

# **HUNDRED AND FORTY-FOURTH REPORT**

## **PUBLIC ACCOUNTS COMMITTEE (1988-89)**

(EIGHTH LOK SABHA)

**DEFECTIVE AMMUNITION**

**MINISTRY OF DEFENCE  
(DEPARTMENT OF DEFENCE PRODUCTION  
AND SUPPLIES**



*Presented to Lok Sabha on 5 April, 1989*

*Laid in Rajya Sabha on 24 April, 1989*

**LOK SABHA SECRETARIAT  
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### PART II\*

Minutes of the sittings of the Committee held on :

7-12-1988

3-4-1989

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

PUBLIC ACCOUNTS COMMITTEE

(1988-89)

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\*Appointed as Chairman w.e.f. 5-9-1988 *vice* Shri C. Madhav Reddy resigned from Chairmanship of the Committee.

@Appointed w.e.f. 7-12-1988 *vice* Shri Kalpnath Rai ceased to be member of the Committee on his appointment as a Minister of State.

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3. Shri A. Subramanian—*Senior Financial Committee Officer*

## INTRODUCTION

1, the Chairman of the Public Accounts Committee do present on their behalf this Hundred and Forty-Fourth Report on Paragraph 76 of the Report of the Comptroller and Auditor General of India for the year ended 31 March 1987, Union Government (Defence Services) relating to defective ammunition.

2. The Report of the Comptroller and Auditor General of India for the year ended 31 March 1987, Union Government (Defence Services) was laid on the table of the House on 13 May, 1988.

3. The Committee's examination has revealed that the first defect of lid detachment from the body of the ammunition which was being manufactured and supplied by the Ordnance Factories to the Army since 1964, was noticed only in 1975. For reasons not very cogent, at this stage the matter was not taken up seriously and the defect was sought to be removed by local repairs. When this mode of repair did not prove effective, the Director General Ordnance Services reported the matter to Director General Inspection (now Director General Quality Assurance) in March 1977. The Director General of Inspection attributed the defect to inadequate fusing of welded material between the ammunition body and the lid at the manufacturing stage.

The Committee have found that inspite of the fact that the operational requirement for this ammunition was inescapable, the defect of lid detachment from the body was not given the urgency and seriousness it deserved even after March 1977. A repair schedule was prepared in September, 1978 but the repair work was undertaken only in 1980. The Committee have been concerned to note that it took an abnormally long period of about 5 years in commencing this repair work after detection of the defect in 1975. The Committee have deprecated that a matter involving defence preparedness of the country was not treated seriously and earnest efforts do not appear to have been made to solve the problem promptly. The Committee have stressed that Government should draw a lesson from this sad experience and gear up their machinery adequately so that such challenges are met effectively as the country cannot afford to take any chances in items concerning the defence preparedness of the country.

4. The Committee have expressed their deep concern that the authorities failed to remove the first defect of lid detachment from the body, which was noticed in the ammunition as early as in 1975, inspite of the various repair measures taken from 1980 till March 1985. As borne out by the findings of both the Investigating Committees constituted in 1981 and 1985, the incidence of reopening of lids of repaired ammunition was due to inadequate care during repairs, which in the opinion of the Committee is highly deplorable. The Committee have been distressed to find that while the repeated processes of repair were going on, new ammunition manufactured and supplied also suffered from the same deficiency. According to the Ministry of Defence, the expenditure involved in carrying out repair activity at the depot was to the tune of Rs. 785157. Further, the cost of surplus material left unused at the time of suspension of repairs in February 1985 was Rs. 142194. The Committee have deprecated that apart from above wasteful expenditure store items worth Rs. 10.42 crores remained unused for a considerably long time which is clearly indicative of faulty planning in a vital matter concerning the defence of the country. The Committee have emphasized that the Ministry should draw appropriate lesson from this sad experience and take effective measures in future to avoid gross mis-utilisation of meagre resources of the country.

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5. The second defect of cracking in the body of the ammunition was reported in March 1985. 100 per cent survey of the ammunition in depots which was ordered in January 1986 has since been completed by DGOS, as a result of which the cost of the ammunition declared repairable and those declared unserviceable is of the order of Rs. 598.55 lakhs and Rs. 127.50 lakhs, respectively. The cracked ammunition is proposed to be retrieved by providing the recommended coating. Cracked ammunition so retrieved were subjected to users trials on 10th and 11th April, 1987 and were found satisfactory. According to the Ministry the cost and time involved in repairing the defective ammunition will be approximately Rs. two crores and 1 and a half years, respectively.

In the opinion of the Committee, it is highly distressing that in spite of the fact that ARDE, Pashan had confirmed the technical suitability of the ammunition repaired by coating in September 1987 no tangible steps have so far been taken to initiate the repair measures. Even the case for obtaining the Ministry's approval in principle or the repair job has not been processed so far. The Committee have strongly condemned this lackadaisical approach on

the part of the concerned authorities in spite of the operational requirement of the ammunition and also when an exorbitant amount of about Rs. 725.75 lakhs being the cost of the defective ammunition remains indefinitely locked up unused. The Committee have stressed that urgent steps should be taken to repair the costly defective ammunition expeditiously, keeping in view the remaining shelf life of the defective ammunition.

