C.P.U. No. 79

COMMITTEE ON PUBLIC UNDERTAKINGS (1967-68)

EIGHTH REPORT

(FOURTH LOK SABHA)

HINDUSTAN AERONAUTIC LTD.

MINISTRY OF DEFENCE

(DEPARTMENT OF DEFENCE PRODUCTION)

LOK SABHA SECRETARIAT
NEW DELHI
March, 1968/Chaitra, 1890 (Saka)
Price : Rs. 1.40

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(1967-68)

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STUDY GROUP III ON AERONAUTICS

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(1967-68)

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INTRODUCTION

I, the Chairman, Committee on Public Undertakings, having been authorised by the Committee to submit the Report on their behalf, present this Eighth Report on Hindustan Aeronautics Ltd.

2. This Report is based on the examination of the working of Hindustan Aeronautics Ltd. upto the year ending 31st March, 1967. The Committee took evidence of the representatives of Hindustan Aeronautics Ltd. on the 17th and 18th January, 1968 and of the Ministry of Defence (Department of Defence Production) on the 25th January, 1968.

3. The draft Report was considered at various stages by the Study Group of which Shri Awadheshwar Prasad Sinha was the Convener. The Report was finally adopted by the Committee on the 25th March, 1968.

4. The comments of the Ministry of Defence on factual verification of the Report, received on 26th March, 1968, were considered and approved by Shri Awadheshwar Prasad Sinha and Shri S. S. Kothari on 27th March, 1968, as authorised by the Committee.

5. The Committee wish to express their thanks to the officers of the Ministry of Defence (Department of Defence Production) and Hindustan Aeronautics Ltd. for placing before them the material and information that they wanted in connection with their examination. The Committee also wish to thank the officers of the Ministry of Works, Housing and Supply (Department of Supply) for the assistance rendered in connection with the examination of an audit para. They also wish to express their thanks to the non-official organisations|individuals who, on request from the Committee, furnished their views on the working of Hindustan Aeronautics Ltd.

6. The Committee also place on record their appreciation of the assistance rendered to them in connection with the examination of audit paras pertaining to Hindustan Aeronautics Ltd. by the Comptroller and Auditor General of India.

D. N. TIWARY,
Chairman,
Committee on Public Undertakings.

NEW DELHI;
March 27 1968.
Chaitra 7, 1890 (*S*).

I

HISTORICAL BACKGROUND

The aircraft industry in India is entirely owned and operated by Government. The Hindustan Aeronautics Ltd., a government company, was formed on the 1st October, 1964, on the merger of the Hindustan Aircraft Ltd., Bangalore and the Aeronautics India Ltd., New Delhi. The amalgamation of these two public sector undertakings was ordered by the Government of India.

2. Among the objects and the functions of the company are to carry on the business of manufacturing, and assembling aeroplanes, airships, sea-planes, balloons, helicopters, gliders, parachutes and aircrafts and aero-engines of every description whether required for civil, commercial or military defence purposes and requirements or otherwise.

3. The erstwhile Hindustan Aircraft Ltd. was promoted by late Shri Walchand Hirachand in December, 1940, in association with the Government of Mysore, as a private limited company. In March 1942, the Government of India joined Hindustan Aircraft Ltd., as a share holder—the Managing Agents, Government of Mysore and the Government of India contributing Rs. 25.00 lakhs each. In June 1942, the Government of India purchased the interests of the company holding 2|3rd of share capital and took over its management. Subsequently during World War II in 1943 the U.S. Air Force was entrusted with the management of the Hindustan Aircraft Ltd. subject to the control of the Board of Directors. At close of the War in 1945, the management reverted to the Government of India in the Ministry of Industry and Supply. In January, 1951 the control of the Hindustan Aircraft Ltd. was transferred to the Ministry of Defence. In the early days the company was mainly concerned with repairs, overhaul and maintenance of Indian Air Force aircraft. Subsequently, it undertook the manufacture of various aircraft such as HT-2, Pushpak, Krishak, Kiran, Gnat and HF 24. The manufacture of jet engines and Alouette helicopter, under licence from U.K. and France, was also taken up.

4. The erstwhile Aeronautics India Ltd. came into being as a Government company on the 16th August, 1963 to undertake the manufacture of the MIG-21 aircraft for which the Government of India had entered into a collaboration agreement with the USSR authorities in 1962. The manufacture of this aircraft was to be

done at three different places—at Nasik for manufacture of airframe, at Koraput for manufacture of aero-engines and at Hyderabad for electronics equipment. The factories were to be set up in accordance with a Project Report prepared by the MIG Planning Unit of the Ministry of Defence, in collaboration with Soviet specialists.

5. Aircraft Manufacturing Depot was established at Kanpur in January, 1960 as an Air Force Unit for manufacture of Hawker Siddeley 748 twin turbo prob transport aircraft and gliders. It was run departmentally by the Department of Defence Production till the 1st June, 1964, when it was placed under the management of the Aeronautics India Ltd. It now forms the Kanpur Division of the Hindustan Aeronautics Ltd.

6. On promulgation of the Aircraft Companies Amalgamation Order, 1964 on the 1st October, 1964, the Hindustan Aircraft Ltd. was dissolved and all its undertakings merged with those of the Aeronautics India Ltd. to form the Hindustan Aeronautics Limited. It has five Divisions located at Bangalore, Hyderabad, Kanpur, Koraput and Nasik. The erstwhile Hindustan Aircraft Ltd. was constituted as the Bangalore Division of the amalgamated company.

Examination by Estimates Committee

7. The working of the erstwhile Hindustan Aircraft Ltd. was examined by the Estimates Committee in 1956-57 and 1959-60 and their recommendation/observations are contained in their Sixty Seventh Report (First Lok Sabha) and the Hundred and Twenty-Fourth Report (Second Lok Sabha) respectively. The replies furnished by the Government indicating the action taken by them on the recommendations contained in these reports were considered by the Estimates Committee (1959-60) and the Committee on Public Undertakings (Third Lok Sabha) and their Action Taken Reports—Sixty Fifth of Estimates Committee (Second Lok Sabha) and Thirty Fourth of the Committee on Public Undertakings (Third Lok Sabha), respectively, were submitted to Parliament.

8. The working of the other Divisions of the Hindustan Aeronautics Ltd. had not been examined earlier.

II

AMALGAMATION

The Hindustan Aircraft Ltd. Bangalore was merged with the Aeronautics India Ltd., New Delhi, on the 1st October, 1964 to form a new company after amalgamation—The Hindustan Aeronautics Ltd. The Government order on the subject states as follows:—

> "Whereas the Company Law Board is satisfied that, for the purpose of securing coordination in policy and the efficient and economical expansion and working of Aircraft Production Units in the Public Sector in India, it is essential in the public interest that the Hindustan Aircraft Limited and the Aeronautics India Ltd. being companies incorporated under the Indian Companies Act, 1913 and the Indian Companies Act, 1956 respectively which are engaged in the manufacture and production of aircraft, aero-engine, accessories and missiles should be amalgamated into a single Company."

10. The Estimates Committee examined the Reports and Accounts of the Hindustan Aircraft Limited, Bangalore in 1960-61. In their Hundred and Twenty Fourth Report (Second Lok Sabha) they recommended as follows:

> "Since both† the organisations would be under the administrative control of the same Ministry and would be manufacturing different types of planes the necessary element of competition is not *prime facie* very apparent. On the other hand, as already recommended by the Committee in para 3 of their 80th Report (2nd Lok Sabha) the normal pattern should be to utilise the existing organisations to take up new activities in the line instead of creating new units. The Committee hope that Government will examine at an appropriate time the feasibility of having one organisation for the two undertakings engaged in aircraft industry. In this connection, the Committee note the pattern followed in the case of Fertilizers and Steel—

†Hindustan Aircraft Ltd., Bangalore and the Aircraft Manufacturing Depot, Kanpur.

where for very good reasons the Government set up one organisation to look after allied producing units."

11. While accepting the recommendation Government stated as follows:

"The recommendation has been accepted. Government have set up a single Corporation with effect from 1st October, 1964 to look after the activities connected with aircraft production and repairs. This single aircraft corporation has within its ambit the aircraft production units of Hindustan Aeronautics Limited, the production units dealing with the manufacture of MIG 21 aircraft and the production unit dealing with the transport aircraft at Kanpur."

12. It would be seen that when the Estimates Committee expressed their views in 1960-61, there were only two units *i.e.* at Kanpur and Bangalore. The third unit, the Aeronautics India Ltd. was set up only in August, 1963, and its amalgamation with the other two units has to be examined as a separate issue.

13. Government have stated that the aircraft factories were combined into a single company in 1964 with a view to conserve resources in a field, where the technical talent of the country was limited, and to plan and coordinate the activities of all the aircraft manufacturing units in such a manner that the most efficient and economical use could be made of the limited resources. During evidence of the representatives of the Hindustan Aeronautics Ltd. and the Ministry of Defence (Department of Defence Production), the Committee were informed that at the time of amalgamation only Bangalore and Kanpur Divisions were in production. The MIG Division was still in the process of building up. Even the Kanpur Division had not yet reached its full rated capacity.

14. The Managing Director of HAL stated that the benefits of amalgamation were not immediately apparent, but it did make available to the organisation, as a whole, the resources of different Divisions. It was expected that from the point of view of production, a distribution of potential capacity would be possible. He further explained that at the moment there was no surplus capacity in Kanpur or any other Division. Kanpur Division of HAL was expected to reach its rated capacity by 1969 or 1970. The reason was that manpower apparatus was not yet in position and men were still being recruited and trained. At present there was very little inter-change or helping of each other. He, however, added that in their future planning, when Kanpur Division reached a stage of proficiency at which it could take more work, they would be giving

it more work from their Bangalore Division. At Bangalore they were short of tooling capacity but it would be fully utilized with the tool rooms coming up at Koraput and Nasik Divisions. He stated that when the factories fully come to production stage, they would be able to take up the capacities of one another to produce different types of aircraft in future.

15. The Committee feel that as the various divisions of HAL are dealing with manufacture of aircraft which differ from each other in design, scope, jigs and tooling, it would not be easy to divert the surplus capacity of one unit to the aid of other units. The Committee recommend that an expert Committee should examine the question of utilisation of surplus capacity of one unit by other units.

16. The Ministry have stated that as a result of amalgamation it has been possible to lay down uniform conditions of service for all HAL employees, and to make the best use of the available manpower through inter-divisional transfers and permission is granted to HAL employees for applying for the posts advertised by other divisions of HAL. During evidence the Managing Director stated that on the personnel side a review of the manpower requirements of the entire organisation had been made and HAL were recruiting engineers and other staff under common plan which applied to all the divisions.

17. The Committee feel that in spite of laying down uniform service conditions for HAL employees, the practicability of utilisation of surplus personnel of one division in another division with varying technological requirements of trade appears to be limited. The Committee hope that the Management keeping in view the size and complexity of the problem would devise an efficient procedure which would enable one unit to draw upon the surplus personnel of the other units in time of need and to ensure that no bottlenecks in production are caused on this score.

18. During evidence the Managing Director admitted that the amalgamation had created its own problems of management control and of developing system of control within the organisation. He, however, stated that in the course of another four or five years they would be able to develop an infra-structure of the company to achieve economy, coordination and efficiency.

19. Explaining the need for amalgamation at the present juncture, when there was no immediate advantage, the Managing Director stated that had these companies in the aircraft industry not been

amalgamated in 1964, they might have developed separately in different directions and later on merger might have been difficult. In this connection he cited the instance of the Indian Airlines Corporation and Air India. In order to achieve greater efficiency, economy and coordination, a suggestion for the amalgamation of these two organisations was made. It was found that because these were separate institutions they had developed in different directions with different terms and conditions of service and different outlook on commercial and operational matters. It was, therefore, not found possib'e to merge these two organisations now.

20. The Committee find that the nature of work required to be done by the MIG complex is different from that done at the Kanpur and the Bangalore Divisions. The collaboration arrangements are with different parties and the procedure followed by them is different, although the responsibility in each case is being shared by the Government and HAL at different levels. The instrumentation, equipment and techniques are different for each type of aircraft. The Committee, therefore, feel that it would have been better, at least in the initial stages, if the MIG complex had remained a separate entity and the Bangalore and the Kanpur Divisions had only been merged into one unit as suggested by the Estimates Committee. The Committee are not convinced with the argument that the amalgamation would have been difficult at a later stage.

21. The Secretary, Department of Defence Production stated during evidence that under the Industrial Policy Resolution, the aeronautics industry was in the public sector and comprised of one unit which was under the Department of Defence Production. Although this has created a certain amount of monopolistic attitude of mind which was somewhat contrary to commercial attitude and to that extent was a disadvantage, he felt that on the whole the present arrangement was that best solution under the existing circumstances.

22. The Committee agree that instead of one company, existence of separate public undertakings for aircraft production, under the same Ministry would have been helpful in corelating the achievements of one unit against the other. This would also have created a sense of competition between these units where one unit would have vied with the other in showing better results. The amalgamation has however precluded these advantages and has led to the development of a monopolistic attitude of mind in HAL which is contrary to commercial attitude.

23. Considering all aspects of the question, the Committee would suggest that the Government should carefully assess the results of amalgamation during the next four or five years and if the contemplated benefits of amalgamation do not emerge, the matter might be reviewed and, if necessary, the Company may be reorganised on a more practical and efficient basis.

III

MIG COMPLEX

The project to undertake manufacture of MIG-21 aircraft in India in collaboration with the U.S.S.R. was conceived sometime during July, 1962, leading to the conclusion of an Agreement dated the 29th August, 1962 between the Governments of the U.S.S.R. and India. The Project Report was subsequently prepared with the assistance of a Soviet team, which was especially sent to India for the purpose and was submitted to the Government of India in September, 1963.

25. It was decided by the Government to establish three factories—the first at Nasik to manufacture airframes and allied equipment, the second at Koraput for the manfacture of engines; and the third at Hyderabad for the manufacture of electronic equipment. The factory at Nasik was planned not only for the manufacture of airframes but also for the final assembly of aircraft with the engine and radio equipment.

26. After acceptance of the preliminary Project Report by the Government, another Soviet team consisting of specialists in various fields came to Nasik in 1965 to assist H.A.L. in the preparation of the "Working Project Details". This work involved planning of each and every shop in great details, including the selection of machinery/equipment and its layout, routing of internal services, office accommodation, organisation and personnel requirements, etc. and was completed during early 1966.

A. Selection of sites

27. The production of MIG-21 aircraft involved the setting up of three units to manufacture the airframes, the aero-engines and the electronic equipment, as each of these had a separate technical consideration of its own. The following requirements were necessary for the unit producing the airframes:

(a) Availability of sufficiently levelled land of good hard soil and low water table for the construction of an airfield without any airfield approach construction.

(b) Adequate water supply.

(c) Adequate electric power supply.

(d) Reasonably good climatic conditions such as temperate weather, dust free atmosphere, low annual rainfall, low relative humidity, etc.

(e) Good rail and road communications and preferably within easy reach of a port.

28. A number of sites were surveyed and the choice for the unit to manufacture the airframes was narrowed down to Nasik in Maharashtra State. The actual site near Nasik was selected after a detailed survey.

The requirements of the engine factory were put down as similar to the airframe factory, with emphasis on temperate nature of climate. Koraput which is located at an altitude of 3,000 ft. fully met these conditions. In addition to Koraput, a site near the airframe unit at Nasik and a site in Poona were also considered.

29. Some of the considerations for the establishment of the electronics factory were as follows:—

(i) Topographical and geodetic characteristics *i.e.* relief, shape of site, immunity from inundation by high flood waters, availability of forests and green zones.

(ii) Geological survey, *i.e.* seismography of the region, load carrying capacity of the soils, depth of sub-soil waters, absence of minerals in the area of the site.

(iii) Absence of neighbouring industrial enterprises with harmful industrial discharges.

(iv) Availability of necessary power resources and transport connections.

(v) Availability and possibility of on the spot training sufficiently skilled personnel, availability of local construction materials and organisation capable of implementing the construction of the factory.

(vi) Existence of subsidiary industries in the vicinity of the electronic factory.

(vii) Facility of transport from manufacturing point to assembly point.

(viii) Strategic considerations.

In addition to Hyderabad, sites at Koraput, Nasik, Poona and Bangalore were considered.

30. The setting up of the electronics factory had to be dealt with on its own merit. The electronics factory was to be used for the production of other electronics equipment after the factory had completed the manufacture of the airborne electronic equipment for the MIG-21 aircraft. The electronics factory producing airborne equipment is generally not considered part of any aeronautical complex in the western countries. The aircraft factories buy the electronic equipment from the electronic factories wherever they may be located. Hyderabad was eventually selected to be the site for the electronics factory.

31. The question whether the two units manufacturing the airframes and the aero-engines could not have been located at the same site was examined by the Government and the conclusion was that separate factories at different locations were required for the following reasons:—

(a) The volume of production at each of these units would be very high.

(b) The organisation would be very unwieldy if it was made responsible for the production of both the aircraft and the engine.

(c) The establishment of separate units will be conducive to expansion in the future.

For these reasons, it was decided that the two units should be located at different sites.

32. The alternatives for the location of the engine factory were Poona, which would have been nearer Nasik, and Koraput in Orissa. The Soviet specialists who assisted in the preparation of the project report were requested to advise on a choice between Poona and Koraput. The Soviet specialists advised that the presence of industrial undertakings in the proximity of Poona would shorten the time for mastering the engine production; and increase the availability of skilled workers to the factory quickly. In their opinion the time required for construction of the factory and mastering of engine production would be reduced by 6 to 8 months if the factory was set up at Poona instead of at Koraput. They also advised that if, on the other hand the object was the establishment of an industrial centre for the manufacture of engines with considerable expansion of the volume of production in future, Koraput would be the better choice. The Emergency Committee of the Cabinet which considered the views of the Soviet specialists, decided that the factory for the pro-

duction of airframe should be located at Nasik; and that the factory for the production of aero-engines should be located at Koraput.

33. During evidence, the Managing Director informed the Committee that the physical separation of the airframe factory at Nasik and the aero-engine factory at Koraput did pose problems to the Management. Koraput is located in an area which is not well served by either the railways or the road service. The distance between Nasik and Koraput is about 900 miles by road and rail and about 600 miles by air. He stated that each time an engine had to go from Koraput to Nasik it would take about a week, if sent by a passenger train, and would cost Rs. 1000/- per engine. Since in course of time, H.A.L. would also be doing the overhauling of MIG-21 aircraft, each time an aircraft is received at Nasik, its engine will have to be stripped and sent to Koraput, where it would be overhauled and then sent back to Nasik. Among other things, it is very likely that the sensitive parts of the engine might get damaged during transit by rail and the whole process might have to be repeated. The Managing Director admitted that it would have been more efficient and economical if both the factories were at one place.

34. The Secretary, Department of Defence Production was, however, of the view that there was nothing basically wrong in having separate aero-engine and airframe factories. He pointed out that in other countries the air-frame and aero-engine factories were generally located at different places, and in some cases even at considerable distance from each other. Once a factory was hundred miles away then it could even be 800 miles away. The transport charges were only a small part of the whole cost and it was really not a very important factor. He stated that for reasons of strategic considerations and economic development of new areas, it was decided that the two factories should be far away from each other.

35. The Committee do not agree that distance between the airframe and aero-engine factories does not make any difference to defence production. The distance between the components and engine manufacturing plants and the assembly plant does play a very important role. The entire programme and schedule of construction is affected by distance. Existence of a long and difficult supply line from the point of manufacture of engine to the aircraft assembly point has its own financial, functional and time-consuming disadvantages. The Committee feel that the selection of Koraput as a site for aero-engine factory appears to have been decided more on strategic and other considerations than those of economy and efficiency. Although there is no question of changing the decision now, it would

have been more advantageous to have had both the factories nearer to each other. They hope that the management would ensure that these factories now function efficiently and that disadvantages of distant locations are reduced to the minimum.

36. The Committee hope that unless strategic considerations are overwhelming Government will pay due attention to economic considerations in future so as to lighten the financial burdens of an undertaking.

37. One of the reasons for selecting Koraput was the economic development of that area. Where a factory of the magnitude of the present aero-engine factory is set up, it brings into that area very sophisticated items of technology and many ancillary and auxiliary industries can come up. **The Committee note that rail and post and telegraph facilities are being developed in this region. There is, however, need for expeditious completion of railway link and provision of prompt and extensive posts and telegraph facilities in this area. It is probably due to this reason that development of the area around Koraput, as sequel to the location of the aero-engine factory has not come about. The Committee feel that vigorous efforts should be made both by the Central Government and the Government of Orissa to carry out the policy of economic development of the area around Koraput.**

B. Civil Construction

38. To expedite the setting up of the MIG factories at Nasik and Koraput, the construction of buildings was started as early as 1964, based on the requirements of the Project Reports. Normally it takes three to four years for the buildings to be completed and for the shops to be commissioned after which only the production can start. This project was however planned to commence production simultaneously with the construction of buildings.

39. The civil construction works at Nasik and Koraput were however entrusted to the Maharashtra and Orissa Governments respectively for the following reasons:—

(i) It was necessary to complete the civil works on an urgent basis consistent with the production programme envisaged.

(ii) The MES could not undertake the construction work as they were already fully strained in relation to additional commitments after the emergency, and C.P.W.D. had other important assignments on hand.

(iii) It was impractical to build up a suitable civil engineering organisation for this purpose within HAL.

40. The Ministry have stated that although the Aeronautics India Limited was incorporated on the 16th August 1963, the MIG project was assigned to the company only on the 30th March, 1964. The Ministry of Defence accorded sanctions for a number of civil works at Nasik, before the assignment of the project to the company. Presumably this was with the idea that civil construction need not be held up pending detailed examination and approval of the Project reports, which was expected to take time.

41. The accounting instructions issued by the Government for the execution of the works contemplated that the Accountant General, Maharashtra would audit all expenditure incurred by the project authorities, with reference to the sanctions accorded by the Ministry of Defence, and act as sub-audit officer to the Defence Accounts authorities. Where such arrangements are made, the complete responsibility for audit in all respects rests with the Accountant General and the Defence Accounts authorities accept the expenditure as certified by the Accountant General and incorporate the same in the books of Defence Accounts.

