
	<p>Government of India Ministry of Defence Ordnance Factory Board "AYUDH BHAVAN" 10-A, S. K. Bose Road Kolkata - 700 001</p>	 <b>OFB</b>
<p>Tel : (033) 2213 0281 (DDG/QCS) Tel : (033) 2210-0823 (Dir./QCS)</p>	<p>FAX: (033) 2210 7629</p>	
<p>No.108/QRM(Armt)/TS/QCS</p>		<p>Date:27.12.2016.</p>

To  
Directorate of Quality Assurance (Armt.)  
Govt. of India, Min. of Defence  
Department of Defence Production (DGQA)  
'H' Block, P.O. - Nirman Bhawan  
NEW DELHI - 110 011.

(Kind Attn: Shri Jatindra Pal Singh, SSO-II)


**Sub:** Draft minutes of 27<sup>th</sup> Quarterly Review Meeting on Defect/ Accident investigation of armament stores manufactured by Ordnance Factories held on 30<sup>th</sup> Nov, 2016

**Ref:** DQA(Armt) letter no. S/42/DI-QRM/DGQA/DQA (A)/TC Dated Nil

The draft minutes for the 27<sup>th</sup> Quarterly Review Meeting on Defect/ Accident investigation of armament stores manufactured by Ordnance Factories held on 30<sup>th</sup> Nov, 2016 has been studied and some amendments are proposed to incorporate in the final minutes. Ammendments are proposed for Appendix 'A', 'B', list of attendee and concluding remarks also. **The proposed changes are marked as italicized and under lined for addition and strike through (cut mark) for deletion.** The relevant pages where changes/amendments are proposed is also enclosed herewith.

It is requested to incorporate the same and issue final minutes of meeting accordingly.

Encl: 13 pages.

  
(M.M. Das)

Dy. Dir./QCS

For Director General, Ordnance Factories

(फैक्स) /ई-मेल

दूरभाष: 2301 2041

फैक्स: 2301 3120

ई मेल: armt-dgqa@nic.in



भारत सरकार, रक्षा मंत्रालय

रक्षा उत्पादन विभाग (गु.आ.म.नि.)

गुणता आश्वासन निदेशालय (आयुध)

निर्माण भवन, पोस्ट नई दिल्ली -11

संख्या:- S/42/DI-QRM/DGQA/DQA(A)/TC

दिसंबर 2016

**The DGOF & Chairman**  
OFB, 10A SK Bose Road  
Kolkata-700001

(Kind Attention Shri Rajat Paul, Dir ,QCS)

**27<sup>TH</sup> QUARTERLY REVIEW MEETING ON DEFECT/ACCIDENT**  
**INVESTIGATION OF ARMAMENT STORES MANUFACTURED BY**  
**ORDNANCE FACTORIES**

Draft minutes of meeting of 27<sup>th</sup> QRM is forwarded herewith for vetting please. Please ensure to return the same duly vetted through return email/fax by 23 Dec 2016.

**संलग्नक:-** उपरोक्तानुसार

---sd----

(डॉ. जतिन्द्र पाल सिंह)

व.वै.अधिकारी-II

सहायक निदेशक (गु.आ./त.स.)

कृते अपर गु.आ.म.नि. (आयुध)

## MINUTES OF MEETING 27TH QRM

27th QRM was held on 30th Nov 2016 at SQAE (A) Delhi Cantt under Chairmanship of Maj Gen Shamsher Singh, ADGQA (Armts). The Chairman gave welcome address to all the stake holders present in the meeting and expressed his gratitude to all agencies for their involvement in improving the Quality of the stores being supplied to the Defence Forces. Chairman appreciated the joint efforts of all stake holders for providing support in executing good Quality control practices, storage, handling and conducting correct drill practices which helped to achieve the confidence of the soldier. Further expressed to continue the job as a combined team in future also. The Chairman requested Sh. CL Maurya DDG/QCS, OFB to share his experiences, wherein he addressed the forum and ~~stated the improvements of Quality being done by incorporating changes suggested by DGQA time to time~~ *stated that concerted effort by all stake holders through QRM is resulting in improvement in quality of products.* Rep MGO, Col Amit Kasodekar, Dir / EME (Armt, SA & A) stated the requirement of continued efforts in the same direction to arrest manufacturing lapses for further improvement in the Quality of stores. The Chairman expressed to have a fruitful discussion in this QRM. The following were present:-