6. The Committee have been shocked that out of the 9 suppliers of empty bodies for the ammunition between 1980 and 1984 firm A has supplied upto 58.6 per cent only under the category of serviceable pieces, firm B has supplied upto 75.8 per cent and firm D upto 80.5 per cent. If as intimated to the Committee, the quality checks on release of raw materials before consumption and scrutiny of the supplies at the time of taking delivery at the ordnance factories were as efficient as is required to be, the Committee wonder how a substantially large number of defective pieces were procured during 1980 to 1984 particularly from the 3 firms mentioned above. The Committee are convinced that lack of quality checks and failure to enforce the prescribed standards had resulted in acquisition of a large number of bad stock over the years, requiring further expenditure on repairs. The Committee have recommended that the entire issue as to the observance of the prescribed procedures should be examined by an independent Committee and responsibility fixed for the substantial loss that occurred to the exchequer due to apparent failures in performance of the prescribed duties by some of the concerned officers.

7. The Committee (1988-89) examined Audit Paragraph 76 at their sitting held on 7 December, 1988. The Committee considered and finalised the Report at their sitting held on 3 April, 1989. Minutes of the sittings form Part II\* of the Report.

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

9. The Committee would like to express their thanks to the Officers of the Ministry of Defence (Department of Defence Production and Supplies) for the cooperation extended to them in giving information to the Committee.

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

†Not appended to the cyclostyled copy.

[viii]

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

NEW DELHI;  
April 4, 1989.  

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Chaitra 14, 1911 (Saka)

AMAL DATTA,  
Chairman,  
Public Accounts Committee.



## REPORT

**The Report is based on enquiry initiated by paragraph 76 of the Report of Comptroller and Auditor General of India for the year ended 31 March, 1987, Union Government (Defence Services), which is appended at Appendix I.**

### *Introductory*

2. An ammunition manufactured and supplied by Ordnance Factories for use by the Army was found to suffer from two defects viz. (i) lid detachment from the body and (ii) cracking in the body (Shell) itself. The ammunition in question was being manufactured and supplied by the Ordnance Factories to the Army since 1964.

3. The first defect of lid detachment from the body was noticed as early as in 1975, even though ammunition in question was being manufactured and supplied by the Ordnance Factories to the Army since 1964. According to the Ministry the defect (though noticed in 1975) was reported by Director General Ordnance Services (DGOS) for the first time in 1977 to Director General Quality Assurance (DGQA). The information relating to the year of manufacture and name of the manufacturer of the defective ammunition was not indicated by DGOS. When the defects of partial opening of the lid was first observed by DGOS in 1975, local repairs of ammunition were done by DGOS by applying 2 inch wide adhesive tape. When this mode of repair did not prove effective, DGOS reported the matter to Director General Inspection (DGI) now (Director General Quality Assurance) DGQA in March 1977. It was then decided to repair the defective ammunition by re-welding of loose|partially detached lids using PVC welding rods.

4. The Addl. Director General Ordnance Services explained during evidence that when the defect was first noticed in 1975, it was reported and subsequently they started noticing them regularly. During evidence it was also brought out that all inspections were carried out from 1964 to 1974 and it was difficult to say that there was no defect during that period as their system of sampling or system of inspection did not ensure 100 per cent check.

5. On investigation it was revealed that the ammunition had been used repeatedly for training purposes or was lifted/retrieved after laying. However, DGOS in 1978 ordered 100 per cent inspection of bulk stock of the ammunition of 1974-76 manufacture, held in various depots, and segregation of defective ammunition for repair/replacement survey report, the cause of the defect was analysed and certain remedial measures were introduced. A repair schedule was prepared in September, 1978 and repair process was to be tried out at an Ordnance Factory in July 1979. Since the factory could not undertake repair work it was decided by the Ministry in December, 1979 that the repair should be arranged by the DGOS. According to this decision the ammunition was repaired by re-welding of the loose/detailed lids by PVC welding rods. Training was accordingly imparted to a team from DGOS at another Ordnance Factory for undertaking repairs in Depots. According to the Audit para the actual repair work was undertaken in 1980.

6. On an enquiry as to why the decision to carry out the necessary repairs was not taken immediately after 1975, the Ministry of Defence have stated that in the case of the ammunition which had been used repeatedly for training purpose or were retrieved/recovered after laying, the defects were first reported in 1977. According to the Ministry, only when the defect was revealed in the virgin ammunition in 1978, the matter was analysed and certain modifications were effected in the welding process as well as in the testing criteria for the welded ammunition. The Ministry have also stated that no deficiency was found in the quality control system but only inherent limitations in the material were noticed.

7. The ammunition so repaired also developed the same defect. The matter was reinvestigated by the Director General Inspection (now DGQA) who recommended in June 1981 that the rewelded lids be further reinforced with non-magnetic metal clips. Rectification of the defect by use of non-magnetic metal clips also did not prove to be a satisfactory arrangement. Despite this reinforcement, the defect of lid detachment persisted.

8. Asked as to why the inadequate fusing of welding material could not be detected by the factory through its quality control unit or by the Inspection authorities, the Ministry stated that the efficacy of welding was checked by subjecting the welded ammunition to an Air Pressure Test and this test was being carried out on all the repaired ammunition and only ammunition passing this requirement was released for further processing. According to the Mini-

stry, the separation of lid from the body occurred during storage and subsequent to the detection of separation of lid from the body at the depot, an additional check by means of Pull of test at 25 kg. was also introduced on a percentage basis.