42. Even after the Aeronautics India Limited was formed and the project assigned to it, the arrangement remained unaltered. This was because the various accounting documents were kept by the State Government and contracts, etc. were concluded in accordance with State Government's rules and procedures. H.A.L. accordingly requested the Accountant General, Maharashtra to continue to audit the expenditure incurred by the Defence Project Wing and he agreed to discharge this function as before.

43. This type of works are normally known as deposit-works. In respect of such works HAL was required to pay in advance in a lumpsum or in convenient instalments. As the total value of the works awarded to the Maharashtra Government was considerable, a working arrangement was agreed upon between HAL and the Maharashtra Government whereby monthly requisitions were submitted by the Maharashtra Government to HAL indicating their requirements of funds on monthly basis. In addition, monthly statements of accounts giving in detail the amounts received and expenditure booked on various component items of work were also being rendered. Before making any payment to the State Government on the basis of the requisitions submitted by them, the same was linked up with the past expenditure statements and after ensuring that the demand was reasonable, further releases of funds were made.

44. It has been stated that in a project of this kind and magnitude, it is necessary that sufficient funds are left with the Executive Officers to meet the demands for supply of steel etc., which are to be procured in advance and payments in respect of which are also to be made within specified time limits, if the discount admissible is to be availed of. In view of this, the outstanding amounts with the Maharashtra Government are not considered as unreasonable.

45. As the Accountant General, Maharashtra acted as sub-audit officer in respect of expenditure on civil works, HAL did not get any copies of contracts, etc., nor the bills of the contractors duly supported by the measurement books as those records were maintained by the Maharashtra Government and subject to audit by Accountant General, Maharashtra.

46. So far as HAL is concerned, in the absence of contracts and measurement books it was not possible to ensure that the expenditure shown by the Maharashtra Government against various works was really in keeping with the physical progress of the work. Nor was it possible for HAL to exercise a scrutiny in this respect as the expenditure booked against works covered not only payments in respect of works done by the contractors but also covered on-account payments in respect of stores collected by the contractors for the works. In view of this, it was not possible for HAL to adjudge the payments made to contractors|expenditure booked to works with reference to a visual estimate of physical progress of work. It was the responsibility of the Maharashtra Government to ensure that the payments made to the contractors were in accordance with the terms of the contracts and that expenditure booked was correct and did not exceed the administrative approvals.

47. The management has stated that despite this position H.A.L. had persuaded Maharashtra Government to render monthly statements showing the physical progress of the works in terms of percentages. It was noticed that on 31.3.1967 the physical progress of civil works as per statement furnished by the Maharashtra Government was Rs. 8,61,89,979 where as the payments made to them was Rs. 8,39,20,147. The payments made to the Maharashtra Government were thus fully covered if the value of stores plus the inventory holding in respect of the material procured for the works were taken into account.

48. Regarding the quality of the works entrusted to agency of the Maharashtra Government, it had always been held by HAL that the works should be subjected to an independent inspection by a

quality control organisation. This point had been repeatedly brought out by HAL at the various co-ordination meetings held to discuss all the aspects concerning the civil construction at Nasik. These meetings were presided over by the Secretary (Defence Production) and participation from the Maharashtra Government has been at the level of Additional Secretary to the General Administration Department and Chief Engineer of the Defence Project Wing. The Maharashtra Government officials had however resisted this demand for an independent Quality Control check on the ground that normal Public Works procedures were being followed and that in addition there was an inspection by the Technical Advisor to the Maharashtra Government.

49. The scope of inspection by HAL had therefore been restricted only to visual inspection at the stage of taking over of the buildings. At that stage, many defects had been noticed most of which were minor in nature, but amongst which were three main categories of major defects:—

(i) Inadequate water proofing of buildings;

(ii) Cracks in floor slabs; and

(iii) Concreting of the runway was improperly done.

The lists of defects as noticed at the time of taking over had been passed on to the Maharashtra Government with a request to rectify the same indicating *inter-alia* that it should be at the cost of the contractor responsible for the work. As the contracts were entered into by the Maharashtra Government measurements were recorded by their engineers and payments were made based on these measurements by their accounts authorities and were finally subjected to audit by A.G., Maharashtra, there was little that HAL could do in this connection except to point out the defects and to have them rectified.

50. The Maharashtra Government had been informed by HAL of the unsatisfactory nature of the waterproofing and had been instructed that it should be rectified. It has however been reported that in spite of the requests, the rectification work had not been carried out in a satifactory manner, neither in factory buildings nor in residential quarters.

51. The rectification of the runway is being done by the Nasik Division itself. The work is in progress and is expected to cost about a lakh of rupees.

52. Regarding flooring, however, there was a diffierence of opinion. The Maharashtra Government was not willing to accept

the responsibility for cracks in the floor which according to them were attributable to the design. At the direction of the Secretary (DP) the matter was discussed by the Chief Engineer, HAL Bangalore with Chief Engineer, Defence Project Wing when it was decided that the case should be referred to an independent authority, *viz.* Maharashtra Engineering Research Institute, Nasik for examination and report. This report is awaited.

53. The procedure followed at Koraput is more or less the same as at Nasik. The Accountant General, Orissa acts as sub-audit officer to the Controller of Defence Accounts.

54. During evidence the Managing Director, HAL informed the Committee that final bills had not been received from the Maharashtra Government in respect of the buildings completed by them and that HAL was pressing them to finalise the accounts. It was also observed that the contracts for some buildings in the third phase of construction were handed over to a certain firm at an enhanced rate to ensure that they were ready in time, but in spite of that the target dates were not adhered to.

55. The Committee note that the work of civil construction had been handed over to the Public Works Departments of Maharashtra and Orissa Governments before the projects were taken over by HAL, and the arrangements were such that the management had no say in this matter. It was therefore not possible for HAL to adjudge the payments made to contractors|expenditure booked to works with reference to an estimate of physical progress of work. It is, however, surprising that HAL did not keep any watch over the quality of the buildings and that the scope of inspection by HAL had been limited only to visual inspection at the time of taking over the buildings. A number of defects had been noticed at the time of taking over the buildings which could have been avoided if HAL had an opportunity to point them out during construction.

56. The progress of construction at Nasik had been far behind the schedule throughout the different phases. The completion of the Administrative Building, Heat Treatment and Plating Shop, Machine Shop, Sheet Metal Block, Engineering Block, Central Laboratory and Paint and Final Finish Shop in the third phase of constrution was delayed by about three months beyond the revised target dates. The delay in construction of the Heat Treatment and Plating Shop also upset the manufacturing schedule to a considerable extent. All these buildings were given to a firm for construction at increased rates but in spite of that the target dates were not adhered to.

The project was planned to commence assembly of aircraft more or less simultaneously with construction of buildings. Therefore the speed with which the works were to be completed was of great importance. The Committee regret to note that the time schedule, which was the essence of the matter, had not been kept up.

57. The Committee desire that the payments made by HAL to the Maharashtra Government should be settled as early as possible in consultation with the A.G. Maharashtra. It is hoped that the dispute over cracks in floor slabs, which has been referred to the Maharashtra Engineering Research Institute, Nasik will be promptly settled.

58. Similary in Koraput, no direct supervision was exercised by HAL. Only liaison with the State Government engineers was maintained and periodic inspections were carried out by HAL staff. Before taking over the buildings HAL staff was supposed to have satisfied themselves that the specifications were adhered to and deviations|defects were pointed out for rectification|redoing. The payments were made by way of advance to cover the expenditure of Government of Orissa in works, purchases etc. Every month Additional Chief Engineer (Roads and Buildings) gave an estimate of his requirements for the following month and the same was paid either before the month's end or in the first week of the following month. In turn he was expected to keep a balance of not more than Rs. 10 lakhs towards the end of the month out of the advance paid in the previous month. This arrangement was as per PWD Code of Orissa Government for Deposit works.

59. Regarding the civil works at Koraput, the Managing Director informed the Committee during evidence that it was under discussion with the Orissa State Government as to when Orissa Government should break off and HAL should take over. It was further stated that HAL had to set up its engineering organisation in any case for the maintenance of the township and that organisation could take over the work of supervising the construction of the remaining part of the township.

60. However, during a discussion on a calling attention nctice in Rajya Sabha on the 19th March, 1968, the Minister of State in the Ministry of Defence stated that a representation was received from the Government of Orissa on the 9th February, 1968, wherein it had been pointed out that if the responsibility for construction was taken over by HAL, there would be difficulty in keeping the Orissa Government engineering cadre fully employed and that the present set up should continue for the execution of the rest of the work till

the project was completed in all respects The Minister further stated that the Managing Director HAL held discussions with the Orissa Government and clarified to them that HAL was quite prepared for the present not to take up the construction work and that HAL would delay setting up the full organisation for maintenance. So, for the present the Government of Orissa would continue to handle the construction work.

61. As the work of civil construction is nearing completion, it will be desirable that a nucleus maintenance organisation of HAL is set up, so that it is ready to take over as soon as the work is completed by the Orissa Government. They also hope that while recruiting staff for the maintenance organisation preference will be given to the personnel at present working in the construction work.

C. Production

62. Since the establishment of facilities for the manufacture of MIG 21 aircraft from raw materials would have taken a fairly long time, it was decided to supply aircraft to the Indian Air Force after assembling the same from different types of imported assemblies. Besides meeting the requirements of the Air Force in time, this had the additional advantage of providing necessary training and technical know-how to the Indian staff in the assembly of this sophisticated type of aircraft. The following programme had been drawn up for the manufacture of aero-engines at Koraput, electronic equipment at Hyderabad and the airframe at Nasik.

Koraput Division

63. As per delivery programme finalised in June 1966, the target dates were as under:—

(a)	Delivery of first engine after test ..	May, 1968
(b)	Delivery of first engine from major assembly	Sep., 1968
(c)	Delivery of first engine from sub-assembly ..	Oct., 1968
(d)	Delivery of first engine from details ..	March, 1969
(e)	Delivery of first engine with imported difficulties components and manufacture of simple parts	April, 1970
(f)	Delivery of first engine manufactured from raw materials	January, 1971

64. The management have stated that in view of the delay in concluding contracts for supply of test equipment, first engine after

testing is likely to be delivered in December, 1968. The delivery of engines from major assemblies, sub-assemblies and detail's are likely to be delayed by 6 to 7 months respectively.

65. The Committee regret to note that the target dates for the delivery of engines are not being adhered to although the scheduled programme was liberal. They hope that the Koraput Division would try to make up the lost time so that schedules of other Divisions are not adversely affected. The Committee feel that the time schedule for producing an engine indigenously is rather long in view of HAL's experience in this line. .. ..

Hyderabad Division

66. The first phase production programme from fully assembled equipment has been completed by July, 1967 and at present the second phase of sub-assembly work and testing is in progress. So far 30 per cent of the second phase schedule have been completed. The production programme has been arranged to suit the production programme of Nasik Division.

Nasik Division

The targets were as follow :

(i)	Erection from fully-equipped assemblies	January, 1967
(ii)	Assembling the air-craft from detailed Assemblies	April-May, 1968
(iii)	Indigenous production (Manufacture from raw materials) ..	July,1970

Erection from fully equipped assemblies has been done as per schedule.

67. The present orders with HAL for this aircraft would keep the factories at Nasik, Hyderabad and Koraput busy for a few years. Thereafter, the factories will need additional orders.

D. Cost of Production

68. The Ministry have stated that estimates of cost of production from sub-assemblies, details, raw materials and profitability had not yet been worked out in the case of three factories of the MIG complex. These estimates had not also been included in the Project Report. **The supplies to IAF would be on "cost plus profit" basis. The quantum of profit was yet to be deciaded. HAL had not been** able to make any reasonably accurate estimates of production costs and financial results for the factories so far.

69. The Committee are surprised to note that an essential item like the cost of production was omitted from the project Report, with the result that HAL which took over the project at a later stage had no idea about the cost of production of this aircraft. The Committee recommend that the cost of production of the aircraft at various stages should be worked out without delay. In future it should be ensured that the cost of production is always included in the Detailed Project Report of a project.

E. Electronics Factory

70. The Electronics Factory at Hyderabad according to the production programme drawn up with the help of collaborators, had to start production of fully assembled sets by end of 1966, and from sub-assemblies from the beginning of 1967. These two stages have been achieved. There are delays cropping up at present due to non-receipt of plant and machinery, raw materials, tools, etc. in time which is mainly due to the closure of the Suez Canal.

71. The Committee hope that the delays in receipt of equipment will be reduced to the minimum possible limit so that production programme is not affected.

IV

BANGALORE DIVISION

The Bangalore Division is the oldest of all the Divisions of the Hindustan Aeronautics Ltd. It has an experience of nearly 27 years in the manufacture and maintenance of aircraft, aero-engines, accessories, etc. They have also developed certain traditions and conventions. In many matters-like accounts, planning, procedure recruitment and training, design and organisation other Divisions look towards Bangalore for practices and conventions. As the new Divisions build up, fresh problems and situations will arise. The Bangalore Division, therefore, assumes a special responsibility. On the other hand on amalgamation of the Hindustan Aircraft Ltd. with the Aeronautics India Ltd., the Bangalore Division was put to a loss in as much as it had to part with some of its experienced personnel to help the other Divisions to grow. Any assessment of the working of this Division has also to be viewed in the light of this un-assigned role of the Division.

A. Production

73. The original programme of the Hindustan Aircraft Limited, when it was started in 1940 was to manufacture the Harlow PC 5 trainers, Curtiss Hawk Fighters, and Vultee Attack Bombers. Barely eight months after the inception of the factory the first aircraft was assembled and flown and production of Hawk-P-36 and Harlow IC-5 commenced. About the same time the first 10 seater Indian glider was locally designed, built and test flown. In March, 1943 the company switched over to defence work *i.e.* overhaul|repair of airrraft, engines and related accessories till the duration of World War II. As a result of this, HAL grew into one of the largest overhaul|repair organization in the East.

74. In 1947 on the advice of a Technical Mission, HAL was entrusted with the manufacture of Pereival Prentice Trainer aircraft for the Indian Air Force. The first aircraft flew in April 1948. In 1947-48 a modern all-metal Basic Trainer Aircraft—the HT 2, was designed and developed by HAL. This aircraft has been under production for some years. In March, 1950, the Government of India entered into a licence agreement with the De Havilland Company of U.K. for the mnufacture of Vampire Jet aircraft in HAL. The entire requirements of this airraft in the country have been met by HAL.

75. The Bangalore Division is currently engaged in the manufacture of the following types of aircraft:—

1. HF—24—Marut.
2. HJT—16—Kiran (Basic jet trainer)
3. Gnat—Fighter aircraft.
4. Krishak—For air observation post duties.
5. Pushpak—An ultra light two seater aircraft for *ab-initio* training of pilots.
6. Aloutte—Helicopter.

76. Besides the aircraft, the Bangalore Division is manufacturing and developing the following categories of aero engines:—

1. Orpheus 701—Turbo jet engine for Gnat.
2. Orpheus 703—For Marut.
3. Dart RDA—7—For Avro 748.
4. Artouste—For helicopter.
5. HJE—2500—For Kiran.
6. Piston Engine—For Pushpak.

77. Alongside HAL continues to handle the repair|overhaul of Dakotas, Dove|Devon, Liberators, Fairchild Packet, Canberra and those aircraft, which have been manufactured by HAL and also the overhaul of piston and jet engines of various types. First and second line maintenance of IAF aircraft is also undertaken by HAL at ten outstation depots.

B. HF-24 MK-1 Aircraft

78. Government approved in 1956 the appointment of a team of German engineers to assist HAL in the design and development of a supersonic fighter aircraft known as the HF-24. The first prototype of the HF-24 Mk. 1 aircraft powered by two Orpheus 703 engines made its successful flight in June, 1961 and the second prototype in October, 1962. An initial batch of these aircraft was handed over to the Indian Air Force on 10th May, 1964.

79. The aircraft is designed to be a multi-purpose twin engined monoplane of all metal construction with a high supersonic performance. This is the first time that an aircraft in the supersonic category has been completely designed and developed in this country. This is the major project of HAL Bangalore. Along with the German experts, more than 100 Indian engineers were associated and they have gained a fair degree of experience in the design and development of modern high speed aircraft.

80. Simultaneously with the development of the aircraft, steps have been taken by HAL to productionise the aircraft. In the first stage, which has already commenced, a certain number of aircraft are being manufactured with two Bristol Siddley Orpheus 703 Engines. This is proposed to be followed by the manufacture of HF-24 aircraft with re-heat version of the engine. The development of the aircraft for a still higher performance depends upon the availability of suitable engines.

81. The Committee noticed that there were delays in the delivery schedules, which led to frequent revisions in production targets. Explaining the reasons for these, HAL has stated in a written reply that the Bangalore Division had insufficient experience of productionising an indigenously designed aircraft, involving production planning, methods development and tool design before 1960. Prior to the HF-24 HAL had, with the exception of the HT-2, only been engaged in licence manufacture of the Prentic, Vampire and Gnat. In the case of the Licence projects, the data for production planning, process sheets and tool drawing were furnished by the licenser, and the methods study and tool design was limited to changes in processes and tool to suit the available machinery and equipment.

82. Thus it can be seen that a commitment was entered into for production of a certain number of aircraft without sufficient information or experience being available to enable preparation of reliable plans for production and, these targets had to be subsequently redetermined for the following reasons:—

Prototype Tooling: When the first order was placed, even the prototype tooling had not been completed. When the second order was placed, final assembly of the first prototype had just commenced. The average man hours for manufacture of pre-production aircraft was assumed to be 1.1. lakhs, whereas it was established that an average of about 9 lakhs man hours had been taken for construction of the two prototypes. A total of 30 lakhs man hours only were assessed for the full range of production tooling, whereas about 11 lakhs man hours were expended for the limited prototype tooling alone.

Production Engineering Department: The Production Engineering Department for the HF-24 was newly established in November, 1960. The requirements for planning staff had to be met mainly by recruitment of Diploma holders in engineering who had no previous experience. The other source, normally drawn upon for obtaining methods engineers, *viz.* the shops, could not be utilised since there were hardly any academically qualified personnel in the shops. In

the absence of qualified and experienced personnel, changes required for production could not be indicated in time *i.e.* while the drawings were being prepared. It took a long period after the flight of the first prototype before methods engineering staff were able to put up worthwhile recommendations for drawing changes to facilitate production. The drawing changes were issued by the Design Department as requested by Production Engineering Department and considerable improvement in the jig cycle times and man hours for manufacture were observed after these changes were implemented. However, valuable time was lost.

Tool Design: The remarks made regarding the inexperience of methods engineering personnel equally apply to the tool design staff. As a result, tools fabricated as per the tool drawings are frequently snagged during the tools proving stage and are not available for production until necessary changes have been effected. Special emphasis is being laid for procuring suitably qualified and experienced personnel for methods engineering and tool design since these are two fields in which HAL had little previous experience.

Tooling: For the HF-24 a large number of tools of various descriptions, machining fixtures, sheet metal forming tools, welding fixtures, pipe templates, plastic moulding tools, sub-assembly and major assembly jigs and interchangeability media had to be manufactured in the aircraft factory. About 70 lakh man hours (exclusive of prototype tooling man hours) and 7 years have been expended so far on this task. In foreign countries much of the tooling is sub-contracted to various engineering firms but such facilities are not presently available in India. The lack of tooling capacity has affected the aircraft manufacturing programme.

Procurement of Materials: In the early stages of the project a certain procurement lead time was assumed for all materials. In actual practice, however, it has been experienced that the average procurement lead time for raw materials, standard parts and consumables is much more and, for proprietary equipment, the average period is even longer. The delay in procurement has adversely affected production schedules, particularly so when new modifications are introduced during the course of production. The procurement lead times referred to above are in respect of imported materials which form the bulk of production requirements. Even in respect of indigenous materials the lead time is of the same order.

Production Drawings: Issue of production drawings commenced some years ago. Since the design and development phase is not yet completed, new drawings and drawing changes continue to be issued

for production. Even after the sealing of drawing a large number of new drawings and drawing changes have been issued. During this period a number of re-release modifications have been introduced. Of these, some modifications involve new tooling and a few modifications require new procurement.

83. Aircraft deliveries are greatly affected by the late release of drawings due to the snowballing effect of delays in the intermediate stages of tooling, material procurement, parts fabrication and assembly.

84. The above reply of HAL shows that the complexities of producing a sophisticated aircraft like the HF-24 had not been properly visualized either by the German engineers or HAL. The Committee are unable to understand as to what were the factors that contributed to the formulation of such unrealistic targets. The lack of experience in production planning must have been all too apparent to the management when they formulated such optimistic estimates initially. Preparing optimistic estimates of production and then not being able to adhere to such schedules creates disappointment and disillusionment regarding the competence and efficiency of the organisation. The Committee therefore cannot but emphasize the need for realistic planning and formulation of realizable targets in such matters.

85. The Committee do agree that productionising an indigenously designed aircraft is by no means an easy task, especially when the aircraft manufacturing industry in India is still in its infancy. They, however, feel that much of the time and money lost in prototype tooling, production engineering, tool designs, etc. could have been saved by proper planning and synchronization of development in these different fields. The Committee earnestly hope that production planning organisation will now be suitably geared up so that the future production of this aircraft is streamlined, and the difficulties experienced in the initial stages of manufacture of this aircraft are not encountered again.

C. HF 24—Mk II

86. During evidence the Managing Director informed the Committee that efforts were being made to improve the performance of the HF 24 MKI, as there was considerable growth potential. This aircraft is fitted with orpheus engine. This aircraft is also being developed as a trainer aircraft with two seats and also for use for

reconnaisance photography. HAL had already succeeded very largely in the case of Mark I. The only hold up was in its own production capabilities. **It had not fully realised the complexities of production of this aircraft and made optimistic estimates. HAL's production planning organisation needed to be changed. The needful was being done but it would still take four or five years to fulfil their demands for Mark I. The Committee hope and trust that the efforts of HAL in developing the aircraft will be successful.**

D. HJT-16 (Kiran)

87. In December, 1959, the Government of India approved the design and development at HAL of an indigenous Basic Jet Trainer the HJT-16. The aircraft is powered by Viper II, turbo-jet engine. It is a single engine aircraft, fully aerobatic, with two side by side seats for basic pilot training. The first prototype was successfully test flown in September, 1964 and the second prototype in August, 1965.

