the rates of accidents on MiG-23 and MiG-27 aircraft. However, it was more than the rates of accidents on MiG-29, Jaguar and Mirage-2000 aircraft. The Committee enquired about the number of MiG-21 aircraft lost including their value during 1991-2000. According to the Ministry, 100 MiG-21 aircraft valuing Rs. 238.79 crore were lost during the period. In the vetting comments, Audit brought out that the Air Force lost 38 MiG-21 aircraft during 1997-2000 alone. Further, according to Audit, out of 84 accidents reported during 1997-2000, 58 accidents (69 per cent) involved MiG variants.

3.2.3 Asked to explain the measures instituted by Air Headquarters and the Ministry of Defence to reduce the rate of accidents, the Ministry in a note enumerated some of the important measures taken to avoid recurrence, more importantly those relating to prevention of accidents as follows:

i. "Each accident/incident is investigated by an independent Court of Inquiry (COI) consisting of specialists from various fields;

ii. Determination of the cause and timely introduction of preventive measures;

iii. Recommendations of the Committee on fighter Aircraft Accidents(COFAA) report are being implemented and the progress reviewed regularly;

iv. Human Error (Aircrew/Technical) accounts for a substantial percentage of accidents/incidents. Measures to enhance quality of training to improve skill levels, ability to exercise sound Judgment and improve situational awareness are constantly being reviewed and implemented. Renewed thrust on acquiring simulators and the Advanced Jet Trainer (AJT) is a step towards improving the quality of the man behind the machine;

v. Technical Defects contribute to the cause of accident and a major portion of the incidents. Constant interaction with HAL at the highest level is being maintained to discuss serious flight safety issues. Original Equipment Manufacturer (OEM) at Russia, France, Israel, Romania, Poland and the UK are also approached to provide support to overcome the technical defects. During the last one year a number of

remedial measures, special checks/modification on the HAL manufactured/overhauled aircraft have been initiated;

vi. Defence Research & Development Organisation (DRDO) and other independent agencies Director General of Aeronautical Quality Assurance (DGAQA), Centre for Military Airworthyness Certifications (CEMILAC) are being involved in all cases of accident investigation, to get a wider perspective and scientific analysis for preventing accidents/incidents; and

vii. Measures to reduce bird menace are being implemented at a fast pace in accordance with the Committee on Fighter Aircraft Accidents (COFFAA) recommendations."

4. *Causes of accidents*

Human error, technical defects and bird strike were the main contributory factors leading to aircraft accidents and incidents in IAF. These are discussed in the succeeding paragraphs.

4.1 *Human error*

4.1.1 Human error comprises of error on the part of aircrew on flying duty or ground duty or of both. According to Audit, majority of human error accidents were caused as a result of inadequate flying skill, error of judgment, poor airmanship/supervision, inadequate briefing, lack of situational awareness and inability to negotiate even relatively innocuous weather condition. There were instances of accidents due to gross negligence, indiscipline and inability to handle aircraft emergencies and mishandling of controls. Audit paragraph highlighted that of the total 77 cases of accidents due to human error during 1991-97, 21 cases were due to inexperienced pilots, 10 cases were due to error of judgment and 8 cases were due to non-adherence to laid down procedure and instructions. The representative of Air Headquarters informed the Committee in evidence that out of 283 accidents which took place from 1991 to August 2000, 119 accidents i.e. 42 per cent were on account of human error. He intimated the Committee that during the period 1997-99 the human error accidents had shown an increasing trend. He added that 14 accidents took place in the year 1999 and five accidents occurred till August 2000.

4.1.2 Apprising the Committee as to how aircraft accidents occur due to human error, the representative of Air Headquarters explained:

> "Many human error accidents are at times contributed due to provocation by other factors where it could be inability to cope with a technical defect which the pilot should have coped with. After all, at that time a mechanical problem could occur but he must have been able to cope with it. So, human error accidents have a combination of technical as well as skill problems".

4.1.3 Elaborating further on the weak areas and action taken to reduce human error accidents, he deposed:

> " The error of skill and judgement is inherent in our flying discipline. Secondly, weeding out of weak pilots during training is an important area in eliminating error of skill and judgement which we are doing very rigidly. The other action taken to eliminate errors of skill and judgement is restructuring of training. This is an on-going process and will keep showing improvement as we refine our training system. Of course, in terms of training the factor of AJT is always brought in and is mentioned."

He further added:

> "The other error, which comes, is inadequate experience and non-compliance of laid down instructions. Inadequate experience and non-compliance of laid down instructions have also caused accidents over the decade. We have identified that a

pilot is more susceptible during his initial period of six years or six hundred hours of flying. During that period he is more susceptible to human errors because his skills are still developing. It is during this time that we give maximum attention to the pilot and we ensure that very strict disciplinary action is taken against defaulters so that for the rest of their career they do not make such mistakes. However, still we find that there are incidents where pilots have through their disregard for rules and regulations cause certain accidents. This is inherent in the system. But we still persevere and correct those occurrences as and when they take place."

4.1.4 To a query from the Committee about the study being undertaken by Air Headquarters on the accidents due to error of ground crew, the representative of the Ministry explained that interaction with ground crew is called human error servicing. Elaborating on this point, he further deposed:

"Human error servicing study has been completed. In fact, this is an on-going process. Almost every year a survey is done, studies are carried out, problems are highlighted and action is taken. This year the study (has been completed) and the implementation process is going on. Any Accident Prevention Programme for each year is spelt out by the Command at a Command Flight Safety Council meeting which is attended by the Chief of Air Staff. He approves it and then action is taken within a period of one year. This is part of our business and it is an on-going process. It is going on as far as human error studies are concerned."

4.1.5 In a case study, undertaken by Audit it was highlighted that two AN-32 aircraft collided during dark night paradrop rehearsal sortie in mid air in April 1992 due to aircrew's over confidence, disregard to briefing and lack of situational awareness involving loss of Rs.11.82 crore besides killing eight aircrew members and one passenger. Investigations revealed that re-employed and out of touch pilots were permitted to fly a large formation sortie without preliminary practices. Asked what were the compelling reasons that allowed authorizing of that sortie when it was known that pilots were re-employed and out of touch, the Ministry in a note stated."

"It is a misconception that the re-employed officers were out of touch. The fact of the matter is that the officers were especially, re-employed for flying duties. Before assigning them to flying tasks, their currency and competence is checked out to the same level as any officer on regular employment. The CoI in its findings, also substantiated the fact that the re-employed officer was in current touch and also qualified for the sorties."

4.1.6 Further, the Committee desired to know whether the officer who authorized the sortie was aware of the limitations of pilots to undertake such sortie. The Ministry informed the Committee that the sortie was authorized by the then Flight Commander. It was stated that the Flt Cdr was the officer empowered to authorize the sortie. The Ministry emphasized that there was no abnormality in authorizing the re-employed officer for the sortie.

4.1.7 In their vetting comments on the information submitted by the Ministry in the instant case, Audit mentioned the following facts which made the statement of the Ministry inconsistent:

i. "The COI established that the accident was caused due to overconfidence, disregard for briefing and lack of situational awareness on the part of the pilots.

ii. In a special report submitted in April 1992 by the presiding officer of COI to the Inspector General (Inspection and Flight Safety) at Air HQ, the presiding officer observed that the station authorities (AOC, Chief Admn Officer, COO and C Eng O) were ill-prepared for the paradrop exercise. The Chief Admn Officer and C Eng O were not even aware that such as exercise was in the offing. He further noted that given the background, qualification and experience levels of the AOC and the COO, there appeared to be a shortfall in the expertise required to effectively supervise the training and operations of

the locally based transport squadrons. While endorsing the views of the presiding officer, the IG remarked:

"This merely strengthens my conviction regarding the general malaise and lowered standards which sustains almost without exception throughout the IAF."

iii. The IG had stated emphatically in May 1992 that it was a lacuna which permitted "out of touch" crew to fly large formation rehearsals without preliminary practices in smaller numbers by day and then, only, by night."

4.1.8 On being asked specifically what remedial measures were taken to avoid recurrence of authorizing inexperienced and out of touch pilots to fly aircraft, the Ministry in a note stated:

"Presently, there is no re-employment in the Flying Branch."

4.2 *Technical defects*

4.2.1 Indian Air Force lost a large number of aircraft due to technical defects. According to the Audit paragraph, 67 per cent of the total aircraft lost in 1996-97 were lost due to technical defects against 28 per cent in 1991-92. During 1991-97, 82 out of 187 accidents i.e. 44 per cent occurred due to technical defects. IAF intimated Audit in August 1996 that most of the accidents due to technical defects were attributable to manufacturing/overhauling agencies like Hindustan Aeronautics Limited (HAL).

4.2.2 The Committee were informed by the Ministry that during the period 1991-2000, 126 accidents i.e. 44 per cent were attributable to technical defects. Of these, 24 accidents were attributed to manufacturing/overhauling defects by HAL. The Sub-Committee (Defence) of PAC during their study tour in September 2000 visited HAL and discussed with them the relevant issues brought out in C&AG's Report on the subject. The Ministry (Department of Defence Production & Supplies) had also furnished information to the Sub-Committee on the issues dealt with in the Audit Paragraph. In their information, the Department of DP&S offered the views of HAL on the technical accidents attributed to them by IAF, which reads as follows:

> "This is not a statement of fact. All the aircraft in IAF inventory are not manufactured/overhauled by HAL and nearly 1/3rd of the aircraft are imported, which are either overhauled by IAF or sent to OEM. Further all TD accidents are not attributable to manufacturing/overhauling agencies like HAL. Technical Defect accidents are caused due to mal-function/failure of a component or a sub-system. Such a mal-function/failure could be due to inherent design inadequacy or induced due to manufacturing quality, maintenance lapses and operational violations. As TD accidents include material failures, design defect, manufacturing defect and human error (servicing), they have to be further categorised, as such, before apportioning the responsibility for TD accidents to the agencies like HAL, IAF, OEM, etc."