9. The Committee note that the first defect of lid detachment from the body of the ammunition which was being manufactured and supplied by the Ordnance Factories to the Army since 1964, was noticed only in 1975. For reasons not very cogent, at this stage the matter was not taken up seriously and the defect was sought to be removed by local repairs. When this mode of repair did not prove effective, the Director General Ordnance Services reported the matter to Director General Inspection (now Director General Quality Assurance) in March 1977. The Director General of Inspection attributed the defect to inadequate fusing of welded material between the ammunition body and the lid at the manufacturing stage.

10. The Committee find that inspite of the fact that the operational requirement for this ammunition was inescapable, the defect of lid detachment from the body was not given the urgency and seriousness it deserved even after March 1977. A repair schedule was prepared in September, 1978 and repair process was to be tried out after a period of 10 months at an Ordnance Factory in July, 1979. Since the factory could not undertake repair work it was decided by the Ministry in December, 1979 that the repair should be arranged by the Director General Ordnance Services. It was decided at this stage to repair the ammunition by rewelding of the loose/detached lids by PVC welding rods. The repair work was ultimately undertaken only in 1980. The Committee are concerned to note that it took an abnormally long period of about 5 years in commencing this repair work after detection of the defect in 1975. The Committee cannot but deprecate that a matter involving defence preparedness of the country was not treated seriously and earnest efforts do not appear to have been made to solve the problem promptly. The Committee hope that the Government would draw a lesson from this sad experience and gear up their machinery adequately so that such challenges are met effectively as the country cannot afford to take any chances in items concerning the defence preparedness of the country.

#### *1st Investigation Committee*

11. The first Investigation Committee to go into the causes of the defect of lid detachment from the body and to suggest reme-

dial measures was constituted on 30.4.1981. The team examined the available apparatus at the depots, method of repair being followed, as also the storage conditions. The observations of the team common to almost all depots are as follows:—

- (a) At all places, the apparatus being used was neither standard nor properly fabricated to meet the requirements *viz.*, pressure roller not being used or not of proper size and shape: ammunition spindle not mounted on roller bearing lid pressure plate loose, heating apparatus incorrectly mounted.
- (b) Welding process not being followed correctly.
- (c) Use of incorrect welding rod.
- (d) Incorrect welding temperature.
- (e) Load test apparatus incorrectly fabricated.
- (f) Storage conditions not conducive or boxes not stacked permitting free circulation of air.

12. According to the team, the main cause of ineffective welding was due to improper and insufficient instructions regarding process of repair, use of non-standard apparatus, and lack of understanding of the important aspects of the welding process. The team explained the entire process to all concerned followed by a welding practice by all concerned depot staff where facilities existed and issued detailed instructions to all the concerned depots.

13. The Investigating Committee recommended that stainless steel (non-magnetic) clips should be used on the ammunition to strengthen the welded joints of the ammunition body and lid. The Committee further recommended that these clips should be provided on repaired ammunition pieces also. As mentioned earlier, rectification of the defect by use of non-magnetic metal clips also did not prove to be satisfactory.

14. The Committee desired to know as to when it was realized that rectification of the defect by use of non-magnetic metal clips also did not prove to be a satisfactory arrangement and what subsequent steps were taken to remove the defect in the ammunition. The Ministry of Defence stated that the use of clips provided additional re-inforcement for the welded ammunition and later, the entire repair process had to be reviewed in the light of the cracking of the body reported in a percentage of the ammunition.

15. The ammunition repaired in 1980 again developed the same defect of lid detachment from the body. The first Investigating Committee to go into the causes of the defect of lid detachment from the body and to suggest remedial measures was constituted on 30-4-1981. This Committee found that the main cause of ineffective welding was the existence of improper and insufficient instructions regarding process of repair, use of non-standard apparatus and lack of understanding of important aspects of the welding process. The Committee strongly deplore the lack of seriousness on the part of the concerned authorities, as borne out by the findings of the Investigating Committee to ensure proper arrangements for the repair of defective ammunition. The Investigating Committee recommended that stainless steel non-magnetic clips should be used in the ammunition to strengthen the welded joints of the ammunition body and lid, and that these clips should be provided in repaired ammunition pieces also. The Committee note that rectification of the defect by use of non-magnetic metal clips also did not prove to be a satisfactory arrangement. The Committee would like the Government to take urgent steps to strengthen adequately the implementing and monitoring machinery pertaining to defence store items of sensitive nature so that situations of this type do not recur in future and defence requirements of the country are not adversely affected.

*Infructuous Expenditure on repairs till February, 1985.*

16. While the repeated processes of repairs were going on, new ammunition manufactured and supplied also suffered from the same deficiency in-so-far as the number of defective pieces assessed at 1.7 lakhs in 1980 increased to 3.72 lakhs in February, 1985. According to Audit out of the 3.72 lakhs pieces, 2.92 lakh pieces were repaired till then at a cost of Rs. 20.44 lakhs. The total value of the 3.72 lakhs defective pieces was Rs. 10.42 crores.