88. The Ministry of Defence placed two orders on HAL for this aircraft in August, 1963 and April, 1965. The first order was expected to be completed by 1966 and the second by 1968-69. However, the deliveries are now expected to be completed only by 1970-71. HAL have intimated that two pre-production aircraft have been completed and are undergoing development trials. Several modifications had to be incorporated in earlier stages.

89. During evidence, the Managing Direction informed the Committee that this aircraft was designed entirely by HAL personnel and that they had run into certain problems of flight characteristics. Those problems had been overcome, but then a particular metal, used in a vital part, cracked. That part had to be replaced and the aircraft rebuilt. **The Committee are surprised to note that an aircraft, the prototypes of which had been successfully test flown as early as 1964 and 1965 should have run into problems of flight characteristics in 1968 at the pre-production stage. This appears to be indicative of the fact that design and production engineering wings of HAL have certain handicaps to overcome. The Committee hope that HAL would now be able to srteamline their production engineering department and make good the delay.**

90. The Committee were informed that HAL had not explored foreign market for HJT-16 (Kiran) aircraft. **The Committee feel that efforts should be made to explore the market for this plane in South East Asian and African countries. A trainer aircraft which**

has proved its utility in India is likely to be of use to other countries in these regions.

E. Gnat aircraft

91. The Government of India entered into an agreement in September, 1956 with Folland Aircraft Ltd., U.K. for the manufacture of the Gnat aircraft, under licence, at HAL.

92. Certain delivery programmes had been drawn up for the supply of these aircraft, but the actual delivery fell short of the scheduled targets. The schedules of deliveries had to be revised a number of times. HAL has ascribed this shortfall in production to a number of technical difficulties.

93. The Committee feel that there is not much force in the arguments advanced as many of these difficulties could have been foreseen in the initial stages. As this aircraft is vital for the defence needs of the country, the Committee hope that HAL would take necessary steps to streamline their production methods to ensure delivery of aircraft according to schedule.

F. Pushpak

94. In 1958 HAL undertook and completed the development of an ultra light two seater aircraft—Pushpak—suitable for flying clubs for *ab-initio* training of pilots.

95. The total orders so far received for the Pushpak aircraft are for 143 aircraft, of which 125 aircraft have been manufactured. The production of the remaining 18 aircraft will start in 1968 and the project will continue till the end of the year.

G. Krishak

96. HAL has also undertaken the manufacture of the Krishak—light four seater aircraft designed to perform among other jobs, air observation duties and pest control and agricultural spraying. Production of AOP Version has been taken up. After completion of the present order, this line of production will be closed.

H. Agricultural aircraft

97. HAL has also taken up the design and development of an agricultural aircraft, for crop spraying purposes and an engine to power this aircraft. The basic design concept has been discussed and finalised with the Ministry of Food and Agriculture. The Managing Director stated during evidence that the Ministry had not placed any firm order but had indicated their requirement of about 300

agricultural aircraft over a period of six to eight years. The final approval of the aircraft by the Ministry was expected towards the end of the year 1968, by which time HAL would have satisfied themselves about capabilities of the aircraft, which they are developing according to the job requirements specified by the Ministry. At present the project was being financed from HAL's own resources. In reply to a question the Managing Director informed the Committee that in case the Ministry of Food and Agriculture did not place an order for this aircraft HAL would have to write off the money that they had spent from their funds.

98. **The Committee are surprised to note that HAL have taken up the development of this aircraft without any firm orders from the Government and that the whole effort and expenditure will go waste if for any reason, the Ministry of Food and Agriculture fails to place an order for the indicated number of agricultural aircraft. HAL have had a sad experience in the case of HS 748 aircraft and gliders where the I.A.F. did not honour the indications they had given. The Committee have examined these cases in a subsequent chapter of this Report. Such drastic cut in orders results in enormous extra-expenditure, and loss of manpower and time which could be utilised in more useful production. In fact if the actual requirements of the Government were known in the beginning it might not have been economically viable at all to launch these projects for such a small number of aircraft. The Committee therefore feel that the Ministry of Food and Agriculture should place firm orders with HAL for the number of aircraft required by them. There should also be a formal agreement regarding the financial burden of designing and developing the Agricultural aircraft with a provision for financial indemnity for either of the parties not being able to fulfil the terms. HAL has to sustain a strong and efficient aircraft industry and as such it is necessary for it to keep its financial commitments limited. The Committee feel that this should have been done before the project was taken on hand.**

I. Alouette Helicopters

99. The programme drawn by the Planning Team in consultation with the Sud Aviation of France envisaged a gradual build-up of manufacturing capacity for Alouette helicopter. The first batch of helicopters was to be constructed from imported major assemblies, sub-assemblies and details. Production time estimated was two months in the case of the initial flyway aircraft, five months for assembly from major components, seven months for construction from sub-assemblies, which had to be put together in jigs prior to the

erection of the aircraft, and nine months for manufacture from details, which had first to be made into sub-assemblies, then erected on jigs, and finally assembled into helicopters. The programme was designed to lead up, after a certain stage, to the manufacture of helicopters from raw materials for which details, sub-assemblies and major assemblies were to be produced in the Bangalore Division.

100. Subsequently the Bangalore Division indicated a delivery schedule for the first batch of helicopters to be built from wholly imported parts. The performance however fell behind schedule. The principal reason for the shortfall in output is stated to be delay in the fabrication of structure assembly jigs, which were necessary at the later stages of manufacture. The jigs had been made at Bangalore from Sud Aviation's drawings, and some difficulty had been experienced in getting them to conform to very precise specifications.

101. Concurrently with the construction of the first batch of machines from imported parts, the Bangalore Division was to prepare for production of subsequent helicopters from raw materials.

102. The Planning Team found that Sud Aviation worked to a certain time-cycle for large scale manufacture. In the case of the Bangalore Division it was estimated that after a certain stage the manufacturing time-cycle would be equal to that envisaged by the Planning Team. Working back from this the Planning Team decided on a longer time-cycle for the initial manufacture from raw materials. The management at Bangalore, however, reduced the time-cycle by one third. Regarding the reasons for this change HAL have stated that as far as can now be ascertained, this change was arbitrary.

103. Indents were placed on DGISM for raw materials and bought-out equipment. ISM was however, unable to locate sources of supply for many items. The Bangalore Division, therefore, had to place orders direct on suppliers.

104. Because of delays in procurement, the delivery programme for manufacture of machines from raw materials was revised. The delivery of raw materials did not keep up to expectations, with the result that certain items were still outstanding, and even for some of these firm supply contracts had yet to be placed.

105. Manufacture of the Alouette from raw materials require a large number of tools, which were to be made in the Bangalore Division. To meet the original programme these tools should have been completed earlier. Many of the tools which were manufactured were not in family groups and their production did not follow a

predetermined plan for the manufacture of detailed parts. Tools for the manufacture of several important items of the transmission system were yet to be made.

106. Delays in tools fabrication have been attributed in part to some of the tool-drawings being in French and because of the late receipt of certain drawings. In addition, it has been stated that a number of tools have had to be re-worked due to discrepancies between tool-drawings, and the actual parts. These could be contributory causes but the principal reason for delays seems to be in the limitations of the Tool Department itself, which was unable to cope with the many demands made upon it, especially by the HF-24 and the HJT-16 projects.

107. Tool planning, design and fabrication is at present the sole responsibility of the Tool Department, which works directly under the Gentral Manager. Normally the Production Planning Department should decide the sequence and timing of tool fabrication required for a given production programme. The fact that it does not do so in the Bangalore Division accounts to some extent for the failure of the Tool Department to meet the needs of the Alouette Programme. The production from raw materials thus did not proceed satisfactorily.

108. A consultant was of the view that it would not be possible to manufacture the helicopter from raw materials to the time-cycle set by the management. He felt that a more realistic estimate would be a very much longer time-cycle in the initial stages, which could be shortened after a certain stage. After detailed study of the Bangalore Division's plant and workshop, he eventually came to the conclusion that the manufacturing time-cycle could be reduced in the initial stages, and that too with the help of some Sud Aviation engineers and technicians, and with the purchase of certain components which the Bangalore Division would not be able to manufacture for some time.

109. It is therefore quite clear that the management of the Bangalore Division must accept responsibility for arbitrary reduction of the manufacturing time-cycle recommended by the Planning Team, which led to early promise of unrealistic deliveries. This initial error has been aggravated through delays in procurement of raw materials, and more particularly, delays in tooling for which the management is accountable. The Committee feel that the tooling activity is poorly planned and controlled, and calls for re-organisation and strengthening of both the Tool and Production Planning Departments. The Committee hope that this would be looked into and the situation remedied soon.

J. Aero Engines

110. Under a licence agreement with Bristol Aero-Engine Ltd., U.K. the Aeroengine factory at Bangalore is manufacturing the Orpheus turbo jet engines-701 engine for the Gnat aircraft from raw materials and 703 engine for HF 24 MK I. Under another agreement with Rolls Royce, Derby, Dart RDA-7 turbo prop engines are being manufactured to power the HS 748 aircraft. Production of Artouste turbojet engine is also on hand under a licence agreement with Turbo-mecca of France for Alouette helicopters.

111. The actual cost of production of an engine has been more or less in line with the estimated cost of production, except in case of Dart RDA-7 engine. It has been stated that the original estimate of this engine was based on the production programme of a figure, which was cut down to less than one third on receipt of the actual order. In this case the actual cost of production is nearly double that of the estimated cost of production.

112. HJE-2500 engine is being designed and developed by HAL for the HJT-16 aircraft. Its inaugural run was made a few years ago. It has been stated that development of an engine requires a minimum of four prototypes for development work upto type certification stage. Subject to availability of necessary funds, it is anticipated that the development of this engine will be completed shortly. The production of this engine would meet only future orders for the HJT-16 aircraft. Meanwhile it will be powered by Viper II.

113. A four cylinder piston engine for Pushpak has also been designed by HAL. It has been installed on Pushpak and test flown. The performance of the aircraft with this engine has proved satisfactory.

114. The Gas Turbine Research Establishment, Bangalore is developing a reheat system on the Orpheus 703 to improve the performance of the HF 24 MK I aircraft. The development of the reheat engine on test bed has been completed and further developments are in progress.

115. During evidence, the Managing Director informed the Committee that though the rated capacity of the aeroengine factory was based on two shifts, in actual practice HAL was working with full one shift and a partial second shift and as such there was surplus machine capacity. At present 40 per cent of machines were not being used as the orders had not come upto expectations. This

was so not only in case of Dart RDA 7, but also in case of a jet engine, which was to be fitted in IAF transport planes as auxiliary power units. The requirements in this case were cut down to half. It was also stated that Orpheus engine at present was being used in only three countries—UK, Italy and India and that all of them were meeting their requirements from their owns resources. There was thus no scope of exporting the engine or any part thereof. In the case of the Dart, which was more commonly used in the civil airlines; HAL had been able to export some items, but here again the capacity for sales abroad was somewhat limited.

116. The Committee recommend that HAL should make sustained efforts to develop and manufacture jet engine indigenously with Mach 2 capabilities to obviate our dependence on aero engines of foreign manufacture. They also urge that efforts should be made to get more work for the engine factory by way of overhauling jet engines of the I.A.F., the I.A.C. or of foreign airlines operating in India. That might go to some extent in utilising the surplus capacity of the aero engine factory.

117. There is some imbalance in the production capacities of the Bangalore plants for aero-engine manufacture and that of airframes. The engine plant is currently working at a faster rate. It might be faced with lack of work unless more orders are received and production of airframes is speeded up.

K. Overhaul

118. HAL is recognised by the Directorate of Civil Aviation and has the approval of the American Federal Aviation Agency for the repair and overhaul of DC 3, C 475 and Pratt & Whitney aero-engines. The Company is an authorised DC 3 service centre of the Douglas Aircraft Company. It is also a repair and service agent for the de Havilland Division of Hawker Siddeley.

119. The Company has been providing facilities for repair maintenance and overhaul of aircraft like the Dakotas, Dove|Devon, Fairchild Packet and Liberator, and accessories. The Company has also been entrusted with the task of overhauling the Canberra aircraft and some of its related accessories. Overhaul of piston and jet engines is also being done by HAL at the Bangalore Division and its branch factory at Barrackpore. HAL is also assisting Air India in stepping up the overhauling programme of their Wright Cyclone Engines at Bombay.

120. In order to avoid loss of time and expenditure in ferrying the aircraft to be overhauled all the way to Bangalore and to separate overhaul work from the manufacturing work, HAL opened a

separate branch factory at Barrackpore in April, 1951 for overhaul and repair of aircraft. This factory is a unit of the Bangalore Division. Spares required for the work at Barrackpore are supplied from the Bangalore Division and its finances are controlled by the Head Office.* Although the accounts of the branch factory are maintained separately to a certain extent, they are not treated as separate, but merged in the accounts of the main Division, while finalising the annual accounts under the Companies Act. This factory concentrates on the repair and overhaul of Dakota aircraft belonging to IAF, IAC and non-scheduled operators. Besides this factory, HAL has also small detatchments posted at certain outstations to undertake the first and second line servicing of Dakota aircraft of IAF at those outstations. Bangalore Division also undertakes certain categories of repair and maintenance of the aircraft| aero engine manufactured there. In course of time as the MIG Divisions grow, they would also be undertaking the repair and overhaul of their respective products.

L. Accessories factory

121. While considerable production capacity has been established for the manufacture of airframes and aero-engines, relatively little has been done so far to produce important components and accessories indigenously. In a modern aircraft the value of such equipment is about 30 per cent of the total initial cost, besides recurring requirements for maintenance and repair of equipment in use.

122. Each aircraft requires several thousand parts and individual components and accessories for its manufacture. It has been stated that approximately 80 per cent of these are made indigenously, but the remainder, which call for highly specialized material or design or manufacturing techniques, have to be imported. From amongst the latter, it is proposed to manufacture under licence certain ranges of the following types of equipment:—

(i) Flight and Navigation instruments.

(ii) Hydraulic Equipments.

(iii) Wheels and Brakes.

(iv) Undercarriage.

(v) Air-conditioning and Pressurisation equipment.

123. Even so, certain types of equipment would continue to be imported until production can be expanded further to include them.

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*Hindustan Aeronautics Ltd. informed after the presentation but before printing of the Report that the finances of the Barrackpore Factory were controlled by the Bangalore Division and not by the Head Office, as mentioned above.

These manufacturing programmes are however dependent upon the import of raw materials. Self-sufficiency in supplies is difficult of achievement for HAL because, while requirements of specialized materials and aircraft parts cover a very wide variety of goods, the volume of each is small. The pace of technological progress is such that designs become obsolete very quickly. In these circumstances, HAL would have to continue importing materials without which its aircraft would not be able to fulfil their given tasks.

124. During evidence, the Managing Director informed the Committee that HAL had prepared a project report for an Accessories Factory. It was based on producing a range of equipment, including some equipment of the Bendix International of U.S.A. But early in 1967 U.S. State Department placed a ban on the supply of manufacturing Know-how in respect of equipment which could be used in tactical striker aircraft. This upset the plans of HAL considerably, though the State Department has now relented and the conditions imposed earlier have been relaxed.

125. As a large part of the work related to Bendix equipment, HAL got into touch with manufacturers in France, England and West Germany. They came forward with certain proposals. A fresh project report was being drawn up, keeping in view the Bandix offer to permit HAL to make the equipment, even if it were to be used on the HF 24.

126. HAL has also agreements with Dunlop Rubber Company, U.K. and with Dowty Rotols for wheels and brakes and under carriages and hydraulic equipments. HAL will also manufacture ejection seats under licence.

127. The Secretary, Department of Defence Production informed the Committee during evidence that one of the difficulties envisaged about the Accessories Factory was that each type of aircraft used a different type of equipment and it would be problem of standardisation. Even in combat aircraft of different types, every item was so very accurate that the slightest change would first take time and then it might result in something going wrong somewhere else. This factory therefore might be supporting only such of those aircraft which would be designed and developed by HAL or those whose manufacture was established.

128. The Committee would suggest that manufacture of all important components and accessories should be taken up early. The Committee on Aircraft Parts, set up by the Department of Defence

Production in September 1965, having completed standardisation of simple items could now take up more complicated items.

129. It was stated during evidence that a detailed study had been made both of aluminium alloy and special steel required for aeronautical industries. The demand for the next five years, along with specifications had been projected out. The alloy that is used in aircraft factories requires four to five times the effort needed for producing ordinary aluminium. HAL was getting certain types of allow sheetings from the Indian Aluminium Co. but its requirements were for a fairly wide range of alloys. The indigenous sources are being tapped, but the highly specialised quality of aluminium alloy would continue to be imported.

130. HAL has also developed a foundry to meet its various production requirements. In order to meet HAL's increasing demands for light alloys, magnesium castings, and other precision casting and forgings, the Foundry and Forge of HAL is being expanded. The Government of India have also entered into a licence agreement with High Duty Alloys Ltd., U.K. for the technical know-how. This agreement has been assigned to HAL for execution. **The Committee hope that HAL will be able to make a major break-through on this project and will be able to meet its requirements of raw materials from its own Foundry and Forge Shop.**

131. The Accessories factory when set up would call upon both private and public sectors to produce many of the goods and components, which will be finally assembled and sent out from the factory. **The Committee feel that enough attention has not been paid to this aspect of the problem. There is a need to develop indigenous sources of supply of raw materials. The Committee would suggest that wherever necessary HAL/Government should provide necessary facilities to such private undertakings, which are anxious to do their bit to feed this factory, by way of raw materials, dies, capital goods, etc. An independent agency could explore this aspect of the aeronautical industry as a whole.**

V

KANPUR DIVISION

A. HS 748 aircraft

HS 748 aircraft was selected as a suitable medium transport aircraft for manufacture in India to replace the ageing Dakotas in use with the Indian Air Force and the Indian Airlines Corporation. A decision in this regard was taken by the Government of India in 1959 and an agreement was concluded with the Hawker Siddeley Group. Consequently four hangers at Kanpur were taken over in January, 1960 and the I.A.F. Aircraft Manufacturing Depot was established to manufacture Avro 748—later redesignated as HS 748—on merger of A.V. Roe & Co. with Hawker Siddeley Aviation Ltd. On the 1st June, 1964, the Depot was merged with the Aeronautics India Ltd., which was later amalgamated with the present company, the Hindustan Aeronautics Ltd.

133. The first set of jigs for HS 748 was set up in the Depot by mid-1960. At that time the indication was that 180 aircraft would be required by the I.A.F. However the present order is only for 27 aircraft from the I.A.F. and 14 aircraft from the I.A.C. As a consequence of shrinkage of orders, it has not been possible to build up the originally planned rate of production. The available plant at Kanpur is assessed as adequate for an annual production of seven aircraft per year. The existing establishment of personnel at Kanpur factory is, however, sufficient for the production of five aircraft per year. It is proposed to build up this capacity to seven aircraft per year by 1969-70.

134. In August 1959 Air Headquarters had given the following requirements of the IAF for the AVRO 748 aircraft:—

(a) Avro 748 (non-military version)	29 aircraft
(b) Avro 748 (side loading Military Freighter version)	56 aircraft
(c) Avro 758 or any other suitable type	95 aircraft
TOTAL	180 aircraft

135. The July 1959 Licence Agreement provided for the manufacture of Avro 748, powered by 2 Rolls Royce Dart 6 engines.

Early in 1960, Hawker Siddeley intimated that they had undertaken the development of the Series II version of this aircraft powered by two Rolls Royce Dart 7 engines. It was evaluated by an IAF team who expressed a preference for the Series II, as the design specifications were superior to those of Series I. It was then decided to switch over to the production of Series II aircraft from the 5th Aircraft onwards.

136. During their visit to the Kanpur Factory of HAL, the Committee were informed that one of the considerations for selecting HS 748 aircraft for manufacture in India was to participate in the design development and production of a transport aircraft to replace the Dakotas of the IAF and the IAC and this aircraft was considered to be most suitable. But as the subsequent events developed on the northern borders, during 1960-62, the Air Force changed their requirements.

137. The question of suitability of HS 748 for use on the regional routes of Indian Airlines Corporation was examined for the first time, when the concept of manufacture in India of a transport aircraft for the use of both IAF and for civil airtransport was considered. At that time, the tentative view of IAC was that as between HS 748 and Fokker Friendship—27, the later would meet their requirements better than the former. After a decision was taken in the matter, the feasibility of utilising this aircraft for civil air transport operations was further pursued.

138. The performance of HS 748, Series I, did not quite suit IAC's requirements. When Series II aircraft was offered to IAC, they arranged practical operational trials of this aircraft on its freighter routes in the Eastern Region in April, 1965. As a result of these trials, IAC accepted the aircraft and placed an order for nine aircraft in the passenger version in October, 1965. This was subsequently increased to fourteen aircraft. The stipulated delivery schedule was as follows:—

Year	*Number of aircraft*
1967	2
1968	5
1969	5
1970 (by March)	2
TOTAL	14

139. IAC is required to pay a price of Rs. 82.53 lakhs equivalent to the cost of an imported similar aircraft. So far, four aircraft have been delivered to the IAC. The operational returns have just started to come in and it is too early to compare the performance of HS 748 and Fokker Friendship 27, already in service with IAC.

140. As regards the future requirements of the IAF and IAC, the Secretary Department of Defence Production informed the Committee that the Ministry of Defence was considering the utilisation of this aircraft as replacement for the Dakotas for trainer and that they may possibly have requirement for more aircraft and that IAC might also have to go in for additional aircraft. It was also stated that if this materialised, at the rate of nine aircraft per year with the existing facilities, HAL, Kanpur should have sufficient orders to keep itself occupied till 1975 or so.

141. It is seen that HAL received no detailed plans or estimates that may have been drawn up before this project was undertaken. The commitments and obligations of the Aircraft Manufacturing Depot were taken over by the Aeronautics India Limited in June, 1964 and in October 1964, with the formation of the Hindustan Aeronautics Ltd. passed on to the new company. Asked for the omission of such an important aspect of a project the Secretary, Department of Defence Production informed the Committee during evidence that a Detailed Project Report in respect of HS 748 was unfortunately not prepared. A team of officers was sent to U.K. and after the agreement was signed in consultation with Hawker Siddeley they prepared a quick plan and the implementation was on the basis of that plan.