It was further stated that aircraft of non-HAL origin had more than 1/3rd share of TD accidents. Hence, according to them, most of the 'Technical Defects' accidents were not attributable to manufacturing/overhauling agencies. The users also had their contribution to TD accidents.

4.2.3 Giving an analysis of 82 TD accidents that occurred during 1991-97, the Department of DP&S *inter-alia* stated:

> "These include, 5 accidents due to 'TD+HE', 24 accidents involving aircraft of Non-HAL origin and 10 accidents involving aircraft of HAL origin where failure of engine/equipment of Non-HAL origin (Engine like Viper, R-23, R-29 and slat motor body of Jaguar aircraft etc.). Excluding these there are 34 Cat-I TD accidents involving aircraft of HAL origin accounting for 18% of the total number of accidents. Out of these 34 accidents, only 3 are attributable to HAL which is 1.5% of the total accidents."

4.2.4 In this context, the Committee desired to know the comparative status of accidents due to technical defects in respect of aircraft manufactured/assembled by HAL and those directly imported by the Government. The Committee were informed that out of 83 accidents of fighter aircraft caused due to technical defects during 1990-2000, 40 aircraft were of HAL origin and 43 were imported. Highlighting the performance of HAL origin aircraft in evidence, the Secretary, Department of Defence Production and Supplies *inter-alia* stated:

> "The rate of accidents on aircraft manufactured and overhauled by HAL is lower than those wholly imported and maintained either by the manufacturer or elsewhere."

4.2.5 To substantiate the point that aircraft of HAL origin performed better compared to imported aircraft of similar type and class, the Department of DP&S furnished the following statistics about the rate of Category-I TD accident during 1991-2000 to the sub-Committee:

a. "Rate of Cat-I TD accidents of MiG-27 (HAL built/overhauled) is less than 1/4th of the rate for MiG-23 (Imported/overhauled by IAF).

b. Rate of Cat-I TD accidents of Jaguar (HAL built/overhauled) is less than ½ the rate for MiG-29 (Imported and overhauled by IAF)

c. Rate of Cat-I TD accident of Kiran Jet Trainer (HAL designed and built/overhauled) is almost 1/4th the rate for Iskra trainer (Imported and overhauled by IAF).

d. Rate of Cat-I TD accident of the basic piston engine trainer HPT-32 (HAL designed and built/overhauled) is much lower in the IAF than accident for basic trainer T3A – Fire Fly of US Airforce.

4.2.6 On the rate of accidents of MiG-21, the Department in their note explained as follows:

> "As regards MiG-21, there is no imported aircraft of its type in IAF for comparison. The data on accident rate of MiG-21 aircraft operating elsewhere or any other aircraft of its class is not available for comparison. Hence, any statement on the accident rates could be subjective. The accident record of MiG-21 is not as abysmal as one would think considering its design vintage and the fact that it is a single engine fighter, demanding aircraft and were the most in action. IAF and HAL are making continuous efforts to bring down the accident rate of this important fleet."

4.2.7 During 1991-97, less than 50% accidents on MiG-21 variants could be attributed to TD. Most of these accidents were attributed to design inadequacies. Quality, maintenance and operational lapses had also contributed for few accidents. According to the Ministry major problem areas were identified and various steps were taken for improvement in MiG-21 variants. This is shown in **Appendix**. It is seen from Appendix that on the problem relating to Flame Tube Burning of R-25 engine caused due to design deficiency, a contract was signed with Russians for modification of design. During evidence, the Committee desired to know about the status of modifications. In response, HAL representative informed the Committee as follows:

> "The flame tube has already been re-designed. They have produced the flame tube and is under testing in that country."

The Committee were also apprised that pending design change of the engine, some interim measures were taken by HAL to effect improvement in the engine.

4.2.8 IAF intimated Audit that there had been reluctance on the part of HAL representatives to accept failures pertaining to their technical personnel, manufacturing techniques or quality assurances. In this context, the Department of DP&S in their note explained the position as follows:

"It is clarified that the Court of Inquiry (CoI) is a fact-finding body to establish the precise cause for failures. HAL representative as members in attendance of CoI, would provide the technical expertise and all assistance in investigation of failed components to establish the precise cause of the accident. HAL specialists cannot endorse the inferences/conclusions drawn, if they are not supported by material evidence, which is the essence of any accident investigation. HAL contests only on technical grounds and reasons for dissent are recorded. Hence, technical disagreement cannot be construed as reluctance to accept failures. In fact, dissents have to be encouraged to arrive at the root cause and to institute appropriate preventive measures. Out of 45 Csol on Cat-I accidents where HAL has participated during the review period, there has been agreement in 29 cases and 16 cases have been dissented. This reflects the need for expertise in accident investigation which has been stressed in the report of high level committee headed by Dr. APJ Abdul Kalam."

To substantiate their point, it was stated that the lapses reported against HAL in respect of two cases (MiG-21 and Avro aircraft) of accidents brought out in Audit Paragraph were subsequently resolved where HAL's initial viewpoint was found to be correct.

4.2.9 As per Audit paragraph, though a decision to impose a warranty clause on all HAL manufactured/overhauled aircraft or components was taken in principle as early as January 1995, yet no significant steps were taken in this regard till 1997. It is learnt from Audit that Air Headquarters forwarded a draft warranty clause to HAL in July 1998 which was examined and returned by HAL with comments in November 1998. On being enquired what were the constraints in finalizing the terms and conditions of the proposed warranty clause, the Ministry in a note stated:

"The constraints in finalizing the warranty clause on all HAL manufactured/overhauled aircraft, engines and components, primarily, relate to Techno-commercial aspects, which would result in basic cost enhancement of 7.5%, cost/payment rescheduling, issues related to premature withdrawal of equipment etc. The matter is under examination in the Ministry in consultation with all concerned."

4.3 *Bird strike*

4.3.1 According to the Audit paragraph, during the period 1991-97, 17 accidents and 574 incidents occurred due to bird hit. An Inter Ministerial Joint Sub-Committee (IMJSC) was formed to prepare an action plan to combat bird hit by sanitising of populated area around the airfields. The Sub-Committee in February 1990 recommended that the capital cost intensive schemes involving modernisation of slaughter houses, carcass utilisation centres, garbage disposal and sewerage/drainage system be met by the Central Government. They pointed out that though the problem areas and their remedial measures had been identified almost a decade ago, these could not be implemented due to lack of financial resources. Though in March 1995, Government decided to provide 100 per cent funding of these measures through schemes coordinated by the Ministries of Urban Development and Agriculture, Audit pointed out that no measures had been undertaken till March 1997 to combat bird hit accidents/incidents.

4.3.2 In the aforesaid background, the Committee enquired about the progress made towards implementation of the recommendation of the sub-committee in combating bird menace. The Ministry in a note stated that IMJSC was formed in 1990 to reduce bird activities around ten priority-I airfields. According to them, the progress on implementation of recommendations of IMJSC was slow due to lack of funds and commitment by the Ministries. It was stated that the original cost of Rs. 75.45 crore had been revised to Rs. 118 crores. According to the Ministry, an action plan was formulated for total denial of habitat of birds at ten Priority-I airfields. They submitted that once the plan was set in motion, progress would be closely monitored vis-à-vis constraints and necessary modifications would be effected.

4.3.3 To a related query from the Committee, the representative of Air Headquarters, during evidence *inter-alia* deposed:

> "The significance of minimising bird menace has been taken up on highest priority from December, 1998. A separate financial head for flight safety has been created and adequate finances for launching anti-bird measures like all-round vegetation clearance on the airfields, continuous grass cutting, and eradication of bird habitat. Even the areas that have been affected by bird hit cases have come down to a minimum after 1998. However, in respect of areas outside the Air Force bases where we have no control and the local flying areas, recommendations were made ten years ago on solid waste management, carcass and sewage disposal but they have not been implemented. Regular discussions with the MoD are held with the Inter-Ministerial Joint Steering Committee. The areas outside the airfields, I would submit, are still vulnerable to bird hits. During 1999-2000, the IAF lost two aircraft and one pilot due to two bird hits. This year, we have lost one at Palam due to a bird hit. The Inter-Ministerial Joint Steering Committee is supposed to set up abattoirs and come up with different measures for reducing bird population surrounding the airfields. Unfortunately, this has not progressed to the extent it should have progressed."

4.3.4 Audit paragraph highlighted that as a result of non-implementation of the measures recommended by IMJSC, IAF entailed a loss of Rs. 170.67 crore in bird hit accidents alone during the year 1991-92 onwards and even operational efficiency had to be compromised often, when vital operational missions and training exercises at low levels were forced to be either cancelled totally or restricted severely due to intensive bird activity around airfield. Asked about the number of accidents/incidents that occurred due to bird hit during 1997-2000, the Ministry intimated the Committee that there were two accidents and 231 incidents amounting to provisional loss of Rs.13.25 crores.