17. As regards the increase in the number of defective pieces from 1.7 lakhs in 1980 to 3.72 lakhs in February 1985, the Secretary of the Department of Defence Production and Supplies explained during evidence that the increase in number from 1.7 lakhs to 3.72 lakhs was not because production from 1980-85 became defective but because the initial survey was only of a limited period stock. According to the Ministry the expenditure involved in the repair activity at the depots was as under:—

- (a) no additional expenditure was involved for fixing two inch adhesive tape from 1975 to 1977, as it was a routine

repair activity in the depot;

- (b) the following expenditure was incurred for repair with PVC welding rods and reinforcement with non-magnetic stainless steel clips:

(i) Welding rods	.. Rs. 49477.00
(ii) Stainless Steel Clips	.. Rs. 735680.00

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Total Rs. 785157.99

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18. In March, 1985 orders were issued to suspend further repair of the ammunition. According to the Ministry the repair of the ammunition as done earlier did not commence after suspension of such repairs. According to the Ministry the cost of surplus material left unused at the time of suspension of repairs in February 1985 is as under:—

(i) Welding rods	.. Rs. 82875.00
(ii) Stainless Steel Clips	.. Rs. 59319.00

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Total Rs. 142194.00

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19. The Committee enquired that when the existence of the defect was known, how was more and more production of the defective ammunition resorted to without identifying the cause and rectifying the defect. According to the Ministry of Defence the initial inspection ordered by DGOS was of a limited nature. This was later extended to cover the entire stock and accordingly the number of defective pieces also went up. The Ministry have stated that when the existence of the defect came to light, the causes were analysed and remedial measures as mentioned were taken up. According to the Ministry, these remedial measures were expected to eliminate the causes of defects.

20. The Ministry further explained that keeping in view the operational requirement of the store and low percentage of defect of minor nature i.e. partial opening of lid, the necessity of stopping the production was not felt because of the technical feasibility that partial opening of lids could be rewelded. Only when the defect of cracks was reported, it was decided to stop production.

21. Asked as to how the Army had been accepting further supplies of this ammunition despite being aware of the defects in the new as well as repaired stock of ammunition, the Ministry stated that the operational requirement for this ammunition was inescapable. The defect had been noticed only in a percentage of the ammunition and that too after varying periods of storage.

22. The second Investigating Committee headed by the Controller of Inspection (Ammunition) Kirkee CICA and with a representation each of C.A.D., Pulgaon—ARDE Pune, CIME, Kirkee and Ordnance Factory Board was constituted in 1985 to go into the defects and suggest remedial measures. The Committee *inter alia* recommended as follows:—

- (i) Opening of lid and cracking of body was pre-dominantly in respect of empty ammunition lots supplied by firms 'A' and 'B'.
- (ii) The incidence of reopening of lids of repaired equipment was due to inadequate care during repair.
- (iii) The tendency of lid opening as well as cracking of ammunition is primarily attributed to use of scrap in the virgin materials by the manufacturers of empty body.

The Ministry of Defence have stated that the recommendations of this Committee were considered to be erroneous on the basis of 100 per cent survey and the expert opinion of a reputed institute.

23. The Committee are deeply concerned to note that the authorities failed to remove the defect of lid detachment from the body which was noticed in the ammunition as early as in 1975, in spite of the various repair measures taken from 1980 till March 1985. As borne out by the findings of both the Investigating Committees constituted in 1981 and 1985, the incidence of reopening of lids of repaired ammunition was due to inadequate care during repairs, which is highly deplorable. It is further distressing to find that while the repeated processes of repair were going on, new ammunition manufactured and supplied also suffered from the same deficiency. The Ministry stated that the production of the ammunition could not in the meantime, be stopped due to its operational requirements. According to the Ministry of Defence, the expenditure involved in carrying out repair activity at the depot was to the tune of Rs. 785157. Further, the cost of surplus material left unused at the time of suspension of repair in February 1985 was Rs. 142194. The Committee deprecate that apart from above wasteful expen-

diture store items worth Rs. 10.42 crores remained unused for a considerably long time which is clearly indicative of faulty planning in a vital matter concerning the defence of the country. It is imperative that the Ministry should draw appropriate lesson from this sad experience and take effective measures in future to avoid gross mis-utilisation of meagre resources of the country.

*The second defect of cracking in the body . . .*

24. The other defect of cracking in the body of the ammunition was reported by one of the ammunition depots in March 1985. The ammunition developed cracks in its body containing the explosive material resulting in exposure of filling and its deterioration in storage.

25. The defects pertaining to the Body/Lid cracking for ammunition manufactured in 1982 were first reported in March 1985 by DGOS. According to the Ministry, as soon as the defect of body/lid cracking was noticed the matter was discussed with Central Institute of Plastics Engineering and Tools, Madras in July 1985 on cracking of ammunition bodies. They carried out investigations on cracked ammunition bodies and intimated that the material used was LDPE which was generally susceptible to environmental stress cracking. National Chemical Laboratory, Pune also concurred with the above mentioned view that LDPE was prone to environmental stress cracking. The Committee enquired when it was susceptible to environmental stress cracking, why this defect was not shown earlier? The Secretary of the Department stated that the longer the storage, the longer the susceptibility and if the material was stored for a longer period, then it was susceptible to environmental stress cracking.

26. 100 per cent survey of existing stocks of ammunition to ascertain defective/sub-standard ammunition was ordered in January, 1986. DGQA had suggested retrieving of defective ammunition by providing coating. Defective ammunition so retrieved were subjected to User's trials on 10th and 11th April 1987 and were found satisfactory. Armament Research Development Establishment (ARDE), Pashan also carried out technical evaluation of ammunition so repaired and confirmed its technical suitability on 24-9-1987. According to the Ministry, Action Plan for repair of ammunition by DGQA has been prepared and repair job would be undertaken soon.