142. The Committee are surprised to note that the Government did not pay any attention to this essential aspect while undertaking the project. No satisfactory reasons were advanced by the Ministry during evidence for not preparing the Detailed Project Report. The Government cannot plead ignorance of this procedure as by that time a number of Public Undertakings had already been set up and preparation of DPR had become an established practice.

143. The management have admitted that the curtailment of requirements from 180 to 41 aircraft has adversely affected the cost of production. In the absence of estimates of cost of production from sub-assemblies, details and raw materials, HAL has not yet fixed the cost of HS 748. A study team has reported on the cost of this aircraft. It has been stated that on the basis of the recommendations made by the study team, the cost of the aircraft is being finalised. The cost of production of this aircraft is much more than

what I.A.C. was paying . The question of subsidising HAL for the aircraft sold to the I.A.C. is engaging the attention of the Government. The present expectation of manufacturing five aircraft every year, going up to seven eventually, will hardly help to bring down the cost. There are no immediate prospect of HS 748 being sold to other countries.

144. The very fact that the IAF had to reduce their demand of this aircraft so drastically shows that they did not find it suitable for their requirements as originally envisaged. The Tata Committee also did not commend the aircraft. The Committee doubt the wisdom of setting up this project. However, now that huge investments have been made in the project and having come this far, they feel that some method should be devised to make the most of this venture. IAC should also be made to rely more on the indigenous aircraft industry and to gradually standardise its fleet.

B. Future Plans for HS-748

145. On the basis of present orders, the Kanpur Division is expected to remain busy with the production of HS 748 aircraft till 1971-72. HAL and the Department of Defence Production are expecting that some more orders would come in and that might keep the Division fully engaged till 1976. In case, the order for the additional aircraft does not materialise, HAL has some tentative alternative proposals for the Kanpur Division. The proposals relate to (i) the manufacture of small medium aircraft like Trainer|Agriculture| Communication|Executive Helicopter; (ii) supplementing the production of Bangalore and Nasik Divisions by manufacturing main assemblies with fuselage, wings etc., on sub-contract; and (iii) developing HAL Kanpur into an aircraft overhaul base by transferring such work from HAL Bangalore and Barrackpore. It is quite likely that after some time IAC might like to replace both Fokker Friendship and HS 748 by a more modern aircraft. It is understood that IAC are considering various types, but have not yet made up their mind as to which of the proposed aircarft would meet their requirements better.

146. The designing and developing an aircraft and an engine is a long drawn out process and involves very high costs. Perhaps the only alternative open to HAL would be to enter into collaboration agreements with other countries to manufacture tried and proven designs. However, the aim in the civil programme, as in the military, should be to concentrate on a project for which the potential market is large in relation to the development cost. Unfortunately,

the prospects for export are bleak in the face of fierce competition abroad. Perhaps the Committee on Aeronautics constituted by the Government will go into this question for the aeronautics industry as a whole and suggest some specific steps in this direction.

147. A suggestion has been received by the Committee that installation of 532 engine on HS 748 aircraft instead of 531 engine might lead to reduced operating cost, besides standardising the engines in IAC. It has also been observed that the noise level of HS 748 aircraft needs to be reduced and airconditioning and pressurisation also need improvement. It is understood that a slight modification of the existing engine would be necessary to make the change from 531 to 532 and that a new type of sound absorbent material could reduce the noise level of the aircraft. **The Committee hope that these suggestions will be considered by HAL.**

C. Tooling

148. Messrs Hawker Siddeley Aviation Ltd. had quoted in January, 1959, a figure of 19 lakhs Indian hours for jigs and tools based on a production rate of five aircraft per month. On the basis of a production rate of three aircraft per month, the man hours could be reduced by 10 per cent *i.e.* to 17·25 lakhs Indian man-hours. The man-hours of direct labour were assessed by Hawker Siddeley on the assumption that one U. K. man-hour was equal to 2 Indian man-hours. Therefore, including the estimated cost of raw materials for the manufacture of jigs and tools at Rs. 10 lakhs, the cost of manufacturing the tools was worked out at Rs. 80 lakhs.

149. The Aircraft Maintenance Depot, Kanpur however assessed that one U. K. man hour was equal to only 1.5 Indian man-hours and also that the man-hour rate would be only Rs. 3.60 and not Rs. 4.00. Based on this, a sanction of Rs. 56.50 lakhs was issued for the manufacture of jigs, fixtures and tooling, including material.

150. The expenditure incurred on tooling up to 31st December, 1966 was however Rs. 196 lakhs. It was estimated that over 26 lakh man-hours were spent on tooling by 31.12.1966, despite the fact that work on a significant number of tooling was stopped before completion. It is thus obvious that the extent of effort required for the manufacture of tooling was greatly under-estimated. The reasons for this underestimation have been stated to be as follows:—

(a) The manufacture of tooling was undertaken for the first time. There was lack of experience. AMD could not find a suitable jig and tool designer for a number of years in spite of efforts made through UPSC.

(b) The assessment of AMD Kanpur that one U. K. man hour was equal to 1.5 Indian man hours was based on the assumption that trained workers would be readily available for the manufacture of tooling. The assumption was not justified. AMD had to recruit and train workers. These handicaps were apparently not given due consideration when the cost estimates were prepared.

(c) The man hour rate of Rs. 3.60 also proved to be very low. The toolings manufactured during the AMD period have been costed at Rs. 6.50 per man hour by a Special Committee appointed to value the assets and liabilities of AMD. This estimate of man hour cost has been accepted by Government.

151. An Executive Director of Hawker Siddeley visited the Kanpur Factory in July, 1964 to assess the production facilities. He recommended that in view of the small number of aircraft to be manufactured, it would not be economical to undertake manufacture of 100 per cent tooling. He also noted that families of tools had not been kept together and that there would be difficulty in proving the tools. He recommended that the manufacture of tooling should be restricted to fuselage stage only. The recommendation was accepted and in January 1965 orders were issued restricting the tooling. At that time there were over 5000 tooling job cards on the shop floor. It took the Kanpur Division two months to segregate these and stop further work on tooling relating to the non-fuselage stage.

152. An analysis of the cost incurred by the Kanpur Division upto 31st December, 1966 on tooling is as follows:—

Utilised Jigs, Tools etc.		(*Rs. in Lakhs*)	
Jigs, fixture, etc. in use		79.68	
Finished details of tools used/likely to be used for manufacture (fuselage tools)	= 5059		
Non-fuselage tools	= 1527	51.08	
		130.76	130.76
Jigs, tools etc. not likely to be utilised.			
Fuselage tools (1628 nos.)		13.02	
Finished details tools (non-fuselage)		22.55	
Unfinished details tools (non fuselage)		16.05	
Unfinished jigs		0.87	
		52.49	52.49

Work in progress	10.31
Adjustment of audit objections	2.44
	196.00

153. It would be seen from the above that as a result of the restriction of tooling to the fuselage stage only 2819 non-fuselage tools worth Rs. 22:55 lakhs and 2475 incomplete tools worth Rs. 16.05 lakhs could not be put to effective use. Even fuselage tools worth Rs. 13.02 lakhs could not be utilised. These include (i) tools not being used on account of change in tooling arising from the decision to change over from Series I to Series II aicraft and (ii) tools which could not be utilised for want of assembly fixtures and plant facilities. The non-utilisation in the first category is unavoidable, but the tools falling in the second category could have been foreseen.

154. The task of tool try out has also been grossly underestimated. It was envisaged that a tool-tryout rate of 40 tools per day was possible. As the work progressed it was found that approximately 70 per cent of the tools required rework, some of them as many as four times. The maximum rate of tool tryout which could be achieved was 70 tools per week. Gradually more difficult tools were left and the number of tools passing tryout dwindled to approximately 20 per week. As against the assessment of completing the job by March 1965, the Kanpur Division still has some tools to clear. Apart from being an extra load, rectification of tools also adds to the cost. Modification costs are approximately on an average 30 per cent or more of the cost of manufacturing the tool.

155. During evidence, the Managing Director, informed the Committee that the tooling which had become infructuous at Kanpur was due in a large measure to changes in plans and estimates of the number of aircraft required. When orders for only 27 aircraft were received HAL realised that making tooling for all the different parts would be wasteful and time consuming and the whole plan was revised in 1964. The tooling was restricted to fuselage. In the tooling done, the families of tools were not taken into consideration and the easier tools were taken first. Till the family was completed, it was not possible to prove the tooling. Secondly the tooling was not built up in stages to match the programme of manufacture-simple tools had been made for different stages, but few of them were complete. A part of the responsibility for the infructuous tooling could be attributed to the drastic cut made in the demands of HS 748 aircraft by the I.A.F. He further stated that

out of the infructuous tooling of Rs. 52.49 lakhs, tools worth Rs. 36.37 lakhs were made before H.A.L. took over the Kanpur Division. But even after that in 1964, the momentum of work continued. It was only some time in 1965 that HAL revised the programme, but by that time tools worth Rs. 16.12 lakhs had been fabricated.

156. The Committee regret to note that the management responsible for initiating the project did not start the work in a planned and phased manner. It is surprising that tooling was taken up at random without keeping in mind the stages and families of tools. This clearly shows that there was no proper planning in regard to manufacture of tooling and the managerial staff also failed in their duty. The Committee recommend that remedial measures should be taken to minimise the loss.

D. Gliders

157. The project to manufacture gliders is another story of high hopes and low performance. The Government of India sanctioned in March, 1962 the manufacture of 91 "Rohini" side-by-side glider trainers at a cost not exceeding Rs. 15,000/- each, and purchase of drawing for this glider at a cost of Rs. 1,400/- only. In June 1963 the manufacture of a further quantity of 80 "Rohini" gliders and 129 single seater (I.T.G. 3) gliders was sanctioned. The time schedule drawn up for the manufacture of 265 out of these 300 gliders provided that 160 gliders would be manufactured in 1963 and 1964 and 105 in 1965.

158. The design and development of gliders is undertaken by the Technical section of the Civil Aviation Department. They do not however undertake production of gliders. Complete sets of drawings of the designs developed by them are supplied to the interested organisations with permission to manufacture them in series. Two companies in India—one of them being HAL, Kanpur, started production of the Rohini and I.T.G.—3 gliders. The other company (Fabres India Ltd., Calcutta) in the private sector remained in production till 1962-63.

159. The Rohini is a side by side two seat training sailplane. It flew for the first time on May 10, 1961 and was followed by three more prototypes.

160. During the visit of the Committee to Kanpur in July 1967 the Committee were informed that the Kanpur Division had manufactured till then only 62 double seater and one single seater gliders and another 43 were expected to be ready soon. At the time of take over in 1964, the IAF Depot had manufactured 33 gliders. It was stated that H.A.L. had orders only from the I.A.F. for N.C.C. One glider had, however been sold to the Indian Institute of Technology, Kanpur and some had been presented to Malayasia.

161. The time schedule for the production of gliders and the number of gliders actually manufactured are as follows:—

Year	Delivery programme	Nos. ready for delivery	Remarks
1962	5	—	
1963	42	21	
1964	44	18	
1965	62	8	
1966	108	10	Intimation curtailing orders of gliders was received during December, 1965.
1967	74	8	

162. The reasons assigned for the shortfall in production and delivery programme are stated to be higher cost of tooling than originally estimated, higher labour content than originally estimated, failure to procure a certain type of spruce wood indigenously and non-collection of gliders by N.C.C.

163. There is no formal agreement for the supply of 300 gliders to the I.A.F. The work was started on the strength of a letter dated the 14th March, 1962 from the Ministry of Defence to the Chief of Air Staff conveying "the sanction of the President to the manufacture at the Aircraft Manufacturing Depot, Kanpur ninety-ones Rohini side-by-side glider trainers, designed and developed by Director General, Civil Aviation's Technical Directorate, required for the NCC at a cost not exceeding Rs. 15,000/- each". The supply of these gliders was to commence by the 16th July, 1962.

164. It was stated during evidence by the representatives of the Department of Defence Production that when the manufacture of gliders was taken up, the IAF Depot was a departmental undertaking

and it was not necessary and also not usual to enter into an agreement. As in the case of HS 748, in the absence of any formal agreement, the Kanpur Division had the misfortune of facing a drastic cut in the orders for gliders. **As a result of this, the production target had to be restricted to 105 gliders as against 300 in December 1965. Till that date HAL had manufactured only 57 gliders and out of these delivered only 37. The Committee cannot escape the conclusion that the then management at the Kanpur Division made no serious efforts to keep up the schedule of delivery for the gliders.**

165. The original estimated cost of production was Rs. 15,000 per glider. It was later revised to Rs. 25,000. The latest estimates are that the average cost of production of eighty-five Rohini gliders would be Rs. 39,200 each and the average cost of production of twenty I.T.G. 3 gliders would be Rs. 37,100 each. The Committee, however, learnt during their visit to Kanpur that the actual cost of production came to Rs. 42,450 for Rohini and Rs. 47,560 for I.T.G., 3 gliders. The details of cost of production of the firm in private sector which manufactured gliders for sometime are not available and therefore a comparison of the costs of HAL Kanpur is not possible. **It is regrettable that even after this successive revisions the estimates of cost of a glider were unrealistic. Equally disappointing is the fact that machinery, stores, tools, etc. worth Rs. 26.30 lakhs had to become surplus to the requirements of HAL consequent on the reduction in demand from 300 to 105 gliders only.**

166. In a written reply it was stated that in this case the failure on the part of HAL to deliver the gliders has been helpful, because if more gliders had been produced but not delivered to the NCC, more gliders would have remained unused. Asked to elaborate the statement, the representative of the Department of Defence Production stated during evidence that in 1962-63 a big plan for the increase of NCC Air Units was drawn up. The scheme was drawn up on the assumption that all the facilities would be provided by the State Governments. But on a review being made later in 1963-63, it was found that the State Governments were not in a position to make available hangar accommodation and in certain cases even airport facilities did not become available. It was to be the responsibility of the Ministry of Defence to provide gliding instructors. The Secretary, Ministry of Defence Production stated during evidence that after the Chinese aggression, even the few Air Force personnel, who had been made available earlier, were withdrawn by the I.A.F. This led to much slow building up of NCC Air Units. But since then, much water had gone down the river.

167. The Committee fail to understand why a scheme drawn up in 1962-63 by the Defence authorities, which on account of certain set backs could not be put into effective operation then, should not be pursued now, so as to make use of at least those gliders which have been manufactured and delivered or awaiting delivery at Kanpur.

VI

ORGANISATION AND PERSONNEL

A. Administrative set up

The Hindustan Aeronautics Ltd., has a Board of Directors consisting of seven Directors appointed by the President at every Annual General Meeting to hold office till the next Annual General Meeting. The Chairman and the Managing Director are also appointed by the President. The Chairman works part time in an honorary capacity. The Managing Director is the Chief Executive of the Company. The Company has five Divisions each headed by a General Manager at Bangalore, Kanpur, Nasik, Koraput and Hyderabad. Each General Manager is directly under the Managing Director. The Managing Director is assisted by the Financial Adviser, Senior Technical Adviser, Chief Administrative Officer and the Company Secretary.

169. The General Managers are in full charge of the resources of their respective Divisions. Their functions include planning and control of production, the control of funds assigned to them and aspects of local administration.

170. The Managing Director and General Managers have been given specific financial powers by the President of India. The Managing Director in turn has delegated certain powers to the General Managers. The Managing Director retains control only of major matters, such as production plans, allocation and use of funds. The Head Office also co-ordinates labour policy and certain administrative arrangements. The aim is to give as much autonomy as possible to the General Managers in the fulfilment of their production plans within the framework and resources of the Company. The Managing Director stated during evidence that the different Divisions are largely autonomous and the technical designs are also dealt with by the Divisions themselves. Each Division has its own Financial Controller, who is responsible to the General Manager concerned.

171. Coordination among the different Divisions is maintained through periodical meetings once in two or three months, of the Managing Director with the General Managers of the five Divisions. At this meeting, policy matters as well as day to day administrative

problems are discussed across the table and settled. It is the usual practice to invite points for the agenda from all the participants. Various functional Departments in the Head Office, such as Production, Finance and Administration interpret the management policies and co-ordinate execution of these policies by the five Divisions of HAL. The Financial Adviser holds meetings with the Financial Controllers. All matters which require policy decisions and forward planning are discussed at these meetings.

172. The need for close coordination, particularly between the three Divisions of the MIG Project, cannot be over emphasised. The periodical meetings of the General Managers is a step in the right direction and the Committee hope that no effort will be spared to achieve this objective.

B. Co-ordination with Ministry of Defence

173. The Managing Director stated during evidence that the contacts of HAL with the Ministry of Defence are very close. The management reports to the Board all the major decisions that have been taken and the Board if it so desires can alter some of the arrangements. The Board also includes representatives of the Ministry of Defence and the Ministry of Finance and of the Air Force. Since the representative of the Ministry is on the Board of Directors of the Company, he informs HAL if any new projects are to be taken up. This consultation is, however, not compulsory. There is nothing formal or a hard and fast rule laid down for this purpose. In actual practice consultation does take place before any major project is accepted.

174. Regarding the MIG Project, the Managing Director stated during evidence that in the initial project stage HAL did not come into the picture. It was a Government to Government transaction. The Ministry of Defence appointed Project Teams from amongst its own officers who dealt with these matters. The leaders of the project teams eventually became the General Managers of three factories at Nasik, Hyderabad and Koraput. Even today all the major contracts and specially the price are negotiated on Government to Government basis. The companies come into the picture when it comes to the actual operation of these contracts and the day to day running of the factories. Whenever any major negotiations take place, either the General Manager or the Managing Director is present and the technical advice of the General Manager is obtained.

175. The Managing Director informed the Committee during evidence that there is a gradual shift in policy now and the Company

is coming into negotiations more and more. HAL is now entering into licence agreements of its own with a number of manufacturers like Dunlops, Martin Baker, Bendix, ttc.

176. Negotiations with foreign firms, are carried on by the management under the direction of the Board of Directors. The firm agreement has however, to be approved by Government. Government clearance is required especially when foreign exchange is involved.

177. It has been accepted by the Ministry that since HAL is going to operate the agreements, HAL must be consulted at every stage before any decisions are taken. Consultations take place between the Department of Defence Production and HAL as to what the undertaking can do and what jobs should or should not be taken in hand. During negotiations with the Russian Government the technical advisers of HAL sit alongside to advise.

178. The Committee enquired whether in view of the fact that Government carried on all the negotiations and arrived at decisions, and HAL was expected merely to implement them, whether HAL had merely legal autonomy on paper or did it enjoy actual autonomy. The representative of HAL stated that although in the case of MIG and AVRO 748 projects HAL had little to do in the earlier stages, it now came into the picture in all major matters. When the contract for quantities of machinery and equipment was drafted, it was referred to HAL direct. HAL commented on the technological requirements and whether the quantities of machinery and equipment were in accordance with the agreement. The Ministry comes into the picture when the final pricing of the contract is to be done. Discussions on pricing part have to be conducted on the Government to Government basis. HAL is an observer at this stage but on the technological side it is the actual decision makers. The detailed project report is examined by HAL with a view to see that as much material as possible is obtained indigenously and the machinery to be imported is reduced.

179. The Committee hope that with the passage of time and accumulation of experience, HAL will be more intimately connected with the formation and approval of project reports as it is their responsibility to ensure the execution of such projects. The Ministry should pay more attention to policy matters which come within their orbit of activity.

C. Chairman and the Managing Director

180. The Secretary of the Department of Defence Production stated during evidence that it was essential to have a Chairman in

addition to a Managing Director. The Chairman was the man whom Government could always consult in addition to the Managing Director. He added that the Chairman as an official, was essentially apart from the Managing Director because, if, for instance, the Managing Director was functioning in an inefficient manner it would take much longer time to find out the causes of inefficiency if there was no Chairman. He felt that on the whole on an organisational basis it was better to have a Chairman separate from the Managing Director because he could pick up some major points and take them up at a higher level and fight on behalf of the Management. The Chairman had a hand in framing the policy of the Company and was also more intimately connected with the Company than the members of the Board and therefore he could guide the Board and the Management.

181. The Managing Director of the Hindustan Aeronautics Ltd., however, stated during evidence that there was no necessity of a Chairman as it did not affect the Company in any way. The Chairman merely presided over the meetings of the Board of Directors and did not exercise any powers.

182. The Committee feel that the argument put forward by the Secretary of the Ministry is not tenable. The Managing Director is supposed to be a person appointed by the Government on grounds of his abilities, experience and efficiency apart from being one who is in close contact with the working of the projects and hence being the fittest person to head it or lead it. There should be no difficulty in Government being able to obtain any information they want from the Managing Director. **The Committee feel that when the Chairman has no executive functions and is simply required to preside over the meetings of the Board there is no point in having one such in addition to a Managing Director. This makes the organisation top heavy without any attendant advantages. It leads to duality of control and clash of personalities. The Committee, are therefore, of the view that it will be better to combine the posts of Managing Director and Chairman.**

D. Deputationists

183. The IAF is one of the few airforces in the world which has come to rely on the home industry to meet a sizeable portion of its aircraft requirements. The association between the IAF and HAL, which is there since the inception of HAL, has become closer over

the years and the vital need of close coordination has been demonstrated by the fact that it has become an accepted practice to have senior most officers of the Air Force to be the Chief Executives of HAL.

184. The Estimates Committee however, pointed out in their 52nd Report (3rd Lok Sabha) that besides being costly, the practice of depending upon Government for manning posts, in public undertakings, particularly non-technical ones, was not condusive to efficiency.

185. The number of officers in different senior categories and the number of deputationists from among them at present are as follows:—

HAL Scale of pay	Total No. of officers	Total No. of deputationists
Rs. 3000—3500	1	1
Rs. 2500—3000	2	1
Rs. 2000—2500	6	5
Rs. 1600—1800	1	1
Rs. 1600—2000	12	7
Rs. 1300—1600	46	16
	68	31

All the deputationists are from the services except one.*

186. During the evidence of the representative of the Hindustan Aeronautics Ltd. the Committee enquired whether such an arrangement was satisfactory keeping in view the necessity of maintaining continuity of leadership in an industry like aeronautics. It was explained that the requirements of personnel for the aircraft industry were fairly heavy, specially during the last four years when the MIG projects had been coming up. On the engineering side alone HAL needed 1100 to 1200 engineers in various categories. The fresh engineers had to be trained before they could do any effective work in supervising the activities on the shop floor. So in the past HAL had to get officers on deputation to make up such deficiencies and gaps.