### DQA (Armts)

- (a) Brig Jai Dev Singh, Controller, CQA (SA) Ichapur
- (b) Brig Nishchaya Raut, DDG (Wpn), HQ DQA (A)
- (c) Brig Ravi Bhardwaj, Controller, CQA (W) Jabalpur
- (d) Brig S. Sunder Rajan, Controller, CQA (AVA) Avadi
- (e) Shri K Chandrasekaran, Offg DDG (SA & I), HQ DQA (A)
- (f) Col PC Jena, Dir (Wpn), HQ DQA (A)
- (g) Shri AV Shinde, Jt Controller, CQA (A) Kirkee
- (h) Lt Col P.D. Bahuguna, JDQA (TC), HQ DQA (A)
- (j) Shri SS Mungse, Dy Controller, CQA (A) Kirkee
- (k) Shri Virendra Singh, JAG (NFSG), CQA (I) Dehradun
- (l) Shri Nagendra Kumar, SSO – I, DDQA (Amn), HQ DQA (A)
- (m) Shri SK Dubey, SSO – I, DDQA (SA), HQ DQA (A)
- (n) Dr. JP Singh, SSO – II, ADQA (TC), HQ DQA (A)
- (o) Shri SK Mallick, Dy Asst. Controller, CQA (SA) Ichapur

### DQA (M & E)

- (a) Shri P Chakraborty, Controller, CQA (MET) Ichapur
- (b) Dr. HC Dwivedi, Jt Controller, CQA (ME) Pune

**ARMY HQ**

- (a) Col Amit Kasodekar, Dir (Armt, SA & A)
- (b) Col Anuj Hajela, Addl Officer, Arty - 4
- (c) Col SK Chhabra, GSO – I, AAD Dte
- (d) Lt Col H Sengupta, Addl Officer, Inf Dte
- (e) Lt Col Surender Singh, JDOS (Amn)/ DGOS
- (f) Lt Col BK Tiwari, TSO – I, HQ Tech GP

**ORDNANCE FACTORY BOARD (Amended)**

- (a) Shri CL Maurya, DDG / OFB
- (b) Shri MN Haldar, DDG / OFBND0
- (c) Shri SK Tiwari, Jt GM, OF Ambajhari
- (d) Shri AK Singh, Jt GM, OFC
- (c) Shri Vijay Mittal, Dir / OFBND0
- (f) Shri VK Srivastava, Jt GM, OFBL
- (g) Shri SD Gurav, Dir, OF Chanda
- (h) Shri AK Choudhary, Jt GM, OF Khamaria
- (i) Shri HK Nanda, Jt GM, OFBL
- (j) Shri Rajat Paul, Dir / OFB
- (k) Shri BV Rao, Jt GM, OFA
- (l) Shri Vivek K. Sharma, Jt GM, GCF
- (m) Shri Akhilesh Kumar, DGM, FGK
- (n) Shri Ashok Kumar, WM, OFAJ
- (o) Shri Naveet Sharma, AWM, OF Katni

2. During proceeding of QRM detailed discussion on Defect Investigation(DI) cases. Previous Agenda Points, New Agenda Points were deliberated upon. Details of discussion and Decision taken are summarized below:

- (a) Summary of DI cases - Appendix 'A'
- (b) Previous Agenda Points - Appendix 'B'
- (c) New Agenda Points - Appendix 'C'