27. Another Technical Group was constituted in August 1986. This Technical Group had held two meetings on 29 November, 1986



and 8 December, 1987. This Technical Group laid down the procedure and priorities for repairing the defective ammunition by providing the said coating.

28. According to the Ministry of Defence, 100 per cent survey of the ammunition in Depots had been completed by DGOS and the position that emerged was as under:

(a) Total qty. held . . . . .	13,27,927
(b) Total qty. found serviceable . . . . .	9,98,037
(c) Qty. found repairable (lid separation) . . . . .	2,72,071
(d) Qty. found unserviceable . . . . .	57,819

29. Cost of the Ammunition surveyed, declared as serviceable, unserviceable and repairable was as under:—

(a) Cost of ammunition surveyed . . . . .	Rs. 2921.43 lakhs
(b) Cost of serviceable ammunition . . . . .	Rs. 2195.68 ,,
(c) Cost of repairable ammunition . . . . .	Rs. 598.55 ,,
(d) Cost of unserviceable ammunition . . . . .	Rs. 127.20 ,,

NOTE—The cost of the ammunition varies depending on the year of manufacture. However, the cost has been worked out at the rate of Rs. 220 per piece which was the cost in 1980.

Cost of defective and repairable ammunition had been indicated as Rs. 598.55 lakhs. DGOS had identified 9 locations for carrying out repair of defective ammunition simultaneously. A team of approximately 15 members of the contractor can repair 100 to 120 pieces per day. The expected time of repair of all defective pieces is approximately 1½ years. According to the Ministry, the cost involved to complete the repairs of defective pieces may be approximately Rs. 197 lakh. The Ministry have informed that FRP Coating will provide fresh lease of Shelf-life to the repaired ammunition. ISAT (B) trials to ascertain shelf life of samples of ammunition so repaired are in progress at ARDE. According to the Ministry, the following steps are under consideration to remove the defect in the ammunition:—

- (i) Introduction of a new material with better crack resistance and welding properties.

- (ii) Till such time the new material is introduced re-inforcing the existing ammunition Bodies with FRP coating.

30. According to the Ministry, the following is the latest position on the implementation of the recommendations of the last Technical Group:—

(i) *Sanction for the Repair*

In order to obtain Ministry's approval in principle for the repair job, a case is being processed by Army HQ.

(ii) *Assessment of firms capable of under-taking repair:*

Details of firms interested in undertaking the repair job have been collected and capacity verification of these firms is in progress.

(iii) Statistical analysis of various firms involved in producing ammunition bodies indicating the year of production and number of ammunition which developed cracks/lid opening depot-wise will be attempted.

31. The second defect of cracking in the body of the ammunition was reported in March 1985. Both Central Institute of Plastic Engineering, Madras and National Chemical Laboratory, Pune on carrying out the defect investigations on cracked ammunition had intimated that the used material LDPE was generally susceptible to environmental stress cracking. 100 per cent survey of the ammunition in depots has since been completed by DGOS, as a result of which the cost of the ammunition declared repairable and those declared unserviceable was stated to be of the order of Rs. 598.55 lakhs and Rs. 127.50 lakhs, respectively. The cracked ammunition is proposed to be retrieved by providing the recommended coating. Cracked ammunition so retrieved were subjected to user's trials on 10th and 11th April 1987 and were found satisfactory. According to the Ministry the cost and time involved in repairing the defective ammunition will be approximately Rs. 197 lakhs and 1½ years, respectively.

**32.** It is highly distressing to note that in spite of the fact that ARDE, Pashan had confirmed the technical suitability of the ammunition repaired by coating in September 1987 no tangible steps have so far been taken to initiate the repair measures. Even the case for obtaining the Ministry's approval in principle for the repair job has not been processed so far. The Committee strongly condemn this lackadaisical approach on the part of the concerned authorities in spite of the operational requirement of the ammunition and also when an exorbitant amount of about Rs. 725.75 lakhs being the cost of the defective ammunition remains indefinitely locked up unused. The Committee need hardly stress that urgent steps should be taken to repair the costly defective ammunition expeditiously, keeping in view the remaining shelf life of the defective ammunition. The Committee would like to be apprised of further steps taken in this direction in repairing the defective ammunition and the cost involved in the entire operations.

*Gap in the meetings of the Technical Group and delay in circulation of the minutes.*

**33.** The Technical Group was constituted on 22 August, 1986. This Technical Group had held two meetings on 29 November, 1986 and 8 December, 1987. The Minutes of these meetings were circulated to all concerned on 27 January, 1987 and 18 March, 1988.

**34.** According to the Army HQrs the gap of more than 1 year between the two meetings of the Technical Group occurred because at the end of the first meeting held on 29 November, 1986 it was decided that exact figures of repairable and unserviceable ammunition would only merge after the complete holdings were inspected. It was expected that this survey would be completed by August, 1987. However, the results of 100 per cent survey became available only in February, 1988. Further, it was also decided in the meeting held on 29 November, 1986 that shelf life of ammunition would be determined by Controllerate of Inspection (Ammunition) in consultation with ARDE. This was considered an important input for the subsequent meeting. It has been contended that since the requisite information was not forthcoming from the concerned agencies, the second meeting of the Technical Group was called on 8 December, 1987.

