P. A. C. 385

PUBLIC ACCOUNTS COMMITTEE
(1972-73)

(FIFTH LOK SABHA)

NINETY-SECOND REPORT

[Paragraph contained in the Report of the Comptroller and Auditor General of India for the year 1970-71 Union Government (Defence Services)]

LOK SABHA SECRETARIAT
NEW DELHI
April, 1973/Vaisakha, 1895 (SAKA)

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(1972-73)

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INTRODUCTION

I, the Chairman of Public Accounts Committee, as authorised by the Committee do present on their behalf this Ninety Second Report of the Committee (Fifth Lok Sabha) on the paragraphs contained in the Report of Comptroller and Auditor General of India for the year 1970-71—Union Government (Defence Services).

2. The Report of Comptroller and Auditor General of india for the year 1970-71, Union Government (Defence Services) was laid on the Table of the House on the 7th April, 1972.

3. The Committee examined paragraphs relating to the Ministry of Defence on 25th January, 1972, 27th January, 1972 and 15th March, 1973. Written information was also obtained from Government on certain points arising out of the Audit Paragraphs through questionnairies issued to the Ministry after the sittings. This Report was considered and finalised by the Committee at their sitting held on 25th April, 1973. Minutes of these sittings from Part II* of the Report.

4. A statement showing the summary of the main conclusions/ recommendations of the Committee is appended to the Report (Appendix II). For facility, of reference, these have been printed in thick type in the body of the Report.

5. The Committee place on record their appreciation of the assistance rendered to them in the examination of these Paragraphs by the Comptroller and Anditor General of India.

6. The Committee would also like to express their thanks to the officers of the Ministry of Defence for the cooperation extended by them in giving information to the Committee.

NEW DELHI;
April 25, 1973
Vaisakha 5, 1895 (*S*).

ERA SEZHIYAN,
Chairman,
Public Accounts Committee.

*Not printed (one cyclostyled copy laid on the Table of the House and five copies placed in Parliament Library.

CHAPTER I

DEFENCE

Tyres and Wheel discs

Audit Paragraph

1.1 After extensive trials were carried out in accordance with the recommendations of the Research and Development Organisation it was decided that for greater mobility in sandy terrains sand tyre equipment should be procured for vehicles used by units deployed in such terrain. Accordingly, the undermentioned sand tyre equipment for 1 ton trucks were procured from the trade:—

(a)Tyres, tubes and flaps

(i) Tyres	4,858 nos.	Procured between May, 1967 and June 1968 at a cost of Rs. 28·34 lakhs.
(ii) Tubes	4,566 nos.	
(iii) Flaps	3,352 nos.	
(b) Wheel Discs .	5,797 nos.	Procured during June 1970 and January 1971 at a cos of Rs. 10·07 lakhs.

1.2 4,501 wheel discs with matching tyres, tubes and flaps were issued between July 1970 and October 1970 to certain units deployed in sandy terrain. The units, however, experienced difficulties in fiting them to the brake drum of the vehicles. In view of these difficulties the Ordance Depot stocking them requested the Direcfor General Supplies and Disposals, in February, 1971 to suspend further procurement of the discs.

1.3 The Ministry stated (December 1971) that after technical guidance no difficulty was being experienced in fitting the wheel discs. However, a modification kit costing Rs. 400 per vehicle was proposed to be intoroduced to give the vehicles greater manoeuvrability and trafficability. In the meantime, all the tyres, tubes and flaps costing Rs. 28.34 lakhs (procured 3 to 4 years ago) and wheel discs costing Rs. 10.07 lakhs were lying unutilised in the depot and units (December 1971. According to the Army authorities, all the sand tyre equipment would be fully utilised. The normal shelf life of tyres and tubes/flaps is 6 years and 3 years respectively. The Ministry stated that these could be stored over a longer period if properly preserved.

[Paragraph 10 of Report of Comptroller & Auditor General of India for the year 1970-71, Union Government (Defence Services)]

1.4 According to information furnished during evidence, the idea of using sand tyre for vehicles to be used in sandy terrain came up before Government on 22nd April 1966. The Joint Secretary, Ministry of Defence stated: "The tests were carried out in July-August 1966. The results were given by R&D in August 1966. The Army opted for three types of vehicles for the sandy terrain." These three types of vehicles were Jeep, Nissan 1 tonne and 3 tonnes TMB vehicles. Asked whether the trials were carried out only with Jeep, the scientific Adviser to the Ministry of Defence replied that special tyres were fitted to the Jeep....The Joint Secretary, Ministry of Defence also stated: "In the Jeep during the course of the trials they actually used a tyre of the size of 9.00 x 13.00. It was then available. This was the recommendation and it worked later. In short they recommended the equipment which was actually tried and this was found satisfactory." Asked whether this equipment was not tried in the case of other vehicles, *viz.* Nissan and TMB, the witness replied: "In the case of Nissan they realised that it required a larger tyre. The rims were not available and they went by inference and recommended a larger size, although it was not tried." To a question, whether the experiment was not incomplete, the Scientific Adviser, Ministry of Defence stated: "We had Nissan I tonne Dodge 1 tonne which is also used. They are of same weight class and one of 4 wheel drive trucks. It was presumed that both of these would have similar behaviour. Something which would work for Dodge would work for the other also. That presumption was necessarily not correct." To a further question, the witness replied: "You might say, Sir, that this was a faulty judgement. Nissan is a locally available truck. It is a sturdier truck. The structure is similar weight is the same, both are four wheelers, so that natural assumption was that what would go for the Dodge, would go for the Nissan also, provided the necessary modifications are carried out."

1.5 Elaborating further, the Joint Secretary, Ministry of Defence had the following to say in this regard: "In the case of the Nissan and TMB 3 tonnes, trials were also conducted. But there was a difference that while it was possible to use a larger tyre with the same rim for the Nissan. The tyres required for sandy terrain could not be fitted on rims which were available as standard fitment on these vehicles." The witness continued: "Following the report of the R&D, M.G.O. sought Government approval for the procurement of wheel discs, tyres tubes and flaps. Order for tyres tubes and flaps were placed through the DGS&D on two firms. In so far as discs were concerned, we thought.....we would see whether the ordance stocks already available pertaining to Dodge vehicle would suit the Nissan vehicles."

1.6 The Committee desired to know why the wheel discs were procured from June 1970, onwards although a decision to go in for sand tyre equipment was taken in August 1966. In this connection, the Ministry submitted the following reply:

"In August 1966, the R&D forwarded to the General Staff Branch a copy of their initial Report on the trafficability trials of wheeled vehicles on the sandy terrain of Rajasthan. The above recommendations of the R&D were examined by the General Staff Branch and on the basis of these recommendations it was decided by General Staff Branch on 19th December 1966 to equip truck 4x4 1 - ton Nissan with sand tyre equipment. In implementation of the decision taken by the General Staff in December 1966, MGO on 24-12-1966 sought Government's approval for the procurement *Inter alia* of sand tyres, tubes, flaps and wheel discs for Trucks 1 - tonn Nissan. The aforesaid proposal of the MGO was considered at a meeting held in Additional Secretary's room on 31st December 1966. It was decided that subject to the requirements being vetted by the Ministry of Finance (Defence/O), the proposal of the MGO Branch to procure wheel discs, tyres, tubes and flaps should be accepted and the MGO Branch should progress the Indents accordingly.

The MGO Branch placed an indent dated 5th January 1967 on the DGS&D for the procurement of 6,500 sand tyres with matching tubes and flaps; but the indent for the procurement of 6,500 Nos. of now wheel discs for Trucks 1 - ton Nissan was placed on the 7th December 1967 on the DGS&D by C.O.D., Malad. The delay in the placement of the indent for the wheel discs arose in the circumstances mentioned horeinafter.

At the time of indenting for the tyres, tubes and flaps in January 1967, the Ordnance Depots held in stock 16,449 wheel discs size 600 x 16, which were in use on Weapon Carriers, etc. It was thought that these wheel discs could be used for fitting the Nissan 1 - ton vehicles with sand tyres, for which the R&D Organisation was carrying out trials in December 1966 on such use of these wheel discs. It was found that these wheel discs could not be directly fitted on to the Nissan 1-ton vehicles and that to do so a modification kit which it had developed after trials by the Vehicles Research and Development Establishment, Ahmednagar, would have to be used. The case was put up in May 1967 to the General Staff for approval of the modification kit for use of the surplus wheel discs, which involved an expenditure of Rs. 887.00 plus overheads per vehicle. The cost of this modification kit exceeded the cost of a new wheel disc, indications of which were given as Rs. 100|- per

wheel disc by the R&D Organisation in July 1967. Since the cost of the modification to utilise the wheel discs in stock was found to be more than the procurement cost of the new wheel disc, the General Staff decided on 10th August 1967 that procurement of the new wheel disc should be arranged.

In implementation of the decision taken by the General Staff on 10th August 1967 that the procurement of new wheel discs be arranged for fitment to trucks 1 - ton Nissan, Central Ordance Depot, Malad, forwarded an indent dated 7th December 1967 for the procurement of 6.500 new wheel discs to the Chief Inspectorate of Vehicles, Ahmednagar, for vetting before it could be placed on the DGS&D for procurement action. The time taken *i.e.* from 10th August 1967 to 7th December 1967, was due to the following reasons:—

(i) The Army authorities requested on 1-9-1967 the R&D to give an indication of the cost of the new wheel discs, which was required to be indicated in the indent to be placed;

(ii) The General Staff Branch was, requested to clarify that the new wheel discs to be procured were for all trucks 1 - ton Nissan held by 11 and 12 Infantry Divisions; and

(iii) The time taken in processing the indent by the Army authorities for obtaining financial clearance, which was accorded on 29th November 1967.

The indent dated 7th December 1967 was vetted and cleared by the Chief Inspectorate of Vehicles, Ahmednagar, on 22nd February 1968. The delay in clearing the indent was due to the non-availability of drawings/paper particulars from the R&D to Director of Inspection (Vehicles), Ministry of Defence, New Delhi, on 12th February, 1968, which in turn were subsequently forwarded to C.I.V. Ahmednagar, on 15th February 1968.

The estimated cost of Rs. 80|- was shown by C.O.D., Malad, in their indent dated 7th December 1967. The quotation was received by the DGS&D from M/s. ————————, Durgapur, for the supply of wheel discs at the rate of Rs. 173.70 each, As the cost of procurement exceeded the estimated cost by more than 50 per cent, the MGO Branch progressed the case for obtaining financial clearance for the procurement of wheel discs at the enhanced cost. Final clearance was given by the MGO Branch on 30th July 1968 to the DGS&D for the procurement of the wheel discs at the enhanced cost. In pursuance of this clearance, the DGS&D placed an advance and final A|T on 24th August 1968 and on 25th September

1968 respectively. The delivery period stipulated in this A|T was that supplies should commence within 12 months from the date of the A|T and completion in six months thereafter (i.e. to be completed by 28-2-1970 or earlier if possible). According to the A|T, a pilot sample was to be approved by the Director of Vehicles (R&D) or Vehicles Research & Development Establishment, Ahmednagar, before commencing bulk production.

In January 1969, the Directorate of Inspection (Vehicles), New Delhi requested the firm viz. M|s..... to indicate when they would be in a position to tender the pilot sample of wheel discs for trials in accordance with the stipulations made in the DGS&D's A|T dated 25-9-1968. The subsequent developments in this regard are indicated below:—

(i) On 15th January 1969, the firm inforced the Defence Inspection authorities that the tools were being manufactured but they were still awaiting Import Licence for importing rims, flanges and lock ring sections from the U.K.

(ii) On 30th January 1969, the Defence Inspection authorities informed the MGO Branch that the firm was still awaiting Import Licence for the raw materials and that the pilot samples of wheel discs could only be manufactured after the receipt of the raw material.

(iii) On 29th May, 1969, the Defence Technical authorities again approached the firm to indicate the position and also the probable date by which the pilot samples of wheel discs could be available for trials.

(iv) On 3rd June, 1969, the firm indicated that the first lot of imported raw material from the U.K. was expected to be received about the end of July 1969 or early August 1969 and that thereafter they would tender the pilot samples of wheel discs as early as possible.

(v) Subsequently repeated requests were made by the Army authorities to the firm to tender the pilot samples of wheel discs for tests.

The firm offered the pilot samples in November, 1969, which were cleared by the VRDE Ahmednagar, in December 1969. Accordingly, in their letter dated 30th December 1969, the MGO Branch informed M|s.....that their pilot sample had been found satisfactory on trial and clearance for bulk production was accorded. The firm accordingly commenced bulk manufacture and dur-

ing the period June 1970 and January 1971 a total quantity of 5,797 wheel discs were received from the firm at C.O.D. Malad."

1.7. Regarding the clearance of the pilot sample offered by the firm, the Joint Secretary, Ministry of Defence stated during evidence: "....The wheels were tried out on the Nissan trucks operated from a regiment in Calcutta. These samples were produced in Durgapur and the vehicles were obtained from a unit in Calcutta and tried out in the Calcutta area where there was no sandy soil." Asked why it was not tried out in a sandy area, the witness replied: "There was no doubt about it that it should have been tried out on a sandy terrain. But as it happened, it was tried out in Calcutta and there was some difficulty in steering, but the R & D expected that it would not be a very major hindrance and, therefore, on that basis, the pilot sample was cleared."

1.8. Regarding the difficulties that arose later, the witness deposed: "When they fitted these tyres and tried them out in Rajasthan, they found that the vehicle started wobbling and the steering was not very still."

1.9. When asked why the trials were not done in a sandy terrain and instead at Calcutta, the Scientific Adviser to the Minister of Defence informed: "I think we must accept that this was an error of judgement. We should not have tried and finalised it on a hard surface; it was meant to be really tried out on a sandy soft surface."

110. Explaining the position further, the witness added: "[The firms] design for the new wheel disc was evolved out of the experience of Dodge. When it was given, it was not tried under field conditions. Unfortunately, it was tried in hard soil. Therefore, when it was actually fitted and tried out in sandy conditions, we discovered there was much more of wobble and the steering was much harder than was acceptable. Therefore, the problem was to make the wheel disc acceptable under the sandy terrain conditions. So, an adapter was made to fit in with the wheel disc so that the distance from the king pin would be less, and the wobble would reduce. This was introduced when it was found that under the terrain of the kind in which it was meant to operate there was some difficulty with Sankey's wheel disc. This additional adapter had to be ordered and introduced, which entailed a delay of about six months".

1.11. The Committee desired to know whether the mobility of the army units in the sandy terrains suffered due to the inability to

used the sand tyre equipment. The Ministry, in a note, stated as follows:

> "The operations in 1965 showed that the mobility of our troops operating in the Rajasthan Sector was affected due to the lack of sand tyre equipment. In February 1966, the General Staff informed the Director of Vehicles (Research and Development) that units in the Southern Command had used certain types of tyres on current 'B' vehicles with certain modifications which had resulted in some improvements in trafficability. Accordingly, in February 1966, the General Staff at Army Headquarters requested the Research & Development Organisation to undertake a study immediately to find means for improving the performance of wheeled vehicles in sandy terrain. In this connection, an extract of a note dated 22nd April, 1966 from the Chief of the Army Staff is reporduced below:—
>
> "One of the big problems that you are going to face in operations in the future is movement in the Rajasthan desert. Initially, I had been told that sand tyres have been issued to units during the Pakistani aggression. Later we found that sand tyres had not been issued and they were trying to use low pressure tyres of some kind or the other.
>
> What are the development people's views on movement in the desert? Is anything being done to study it and if not, should we not take suitable action?"

In accordance with the above directive, the problem of finding an immediate solution for improving the performance of vheicles deployed in sandy terrain was undertaken as a developmental effort by the Research and Development Organisation. The recommendations by the R&D on the procurement of sand tyre equipment are indicated in their Report of August, 1966.

During the period July 1970 to October 1970, qty. 4,501 wheel discs with matching tyres, tubes and flaps were issued to units deployed in sandy terrain for fitment to trucks 1-ton Nissan. After necessary clarifications were issued in November, 1970, by the Vehicle Research and Development Establishment, Ahmednagar, the user units did not experience any difficulty regarding the fitment of sand tyre equipment on trucks 1-ton Nissan. However, the following difficulties in regard to the trafficability and manoeuvra-

bility still persisted and were reported to R & D in February, 1971:—

(a) Excessive vibrations on the chassis of the vehicle leading to working loose of nuts and bolts on wheel studys as well as components fitted on chassis over short runs.

(b) Excessive self-righting action of the steering while negotiating bends in uneven sandy areas.

(c) Frequent wobbling of front wheels of the vehicle while driving at lower speeds over hard uneven ground.

To overcome the defects mentioned in the preceding paragraph, suitable modification kits (adapters) were developed by the R&D, introduced into service and procured during the period January, 1972 to April 1972. As on 8th January 1973, quty. 925 trucks 1-ton Nissan deployed in sandy terrain have been fitted with sand tyre equipment with the help of modification kits (adapters) by the user units and no complaints regarding their performance have been reported.

Prior to the introduction into service and procurement of the Modification Kits (adapters) as indicated in the preceding para, the mobility of the Army Units in the use of 1-ton vehicles in sandy terrain suffered. The 1-ton vehicles were, however, used by the Army Units in the sandy terrain without the sand tyre equipment. Except for difficult sandy areas the performance of these vehicles was by and large satisfactory."