5. *Training*

Training is imparted to pilots in three stages in various training establishments. The first stage basic training is imparted on HPT-32 basic trainer aircraft. Thereafter, stage II training of the pilots takes place on Kiran/Iskra aircraft. After successful completion of stage II training and award of wings and commissioning, the trainees are trifurcated at stage III into fighter, transport and helicopter streams. Audit examined 141 cases out of 187 cases of accidents which occurred during 1991-97 and noticed that 77 accidents occurred during training sorties and remaining 64 in other sorties. The factors responsible for accidents are discussed in the succeeding paragraphs.

5.1 *Non-availability of advance jet trainer (AJT)*

5.1.1 According to the Audit Paragraph, the La Fontaine Committee set up to make an in-depth study into the accident pattern and entire training process found noticeable co-relation between the pattern of training and aircraft accidents. It pointed out in 1982 that there existed a quantum jump in skill/judgement as IAF had no suitable operational transitional trainer aircraft to fill the intervening gap before the pilots are taken on to the operational fighter aircraft. The Ministry intimated Audit that Hunter and MiG-21 were not specially designed as advanced trainer and had some limitations for imparting air combat and weapon delivery training. It added that acquisition of an advance jet trainer (AJT) would enable the IAF to impart better operational training to the pilots. As no AJT was acquired by IAF, the stage III training continued on Hunter and MiG-21. An analysis of accident data by Audit revealed that there were more accidents in Stage III training conducted on MiG-21 aircraft than on Hunters. While in MiG operational flying training unit (MOFTU), there had been 11 accidents during 1991-97, of which, three were fatal, there were no accidents in Hunter operational flying training unit (HOFTU). The Chief of Air Staff (CAS) viewed the Lack of AJT as one of the reasons affecting the aircrew performance and reportedly stated, in May 1992, that the use of an operational trainer such as MiG-21 for advanced jet training exposes the young inexperienced pilot prematurely to an operational type without essential transitional training on AJT. In April 1995, the Ministry had highlighted to

Prime Minister's office that lack of AJT was the main reason for human error accidents as pilots converting on sophisticated MiG-21 from Kiran/Iskra trainer had difficulties in coping with the quantum jump in performance and technology of MiG-21's as compared to pilots converting on Hunters. Stage III training on Hunter aircraft continued till 1996, though it was phased out of training role in 1991 itself. From 1996 onwards, stage training on Hunter aircraft had been discontinued and was being conducted on MiG-21's only, which was not optimally suitable for operational training role. The Audit in the vetting comments pointed out that the entire fleet of MiG-21 FL (Type 77/66) being utilised for stage-III training would be phased out by 2003-04.

5.1.2 On the question of procurement of AJT which was recommended in 1982 by LA Fontaine Committee, the Ministry intimated that approval of Cabinet Committee on Security (CCS) was obtained on 20 July 1993 for procurement of AJT. Negotiations had been in progress to identify a suitable vender to meet the IAF's long-term requirements. The Committee specifically desired to know the reasons for abnormal delay spanning over 18 years in procurement of AJT. The Defence Secretary, in evidence conceded that there had been a considerable delay in the procurement of AJT. He added that at some point of time, it made a progress upto a point and then stopped. He referred to the Report of Standing Committee (SCD)on Defence on the subject which was presented to Parliament on 25 February 1999. In their 4th Report, (12th Lok Sabha) the SCD had analysed the chronological sequence of events regarding action taken to procure AJT and the associated delays. It was learnt from the Report that though certain efforts had been made since 1984 which included exploring the possibility of developing an indigenous AJT by HAL and various other options, the Government failed to decide upon any concrete option for acquiring AJT till 1999. Giving the latest position in this regard, the Defence Secretary stated as follows:

> "The point is that we have now zeroed in on the Hawk of the British Aerospace Industry. The problem is not about negotiations or the price. We are willing to compress all the procedure. The problem is that there are a number of sub-systems of American origin in the Hawk. It is just not acceptable to us because once they come to us, there is going to be a problem of product support. So, the Hawk manufacturers are now exploring the technical feasibility of replacing the American sub-systems with alternate sub-systems. The matter is with them now to give us an option. They are working on that. The Chief of the Air Staff had discussions with them. He had laid down a very specific time-bound schedule. Once they come out with a technical alternative, then, we can close in on this option of supply for the Hawk."

5.1.3 Asked to spell out the impact of non-availability of suitable trainer aircraft in the training of pilots for such a long time, the Ministry submitted that in lieu of an advanced jet trainer, training had been conducted on an operational trainer aircraft which has inherent limitations for *ab-initio* jet flying training. Highlighting the constraint faced by the trainees on a MiG-21 trainer, the representative of Air Headquarters admittedly stated in evidence:

> "For a training mission, however, we will not say that it is an optimum aircraft. It is a sub-optimum aircraft."

5.1.3(a) It was stated that the aircraft (MiG-21) as a trainer was demanding. Explaining the concept of demanding aircraft, the Defence Secretary in evidence stated:

> "What really happens is, the threshold speed of Kiran is 160 km. and it straight goes to 340-360 km. when the pilot is switched over to the MiG-21. There are a number of factors where it means a quantum jump. Similarly, the rate of descent for Kiran is supposed to be given as two metres per second. For MiG it is 10 metres per second. There are more critical approaches because of absence of blown flaps and a number of things. It is a demanding aircraft."

5.1.4 Giving the details of accidents in MiG-21 operational Flying Training Units and Hunters operational Flying Training Units during 1991-2000, the Ministry stated that there were 19

accidents at MOFTU as compared to two at HOFTU. Human error and technical defects accounted for most of these accidents. The Ministry added that the reasons could be attributed partially to the use of trainer (MiG-21) for an advanced Jet trainer. The higher number of such accidents at MOFTU were attributable to the following factors:

> "a) More number of aircraft on strength, more trainees and consequently higher flying task is executed at MOFTU.
>
> b) Maintenance support inadequacies as highlighted earlier being an aircraft of Russian origin.
>
> c) Mig-21 (T-77) being used for these tasks are old technology aircraft and the aircraft per se is more demanding in its flying and maintenance activities."

5.2 *Unreliability of trainer aircraft*

5.2.1 *HPT-32 aircraft*

5.2.1.1 HPT-32 aircraft manufactured by HAL is in use since 1984 for imparting basic flying training of pilots. Audit paragraph mentioned that the prototype of HPT-32 developed by HAL was accepted with diluted Air Staff Requirements (ASR) and the reliability of its engine had been suspect since its induction as there had been 5 serious and 3 major accidents and 74 incidents between 1988-1995. Despite implementation of operational instructions recommended by a high level joint HAL – IAF study team in August 1991 which had examined various maintenance and operation aspects as well as reliability of the engine, the engine snags still persisted. In 1995 itself, there had been 409 engine related snags creating a grave doubt on reliability of the engine. The inquiry into fatal accident at Air Force Academy and another at Basic Flying Training School in October 1995 pointed towards malfunctioning of the engine. A fresh joint study team was ordered in November 1995 which submitted its recommendations in December 1995. While implementation of recommendations was in progress, more cases of engine snag came to notice. The entire HPT-32 fleet had to be grounded in December 1995. Air HQ, intimated Audit that the unreliability of the basic trainer, where experienced level of neophyte pilots to cope up with such serious emergencies was very limited, was a matter of serious concern. Consequent to engine snags, limitation had been imposed on solo flying of cadets. The basic trainer aircraft, therefore, remained unreliable.

5.2.1.2 In their reply furnished to the Sub-Committee (Defence) of the PAC, the Department of DP&S clarified that HPT-32 was not accepted with diluted ASR. According to them, in any design and development programme, it is a standard practice that at an appropriate stage of development, certain concessions on the original ASR are mutually accepted after detailed discussions and technical appreciation. In any ASR, there are three categories of requirements viz. Essential, Desirable and Flexible. They mentioned that IAF would never relax on essential requirements for their operations. They argued that these concessions should not be deemed as dilution of basic requirements of the aircraft.

5.2.1.3 As regards the causes of accidents in HPT-32, the Committee were informed that out of the 8 accidents, three were due to human error, four were due to technical defect and one was due to both technical defect and human error.

5.2.1.4 Commenting on the reported unreliability aspect of the engine of HPT-32 causing accidents, the Department of DP&S in their reply further submitted that HPT-32 aircraft, no doubt, had problem of engine stoppages but most of them were on the ground, during landing roll, with the throttle at idle position. A lasting solution could not be found as the stoppages were random in nature and were not repeatable during the investigations. According to them, out of the 74 incidents, 69 were on the ground and five engine failure incidents occurred in air. The reason for all the five engine failures in air could be clearly established and measures to prevent recurrence of such incidents were stated to have been taken. The Committee were further

informed that inspite of the best efforts to bring out the difference between 'engine failure in air and 'stoppages on the ground' and clarifying that engine cut incidents on ground were not a cause for concern, the required confidence could not be generated. Hence HPT-32 fleet was grounded for a short period in December 1995 and Air Headquarters also did impose some restriction for solo flying during 1996.