*Hindustan Aeronautics Ltd. informed after the presentation but before printing of the Report that all the deputationists were from Government service and not that all deputationists were from the services, except one.

187. It was stated that at present the number of technical officers from the IAF with HAL was a little over 50. Some of them had been in HAL for 5 to 6 years. A scheme had been worked out for the permanent absorption of a number of these officers because their presence in some of the responsible positions was essential. It was further stated that in the work like testflying of aircraft, HAL's own test pilots could only fly those aircraft which were in HAL, whereas Air Force pilots flew on a wide range of aircraft and they had a good deal of information and experience. HAL would very much like to gain from their experience. Similarly air-armament engineers were almost a monopoly of the I.A.F. The expertise on arms which HAL needed in designing an aircraft had to come from the Air Force.

188. The Secretary, Department of Defence Production observed during evidence that when Air Force sent an officer to HAL, he remained there for a considerable length of time and then for purposes of Air Force he did not remain a really effective Air Force officer, because the two organisations had different standards and nature of work. On the other hand a deputationist in HAL became effective only after two years and when he was to be reverted after a normal term of three years, the aeronautical factory was not able to take full advantage of his knowledge and experience. He further stated that the IAF was anxious to ensure that none of its officers remained on deputation outside the Air Force for more than 3 or 4 years at a time, while HAL wanted to keep them for long years to have continuity and to utilise their experience.

189. The Committee appreciate that HAL would need officers on deputation from the Indian Air Force. In the long run the expertise of an IAF officer in HAL and his stay in HAL is in the interest both of HAL and the I.A.F. The position is not irreconcilable and the Government should evolve an arrangement by which all the interests are protected to the best advantage. The Committee are of the view that too frequent changes in the top positions are not conducive to efficiency. They therefore recommend that whenever necessary, deputation should be taken for at least 4 to 6 years There should also be objection to their absorption in HAL if they are willing and are found suitable.

E. Middle management

190. It has been noticed that in the Bangalore Division the percentage of qualified engineers who have got academic qualifications to back up their work is very small. Most of the staff has come up from the shop-floor. This has been in a way a handicap to HAL. Persons good at machine work need not be good planners. One of

the reasons for the Bangalore Division having run into difficulties in their production planning and scheduled delivery dates has been lack of planners. In the Kanpur Division, the inadequacy in production planning and technical skills have been a hindering block.

191. HAL has made efforts to recruit and train personnel at the middle management level. On the strength of an assessment made of the appointments to be filled during the next five years, a scheme for recruitment and training of approximately 150 Graduate Engineers every year has been introduced. The need for continuing the scheme or for enlarging it would be reviewed from time to time. It is stated that the first batch of direct recruits under the scheme would begin training in March, 1968 and will be in position in September, 1969. A similar scheme for recruitment of Graduate apprentices for administrative appointments is also stated to be under consideration of HAL.

192. Besides it is proposed to establish a Company Staff Training College at Bangalore to run management courses for direct recruits as well as to run refresher courses to improve the managerial efficiency of the existing executives of HAL.

193. The Committee hope that the steps being taken by H.A.L. will prove useful in tackling this problem. They feel that a reasonable percentage of top technicians, must have practical experience of the job. Arrangements should however be made to see that these technical personnel are able to obtain professional qualifications, which would entitle them to go up to the next grade.

194. Under Article 98 of the Articles of Association of the Company, power is vested in the Board of Directors to manage the business of the Company and to exercise all such powers and to do all such acts and things as the Company is authorised to exercise and do subject to the provisions contained in the Memorandum and Articles of Association of the Company or any regulations made by the Company at their general meetings and provisions of the Companies Act.

F. Delegation of powers

195. This general power vested in the Board of Directors is restricted by the reserve power vesting in the President of India by virtue of article 107(2) of the Articles of Association of the Company whereby the President is empowered to entrust and confer upon the Chairman, Managing Director, and General Managers, such powers exercisable under the Articles by the Board of Directors as he may deem fit.

196. In exercise of the above reserved power vesting in the President of India, powers have been delegated from time to time to the Managing Director and the General Managers. Whenever any specific proposal falls beyond the purview of these delegated powers of General Managers, the proposal is submitted for the approval of the Managing Director, the Board or through the Board to the Government, as the case may be, in terms of the provisions of Article 119 of the Articles of Association.

197. The Committee understand that the delegation of powers to the Managing Director/General Managers is not adequate. It has been stated that certain specific powers based on the model code for public sector undertakings have been given to the Managing Director/General Managers whereas residuary powers are left in the Board of Directors. **This results in frequent references being made necessary to the Board on a large number of points. The Committee would suggest that feasibility of enhancing the powers of the Managing Director/General Managers might be examined by the Government.**

G. Absenteeism

198. The overall monthly percentage of absenteeism of direct labour, both in the Aircraft and the Engine Factories at the Bangalore Division for the period April 1966 to March 1967 is as follows:

Month	Aircraft Factory	Engine Factory
	%	%
April, 1966	27.94	25.87
May, 1966	25.10	28.08
June, 1966	22.30	24.53
July, 1966	18.40	21.57
August, 1966	17.30	16.87
September, 1966	18.02	17.14
October, 1966	16.34	17.14
November, 1966	17.30	15.94
December, 1966	16.74	15.80
January, 1967	24.90	24.79
February, 1967	26.60	23.36
March, 1967	24.00	23.02

199. The reasons for absenteeism are stated to be mainly health grounds, family difficulties, litigation in courts, observance of social customs and personal difficulties in individual cases. This includes absence on account of availing of the leave facilities by the employees and the absence on loss of pay, unauthorised absence, etc. The absenteeism on account of availing of the authorised leave facilities works out to roughly 13·5 per cent and the balance is due to the other causes. The percentage of absenteeism is more particularly during the first half of the calender year when the leave at the credit of workers is available for utilisation.

200. It has also been stated that one of the reasons for this high percentage has been the availing of leave facilities by the employees at the Bangalore Division under the Employees State Insurance Scheme, which provides for larger leave benefit than under the Company's rule. Under the Scheme certain protection is granted to the employees which makes it difficult, for HAL to take any disciplinary action. Besides, a small percentage of absenteeism is also on account of employees undertaking casual work elsewhere for monetary gains.

201. The absenteeism in the Kanpur Division for the year 1965 was 8.6 per cent and for the year 1966 it was 14.6 per cent. The figures in 1966 had gone up due to the illegal strike culminating in lockout during September/October, 1966.

202. The average percentage of absenteeism among the different categories of staff in Nasik Division is as follows:—

Senior Supervisory Staff (Rs. 700 and above)—11.9 per cent.

Supervisory personnel (Rs. 195—860)—13·4 per cent.

Direct workers—14·00 per cent.

Indirect workers—11·2 per cent.

203. In Koraput Division, based on study of one year from March, 1966 to February, 1967, it has been noticed that the absenteeism—authorised or unauthorised—is 19,105 and 639 man-days respectively. This is probably due to the remoteness and backwardness of the area and lack of communication. People under the circumstances are prone to be away frequently and for long durations for the sake of change; the transit period itself is longer compared to a developed area.

204. It would be seen that the percentage of absenteeism of direct labour at HAL Bangalore is very high. One of the reasons stated to be is that the employees avail themselves of leave freely under the facilities available under the ESI Scheme. This contention has, however, been contested by the Ministry of Labour, Employment and Rehabilitation to whom a reference* was made by the Department of Defence Production on the question whether there has been an increase in absenteeism among the workers consequent upon the introduction of the ESI Scheme. In 1966 the ESIS Review Committee, consisting of representatives of Governments, employers and workers, came to the conclusion that there was no evidence to show that absenteeism in industry had shown a significant increase after the introduction of the ESI Scheme or that they had been malingering on a large scale.

205. The eligibility for sickness benefit under the Employees' State Insurance Act, 1958 is by itself not unreasonable. The worker is entitled to receive benefits only at the rate of 7/12 of the wages. Also, the act provides for 2 days' waiting period for which no payment is made by the ESI Corporation. These, generally, should act as a deterrent to the misuse of the eligibility for sickness. The abuse will gradually disappear when the employment on a casual basis does not give more advantages than remaining on duty. The Ministry of Labour, Employment and Rehabilitation have also pointed out that the remedy is that the Medical Officers of the undertaking should not be lax in the matter of giving sickness certificates. The Ministry of Labour, Employment and Rehabilitation have stated that the matter would be reviewed after some experience has been gained.

206. It is thus seen that there is recognition of the fact that the doctors are somewhat lax in recommending sick leave to employees. The Committee feel that in order to control absenteeism resulting from the working of the E.S.I. Scheme, H.A.L. should take up the matter with the Ministry of Labour and Employment in order to plug the loopholes leading to misuse of E.S.I. Scheme facilities on medical grounds.

207. In order to reduce the percentage of absenteeism H.A.L. has introduced an Attendance Bonus Scheme, whereby the employees who surrender their casual and sick leaves are paid certain bonus.

*The Department of Defence Production stated at the time of factual verification that they did not specifically enquire from the Labour Ministry whether there had been an increase in absenteeism among the workers consequent on the introduction of ESI Scheme. In fact, in the case of H.A.L. the fact that there has been an increase was quite clear.

This has helped to a certain extent in reducing absenteeism. An Attendance Bonus Scheme is, however, in the form of a negative approach to the problem. A great responsibility lies on the shoulders of the workers of H.A.L. as the success or failure of H.A.L. would depend upon their performance. **The Committee suggest that the management should examine the causes of absenteeism, in detail and try to find solutions for them. The management should also endeavour to establish a rapport with labour and labour union leaders in order to discourage abuse of ESI facilities.**

208. The complaint that the laxity of doctors in issuing certificates of incapacity had aggravated the problem of absenteeism and had put the employers to a great deal of trouble and inconvenience was also made before the ESIS Review Committee. That Committee sought from the employers data of actual absenteeism due to sickness for a certain number of years, before and after the implementation of the Scheme, in various areas in the country. Unfortunately, with the exception of a very few factories, no figures of any kind were furnished. Such figures as were produced by a few factories were also not enough to justify any general conclusion regarding the seriousness of this problem.

209. The rate of absenteeism is high not only in H.A.L. but also in other undertakings in Bangalore. It is understood that in many of these undertakings there is not a single workman, who does not fall ill for precisely the 56 days that the E.S.I. Scheme permits him to stay away. There are two benefits to be derived by this absence. Firstly the mechanic/workman who absents himself gets a job outside under some private arrangement. Secondly the man who is detained because of other workman's absence gets overtime wages. There is often a sort of roster, whereby the workmen absent themselves on a pre-determined basis. Although the Ministry of Labour, Employment and Rehabilitation has thrown the onus on the Medical Officers, they recognise that there is misuse of the E.S.I. Scheme. They admit that the abuse will gradually disappear when the employment of the workers outside on casual basis does not give them more advantage than remaining on duty. **In view of the above facts the Committee are of the opinion that the working of the E.S.I. Scheme needs a thorough re-examination in the light of the experience of the undertakings in Bangalore.**

H. Labour Welfare

210. HAL has introduced a number of schemes for the welfare of its workers. Some of these schemes are Employees Welfare Fund, Cooperative Societies, Provident Fund, Gratuity Schemes, loans to Housing Societies, leave travel concessions, supply of uniforms to

certain category of employees, housing, transport and medical facilities. These schemes have been uniformly extended to all the five Divisions of HAL for benefit of employees. Besides, there are a few other amenities which are at present enjoyed only by the employees of the Bangalore Division. It has been stated that the question of extending the remaining amenities to other Divisions will be considered as soon as they get through the project stage and go into production.

(i) *Canteens*

211. One of the facilities which has not been extended uniformly is regarding canteens. HAL has provided canteen facilities to the employees in accordance with the provisions of the Factories Act, 1948. However the canteens at the Bangalore Division are subsidised in regard to service of tea, coffee, snacks and meals. Canteens in other Divisions have been provided with accommodation, furniture, cooking utensils, free water, gas, electricity, etc. Food stuffs are sold on no-profit no-loss basis as per the provisions of the Factories Act.

212. The Workers' Canteens at Bangalore Division have been functioning almost from the inception of the factory. The present tariff was fixed during April, 1947 to run the canteens on no-profit no-loss basis with reference to the then cost of materials. But in spite of subsequent increase in the cost of foodstuff, the tariff has not been changed.

213. The expenditure incurred by way of subsidy during the year 1966-67 for the canteens is given below:—

1.	Executive Canteen ..	Rs. 1,14,767	
2.	Aircraft Factory Canteen ..	Rs. 9,33,773	
3.	Yelahanka Canteen	Rs. 59,765	
4.	Workers Canteen (Engines)	Rs. 2,93,193	
5.	Engine Staff Canteen	Rs. 67,906	
	Total ..	Rs. 14,69,404	
6.	Barrackpore Canteen ..	Rs. 1,80,000	(Approx.)
	Grand Total ..	Rs. 16,49,404	

214. The subsidy during 1966-67 on foodstuffs alone amounted to Rs. 6.00 lakhs. The number of employees benefited by these facilities as on 31st December, 1966 was approximately 21,000.

215. All the 3000 employees of the Kanpur Division are benefited by the subsidised canteen facilities. The subsidy includes free accommodation, water and electricity charges, utensils and the wages of the canteen staff. The subsidy amount to Rs. 4,000 approximately per month.

216. At Naisk canteen are subsidised by providing staff, furniture, utensils, free accommodation, water, electricity, cooking facilities etc. The prices of foodstuffs were fixed in 1965. It has not been possible to enhance the prices because of agitation by the workers. The Division is incurring a loss of Rs. 3300 every month as the prices have since gone up. The number of employees benefited is 2300.

217. The canteens in the Hyderabad Division are subsidised towards its capital facilities like furniture, utensils and staff for running the canteens. Accommodation, electricity and water are provided free by the Management. The expenditure on provisions and fuel are being met by the canteen out of realisations from sale of foodstuffs. The cost of foodstuffs, during the last few months have increased and the canteens are running at a loss estimated at Rs. 500 p.m. It has not been possible to increase the prices of various items of foodstuffs due to resistence from the employees. The number of employees benefited is 1100.

218. The canteen at Koraput is also subsidised by providing facilities as in the other two MIG Divisions. The canteen is running on a no-profit no-loss basis. The number of employees benefited by the canteen services is 500 per day.

219. It would be seen from the foregoing paragraphs that the Bangalore Division canteens are highly subsidised because the rates of foodstuffs charged from workers there are abnormally low. This has resulted in the labour unions at the other Divisions of HAL agitating for charging the same rates as in the Bangalore Division.

220. During evidence, the Managing Director explained that canteen was a facility which was provided under the Factories Act. There was nothing in the Act to say as to what extent a canteen should be subsidised. At all the canteens HAL was providing free accommodation, lighting, fuel equipment and staff to run the canteen. It was stated that in the Bangalore Division the canteens through long usage and custom had been heavily subsidised. In the old days, Bangalore was a cheap place. One could get a full plate of meal for 19 paise and a bigger meal for 41 paise. Those rates were fixed about 15 years ago. Since then the prices had

increased. In those days there was hardly any subsidy, but now HAL was subsidising 70 per cent of the direct expenses on food alone in the Bangalore Division, which meant that HAL was paying about Rs. 6 lakhs a year to provide food to the workers at these unrealistic low rates. A point was raised during evidence whether the possibility of linking further increase in the dearness allowance or any other allowance with some increase in the canteen tariffs had been considered. The Managing Director informed the Committee that an offer based on these lines was made to the different labour unions in all the five Divisions of HAL, but so far labour unions at only two Divisions had accepted it. He further stated that the labour unions at Bangalore and Barrackpore had not only rejected the offer, but had also withdrawn from the Canteen Committees. Another point discussed was that since the prices were continuously rising, there should be a limit to subsidising the direct costs of foodstuffs in the canteens. The Committee were informed that HAL was trying to work out a formula in each case so that it would keep the canteen subsidy to a minimum and that it was going to be discussed with the labour unions.

221. It was also brought to the notice of the Committee that a practice had grown up in the Bangalore Division whereby after having paid 41 paise for a full meal, a worker could get an additional helping by paying another ten paise. It was also reported that much of the food thus obtained was being carried away home in tiffin boxes. The Managing Director informed the Committee that any increase in the rate of second helping was difficult as this had become a custom over many years. Any change that might be made would be resented. Even attempts of the management to advise the workers not to waste food had been resented. On account of the second helping and waste of foodstuff, the Committee were informed, that in the recent times the serving of about three thousand meals a day at the Bangalore Division had almost doubled itself to between seven and eight thousand meals a day.

222. It is needless for the Committee to emphasise the necessity of avoiding wastage of food. As for the second helping, the Committee do not see any reason why it should not be raised to the level of the price of the first meal. A facility given at one place and denied at another does cause resentment among the workers. The Committee feel that the canteen facilities are meant for the workers on duty and not for their families at home. The practice of carrying food home is, therefore, unreasonable and should be discouraged. One way of doing it would be to prohibit the bringing of tiffin boxes etc. into the canteens.

(ii) Pay and allowances

223. It was brought to the notice of the Committee that workers of a particular Division were not getting the same allowances or amenities which workers of other Public Undertakings in the city were getting i.e. at Hyderabad.

224. During evidence, the Managing Director informed the Committee that in Hyderabad certain Public Undertakings were giving house rent allowance and city compensatory allowance to their workers but HAL was not paying these allowances to its workers. He explained that the reason for this was that the entire question of giving allowances to the workers in the engineering industries was before the Engineering Wage Board. It was also pointed out that the scales of pay and allowances of the different categories of workers were the same in all the five Divisions of HAL, based on the Bangalore Division's scales, except for the hardship allowance which the workers were getting at Koraput. It was stated that HAL was awaiting the recommendations of the Engineering Wage Board in this respect.

225. The Committee enquired whether there was coordination between the General Managers of the Public Undertakings in big cities like Bangalore and Hyderabad in matters like transportation, canteens allowances and attitudes of labour unions and whether they discussed these matters of common interest frequently. The Managing Director stated that such a system had developed at Bangalore, where there was a Coordinating Committee of Union Industries. HAL was taking guidance from this Committee, but in Hyderabad such a system had not come into vogue. The working of Coordination Committee of Union Industries in Bangalore has to a certain extent avoided dissimilarities between the facilities/amenities being given to the workers of the Public Undertakings in Bangalore.

226. The Committee are of the opinion that as there are a number of Public Undertakings in Hyderabad, there is justification for a similar coordination Committee to function in Hyderabad where problems common to the Public Undertakings could be discussed in order to arrive at a satisfactory solution. Necessary steps should be taken towards this direction.

227. The Committee feel that matters relating to the working conditions of workers in Public Undertakings need an all India approach and unless there is coordination throughout India these difficulties would persist. The Government should, therefore, examine this issue on a broader perspective.

(ii) *Engineering Wage Board*

228. It was suggested to the Committee that in view of highly specialised nature of aeronautical industry, there was a need for a special National Tribunal to consider the question of wages, allied matters and classification of workers instead of the Engineering Wage Board, as at present.

229. During evidence, the Managing Director informed the Committee that the first reference to the Engineering Wage Board of the wages paid to the workers of H.A.L. was made about three years ago at the request of the labour union at Bangalore, whose charter of demands stated that their wages should not be settled by any body but the Wage Board. Since then the Board had been dealing with the problems of H.A.L. It was further explained that the change in the attitude of the labour unions that they should be dissociated from the Board had come about as a result of recent developments. One of the reasons was considerable increase in the wages of Airlines employees, secondly increase in the dearness allowances given to Central Government employees by the Gajendragadkar Commission; thirdly the interim award of the Engineering Wage Board given in 1966 and partly implemented in 1967 was very low. It was also pointed out that in Bombay, where H.A.L. workers were working in the same shop alongside Air India workmen, the scales of pay of HAL's technicians and those of Air India's differed greatly. The scales of pay of Air India started from the point, where the scales of pay HAL workers doing similar job ended. It was reported that the unions appeared to feel that if they remained with the Engineering Wage Board, they would be equated with the whole lot of industries, where the wage scale was lower than that of the Airlines. Most of the unions were strongly opposed to the Board now. **It was further stated that the Board was considering the question as to whether the aeronautical industry should be treated separately. Since the Engineering Wage Board is already seized of the matter, the Committee do not wish to make any comments on the subject.**

VII

DESIGN ORGANISATION

HAL has a Design Engineering Organisation at Bangalore to design and develop new aircraft and aero-engines. The other four Divisions of HAL have only small cells for product improvement. The Design Engineering Organisation was established in 1940. In the beginning the Bangalore Division was largely engaged on licence manufacture and as such the design work was limited in scope i.e. introduction of modifications, preparation of drawings for manufacturing of detail components, detail design, repair scheme, etc. After World War II a number of different designs for converting Military C-47 Dakotas to suit the requirements of various airline companies were developed by the Design Engineering Organisation. The first all metal aircraft HT2 was designed and built for production by HAL.

231. During 1956 the services of aircraft design expert Dr. K. W. Tank with his team of eighteen German Engineers were contracted to design, develop and manufacture the HF-24, a highly sophisticated modern supersonic fighter aircraft. Along with the German experts, a good number of Indian engineers were associated and they have gained a fair degree of experience in the design and development of modern high speed aircraft. Extensive design work is now being carried out on the HF-24 aircraft for its role in different variants.

232. Between 1955 and 1958 HAL also started the development on the HJT-17 advanced Jet Trainer for the I.A.F. Considerable design work was carried out on this aircraft, before it was decided to switch over to a more urgent basic Jet trainer requirements of the IAF designated as HJT 16. In 1959, the Government of India entrusted HAL with the design and development of a basic Jet Trainer HJT-16 to be powered by Viper II in the initial stages.

233. In the latter half of 1958. HAL undertook the design and development of the Pushpak, an ultra light two seater aircraft, and the design and development of a light four seater aircraft —Krishak.

234. In 1962 design work related to the introduction of Jet Pack installation on the Fairchild Packet Aircraft undertaken with a view to improve safety and high altitude capacity of the aircraft.