1.12. Asked to state the number of modification kits which have been obtained so far for vehicles, the Ministry, in a note, stated that 1416 sets of modification kits (adapters) at a cost of Rs. 5,98,800/- had been procured between January 1972 to April 1972.

1.13. The Committee asked when the tyres and tubes were received from the firms. In this connection the Master General of Ordinance Army Headquarters stated: "They were received from the manufacturers in June 1968. They were released to the units in July 1970 to October 1970. They were issued from COD in matching quantities, that means, the wheel discs, tyres, tubes and flaps. These tyres are in use at present. Todate, we have not received any reports of any failures of these particular tyres. If there is any question of BLR (Beyond Local Repairs), they would have come to us from these two divisions."

1.14. The Committee desired to know the number of tyres, tubes, flaps and wheel discs which had been used so far. The Ministry stated as follows:

"The following is the utilisation position of the sand tyre equipment (tyres, tubes, flaps and wheel discs) mentioned in the Audit Para:—

Sl. No.	Nomenclature	Quantity procured	Quantity utilised
1.	Tyres	4,858 Nos.	4,675 tyres, 4,566 tubes and 3,352 flaps have been utilised upto 8-1-1973.
2.	Tubes	4,560 Nos.	
3.	Flaps	3,352 Nos.	
4.	Wheel discs	6,500 Nos.	Qty. 4,675 utilised upto 8-1-1973.

1.15. As regards the storage and issue of tyres, the representative from the Army Headquarters stated: "These are items which are perishable and only issued to the units for satisfaction of immediate wants. When they are with the units they may be kept there for some time before they are used. However, from experience it has been found that the minimum life of these tyres and tubes are six and three years respectively. In the COD they were being kept under ideal conditions in a room which was dark. Secondly, the COD would not issue either of these to the units until such time as the wheel discs had arrived because all the items have to be matched. It is pointless to send them to the units, just only tyres and tubes."

1.16. Asked whether the usefulness of tyres etc. remained unimpaired so far and whether it was likely to remain so till they could be issued to the user units, the Ministry, in a note, stated:

"The entire quantity of tyres (4,858 Nos.), tubes (4,566 Nos.) and flaps (3,352 Nos.) procured during May 1967 to June 1968 have been issued to user units. The Army Headquarters have stated that the tyres and tubes were properly preserved and periodically turned over, thus minimising deterioration while in storage. If at all any deterioration has taken place due to the life factors in these tyres and tubes, it will be marginal. Even though Defence Technical authorities informed Army Headquarters in November 1967 that the shelf life of tyres and tubes might be estimated to be 6 years and 3 years respectively, they have also added that the shelf life is considerably influenced by the conditions of storage and their exposure to different climatic conditions."

1.17. The Committee note that the Research and Development Organisation of the Ministry of Defence, after carrying out trials recommended sand tyre equipment for use on three types of military vehicles, namely, Jeep, Nissan truck and 3 tonne TMB, which were selected for deployment in the sandy areas. However, no field trials of the sand tyre equipment to be fitted with Nissan trucks were made as the special type of wheel required for trials on these trucks was not available and it was considered unwise to invest some amount on the manufacture of one or two trial wheels. The type of the equipment to be fitted on the Nissan trucks was decided on the basis of the assumption that whatever equipment could be fitted on Dodge trucks would also be useable on Nissan trucks. Again the samples of the sand tyre equipment got manufactured by a private firm were tested under different conditions. The equipment meant for use on sandy soil was put on trial in Calcutta, where there was no sandy soil. On the basis of these faulty trials bulk orders for procurement of sand tyre equipment consisting of wheel discs, tyres, tubes and flaps were placed and equipment worth more than Rs. 38 lakhs was received. When the equipment was issued to the units deployed in sandy terrain, it was found that it could not be used with advantage on the vehicles for which it was intended. The entire equipment was lying unutilised and the amount spent on it may be said to have been totally infructuous. The Committee take a serious view of this for no one seems at any stage to have thought of taking the obvious precautionary steps to make sure that what was being ordered was capable of being used. The Committee desire that the circumstances leading to the adoption of sand tyre equipment for Nissan trucks without field trials and the omission to carry out trials of the sample equipment under the appropriate condition before placing a bulk order for manufacture may be investigated with a view to fixing individual responsibility.

1.18. The Committee would also like to be apprised of the action taken in the matter of introduction of a modification kit for making the equipment useable on the vehicles. Adequate steps will no doubt be taken to ensure that the equipment lying unused is properly maintained.

Defective construction of magazines

Audit paragraph

1.19. In April, 1963 Government sanctioned construction of 34 special storage sheds for an ammunition depot at a station at an estimated cost of Rs. 86.20 lakhs. These storage sheds were com-

pleted at an approximate cost of Rs. 88.80 lakhs and were brought to use from July, 1965.

1.20. In February, 1970 the users reported that cracks had developed in the vertical RCC columns in 31 sheds. Since the buildings, built to permanent specification, showed considerable signs of deterioration in such a short period and the cracks were of a special nature, the Chief Engineer sought the technical opinion of the Central Building Research Institute. The report of the Institute (October, 1970) disclosed that saline water had been used during construction and compaction of concrete was poor making it porous and full of voids. These had resulted in absorption of rainwater and accelerated corrosion in presence of excessive soluble salts. The high water table in the area had also probably contributed to migration of salts and moisture into the foundation resulting in deterioration of foundation reinforcement. It was held that the deterioration was heavy and no satisfactory method could be devised for protection of the concrete. However, some remedial measures including sizeable repair which might help in extension of the life of the structure were suggested.

1.21. The Chief Engineer held in November, 1970 that as the causes of deterioration brought out, among other things, lack of proper supervision and defective execution of the work, further investigation was warranted. A Technical Board assembled in April, 1971 for further investigation of the matter confirmed that the deterioration was due to saline water, use of bricks containing harmful soluble salts, improper compaction and curing of concrete, lack of adequate cover for reinforcement use of fine sand instead of course sand and inadequate projection of roof slab.

1.22. Ministry stated that sanction was accorded in November, 1971 for special repairs to the magazines at an estimated cost of Rs. 14.10 lakhs and that the question of initiating disciplinary action against the persons responsible for the supervision of work as also whether any action could be taken against the contractor was under consideration.

[Paragraph 15 of Report of Comptroller and Auditor General of India for the year 1970-71, Union Government (Defence Services).]

1.23. According to the information furnished by the Ministry: "The Ammunition Depot for Western Command was located at..... as an interim measure, pending a decision on its final location.

1.24. At a meeting of the Defence Minister's Committee held in August, 1952, it was pointed out that the location of the Depot at....

as a permanent measure was not suitable as it was not advisable to have large stocks of ammunition near an international airfield which is within 15 miles of..... This location at...was also considered unsuitable for the following reasons:

(i) It was served only by a branch meter gauge railway line.

(ii) The area was lowlying and was liable to be flooded during the monsoons.

(iii) There was not adequate area for its expansion.

The suitability of other stations in Western Command for the permanent location of the Depot was accordingly examined and a Recee Board was convened by Head-quarters, Delhi Area. After an examination of the various aspects, Headquarters, Western Command issued a covering order on 11-3-53 for user-cum-costing Recee Board, which was held at....on 26-3-53 for the purpose of selecting a suitable site on the permanent location for the Ammunition Depot.....as a site for a permanent location for C.A.D was chosen due to the following considerations:—

(a) There was no major airfield in the vicinity.

(b) It was served by both the broad and meter gauge railways which would facilitate distribution of ammunition in times of emergency.

(c) The land was high except for a portion of the site in respect of which preventive measures had been provided so that there was no danger of flooding.

(d) Adequate area was available for expansion.

The proposal was accepted by the Government on the recommendations of the then Chief of the General Staff and Master General of the Ordnance.....Subsequently, the proposal was finally approved by the Defence Minister's Committee in its meeting held on 24-10-1956."

1.25. According to Audit paragraph, the Government sanction for the construction of storage sheds in the Ammunition Depot was given only in April, 1963. In the course of evidence the representative of the Ministry of Finance (Defence) stated: "The Government sanction of April, 1963 described that the project was to be executed in three phases." Asked to furnish the break-up figures phase-wise for the construction of the Administration Blocks, staff quarters and

storage accommodation, the Ministry, in a note, have furnished the following information:

> "It is not possible to indicate exactly the completion cost separately for administrative, domestic and storage accommodation phase-wise as combined contracts were concluded and no separate accounts were maintained. However, a statement showing the breafings as far as possible of the cost as per administrative approval and completion cost for administrative accommodation, domestic accommodation and storage accommodation separately for each phase is enclosed at Annexure I."

1.26. From the statement, it is found that the storage accommodation was to be constructed in the 2nd and 3rd phases only.

1.27. As regards the number of sheds in which cracks had developed, the Principal Defence Secretary intimated: "According to my information, all of them are defective. There is a varying degree of defect. The only thing is that in respect of remaining three, complaints have not been received but it appears to me that the entire construction was defective." The witness continued: "The report (of the CBRI) gives the degree of deterioration. It says that shed Nos. 1 to 17 shows sign of initial cracking, RCC column appears to be sound. Shed Nos. 27 to 34 marks deterioration. So there are varying degrees of deterioration."

1.28. The Committee desired to know whether any cracks had also developed in buildings other than the storage sheds. The Ministry stated that according to a communication dated 20-6-1970 from the Chief Ordnance Officer, Ammunition Depot to the Chief Engineer, Poona and Rajasthan Zone, the cracks had developed in RCC columns of the storage sheds only.

1.29. During evidence it was stated that the Officer Commanding of the Ammunition Depot reported on 24-2-1970 that certain vertical columns of the walls of storage sheds required urgent repairs. Asked to state whether at that time be was aware of the damage done to other buildings, the Ministry stated:

> "In his letter No. 2223/1/Ex dated 24-2-70, the D.C., Ammunition Depot.... had written to the GE Kota only in general terms and the inclusion of the term 'and several other buildings' along with the words '31 sheds' was not factually correct. The position was subsequently clarified by the Officer Commanding in his letter dated 20-6-1970 addressed to the Chief Engineer (P&R) Zone, Pune in which it was stated that only the sheds had developed cracks."

1.30. The Committee desired to know whether any test was done before the construction of buildings was undertaken in regard to salinity etc. The Engineer-in-Chief, Army Hq. informed that initially in 1956, at the time of the sitting, the water test was carried out by the College of Military Engineering. As regards their findings, the witness stated: "There were a total of 25 wells in that area and samples from these wells were sent to the College of Military Engineering and they cleared 21 out of these 25 wells and said that the water from those 21 was suitable for construction while that from the remainder was not suitable."

1.31. To a question whether the water from these four wells was used for construction, the Engineer-in-Chief, Army Hq. stated that water was used only from the 21 wells which were cleared for construction. Replying to a further question as to how the salinity came in, the witness added: "We were aware that the water was saline and it was saline at that time also but it was considered suitable for construction. Before taking up the construction in hand in 1963 and 1964, we had sent samples to the Central Road Research Institute, Delhi...." Asked to state the reasons for sending the water samples to the CRRI, Delhi instead of the CBRI, Roorkee, the Engineer-in-Chief, Army Hq. informed: "They too have their laboratories and it was convenient to have it done in Delhi, they also carry out concreting work and we had asked them a very specific question whether this water was suitable for brick construction, for concreting and so on, and they had given us clearance that the water was suitable for construction."

1.32. When asked why the CRRI which would be primarily concerned with road research and not building research as such, was entrusted with the water tests for the construction of depots, the representative stated:"....here it was testing the suitability of this water for concreting. The facilities available at both the laboratories are indentical."

1.33. When asked to explain how to interpret the two different conclusions viz. CRRI holding the water suitable for construction and CBRI attributing the salinity of water used as the cause for cracks of the storage depots, the Engineer-in-Chief, Army Hq. replied: "The Road Research Institute said so in 1963, but the building Reasearch Institute has told this to us in 1970. As I was trying to explain, not enough was know about the suitability of water for concreting purposes, and the only thing which we in India could rely upon was a British Standard specification. The report which came from the Central Road Reasearch Institute was based on the British Standards

Specification. Subsequently, in 1964, the Indian Standard Institute in Delhi also published a standard specification but only as a guideline and in all these guidelines it was stipulated that over 80 per cent strenght achieved saline water may be used...." The Principal Defence Secretary also had the following to say in this regard:

"According to what I have been able to find, no matter to which institute you would have sent it in 1963, the answer would have been the same, because the test which was being employed by them was laid down by the British specifications and did not deal with the particular problem which, later on Roorkee discovered, had caused trouble in this particular construction. Further on, it is my view that even today, the matter has not been satisfactorily settled by the technical people.

I shall read out to you the British specification on this, on the basis of which the certificates were given and on the basis of which certificates we proceeded further. The survey or the test merely applied to the following:

> "The strenght of concrete made with water under test should not be less than 80 per cent of the strength of the concrete made with distilled water, and the difference in initial setting time of cement treated with distilled water and with water under test should not be more than 30 minutes."

They did not go into the particular question of salinity.

After further discussion, the ISI in 1970 have published a slightly different version, but even in 1970, the ISI have laid down merely guidelines for permissible limits of various soluble solids but in case of doubt, the test of compressive strength is the overriding factor for taking decision. The point that I am trying to drive at is that the full experience in terms of testing and giving the certificates and the full experience of this particular construction and the difficulties that develop have not yet been fully taken into account. So far as the Defence Ministry is concerned, we are working on this. After this study, I propose to refer this matter for further and more detailed discussions by the technical experts.

1.34. Replying to a question whether it was not an abnormal procedure that the CRRI, Delhi was selected for water-testing instead of CBRI, Roorkee the witness stated that the normal procedure was reference to a testing laboratory competent to do the job with-

in the area of the Command handling this particular project. Giving further details about the nature of reference made and the advice received from the CRRI, Delhi, the Principal Defence Secretary stated: "The reference to the Institute, the laboratory, was not for suitability of water generally. The reference was '(1) consolidation of water bound Maccadam for road work; (2) brick masonry, stone masonry in cement|in lime|mortar; (3) cement concrete, lime concrete in foundation; (4) reinforced concrete for roof slabs, RCC beams, lintels'.

Reference was made in regard to suitability on all the four points. The laboratory was equipped to deal with suitability on all these four points. The laboratory certified in regard to all these four points and it is not for us to take the view that one laboratory is better than the other."

1.35. The Committee enquired whether, after 1970, a reference was made to the CRRI, Delhi which was consulted in 1963, the witness informed: "We have not done so. But as a result of this study, we are going to do so. We will place it before a number of engineers."

1.36. The committee desired to know the number of cases where references were made to the CRRI, Delhi for testing of concrete structure for the Ministry of Defence. The Ministry informed the committee as follows:

> In no other case a reference appears to have been made in this regard to CRRI, Delhi. It is, however, mentioned that the need for a reference arises only when quality of water is doubtful. In most cases, it is not so."

1.37. Replying to a question whether Government had any machinery to test whether the quality of water used was according to the specific clause in the contract that it should be clean, free from acid or alcohol or organic matter or other impurities, the Engineer-in-Chief Army Hq. stated: "Water is tested under the arrangement of the Department. The source is approved by the engineer who is in charge of that work. Until he approves the source of water, the contractor cannot use use it for any construction."

1.38. The Committee desired to know whether any assessment of the life of the structures after the cracks were noticed, was made. The Principal Defence Secretary, in reply, stated: "...It is quite clear from the nature of the cracks that unless and until the matter is handled properly, the life of the structure will barely last 3-4 years."

1.39. Regarding the life of the structure after the postponed special repairs, the witness stated: "Even after the special repairs, the life of the structure will not be the same as was assumed or intended to be. This question has been gone into and we have come to the conclusion that it is worth spending Rs. 14 lakhs on special repairs."

140. The Committee enquired whether any action had been taken against the supervisory staff concerned with the construction. The Principal Defence Secretary replied: "The inquiry is going on and quite a number of steps have been taken before dealing with these.....I am convinced by going through the papers that the standard of care exercised was less than normal. From the findings of the CBRI and the Technical Board it appeared that apart from the use of the saline water, poor workmanship was also a contributory factor for the damage for which the contractor and the departmental staff should, in our preliminary view, be held responsible. A Board of Officers was ordered by the Chief Engineer on 15th February, 1972 to investigate into the lapses in the execution of the work and to recommend disciplinary action against the persons responsible. The Board submitted its findings in May, 1972. These findings are as under: the design work was not faulty. Brackish water was usedd in concreting, the contractor used inferior sand and did not carry out proper compaction of concrete. Lack of supervision by the MES staff. The Board was further unable to pinpoint the responsibility of individuals Further, with a view to pursue the disciplinary action against the concerned staff, in respect of which, as I said earlier, we have taken a preliminary view, the E-in-C directed the Chief Engineer to arrange for a Staff Court of Inquiry and pinpoint the responsibility. The court of inquiry was constituted on 21-9-1972. This court of inquiry is still in progress. 15 witnesses, have since been examined. The inquiry is continuing. The attempt to pinpoint responsibility is being made and without in any way prejudicing the result of the inquiry, we are hoping that they would at least be able to fix responsibility for inadequate supervision during the period of execution of the contract".

1.41. As regards the action to be taken against the contractor, the witness stated: "On that we are still trying to see what we can do. We are advised in legal terms that after one year of the completion, no action is possible in so far as damage to us is concerned. So far as removal from the list is concerned.....he has been removed from the List in August, 1971 but again that is outside this particular inquiry. The worst you can do is to remove

him. Under the legal terms we have been advised that there is nothing more we can do, but this matter is still being examined whether we can do something more."