3. There being no more points. 27th QRM concluded with a vote of thanks to the Chair.

## CONCLUDING REMARKS OF ADGQA (ARMTS)

1. Classified Major Defects of Ammunition and their acceptance number in Dec may be shared with DGOS by CQA (A) in order to avoid segregation of lots as Ammunition are sentenced as per AQL.
2. To avoid loss of evidence and to conclude Defect Investigation logically, samples of Barrel should not be cleaned thoroughly before sending to CQA (Met).
3. To meet the urgency of User, OFB to supply 20 Nos. of Buffer Rod by 31 Mar 2017, and 15 Nos. by June 17 at the rate of 05 Nos. per month.
4. X – Rays films of the shells to be maintained for ammunition store by QC dept of Fys concerned for traceability and meaningful Defect Investigation. CQA (A) to detail team to OFBL to examine the same.
5. Feasibility to be explored at Corps Zonal Workshops for creating facility in respect of cutting of barrels. In this connection SOP to be prepared and issued by CQA (Met), Ichapur.
6. Range Table validation for higher Calibre ammunition may be carried out periodically by user, to attain confidence.
7. Collegiately it has been decided that 155 mm Kranspol Ammunition of 1999 Vintage may be declared Unserviceable.
8. OFB was requested to expedite MSF Ichapur for cutting barrel and preparation of Test pieces so that timely Metallurgical investigation could take place under aegis of CQA (Met) Ichapur.
9. DGOS may decide to earmark “Base year” for declaring Amn lot (105 mm IFG Amn) unserviceable.
10. Focus of QRM should be more towards Quality improvements rather than closure of DI.
11. ~~100% of Ammn (Screw filled) to be x rayed for initial lots (at least 3 Lots) to establish confidence. This action to be implemented as per MGO's requirement.~~ Regarding X-ray of shell 125mm HE, MGO emphasised to carry out X-Ray of 100% screw filled ammn for initial lots (at least 3 lots) to establish confidence.
12. ~~OFB to take up the case for clarification with OEM regarding use of HE Rds for temperature tolerance as per Indian conditions.~~
13. Rep OFC confirmed that Heat Treatment Plant will be ready by 2018 for 125 mm HE Amn.
14. ~~Heat Treatment Process adopted by OFB to be vetted by CQA(Met) for all weapon & Ammn store.~~ OFB may ask for vetting of Heat Treatment Process by CQA (Met) for Weapon & Amn stores.
15. BBU units to be backload by OS Dte to OFCH and OFB to plan training of user reps on replacing BBU.
16. CQA(A) to continue Pre-QRM while remaining AsHSP to discontinue.

Caliber 125mm

APPENDIX 'A'

S No	Control No.	Item	Unit	Discussion / Decision	Action	Info
33	AMN : A/129/14 <u>CQA (AVA)</u> - CQA(AVA)/08/2014 & CQA(AVA)/08A/2014	AMN: 125 mm HE - SHELL LOT NO - 184 BL 10/2004 WPN: NB 581/03166 (T-72) 125 MM HEAT- SHELL LOT NO - 218 A OC 08/05 WPN: NB 10674HO (T-72)	2 LANCER	<ul style="list-style-type: none"> <li>Report of critical examination awaited.</li> <li>Investigational Dynamic Proof Firing results awaited.</li> <li>Samples of Fuze B-15 awaited.</li> </ul>	SQA(E(A) Cossipore CPE Itarsi DGOS	All
34	AMN : A/123/14 CQA (AVA) - CQA(AVA)/T-90/03/2014	125 MM HE SHELL LOT NO - 383 BL 10/2011 BARREL NO.KB 0032 (EX-RUSSIA) (T-90)	ACC & S	<p>The case is under closure. The following were discussed <u>Traceability of X-ray film</u>:-</p> <p>(a) <del>It GM/OFBL stated that defective shells are sentenced for RFR and the same are being boiled out and refilled. X-ray films for defective shells and shells refilled after RFR will be provided.</del></p> <p>(b) (a) Chairman suggested that CQA(A) will deploy a team within 15 days to verify the X-ray films availability and their validation at OFBL.</p> <p>(c) (b) OFB requested <u>suggested</u> for User rep deputation also and</p>	CQA(A) Kirkee OFBL	All

**APPENDIX 'A'**

				<p>the same was accepted. <del>(e)</del> (c) OFBL has to provide the X-ray films of involved lot within a week.</p>		
35	<p>AMN : A/71/15  <u>CQA (AVA)</u>            CQA(AVA)/02/201            5            CQA(AVA)/03/201            5</p>	<p>BARREL NO. L/3807,            L/4300 (T - 72)            AMN: 125 mm HEAT            SHELL LOT NO 51R OC            10-05            152 mm HE LOT NO 310 A            OC 02-08</p>	50 AR	<p>Case is under closure due to non receipt of samples. During discussion, Dir (Instrument) intimated that automatic barrel cleaning m/c is deployed for cleaning of barrel after firing. It was submitted that excessive cleaning of barrel at one place may cause ovality in Bore Dia of barrel. In case of such ovality, DR are raised as bulge. Dir MGO/EM stated that the such instances to be brought to them for taking corrective actions.</p>	CQA(A) Kirkee	All