235. The following design jobs are currently in hand at the Organisation:—

(1) Design and flight development of HF-24 Fighter Aircraft (MK I and MK IR).

(2) Design and flight development of HJT-16 Trainer aircraft.

(3) Prototype design of the Agricultural aircraft.

(4) Preliminary design and Wind Tunnel studies of a new Fighter Aircraft.

(5) Design and development of HJE-2500 Turbojet engine.

(6) Design of powerplant for Agricultural aircraft.

236. A nucleus design and development section for aero-engines was established in 1959. The design section is now handling the following projects:—

(a) PE-90-Four Cylinder four stroke engine for light aircraft.

(b) HJE-2500-2500 lbs thrust—axle flow compressor Jet Engine.

(c) Establishment of 2500 K. W. compressor test rig.

(d) Design of test rig for testing turbines, and combustion chambers of jet engine.

237. Proposals for further strengthening and rationalising of design organisations in HAL complex are at present under consideration.

238. The Committee were informed in a written reply, that where design projects have been undertaken specifically at the instance of the user, the projects are financed by the user by way of 'on account' payment against actual expenditure, otherwise the cost is initially met from the Research and Development Budget and recovered ultimately from the cost of the product. The Committee have however noted that in the case of the agricultural aircraft now being designed and developed at Bangalore, the expenditure is being borne by HAL and have made their observations elsewhere in this Report.

239. The staff in the scale of Rs. 350—600 and above at the Design offices in the Divisions are as follows:—

1. Bangalore Division	
(a) Aircraft	385
(b) Engines	29
2. Kanpur Division	25
3. Nasik Division	27
4. Koraput Division	29
Total	395

240. HAL has intimated in a written reply that the staff strength available at present with the Design Engineering Organisation is sufficient to cope with design modificaton and improvements necessary on the aircraft projects on hand. The strength is also adequate to initiate preliminary design studies for advanced concepts to meet the future aircraft requirements of the Air Force, but will prove to be inadequate once the project has reached a sensible definition and detailed design and drawing work commence. According to HAL it would be desirable that fresh talent be absorved in the organisation so that they may be initiated into current methods and practices adopted in various sections of aircraft design and development work. According to the estimates of HAL the design staff strength has to be reinforced at all levels bringing it upto twice its present strength in the early seventies.

241. The Bangalore Division in the past was largely engaged in licence manufacture. Consequently the design organisation has not developed in numbers and experience in line with the productive facilities that have been established. Considering that with reference to the labour force of 20,000 personnel, the Design staff is only 385; the strength of the Design Organisation appears to be inadequate In many forward thinking organisations in USA and other countries the design and development staff is 20 per cent. of the total task force. **In order to enable HAL to shoulder their responsibilities in designing and development of aircrafts and engines in future, the Committee feel that it is imperative that the Design Organisation is brought on a proper functional footing. The Committee recommend that the design organisations in HAL should be strengthened and rationalized as soon as possible. HAL should also not hesitate to attract persons trained abroad for this purpose either on temporary or permanent basis in order to keep abreast with the latest developments.**

RD 9F Engine

242. During 1961 information was received that two types of jet engines were available in the USSR, which might be suitable as a power plant for HF 24 MK II aircraft. In July-August, 1961 a technical team was sent to the USSR, which reported from Moscow on 5-8-1961 that RD 9F was technically sound and that the airframe and to an extent the engine also would have to be modified to permit satisfactory installation. A contract for purchase of six RD 9F engines was concluded on 18-8-1961.

243. A Soviet team arrived at Bangalore to study the modifications required for the engine and the airframe on 29-11-1961, and

they suggested certain modifications. The assistance of the Soviet authorities was sought for carrying out the modifications to the engine and the scheme was that the entire modification on these six engines would be carried out by HAL.

244. The Soviet authorities were also informed that a licence agreement for manufacture of these engines would be concluded on the understanding that provision would be made for the assistance of the Soviet experts to carry out the modifications. However, the Soviet authorities saw no possibility of refixing the engine in the way suggested by Indian experts. According to them it would amount to producing a new engine. However, on visit of another team to Russia, the Soviet authorities agreed to the modifications to be done in the USSR by Soviet designers and engineers and that they would send modified engines to India. The Soviet authorities however regretted that they could not write into the agreement any guarantee of performance for speed beyond Mach 1.4.

245. The production of RD 9F engine in the USSR was expected to cease during 1962 and they had no requirements for the modified version of the engine. Therefore the Soviet authorities insisted that requirements of HAL should be indicated to them so that necessary arrangements may be made. Accordingly an agreement was made in July 1962 for the supply of further engines and components, even though the first six engines were got to be modified and tried in HF 24.

246. In September 1963, the Soviet authorities were requested to undertake the development of RD 9F engine to Mach 2 performance but they later informed that the development of RD 9F engine was not possible and that the maximum speed possible was 1.4 to 1.6 possibly 1.7 Mach. It was then realised that with the existing resources and technical know-how it may not be possible to develop RD 9F engine for Mach 2 performance in India, when the Soviet authorities themselves had expressed their doubts as well as inability to do so. The total expenditure on this deal was Rs. 2.39 crores.

247. The Committee regret to note that the potentialities of the RD 9F engine to reach Mach 2 capabilities were not properly assessed by H.A.L. authorities before entering into an agreement for its modification. The Committee are also unhappy to note that H.A.L. did not properly assess its own technical know how for development of this engine with the result that a huge expenditure of Rs. 2.39 crores was incurred which ultimately proved to be infructuous. Much of this loss could have been avoided if H.A.L. had listened to the Soviet authorities that they could not guarantee the performance of this engine beyond Mach 1.4.

248. In defence of this infructuous expenditure H.A.L. has stated that it was necessary in the course of a major development project to undertake experiments which must necessarily entail risks. It has also been stated that this project was intended to establish India as a satisfactory designer and manufacturer of supersonic fighters. **The Committee, while agreeing that development of engines and project of this nature does involve risks, feel that H.A.L. should have exercised caution when it came to know that the Soviet authorities were going to cease production of this engine in 1962.**

249. The Committee understand that in some of the western countries, the ground for maintenance of a Design Organisation in an aeronautical undertaking is the technical benefits which might be derived out of it by other industries as well. For instance the demands of aviation have led to the development of materials with high strength/weight properties often coupled with resistance to high tempratures. These have found applications in other branches of engineering. The hydraulic systems of aircraft were developed during the Second World War but now they find use in tractors, earth moving machines, etc. Similarly the aviation provided an initial impetus to electronics, radar and radio. Most of the modern developments in this field have arisen from aviation demand. **The experience of the foreign countries would suggest that the fruits of research which can be utilized by other industries in India should be made available to them.**

250. The Committee have noted that H.A.L. has been concentrating increasingly on utilising its own design skills. This has been amply demonstrated with the HF 24, the HJT-16, HJE-2500 engine. H.A.L. has also taken in hand design of a new combat aircraft. To the extent that this encourages the building up of indigenous designing capability and lowers dependence on foreign countries, it is certainly a most laudable effort.

FINANCE AND ACCOUNTS

Hindustan Aeronautics Ltd., is engaged in production of aircraft and aircraft equipment chiefly to meet the needs of the Indian Air Force. By and large the IAF is the principal customer of HAL and in view of this the financial position is to a large extent determined by the policies of the Government in its capacity as the sole customer. HAL has no effective say in the matter of pricing policy and profit to be derived from items of manufacture. As has been mentioned earlier in this report, curtailment of orders by the IAF has considerable effect on the cost of production, profit and financial position of the Company. Production facilities have been set up more from the point of view of achieving self-sufficiency in defence requirements rather than on considerations of economy. Therefore the normal yardstick of return on investment, capital turn over ratio, etc. cannot be applied to assess the financial performance of HAL.

252. Even then, the Committee have noticed the following lacunae, which when overcome will go a long way to improve the financial structure of the Company.

A. Pricing

253. The majority of jobs are done by HAL on cost plus—basis. On jobs like overhaul/repair of airframes, engines and accessories, and supply of spares, the basis of payment is cost plus 10 per cent profit. On maintenance jobs in outstations, the pay and allowances of HAL staff posted there and overhead on direct labour are reimbursed to HAL. Jobs for civil customers are undertaken on fixed quotations.

254. On the manufacturing projects the quantum of profit is being fixed in each case by the Government. The Ministry of Defence, Department of Defence Production, has considered the possibility of having a uniform formula for allowing profit on HAL manufacturing programmes and suggested a profit margin of 15 per cent on HAL effort, subject to a maximum of 7½ per cent of unit cost. But HAL

are of the view that no uniform formula for allowing profit to HAL as a whole should be applied. It has desired that the quantum of profit on each individual manufacturing project should be decided on its merit.

255. The system of costs plus basis was also the subject of comment by the Estimates Committee (1960-61) in their Hundred and Twenty-Fourth Report on Hindustan Aircraft Ltd. The reply of the Government to the recommendation was as follows:—

> "As regards repair/overhaul it is possible for HAL to give fixed quotations only for specified schedules of work and that too in respect of such projects where HAL has gained sufficient experience. But, by and large due to the diversity of the jobs and inherent difficulty in adopting fixed rates, the substitution of the 'Cost-plus-profit' by a system of fixed quotations is not generally feasible; Government, however, would examine each individual case, as and when fixed quotations are proposed by HAL, and consider such proposals on merits. As regards manufacture of aircraft/engines HAL have proposed the prices of the first few aircraft/engines may be on 'cost-plus' profit basis and thereafter it might be possible to work out fixed quotations. In this connection it may be noted that the Government decides the basis of pricing in each case in consultation with HAL."

256. The Committee are, however, of the view that an undertaking cannot have a proper commercial approach if it runs on "cost plus" basis. Firstly it gives no incentive to reduce costs by cutting out idle time, overtime, wastage of machines, etc. Secondly, this system is likely to prove a heavy burden on the Government because ultimately they are responsible for all the expenditure. Thirdly, the management do not remain cost-conscious and as such are apt to be inefficient. The Committee would recommend that this principle of cost-plus basis should be done away with as early as possible. In items where the manufacture is well established or where the orders are sufficient to undertake large scale production, there should be little difficulty in quoting prices. A system should be evolved whereby after the manufacture of a certain number of aircraft/engines,

fixed prices may be quoted for subsequent production, the prices being revised periodically as might be warranted by changes in the cost.

257. Pending determination of sale price by Government of India to I.A.F., profits on billing has been provisionally made on the following basis:

(a) 5 per cent on cost of aircraft (i.e. expenditure incurred during the company period) and on a batch cost of Rs. 60,630 for Rohini Gliders at Kanpur Division.

(b) 6½ per cent on cost at Bangalore Division; and

(c) 15 per cent on HAL effort at Nasik Division.

258. It is understood that the Government propose to give subsidy to the extent of Rs. 15 to Rs. 20 lakhs for each HS-748 aircraft to be delivered by HAL to IAC. The proposed subsidy appears to be very high. There is hardly any justification for the industry receiving support to such an extent.

259. The solution of the problem lies not in subsidising the cost of production but in making earnest efforts to reduce it. The Committee would suggest that Government should not let this matter linger on indefinitely.

B. Debt-Equity Ratio

260. The equity capital of HAL in 1965-66 was Rs. 38.03 crores whereas the loans from the Government of India were only Rs. 70 lakhs. In 1966-67, the position improved, when the Board of Directors obtained loans amounting to Rs. 14.4 crores and also equity capital amounting to Rs. 50 lakhs. This brought the equity capital of the Company at the end of year to Rs. 38.53 crores, while the loans amounted to a little more than Rs. 15.10 crores. **Though this is an improvement over the previous years, it is still not in conformity with the Government of India's policy of debt and equity ratio being 1:1. There is still over capitalisation in H.A.L. and the Committee hope that Government will keep this in mind while giving further funds to the undertaking.**

C. Sundry Debtors

261. The amount of debts outstanding as on 31-3-1966 was Rs. 5.20 crores, whereas the sales were Rs. 16.46 crores. On 31-3-1967 the debts were Rs. 16.62* crores and the sales were Rs. 29.29* crores.

262. The following table shows the debts outstanding for a period exceeding six months at the end of each of the last three financial years:

Rs. in crores

As on	Total outstanding debts	Debts outstanding for a period exceeding six months
31.3.65	4.99	1.29
31.3.66	5.20	2.79
31.3.67	16.62*	3.42

263. It would be seen that the debts oustanding for a period exceeding six months have registered a sharp inrease from Rs. 1.29 crores on 31-3-1965 to Rs. 3.42 crores on 31-3-1967—*viz.* an increase of 165%.

264. The increase in the amount of sundry debtors appears unjustified particularly in view of the fact that the sales are only to Government departments or undertakings. The outstanding amounts increase the working capital requirements and reduce the profitability of the undertakings. The Committee, therefore, urge that vigorous steps should be taken to realise the outstandings.

D. Audit Paras

I. *Audit Report (Commercial) 1964: Para XV(2) loss on purchase of defective and obsolete equipment.*

265. Hindustan Aeronautics Limited placed an indent on India Supply Mission, Washington for hydraulic test stand of a specific model manufactured by a certain firm in U.S.A. The maufacturers had stopped making that model and had offered the latest model, which was in production. On an enquiry, HAL informed the India Supply Mission that if the old model was not available, they would accept the new model. The manufacturer at this stage did not agree to give 10% discount as the acceptance of the offer had been delayed beyond a specified period by ISM/HAL. At this juncture a tender after the expiry of due date was received from a surplus stockists.

*Hindustan Auronautics Ltd. informed after the presentation but before printing of the Report that the sales as well as sundry debtors included a sum of Rs. 10·17 crores in respect of Nasik Division. Of this Rs. 9.6 crores represented cost of components in respect of which either on account payment were received or defenred credit facility to pay over a period of nine years existed. Out of the said sale of Rs. 10.17 crores only an amount of Rs. 56.00 lakhs was recoverable on 31.3.1967 from IAF. In view of this the figure of Rs. 16.62 crores as sundry debt should be Rs. 7.01 crores and sales should be Rs. 19.68 crores.

for the old model. This late tender was accepted by ISM. The ISM did not consult HAL about placing an order on the surplus stockists.

266. On receipt, the equipment was found of a different type which had apparently been reconditioned and modified to suit the specifications of the type called for by the purchase contract and was, therefore, returned. HAL suffered a loss of Rs. 62,540.16 based on actual ocean freight, customs duty and other charges.

267. During evidence, the Managing Director, Hindustan Aeronautics Ltd. informed the Committee that it was not obligatory for the India Supply Mission, Washington to obtain the approval of the indentor in India before placing an order for supply of material on a firm other than the manufacturer. It was also stated that ISM had no arrangement for inspection of equipment. There was a procedural lapse on the part of ISM in accepting a tender from the surplus stockist after the expiry of the due date. To an enquiry of the Committee as to why this loss should be borne by HAL, the Managing-Director informed the Committee that under the existing instructions the loss occurring in purchase transactions was to be written off by the indentor. HAL's view however was that the purchasing agency should be the one responsible for this loss, but the Department of Supply, under whom ISM works, had not accepted this responsibility and the matter was still in correspondence with the Department of Supply. They had been asked by HAL to accept the responsibility and make good the loss.

268. The Committee also discussed this point with the representative of the Ministry of Works, Housing and Supply (Department of Supply) along with the representative of the Ministry of Defence (Department of Defence Production). The representative of the Department of Supply stated that the indent clearly stated that when the stores were not available from the original manufacturer within a reasonable time, there was no objection to their procurement from the surplus stockists, subject to inspection, preferably by manufacturers or by an independent commercial inspection agency. Only one quotation was received, when tenders were invited on receipt of the indent. The quotation was not for the model asked for, as that model was out of production and the manufacturers had started a new model. On a reference being made, HAL replied that it would like to have the old model as shown in the indent itself, but in case that model had gone out of production, it had no option but to buy the new model. HAL insisted that another attempt should be made to find out whether the old model itself could not be obtained. This showed that the marked preference of HAL was for the old model itself. He further stated that when ISM found an offer coming from

a surplus stockist for the old model and that model was cheaper, ISM cancelled the order on the manufacturers and placed an order on the surplus stockist, without consulting the indentor. It was also stated that as a matter of Government policy settled with Ministry of Defence in 1964 no inspection of machinery, purchased was carried out by ISM, Washington and all goods were accepted on the manufacturer's warranty or where goods were received from surplus stockists, they were obtained on the warranty from surplus stockists. ISM did not get the equipment inspected by inspection agencies in USA as the cost was considerable. An officer of ISM accepted the machine and did not consult his higher officer in this matter. No responsibility could devolve on this officer as the higher officer would also have accepted the machine if the stockist had said that the machine conformed to specifications.

269. The representative of the Department of Supply further informed the Committee that in February, 1960, the surplus stockists was willing to supply a later model of the equipment and/or was prepared to remove the defect, but HAL did not accept either of these offers. The representative was of the view that since the surplus stockist in question was prepared to take back the defective model and give a new model instead, the loss incurred by HAL on the transaction could not be shifted to ISM.

270. It was stated during evidence that the Ministry of Defence had sanctioned the *write off of this amount as irrecoverable loss arising out of the India Supply Mission's contract and the loss was debitable to the accounts of HAL Bangalore. **The Committee are not aware at what level this decision was taken, whether the Ministry of Defence did their best to get I.S.M. to accept this debit, and whether they tried to find out who was responsible for this lapse which resulted in this loss. The Committee desire that these points might be looked into.** The Secretary, Department of Defence Production had stated during evidence that the question whether the cost should be reimbursed by I.S.M. or H.A.L. should be held responsible, had not been formally referred to the Ministry by HAL. HAL's view was that as the item which it had indented for had not been received the cost should be borne by I.S.M.

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*It was stated by the Deparment of Defence Production at the time of factual verification that ISM had suggested that the loss might be written off and their advice was passed on by the Ministry of Defence to HAL. It is, therefore, not correct to say that the Ministry of Defence sanctioned the write off.

271. The Committee after examination of the whole issue feel that the deal suffered from the following defects:—

(i) I.S.M. accepted the tender after the expiry of the stipulated date. This was a procedural lapse.

(ii) The inspection of the machine was not carried out by I.S.M. in spite of a specific stipulation to that effect. The purchase of the machine was made in 1958 and the settlement of the question whether the inspection of purchased item should or should not be made in U.S.A. was decided in 1964 only. Thus in 1958, there was no agreement that inspection should not be carried out in U.S.A.

(iii) The officer of I.S.M. who accepted the machine without ascertaining whether it was in accordance with specifications or not was at fault. He further failed to refer the matter to his higher officer before accepting the machine. The plea of the representative of the Ministry of W.H. & S. that the higher officer would also in all probability have accepted the machine and therefore, no responsibility could be fixed on the junior officer appears to be a mere hypothesis.

(iv) There was hardly any advantage in an officer of I.S.M. accepting the machine if he could not carry out a technical inspection of the same. I.S.M. could have got the machine inspected by technical experts in U.S.A. before accepting the machine. The plea of high inspection cost is untenable as the I.S.M. or the Ministry of W.H. & S. do not appear to have obtained any estimates of cost of inspection. These were not made available to the Committee when the Committee sought information on these points.

(v) The failure to carry out inspection resulted in acceptance of not merely an obsolete model but also a defective and reconditioned machine which also entailed additional loss by way of transportation charges.

272. The net result of all these short-comings was that HAL was supplied a machine which was not according to the specifications it had laid down in its indent on I.S.M.

273. The Committee accept the general principle enunciated by the Secretary of the Department of Defence Production that when an agent acts for an indentor and acts bona fide then the indentor has to accept the credit as well as the debit side of the transaction. But

on the other hand when the agent does not fulfil all the conditions of the indentor then the agent should be responsible. The Committee, therefore, feel that the responsibility in this case rests with I.S.M. The Committee recommend that the question should be settled without any further delay.

II. *Audit Report (Commercial), 1966—Section IX (2) Avoidable expenditure on purchase counter sinks.*

274. In November, 1962 HAL invited quotations for the supply of counter sinks and received three offers in December, 1962, which were valid up to 25th January, 1963. On 4th January, 1963 HAL called for samples and requested the tenderers to keep their offers valid for 45 days from the date of submission of the samples. Although this stipulation was agreed to by all the tenderers, HAL neither finalised the performance report on the samples within the extended validity period nor asked for its further extension. A purchase order made on the lowest tenderer on 10th July, 1963 was not accepted by the tenderer, as it was after three months from the expiry of the extended validity date.

275. In November, 1963, HAL called for fresh quotations and an order at higher rates was placed on another firm involving an extra expenditure of Rs. 53,295.

276. During evidence, the Managing Director HAL admitted that there was a delay in inspecting the equipment and that it was a fault of HAL.

277. The loss on account of retendering could have been avoided, had action been taken by the persons concerned in accordance with a predetermined schedule or programme of work. The samples were received in the Receiving and Shipping Department of the Company on 20th February, 1963 and were sent by Purchase Department to the Inspection Department on the 18th March, 1963. The Inspection Department intimated the suitability of the samples to the Purchase Department on the 26th April, 1963—nearly 40 days after, and the actual order was placed by the Purchase Department on the 10th July, 1963—after a gap of 2½ months. The delay and the consequent loss are regrettable. The Committee suggest that a thorough enquiry should be made in this matter to fix responsibility and the persons found guilty should be suitably dealt with. The procedure should also be streamlined to eliminate recurrence of such delay.

III. *Audit Report (Commercial) 1967—Section XV Avoidable Expenditure on purchase of Stores.*

278. The Hindustan Aeronautics Ltd., Bangalore placed an indent on the India Supply Mission, London in December, 1962, for certain

items of air conditioning and pressurisation equipment estimated to cost £1,52,727 approximately. In March, 1963, when the indent was being processed, HAL asked India Supply Mission to suspend action on it pending full evaluation trial of the equipment. The suspension was lifted in June, 1963. In December, 1963, the Indian Supply Mission placed a contract for the equipment with the British firm at a cost of £1,13,092.

279. Between April, 1964 and November, 1965 HAL asked for the cancellation of supply of certain items of equipment costing £ 27,452 on the ground that a review had established that the items of equipment would not be required. The firm in question however demanded cancellation charges amounting to 100 per cent of the value of all the items, except one, costing £ 1,593 for which it accepted cancellation on payament of a sum of £ 415. Out of the remaining items costing £ 25,859 stores worth £ 13,374 have already been supplied and the balance is being held in store by the firm pending settlement of the question of cancellation charges payable.