1.42. The Committee are distressed to note that out of the 34 special storage sheds for an ammunition depot constructed and completed in July, 1965 at an approximate cost of Rs. 88.80 lakhs, 31 sheds developed cracks and showed signs of deterioration within a short period of 5 years. The repairs to these sheds are estimated to cost additional Rs. 14.10 lakhs. The Committee feel that this is clearly a case of defective construction for which responsibility at all levels should be fixed and those found guilty should be dealt with without any leniency. The Committee would like to be informed of the action taken in this behalf within three months.

CHAPTER II

DEFENCE PRODUCTION

A new ordnance factory

Audit Paragraph

2.1. (i) Twelve and half years ago, in September 1959, Government decided to set up an ordnance factory for production of four new types of explosives. Their production was expected to be firmly established by the end of 1963, resulting in the country's self-sufficiency in them and considerable savings in foreign exchange. The original and revised estimated costs of the factory are Rs. 11.70 crores and Rs. 16·52 crores respectively.

(ii) After reviewing the peace and war requirements, the capacities available/proposed for manufacture of ammunition, hardware/ammunition filling and the most economical size of the plant, it was decided to set up the following plant capacities for the three main explosives (out of the four to be produced):—

Explosives	Plant capacities
A .	. 90 short tons per month
B	. 25 short tons per month.
C	. 116 short tons per month

(iii) The first sanctions to civil works covering preliminary works such as site preparation, approach road, external services, etc, were issued in February 1961. The sanctions for building up the factory colony and certain non-residential buildings were issued in June, 1961. Between October, 1962 and October 1964, production buildings were sanctioned. The buildings were completed during April 1964 and December, 1965.

2.2. Indents for all the plants were covered by contracts during February, 1961 to November 1962. The plants and equipments were received in the factory in instalments during July 1963 to January 1966.

2.3. The plant procured from a foreign Government for production of explosive "A" at a cost of Rs. 23.73 lakhs was a second hand plant (of 1937 vintage) part of which had been reconditioned and part replaced. This second hand plant was preferred to a more modern plant offered by another foreign firm, which had agreed to give performance guarantee and the operational cost of which was also cheaper, on cost and technical considerations. The Ministry stated (January 1972) that the supplier of the more modern plant had absolutely no experience in manufacture of this explosive and the cost of the plant offered by it was about Rs. 95 lakhs which was considered too high at a time when foreign exchange was extremely scarce. The second hand plant was expected to yield, under continuous working all days of the month, 90 short tons per month in three shifts of 8 hours each; the agreement, however, did not include any performance guarantee clause. Though the foreign Government had indicated that the plant would be available in India by December 1962, the consignments reached the site between July, 1963 and October 1964 as re-conditioning of the old plant took more time than expected for the reason that the original sub-contractors for the reconditioning having failed, the foreign Government had to contract with another party for this work. The second hand plant, which was first comissioned in December 1964, suffered from frequent breakdowns. Although the known requirements of the services were continuing to be met from June 1965 onwards, the plant capacity was also found to be very low (about 40 short tons) and this was under discussion with the supplier till the end of September, 1967. The latter supplied certain essential ancillary equipments and replacements free of cost and their technicians carried out further trials in November-December 1967 and again during October 1969 to January 1970. Although the foreign supplier was of the view that the 90 short tons' capacity was achievable by working all days in a month under emergency conditions, appreciation of the Director General, Ordnance Factories, was that a capacity of only 70 short tons per month could be deemed to have been ultimately demonstrated (in February 1970) working under normal conditions for 22 days in a month. A claim of £ 77,525 (about Rs. 14 lakhs as per current rate of exchange) of the supplier has been withheld and is yet to be paid. The Ministry intimated (January 1972) that, as a measure of compromise, the foreign Government has proposed to reduce the original plant cost by £ 2,500 (about Rs. 0.45 lakh) and has also withdrawn its claim of £ 4,480 (about Rs. 0.991 lakh) towards the visit of its technicians. Government has agreed to settle the outstanding bills on this basis.

2.4. Since June 1965 explosive "A" is being produced from the plant meeting the needs of the Services. During May 1967 explosive "A" worth Rs. 14.4 lakhs, of a type different from that covered by the agreement with the plant supplier was imported (for stock pile). Production of the variety equivalent to the imported one has since been established in the factory.

2.5. A plant with capacity to manufacture 25 short tons of explosive "B" was procured from abroad at a cost of Rs. 42.77 lakhs and commissioned in December 1964. Due to substantial increase in the requirements of propellants it was decided in August 1963 to augment production of this explosive upto 75 short tons per month at an aditional expenditure of Rs. 1.27 crores (including cost of plant as well as civil works). The augmenting plant supplied by the same foreign firm at a cost of Rs. 68.40 lakhs was received and erected in September 1967 (the necessary civil works were completed in April 1967). Although it was commissioned in December 1967, the capacity production of 73 short tons per month was demonstrated in June 1972 only. The guarantee run on the plant had to be deferred till 1970 since till then the plant had not yielded an acceptable grade of one variety (envisaged in the contract) of this explosive. For that variety repeated trials were necessary by the Defence Inspectors before they were satisfied fully about the product. The Ministry explained (January 1972) that when production is established for the first time in the country, elaborate climatic, firing and other trials are insisted upon on behalf of the users and this necessarily takes time. The Ministry added (February 1972) that during the trial runs the plant such as it was, was utilised to meet the requirements of the Services for all but one of the contracted varieties.

2.6. During January 1968 to October 1969 explosive "B" worth Rs. 103.14 lakhs was imported. That worth Rs. 12.54 lakhs was of the variety covered by the agreement with the plant supplier, while the rest worth Rs. 991 lakhs was of a different variety not then covered by the contract with the plant supplier. Production of the latter variety in the factory is under establishment and trials are in progress (December 1971) in consultation with the plant supplier who is offering technical advice therefor without any additional payment. The amunition for which this variety of explosive is required is manufactured in a new factory set up for this purpose during 1963 to 1965 (production commenced from September 1965).

2.7. For production of explosive "C", a plant with capacity of 120 short tons per month was procured from abroad at a cost of Rs. 84.09 lakhs and erected by November 1966. This plant was first comissioned in December 1966 but the first trial run by the representatives of the supplier in January-February 1967 was unsuccessful because there was excess acidity in the final product and also because they considered it unsafe for operation until some modifications were carried out. The re-commissioning trials were conducted in September 1967 and after some modifications the plant was recommissioned in March 1968 but this time too, explosive of accepted quality could not be produced and some further modifications were carried out by the plant supplier. The plant was commissioned and production established in April 1969. The Ministry stated (January 1972) that modifications to chemical plants of this nature to suit the actual conditions of working including establishment with indigenous raw materials are not uncommon, and in fact the contract itself provided 8 months time to the supplier to carry out modifications as necessary. In this case efforts by the supplier were necessary even after 8 months as one of the units (the other units were successfully commissioned in 1967-68) of this plant did not yield a satisfactory product till April 1969. During the various trials from December 1966 onwards, the plant was producing explosive "C", which after purification was utilised to meet the needs of two filling factories for the varieties covered by the contract with the plant supplier. In June 1968 and June 1969 explosive "C" worth Rs. 46.83 lakhs, but of a variety different from that covered by the contract with the plant supplier was imported. Production of the imported variety in the ordnance factory was finally established by September 1970 after which the factory has been meeting the current needs (which are small) of one of the two filling ordnance factories.

(iv) None of the above plants has been working to the capacity stated to have been established. Mostly production of explosive "A" has not exceeded 44 short tons (upto 1970-71) as against the demonstrated capacity of 70 short tons (in three shifts). Similarly, monthly production of explosive "B" has not exceeded 51 short tons as against the production capacity of 75 short tons. The maximum monthly production of explosive "C" has been 66 short tons only as against the capacity of 120 short tons per month.

2.8. **The average monthly production of these three explosives during the years 1969-70 and 1970-71 as against the rated capacities was as follows:—**

	Rated capacity per month	Average monthly production 1969-70	1970-71
		Metric tonnes	Metric tonnes
Explosive "A"	90 short tons or 82 metric tonnes	19	10
Explosive "B"	75 short tons or 68 metric tonnes (after augmentation).	34	28
Explosive "C"	120 short tons or 109 metric tonnes	12	4

2.9. Actual production of explosives "A" and "C" has been far below the peace time requirements assessed at the time of planning the factory, *viz.*, 40 short tons (36 metric tonnes). The Ministry has stated (February 1972) that in January 1972 the production of explosives "A" and "B" was 60 metric tonnes each and the monthly production of each during 1972-73 is expected to be 50 to 55 metric tonnes. Similarly, the production of explosive "C" in January 1972-73 is expected to be 50 to 60 metric tonnes.

2.10. The low level of production of the explosives "A" and "C" is stated to be due to lack of demand for them. The less demand for explosive "A", which is used as a base in manufacture of propellants in another factory, is due to inability of the latter factory (for various reasons such as lack of demand from the Services, suspension of production of one weapon due to change of design, time taken for the development of new item and for the provision of the required new hardware components, lack of storage space, etc.) to manufacture propellants. The Ministry has stated (February 1972) that during the period June 1965 to January 1972, 1630 metric tonnes of Explosive "A" had been produced against the actual use of 1500 metric tonnes. About explosive "C", it was intimated by the Director General, Ordnance Factories, in January 1971 that the filling factory (which is different from the new one) was still carrying out trails in consultation with the Inspectorate for change over from the existing explosive filling to the new filling (explosive "C") and on completion of the trials the requirement of the new explosive would be reviewed. The Ministry has stated (February 1972) that during the period December 1966 to

September 1971 the production of Explosive "C" was 257.70 metric tonnes against an actual off-take of 75 metric tonnes. Although the orders placed on the new factory could ensure full utilisation (68 metric tonnes) per month of the plant for production of explosive "B" the actual outturn was only about 31 metric tonnes per month on an average during the years 1969-70 and 1970-71. This is because the factory has not yet established production of a variety of this explosive, different from that covered in the contract with the plant supplier, required for an ammunition subsequently established in an ordnance factory.

(v) As a result of under-utilisation of the main plants, the plants procured for intermediate process materials also have remained substantially under-utilised. To process materials "X" and "Y" are needed to produce explosive "A". The main second hand plant for production of that explosives is an integrated unit and is designed for producing "X" also from "Y" while a separate imported plant costing Rs. 43.25 lakhs (including customs duty, ocean freight, erection charges, etc.) is designed for producing 420 short tons (382 metric tonnes) of "Y" per month. Pending a guarantee run, the latter plant could not work for regular production till April 1969. Thereafter the plant was put on regular outturn by June 1970 the delay having been caused by (i) prolonged discussions with the supplier before final take over (ii) lack or graphite electrodes not supplied by the plant supplier till negotiations for plant take over were completed and (iii) temporary shortage of the indigenous basic raw material (needed for production of "Y") for which indents were placed on the Director General, Supplies and Disposals, in July and December 1970. During the year 1968-69 to 1970-71, the monthly average production of the process material "Y" was 29 metric tonnes, 31 metric tonnes and 54 metric tonnes respectively —in 1970-71 the monthly production was between 5.400 metric tonnes and 284.600 metric tonnes. Further, the process adopted for manufacture of "X" in the second hand plant is also stated to be very old and costly. The estimated cost of manufacturing "X" from the basic raw material is about Rs. 20,000 per metric tonne while the f.o.b. cost of one ton of imported material ("X") is Rs. 3,850 only which is about one-fifth of the factory's production cost The Ministry has stated that the lesser cost of production abroad is due to the lesser cost of basic raw materials, larger capacity plants and continuous production on the basis of their full utilisation, apart from the use of more efficient processes. Partly due to delay in taking over the plant for "Y" and partly due to difficulties in procuring the basic raw material, certain quantities of "X" were im-

ported during September 1966 to March 1971 at a cost of Rs. 25.18 lakhs. To that extent, the imported plant for production of "Y" and part of the integrated main plant which is meant for production of "X" remained unutilised.

2.11. Process material "Z" is the starting material for manufacturing explosive "B". A plant with a capacity of 65 short tons (59 metric tonnes) per month was procured from abroad at a cost of Rs. 48.00 lakhs to manufacture this process material. This plant was put into operation from July 1966 but the average monthly outturn has not so far (upto 1970-71) exceeded 36 metric tonnes in any year. In 1969-70 and 1970-71 the monthly average production was 24 metric tonnes and 31 metric tonnes respectively. Production was restricted due to low rate of production of the final product "B". The Ministry has stated (February 1972) that consequent upon increased demand of the Services, the production from September 1971 has averaged 55 metric per month.

2.12. Process material "H" is an intermediate product for manufacture of explosive "C". A plant for production of "H" was procured at a cost of Rs. 20.91 lakhs (including customs duty, ocean freight, erection charges, etc.). The capacity set up was 120 short tons (109 metric tonnes) per month to match the capacity of the final product plant. Although the "H" plant was commissioned by March 1966, the plant could not be operated on a regular footing till March 1969 (the total production during this period was 321 metric tonnes only) as the main plant was commissioned satisfactorily only in April 1969. Even from April 1969 the "H" plant is working far short of its installed capacity as the main plant remains underutilised for want of orders. During 1969-70 the average monthly production of this intermediate product was 12 metric tonnes only and during 1970-71 there was no production at all. The Ministry stated (January 1972) that this was because production of "H" during the trial runs was more than what was required during 1970-71 for the filling factories and that production was subsequently hampered due to delay in receipt of the raw material, methanol, indented on the Director General, Supplies and Disposals. It has, however, been stated (February 1972) that the production from October 1971 has increased to 50 metric tonnes per month and is expected to be maintained between 60 to 65 metric tonnes per month during 1972-73.

(vi) Apart from these process plants, there are three acid plants in the factory which also remained substantially under-utilised as indicated below:—

	Capacity per month	Annual production 1968-69	1969-70	1970-71 (in metric tonnes)
Nitric Acid plant—cost Rs. 26·88 lakhs	425 short tons or 386·36 metric tonnes	888	938	1511
Nitric Acid Concentration plant—cost Rs. 26·24 lakhs	1500 short tons or 1363·13 metric tonnes	2050	1598	1129
Suphuric Acid Concentration plant—cost Rs. 45·06 lakhs.	4840 short tons or 4400 metric tonnes	6432	4802	4105

2.13. The Ministry has stated (February 1972) that the production of Nitric Acid, Nitric Acid Concentration and Sulphuric Acid Concentration during October 1971 to December 1971 was 480 metric tonnes, 672 metric tonnes and 2300 metric tonnes respectively and their expected production during 1972-73 is 2700 to 3000 metric tonnes, 8600 to 9000 metric tonnes and 25000 to 27000 metric tonnes respectively.

2.14. It may be mentioned that a Nitric Acid plant recently installed (production commenced from January 1971) in another ordnance factory with production capacity of 20 tons per day is being utilised only 7 days in a month at present and this is stated to be sufficient to meet the current requirements of Nitric Acid of that factory. The Ministry explained that this plant was procured not merely to meet the full requirements of that factory but mainly as replacement of the old and unreliable plant there. The annual production of the two acid concentration plants in the new factory is limited to about one month's production capacity. Chemical plants are subject to heavy corrosion. The acid concentration plants, the Ministry has stated, are required to the extent of 80 per cent of their capacity for production of explosive "C" and therefore those plants have been under-utilised to the extent production of the latter has been low.

(vii) The total cost of production including final and intermediate products of the factory during 1969-70 was only Rs. 2.62 crores as against the capital investment of Rs. 15 crores actually made upto March 1970. During the year 1970-71, the total cost of production was still less, *viz.* Rs. 2.22 crores. During this year the total production of explosive "A" was about 50 per cent of that produced in the previous year and there was very little production of explosive

"C". While actual production has been about 30 per cent only of capacity, the number of employees—industrial and non-industrial (number 2795) is 83 per cent of what, it is estimated, would be needed for full production in the factory. During the two years 1969-70 and 1970-71, the direct material cost in the factory was Rs. 106 lakhs, direct labour cost was Rs. 22 lakhs while overheads (which include Rs. 121 lakhs as depreciation) were Rs. 256 lakhs. The Ministry has stated (February 1972) that in chemical and explosive factories where heavier corrosion is experienced when plants are working intermittently than when worked continuously, it has been the experience that while direct labour cost varies with production though not strictly proportionately, the cost in respect of maintenance charges, indirect labour (estate maintenance, security, fire fighting and other overheads) cannot vary proportionately with production. It has also been stated that on a rough estimate the product value of 1971-72 is expected to be of the order of Rs. 3.56 crores mainly due to the increased rate of production from October 1971 onwards; the estimated total cost of production during 1972-73 is expected to be of the order of Rs. 5.28 crores. The Ministry has contended that the lower rate of production in the earlier years has been due to lack of demands from the Services and not due to the incapacity of the plants.

2.15. The Ministry has stated (January 1972) as follows:—

"It was for the first time in the country that a chemical complex of this nature was planned and coordinated by the ordnance factories without any help from foreign or Indian consultants....In the satisfactory commissioning of chemical plants of this nature unexpected difficulties are bound to crop up due to conditions of working being different from those familier to the plant suppliers and a variety of other reasons. Before a product is cleared as satisfactorily established, elaborate and time consuming trials by the factory Inspectors and the users are necessary. These factors apart, the requirements of the Services in the 1960's had undergone basic changes with reference to their needs in 1950's. New types of weapons, new types of propellants had to be developed. Until the design of the weapons is finalised, the propellant design had to wait as also the explosives specifications....Barring certain unforeseen technological problems, the....complex was completed and commissioned satisfactorily and the production potential for a wide variety of explosives is today available to be pressed into service as the demands

of the Services increase. The inevitable technological problems that would crop up in the process of establishing an explosive complex like....in the conditions which exist in India, and the continuously changing pattern of the demands of the Services should not be allowed to detract from the solid and successful work that has been but in by those in charge of implementation of this project."