5.2.1.5 The Committee inquired about the steps taken subsequent to the joint studies conducted by IAF and HAL on the recurring engine snag noticed in HPT-32 aircraft. The Department in their note enumerated as follows:

> "After joint studies, a number of measures were taken in the areas of overhaul, maintenance and operations. Although the number of incidents reduced, they were not eliminated altogether. HAL and IAF continued to work together to solve this problem and on our request, a specialist from Textron Lycoming visited India in Jan 96 for extensive interaction with IAF and HAL. He visited once again in 1997 and was appreciative of all the measures taken till then. He was categorical that the engine itself had no problem and advised that the airframe fuel system (be) examined. A *de novo* study of the airframe fuel system undertaken by HAL identified certain deficiency in the venting of air from the collector tank. Extensive experiments were done on the ground with a full scale airframe fuel system rig. The phenomenon of engine cut on the ground at idle RPM setting could be reproduced during the experiments. It was also found that at higher RPM range, the venting deficiency did not interfere with the functioning of the engine. After these simulations, aircraft fuel system was modified and flight evaluated by HAL test pilots and cleared for implementation at the operating units. As on date 56 aircraft have been modified and are performing satisfactorily".

The Ministry further informed the Committee that there had not been any accident in which engine cut as a cause had been established during the last five years.

5.2.1.6 Emphasizing the reliability aspect of HPT-32 trainer, the Department in their note stated:

> "While there were some problems that are not unusual in aviation, they were not so critical to term the indigenous basic trainer as unreliable. In fact, IAF had placed a repeat order for HPT-32. Notwithstanding the problem of silent stoppage of engine incidents on ground, the TD accident rate of HPT-32 is 0.24, whereas the TD accident rate of comparable aircraft T3A of USAF is 0.35."

5.2.2 *Kiran aircraft*

5.2.2.1 According to the Audit paragraph, the Kiran aircraft being used in stage II training of pilots was also beset with problems. Since 1989, there had been 11 cases of its engine flameout in air or on ground affecting the confidence level in reliability of the aircraft, thereby affecting the flying training. Besides, the performance of radio compass and radio transmission equipment fitted on Kiran aircraft had also been a weak area for considerable time. In the vetting comments, Audit pointed out that HQ Training command, Bangalore in January 1997 proposed to Air Headquarters for an early upgradation of avionics equipment on Kiran aircraft in the interest of flight safety.

5.2.2.2 The Committee desired to know the deficiencies in the Kiran aircraft which had made them reportedly unreliable and the corrective steps taken to improve its reliability. The Department of DP&S in their note explained:

> "The Kiran aircraft which is a basic jet trainer of indigenous design does not have any problem of serious nature to doubt its reliability in service. In fact, it is the most reliable aircraft of its class with a very low TD accident rate of 0.12, compared to 0.43 for Iskra (Imported). The accident rate of the Iskra aircraft is 3.5 times higher than that of Kiran aircraft. Out of the 11 flameout cases mentioned, 9 relate to imported Viper engines overhauled by IAF. This has been examined in detail by a

Committee constituted by IAF and the problem has been contained to a large extent. One case of Orpheus engine flame out was due to maintenance problems and corrective measures were introduced. The other case was a ground incident caused due to incorrect setting of Combined Control Unit (CCU) at the factory."

5.2.2.3 On the question of deficient avionics equipment in the aircraft, the Department in the same note stated that being a design of 1960 vintage, upgradation of avionics equipment though desirable, it was not flight safety critical.

5.2.3 *Iskra aircraft*

Audit paragraph highlighted that Iskra aircraft inducted into the IAF in 1975 had been operating without any location aid and survival items. During last 10 years Iskra had a total of eight accidents, of which, five were serious. The requirement of fitment of rear view mirror was considered essential during close low level tactical sorties of cadets. However, the aircraft continued to fly without any location aid and survival items. Audit, in the vetting comments, pointed out that though rear view mirror had been provisioned in the aircraft, the status of provisioning of location aid and survival items for the aircraft was not known.

6. Non-availability of synthetic training aid

6.1 *Simulator*

6.1.1 The simulators are synthetic training aid aimed at providing efficient training to teach various flight exercises as well as to enable pilots to acquire higher flying skills. The Rathore Committee on flight safety reportedly recommended in June 1994 that maximum number of simulators be made serviceable and operational. In this context, the Committee enquired whether simulators existed for all aircraft and helicopters held in the IAF. The Ministry replied negatively on this point. Giving details of the simulators held in the IAF, the Ministry intimated the Committee that IAF had five simulators for MiG-21 aircraft, two for the Jaguar aircraft, one for the Mirage aircraft and one for the Kiran aircraft. Besides, Air Combat simulator existed for advanced training for all fighter aircraft.

6.1.2 Audit paragraph highlighted that four of the five simulators procured from the manufacturers abroad at a cost of Rs. 12.90 crore and installed in 1970s for imparting training on MiG-21 aircraft were lying unserviceable since long. The performance of the fifth simulator, which was partly serviceable, was unreliable and the maintainability of these simulators had become doubtful due to their ageing. Pursuant to the recommendation of the Rathore Committee, Air HQ conducted a study and decided that these simulators be upgraded by changing the major components. Proposals were invited from the vendors, of which, the proposal of M/s RAMCO System, Chennai was found suitable and accepted. Air HQ obtained Government sanction in August 1996 for upgradation of the simulators at a total cost of Rs. 3.18 crore. However, according to Audit, only one simulator had been upgraded and the remaining four were lying unserviceable/unreliable as of August 1997. Besides, IAF did not have the simulator that could simulate MiG-21 BIS aircraft, which was the mainstream of the IAF.

6.1.3 The Committee enquired the reasons for which these five simulators were lying unserviceable/non-operational and efforts made to make them operational. The Ministry in a note stated:

"These simulators were based on valve technology analog computing system and gave good service up to early eighties. Thereafter, serviceability of these simulators started receding due to ageing and want of required spares from USSR, mainly due to obsolescence of technology. All the four simulators became unserviceable by the end of nineties. The IAF set-up a committee of experts in 1995 to suggest ways and means to make these simulators usable for flying training. The committee recommended upgradation of these to PC-based technology through indigenous sources. The IAF signed a contract in June, 1996 with an Indian firm, M/s Ramco

Systems Ltd, Chennai to upgrade four unserviceable KTS-4 simulators and one TL-8 simulator (made Cat "E" in 1992). All the five simulators were upgraded by Jan, 2000."

6.1.4 Indicating the status of serviceability of the existing simulators as of June 2001 the Ministry stated that one simulator of MiG-21 aircraft, two of Jaguar aircraft and one of kiran aircraft were unserviceable.

6.1.5 The Committee were informed that the Jaguar simulators were of 1980 vintage. In the vetting comments, Audit pointed out that most of the peripherals including the computer had become obsolete and product support was not available. As a result, the 17 wing Jaguar simulator had been lying unserviceable since July 1996 and 7 wing simulator since December 1998. The Vice Chief of Air Staff (VCAS) had reportedly approved sequential upgradation of both the simulators with state-of-art computing and visual systems. The 17 wing simulator was proposed to be upgraded first followed by 7 wing simulators six months later. According to Audit, Air HQ in September 1999 also issued a task directive (No. 04/99) to formulate the qualitative requirements (QRs) for upgradation of Jaguar simulators and a report in this connection was required to be submitted by 15 October 1999 by a group of professionals. While furnishing the status of serviceability of simulators held on the inventory of IAF, the Ministry did not intimate the Committee about these Jaguar simulators.

6.1.6 According to Audit, Kiran aircraft simulator installed way back in May 1986 at Air Force Academy, Hyderabad does not fit in the training requirements of the present day modern Air Force. The Sub-Committee (Defence) of PAC during their visit to AFA also came across a simulator installed in the Academy which was non-functional. Even at the time of handing over, the simulator had a number of defects/shortcomings which could not be rectified by the ADE. HQ Training Command, Bangalore in June 1997 initiated a case for provision of a new generation Kiran flight simulator at Air Force Academy to impart effective training to stage-II trainee pilots

6.1.7 In their vetting comments, Audit further pointed out that Air Force was also holding one KTS-6 simulator for MiG-23 MF aircraft about which the Ministry's information to the Committee was silent.

6.2 *Non-availability of Computer based training aid*

6.2.1 According to Audit, Chief of Air Staff (CAS) directed that all pilots should undergo computer based training regularly to cope with emergency situations and also to explore the availability of computer based training aid similar to that held by the Air Force of UK and USA. The idea was mooted considering the failure of young as well as senior pilots to face emergency situations. Till March 1997, computer based pilot training device was not provided by IAF. IAF also reportedly proposed one hotshot simulator in each squadron with a view to reducing human error accidents by thoroughly practicing emergencies on the ground using simulators to prepare the pilots to face the actual emergency in air. However, Audit pointed out that there had been no progress towards acquisition of such a training aid.

6.2.2 The Committee enquired about the progress made in the acquisition of computer based training aid. The Ministry in a note stated that acquisition of full mission simulators required a large amount of finances. Because of limited fund availability, IAF was in the process of acquiring computer based training platforms. These were planned to be positioned at Flying Training Establishments and operational Field units. Asked to indicate the constraints and impact of non-availability of computer based training aids on skill level of pilots. The Ministry stated:

"Flight Simulators and computer-based training aids help enhance operational efficiency and promote flight safety by improving the skill level of the pilots. Availability of these aids would bear positively on the proficiency of aircrew."

6.2.3 Elaborating on the shortfalls in the training systems and measures taken to overcome them, the representative of the Air Hqrs intimated the Committee that there were three areas which needed attention. One was the induction of AJT, the second one was the requirement of simulators and advanced computerised training. The third one was about the modern approach and navigation aids at our training basis. About simulators and computerised training, he stated that this was a long-term project requiring an investment of Rs, 4500 crore approximately. The progress in the project had reportedly been commenced. On navigation aids he stated that it was proposed in the next plan for induction of considerable number of these aids into our training organisation.