35. With regard to the delay in the circulation of the Minutes of the aforesaid two meetings of the Technical Group, it has been stated that these Minutes had to be withheld for some time because certain established data was awaited in order to ensure that the premises, based on which certain decisions had been taken in the meeting, were correct and validated.

36. The Technical Group was constituted on 22 August, 1986. This Technical Group held its first meeting on 29 November, 1986. It is regrettable that the second meeting of this Group for consideration of a very important and serious matter was held only after a period of more than one year on 8 December, 1987. The minutes of these two meetings were circulated to all concerned on 27 January, 1987 and 18 March, 1988 respectively. In the opinion of the Committee the above situation reflects very poorly on the working of the Defence Ministry in the matter as vital as the defence preparedness of the country.

*Defective supply of empty bodies*

37. According to the Audit Paragraph the second defect of cracking in the body of the ammunition was mostly confined to empty bodies supplied by two firms and it was felt that the defect could be due to use of re-cycled material, instead of virgin material.

38. According to the information furnished to the Committee, the stock of 13.27 lakh pieces included defective pieces manufactured between 1980 and 1984, as detailed below:—

Year of manufacture	In stock	Serviceable	Requiring major repairs	Unserviceable
1980 . . .	93343	73532	14962	4849
1981 . . .	69124	51453	9683	7988
1982 . . .	87263	73215	3648	10400
1983 . . .	68060	61126	2036	4898
1984 . . .	6307	6093	178	36
<b>Total . . .</b>	<b>324097</b>	<b>265419</b>	<b>30507</b>	<b>28171</b>
<b>Percentage . . .</b>		<b>81.9%</b>	<b>9.4%</b>	<b>8.7%</b>

39. The empty bodies for the above ammunition since 1980 were supplied by nine private firms and the firmwise analysis of supplies of defective bodies indicated the following position:

	Stock	Serviceable	Requiring major repair	Unserviceable	Percentage of serviceable pieces
Firm A . . .	41,152	24,128	6,396	10,628	58.6
Firm B . . .	32,687	24,783	800	7,104	75.8
Firm C . . .	20,430	18,615	1,655	160	91.1
Firm D . . .	73,453	59,120	8,874	5,459	80.5
Firm E . . .	97,935	88,832	5,400	3,703	90.7
Firm F . . .	15,447	14,148	1,177	122	91.6
Firm G . . .	429	405	24	..	94.4
Firm H . . .	58	58	..	..	100.0
Firm I . . .	42,506	35,330	6,181	995	83.1
	3,24,097	2,65,409	30,517	28,171	81.9

40. The tables above would indicate that despite defects having been noticed by 1978, the Ordnance factories continued to place orders and obtain supplies from the same firms although most of the supplies failed to fulfil quantitative needs and about 9.4 per cent of the stock had to undergo major repairs and 8.7 per cent of the stock had to be declared unserviceable. Further the supplies made by Firms A, B and D were so bad qualitatively that about 20 per cent of their supplies are either unserviceable or required major repairs.

41. One of the causes for the failure of the bodies, as reported by a technical committee, was usage of recycled raw material instead of virgin material. According to the Secretary, the prescribed requirement was that each supplier should use only virgin material and quality control measures provided for inspection and passing of raw material before moulding the same and that unless they were so cleared, they could not be used. According to technical advice rendered to the Secretary, if recycled material had been used upto 30 per cent, there was no mechanism to find it out, after the material had been moulded.

42. The Committee are shocked to note that out of the 9 suppliers of empty bodies between 1980 and 1984 firm A has supplied upto 58.6 per cent only under the category of serviceable pieces, firm B has supplied upto 75.8 per cent and firm D upto 80.5 per cent. If as intimated to the Committee, the quality checks on release of raw materials before consumption and scrutiny of the supplies at the time of taking delivery at the ordinance factories were as efficient as is required to be, the Committee wonder how a substantially large number of defective pieces were procured during 1980 to 1984 particularly from the 3 firms mentioned above. The Committee are convinced that lack of quality checks and failure to enforce the prescribed standards had resulted in acquisition of a large number of bad stock over the years, requiring further expenditure on repairs. The Committee recommend that the entire issue as to the observance of the prescribed procedures should be examined by an independent Committee and responsibility fixed for the substantial loss that occurred to the exchequer due to apparent failures in performance of the prescribed duties by some of the concerned officers.

NEW DELHI;  
 April 4, 1989  
 Chaitra 14, 1911 (S)

AMAL DATA  
 Chairman,  
 Public Accounts Committee

## APPENDIX I

(Vide Para 1)

*Paragraph 76 of the Report of the Comptroller & Auditor General of India for the year ended 31 March 1987 No. 2 of 1988, Union Government (Defence Services).*

*Defective ammunition.*

An ammunition manufactured and supplied by Ordnance Factories for use by the Army was found to suffer from two defects; lid detachment from the body and cracking in the body itself.

The first defect was noticed as early as in 1975. The Director General of Inspection (DGI) attributed the defect to inadequate fusing of welding material between the ammunition body and the lid at the manufacturing stage. It was decided in December 1979 to repair the ammunition by rewelding of the loose/detached lids by PVC welding rods. The repair work was undertaken in 1980 when repairable holding was report to be 1.7 lakh pieces. The ammunition so repaired also developed the same defect. The matter was reinvestigated by the DGI who recommended in June 1981 that the rewelded lids be further re-inforced with non-magnetic metal clips.