[Paragraph 4 of the Report of the Comptroller and Auditor General of India for the year 1970-71—Union Government (Defence Services)].

2.16. The Committee were informed during evidence that the proposal to start a new ordnance factory was started as early as in 1948 and that the project was finally approved in September, 1959, as a result of certain recommendations made by two committees and consultancy reports given by two foreign experts. As regards the original estimated cost of the factory, the Secretary, Defence Production stated that the project was sanctioned for Rs. 11.7 crores and added: "The figure went to Rs. 14.80 crores from 1959 to 1964. This was because the prices and services were worked out on 1962-63 rate basis. It went further to Rs. 16.51 crores as a result of the decision to provide additional residential accommodation at...."

2.17. Asked why the provision for the residential accommodation was not provided originally the witness stated: "Probably because they thought that people would come from the neighbouring villages and would live there, therefore they were not provided."

2.18. The Committee desired to know whether there was any further revision of the estimate. In a note, the Ministry have replied: "It is submitted that in so far as project as originally conceived and sanctioned is concerned, there has been no further revision of estimate beyond Rs. 16.52 crores. However, in addition to the revised estimate amounting to Rs. 16.52 crores sanctioned on 9-2-1967 for the main project at....there was another sanction covering an estimate of Rs. 126.77 lakhs catering for augmentation of capacity for Explosive 'B' at.... The total estimate for which Government sanction has been issued therefor stands at Rs. 17.7857 crores (Rs. 16.5180 crores+Rs. 1.2677 crores). This estimate has not been revised further by any other Government sanction. DGOF has, however, informed us that the Accounts Department has been compiling certain figures in respect of deferred expenditure. The final figure together with the manner in which such expenditure is to be adjusted is under discussing by DGOF with the financial authorities."

2.19. The Committee pointed out that the entire complex of three plants was expected to be commissioned by 1963 and enquired about the reason for not completing the works within the period fixed. The Secretary, Defence Production, informed: "These were specialised plants for which discussions had to be held and most of the plants were ordered between 1962 and 1964. The last plant was ordered in 1964. Obviously we could not sanction civil works much ahead of the plant being determined, because in regard to most of these plants, the plant suppliers would have to indicate foundations and other data. So civil works could not be sanctioned until the plant was determined and that was determined between 1962 and 1964. As they went on determining, we started sanction for civil works also. So, obviously the time schedule indicated was affected by the later ordering of the equipment partly or substantially." Drawing attention of the witness to the fact that according to the decision taken in 1959 the project was due for completion within four years, the Committee asked why these things were not taken into consideration at that time. The witness replied: "Everybody plans according to the best possible estimate that he can make.... In this particular project, I do not know the time-frame prescribed for ordering the equipment. But between the time of indenting and ordering, there was a gap of anything from 15 to 18 months.... After the sanction is given, we go on to order the equipment; then we go on to preparing the plans and estimates for buildings and civil works; then we go out to tender, and then we award the contract to the contractor and the time is prescribed. But it is very rarely except in very exceptional cases that the time prescribed in the project report is adhered to."

2.20. The Committee were informed that the indents for all the plants were issued by October, 1960 and enquired why there was a delay of more than a year in issuing the same. The Ministry, in a note, have stated as follows:

> "The DGOF had taken necessary action for indenting various plants and equipments as early as December 1959 on restricted tender basis—a course which was considered necessary to cut short the time for procurement. As the associate Finance wanted individual sanctions for various plants, the matter came up for consideration of this Ministry. It was only after protracted discussions the above points were resolved and final clearance given to DGOF in August 1960 to invite tenders."

2.21. The Committee note that a decision to set up an explosive factory was taken in September, 1959. The production of explosives was expected to be firmly established by 1963 resulting in a saving of foreign exchange of about Rs. 4 crores annually besides making the country virtually self-sufficient in regard to an item of considerable importance. The factory was, however, set up gradually during February, 1961 and January, 1966. Consequently the estimated cost of the project went from Rs. 11.70 crores to Rs. 14.80 crores. The delay was mainly due to lack of proper planning. Considerable delay also occurred in the ordering of the equipments. The Committee are surprised that according to the Secretary, Defence Production, "it is very rarely....that the time prescribed in the project report is adhered to." There should have been a realistic time schedule for the various items of work and it should have been adhered to. The Committee suggest that in future there should be a periodical review of the implementation of such big projects, at the Government level.

2.22. Apart from delay, optimum utilisation had not been made of the available capacity, the process plants for the intermediate products as also the connected acid plants have remained underutilised and production has been low as compared to capital investment. The Committee have dealt with those aspects in the succeeding sections of this Report.

2.23. As regards the procurement of the second-hand plant for the manufacture of explosive 'A' from U.K. Government, a chronological note furnished by the Ministry is reproduced at Appendix I. The Secretary, Defence Production, stated that as the U. K. Government put up a much bigger plant, this plant became surplus with them. Asked whether any assessment had been made about the anticipated residual life of the plant, the Secretary, Defence Production, stated "Yes, Sir. This machine was expected to have, when it was purchased, residual life of 7 to 8 years after re-conditioning in U.K. and commissioning in India. So far the plant had worked from 1965 and we hope that it will work for another to 5 years." The witness further stated that it was Dr.....'s assessment that it would have a life of 7 to 8 years. Asked how he came to the conclusion about the life of the plant, the DGOF replied: "It.....depends upon the condition of the plant as well as the frequency of breakdown that were experienced earlier. It is, therefore, not possible for anybody to scientifically and rationally assess the residual life of any machine.

2.24. To another question, the witness replied: "I understand DR....went to U.K. twice. He had occasion to see the plant both

while working and while not working and had discussions with the U.K. authorities and the plant operators. Presumably, based on this, he gave the life of the plant as 7-8 years." The Committee enquired whether, after the visits of Dr...in 1952 and 1955, there was any note on record to indicate what he saw and recommended. The Secretary, Defence Production, stated: "I am afraid, we have not got that report here....What has happened is this that in 1961, when we placed the order, of course, as far as I can gather, no fresh assessment was made." Asked whether this plant was in operation in 1955, the Secretary, Defence Production, informed: "This plant was worked for a total period of about 6 years and that too, intermittently. Normally, plants of this type have an average life of 15 years." When asked how long it worked continuously and then broke down, the witness stated: "We have not got any detailed information today."

2.25. When pointed out that according to the statement made by the witness, the plant would work for another 3 to 5 years, the Secretary, Defence Production informed: ".....some parts are to be replaced and when it is done, it will do service for 3 or 4 years. It is based on the frequency at which it breaks down." The witness added: "We merely asked the head of the Department as to what would be the life of the plant. He gave an opinion in consultation with the people who operate this plant, that subject to certain replacements being made, it should give service for 3 years."

2.26. The Committee pointed out that when the plant arrived in India, an assessment should have been made whether the plant looked like the one promised. The representative from the Ordnance Factories informed the Committee: "This second-hand plant which was there in U.K. was dismantled and inspected by the U.K. Defence Ministry personnel and then we found that about 1/3 plant could be brought to India as it was and another 1/3 could be brought to India only after reconditioning in U.K. and the balance items were purchased in U.K. and in India." The Secretary, Defence Production, also stated: "The commissioning trials have been carried out. Whether somebody has reported about that or not, I do not know."

2.27. The Committee desired to know the system followed by the Ministry to check up the machinery after installation. The Assistant DGOF stated: "After the plant was installed, the operating and maintenance technical personnel were asked to assess what was the expected life of these various plants and what was the residual sale value in case it was scrapped. The depreciation which we charged every year was based on such assessment of life." The witness further stated that in this case also the valuation was done itemwise and

that it was not uniform for all the items. Continuing further, the witness informed: "Those parts of the equipment which were handling acid, we had to assess their life as very short. Based on such assessment, the life of the whole plant is worked out."

2.28. To a query as to what would have been its cost when it was procured in 1937 by U.K. Government, the witness replied: ". . . we do not have that information." The witness further stated: "We asked the War Office whether they would be able to supply a new plant and what it would cost. They said that it would not be possible for them to fabricate for us a new plant but such a plant might cost Rs. 34-35 lakhs."

2.29. The Committee pointed out that this U.K. plant did not give any performance guarantee and enquired why this was preferred to the new German plant which had also performance guarantee. The Secretary, Defence Production, informed: "The U.K. Government said that since it was a Government to Government transaction, they were not prepared to give any guarantee but they would be prepared to recondition the plant and charge us the actual cost of reconditioning." To a query whether the performance guarantee was refused even when insisted upon by Government, the witness replied in the affirmative. Explaining further, the witness stated during evidence: "The reason was that this plant was costing only one-fourth of a new plant and we did not have enough foreign exchange to spend on a new plant costing Rs. 95 lakhs." Asked whether foreign exchange for this purpose was applied for and refused, the Ministry, in a note, have stated as follows:

> "While scrutinising the offer for the German plant *vis-a-vis* the U.K. Ministry of Defence offer, no request was made for release of foreign exchange to the extent of Rs. 95 lakhs. The decision to go in for the second-hand U.K. Plant was taken mostly on technical grounds."

2.30. The Committee desired to know the advice of the Financial Adviser on these two proposals. The representative from the Ministry of Finance (Defence) stated: "I understand that the Financial Adviser had then said, that the new plant might be considered."

2.31. The Committee understood that in the Financial Adviser's note, there was this observation: "We note that from the point of operational efficiency and recurring cost M|s. Vozak Cheim's new plant is *prima facie* more suitable than the War Office offer of a second-hand plant, since as pointed above, the extra capital cost can be more compensated by way of saving in operational costs in a few

years' time....It would be preferable to go in for the new plant rather than the old second-hand plant which does not contain the latest modifications specially where there is no performance guarantee attached to the offer." The Committee desired to know why this was turned down. The Secretary, Defence Production, informed: "The FA's advice was purely on the basis of cost. We had also to take into account whether a plant should be purchased from a supplier who had never produced (the explosive) before. Now the technical advice was definitely against going and bringing a plant from a country and from a supplier who had never produced (the explosive) at all. This was the most important consideration. I agree with the FA's observation that if we had purchased the new plant, even though the capital cost would have been higher, the running cost might have more than offset the increased capital cost....A new plant is always better than an old one but a new plant produced by one who had never produced it before, which had never been used to produced (the explosive) is a risk which we could not certainly take...."

2.32. When the attention of the witness was drawn to the fact that the actual running cost of the old plant was much higher as compared to a much smaller amount for the new plant, the Secretary, Defence Production, stated: "....I agree that the German plant, which costs more in capital, might be cheaper in the long run. I never disputed it at any time." The witness added: "....it is always known that ....the cost of operation of a second-hand plant will be more than that of a new plant."

2.33. It was then pointed out to the witness that according to the F.A. in an informal discussion, the DGOF had given certain data which clearly indicated that the economic utilisation would result in saving of Rs. 31.80 lakhs per annum if the rated capacity of the plant was fully utilised. The witness replied: "The Financial Adviser's opinion so far as the cost of the running plant and overall finding is concerned is correct. I am not denying that." The witness added that the noting of the Director, Planning and Coordination to whom the matter was referred by the Financial Adviser, read as follows:

"I have just now received a communication issued by Dr....that necessary settlements etc. will also be made along with the plant. There is no advantage in going in for a new plant as the process will be the same and the economic working will be the same."

2.34. When asked whether, therefore, the views of the Director, Planning and Coordination, was not endorsed by the Financial Adviser, the witness stated: "This opinion was given by the technical officer....That since the process offered by both was the same, the

working economies would be the same....The background was that the Germans claimed that their day-to-day working cost would be cheaper than that in the second plant. On this, Dr...said that the working economies would be the same since the process offered was the same."

2.35. The Committee then referred to the following note of the A.F.A.:

> "If the Ministry of Defence still feel that for other considerations we will have to tie ourselves up with the UK War Office, it would be much safer to go in for a new plant from the War Office, UK, whatever be the delivery date, so long as it is not likely delay the project abnormally."

To this, the Secretary, Defence Production referred to the following observation of the Deputy F.A.:

> "If, however, Ministry of Defence feel that further delay is unacceptable and the chances of getting a new plant are remote, they can on their own responsibility take the decision to buy the second-hand plant."

2.36. When asked to state whether any enquiry was made by the Ministry whether the new one was available in U.K. or not, the witness replied: "We enquired, when they offered the second-hand one in May 1960, but they said that they had neither the personnel nor the facilities to design and supply a new plant; if, however, we wanted to fabricate new plant ourselves, they would be prepared to give us the technology and all the connected drawings. The witness further stated: "The War Office told us they could not design or supply a new plant. They did not have any other plant. They normally do not manufacture a plant." When asked that if U.K. War Office was prepared to give the technology and drawings, what were the considerations in not accepting them and having a new one, the witness stated: "These have been pointed out in Dy. FA's note that it would mean delay, that it would take much longer, if were to design a new plant and get it fabricated."

2.37. The Committee pointed out that the U.K. plant was commissioned only in December 1964 *viz.* after four years of indenting for it and enquired whether any assessment was made then about the time to instal a new plant. The DGOF in reply stated: "There is no record whether this point was considered at that time. But it is doubtful whether in 1960 we would have to get a competent engineer to do that."

2.38. The Committee feel that the purchase of explosive production plant of 1937 vintage from U.K. in preference to a new plant offered by a German firm was unwise. No performance guarantee could be obtained for this plant. Its residual life after reconditioning was stated to have been assessed as only 7 or 8 years. Although the German plant was costlier by about Rs. 71 lakhs, according to the data given to the Financial Adviser, its purchase resulted in a saving of recurring expenditure of Rs. 31.80 lakhs per annum. That it was considered risky to purchase it owing to the fact that the firm had not produced the explosive is not convincing enough as the firm had agreed to give performance guarantee. At this stage the Committee can only express their dissatisfaction and hope that such purchase proposals would be examined more carefully in future.

2.39. The Committee were informed by the Secretary, Defence Production that the original capacity of this plant was 900 tonnes per annum. Asked how much it had produced, since the time it was commissioned, the witness gave the following figures:

(in terms of percentage of original annual capacity)

1965	19·5%
1966-67	31·9%
1967-68	32·7%
1968-69	27·1%
1969-70	22·9%
1970-71	12·2%
1971-72	35·3%
1972-73 (Till Nov. 72)	58·1%

2.40. When asked how even in peace time the target had not been fulfilled, the witness replied: "The explosive requirement is linked with the requirement of the ammunition filling. About 20 items were given up. But throughout this period, we went for the other ammunition. The quantity that was required and produced was in January 1972."

2.41. The Committee pointed out that according to Audit paragraph, the reason for low production was due to the lack of demand which in turn was due to the inability of the Cordite Factory to manufacture propellants etc. The Secretary, Defence Production had the following to say in this regard: "This is because when the—variety production is linked to the production of ammunition and the ammunition production in turn is linked to the demand of the

services. Sometimes there is a lack of demand from the services. There is no use of producing more and keeping it in store. Moreover we cannot keep them in storage for long."

2.42. The Committee then asked why a smaller capacity plant was not gone into. The witness informed thus: "It is like this. It is not based on peace time requirement. But certain inbuilt allowance has to be made for the increase in the requirement at the time of war..Therefore, this capacity was determined as a result of compromise between the war time requirement and the peace time requirement."

2.43. Referring to the procurement of a separate plant for producing process material 'Y', the Committee pointed out that while the main plant arrived by 1964, this 'Y' plant was received only by 1966. The Assistant Director General, Ordinance Factory stated: "As far as the subsequent delay in the case of French Plant is concerned, since the difference in the offers was very much, we had certain doubts about the competency of the party. We therefore had to satisfy ourselves that the tenderer will be able to meet our requirements."

2.44. The Committee enquired why the guarantee run in this case was delayed till April 1969. In a note furnished to the Committee, the Ministry have stated: "Chronological history of this case highlighting the difficulties is given below:—

Erection—The erection of the entire plant was completed in June 1966 under the guidance of the plant supplier's representatives.

Commissioning—Immediately after completion of erection the Nitrogen plant which is a part of the main plant and a necessary safety pre-requisite for production of intermediate "Y" was put on production trial when it was seen that one of the imported consumable item supplied along with the main plant had deteriorated despite careful storing due to the effect of tropical climate ambient weather conditions on prolonged storage prior to use. This material was, therefore, obtained afresh and the plant was put on production trials again in October 1967. The trials were continued upto February 1968 in which a total quantity of 475 MT of intermediate "Y" was produced in the plant. Thereafter a quantity of the Tonnes was produced on our own even with the defective crusher.

After these trials the continued production was again deferred since the performance of one of the major items of the plant was not satisfactory and the plant supplier agreed to replace it at his

cost. This replacement item received at site from abroad and was erected by April 1969 and the plant was run for a period of 29 days as a guarantee run during which period a quantity of 369 MT was produced.

The delay between various stages of commissioning was also partly caused, due to the contractor not agreeing to depute his representatives to India unless his claims are settled to his satisfaction and he is fully absolved of the responsibility for delay in commissioning of the plant."