6.3 *Inexperienced training instructors*

6.3.1 It is learnt from Audit that Director of Flight Safety pointed out that Chief flying instructors and senior flying supervisors in the flying training establishments did not hold institutional expertise and were among those who had either been overlooked to take over the command of a flying squadron or ignored for their next promotion. Asked to comment on the quality of flying instructors and supervisors in the light of observations made by Director of Flight Safety, the representative of the Ministry, in evidence clarified the point as follows:

> "We have a selection policy for flying training instructors. Only the selected best pilots are sent to the flying instructors school. They are above average and out of the pilots that go, the suspension rate is nearly ten per cent to 12 per cent. A comment has been made that aircrew who have finished their flying instructor job and have gone to the squadrons are coming back for a second assignment. I submit to you that out of all the instructors that are there would be only five per cent or ten per cent who are employed on flying instructor's duties because they may not get a higher assignment at a squadron command but that does not mean that they are poor instructors. When an officer is unable to reach the peak, he himself wants to go and continue his flying in a flying instructional environment. I do not subscribe to that opinion. I can assure you that today the instructor's community in the Air Force is extremely qualified and fully competent".

6.3.2 The Committee specifically desired to know what measures the Ministry/Air Hqrs had taken to improve pilot training infrastructure and provide suitable trainer aircraft and instructors. The Ministry in a note *inter-alia* stated:

> "(a) The absence of the AJT has created a gap in training from a basic trainer aircraft to a sophisticated fighter aircraft. An analysis of the accident data has revealed that there were difficulties in transiting from the Iskra/Kiran aircraft to the MiG class of aircraft. This has also been brought out in the Human Error Study (Aircrew) done at DFS. Presently Stage-III training is being imparted on MiG 21 fighter aircraft and induction of AJT is being considered. Commercial negotiations are in progress with M/s BAE Systems, UK for the acquisition of Hawk aircraft. The first four aircraft would be delivered to IAF, 35 months after the contract is signed. For the interim period negotiations are in progress with M/s BAE Systems, UK to train 25 IAF fighter pilots per year for a period of three years.
>
> (b) The best officers and highly rated professionally competent pilots are being posted to the various flying training establishments. A thorough check-out is done both at AHQ and Flying Instructors School, Tambaram to ensure that only the best, highly motivated, professionally competent pilots are cleared as instructors.
>
> (c) Flight Simulators and computer based training aids help to enhance operational efficiency and promote flight safety by improving the skill level of the pilots. Availability of these aids would bear positively on the proficiency of aircrew."

7. *Investigation of accidents*

7.1 *Court of Inquiry*

7.1.1 It is learnt from Audit paragraph that as per extant orders, all aircraft accidents are to be investigated within a period of four months and loss on account of damage to aircraft and service property be regularised within one year from date of accident. The time limit for finalisation of COI was stated to have been increased from one to four months in July 1993. Scrutiny of the process of finalisation of investigation of 112 accidents by Audit disclosed that Air Hqrs failed to finalise the cases within the revised time limit of four months also. Out of 66 cases, 12 were finalised in time and 54 cases got finalized with delays which ranged between 4 months and more than two years. 46 cases were pending finalisation till March 1997. The Committee desired the Ministry to spell out specific reasons for not adhering to the enhanced time limit in the investigation to the cases. The Ministry in a note explained:

> "Time frames have been laid down for the conduct of Courts of Inquiry as per AFO 7/93. However, investigations do get delayed at times. When the courts of Inquiry need to be re-convened due to certain observations by the HQs/Specialist Dtes. Investigations also get delayed when components of the crashed aircraft are required to be sent to the specialist agencies within India (National Aeronautical Laboratory, Defence Metallurgical Research Laboratory. Hindustan Aeronautics Limited, etc) or abroad for detailed material and failure analysis. The Presiding Officer and the technical member of the investigating team accompany the item to the designated agency. Since organisations such as DMRL/NAL are the metallurgical labs committed to numerous investigations, therefore all investigations are prioritised as per the urgency. On an average 8-10 Courts of Inquiry are being completed every quarter by the IAF."

7.1.2 In response to a query from the Committee on the reported delays in investigation by COI, the representative of Air Headquarters deposed:

> "I must confess that at the time of the C&AG's report in 1997 the number of courts of inquiry, which were pending were considerable. But finalisation of accident investigation now is well on target. Of the 26 accidents, which took place last year, 24 inquiries are already finalised. Two inquiries are pending for want of Defect Investigation Report from the original agency in Romania and Poland which we do not have control over, to that extent. This degree of expeditious finalisation of court of inquiry, resulting in immediate implementation of prevention measures, has not been achieved before. During the current financial year, which is from the 1st of April, there were eleven category-1 accidents. Three courts of inquiry are already finalised and I am hopeful that others will be finalised in a short time.

7.1.3 The Committee desired to know whether the recommendations made by various COI were implemented in full. In case of non-implementation of the specific recommendations, the Committee desired the Ministry to furnish reasons for the same. The Ministry in a note stated:

> "By and large, the recommendations made by the COIs are implemented. Howeveer, there are instances where the Specialist Dte's/Specialist establishments like ASTE/AEB feel that a particular recommendation made by the COI is not valid. In those cases that specific recommendation is not implemented."

7.1.4 Asked about the existing monitoring mechanism to follow-up implementation of the recommendations of COI, the Ministry stated that as per AFO 7/93, follow up action on various recommendations accepted by Air HQ is to be taken by the concerned specialist Dtes. Prevention cell at Dte of Flight Safety monitors the follow up action being taken by various agencies.

7.2 *Assessment of losses*

A scrutiny by Audit revealed that out of 187 cases of accidents occurred during 1991-97, only in 87 cases (47 per cent), the loss of Rs.337.15 crore had been assessed and regularised as of March 1997. As regards flying incidents which occurred during the same period, out of 2729 incidents, loss aggregating Rs. 76.93 crore in respect of 353 incidents only had ben assessed and regularised as of February 1997. The Committee enquired to know about the status of assessment and regularisation of cases of accidents/incidents those occurred during 1991-97. They also desired to know the amount of loss regularised and reasons for delay in regularising the same. According to the Ministry, during the period 1991-97, losses in all the cases had been assessed. Out of 187 accidents, regularisation of losses had been completed in 124 cases valuing Rs. 790.25 crore. The Ministry could not furnish any information about assessment/regularisation of cases of incidents beyond February 1997. The reasons for delay in regularising loss in accidents/incidents were also not furnished by the Ministry.

7.3 *Committees on flight safety*

Audit Paragraph highlighted that in order to study and recommend various aspects affecting flight safety in IAF, the following committees were set up:

i. La Fontaine Committee of 1982.

ii. IG Krishna Committee of 1987

iii. Nehra Committee of 1989

iv. Pratap Rao Committee of 1991

v. Rathore Committee of 1994

vi. High Power Committee.

The scope of investigation of the committees was reportedly confined to a few areas only. While La Fontaine Committee mainly dealt with training aspects and accidents with special emphasis on accidents related to human error, the IG Krishna and Nehra Committee, mainly dealt with the technical problems related to MiG-21 variants. The Pratap Rao Committee reviewed the accidents involving young pilots and the Rathore Committee was tasked to suggest ways and means to prevent accidents caused due to human error as well as technical defects. While thirty out of thirty two recommendations of La Fontaine Committee including change in training pattern had been accepted and implemented, the recommendations of IG Krishna and Nehra Committee had been accepted and implemented in full. As regards 22 recommendations made by Pratap Rao Committee, 16 were implemented and the remaining were not considered feasible. Rathore Committee had made 57 recommendations which were accepted in full. But, only 33 were implemented till May 1996. Some of the major recommendations which were yet to be implemented were related to procurement of weather radar, air combat simulators, increase in the Unit Establishment (UE) of two seater aircraft in combat squadrons and selection of pilots.

7.4 *Committee on Fighter Aircraft Accidents (COFAA)*

7.4.1 Expressing serious concern at the growing number of fighter aircraft accidents, Ministry of Defence constituted a high powered Committee on Fighter Aircraft Accidents under the chairmanship of the then Scientific Advisor to Raksha Mantri in February 1997 to identify the causes for increased fighter aircraft accidents and to prepare a comprehensive action plan to minimise the losses. The Committee had submitted its report in September 1997 which contained 84 recommendations.

7.4.2 Intimating the present status of implementation of COFAA recommendations, the Ministry stated that of the 84 recommendations made by the Committee, 74 had been accepted for implementation. Nine of these recommendations pertained to Hindustan Aeronautics Limited (HAL), Director General of Aeronautical Quality Assurance (DGAQA) and Centre for Military

Airworthyness Certifications (CEMILAC). 18 recommendations pertained to IAF. The balance of 47 recommendations were to be implemented jointly by MOD, IAF, HAL, DGAQA and CEMILAC. Of the 74 recommendations accepted for implementation, 45 recommendations have already been implemented. These pertained to improvement in aero-engine design of MiG aircraft by HAL/BRDs, revisions of servicing schedules, revisions/improvement of existing procedures of acquisition of new aircraft, positioning/augmentation of man power, introduction of preventive measures, improvement in accidents/defect investigation procedures etc. Most of them were stated to be on-going processes. The Ministry added that 24 recommendations were under various stages of implementation. These pertained to improvement of aero-engine design features in collaboration with Russian manufacturers, procurements of aircraft design data and service bulletins from abroad, procurement of modern test equipment and rigs, aircraft spares, advanced Jet Trainer, upgradation of existing aircraft simulators, induction of new aircraft simulators for training of pilots, aircrews and maintenance personnel, modernization of airfield and ATC facilities, combating bird hazards, indigenisation of aircraft spares, creation of data base and information network, establishment of maintenance and admin safety officers, establishment of Air Force Engineering Colleges, increase in the existing accommodation of airmen etc. The remaining five recommendations were also being implemented.