While the repeated processes of repairs were going on, new ammunition manufactured and supplied also suffered from the same deficiency insofar as, the number of defective pieces assessed at 1.7 lakhs in 1980 increased to 3.72 lakhs in February 1985. Out of these 3.72 lakhs pieces, 2.92 lakhs were repaired till then at a cost of Rs. 20.14 lakhs. The total value of the 3.72 lakhs defective pieces was Rs. 10.42 crores.

Rectification of the defect by use of non-magnetic metal clips also did not prove to be a satisfactory arrangement. Despite this reinforcement, the defect of lid detachment persisted. A new defect was also noticed in these repaired pieces; they were not totally non-magnetic.

The other defect of cracking in the body of the ammunition was reported by one of the ammunition depots in March 1985. The ammunition developed cracks in its body containing the explosive material resulting in exposure of filling and its deterioration in storage. This defect was mostly confined to empty bodies supplied by two firms and it was felt that the defect could be due to use of re-cycled material instead virgin material. A few cases of the defect of body/lid cracking was noticed in respect of ammunition manufactured in 1982. The necessity of initiating large scale remedial measures were not contemplated prior to 1985.

Taking note of the above defects, in March 1985, orders were issued to suspend further repair of the ammunition. Its use even for practice purpose was also not acceptable to the users.

The Army Headquarters intimated in November, 1986 that:

- (i) 100 per cent survey by the DGI was in progress. Till 17th September 1986, only 4.5 per cent of the total stock could be surveyed. Of this, 47 per cent was declared Serviceable, 20 per cent repairable and 33 per cent stock costing Rs. 54.11 lakhs was found unserviceable.
- (ii) Any metal clip would be detectable by a latest device whether the metal is magnetic or non-magnetic. In March 1986, the DGI decided to do away with the use of metal clips altogether.
- (iii) A technical group has been convened to study the condition of ammunition, design aspect and to identify the repair agency as well as to prepare a fresh repair schedule.
- (iv) Final decision regarding write off of the loss due to premature downgradation, measures taken towards improvement of quality of material at pre-production stage and prospects of recoverable material from downgraded ammunition for reuse would be known on finalisation of recommendations of the technical group.

To sum up:

Although defects in ammunition were noticed in 1975, the quality of ammunition segregated for repairs rose from 1.7 lakh pieces in 1980 to 3.72 lakhs in 1985 valued at Rs. 10.42 crores approximately. No effective measures were taken to rectify the defects in the ammunition produced



side by side as similar defects were also noticed in the ammunition of 1981 to 1984 manufacture. Ammunition costing Rs. 10.42 crores was unacceptable to the users.

An expenditure of about Rs. 20.44 lakhs incurred on the repair of the ammunition had also become nugatory, as the repaired ammunition also developed the same defects.

Of 4.5 per cent of the all India stock surveyed upto 17th September 1986, 33 per cent of the ammunition costing Rs. 54.11 lakhs had been declared unserviceable. The result of survey of the remaining 95.5 per cent of the all India stock is awaited.

Action taken to improve the quality of material at pre-production stage, identification of repair agency, repair of repairable quantity/prospects of recovery of material for reuse from down-graded ammunition and write off of loss remain to be finalised (November, 1986).

The case as referred to the Ministry of Defence in June 1987 and their reply has not been received (October, 1987).

APPENDIX II

*Conclusions and Recommendations*

Sl. No.	Para No.	Ministry Department concerned	Conclusion Recommendation
1	2	3	4
1	9	Defence (Deptt. of Defence Production and Supplies)	The Committee note that the first defect of lid detachment from the body of the ammunition which was being manufactured and supplied by the Ordnance Factories to the Army since 1964, was noticed only in 1975. For reasons not very cogent, at this stage the matter was not taken up seriously and the defect was sought to be removed by local repairs. When this mode of repair did not prove effective, the Director General Ordnance Services reported the matter to Director General Inspection (now Director General Quality Assurance) in March 1977. The Director General of Inspection attributed the defect to inadequate fusing of welded material between the ammunition body and the lid at the manufacturing stage.
2	10	do.	The Committee find that inspite of the fact that the operational requirement for this ammunition was inescapable, the defect of lid detachment from the body was not given the urgency and seriousness it deserved even after March 1977. A repair schedule was prepared in September, 1978 and repair process was to be

tried out after a period of 10 months at an Ordnance Factory in July, 1979. Since the factory could not undertake repair work it was decided by the Ministry in December, 1979 that the repair should be arranged by the Director General Ordnance Services. It was decided at this stage to repair the ammunition by rewelding of the loose|detached lids by PVC welding rods. The repair work was ultimately undertaken only in 1980. The Committee are concerned to note that it took an abnormally long period of about 5 years in commencing this repair work after detection of the defect in 1975. The Committee cannot but deprecate that a matter involving defence preparedness of the country was not treated seriously and earnest efforts do not appear to have been made to solve the problem promptly. The Committee hope that the Government would draw a lesson from this sad experience and gear up their machinery adequately so that such challenges are met effectively as the country cannot afford to take any chances in items concerning the defence preparedness of the country.

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do.