2.45. As regards the high manufacturing cost of 'X' in India as compared to imported one, the Assistant Director General, Ordnance Factory informed: "In the continent, they have started using urea for direct fusion. It is a simpler method of manufacture. It has been taken up in Germany during the last 4 or 5 years. In fact Americans also are using this new process." When asked whether the fact that this new method of manufacture had been developed in America was known to the Ministry, the Director General Ordnance Factory replied: "At that time, we know that America had adopted a different process which was economical and also that for the plastic industry, 'X' could be sold. Although we guessed that it was something like the urea method, they never offered us the plant or technical data." The witness further informed the Committee: "The (process material 'X') manufactured even starting from calcium carbide would have been cheaper provided raw material was available to us at rates normally prevailing in the continent. But the cost of production of explosive 'A' would be cheaper still if the new process starting from urea is adopted."

2.46. To a question the Assistant Director General, Ordnance Factory informed that indigenous production of any heavy chemical industry item was costlier than the imported one; as the basic raw material was not produced here. The Secretary, Defence Production informed in this connection that calcium carbide was not produced in the Ordnance Factories.

2.47. Pointing out that the estimated cost of manufacturing 'X' from basic raw material in the second hand plant was Rs. 20,000/- per tonne while the f.o.b. cost of one ton of imported material was Rs. 3850/- only, the Committee desired to know why this could not be foreseen at the time of purchase of the second hand plant from U.K.

2.48. The Committee also desired to know whether any study was made about the economics of production of 'X' in this plant. Further, the Committee enquired whether any steps were taken to

economise and bring down the cost of production of 'X'. The Ministry have submitted the following note, in this regard:

At the time the decision was taken to go in for the second-hand plant for explosive 'A' we had indication that the DCD to be produced from indigenous raw materials may be costlier to start with than the 'X' produced abroad by a different process and on a much larger outturn. However, the decision to go in for a plant from U.K. and for a small capacity was taken for the following reasons:—

(i) As explained during the PAC meeting on examination of the offers we received in 1960, we had no other option but to go in for the second-hand plant which was the only technically acceptable one and whose capability for production of the required quality of explosive 'A' was known to us. We could not get offer for a plant for production of explosive 'A' based on different process and starting material which were known to have been then recently established in United States and Canada. Considering the fact that this explosive was known to be difficult to manufacture and that this explosive was not being used by the continental countries for Defence, we could not accept any offer from these countries.

(ii) Government had taken a decision to put up a plant starting from indigenous raw materials rather than depending on continuous import of DCD for production of explosive 'A'. This decision for achieving self-sufficiency for a vital defence store naturally meant our going in for a small capacity plant just to meet our requirements and using only indigenous raw materials.

(iii) Investigations had indicated then that the process material 'X' being made abroad for the plastic industry may not be able to produce the final explosive 'A' of the required purity unlike the DCD produced in the U.K. plant which was known to have the required purity.

(iv) The extent of labour and supervision requirements for this plant became known to us only after the plant was assembled at the Factory.

(v) At the time this plant was purchased, it was also our intention that modification which U.K. was thinking of

at that time for improving the efficiency of the process could also be subsequently adopted in our plant leading to further reduction in the cost of production. This modification could not be put through since the U.K. authorities themselves as reported to us had faced serious problems in their new plant for explosive 'A' where the modifications did not yield the expected improved efficiency.

Production cost: Besides the technical reasons given above which would account for increased cost of production in India, two other factors have contributed to the high indigenous cost of production on operation. These are:—

(i) the indigenous cost of Rs. 20,000/- per tonne was experienced at a time when the 'X' plant was working at much lower levels of production than the capacity of the plant. We, therefore, expect that with the increased levels of production overhead expenditure would get distributed over a larger quantity of production leading to lower cost of production.

(ii) We have put up as a part of this project a self-contained estate and residential accommodation considering the remote location of the factory. Naturally this has its incidence on the cost of production of the finished store unlike Factories abroad where manufacturers do not maintain such self-contained estates nor provide for residential accommodation as has been done by us out of necessity and as a model employer.

(iii) During the process of manufacture of 'X' we get Calcium Hydroxide as a by-product. This by-product has been utilised for neutralisation of waste Acid arising in the Factory, the credit towards this has not been taken into account while arriving at the cost of production. Taking the above factors into consideration, the likely cost of 'X' assuming the raw material cost prevailing abroad and on fuller utilisation of the plant is likely to be of the order of Rs. 6900 per tonne.

Further Trials—Considering the increased cost of indigenous production, we have been making technical studies with a view to carrying out modifications in the processing techniques so as to achieve higher yield and efficiency. These are in the nature of control of PH by addition of Acid, injection of Carbondioxide in the extraction stage etc. The trials are expected to take appreciable

time, since the supply of the Carbide has been far below our requirement and as such rate of production of DCD in the plant would continue to be for some time to come at low levels when compared to the plant capacities."

2.49. As regards the plant for explosive 'B' the Committee desired to know why augmentation of production from original 25 to 75 short tonnes could not be done initially. The following explanation was given by the DGOF in this regard: "Originally we were having (one type of) rifles in the infantry, but after the Chinese war, (another type of) rifles were introduced and that is why the demand went up. Consequently, when we placed the order in March, 1962 for the first plant, we could not have anticipated this increased demand." To another question the Secretary, Defence Production, stated that the decision to use the new type of weapon was taken after October, 1962. When asked why a plant of a capacity more than 75 short tonnes was not ordered, when the total requirements after the Chinese aggression were known, the DGOF replied: "Although we wanted much higher additional capacity after introduction of (new type) rifles, the expansion was really restricted to match the capacity of 'Z' plant. Thus the decision was to step up the capacity of plant 'B' to 75 short tonnes a month with a view to fully utilising the entire capacity of the 'Z' plant — 'Z' being the major raw material for production of explosive 'B.'" The Committee enquired why, when the capacity for the process material 'Z' was 65 short tonnes/month, the capacity of 'B' plant was not matched. To this the DGOF replied: "There was no heavy demands for explosive 'B' until the introduction of (new type of) rifles in the Services. The total peace-time requirement of the pounder before this was only 8 tons/month."

2.50. The Committee referred to the Audit paragraph which stated that the ammunition for which a particular variety of explosive (the production of which was under establishment in the 'B' factory) was required was manufactured in a new factory set up for this purpose during 1963 and 1965. Asked whether the new factory was being fed with this variety from within the country instead of being imported as was done earlier, the Assistant DGOF stated in the course of evidence: "When the expansion plan was thought of, the capacity was restricted to 75 short tonnes to match with the capacity of ('Z' plant) and we knew that this expanded capacity will not meet the requirement of the plant at (the new factory). Subsequent to the establishment of the plant at the factory there was a surplus capacity because the demand for other varieties was low. Then we thought we could utilise it fully. In peace time we are trying to keep

it fully utilised. Efforts are going on this line but we are yet to succeed in a sustained way." The DGOF also stated: "According to the present level of orders we might have some surplus capacity to meet the requirements of (the new factory) after the new variety is established at 'B'. But even after the establishment of this variety at 'B', even the expansion plant at 'B' is not capable of meeting the entire requirements of all the three factories."

2.51. In a note subsequently furnished to the Committee, the Ministry have intimated about the progress made in the production of a different variety of explosive not covered by the contract and which was under establishment in the factory, as follows:

> "Though the trials were taken on hand from middle of 1966 onwards and with the advice of the plant suppliers and trials have not yielded the required variety on a sustained basis. Number of batches produced under different operating conditions were tested for their physical and chemical properties, storage stability and ballistics performance. Stray batches have of course been found marginally acceptable but it has not been possible to fix firmly the operating conditions so as to yield the required product on a regular and sustained basis. From a study of the inherent chemical properties and the results obtained with the closed vessel firings, it is the opinion of the Chief Inspector that the production of this variety would call for a small addition of another explosive. This explosive plant is being set up now at the same Factory under another project and is expected to be available for use by middle of 1974 when we look forward to more purposeful and hopeful trials for this variety of explosive 'B'. Even after we are able to establish this production variety, it will be possible to meet only a small requirement of this variety and that too in peace time, since the capacity of production of explosive B at the Factory would be mostly required for meeting the requirement of explosive B of the other three varieties and of the fourth variety in the other two Filling Factories."

2.52. Asked how much B explosive were produced, the Secretary, Defence Production, stated: "In 1971-72, we had produced 465 tonnes." As regards the average production for the years 1970-71 and 1971-72, the Assistant DGOF informed: "Out of this factory the monthly average in 70-71 and 71-72 were 29 tonnes and 42 tonnes respectively."

2.53. As regards the low production of process material 'Z', the Committee were informed during evidence by the Assistant DGOF: "The factory was planned originally in 1959. We obtained the estimated requirements from Services for different types of ammunitions. By the time this factory came into production, this particular type of ammunition had become obsolete and the new varieties are being introduced." The Committee pointed out that even in 1972-73 the production was not to the capacity installed. The Assistant DGOF stated: "There are many items for which we had planned but are not required by Services now."

2.54. Asked to state the average monthly production of process material 'Z' in 1971-72 and 1972-73. In a note, the Ministry have stated as follows:

> "The average monthly production during 1971-72 was 39 Metric Tonnes and during 1972-73 upto and including February, 1973 50 Metric Tonnes per month."

2.55. As regards the plant 'C', the Committee were informed during evidence that the indent was raised in September, 1960 and order for the plant was actually placed in September, 1962. .Asked about the delay of about two years in ordering, the Assistant DGOF deposed: "It had taken us one year to raise the indent for this plant. Thereafter, the quotation was received from the London Office. From there we found that the tenderer had not given complete details of the plant nor confirmation of meeting Indian Safety Regulation. We had extensive correspondence on three or four occasions with this party to make sure that their offer was complete and would meet our requirement of safety. After this was satisfied, we had found that the cost of this plant was more than double what we had estimated. So we had to come to the Government for additional fund and decide whether we wanted this plant or not. A committee was appointed by Government to re-examine the necessity. The Committee recommended that we must have the production capacity in the country. Then additional funds were made available and the London Office was asked to conclude the contract."

2.56. The Committee pointed out that the plant 'C' was erected in November, 1966 but production was established only in April, 1969 *viz*, after more than two years. Asked about the delay, when it was required urgently, the Assistant DGOF informed: "The erection was completed in November, 1966. As per the contracts, they were to be given a reasonable time for supplying building drawings and these became available to us six months after the contract was signed. The work being mostly of 3-storeyed nature, they took about

22 months to complete the building, which we consider not very unreasonable. Again these type of ammunition is not required now. They have now gone in for more sophisticated things." When asked how the capacity was being utilised now, the DGOF informed: "This will be required for future... The actual orders to utilise it are not forthcoming." The Committee were informed that according to the Ministry low production of 'C' explosive was due to low demands and that the main reason for this was due to delay in switch over from existing type of filling to another type of filling in...factory. Asked to state the present position of switch over in the above factory, the Ministry, in a note, stated:

> "Of the seven major items requiring this new explosive 'C' the suitability of indigenous product has been cleared after trials in the case of five items and further trials in the case of other two items are still on hand. Of the five items cleared in the case of one item the switch over is partial and would be completed after certain additional facilities are provided at...."

2.57. Referring to the process material 'B', the Committee pointed out that its production was subsequently hampered due to delay in receipt of the raw material. The Committee desired to know the reasons for the delay in the receipt of the raw material. In a note furnished to the Committee, the Ministry have stated: "Due to reduced demand for the final explosive 'C', it was not necessary to run this plant during 1970-71 to meet the Defence requirements especially since we had manufactured this material earlier and held in stock for ready conversion to explosives 'C'. We, however, made enquiries with the trade parties with a view to manufacturing and supplying of this material to civil Trade. After correspondence with the likely users of this material, demand from civil trade started coming in. Factory then raised indents on DGS&D in August, 1970 for supply of material.

The only supplier of this chemical Methanol in India is FCI Trombay. The purchase, therefore, had to be negotiated especially since the Fertiliser Corporation was not agreed to the standard terms of the inspection of DGS&D. This negotiation took about 4-5 months after which Methanol was received in the factory and the intermediate product 'H' was manufactured and supplied to civil trade. To avoid any recurrence in future of delay in meeting the trade demands, Government has since authorised manufacture to stock of 15 tons of intermediate product 'H' so that it could be issued ex-shelf to trade without waiting for receipt of Methanol from FCI."

2.58. In another note, the Ministry stated that the average monthly production of 'H' during 1971-72 was 16 M. tonnes and during 1972-73, 24 M. tonnes.

2.59. The Committee were informed that the expected production during 1972-73 of Nitric acid, Nitric acid concentration and sulphuric acid concentration plants were 2700 to 3000, 8600 to 9000 and 25000 to 27000 tonnes respectively. When enquired how even the expected production for 1972-73 was far below the capacity created, the Ministry stated: "The 3 Acid Plants have been utilised in the current year to the extent of 50 per cent, 20 per cent and 20 per cent of their respective capacities. Since approximately 75 per cent of the capacities of these Acid Plants are meant to match the capacity of the Plant for explosive 'C' has been low during the year, the corresponding utilisation of these Acid Plants have also been below the capacities created."

2.60. The Committee wanted to know whether the Defence capability did not suffer due to the production of the various plants (*viz.* A,B,C,Y,Z,H, and Acid Plants). The Ministry, in this connection, have submitted the following information:

> "It may be confirmed that there has been no handicap by low production of these explosives and the intermediate products, as sufficient stocks of these explosives were available which could have been drawn if necessary by the ammunition factories.
>
> The low production in this factory being due to corresponding low demands from the services and not due to any inherent incapacity of the plants to produce the products, the Defence capability has not suffered due to low production on these plants."

2.61. The Committee are concerned to find that even after 6 years of establishing the factory the capacity of the various plants has not been utilised fully. This is mainly due to requirements having changed consequent on change in ammunitions used. The Committee are convinced that with a little more imagination and foresight these changes could have been foreseen and the pattern of production changed to utilise the capacity fully. The following points deserve specific mention:

(i) Although the plant for production of explosive 'A' went into production in 1965, one hundred and fifty five tonnes (costing Rs. 14.4 lakhs) of a particular variety not covered by the agreement with the plant supplier was imported in

May, 1967. There was delay in establishing production of this variety.

2.62. (ii) The cost of the process material in the second-hand plant procured from U.K. is very high inasmuch as it is more than 6 times the cost of imported material. This is partly because of low production. Technical studies are being made to carry out modifications in the processing techniques so as to achieve higher yield and efficiency. The Committee desire that the cost of production should be progressively brought down.

2.63. (iii) The production of explosive 'B' during the years 1969-70, 1970-71 and 1971-72 was to the extent of only 50 per cent, 43 per cent and 62 per cent respectively. The Committee understand that the orders placed on the factory would ensure full utilisation of this capacity provided it could produce the variety of this explosive meant for a particular ammunition. According to the Ministry the production of this variety will call for a small addition of another explosive to be produced in a plant expected to be available for use by middle of 1974. The Committee desire that there should be no delay in establishing the required variety of explosive 'B' after 1974.

2.64. (iv) The production of explosive 'C' during the period 1969 to 1972 was far below even the peace time requirement. The low production has been due to low demands and the main reason for this is the delay in switching over from the existing filling to the explosive 'C' filling in a factory. It is, therefore, necessary to ensure that there is no delay in this change-over. Further, the connected process material plant is also grossly underutilised. As there is stated to be demand from civil trade for this material, the Committee desire that the process material plant should be fully utilised to meet the requirements of the factory as well as the civil trade.

2.65. (v) The underutilisation of Acid Plants is attributed to the low rate of production of explosive 'C' for which approximately 75 per cent of the capacities of these plants are not. It is, therefore, all the more necessary to take steps to step up production of explosive 'C'.

2.66. The uneconomic working of the explosive factory can be seen from the fact that during the year 1970-71 the total cost of production was only Rs. 2.22 crores as against the capital investment of Rs. 15 crores (upto March, 1970). During the two years, 1969-70 and 1970-71, the overheads alone accounted for about 74 per cent of the cost of production. This points to the need to fully utilise the

capacity of the various plants. The Committee, therefore, desire that there should be a comprehensive examination of the position at the Government level in order to initiate timely action to achieve self-sufficiency in respect of the present requirements of explosives and to reduce the cost of production.

Imported steel bars

Audit paragraph

2.67. Since indigenous production of the kind of steel bars required was not adequate, the Director General, Supplies and Disposals (on receipt of an indent from the Director General, Ordnance Factories, in May 1967) concluded a contract in January 1968 with a foreign undertaking for supply of 3,000 tonnes of steel bars of a specified quality required for manufacture of ammunition shells in an ordnance factory. The contract mentioned a specification and added that the bars should have chemical composition and physical properties prescribed therein. One of the physical properties mentioned was yield per sq. inch. According to the contract, the bars were to be inspected at the supplier's premises by the Director General, India Supply Mission, London and again visually at the port of entry in India by the Chief Inspector of Metals.

2.68. 1,600 tonnes of the bars on inspection by the Director General, India Supply Mission, London, were rejected (June 1968) as the yield point was found to be lower than that specified. During discussions with the representatives of the supplier, it appeared that there was a misunderstanding about the manner in which the yield point was to be determined. In consultation with the supplier, the manner was prescribed by the Chief Inspector of Metals in June, 1968.