8. *Constraints in investigation*

8.1 According to Audit, Aircraft Accident Investigation Board (AAIB) under Director of Flight Safety (DFS) which was responsible to investigate serious flying accidents in IAF and recommend methods of avoiding recurrence of such accidents became virtually defunct due to reduction in manning level with the formation of Institution of Flight Safety in September 1980 and formation of Inspector Generals Branch in January 1986. Pratap Rao Committee while recommending revamping of Aircraft Accident Investigation Board stated that IAF did not have required level of expertise in accident investigation. Only in October 1993, the AAIB was made functional with posting of eight officers to form five core teams. However, in May 1995, DFS stated that AAIB had on its strength technical officers experienced for MiG series of aircraft only and requested for posting of officers qualified/experienced on other aircraft to facilitate a thorough and professional investigation. Again, during 1996 the strength of AAIB depleted which was inadequate to accomplish AAIB task.

8.2 The Committee enquired the reasons for not posting the full complement of manpower in AAIB. The Ministry in a note stated:

> "Due to an overall shortfall in manning in the Indian Air Force, the Institute of flight Safety was created out of the existing manpower establishment of the Dte of FS including Aircraft Accidents Investigation Board. The manning of Aircraft Accidents Investigation Board was thus affected. Subsequently, in 1998 due to a persisting state of manpower shortage the TBM-98 criteria was applied and the manning was to be reduced to 13 officers against an approved figure of 19. However, on the intervention of the Chief of Air Staff (CAS), through internal adjustments, the manning level was made good to 19 officers. Presently, a Statement of Case (SOC) for sanctioning the requisite manpower has been initiated and is under processing."

8.3 Asked to intimate the number of officers actually required for smooth and effective functioning of AAIB vis-à-vis the present posted strength, the Ministry in a note *inter-alia* stated:

> "The number of officers actually required for smooth and effective functioning of the Aircraft Accidents Investigation Board alone, is five F(P) officers and five (AE) officers. Against this, the present manning is nine due to manpower constraints, this being accomplished through internal adjustments. Statement of Case has been initiated to sanction the establishment and avoid the recurring shortage in manning"

8.4 In the absence of full complement of staff, the Committee desired to know its impact on the investigation of aircraft mishap. The Committee were informed that with the state of manning, while there had been no compromise in the quality of investigation, at times finalisation of the investigation had taken more than the desired time.

9. *Prospective plan for replacement of MiG-21 fleet*

9.1 The Committee drew specific attention of the Defence Secretary during evidence to the nation-wide concern over the frequent accidents of MiG-21 aircraft and depletion of MiG fleet and the plan programme for possible phasing out of MiG-21 fleet. The Defence Secretary apprised the Committee that the replacement of the MIG-21 fleet would require huge amount of funds considering the cost of a new aircraft which was around Rs. 150 crore. Further he stated that it needed a significant time lag as well to effect replacement. On this aspect he further deposed:

> "We have been developing Light Combat aircraft but its development has been considerably delayed. Eventually, the MiG fleet as per the original planning is supposed to be replaced by proven indigenous light combat aircraft. The moment that option becomes available, then naturally the phasing out MiG-21 can take place. But we are at a point where we are not able to say whether these aircrafts will go through successful tests. Then, we really have to look at the state of technology, when it is going to be inducted and the time lag we really need to manufacture them. Till that time, we will maintain MiG-21 and our concern will be to see that its combat effectiveness in terms of modern avionics and armaments is significantly improved by the upgrade programme and as and when we have this option of induction of light combat aircraft, we certainly can think in terms of replacing them with the local product."

9.2 It is learnt from Audit that the LCA programme has already suffered considerable delays and the aircraft would not be available at least before 2005. Besides, the ambitious MiG-21 Bis upgradation programme, approved by the Ministry in January 1996, has also been relegated to the background at least up to 2004, a slippage of three years from the original projected schedule.

Observations/Recommendations

10. An aircraft accident/incident is an occurrence not directly caused by enemy action. It involves one or more aircraft resulting in injury to persons and/or damage to aircraft and property. Each accident or incident is investigated by an independent Court of Inquiry (COI) consisting of specialists from various fields. The determination of causes of accidents and incidents and the timely introduction of preventive measures together with their implementation constitute the core of Indian Air Force's (IAF) flight safety programme. The Committee note that during the period from 1991-2000, there had been 283 aircraft accidents and 4,418 incidents in the IAF in which 221 aircraft were totally destroyed and 100 IAF pilots lost their lives. While empirical data indicate that the overall rate of accidents per 10,000 flying hours had registered a decline over the six years period from April 1991 to March 1997, the rate of accident registered a steady rise during past three years. What is further disquieting to note was that there was a sudden spurt of accidents in 1999-2000 which accounted for as many as 32 accidents out of 84 accidents reported during the past three years. Stream-wise accident statistics indicated that the rate of accidents in respect of fighter stream was high and ranged between 1.89 and 3.53 during 1991-97. The rate of accidents in MiG variants was still higher and ranged between 2.29 and 3.99. The Committee were informed that 100 MiG-21 aircraft valuing Rs. 238.79 crore were lost during 1991-2000. Further, out of 84 accidents reported during 1997-2000, 58 accidents (69 per cent) involved MiG variants and the situation was more alarming as IAF lost 38 MiG-21 aircraft alone during the period. Citing reasons for high rate of accidents in the MiG variants, the Ministry argued that the IAF's fighter fleet is overwhelmingly MiG based and thus exposed to the risk inherent in the conduct of fighter flying but accident

rates are impossible to refute. About accidents on MiG-21, it was stated to be an aircraft with dated technology making it more demanding on the pilot and the crew. The Ministry further stated that quality control on spares and rotables had to be compromised to some extent due to disintegration of the manufacturer country. It was also conceded that accident rate in the IAF was higher compared to western standards, primarily due to the fact that majority of the accidents could be apportioned to the medium or low technology segment of the fighter aircraft in the inventory of IAF. As regards corrective steps taken to curb the rate of accidents, the Ministry stated to have taken various steps which included institution of preventive measures based on the findings of the Court of Inquiry (COI), implementation of the recommendation of Committee on Fighter Aircraft Accidents (COFAA), association of expert organisations to get a wider perspective of scientific analysis for preventing accidents/incidents, etc. While the reasons advanced by the Ministry provide insight into some of the fundamental problem areas, the increasing trend in the rate of accidents over the years brings into question the efficacy of preventive measures instituted by the Ministry/Indian Air Force from time to time. A micro analysis into the causes of accidents as dealt with in the succeeding paragraphs reveal various inadequacies and shortcomings in the follow-up rectificatory measures taken to curb aircraft accidents in the IAF.

11. The Committee observe that human error, technical defects and bird strike are the main contributory factors leading to aircraft accidents in the IAF. Taking note of the causes of accidents, the Committee gather an unmistakable impression that the operating standards in the Indian Air Force were far from failsafe. Human error basically comprises error on the part of aircrew on flying duty or ground duty or both which lead to accidents and incidents. Many human error accidents also have a combination of technical as well as skill problems where pilot inability to handle a technical defect leads to avoidable aircraft mishap. The Committee are gravely concerned that out of 283 accidents during the period 1991-2000, 119 accidents i.e. 42 per cent accidents were on account of human error, which registered an increasing trend. Significantly, majority of human error accidents were broadly caused due to inadequate flying experience, error of skill and judgement and non-compliance of laid down instructions. As far as inadequacy in flying experience is concerned, the Committee observe that a pilot is more susceptible to human errors during his initial period of six years or six hundred hours of flying. Recounting the corrective steps taken to curb human error accidents, the Air Headquarters intimated the Committee that while strict disciplinary action was being taken for non-compliance of the laid down instructions, emphasis was being laid on restructuring and refinement of training system so as to minimise error of skill and judgement of pilots. In this context, the requirement of advanced jet trainer (AJT) was also stressed by the IAF for imparting better training to pilots. However, the Committee regret to point out that if the increasing trend of human error accidents in recent years is any indication, the remedial steps taken so far in this regard are grossly inadequate. The lacunae in the training infrastructure and equipment, discussed elsewhere in the Report, further substantiate that the IAF really has to toil hard to equip and fine tune the training system in order to curb the human error accidents.

12. In one individual case of accident that had occurred due to human error, the Committee found that two AN-32 aircraft collided during dark night paradrop rehearsal sortie in mid air in April 1992 killing eight aircrew members and one passenger due to aircrew's over confidence, disregard to briefing and lack of situational awareness. Investigations by the COI revealed that re-employed and out of touch pilots were permitted to fly a large formation sortie without preliminary practices. The Ministry, however, pleaded that it was a misconception and referred to the findings of COI to substantiate that the re-employed officers were in current touch and also qualified for the sorties. The Ministry also emphasized that there was no abnormality in authorising the re-employed officers for the sortie. The Ministry's statement is not borne out by facts as corroborative evidence made available to the Committee portrays a completely different picture. Pertinently, the findings of COI as well as the remarks of the then Inspector General of flight safety in the instant case speak volumes about operating standards in IAF. The Committee consider it a grave and unconscionable act on the part of Ministry of

Defence of taking no disciplinary action against any officer responsible for the mishap even though investigation into the case clearly established lapse on the part of the concerned authorities manning the operation. The Committee recommend that the matter should be looked into with a view to fixing responsibility and the action taken in the matter be intimated to the Committee.