280. Incidentally, the cancellations intimated to the firm covered a few items costing £ 14,672 which the firm itself had advised HAL to exclude from the contract, when it was being negotiated, on the ground that they were not necessary. This advice was, however, not accepted by HAL.

281. During evidence, the Managing Director informed the Committee that the School of Aviation Medicine of the Indian Air Force had advised the IAF to use the air ventilated suit system. The Air Force indicated their requirements and an order was placed for certain equipment. This was however done before any detailed evaluation of equipment had been made. Later the IAF changed their mind and told HAL that they did not want the equipment. Consequently the equipment which had been bought by HAL for this purpose became redundant.

282. It may be pointed out that in order to take advantage of the offer within the validity date, HAL did not wait for the results of the full evaluation trials, as can be seen from the following statement of the Ministry of Defence:

> "The AVS system which forms a part of the entire air conditioning and pressurisation system was introduced at the specific request of the Air Force. Technical evaluation of the air conditioning and pressurisation system was, however, being carried on a HAL (BD) continuously. However, till April, 1965, it was not known that the AVS system would not function adequately. In the meantime as

the validity of the quotations for the entire equipment was about to expire, the contract was finalised. Any delay in the finalisation of the contract would have resulted in extra expenditure by way of increase in prices".

283. The Committee were also informed during evidence that the Indian Air Force was not prepared to accept the responsibility for loss on this account as they had not placed any order with HAL for the equipment. It was ordered only on their advice that they would use it eventually.

284. The Committee regret to note that H.A.L. acted with undue haste and in a most unbusinesslike manner. H.A.L. had earlier sad experience of reduction of orders for certain aircraft/aeroengines by the I.A.F. and should have drawn a lesson therefrom. Technically, the I.A.F. may be right.

285. If the results of the evaluation trials had been fully assessed before placing an indent on I.S.M., London, an extra expenditure of £13,789 (£13,374 being cost of items already supplied but not required and £415 being cancellation charges of one item) could have been avoided. In addition, H.A.L. incurred a further liability in respect of £12,485 for the balance of stores now being held by the firm, besides spending a sum of Rs. 19,585 on freight, customs duty, insurance charges, etc. It is a pity that the firm itself is not prepared to take back the equipment. The firm had in fact advised H.A.L. against inclusion of certain components in the equipment. It has been argued that the intention of the firm was to substitute them with some other components, which were stated to be costlier and these too would not have been useful in the circumstances. The Committee are unable to appreciate the anxiety of H.A.L. to avail of an offer within a specified period without assessing the utility of the equipment in question. The whole episode has certain disquieting ramnifications specially in the field of planning and coordination between the I.A.F. and H.A.L.

286. The Committee would again emphasise that H.A.L. should as far as feasible always insist on customers entering into formal agreements before entering into any commitments or incurring any expenditure on their behalf.

IX

MISCELLANEOUS

A. Township

HAL has its own townships at Bangalore, Nasik, Hyderabad and Koraput. The estimated requirement of land for townships and the land actually acquired for this purpose, the number of dwelling units built and their number per acre are as follows:

	Estimated requirement of land	Land actually acquired	Number of Dwelling units built	Number of Dwelling units per acre
Bangalore	1303 acres	910 acres	2426	6
Kanpur	282 acres	274.52 acres	Construction has not yet begun	
Nasik	1000 acres	100 acres	1753	14 to 18
Koraput	5000 acres	3725 acres	1187	9 to 12
Hyderabad	264 acres	256 acres	500	10

288. The Managing Director of HAL stated during evidence that the total expenditure on construction of townships and the actual capital outlay of the three Divisions of MIG complex is as follows:—

	Expenditure on township	Capital outlay	% of (1) to (2)
Nasik	Rs. 770 lakhs	Rs. 3813 lakhs	20%
Korapur	Rs. 862 lakhs	Rs. 4082 lakhs	21%
Hyderabad	Rs. 163 lakhs	Rs. 762 lakhs	21%
	Rs. 1795 lakhs	Rs. 8657 lakhs	20.7%

289. The Committee were further informed that the township in Bangalore was built before the report of the Committee on Plan Projects and therefore the construction was not in conformity with its recommendations. It appears that much attention has not been paid at Kanpur to this aspect on account of the nearness of the fac-

tory to the city. In the MIG complex, the townships had to be built as the factories were set up at out of way places.

290. It would be seen that at Nasik the number of dwelling units per acre range from 14 to 18 per acre, at Koraput 9 to 12 units per acre and at Hyderabad the density is only 10 per acre. It is not clear why more houses per acre could not be built at Hyderabad. Townships have now become an intrinsic part of every major project in India and in any assessment of a Public Undertaking, the special feature of townships cannot obviously be overlooked. In the three MIG Divisions of H.A.L., the expenditure on townships is more than 20 per cent of the capital outlay. Apart from the initial capital outlay involved, recurring subsidies have to be borne by H.A.L. by way of expenditure on upkeep and maintenance. These have added to H.A.L's. overheads and consequently to the cost of manufacture. **The Committee feel that there is need for reduction in the expenditure on townships at the three Divisions of the MIG complex and all efforts should be made in that direction.**

B. Subsidised Housing Scheme

291. H.A.L. has taken advantage of Subsidised Housing Scheme for Industrial workers. In Bangalore Division the Government/ Housing Board have given a loan of Rs. 16.56 lakhs and a subsidy of Rs. 8.15 lakhs.

292. Kanpur Division has already obtained about 337 quarters through the Labour Commission. These quarters have been allotted to employees. A proposal to hand over 70 acres of land to the Labour Department for construction of 1000 quarters under its Industrial Housing Scheme on the understanding that 70 per cent to 80 per cent of the quarters will be allotted to H.A.L. is under consideration.

293. In Nasik, Hyderabad and Koraput Divisions this facility has not been availed of.

294. The Committee would suggest that Subsidised Housing Scheme for industrial workers should be taken advantage of in other divisions of H.A.L., particularly in Nasik and Hyderabad. This would go a long way in reducing expenditure that is being incurred by H.A.L. on townships.

C. Transport

295. The total number of different types of vehicles, as on 31.3.1967, with the different Divisions of H.A.L. is as follows:—

	Bangalore Division*	Barrackpore Factory	Kanpur Division	Nasik Division	Hyderabad Divisions	Koraput Divisions	Head Office at Bangalore
	1	2	3	4	5	6	7
1. Buses	158	7	1	17	6	4	—
2. Cars	30	3	5	13	7	7	8
3. Station Wagons.	4	—					
4. Pickup Vans	11						
5. Ambulance Vans	4	—	21	15	5	24	—
6. Jeeps	10	2					
7. Tractors	16	7					
8. Scooters/ Motor Cycles	24	1	4	8	1	9	—
9. Scooter 3-Wheeler	7	—	—	—	—	—	—
10. Fire Tenders	5	—	—	2	—	—	—
11. Lorries/ Lift Trucks	86	8	8	6	2	2	—
TOTAL	355	28	39	61	21	46	8

296. The running expenses on the transport of these vehicles during 1966-67 has been as follows:—

Bangalore Division	.. ..	Rs. 58,94,744
Kanpur Division	.. ..	Rs. 1,75,755
Nasik Division	.. ..	Rs. 3,27,267
Hyderabad Division	.. ..	Rs. 1,38,204
Koraput Division	..	Rs. 2,63,916
Head Office	.. ..	Rs. 36,397

297. The vehicles are used for carrying different consignments, the transport of workers, officers and executives to and from the factory, movement within the factory and in town where necessary. In addition at Nasik, transport is provided to the Soviet specialists from township to the factory and back twice a day, as well as for

*Including outstations.

their non-business runs. In Nasik trucks are also used for despatching and bringing goods from Hyderabad and Bombay. In Hyderabad the bulk of the staff stay ten to fifteen kilometres away from the factory site and transport facilities have to be provided. Buses in Koraput are used for transportation of the Soviet specialists, school going children of the employees and for recreational trips of the employees. Cars are also detailed for officers in certain higher grades—for official outstation trips and airport duties.

298. In Bangalore a special train is also run between the Bangalore City Station and the factory to transport employees to and from the factory on all working days. A charge of Rs. 6.50 and Rs. 5.00 per head is levied depending on the grades of pay.

299. The charges levied for conveying employees/officers to the factory site and back depend upon their scales of pay. A subsidised fare is charged at the rate of Rs. 30 per head per month by car, Rs. 15 per head by mini-bus and Rs. 3.75 to Rs. 7.50 per head for workers who use the buses, which ply on predetermined routes, depending on their grades of pay. Income from the hire charges has been as follows:—

(Rs. in lakhs)

	1964-65	1965-66	1966-67
Bangalore Division	11.48	17.30	17.86
Kanpur Division	—	00.03	00.12
Nasik Division	(not indicated)		
Hyderabad Division	—	00.18	00.37
Koraput Division	—	00.08	00.04

300. During evidence of the representatives of H.A.L., the Committee enquired whether the number of cars in the different Divisions could be reduced if the facilities of picking up and dropping officers was given up. It was stated that the cars had normal official duties to perform and this facility was only a sort of extra benefit out of the cars. The present number of cars was actually needed for the staff duties. **The Committee would like to reiterate the views of the Estimates Committee expressed in their 50th Report (Third Lok Sabha, 1963-64) that the provision of the facility of cars/station wagons/jeeps to officers of an undertaking for journeys from residence to place of work and back on payment of monthly charges seems to be neither economical nor desirable. The Committee would like H.A.L. to examine this issue afresh in the light of experience gained during the last few years. If the actual expenditure on this facility**

provided to officers is more than the income from cars, then there appears to be no justification for continuing such a losing service.

301. It has been stated that H.A.L. is paying Rs. 45 lakhs a year as transport subsidy at Bangalore. The recurring expenditure on transport vehicles in all the five Divisions of H.A.L. during 1966-67 was Rs. 68.36 lakhs. The number of vehicles at Bangalore is abnormally large. The large number of vehicles add to the capital and running cost of H.A.L. **The Committee feel that there is enough scope to economise and reduce expenditure on this account. The Committee would suggest that any acquisition of vehicles for future use should be restricted to the minimum possible requirements.**

D. Export Promotion

302. So far H.A.L. has not been able to make a break through in exporting its products. Export promotion can, however, be considered only on the basis of surplus production and competitive prices. The production at H.A.L. has not yet reached a stage where it may be termed as surplus. The production programme has been able to meet the needs of the country alone. It is virtually impossible, at the present stage of aeronautical industry in the country, to compete with countries like France, the U.S.A., the U.S.S.R. and Britain in the world market. Nevertheless, H.A.L. has achieved partial success in exporting some aeroengines and some of their components to Messrs Rolls Royce of U.K.

303. The Managing Director of H.A.L. informed the Committee during evidence that the very specialised nature of aircraft and aeroengine limits the scope of its use to certain specific duties. Unless a person needs such of these duties to be performed, he does not have the need for the aircraft and similarly till he uses that aircraft he has no need for spares for that aircraft or the engine. Besides, there is a tendency to go to the original manufacturer rather than to some one who is manufacturing the product under licence. **This is one of the disadvantages against H.A.L. H.A.L. will have to strive hard to export.**

304. The Committee feel that it should be possible for H.A.L. to get some prospective buyers interested in aircraft like the agricultural aircraft and others which are at the design and development stage. In case H.A.L. can procure an advance order, it would be in a better position to plan production. Several of the civil and military aircrafts in western countries are being ordered at the development stage. This has been so as a result of hard work, improved techniques, meticulous industrial planning and aggressive search for markets abroad. The Committee find no reason why H.A.L. should

not be able to do so and would recommend that energetic steps should be taken to explore the possibilities of exporting products of H.A.L.

E. Future Plan

305. Most of the present projects of HAL would keep HAL busy till about the mid-1970s. All the important types of aircraft under production in HAL would be continued for a certain number of years thereafter. The designing and developing of an aircraft takes seven to eight years. The Managing Director informed the Committee that HAL was carrying on design studies of a new aircraft that would be in use with the Air Force some eight years hence. Considerable studies with different types of engines had been made on this project and the proposals were before the Indian Air Force. It is reported that the engine factory in Koraput is in many ways more complete than the one at Bangalore. It would go a long way towards enabling HAL to design and develop engines of its own.

306. As stated by Chairman H.A.L. in the Annual Report for 1966-67, there is a need to forecast with some measure of certainty as to the types and quantities of aircraft required for the next ten to fifteen years at least. **The kinds of risks, the scale of investments and commitments and other features of the aircraft industry call for such an assessment. With the passage of time, the need has become urgent. It is necessary for H.A.L. to know the forward plans of the different users of H.A.L's. products. In the past H.A.L. had been proceeding in a somewhat *ad hoc* manner with frequent short run and peripatic orders and this was inevitably reflected in the unit costs of H.A.L.'s products, besides making it difficult to make the necessary preparations for manufacture. As Government are almost the sole customers of H.A.L., the Committee hope that they will pay serious attention to this matter. It is seen that, an Aeronautical Committee was set up by Government in November, 1967 to go into this question and their report is expected in the second or third quarter of 1968. The Committee hope that they would make recommendations regarding forward planning, so that H.A.L. can programme their production with some certainty.**

X

CONCLUSION

The aircraft industry in India is in its infancy at present. It therefore suffers from the disadvantages that can accrue to an industry of this kind in a developing country i.e. on the one hand it suffers from lack of technical know-how, designing capabilities and manufacture of tools, on the other hand there is lack of enough demand for some of the types of aircraft which HAL has undertaken to manufacture. By the time a civil aircraft progresses from designing stage to the assembly line it becomes obsolete by international standards. The primary responsibility for careful forward planning rests with the Government who are the main customers of HAL while maintenance of schedules is that of HAL.

308. The Committee appreciate the difficulties faced by H.A.L. in setting up an efficient aircraft industry in India. Its task is no doubt a difficult one. The shortcomings noticed by the Committee in regard to designing, production schedule, tooling and other matters have been pointed out in the Report. **The Committee hope that H.A.L. would be able to overcome the initial disadvantages from which it suffers at present and emerge as an efficient and capable aircraft manufacturing undertaking for meeting the needs not only of India but of this region.**

NEW DELHI;
March 27, 1968.
Chaitra 7, 1890 (*S*).

D. N. TIWARY,
Chairman,
Committee on Public Undertakings.

D. N. TIWARY,

APPENDIX

Summary of main Conclusions/Recommendations

S. No.	Reference to para No. in the Report	Summary of Conclusions/Recommendations
(1)	(2)	(3)
1.	15.	The Committee feel that as the various divisions of HAL are dealing with manufacture of aircraft which differ from each other in design, scope, jigs and tooling, it would not be easy to divert the surplus capacity of one unit to the aid of other units. The Committee recommend that an expert Committee should examine the question of utilisation of surplus capacity of one unit by other units.
2.	17.	The Committee feel that in spite of laying down uniform service conditions for HAL employees, the practicability of utilisation of surplus personnel of one division in another division with varying technological requirements of trade appears to be limited. The Committee hope that the Management keeping in view the size and complexity of the problem would devise an efficient procedure which would enable one unit to draw upon the surplus personnel of the other units in time of need and to ensure that no bottlenecks in production are caused on this score.
3.	20.	The Committee find that the nature of work required to be done by the MIG complex is different from that done at the Kanpur and the Bangalore Divisions. The collaboration arrangements are with different parties and the procedure followed by them is different, although the

(1)	(2)	(3)
		responsibility in each case is being shared by the Government and HAL at different levels. The instrumentation, equipment and techniques are different for each type of aircraft. The Committee, therefore, feel that it would have been better, at least in the initial stages, if the MIG complex had remained a separate entity and the Bangalore and the Kanpur Divisions had only been merged into one unit as suggested by the Estimates Committee. The Committee are not convinced with the argument that the amalgamation would have been difficult at a later stage.
4.	22 and 23	The Committee agree that instead of one company, existence of separate public undertakings for aircraft production, under the same Ministry would have been helpful in corelating the achievements of one unit against the other. This would also have created a sense of competition between these units where one unit would have veid with the other in showing better results. The amalgamation has however precluded these advantages and has led to the development of a monopolistic attitude of mind in HAL which is contrary to commercial attitude. Considering all aspects of the question, the Committee would suggest that the Government should carefully assess the results of amalgamation during the next four or five years and if the contemplated benefits of amalgamation do not emerge the matter might be reviewed and, if necessary, the Company may be reorganised on a more practical and efficient basis.
5.	35 and 36	The Committee do not agree that distance between the airframe and aero-engine factories does not make any difference to defence production. The distance between the components and engine manufacturing plants and the assembly plant does play a very important role. The

(1)	(2)	(3)
		entire programme and schedule of construction is affected by distance. Existence of a long and difficult supply line from the point of manufacture of engine to the aircraft assembly point has its own financial, functional, and time-consuming disadvantages. The Committee feel that the selection of Koraput as a site for aero-engine factory appears to have been decided more on strategic and other considerations than those of economy any efficiency. Although there is no question of changing the decision now, it would have been more advantageous to have had both the factories nearer to each other. They hope that the management would ensure that these factories now function efficiently and that the disadvantages of distant locations are reduced to the minimum. The Committee hope that unless strategic considerations are overwhelming Government will pay due attention to economic considerations in future so as to lighten the financial burdens of an undertaking.
6.	37.	The Committee note that rail and posts & telegraph facilities are being developed in this region. There is, however, need for expeditious completion of railway link and provision of prompt and extensive posts and telegraph facilities in this area. It is probably due to this reason that development of the area around Koraput, as a sequel to the location of the aero-engine factory has not come about. The Committee feel that vigorous efforts should be made both by the Central Government and the Government of Orissa to carry out the policy of economic development of the area around Koraput.
7.	55.	The Committee note that the work of civil construction had been handed over to the Public Works Departments of Maharashtra and Orissa

(1)	(2)	(3)
		Governments before the projects were taken over by HAL, and the arrangements were such that the management had no say in this matter. It was therefore not possible for HAL to adjudge the payments made to contractors/expenditure booked to works with reference to an estimate of physical progress of work. It is, however, surprising that HAL did not keep any watch over the quality of the buildings and that the scope of inspection by HAL had been limited only to visual inspection at the time of taking over the buildings. A number of defects had been noticed at the time of taking over the buildings, which could have been avoided if HAL had an opportunity to point them out during construction.
8.	56.	The project was planned to commence assembly of aircraft more or less simultaneously with construction of buildings. Therefore the speed with which the works were to be completed was of great importance. The Committee regret to note that the time schedule, which was the essence of the matter, had not been kept up.
9.	57.	The Committee desire that the payments made by HAL to the Maharashtra Government should be settled as early as possible in consultation with the A.G. Maharashtra. It is hoped that the dispute over cracks in floor slabs, which has been referred to the Maharashtra Engineering Research Institute, Nasik will be promptly settled.
10.	61.	As the work of civil construction is nearing completion, it will be desirable that a nucleus maintenance organisation of HAL is set up, so that it is ready to take over as soon as the work is completed by the Orissa Government. They also hope that while recruiting staff for the maintenance organisation preference will be given

(1)	(2)	(3)
		to the personnel at present working in the construction work.
11.	65.	The Committee regret to note that the target dates for the delivery of engines are not being adhered to although the scheduled programme was liberal. They hope that the Koraput Division would try to make up the lost time so that schedules of other Divisions are not adversely affected. The Committee feel that the time schedule for producing an engine indigenously is rather long in view of HAL's experience in this line.
12.	69.	The Committee are surprised to note that an essential item like the cost of production was omitted from the project Report, with the result that HAL which took over the project at a later stage had no idea about the cost of production of this aircraft. The Committee recommend that the cost of production of the aircraft at various stages should be worked out without delay. In future it should be ensured that the cost of production is always included in the Detailed Project Report of a project.
13.	71.	The Committee hope that the delays in receipt of equipment will be reduced to the minimum possible limit so that production programme is not affected.
14.	84.	The reply of HAL shows that the complexities of producing a sophisticated aircraft like the HF 24 had not been properly visualized either by the German engineers or HAL. The Committee are unable to understand as to what were the factors that contributed to the formulation of such unrealistic targets. The lack of experience in production planning must have been all too apparent to the management when they for-

(1)	(2)	(3)
		mulated such optimistic estimates initially. Preparing optimistic estimates of production and then not being able to adhere to such schedules creates disappointment and disillusionment regarding the competence and efficiency of the organisation. The Committee therefore cannot but emphasize the need for realistic planning and formulation of realizable targets in such matters.
15.	85.	The Committee do agree that productionising an indigenously designed aircraft is by no means an easy task, especially when the aircraft manufacturing industry in India is still in its infancy. They however, feel that much of the time and money lost in prototype tooling, production engineering, tool designs, etc. could have been saved by proper planning and synchronization of development in these different fields. The Committee earnestly hope that production planning organisation will now be suitably geared up so that the future production of this aircraft is streamlined, and the difficulties experienced in the initial stages of manufacture of this aircraft are not encountered again.
16.	86.	HAL had not fully realised the complexities an production of HF 24 MK II aircraft and made optimistic estimates. HAL's production planning organisation needed to be changed. The needful was being done but it would still take four or five years to fulfil their demands for Mark I. The Committee hope and trust that the efforts of HAL in deve'oping the aircraft will be successful.
17.	89.	The Committee are surprised to note that an aircarft (HJT-16), the prototypes of which had been successfully test flown as early as 1964 and 1965 should have run into problems of flight

(1)	(2)	(3)
		characteristics in 1968 at the pre-production stage. This appears to be indicative of the fact that design and production engineering wings of HAL have certain handicaps to overcome. The Committe hope that HAL would now be able to streamline their production engineering department and make good the delay.
18.	90.	The Committee feel that efforts should be made to explore the market for HJT-16 (Kiran) aircraft in South East Asian and African countries. A trainer aircraft which has proved its utility in India is likely to be of use to other countries in these regions.
19.	93.	The Committee feel that there is not much force in the arguments advanced, for shortfall in production of Gnat aircraft to a number of technical difficulties, as many of these difficulties could have been forseen in the initial stages. As this aircraft is vital for the defence needs of the country the Committee hope that HAL would take necessary steps to streamline their production methods to ensure delivery of aircraft according to schedule.
20.	98.	The Committee are surprised to note that HAL have taken up the development of this aircraft without any firm orders from the Government and that the whole effort and expenditure will go waste if for any reason, the Ministry of Food and Agriculture fails to place an order for the indicated number of agricultural aircraft. HAL have had a sad experience in the case of HS 748 aircraft and gliders where the I.A.F. did not honour the indications they had given. The Committee have examined these cases in a subsequent chapter of this Report. Such drastic cut in orders results in enormous extra expenditure, and loss of manpower and

(1)	(2)	(3)
		time which could be utilised in more useful production. In fact if the actual requirements of the Government were known in the beginning it might not have been economically viable at all to launch these projects for such a small number of aircraft. The Committee therefore feel that the Ministry of Food and Agriculture should place firm orders with HAL for the number of aircraft required by them. There should also be a formal agreement regarding the financial burden of designing and developing the Agricultural aircraft with a provision for financial indemnity for either of the parties not being able to fulfil the terms. HAL has to sustain a strong and efficient aircraft industry and as such it is necessary for it to keep its financial commitments limited. The Committee feel that this should have been done before the project was taken on hand.
21.	109.	It is quite clear that the management of the Bangalore Division must accept responsibility for arbitrary reduction of the manufacturing time-cycle recommended by the Planning Team, which led to early promise of unrealistic deliveries. This initial error has been aggravated through delays in procurement of raw materials, and more particularly, delays in tooling for which the management is accountable. The Committee feel that the tooling activity is poorly planned and controlled, and calls for re-organisation and strengthening of both the Tool and Production Planning Departments. The Committee hope that this would be looked into and the situation remedied soon.
22.	116.	The Committee recommend that HAL should make sustained efforts to develop and manufacture jet engine indigenously with Mach 2 capabilities to obviate our dependence on aero engines of foreign manufacture. They also urge

(1)	(2)	(3)
		that efforts should be made to get more work for the engine factory by way of overhauling jet engines of the I.A.F., the I.A.C. or of foreign airlines operating in India. That might go to some extent in utilising the surplus capacity of the aero engine factory.
23.	117.	There is some imbalance in the production capacities of the Banglore plants for aero-engine manufacture and that of airframes. The engine plant is currently working at a faster rate. It might be faced with lack of work unless more orders are received and production of airframes is speeded up.
24.	128.	The Committee would suggest that manufacture of all important component and accessories should be taken up early. The Committee on Aircraft Parts, set up by the Department of Defence Production in September 1965, having completed standardisation of simple items could now take up more complicated items.
25.	130.	The Committee hope that HAL will be able to make a major break-through on this project and will be able to meet its requirements of raw materials from its own Foundry and Forge Shop.
26.	131.	The Accessories factory when set up would call upon both private and public sector to produce many of the goods and components, which will be finally assembled and sent out from the factory. The Committee feel that enough attention has not been paid to this aspect of the problem. There is a need to develop indigenous sources of supply of raw materials. The Committee would suggest that HAL/Government should provide necessary facilities to such private undertakings, which are anxious to do their bit to feed this factory, by way of raw materials, dies, capital goods, etc. An independent agency could explore this aspect of the aeronautical industry as a whole.