2.69. The bars, after inspection, were received in the factory during October, 1968 to January, 1969. A number of bars were forged into shells at that factory and these shells failed to meet the proof stress value specified. Some of the bars were also tested and in almost all cases the results were unsatisfactory. Sample bars were sent to another ordnance factory and there, too, the results were unsatisfactory. Only 606 tonnes were accepted by the factory and the balance valued at Rs. 49.63 lakhs were rejected as unsuitable. The matter was reported to the supplying foreign undertaking which sent its representative to visit the ordnance factory and collect samples for testing at its factory in the foreign country. A meeting was held in April 1969 in the ordnance factory with the representative of the foreign undertaking and it was re-

corded at that meeting that the tests carried out in the factory in the foreign country on the above samples gave results generally conforming to those reported by the Chief Inspector of Metals. On being approached for free replacement of the rejected material, the undertaking declined to do so, pointing out that before shipping the material had been tested, inspected and accepted by the consignee's representatives. The supplier was, however, prepared to supply an equivalent quantity at the old price, if required. On the considerations that the steel already imported was of good quality and there should be no difficulty in utilising the steel within the country and that in the international market the price of steel had gone up considerably, it was decided (March, 1970) to accept the material. An attempt was thereafter made to persuade two public sector undertakings in India to take over the rejected material and dispose it of in the market without loss to Government. The public sector undertakings not evincing interest in doing so, the rejected materials have been declared to the Director General, Supplies and Disposals, as surplus for arranging disposal in the normal manner (February 1972).

2.70. The Director General, India Supply Mission, London, had stated (March 1969) that the bars had been tested in the manner prescribed by the Chief Inspector of Metals in June 1968. The Ministry of Defence, however, stated in February 1972 that the procedure laid down for test was not followed strictly at the time of inspection at the undertaking's works in that while normalising the test pieces, a blast of cool air was used as against the normal practice of allowing the test pieces to cool freely in still air.

2.71. Subsequently, through another contract concluded in August 1970 with the same foreign supplies steel bars of the appropriate quality have been procured. The specifications, physical properties, etc. prescribed in that contract were the same as those in the contract of January 1968.

[Paragraph 6 of the Report of the Comptroller and Auditor General of India for the year 1970-71, Union Government (Defence Services)].

2.72. The Committee wanted to know whether any investigation was made into the matter and any lapse found on the part of the Inspectors who inspected the material. The representative of the DGS&D stated: "...we made enquiries and we were told that the inspection carried out by DG, ISM, London was in exact terms as specified by the Chief Inspector of Metals, Ishapore. The difference that arose, according to what DGISM, London stated could

be on account of different testing methods diployed in India for testing the yield point." The witness further stated: "Two specific statements have been made by ISM, London. One is that the room temperature in Czechoslovakia at the time the test pieces were prepared was below zero degree, whereas the normalising was done with a cold blast of air. This changed the structure of the steel to some extent in physical properties. While this normalising was done in India, the cooling was done at 20 degrees. That was the change in the method of testing.

2.73. The second change was that the 3 per cent proof stress results were obtained by different methods than that specified by the Chief Inspector of Metals. The yield was obtained by Fall of Micrometer method and not scribed line method."

2.74. When asked why two different standards were prescribed and why the standard method was not supplied to DG, ISM, London, the Secretary, Department of Defence Production replied: "This is a standard test all over the world and all recognised and reliable producers know the testing method." The Chief Inspector of Metals also stated: "We have to take the test piece out of a bar and it has to be forged and machined to 20 mm dia. It has to be heated to 900° C and cooled in air. The process of cooling in air is called normalising. This normalising is a common metallurgical term known to all metallurgists all over the world. It appears in Czechoslovakia the test piece was cooled in a cold blast of air supply. That will produce a quicker cooling of the material and it will impart higher physical properties to the test piece. By this method, the test piece did give the minimum yield strength when tested there. When the material arrived here, it was again tested according to our normal practice and it was found that it was slightly lower in yield strength. This matter was taken up with the supplier. They sent their experts. Their Chief Metallurgist Works Manager of the Poldi Steel Plant along with their trade representative in India, came. In their presence in our Ordnance Factory, Kanpur, we showed them our method of testing and how the yield stress is determined. They were in complete agreement with our method of testing. It would appear that the difference in the results that we obtained was due to the fact that normalising of the test piece was done in a blast of very cold air which should not have been done. If it had been done, as we did here, the results would have been the same. There was no misunderstanding nor was there any information required that was not given. Normalising is common metallurgical term which everybody knows."

2.75. The witness continued: "The Inspector who tested the samples witnessed the test. The test was carried out in the factory itself. He witnessed the test and recorded the test results. In so far as the method of normalising is concerned, he took it for granted that this had been normalised according to normal practice."

2.76. When the Committee desired to know whether the Inspector had actually witnessed the test, the Chief Inspector of Metals had the following to say: "We have enquired about this and tried to find out whether he was physically present during the normalisation process, but we have not been able to find out the fact because the man had already left the service in DG, ISM and he settled down in England. He has not come back so far."

2.77. The Committee were further informed that the Inspector was called back in May, 1972 and that he resigned in June, 1972. To a question whether any statement was obtained from him regarding the tests carried out, as the matter came to light in 1969 itself, the representative from the DGS&D stated: "No formal explanation was called for. But we did call for his report...he reported that he had carried out tests as per the test procedure laid down by the Chief Inspector, Ishapore." The witness further stated that the reply was received from the Inspector on 26th March, 1969 and that "he was only trying to say that the inspection carried out in India was of some different method than the prescribed procedure laid down by the Chief Inspector of Metals." On this point, the Chief Inspector of Metals intervened to say: "Mr.... (The DGS&D representative) has gone back to the argument that according to the Inspector the method of testing done in India is different from the one in other countries, which is not true."

2.78. Explaining the circumstances in which the letter was received from the Inspector, the representative from the DGS&D stated that he wrote that letter "because we had asked for the comments of the DG, London. When we got the rejection report, we wrote to DG, London saying that the material had been rejected and he should find out as to what had gone wrong."

2.79. When asked to state what action was taken by the DGS&D after the receipt of the letter, the witness replied that they pursued this matter further only after the receipt of the Audit para and added: "Actually the question of taking any further action on that letter would have arisen only if there was a contradiction from the Chief Inspector, that the Inspector had not carried out the inspec-

tion in accordance with the procedure. There is no question of mention of a different procedure being adopted. On the contrary, the Czechs sent us a letter."

2.80. In this connection the Secretary, Department of Defence Production had the following to say:

"Mr... (the Czech representative) explained that initially their method of testing was as per Czech standard specification, *i.e.* 5 per cent permanent set proof stress and it was only when the tests failed and further clarification was obtained from India that the second set of tests were taken. On enquiry it was clarified that at Praha, the forged and machined test bars are normalised by cooling the test bars standing vertically in a draft of cold air at a temperature of O° C. which was the room temperature for December-January."

2.81. The DGS&D representative intervened: "This is only a comment on the method of normalising adopted by the Czechs; it does not say that the procedure adopted by the London office is faulty in any way. Normalisation has not been defined as such in the specifications as to how the test piece will be normalised."

2.82. As regards the standard normalisation procedure, the Secretary, Department of Defence Production submitted: "We have verified with every text book on steel production which describes the method of normalisation. Even in communist countries this has been described as cooling still air." In this connection, the Chief Inspector of Metals stated: "Definition of normalisation is cooling in still air from approx. 900° C. If somebody had followed a different method, it is not in accordance with accepted procedure." The Secretary, Defence Production also stated: "We have got confirmation from Mr....on 22nd May, written from Czechoslovakia. It reads like this: 'This is to confirm that the test method carried out by your Works at Kanpur and witnessed by Mr... is accepted to us. We request you to please carry out the tests as agreed and let us have your test reports at the earliest, to enable us to replace the material found defective by you. The expenses being incurred by you in testing of the Shell Bars will be borne by us as agreed."

2.83. The Committee pointed out that the Audit paragraph was brought to the notice of the Ministry much before the Inspector's resignation and enquired why no explanation was called for before relieving him. The representative from the DGS&D admitted that it could have been done.

2.84. The Committee desired to know the procedure now adopted in such matters after this experience. The Secretary, Defence Production replied: "Normally purchases are made through the DGS&D. Recently we have also introduced a system of sending our own Inspectors."

2.85. The Committee enquired whether the rejected steel bars had been disposed of and whether there was any loss incurred by Government as a result. The Secretary, Defence Production informed: "We have not disposed it off yet. We are trying to find alternative uses for the steel and one such effort was to sell the steel to indigenous customers who are otherwise importing this variety of steel. We checked and found that this variety is not allowed to be imported." The witness, answering a further question, stated that the steel was acquired in 1968-69 and stated: "In fact, DGS&D has written to say twice that this is the price offered but we did not consider it attractive. Then we thought of rerolling it and that was also not found economical. Finally, we found that we can use it in our bomb body and within two months we will know whether this will be utilised for bomb body. If that can be, then the entire quantity will be used."

2.86. The Committee were informed that subsequently through another contract concluded with the same foreign supplier, 700 tonnes of steel bars of the required quality had been procured. The Committee pointed out that out of the total quantity of steel bars imported, the supplier had agreed to replace the rejected material at the old rate. The Committee desired to know why then order for 700 tonnes only was placed for supply at the old rate. The Secretary, Defence Production stated: "When this 2968 tonnes was ordered, a deliberate decision was taken to build up a stockpile and at that time indigenous sources were not in a position to supply that quality of steel. But when the party agreed to replace it, at that time Bhilai agreed to manufacture this quality of steel and that was why we ordered for only 700 tonnes. Moreover, they did not agree to replace it free of cost. They said that you could buy another 2900 tonnes." To another query, the witness stated: "The Defence Ministry approached the Steel Ministry and the Steel Ministry said that our requirement would be met to some extent. 700 tonnes was imported because the foreign supplier gave us one concession saying that although the price of steel had gone up, they would supply 700 tonnes at the same price at which the earlier quantity was given."

2.87. To another question as to why when Government ordered earlier for 2968 tonnes, their requirement came down suddenly to

700 tonnes, the witness replied: "In the meanwhile Bhilai started making this steel available to us. For example, in 1970-71, Bhilai gave us 2222 tonnes, in 1969-70, they have given 1391 tonnes and then in 1971-72, they gave 2874 tonnes and in 1972-73 we took only 248 tonnes."

2.88. Regarding the quality of 700 tonnes of steel, the Committee were informed in the course of evidence that it was of good quality and that the firm had given some 1200 tonnes out of which DG, ISM, London had accepted 700 tonnes. Asked whether, when Government originally placed the order, the capability of Indian Steel Plants producing that kind of steel was taken into account, the Secretary, Defence Production stated: "In items of ammunition, we have to have certain stockpile. In a production process, if you suddenly run short of something, you may have to stop production. A certain stockpile is, therefore, allowed to be kept. The decision to import 2900 was a deliberate decision to build up a stockpile. when Bhilai was not able to supply. A certain amount of precaution and safety margin has to be provided where production of ammunition is concerned."

2.89. The Committee desired to know whether the production of ammunition shells suffered due to steel not being available. The Ministry, in a note, have stated:

> "As the supply of steel, required for the ammunition shells, from the indigenous sources showed some improvement during the year 1968-69, 1969-70 and 1971-72 the target for production of the ammunition shells could be achieved during each of these 3 years. However, the rate of supply of steel from the indigenous sources in the beginning of the year 1970-71 had suffered a setback and showed improvement only towards the end of the year. The fresh 700 MT of imported steel from the Czechoslovakia firm was also received in India in September/ October, 1970, *i.e.* after half the year was over. Consequently the production of the ammunition shells fell short by about 25 per cent of the target in 1970-71."

2.90. The Committee are unhappy to learn that 2,400 tonnes of steel bars of a specified quality required for manufacture of ammunition shells in an ordnance factory imported during October, 1968 to January, 1969 were found to be unsuitable for the purpose for which they were procured. Out of the total quantity of 3,000 tonnes only 606 tonnes of the steel bars could be accepted and the balance valued at Rs. 49.63 lakhs were rejected as unsuitable.

From the information made available to the Committee it is clear that the defects in the steel bars crept in at the time of the normalising process. Normalisation of steel bars in the factory, which ought to have been done in still air as per the standard procedure was, according to the Chief Inspector of Metals, Ishapore, done in a blast of very cold air, which affected the physical properties of the metal. It is unfortunate that the Inspector of DG, ISM, London who carried out the inspection at the factory failed to verify the method of normalisation adopted as he took it for granted that the normalisation had been done as per the normal practice. This is a serious lapse which the Committee feel, ought to have been investigated fully for fixing responsibility in 1969 when the defects first came to light. The Committee were informed that the particular inspector was allowed to resign in June, 1972. The reasons why no action was taken against the inspector before he was allowed to resign may be gone into critically and responsibility fixed for the lapse on the part of the concerned officials. The Committee desire that legal opinion should be obtained on the point whether the supplier could have been compelled to replace the defective supplies at their own cost under the guarantee clause.

2.91. The Committee note that the Defence Ministry have now taken a decision to appoint their own inspectors. The Committee desire that the inspection procedure should always be spelt out in very clear and unambiguous terms so that there is no scope for any possible differences in interpretation.

2.92. The Committee note that so far it has not been found possible to utilise the rejected steel bars worth more than Rs. 49 lakhs. The Committee desire that all necessary steps may be taken urgently to ensure that the entire quantity of the unused stock of steel bars is put to economic use.

Construction of residential accommodation for personnel of a new factory:

Audit Paragraph ..

2.93. In connection with the establishment of a new ordnance factory expected to be completed by December, 1966, sanctions for construction of 2677 (out of 3321 envisaged) residential quarters through the agency of a State Public Works Department were issued between December, 1963 and August, 1965. (1996 quartrs were covered by a sanction issued in April, 1965). However, sanction for construction of the main project was issued only in November, 1965 after completion of an engineering study, and procurement of

plant and machinery was sanctioned only during August, 1965 to October, 1966. Nevertheless, the tempo of construction of the residential quarters was not slowed down on the consideration that the State Public Works Department had, meanwhile set-up a special organisation to execute the civil works speedily. As a result, out of 2677 quarters constructed between April, 1965 and July, 1970, 996 are lying vacant (October, 1971). Six hundred and forty-nine of these vacant quarters were taken over by the factory by June, 1969 and the remaining 347 during July, 1969 to November, 1970. The cost of construction of the 996 vacant quarters is Rs. 89.06 lakhs

2.94. Bulk of the plant and machinery for the factory is still in the procurement/setting up stage. The Ministry stated (January, 1972) that slowing down the pace of construction of the residential accommodation would have entitled serious financial repercussions and that it was hoped that all the quarters would be occupied in about 2 years' time when full capacity production might materialise.

[Paragraph 5 of Report of the C&AG of India for the year 1970-71, Union Government (Defence Services)].

2.95. The Committee desired to know the present stage of completion of the technical buildings and erection of machines. The Ministry, in a note, have stated:

2.96. Technical buildings connected with project have all been completed except for the Cartridge Case Shop which is nearing completion and the buildings for the Extrusion Project which are expected to be completed by end of October, 1972. All the machines required for Phase IA have been received and more than 90 per cent commissioned. Few machines for Phase IB have been received and erected.

2.97. Asked how many contracts for the construction of quarters, sanctioned in 1965, had been executed by November, 1965, the Ministry have replied that contracts for construction of 1996 quarters had been executed by November, 1965.

2.98. The Committee enquired why, to the extent contracts had not been executed by them, their construction could not be postponed. To this, the following information has been submitted by the Ministry:

2.99. As construction work in respect of the 1996 quarters had already been taken on hand and completed upto more than 20 per cent by November, 1965, there was no question of either cancelling

the contract or deferring execution of the work. This would have resulted in financial complications.

2.100. The Ministry have also stated that 661 quarters are lying vacant as on 23rd June, 1972.

2.101. Owing to the delay in establishing the new ordnance factory, as many as 996 quarters constructed between April 1965 and July 1970 at a cost of Rs. 89.06 lakhs remained vacant upto October 1971. The position as on 23rd June 1972 was that 661 quarters were lying vacant. The Committee desire that the delay in establishing the factory and the failure to properly coordinate all the works should be examined and the results reported to them. They would also await a report regarding the utilisation of the quarters lying vacant.

Annealing furnaces

Audit Paragraph

2.102. In March, 1964 the Director General, Ordnance Factories, placed on the Director General, Supplies and Disposals, an indent for supply of 3 double-chamber annealing furnaces required by an ordnance factory. Against an advertised tender enquiry floated by the latter tenders were received only from two firms 'A' and 'B'. Duplicate copies of the tenders received were forwarded by the Director General, Supplies and Disposals, to the indentor for his comments. As the tenders lacked technical details, the indentor suggested that the furnaces might be procured from abroad. The Director General, Supplies and Disposals, thereupon informed the indentor that the Department of Technical Development had stated that it would not give clearance from the indigenous angle and in view of the fact that firm 'A' was working in collaboration with West German firms that firm should be in a position to do the job as per requirements. Thereupon, the indentor agreed to placement of order on firm 'A' subejct to supply of one charging machine along with the furnace. The Director General, Supplies and Disposals, accordingly concluded a contract with firm 'A' in July, 1965 for the main equipment (furnaces) at a cost of Rs. 6.03 lakhs. (Another contract was concluded in April, 1966 for the charging machines and some connected spares at a cost of Rs. 1.99 lakhs). The tender enquiry had stated *inter alia* that the furnaces were to be suitable for annealing 2 tons of 70|30 brass strips and gliding metal of a specified thickness every two hours per chamber. The acceptance of tender, however, did not specify the load (i.e., 2 tons of the metals per

chamber) of the furnace. It mentioned the chamber dimensions, connected electrical load, etc. About temperature, it specified the maximum working temperature. As per the terms of the contract, 80 per cent payment was to be made after initial inspection and proof of despatch and the balance 20 per cent after receipt at consignee's end in good condition, final inspection and erection and test at site.