13. Apart from human error, technical defect is another major contributor to aircraft accidents the IAF. The Committee are concerned to note that during the period 1991-2000, 126 i.e. 44 per cent accidents occurred due to technical defects (TDs). The IAF attributed most of the TD accidents to manufacturing/overhauling agencies like HAL. After examining the HAL and other material evidence, the Committee found that all the aircraft in IAF inventory are not manufactured/overhauled by HAL and nearly 1/3rd of the aircraft are imported, the overhaul of which are undertaken by IAF at Base Repair Depots or entrusted to Original Equipment Manufacturer. They note that while aircraft of non-HAL origin had more than 1/3rd share of TD accidents, the Users as well had the contribution to the TD accidents. The Committee's examination further revealed that the aircraft of HAL origin performed better compared to those wholly imported and maintained by the IAF as out of 83 accidents of fighter aircraft caused due to technical defects during 1990-2000, 40 aircraft were of HAL origin and 43 were imported. A deeper look into TD accidents revealed that during 1991- 97, less than 50% accidents on MiG-21 variants were due to technical defects. While most of these accidents were attributed to design deficiency, quality control, maintenance and operational lapse had also contributed to few accidents. As regards the corrective measures taken, the Ministry stated that the causes for major problems leading to accidents in MiG-21 variants were identified and improvements got effected in these aircraft. The Committee were assured that IAF and HAL were making continuous efforts to bring down the accident rate of this Important fleet. Considering the fact that TD accidents accounted for maximum number of accidents, the Committee urge upon the Ministry to follow up the rectificatory steps vigorously so as to minimise accidents on this count. The Committee also stress the need for uninterrupted and cohesive interaction between top functionaries of HAL and IAF in resolving the differences on technical matters pertaining to accident investigation which would not only help identifying precise cause(s) of accidents but also in instituting appropriate preventive measures.

14. The Committee observe that though a decision to impose a warranty clause on all HAL manufactured/overhauled aircraft or components was taken in principle as early as January 1995, the same is yet to be fructified even after a long gap of six years. According to the Ministry, the constraints in finalising the warranty clause primarily related to techno-commercial aspects, which would result in basic cost enhancement of 7.5%, cost/payment rescheduling, issues related to premature withdrawal of equipment etc. The matter was stated to be under examination in the Ministry. While expressing displeasure over the inordinate delay in the matter, the Committee recommend that the finalisation of warranty clause with HAL be expedited without further loss of time.

15. The Committee found that bird strike had its share in the aircraft accidents as well. During the period 1991-2000, 19 accidents and 805 incidents occurred due to bird strike. The Committee observe that in order to combat bird menace around the air fields, an Inter Ministerial Joint Sub-Committee (IMJSC) had recommended way back in February 1990 certain remedial measures like modernisation of slaughter houses, carcass utilisation centres, garbage disposal and sewerage/drainage system through capital cost intensive schemes by the Central Government. According to the Ministry, the progress on implementation of recommendations of the IMJSC was slow due to lack of funds and commitment by the concerned Ministries. The Committee find that even though allocation of funds was increased from Rs. 75 crore to Rs. 118 crore, the action plan formulated for total denial of habitat of birds at 10 priority-I airfields is yet to take off. On oral examination, the Ministry conceded that measures recommended by IMJSC were not implemented even after 10 years. As a result of non-implementation of these measures with seriousness, IAF entailed a loss of Rs. 184 crore during 1991-2000 and even operational

efficiency had to be compromised often when vital operational missions and training excises at low levels were forced to be either cancelled or restricted severely due to intense bird activity around the airfields. The Committee are perturbed to note that implementation of the recommendations of IMJSC for sanitation of areas around selected airfields continued to languish due to the failure of the Ministry of Defence to effectively Co-ordinate with the concerned Central Ministries in the matter. The Committee recommend that effective steps be taken with a sense of purpose and urgency to implement the action plan in a time-bound manner so as to limit bird menace to the barest minimum and enhance operational efficiency of the aircraft fleet. The Committee would like to be apprised of the progress made on this count.

16. The Committee's examination has revealed that the training imparted to pilots in IAF is afflicted with serious shortcomings in terms of available apparatus and infrastructure. To their dismay, scrutiny of 141 out of 187 cases of accidents during 1991-97 revealed that 77 accidents occurred during training sorties alone. The Committee note that the primary causes of accidents in the Flying Training Establishments (FTEs) were broadly due to non-availability of Advanced Jet Trainer (AJT) aircraft, defective basic trainer aircraft like HPT – 32, Kiran, Iskra and inadequate synthetic training equipment viz. Flight simulators, computer based training equipment etc.

The Committee note that training is imparted to pilots in three stages in various training establishments. The first basic training is imparted on HPT-32 basic trainer aircraft followed by Stage-II training of the pilots on Kiran/Iskra aircraft. HPT-32 aircraft manufactured by HAL has been in use since 1984 for imparting basic training to pilots. The Committee observe that the reliability of the engine of the aircraft had been suspect since its induction as there had been 5 serious and 3 major accidents and 74 incidents during the period 1988-95. Despite implementation of recommendations of high level joint studies conducted by IAF and HAL in 1991 and 1995, the engine snags in the aircraft persisted. Consequently, the entire HPT-32 fleet was grounded in December 1995 and Air HQrs expressed serious concern over the reliability of the basic trainer. The Committee were informed that subsequent to the joint studies conducted by IAF and HAL on the recurring engine snag noticed in the aircraft, a number of measures were taken in the areas of overhaul, maintenance and operations in consultation with original equipment manufacturer. It was stated that 56 aircraft had since been modified and were performing satisfactorily. The Committee recommend that efforts should be made to effect modification in the rest of the aircraft fleet in a time-bound manner so as to enhance the efficiency and confidence level of neophyte pilots to cope with in-flight emergencies. The Committee may be furnished a status report on the modifications effected on the trainer fleet. The Committee would also like to be apprised of the number of accidents occurred on HPT-32 aircraft in Stage-I training including the causes and resultant casualties in terms of loss of lives of trainee pilots during the period 1999-2001.

17. The Committee find that since 1989 there had been 11 cases of its engine flameout in air or on ground in Kiran aircraft, used in Stage II training of pilots, affecting the confidence level in the reliability of the aircraft, thereby affecting the flying training. According to the Ministry, out of 11 flameout cases reported, nine were attributed to problem in imported viper engines overhauled by IAF. There was laxity on the part of IAF in the matter of overhaul of the engine of the aircraft which afflicted flying training. The Committee further need hardly to underscore the need for improvement in the quality of maintenance/overhaul of the engine of the aircraft by IAF to enhance its reliability. The Committee would like to be apprised of the engine flameout cases occurring after corrective measures were taken. The Committee found that Kiran aircraft also suffered from deficient avionics equipment. It is further substantiated by the fact that Headquarter Training Command, Bangalore in January 1997 proposed to Air Headquarters for an early upgradation of avionics equipment on Kiran aircraft in the interest of flight safety. It is appalling to note that no action was taken by the Air HQrs despite the fact that the upgradation of avionics equipment was considered essential by their operating unit in the larger interest of flight safety. While viewing seriously such a casual attitude of the Air

HQrs, the Committee recommend that necessary steps be taken at the earliest to suitably upgrade the avionics equipment on the aircraft to avert any possible mishap and a status report on the same be submitted to the Committee.

18. Further, the Committee find that the Iskra aircraft used in Stage II training had been operating without any location aid and survival items since its induction in 1975. Accident statistics revealed that during last 10 years the aircraft had a total of eight accidents, of which five were serious. The Committee would like to know the constraints due to which the location aid and survival items considered essential could not be installed in the aircraft for such a long time. The Ministry may also furnish a status report on the steps contemplated to suitably equip the aircraft as well as operational limitation imposed in the absence of such essential aids.

19. The Committee observe that Stage-III operational training had suffered immensely due to non-availability of Advanced Jet Trainer (AJT) aircraft. The La Fontaine Committee set up to make an in-depth study into the accidents and training process had pointed out as early as in 1982 that there existed a quantum jump in skill/judgement as IAF had no suitable operational transitional trainer aircraft to fill the intervening gap before the pilots are deployed on the operational fighter aircraft. The Ministry admitted that the MiG-21 and Hunter aircraft used for Stage-III training were not specially designed as advanced trainer and had inherent limitations for imparting air combat and weapon delivery training. Asked to explain the high rate of accidents at MiG Operational Flying Training Unit (MOFTU) during 1991-2000, the Ministry stated that MiG-21 variants being used for the operational flying task were of old technology and are demanding in its flying and maintenance activities. The representative of Air Hqrs also admitted that for a training mission, MiG-21 trainer was a sub-optimum aircraft. Way back in 1992, the Chief of Air Staff also held the lack of AJT as one of the reasons affecting the aircrew performance and reportedly stated that the use of MiG-21 as an operational trainer for AJT exposed the young inexperienced pilot prematurely to an operational type without essential transitional training on AJT. Significantly, in April 1995 the Ministry had also impressed upon Prime Minister's office that lack of AJT was the main reason for human error accidents in IAF. The Committee therefore hold that non-availability of AJT coupled with unsuitability of MiG-21 for transitional training role continued to cause a large number of training related accidents besides affecting adversely the combat training of pilots.