(1)	(2)	(3)
27.	142.	The Committee are surprised to note that the Government did not pay any attention to this essential aspect of preparing a Detailed Project Report while undertaking the project. No satisfactory reasons were advanced by the Ministry during evidence for not preparing the Detailed Project Report. The Government cannot plead ignorance of this procedure as by that time a number of Public Undertakings had already been set up and preparation of DPR had become an established practice.
28.	144.	The very fact that the IAF had to reduce their demand of HS748 aircraft so drastically shows that they did not find it suitable for their requirements as originally envisaged. The Tata Committee also did not commend the aircraft. The Committee doubt the wisdom of setting up this project. However, now that huge investments have been made in the project and having come this far, they feel that some method should be devised to make the most of this venture. IAC should also be made to rely more on the indigenous aircraft industry and to gradually standardise its fleet.
29.	146.	The designining and developing an aircraft and an engine is a long drawn out process and involves very high costs. Perhaps the only alternative open to HAL would be to enter into collaboration agreements with other countries to manufacture tried and proven designs. However, the aim in the civil programme, as in the military, should be to concentrate on a project for which the potential market is large in relation to the development cost. Unfortunately, the prospects for export are bleak in the face of fierce competition abroad. Perhaps the Committee on Aeronautics constituted by the Government will go into this question for the aeronautics industry as a whole and suggest some specific steps in this direction.
30.	147.	A suggestion has been received by the Committee that installation of 532 engine on HS

(1)	(2)	(3)
		748 aircraft instead of 531 engine might lead to reduced operating cost, besides standardising the engines in IAC. It has also been observed that the noise level of HS 748 aircraft needs to be reduced and airconditioning and pressurisation also need improvement. It is understood that a slight modification of the existing engine would be necessary to make the change from 531 to 532 and that a new type of sound absorbent material could reduce the noise level of the aircraft. The Committee hope that these suggestions will be considered by HAL.
31.	156.	The Committee regret to note that the management responsible for initiating the project did not start the work in a planned and phased manner. It is surprising that tooling was taken up at random without keeping in mind the stages and families of tools. This clearly shows that there was no proper planning in regard to manufacture of tooling and the managerial staff also failed in their duty. The Committee recommend that remedial measures should be taken to minimise the loss.
32.	164.	The target of production of gliders had to be restricted to 105 gliders as against 300 in December 1965. Till that date HAL had manufactured only 57 gliders and out of these delivered only 37. The Committee cannot escape the conclusion that the then management at the Kanpur Division made no serious efforts to keep up the schedule of delivery for the gliders.
33.	165.	It is regrettable that even after three successive revisions the estimates of cost of a glider were unrealistic. Equally disappointing is the fact that machinery, stores, tools, etc. worth Rs. 26.30 lakhs had to become surplus to the requirements of HAL consequent on the reduction in demand from 300 to 105 gliders only.

(1)	(2)	(3)
34.	167.	The Committee fail to understand why a scheme drawn up in 1962-63 by the Defence authorities, which on account of certain set-backs could not be put into effective operation then, should not be pursued now, so as to make use of at least those gliders which have been manufactured and delivered or awaiting delivery at Kanpur.
35.	172.	The need for close coordination, particularly between the three Divisions of the MIG Project, cannot be over-emphasised. The periodical meetings of the General Managers is a step in the right direction and the Committee hope that no effort will be spared to achieve this objective.
36.	179.	The Committee hope that with the passage of time and accumulation of experience, HAL will be more intimately connected with the formation and approval of project reports as it is their responsibility to ensure the execution of such projects. The Ministry should pay more attention to policy matters which come within their orbit of activity.
37.	182.	The Committee feel that when the Chairman has no executive functions and is simply required to preside over the meetings of the Board there is no point in having one such in addition to a Managing Director. This makes the organisation top heavy without any attendant advantages. It leads to duality of control and clash of personalities. The Committee are, therefore, of the view that it will be better to combine the posts of Managing Director and Chairman.
38.	189.	The Committee appreciate that HAL would need officers on deputation from the Indian Air Force. In the long run the expertise of an IAF officer in HAL and his stay in HAL is in the interest both of HAL and the IAF. The position

(1)	(2)	(3)
		is not irreconcilable and the Government should evolve an arrangement by which all the interests are protected to the best advantage. The Committee are of the view that too frequent changes in the top positions are not conducive to efficiency. They therefore recommend that whenever necessary, deputationist should be taken for at least 4 to 6 years. There should also be no objection to their absorption in HAL if they are willing and are found suitable.
39.	193.	The Committee hope that the steps being taken by HAL will prove useful in tackling this problem. They feel that a reasonable percentage of top technicians must have practical experience of the job. Arrangements should however be made to see that these technical personnel are able to obtain professional qualifications, which would entitle them to go up to the next grade.
40.	197.	The Committee understand that the delegation of powers to the Managing Director|General Managers is not adequate. It has been stated that certain specific powers based on the model code for public sector undertakings have been given to the Managing Director|General Managers whereas residuary powers are left in the Board of Directors. This results in frequent references being made necessary to the Board on a large number of points. The Committee would suggest that feasibility of enhancing the powers of the Managing Director|General Managers might be examined by the Government.
41.	206.	It is seen that there is recognition of the fact that the doctors are somewhat lax in recommending sick leave to employees. The Committee feel that in order to control absenteeism resulting from the working of the ESI Scheme,

(1)	(2)	(3)
		HAL should take up the matter with the Ministry of Labour and Employment in order to plug the loopholes leading to misuse of ESI Scheme facilities on medical grounds.
42.	207.	A great responsibility lies on the shoulders of the workers of HAL as the success or failure of HAL would depend upon their performance. The Committee suggest that the management should examine the causes of absenteeism in detail and try to find solutions for them. The management should also endeavour to establish a rapport with labour and labour union leaders in order to discourage abuse of ESI facilities.
43.	209.	The Ministry of Labour and Employment admit that the abuse will gradually disappear when the employment of the workers outside on casual basis does not give them more advantage than remaining on duty. In view of the above facts the Committee are of the opinion that the working of the ESI Scheme needs a thorough re-examination in the light of the experience of the undertakings in Bangalore.
44.	222.	It is needless for the Committee to emphasise the necessity of avoiding wastage of food. As for the second helping, the Committee do not see any reason why it should not be raised to the level of the price of the first meal. A facility given at one place and denied at another does cause resentment among the workers. The Committee feel that the canteen facilities are meant for the workers on duty and not for their families at home. The practice of carrying food home is, therefore, unreasonable and should be discouraged. One way of doing it would be to prohibit the bringing of tiffin boxes etc. into the canteens.

(1)	(2)	(3)
45.	226. and 227	The Committee are of the opinion that as there are a number of Public Undertakings in Hyderabad, there is justification for a similar Coordination Committee to function in Hyderabad where problems common to the Public Undertakings could be discussed in order to arrive at a satisfactory solution. Necessary steps should be taken towards this direction. The Committee feel that matters relating to the working conditions of workers in Public Undertakings need an all India approach and unless there is coordination throughout India these difficulties would persist. The Government should, therefore, examine this issue on a broader perspective.
46.	229.	The Engineering Wage Board was considering the question as to whether the aeronautical industry should be treated separately. Since the Engineering Wage Board is already seized of the matter, the Committee do not wish to make any comments on the subject.
47.	241.	In order to enable HAL to shoulder their responsibilities in designing and development of aircrafts and engines in future the Committee feel that it is imperative that the Design Organisation is brought on a proper functional footing. The Committee recommend that the design organisations in HAL should be strengthened and rationalized as soon as possible. HAL should also not hesitate to attract persons trained abroad for this purpose either on temporary or permanent basis in order to keep abreast with the latest developments.
48.	247.	The Committee regret to note that the potentialities of the RD 9F engine to reach Mach 2 capabilities were not properly assessed by HAL authorities before entering into an agreement for its modification. The Committee are also unhappy to note that HAL did not properly

(1)	(2)	(3)
		assess its own technical know-how for development of this engine with the result that a huge expenditure of Rs. 2.39 crores was incurred which ultimately proved to be infructuous. Much of this loss could have been avoided if HAL had listened to the Soviet authorities that they could not guarantee the performance of this engine beyond Mach 1:4.
49.	248.	The Committee, while agreeing that development of engines and project of this nature does involve risks, feel that HAL should have exercised caution when it came to know that the Soviet authorities were going to cease production of this engine in 1962.
50.	249.	The Committee understand that in some of the western countries, the ground for maintenance of a Design Organisation in an aeronautical undertaking is the technical benefits which might be derived out of it by other industries as well. For instance the demands of aviation have led to the development of materials with high strength|weight properties often coupled with resistance to high temperatures. These have found applications in other branches of engineering. The hydraulic systems of aircraft were developed during the Second World War but now they find use in tractors, earth moving machines, etc. Similarly the aviation provided an initial impetus to electronics, radar and radio. Most of the modern developments in this field have arisen from aviation demand. The experience of the foreign countries would suggest that the fruits of research which can be utilized by other industries in India should be made available to them.

(1)	(2)	(3)
51.	250.	The Committee have noted that HAL has been concentrating increasingly on utilising its own design skills. This has been amply demonstrated with the HF 24, the HJT-16, HJE-2500 engine. HAL has also taken in hand design of a new combat aircraft. To the extent that this encourages the building up of indigenous designing capability and lowers dependence on foreign countries, it is certainly a most laudable effort.
52.	256.	The Committee are of the view that an undertaking cannot have a proper commercial approach if it runs on "cost plus" basis. Firstly it gives no incentive to reduce costs by cutting out idle time, overtime, wastage of machines, etc. Secondly, this system is likely to prove a heavy burden on the Government because ultimately they are responsible for all the expenditure. Thirdly, the management do not remain cost-conscious and as such are apt to be inefficient. The Committee would recommend that this principle of cost-plus basis should be done away with as early as posible. In items where the manufacture is well established or where the orders are sufficient to undertake large-scale production, there should be little difficulty in quoting prices. A system should be evolved whereby after the manufacture of a certain number of aircraft|engines, fixed prices may be quoted for subsequent production, the prices being revised periodically as might be warranted by changes in the cost.
53	259	The solution of the problem lies not in subsidising the cost of production but in making earnest efforts to reduce it. The Committee would suggest that Government should not let this matter linger on indefinitely.
54.	260.	Though the debt equity ratio is an improvement over the previous years, it is still not in conformity with the Government of India's policy of debt and equity ratio being 1 : 1. There is

(1)	(2)	(3)
		still over-capitalisation in HAL and the Committee hope that Government will keep this in mind while giving further funds to the undertaking.
55.	264.	The increase in the amount of sundry debtors appears unjustified particularly in view of the fact that the sales are only to Government departments or undertakings. The outstanding amounts increase the working capital requirements and reduce the profitability of the undertakings. The Committee, therefore, urge that vigorous steps should be taken to realise the outstandings.
56.	270.	The Committee are not aware at what level this decision to write off the amount as irrecoverable loss arising out of the India Supply Mission's contract was taken, whether the Ministry of Defence did their best to get ISM to accept this debit, and whether they tried to find out who was responsible for this lapse which resulted in this loss. The Committee desire that these points might be looked into.
57.	271 to 273	The Committee after examination of the whole issue feel that the deal suffered from the following defects:—
		(i) ISM accepted the tender after the expiry of the stipulated date. This was a procedural lapse.
		(ii) The inspection of the machine was not carried out by ISM in spite of a specific stipulation to that effect. The purchase of the machine was made in 1958 and the settlement of the question whether the inspection of purchased item should or should not be made in U.S.A. was decided in 1964 only. Thus in 1958, there was no agreement that inspection should not be carried out in USA.
		(iii) The officer of ISM who accepted the machine without ascertaining whether

(1)	(2)	(3)
		it was in accordance with specifications or not was at fault. He further failed to refer the matter to his higher officer before accepting the machine. The plea of the representative of the Ministry of W.H. & S. that the higher officer would also in all probability have accepted the machine and therefore, no responsibility could be fixed on the junior officer appears to be a mere hypothesis.
		(iv) There was hardly any advantage in an officer of ISM accepting the machine if he could not carry out a technical inspection of the same. ISM could have got the machine inspected by technical experts in U.S.A. before accepting the machine. The plea of high inspection cost is untenable as the ISM or the Ministry of W. H. & S. do not appear to have obtained any estimates of cost of inspection. These were not made available to the Committee when the Committee sought information on these points.
		(v) The failure to carry out inspection resulted in acceptance of not merely an obsolete model but also a defective and reconditioned machine which also entailed additional loss by way of transportation charges.
		The net result of all these shortcomings was that HAL was supplied a machine which was not according to the specifications it had laid down in its indent on ISM.

(1)	(2)	(3)
		The Committee accept the general principle enunciated by the Secretary of the Department of Defence Production that when an agent acts for an indentor and acts *bonafide* then the indentor has to accept the credit as well as the debit side of the transaction. But on the other hand when the agent does not fulfil all the conditions of the indentor then the agent should be responsible. The Committee, therefore, feel that the responsibility in this case rests with I.S.M. The Committee recommend that the question should be settled without any further delay.
58.	277.	The loss on account of retendering could have been avoided, had action been taken by the persons concerned in accordance with a predetermined schedule or programme of work. The samples were received in the Receiving and Shipping Department of the company on 20th February, 1963 and were sent by Purchase Department to the Inspection Department on the 18th March, 1963. The Inspection Department intimated the suitability of the samples to the Purchase Department on the 26th April, 1963—nearly 40 days after, and the actual order was placed by the Purchase Department on the 10th July, 1963—after a gap of 2½ months. The delay and the consequent loss are regrettable. The Committee suggest that a thorough enquiry should be made in this matter to fix responsibility and the persons found guilty should be suitably dealt with. The procedure should also be streamlined to eliminate recurrence of such delay.
59.	284. to 286.	The Committee regret to note that HAL acted with undue haste and in a most unbusinesslike manner. HAL had earlier sad experience of reduction of orders for certain aircraft/aeroengines by the IAF and should have drawn a lesson therefrom. Technically, the IAF may be right. If the

(1)	(2)	(3)
		results of the evaluation trials had been fully assessed before placing an indent on ISM London, an extra expenditure of £ 13,789 (£ 13,374 being cost of items already supplied but not required and £ 415 being cancellation charges of one item) could have been avoided. In addition, HAL incurred a further liability in respect of £12,485 for the balance of stores now being held by the firm, besides spending a sum of Rs. 19,585 on freight, customs duty, insurance charges, etc. It is a pity that the firm itself is not prepared to take back the equipment. The firm had in fact advised HAL against inclusion of certain components in the equipment. It has been argued that the intention of the firm was to substitute them with some other components, which were stated to be costlier and these too would not have been useful in the circumstances. The Committee are unable to appreciate the anxiety of HAL to avail of an offer within a specified period without assessing the utility of the equipment in question. The whole episode has certain disquieting ramifications specially in the field of planning and coordination between the IAF and HAL.
		The Committee would again emphasise that HAL should as far as feasible, always insist on customers entering into formal agreements before entering into any commitments or incurring any expenditure on their behalf.
60.	290.	The Committee feel that there is need for reduction in the expenditure on townships at the three Divisions of the MIG complex and all efforts should be made in that direction.
61.	294.	The Committee would suggest that Subsidised Housing Scheme for industrial workers should be taken advantage of in other divisions of HAL, particularly in Nasik and Hyderabad. This would go

(1)	(2)	(3)
		a long way in reducing expenditure that is being incurred by HAL on townships.
62.	300.	The Committee would like to reiterate the views of the Estimates Committee expressed in their 50th Report (Third Lok Sabha, 1963-64) that the provision of the facility of cars/station wagons /jeeps to officers of an undertaking for journeys from residence to place of work and back on payment of monthly charges seems to be neither economical nor desirable. The Committee would like HAL to examine this issue afresh in the light of experience gained during the last few years. If the actual expenditure on this facility provided to officers is more than the income from cars, then there appears to be no justification for continuing such a losing service.
63.	301.	The Committee feel that there is enough scope to economise and reduce expenditure on transport vehicles. The Committee would suggest that any acquisition of vehicles for future use should be restricted to the minimum possible requirements.
64.	303.	There is a tendency to go to the original manufacturer rather than to some one who is manufacturing the product under licence. This is one of the disadvantages against HAL. HAL will have to strive hard to export.
65.	304.	The Committee feel that it should be possible for HAL to get some prospective buyers interested in aircraft like the agricultural aircraft and others which are at the design and development stage. In case HAL can procure an advance order, it would be in a better position to plan production. Several of the civil and military aircrafts in western countries are being ordered at the development stage. This has been so as a result of hard work, improved techniques, meticulous industrial planning and aggressive search for markets abroad. The Committee find no reason why HAL should not be able

(1)	(2)	(3)
		to do so and would recommend that energetic steps should be taken to explore the possibilities of exporting products of HAL.
66.	306.	The kinds of risks, the scale of investments and commitments and other features of the aircraft industry call for such an assessment. With the passage of time, the need has become urgent. It is necessary for HAL to know the forward plans of the different users of HAL's products. In the past HAL had been proceeding in a somewhat *ad-hoc* manner with frequent short run and peripatic orders and this was inevitably reflected in the unit costs of HAL's products, besides making it difficult to make the necessary preparations for manufacture. As Government are almost the sole customers of H.A.L., the Committee hope that they will pay serious attention to this matter. It is seen that, an Aeronautical Committee was set up by Government in November, 1967 to go into this question and their report is expected in the second or third quarter of 1968. The Committee hope that they would make recommendations regarding forward planning, so that HAL can programme their production with some certainty.

Sl. No	Name of Agent	Agency No.
21.	Sat Narain & Sons, 3143, Mohd. Ali Bazar, Mori Gate, Delhi.	3
22.	Atma Ram & Sons, Kashmere Gate, Delhi-6.	9
23.	J. M. Jaina & Brothers, Mori Gate, Delhi.	11
24.	The Central News Agency, 23/90, Connaught Place, New Delhi.	15
25.	The English Book Store, 7-L, Connaught Circus, New Delhi.	20
26.	Lakshmi Book Store, 42, Municipal Market, Janpath, New Delhi.	23
27.	Bahree Brothers, 188, Lajpatrai Market, Delhi-6.	27
28.	Jayana Book Depot, Chapparwala Kuan, Karol Bagh, New Delhi.	66
29.	Oxford Book & Stationery Company, Scindia House, Connaught Place, New Delhi-1.	68
30.	People's Publishing House, Rani Jhansi Road, New Delhi.	76
31.	The United Book Agency, 48, Amrit Kaur Market, Pahar Ganj, New Delhi.	88
32.	Hind Book House, 82, Janpath, New Delhi .	95
33.	Bookwell, 4, Sant Narankari Colony, Kingsway Camp, Delhi-9.	96
	MANIPUR	
34.	Shri N. Chaoba Singh, News Agent, Ramlal Paul High School Annex, Imphal.	77
	AGENTS IN FOREIGN COUNTRIES	
35.	The Secretary, Establishment Department, The High Commission of India, India House, Aldwych, LONDON, W.C.-2.	

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