2.103. The consignee factory received the furnaces, charging machines and spares between July, 1966 and July, 1969 and payment of Rs. 5.992 lakhs was made to the firm. Due to some technical defects, the furnaces on receipt were not accepted by the factory. The firm carried out some modifications to one of the furnaces but during trials it was found that its performance was far from satisfactory The ordnance factory pointed out to the firm in July, 1970 that (i) there was excessive difference of temperature between different points in the furnace and this was likely to affect proper annealing of the brass strips for which purpose the furnace had been procured and (ii) it was not possible to obtain uniform annealing of more than one ton of brass strips per chamber, which meant that the capacity of the furnace supplied by the firm was only half of what was required. The firm stated in reply in september, 1970 that in a furnace of the size temperature variation to the extent found was normal, the acceptance of tender did not specify the load each chamber was required to take and the furnace supplied by it conformed to the technical data and specifications given in the acceptance of tender.

2.104. The modified furnace was still under trials by the supplier and the other two furnaces were yet to be tried (November, 1971). The issue of rectification of the defects etc., has been "engaging the attention of the Director General, Supplies and Disposals, and the matter is being considered in consultation with the Ministry of Law".

[Paragraph 7 of Report of the Comptroller and Auditor General of India for the year 1970-71, Union Government (Defence Services)].

2.105. The Committee pointed out that the tender received by the DGS&D in July 1965 for the main equipment (furnaces) did not specify the load of the furnace and enquired how this was omitted. The Committee also enquired why no mention was made about the permissible maximum temperature variation in the specifications. The Ministry, in a note, have reproduced the comments of the DGS&D as follows:

1. "It is not possible to state as to why the firm failed to indicate the capacity of the furnace in the orginal tender. It may, however,

be mentioned that in reply to a reference from DGS&D, they indicated the capacity to be 3 tons, which was reflected in the contract."

2.106. The relevant extract of the A|T is as follows:—

Extract from A|T No. Project|22182-R|VIII|1426|PAOB dated 9-7-65.

Page No. 8

* * * *

2.107. The following points have also been clarified by you:

* * * *

Load bearing capacity of hearth bricks:

"As regards the load carrying capacity of the hearth bricks, the bricks will be of sufficient strength to carry out a safe load of 3 tons and also to resist any abrasion. However, this is subject to proper loading and unloading of the furnace. It is further presumed that as far as possible the charge load will be distributed on the full area of the hearth.

Also, the steel structure will be adequately designed to carry the load of fully charged furnace."

2. The maximum working temperature and the permissible maximum variation has been duly indicated on pages 5 and 9 of the A/T."

2.108. Maximum working temperature has been stipulated in the A|T as 750° C under the technical data specifications given on page 5 of the A|T. Similarly it has been stipulated on page 9 of the A|T that the fineness of the temperature control instruments must be +30.

2.109. Asked who was responsible for the erection of the furnaces, the Ministry have stated that as per terms of the Acceptance of Tender, the erection of the furnaces was to be done by the consignee factory on the basis of erection drawings furnished by the supplier firm.

2.110. Drawing attention to the fact that the furnaces on receipt were not accepted by the factory due to some technical defects, the Committee asked why these defects were not noticed at time of

initial inspection by the Director of Inspection, Bombay at the firm's premises. In reply, the Ministry have reproduced the comments of the DGS&D:

"As per terms of the A|T, the Director of Inspection, Bombay was to carry out the initial inspection at maker's works for 80 per cent payment. The balance of 20 per cent payment was to be released only on the basis of final inspection notes noted to be issued after erection and test. Inspection in two stages was provided deliberately in the case of plant and machinery as they cannot be fully inspected in one stage only.

In this case, the defects were such as could not be detected at the firm's premises, where the initial inspection was carried out. The furnaces had to be offered for initial inspection in unassembled condition. The stores were *'prima facie'* found acceptable and were permitted to be despatched to consignee.

The defects came to notice only at site after the furnaces were erected and commissioned. Final test is yet to be carried out and final inspection note has not been released so far. As stated in reply to Question No. 50, the matter is under reference to the firm."

E. III. Comments of the Department of Defence production are as follows:

The defects noticed included the following:—

(i) Most of the equipments supplied were not even constructed as per their own drawings. The mating parts did not even match with each other and there were defects in the structural parts fabricated.

(ii) The bricks supplied were not of proper shape.

(iii) The electrical links were weak and defective.

(iv) The circulating fans were not properly balanced.

(v) The structure was weak and required reinforcement.

It was obvious that the equipment was not assembled in the firm's works and defects removed prior to despatch.

2.112. The Committee pointed out that the firm, in September, 1970, raised some points in reply to the complaints made to them by the Ordnance Factory and desired to know the reply of the Defence Department to these points raised by the firm. The Ministry have submitted the following information in this regard:

"The main points raised by the firm in their letter of 7-9-1970 addressed to the General Manager, Ordnance Factory, Ambarnath and the views of the Defence in respect of these points are indicat-

ed in the enclosed statement at Annexure-I. These views were communicated to the DGS&D by the Factory under Fy's letter No. 2003|E0, dated 9-12-1970 (copy enclosed at Annexure-II).

2.113. Asked whether the furnaces have been commissioned after rectification of defects, the Ministry replied in the negative and added that one of the three furnaces was modified by the supplier and commissioned but the result was not satisfactory.

2.114. The Committee pointed out that according to the audit paragraph, the matter was being considered in consultation with the Ministry of Law and desired to know the final decision taken in the matter. In this connection, the following comments of the DGS&D have been reproduced by the Ministry:

"DGS&D will be referring the case to Ministry of Law to examine the legal position and thereafter a final decision will be taken."

2.115. The Committee drew attention to the fact that the furnaces were indented for in March 1964 but could not be commissioned till November 1971 and enquired whether this delay did not affect the production programme of the factory.

"The Furnaces ordered on this firm were meant for augmentation of the annealing capacity for annealing Brass Strips for production of Small Arms Cups for meeting the anticipated increased requirements of Ordnance Factory, Varangaon at peak capacity of production of that Factory. Since Ordnance Factory Varangaon has not yet reached its peak capacity, it has been possible for O.F. Ambarnath to meet the requirements of O.F. Varangaon for Brass Cups with the already existing annealing capacity The non-commissioning of these furnaces has not, therefore, adversely affected the production programme of the factory."

2.116. The Committee regret that three double-chamber annealing furnaces were found defective on receipt. Payment of Rs. 5.92 lakhs representing 80 per cent of the cost was made after initial inspection. The Committee do not think that the inspection was adequate in so far as the equipments were not assembled in the firms works and defects removed prior to despatch. This aspect should therefore be gone into.

2.117. As regards the question of rectification of the defects the Committee have been informed that the DGS&D will be referring the case to the Ministry of Law to examine the legal position. The delay of over 2 years in donig so is obviously unjustified. The

Committee desire that a final decision in this regard should be taken without any further delay.

Procurement of Defective Lathes

Audit Paragraph

2.118. Against an indent placed by the Director General, Ordnance Factories, in April, 1966, the Director General, Supplies and Disposals, concluded a contract with a firm in November, 1966 for supply of 11 lathes at a cost of Rs. 1.75 lakhs plus taxes. The tenders received for supply of the lathes had been referred to the indentor who agreed to placement of the contract with this firm. Later, certain modifications|changes were suggested by the supplier for three of the lathes which were also agreed to by the indentor and those three lathes were accepted in February-March, 1967 after inspection by the inspectors of the Directorate-General, Supplies and Disposals. The remaining eight lathes were accepted in February, 1968 and May, 1968 after similar inspection. These were received in an Ordnance Factory by September, 1968. The performance of all the eleven lathes was, however, not found satisfactory and in April, 1970 (by which time the warranty period of 12 months for these lathes had already expired) the factory asked the firm to send its service engineers to set right the machines. As this was not complied with by the firm and the machines were also not taking any load at all, the Director General, Ordnance Factories, asked the Director-General, Supplies and Disposals, in September, 1970 to reject the machines and recover the amount already paid to the firm. But this has not been possible as the firm had since gone into liquidation.

2.119. The Ministry of Supply stated (November, 1971) that supply of the lathes had been completed in May, 1968 after inspection and that the warranty period has already expired when the user asked the supplier to rectify the defects.

2.120. The Ministry of Defence stated (January, 1972) that the correct specifications were sent to the Director-General, Supplies and Disposals, and added that "if the machine had been inspected properly an specially, of the dimensions of the components and finish were checked properly, after carrying out the respective operations, the machine could have been rejected at inspection itself".

[Paragraph 9 of Report of the Comptroller & Auditor-General of India for the year 1970-71, Union Government (Defence Services)].

2.121. The Committee enquired whether the financial status and technical competence of the firm was ascertained by the DGS&D

before placing order on them. The Ministry in reply have reproduced the following comments from the DGS&D:

"The firm was granted registration in the name of Messrs..... ....., as proprietors of Messrs..... by DGS&D on 17-5-1967 for 3 years with a monetary limit of Rs. 1 lakh per individual order.

2.122. According to Para 21 of the Manual of Office Procedure for DGS&D (1968 edition), which deals with the processing of applications for registration, on receipt of application from the firm, a report was obtained from the bankers concerned regarding the financial standing of the firm and the same was found satisfactory and the firm was granted registration. In addition, an inspection report about the technical competency of the firm was also called for, which was found to be satisfactory. R|C was awarded to the firm as they were registered with DGS&D.

2.123. The name of the firm was removed from the list of registered contractors on 27-3-1971 as they failed to submit their application for renewal of registration after the specified period."

2.124. Asked why the defects could not be detected at the time of initial inspection by the Inspectors of the DGS&D, the Ministry have submitted the following information:

The comments obtained for the DGS&D are reproduced below:—

" So far as DGS&D is concerned, the tests for the alignment accuracy were carried out as far as applicable to the machines required against items Nos. 1(i) to 1(vi) of the A|T and they were found satisfactory. At the time of inspection it was also found that the running of the machine was free from vibrations and undue heating of the bearings. Performance of the machines was actually checked by machining the specified jobs to the dimentions, tolerances and cycle times mentioned in the drawings mentioned against items 1(i) to 1(vi) of the A|T and the same was found to be satisfactory. The machine required against item 1 of the A|T being a conventional type of sliding, surfacing and screw cutting lathe was subjected to the usual machining and alignment tests with satisfactory results."

2.125. *Comments of the Department of Defence Production.*

The main defects in the lathes were:—

(i) Clutch defective is that it does not take the load;

(ii) Excess play in the slides resulting in very rought finish and deep tool marks.

(iii) Machines too light to take heavy cuts required for the operations specified resulting in vibrations.

(iv) Chucking arrangements defective in that the jobs cannot be held firmly and slip during turnings.

(v) In one case there was not even proper lubrication arrangements for the main spindle.

(vi) In one case the facing slide was only a make shift arrangement which had to be modified to a hand operated slide.

2.126. These defects were obviously attributable to defective workmanship/design and could not have developed in transit and storage and if proper inspection were carried out by actual trial, by using the component blanks sent to the firm for this purpose by the DGS&D's Inspector before despatch, these defects would have come to light and the machines would have been rejected then and there.

2.127. The Committee enquired why the factory did not report the defects in time. The following note has been submitted by the Ministry in this connection:

Trying out of the machines by the factory was possible only after the erection was completed which could be done only by March, 1970. In view of the clear inspection procedure stipulated in the A/T the factory expected that the machines must have been tried out on actual performance before acceptance by the DGS&D. Inspector, and, therefore, could not envisage the defects of the type that were ultimately revealed. Otherwise the factory would have arranged at least temporary erection to try out the lathes earlier.

2.128. The Committee pointed out that according to the Ministry of Defence, the correct specifications were sent to the DGS&D and that had the machine been inspected properly, the machine could have been rejected at inspection itself. Asked what the Department of Supply had to say about this, the Ministry have stated:

Comments of the DGS&D are reproduced below:

"So far as DGS&D is concerned, the tests for the alignment accuracy were carried out as far as applicable to the machine required against item Nos. 1(i) to 1(vi) of the A/T and they were

found satisfactory. At the time of inspection, it was also found that the running of the machine was free from vibrations and undue heating of the bearings. Performance of the machines was actually checked by machining the specified jobs to the dimensions, tolerances and cycle times mentioned in the drawings mentioned against items 1(i) to 1(vi) of the A/T and the same was found to be satisfactory. The machine required against item 1 of the A/T being a conventional type of sliding, surfacing and screw cutting lathe was subjected to the usual machining and alignment tests with satisfactory results.

The machine were received by the consignee factory in September, 1968 and that they were covered by a warranty for a period of 12 months. The first report regarding defective supply is stated to have been sent to DGS&D in July, 1970, although this letter is not available in the records of this office. However, the first letter available in the Inspection records of DGS&D is dated 8-9-1970 from the DGOF, Calcutta. This was approximately 2 years after the receipt of the stores by the consignee, when the warranty period had also expired. Had the report about the defective functioning of the machine been made within the period of warranty, action could have been taken to have the stores inspected jointly and set right the defects, if there were any? However, with the considerable lapse of time, it could not be possible for the DGS&D to review or to probe into the matter, particularly, as the warranty period expired long back."

2.129. *Comments of the Department of Defence Productions.*

The defects noticed in the machines are attributable to defective workmanship/design and it is held that these defects would have come to light if the machines had been properly inspected as per terms of the A/T.

2.130. To a question the Ministry intimated that the lathes were still lying unused. Asked whether the production did not suffer due to this, the Ministry have furnished the following note:

"These machines were meant for production of empties for an important item of ammunition. These requirements were met by using alternative machines and to this extent production of the store for which these machines were demanded was not allowed to suffer on this account.

2.131. The Committee find that 11 lathes procured at a cost of Rs. 1.75 lakhs were found defective on erection. Although the

DGS&D is of the view that the inspection was done properly, the Defence Department have considered that all the defects are attributable to defective workmanship/design. The lathes could have been rejected if proper inspection had been carried out by actual trial by the DGS&D's inspector before despatch. The Committee desire that the matter should be investigated with a view to fixing responsibility.

2.132. It is unfortunate that the lathes were not erected within the warranty period of 12 months. The Committee are inclined to take a serious view of the delay which shows lack of planning. Apart from taking suitable action in this regard, strict instructions should be issued to all concerned to avoid delay in erection of machines so as to safeguard the financial interests of Government.

ERA SEZHIYAN,
Chairman,
Public Accounts Committee.

NEW DELHI;
April 25, 1973.
Vaisakha 5, 1895 (*S*).

APPENDIX I

(*Ref.*: Para 2.23 of the Report)

Chronological history of the procurement of second-hand Picrite Plan from U.K.

In February, 1949 Ministry of Defence directed the DGOF to consider and put up proposals for achieving indigenously within a short period a reasonable degree of self-sufficiency in the matter of production of explosives required by the services.

2. In April, 1950, the DGOF submitted a preliminary statement of case as directed by the Government.

3. Sardar Gajendra Singh, the then Works Manager at Cordite Factory, Aruvankadu was deputed to U.K. in April, 1950 where he visited the plant for production of Picrite at Holten Heath. He had visited the plant while it was in operation and the report covered the process, details of operation, raw materials used with their specifications, consumption of raw materials per tonne of product, yields, efficiency obtained at each stage, dimensions of equipments and number of buildings involved. Subsequently, we also received from U.K. their method book for manufacture of Picrite as at Holten Heath. The U.K. authorities also gave us the clarifications required by us in September, 1951. We had also obtained from the U.K. High Commissioner written confirmation from U.K. Admiral Authorities regarding the satisfactory performance of the Picrite manufactured at their Holten Heath Plant.

4. A second statement of case was submitted to the Government by DGOF by the end of 1951 based on the preliminary offers received by him. The project was accepted in principle by the Defence Committee of the Cabinet in July, 1952 and the Cabinet directed that detail planning may be taken on hand by selection of suitable site and consideration of suitable consultants.

5. Mr. C. C. M. Broughton, Chief Superintendent of Explosives Project at Poona visited the Holten Heath Plant in October, 1952. He had also given details about this Picrite Plant along with its capacity. He had also mentioned that the Plant as described by Sardar

Gajendra Singh in his deputation note of 1950 had since then been modified.

6. During 1953-54 project reports were received from two selected consultants *viz.* M/s. Montecatini of Italy and M/s. P.R.B. of Belgium, after the experts from these two firms had visited this country.

7. Before taking a final decision on these reports Government of India deputed in November/December, 1954 Dr. G. S. Kashbaker, Superintendent, Explosives Project to Europe to make a personal appraisal of the various explosive/chemical plants offered. He had visited the Holten Heath Picrite Plant which was then on very low levels of production. He had also mentioned that the U.K. authorities were putting up a similar plant at Caerwent but that the layout at the latter Factory was more upto date and superior. He had mentioned that the process appeared to be simple and hence design of that type should be suitable for our explosives project and should be adopted in preference to any of the continental design as it was known then that the product of that plant is of a quality required by us.