The ammunition repaired in 1980 again developed the same defect of lid detachment from the body. The first Investigating Committee to go into the causes of the defect of lid detachment from the body and to suggest remedial measures was constituted on 30.4.1981. This Committee found that the main causes of ineffective welding was the existence of improper and insufficient instructions regarding process of repair, use of non-standard apparatus and lack of understanding of important aspects of the

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welding process. The Committee strongly deplore the lack of seriousness on the part of the concerned authorities, as borne out by the findings of the Investigating Committee to ensure proper arrangements for the repair of defective ammunition. The Investigating Committee recommended that stainless steel non-magnetic clips should be used in the ammunition to strengthen the welded joints of the ammunition body and lid, and that these clips should be provided in repaired ammunition pieces also. The Committee note that rectification of the defect by use of non-magnetic metal clips also did not prove to be a satisfactory arrangement. The Committee would like the Government to take urgent steps to strengthen adequately the implementing and monitoring machinery pertaining to defence store items of sensitive nature so that situations of this type do not recur in future and defence requirements of the country are not adversely affected.

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**Defence (Deptt. of Defence  
Production and Supplies)**

The Committee are deeply concerned to note that the authorities failed to remove the defect of lid detachment from the body, which was noticed in the ammunition as early as in 1975, inspite of the various repair measures taken from 1980 till March 1985. As borne out by the findings of both the Investigating Committees constituted in 1981 and 1985, the incidence of reopening of lids of repaired ammunition was due to inadequate care during repairs, which is highly deplorable. It is further distressing to find that

while the repeated processes of repair were going on, new ammunition manufactured and supplied also suffered from the same deficiency. The Ministry stated that the production of the ammunition could not in the meantime, be stopped due to its operational requirements. According to the Ministry of Defence, the expenditure involved in carrying out repair activity at the depot was to the tune of Rs. 785157. Further, the cost of surplus material left unused at the time of suspension of repairs in February 1985 was Rs. 142194. The Committee deprecate that apart from above wasteful expenditure store items worth Rs. 10.42 crores remained unused for a considerably long time which is clearly indicative of faulty planning in a vital matter concerning the defence of the country. It is imperative that the Ministry should draw appropriate lesson from this sad experience and take effective measures in future to avoid gross mis-utilisation of meagre resources of the country.

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- 5      31      Defence (Deptt. of Defence Production and Supplies)      The second defect of cracking in the body of the ammunition was reported in March 1985. Both Central Institute of Plastic Engineering, Madras and National Chemical Laboratory, Pune on carrying out the defect investigations on cracked ammunition had intimated that the used material LDPE was generally susceptible to environmental stress cracking. 100 per cent survey of the ammunition in depots has since been completed by DGOS, as a result of which the cost of the ammunition declared repairable and those declared unserviceable was stated to be of the order of Rs. 598.55 lakhs and Rs. 127.50 lakhs, respectively. The cracked
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ammunition is proposed to be retrieved by providing the recommended coating. Cracked ammunition so retrieved were subjected to user's trials on 10th and 11th April 1987 and were found satisfactory. According to the Ministry the cost and time involved in repairing the defective ammunition will be approximately Rs. 197 lakhs and one and a half years, respectively.

6 32 Defence (Deptt. of Defence  
Production and Supplies)

It is highly distressing to note that in spite of the fact that ARDE, Pashan had confirmed the technical suitability of the ammunition repaired by coating in September 1987 no tangible steps have so far been taken to initiate the repair measures. Even the case for obtaining the Ministry's approval in principle for the repair job has not been processed so far. The Committee strongly condemn this lackadaisical approach on the part of the concerned authorities in spite of the operational requirement of the ammunition and also when an exorbitant amount of about Rs. 725.75 lakhs being the cost of the defective ammunition remains indefinitely locked up unused. The Committee need hardly stress that urgent steps should be taken to repair the costly defective ammunition expeditiously, keeping in view the remaining shelf life of the defective ammunition. The Committee would like to be apprised of further steps taken in this direction in repairing the defective ammunition and the cost involved in the entire operations.

7 36 Defence (Deptt of Defence.  
Production and Supplies) The Technical Group was constituted on 22 August, 1986. This Technical Group held its first meeting on 29 November, 1986. It is regrettable that the second meeting of this Group for consideration of a very important and serious matter was held only after a period of more than one year on 8 December, 1987. The minutes of these two meetings were circulated to all concerned on 27 January, 1987 and 18 March, 1988 respectively. In the opinion of the Committee the above situation reflects very poorly on the working of the Defence Ministry in the matter as vital as the defence preparedness of the country.

8 42 Defence (Deptt. of Defence  
Production and Supplies) The Committee are shocked to note that out of the 9 suppliers of empty bodies between 1980 and 1984 firm A has supplied upto 58.6 per cent only under the category of serviceable pieces, firm B has supplied upto 75.8 per cent and firm D upto 80.5 per cent. If as intimated to the Committee, the quality checks on release of raw materials before consumption and scrutiny of the supplies at the time of taking delivery at the ordnance factories were as efficient as is required to be, the Committee wonder how a substantially large number of defective pieces were procured during 1980 to 1984 particularly from the 3 firms mentioned above. The Committee are convinced that lack of quality checks and failure to enforce the prescribed standards had resulted in acquisition of a large number of bad stock over the years, requiring further expenditure on repairs. The Committee recommend that the entire

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issue as to the observance of the prescribed procedures should be examined by an independent Committee and responsibility fixed for the substantial loss that occurred to the exchequer due to apparent failures in performance of the prescribed duties by some of the concerned officers.

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