20. Though the La Fontaine Committee recommended the need for AJT way back in 1982, it took about 11 years for the Ministry to seek approval of Cabinet Committee on security (CCS) in 1993 for procurement of the aircraft. The Standing Committee on Defence in their 4th Report (12th Lok Sabha) had analysed the chronological sequence of events regarding action taken by the Ministry for procurement of AJT and the reasons for associated delays. The Committee note that though efforts were under way since 1984, including exploring the possibility of indigenous development of AJT, procurement of AJT continues to elude even after 16 years while the neophyte pilots continue to be exposed to peril for want of appropriate stage III trainer aircraft. Taking note of the fact that training on Hunter aircraft stands discontinued since 1996, and planned phase out of MiG-21 trainer fleet by 2003-04 and reported negotiations with a foreign country to train the fighter pilots, the Committee are of the considered view that any further delay in procurement of a suitable jet trainer would not only entail huge outgo of foreign exchange on account of training to be imparted to fighter pilots outside the country but also make us heavily dependent on foreign source. While expressing their serious anxiety and concern over the delay in procurement of AJT and its precarious fall out on the operational training of IAF, the Committee fervently hope that the Government would at least now wakeup to its responsibility and take immediate and earnest steps for procurement of a suitable jet trainer.

21. The Committee are concerned that the trainee pilots of Indian Air Force are also deprived of adequate modern training due to lack of a suitable synthetic training equipment like flight simulators and computer based training aid. Five simulators installed

in 1970s for imparting training on MiG-21 aircraft were lying unserviceable since long due to ageing and want of required spares from the manufacturer mainly due to obsolescence of technology. Though Rathore Committee on flight safety reportedly recommended in June 1994 that maximum number of simulators be made serviceable and operational, IAF took six years to get these simulators upgraded through an indigenous Chennai based private firm. The Ministry could not explain the Action Taken to operationalise the simulators of Jaguar and Kiran aircraft. Giving the status of serviceability of all the existing simulators as of June 2001, the Ministry stated that one simulator of MiG-21, two of Jaguar and one of Kiran aircraft were still unserviceable. As per information made available to the Committee by Audit, 17 wing Jaguar simulators had been lying unserviceable since July 1996 and 7 wing simulator since December 1998. As per approval accorded by Vice Chief of Air Staff, all these simulators were required to be upgraded with state-of-art computing and visual systems by Air HQrs. It is also learnt that Kiran aircraft simulator installed way back in May 1986 at Air Force Academy (AFA), Hyderabad had a number of defects/shortcomings and did not fit in the training requirements of the present day modern Air Force. HQ Training Command, Bangalore in June 1997 reportedly initiated a case for provision of a new generation Kiran flight simulator at AFA to impart effective training to Stage-II trainee pilots. Evidently, the Ministry failed to furnish complete information to the Committee on the status of availability/serviceability of simulators in the inventory of IAF. The Committee would like this aspect to be looked into for appropriate action. They desire that a complete status report on the existing simulators in the inventory of IAF including their status of serviceability be submitted to the Committee within a period of three months from the presentation of this Report. They also recommend that besides taking effective steps to make the existing simulators serviceable/operational, action should also be initiated for new acquisition to fill in the gap so as to provide efficient training to pilots in acquiring higher flying skills.

22. The Committee note that though computer based training is considered essential in the wake of failure of young as well as senior pilots to face emergency situations and its requirement was stressed by the then Chief of Air Staff, the IAF is yet to provide the requisite device to pilots. The Committee, therefore, recommend that early action be taken to equip our training squad with computer based equipment similar to those held by all modern Air Forces with a view to enhancing the efficiency level of pilots to deal with in-flight emergencies and help reducing human error accidents.

23. As per extant orders, all aircraft accidents are required to be investigated within a period of four months and loss on account of damage to aircraft and Service property be regularised within one year from the date of accident. The Committee observe that finalisation of investigation into the accidents was delayed in most of the cases during the period 1991-97. A scrutiny of 112 cases of accidents revealed that out of 66 cases finalised till March 1997, only 12 cases were finalised in time and 54 cases got finalised with delays ranging between four months and more than two years. 46 cases were pending finalisation till March 1997. The representative of Air HQrs. conceded in evidence that pending cases of investigation were considerable during the Audit Review period. The Committee further found that out of 187 cases of accidents during 1991-97, regularisation of losses had been completed only in 124 cases valuing Rs. 790.25 crore by June 2001. The status of regularisation of loss on account of incidents occurred during the same period was further discouraging. Out of 2729 accidents, loss aggregating Rs. 76.93 crore in respect of 353 accidents only had been assesssed and regularised as of February 1997. The Ministry could not furnish any information about assessment/regularisation of cases of incidents beyond February 1997. While deploring inordinate delay in the assessment and regularisation of losses on account of accidents/incidents, the Committee recommend that suitable steps be taken to complete the assessment/regularization of pending cases expeditiously for the period 1991-2000. The Committee may be furnished with the status of finalisation of cases of accident investigation by COI as well as assessment/regularisation of losses on this count during the period 1991-2000.

24. The Committee observe that Aircraft Accidents Investigation Board (AAIB) constituted in 1973 under the Director of Flight Safety (DFS) to investigate serious accidents was handicapped due to manpower constraints. Incidentally, Pratap Rao Committee while recommending revamping of AAIB pointed out that IAF did not have required level of expertise in accident investigation. The AAIB became virtually defunct due to reduction in manning level with the formation of Institution of Flight Safety in September 1980 and formation of Inspector General's Branch in January 1986. According to the Ministry, due to persisting shortage of manpower in IAF, the manning level in AAIB was reduced against its sanctioned strength leading to delays in finalisation of investigation accidents over the years. The Committee, however, observed that the case for sanctioning requisite manpower in AAIB was under process. While the Committee are extremely concerned over the manner in which such a vital organ of the institution of flight safety was allowed to function over the years and considering the significance of the role and responsibility cast on the AAIB in the aircraft accident investigation, the Committee expect that Govt. would take immediate steps to strengthen AAIB.

25. The Committee observe that apart from the investigation of aircraft accidents through COIs, Air Headquarters/Ministry constituted six high powered committees to investigate the causes of accidents and suggest remedial measures on the aspects affecting flight safety in IAF during 1982-97. The recommendations of these Committees were largely implemented. Concerned with the growing number of fighter aircraft accidents, MOD constituted another high powered Committee under the Chairmanship of the scientific adviser to Raksha Mantri in February 1997 to identify the causes for increased fighter aircraft accidents and to prepare a comprehensive action plan to minimise the losses. The COFAA had submitted its Report in September 1997. The Committee were informed that out of 84 recommendations made by the Committee, 74 recommendations had been accepted by Government for implementation. Intimating the status of implementation, the Ministry stated that 45 recommendations had already been implemented and the remaining 29 recommendations were at various stages of implementation. Since four years have already elapsed since presentation of COFAA Report to the Government, the Committee urge upon the Ministry to take measures for expeditious implementation of the outstanding recommendations.

Surprisingly, despite implementation of most of the specific recommendations of COFAA relating to MiG variants of aircraft, 58 aircraft of MiG family met with accidents during past three years and IAF lost 38 MiG-21 alone during this period. Further considering that the IAF lost 100 MiG-21 Aircraft during the past 9 years of peace and the technological obsolescence of the aging MiG fleet, the Committee are of the firm view that the nation can ill afford to carry on with this aging fleet any longer notwithstanding the enormous cost involved. What compounds the concern of the Committee is the fact that the planned replacement of MiG-21 fleet with the indigenous LCA suffered a setback coupled with the delay in upgradation programme of MiG-21 BIS. While IAF is saddled with a sad compromise between what the nation can afford against what ought to be discarded, the Government is left with no option but to vigorously pursue the indigenous LCA programme and also induct the latest state of the art fighter aircraft. The Committee would like to be assured of the operational preparedness of the IAF keeping in view the potential of air force in modern day warfare and the supreme concern of national security .

26. In fine, despite a series of measures claimed to have been instituted by Government for better flight safety, the Committee are dismayed that the IAF continues to be plagued by growing number of aircraft accidents. During the past nine years IAF lost 100 pilots in 283 accidents. It's a cruel irony that our brave pilots who are always ready to make supreme sacrifice for the security and territorial integrity of the country should perish in routine peace time sorties. While the whole nation is concerned with the accidents in IAF and loss of precious lives, what worries the Committee is that frequent reports of air crashes, would, in all probability, progressively inhibit and wean away bright young men from joining IAF for combat duties as fighter pilots. The unabated accidents involving fighter aircraft, MIG variants in particular, underscore the urgent need for replacing the ageing

fleet, and the immediate induction of AJT. Having regard to the prevailing security scenario and India's geo-political standing, the Committee need hardly to emphasise the fact that the nation can ill afford to relegate to the background the needs of IAF in the high tech age especially in view of the increasing role of the Air Force in the modern warfare. In order to minimize air accidents and infuse greater vigour and confidence in the operation of fighter flying in the Indian Air Force, the Committee ardently hope that the Government would take appropriate and expeditious action in the matter.

N. Janardhana Reddy

Chairman, Public Accounts Committee

NEW DELHI;

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