8. So based on the data collected as referred to above, it was our technical assessment that a plant design and process as at Holten Heath would be the best to meet our requirements.

9. Based on Dr. Kasbaker's report and an indication of cost furnished by the engineers, a third statement of case for the project was submitted by the DGOF to the Ministry of Defence by middle of 1955.

10. Thereafter Government appointed a Technical Advisory Committee under the Chairmanship of Dr. J. C. Ghosh, Member Planning Commission and assisted by representatives of Ministry of Commerce and Industry, Natural Resources and Scientific Research and Defence to examine the DGOF statement of case and make recommendations regarding plants, processes and other matters connected with the project. The recommendations of this Advisory Committee was generally accepted by the Defence Production Board in November, 1956 and the project estimates were revised in accordance with the recommendations of this Committee.

11. The Defence Production Board appointed a team with Dr. Kasbaker as the convener and one representative each from Defence Science Organisation and Chief Industrial Adviser to the Minister of Commerce and Industry as members to examine the details of the

explosives project and the manner in which the project was to be implemented. This team submitted its report in May, 1957. As a result of the report of the Committee the DGOF submitted the project report in July, 1957.

12. Since by that time the foreign exchange position had become very difficult, the Ministry of Defence and Finance held series of meetings to examine the possibility of bringing down the total cost of the project and consequently it was decided to reduce the scope of the project. On this basis a revised statement of case was submitted by Ministry of Defence to the Defence Committee of the Cabinet in May, 1959 and the project was sanctioned in September, 1959.

13. In September/October, 1959 a CGDP delegation headed by Maj. Gen. Pratap Narayan and including Dr. G. S. Kasbaker, DGOF visited U.K. and continent with a view to obtaining more information and details in regard to consultancy services as well as plants and processes to be procured for the explosives project. This Committee visited the Picrite Manufacturing Plant at Holten Heath. The team had reported that the Plant at Holten Heath was then surplus to the requirements of U.K. and was available for disposal. After discussion with the Ministry of Supply in U.K. they had recommended adoption of the process as at Holten Heath and had mentioned that with redesigning the Plant would meet our requirements. The Plant at that time was apparently not on production, since U.K. had put up 2 more Picrite production plants to meet their requirements. They had also visited in U.K. the new Plant but the team had felt that the design was very complicated, too large in capacity and was unlikely to be suitable to us even for designing in smaller unit. The U.K. authorities had also informed our team that they would be in a position to give necessary assistance to us in setting up a capacity in India by using the surplus plant available at Holten Heath and after stream-lining the layout.

14. Based on this report it was decided to approach the U.K. authorities to ascertain if they will let us have their surplus plant at Holten Heath and also assist us in planning the layout and setting up the production capacity.

15. Pursuant to the above, Ministry of Defence received from War Office, U.K., an offer for a second-hand Picrite Plant.

16. In the meanwhile, the formal indent for a Picrite Plant was raised with DGISD, London, in October, 1960 and DGISD was advised to obtain a formal offer against this indent from the U.K. War Office also. In October, 1960, the U.K. War Office forwarded to us

their draft agreement embodying terms and conditions covering the services to be provided by them for installing the Picrite Plant at Bhandara.

17. In February, 1961, the War Office had informed us that they require an urgent decision from us regarding their second-hand plant for production of this explosive. We had asked for time till June, 1961 to take a decision on this issue since we wanted to have the benefit of examining the offers for a new plant we were expecting against our tender. In the meantime, we had also asked for some clarifications regarding the second-hand plant offered by U.K. authorities. In March, 1961 we received required clarifications from U.K. authorities as also the tender from a German party, against DGISD's enquiry.

18. The offers were evaluated and we forwarded our final recommendations to Ministry of Defence on 21st April, 1961 recommending acceptance of the Holten Heath second-hand plant, since the only other offer from the German party was not technically acceptable since the party had never manufactured this material nor had designed a plant for the same. After the matter was examined between Ministry of Defence and Ministry of Finance (Defence), the Ministry of Defence took the decision to accept the offer given by the U.K. authorities for supplying the second-hand Picrite Plant after reconditioning some of the equipments and replacing some equipments which were beyond reconditioning. However, the cost was further negotiated with them and they effected a reduction of £8,000 in the know-how and £5,000 in the cost of the Plant. The acceptance of the offer was finally given in June, 1961 and the agreement was signed in December, 1961 after further discussions. In the agreement the U.K. authorities had also mentioned that the Plant after reconditioning and purchase of new equipments would in their opinion achieve the satisfactory working condition and the capacity which they had obtained on this plant while in use at Holten Heath.

19. Pursuant to our decision to accept the second-hand Plant, the U.K. War Office removed the Plant and after inspection of all the items sent the items for reconditioning to the firm they had selected for this purpose.

20. When the reconditioning was taken on hand by the contractor, their works were visited in October, 1961 by Shri O. P. Gupta, the then G.M. at Cordite Factory, Aruvankadu, accompanied by his engineering officer. This team had an opportunity of visiting the reconditioning that was then progressing.

21. In August, 1963, Sardar Gajendra Singh, the then General Manager at the New Explosives Factory, Bhandara accompanied by

his Engineering Officer visited the U.K. War Office as also the reconditioning firm. They had also satisfied themselves that the reconditioning was progressing as desired by us. We had also received from the U.K. authorities the list of items to be reconditioned as also the list of items being procured now.

22. After receipt of these Plants at O.F. Bhandara, the packages were opened and the individual items were visually inspected by our Production and Engineering Officers and the necessary inspection notes were also made out.

23. After the buildings were ready the erection of the equipments were taken on hand under the supervision of the U.K representatives. Thereafter, the Plant was put on commissioning when a joint team of operation and maintenance engineers examined the Plant as a whole and in its elements and assessed the expected life of each item, based on their experience, the material of construction utilised and the contents handled in these equipments.

23. *Summary*

It will be seen from the above that we had from time to time (from 1952 to 1963) detailed reports of the Picrite Plant while at Holten Heath—both while working and when not working—and our technical representatives had come to the conclusion that a Plant of this type would be suitable to meet our requirements. We had also satisfied ourselves that the product out of this plant would be capable of meeting the stringent specification of the explosive as adopted by our services.

24. We had also inspected the plant while it was under reconditioning and had inspected all the items on receipt in India. U.K. authorities had also assured us that the plant after redesigning of the layout and reconditioning would be capable of producing Picrite of required specification and capacity under the Indian conditions. In fact after erection was completed, it was reported by Sardar Gajendra Singh that the plant as installed at Bhandara was superior to the one that was at Holten Heath in respect of the layout, process and type of equipments.

25. We had, therefore, satisfied ourselves that this second-hand plant after necessary redesigning, reconditioning purchase of balancing plant and re-erection in India would prove to be a satisfactory plant for meeting our requirements.

APPENDIX II

Summary of main Conclusions|Recommendations

S. No.	Para No.	Ministry/Deptt. concerned	Conclusion/Recommendation
1	2	3	4
1	1·17	Defence	The Committee note that the Research and Development Organisation of the Ministry of Defence, after carrying out trials recommended sand tyre equipment for use on three types of military vehicles, namely, Jeep, Nissan truck and 3 tonne TMB, which were selected for deployment in the sandy areas. However, no field trials of the sand tyre equipment to be fitted with Nissan trucks were made as the special type of wheel required for trials on these trucks was not available and it was considered unwise to invest some amount on the manufacture of one or two trial wheels. The type of the equipment to be fitted on the Nissan trucks was decided on the basis of the assumption that whatever equipment could be fitted on Dodge trucks would also be useable on Nissan trucks. Again the samples of the sand tyre equipment got manufactured by a private firm were tested under different conditions. The equipment meant for use on sandy soil was put on trial in Calcutta, where there was no sandy soil. On the basis of these faulty trials bulk orders for procurement of sand tyre equipment consisting of wheel

discs, tyres, tubes and flaps were placed and equipment worth more than Rs. 38 lakhs was received. When the equipment was issued to the units deployed in sandy terrain, it was found that it could not be used with advantage on the vehicles for which it was intended. The entire equipment was lying unutilised and the amount spent on it may be said to have been totally infructuous. The Committee take a serious view of this for no one seems at any stage to have thought of taking the obvious precautionary steps to make sure that what was being ordered was capable of being used. The Committee desire that the circumstances leading to the adoption of sand tyre equipment for Nissan trucks without field trials and the omission to carry out trials of the sample equipment under the appropriate condition before placing a bulk order for manufacture may be investigated with a view to fixing individual responsibility.

2 1·18 -Do- The Committee would also like to be apprised of the action taken in the matter of introduction of a modification kit for making the equipment useable on the vehicles. Adequate steps will no doubt be taken to ensure that the equipment lying unused is properly maintained.

3 1·42 The Committee are distresed to note that out of the 34 special storage sheds for an ammunition depot constructed and completed in July, 1965 at an approximate cost of Rs. 88.80 lakhs, 31 sheds developed cracks and showed signs of deterioration within a short period of 5 years. The repairs to these sheds are estimated to cost addi-

1	2	3	4
			tional Rs. 14.10 lakhs. The Committee feel that this is clearly a case of defective construction for which responsibility at all levels should be fixed and those found guilty should be dealt with without any leniency. The Committee would like to be informed of the action taken in this behalf within three months.
4	2·21	Defence Production	The Committee note that a decision to set up an explosives factory was taken in September, 1959. The production of explosives was expected to be firmly established by 1963 resulting in a saving of foreign exchange of about Rs. 4 crores annually besides making the country virtually self-sufficient in regard to an item of considerable importance. The factory was, however, set up gradually during February, 1961 and January, 1966. Consequently the estimated cost of the project went from Rs. 11.70 crores to Rs. 14.80 crores. The delay was mainly due to lack of proper planning. Considerable delay also occurred in the ordering of the equipments. The Committee are surprised that according to the Secretary, Defence Production, "It is very rarely.....that the time prescribed in the project report is adhered to." There should have been a realistic time schedule for the various items of work and it should have been adhered to. The Committee suggest that in future there should be a periodical review of the implementation of such big projects, at the Government level.
5	2·22	do	Apart from delay, optimum utilisation had not been made of the available capacity, the process plants for the intermediate products

			as also the connected acid plants have remained underutilised and production has been low as compared to capital investment. The Committee have dealt with these aspects in the succeeding sections of this Report.
6	2·38	do	The Committee feel that the purchase of explosive production plant of 1937 vintage from U.K. in performance to a new plant offered by a German firm was unwise. No performance guarantee could be obtained for this plant. Its residual life after reconditioning was stated to have been assessed as only 7 or 8 years. Although the German plant was costlier by about Rs. 71 lakhs, according to the data given to the Financial Adviser, its purchase resulted in a saving of recurring expenditure of Rs. 31.80 lakhs per annum. That it was considered risky to purchase it owing to the fact that the firm had not produced the explosive is not convincing enough as the firm had agreed to give performance guarantee At this stage the Committee can only express their dissatisfaction and hope that such purchase proposals would be examined more carefully in future.
7	12·62	do	The Committee are concerned to find that even after 6 years of establishing the factory the capacity of the various plants has not been utilised fully. This is mainly due to requirements having changed consequent on change in ammunitions used. The Committee are convinced that with a little more imagination and foresight these changes could have been foreseen and the pattern of produc-

1	2	3	4
			tion changed to utilise the capacity fully. The following points deserve specific mention:
			(i) Although the plant for production of explosive 'A' went into production in 1965, one hundred and fifty five tonnes (costing Rs. 14.4 lakhs) of a particular variety not covered by the agreement with the plant supplier was imported in May, 1967. There was delay in establishing production of this variety.
8.	2.62	Defence Production	(ii) The cost of the process material in the second-hand plant procured from U.K. is very high inasmuch as it is more than 6 times the cost of imported material. This is partly because of low production. Technical studies are being made to carry out modifications in the processing techniques so as to achieve higher yields and efficiency. The Committee desire that the cost of production should be progressively brought down.
9.	2.63	do	(iii) The production of explosive 'B' during the years 1969-70, 1970-71 and 1971-72 was to the extent of only 50 per cent., 43 per cent and 62 per cent respectively. The Committee understand that the orders placed on the factory would ensure full utilisation of this capacity provided it could produce the variety of this explosive meant for a particular

			ammunition. According to the Ministry the production of this variety will call for a small addition of another explosive to be produced in a plant expected to be available for use by middle of 1974. The Committee desire that there should be no delay in establishing the required variety of explosive 'B' after 1974.
10.	2·64	d	(iv) The production of explosive 'C' during the period 1969 to 1972 was far below even the peace time requirement. The low production has been due to low demands and the main reason for this is the delay in switching over from the existing filling to the explosive 'C' filling in a factory. It is, therefore, necessary to ensure that there is no delay in this change-over. Further, the connected process material plant is also grossly underutilised. As there is stated to be demand from civil trade for this material, the Committee desire that the process material plant should be fully utilised to meet the requirements of the factory as well as the civil trade.
11.	2·65	do	(v) The underutilisation of Acid Plants is attributed to the low rate of production of explosive 'C' for which approximately 75 per cent of the capacities of these plants are met. It is, therefore, all the more necessary to take steps to step up production of explosive 'C'.
12.	2·66	do	The uneconomic working of the explosive factory can be seen from the fact that during the year 1970-71 the total cost of production

1	2	3	4
			was only Rs. 2.22 crores as against the capital investment of Rs.15 crores (up to March, 1970). During the two years, 1969-70 and 1970-71, the overheads alone accounted for about 74 per cent of the cost of production. This points to the need to fully utilise the capacity of the various plants. The Committee, therefore, desire that there should be a comprehensive examination of the position at the Government level in order to initiate timely action to achieve self-sufficiency in respect of the present requirements of explosives and to reduce the cost of production.
13.	2.90	Defence Production	The Committee are unhappy to learn that 2,400 tonnes of steel bars of a specified quality required for manufacture of ammunition shells in an ordnance factory imported during October, 1968 to January, 1969 were found to be unsuitable for the purpose for which they were procured. Out of the total quantity of 3,000 tonnes only 606 tonnes of the steel bars could be accepted and the balance valued at Rs. 49.63 lakhs were rejected as unsuitable. From the information made available to the Committee it is clear that the defects in the steel bars crept in at the time of the normalising process. Normalisation of steel bars in the factory, which ought to have been done in still air as per the standard procedure was, according to the Chief Inspector of Metals, Ishapore, done in a blast of very cold air, which affected the physical properties of the metal. It is unfortunate that the Inspector of DG, ISM, London who carried out the inspection at the factory failed to verify the method of normalisation adopted

			as he took it for granted that the normalisation had been done as per the normal practice. This is a serious lapse which the Committee feel, ought to have been investigated fully for fixing responsibility in 1969 when the defects first came to light. The Committee were informed that the particular inspector was allowed to resign in June, 1972. The reasons why no action was taken against the inspector before he was allowed to resign may be gone into critically and responsibility fixed for the lapse on the part of the concerned officials. The Committee desire that legal opinion should be obtained on the point whether the supplier could have been compelled to replace the defective supplies at their own cost under the guarantee clause.
14.	2.91	do	The Committee note that the Defence Ministry have now taken a decision to appoint their own inspectors. The Committee desire that the inspection procedure should always be spelt out in very clear and unambiguous terms so that there is no scope for any possible differences in interpretation.
15.	2·92	do	The Committee note that so far it has not been found possible to utilise the rejected steel bars worth more than Rs. 49 lakhs. The Committee desire that all necessary steps may be taken urgently to ensure that the entire quantity of the unused stock of steel bars is put to economic use.
16.	2·101	do	Owing to the delay in establishing the new ordnance factory, as many as 996 quarters constructed between April, 1965 and July, 1970 at a cost of Rs. 89.06 lakhs remained vacant upto October, 1971. The postion as on 23rd June, 1972 was that 661 quarters were lying

1	2	3	4
			vacant. The Committee desire that the delay in establishing the factory and the failure to properly coordinate all the work should be examined and the results reported to them. They would also await a report regarding the utilisation of the quarters lying vacant.
17.	2·116	Defence Production	The Committee regret that three double-chamber annealing furnaces were found defective on receipt. Payment of Rs. 5.82 lakhs representing 80 per cent of the cost was made after initial inspection. The Committee do not think that the inspection was adequate in so far as the equipments were not assembled in the firms works and defects removed prior to despatch. This aspect should therefore be gone into.
18.	2·117	do	As regards the question of rectification of the defects the Committee have been informed that the DGS&D will be referring the case to the Ministry of Law to examine the legal position. The delay of over 2 years in doing so is obviously unjustified. The Committee desire that a final decision in this regard should be taken without any further delay.
19.	2·131	do	The Committee find that 11 lathes procured at a cost of Rs. 1.75 lakhs were found defective on erection. Although the DGS&D is of the view that the inspection was done properly, the Defence Department have considered that all the defects are attributable to defective workmanship|design. The lathes could have been rejected if proper

			inspection had been carried out by actual trial by the DGS&Ds inspector before despatch. The Committee desire that the matter should be investigated with a view to fixing responsibility.
20	2 132	do	It is unfortunate that the lathes were not erected within the warranty period of 12 months. The Committee are inclined to take a serious view of the delay which shows lack of planning. Apart from taking suitable action in this regard, strict instructions should be issued to all concerned to avoid delay in erection of machines so as to safeguard the financial interests of Government.

'MGIPND—LS I—503 LS—17-7-73—1400.