**APPENDIX 'A'**

S No	Control No.	Item	Unit	Discussion / Decision	Action	Info
49	CQA(A): A/18/15/FB CQA(W) : CQAW/A/07/03 /2015	SHELL 130MM HE /FVC GUN 130 MM M-46 REGD NO : N-7876 (CATAPULT MOUNTED ON ARJUN TK)	02 MED REGT	Samples awaited at MSF Ichapur	DGOS	All
50	CQA(A) : A/31/15/FB CQA(W) : CQAW/A/15/03 /2015	GUN 130 MM M-46 REGD NO : N-7984D	22 MED REGT	Draft final co-ordinated report under compilation.	CQA(W) Jabalpur	All
51	CQA(A) : A/41/15/FB CQA(W) : CQAW/A/27/05 /2015	GUN 130 mm M-46 REGD NO : NPT- 4133	10 MED REGT	Cut pieces of barrel and muzzle brake awaited from OFB and FGK.	OFB & FGK	All
52	CQA(A) : A/40/15/FB CQA(W) : CQAW/A/09/03 /2015	GUN 130 mm M-46 REGD NO : N-6283E	10 MED REGT	Cut pieces of barrel and muzzle brake awaited from OFB and FGK.  The following were proposed: (a) Barrel cutting machines to be installed at base workshop to avoid material transportation. (b) Feasibility study to be	OFB  <a href="#">CQA(A)</a>	All

**APPENDIX 'B'**

**PROGRESS ON MINUTES OF PREVIOUS QRM**

Sr. No.	Agenda Point	Discussion/Decision during 27 <sup>th</sup> QRM	Action	Info
1	<p>(a) <b>Painting of Obturating Band (OB) to be discontinued (OFAJ)</b></p>	<p>ADGQA(A) asked COA(A) to intimate the present status. Rep COA(A) intimated that the point has already been settled. ADGQA(A) directed that the point regarding checking of minimum thickness of external coat be included in the ATP of shell 125mm HE production.</p> <p><b><u>Point is closed.</u></b></p>		All
	<p>(b) Automation of shell Painting (OFAJ)</p>	<p>Rep OFB intimated that all out efforts have already been done for external painting in line with Brig Niraj Pathak Committee Report. Also they are expediting the procurement action for installation of automatic painting plant. <i>OFB mentioned that the Brig Niraj Pathak committee has not recommended for automation of internal painting. Committee has recommended to ensure that the excess paint is removed by sucking out. Accordingly, Internal painting of the shell will be carried out by spray painting &amp; excess paint, if any will be removed by way of pneumatic suction arrangement. However they expressed inability over the internal painting with the plea that the same has also not been specified in OEM documents. The issue was deliberated in depth in which ADGQA(A) directed OFB to take up the issue with OEM and seek clarification in this regard.</i></p>	OFB	All
	<p>(c) Introduction of online Ultrasonic Testing Machine for crack detection (OFAJ)</p>	<p>No point was found to be noteworthy for discussion and decision. ADGQA(A) was briefed about the progress which was satisfactory.</p> <p><b><u>Point is closed.</u></b></p>		All
	<p>(d) Automation and up-gradation of X-ray machine</p>	<p>Rep OFB intimated that X-Ray of screw filled shells is not required. However, 10% X-Ray may be carried out for initial lot to gain the confidence. <i>the decision for 100% X ray, as decided during the previous QRM is required to be reviewed and brought to 10% initially.</i> Rep MGO stressed for 100% X Raying should be carried out in initial three lots. The issue was deliberated in depth in which Rep OFB stated that issue regarding 100% X raying for screw filling will be examined in terms of capacity and capability at their end. ADGQA(A) stated OFB to give feedback in this regard at the earliest and also to adhere the PDC for installation of Automatic X Ray machine.</p>	DGOS OFB COA (A)	All

**APPENDIX 'B'**

	(e) Temperature tolerance limit of HE shell .	The issue regarding non receipt of any feedback from ARDE/HEMRL was discussed. ADGQA(A) asked OFB to take up the issue with OEM for clarification in line with procurement action of 125mm FSAPDS.	OFB	All
	(f) Study to analyze behavior pattern of reworked propellants.	The point was not discussed.	ARDE	All
2	Dynamic Balancing of 130 mm	Rep CQA(A) stated that the draft Brig Shardendu Committee report has been received by them. Rep OFB intimated that 01 lot has already been manufactured at OFA , filled at OFBL and issued to 18 FAD for early exploitation. After exploitation, further analysis will be carried out. ADGQA(A) asked rep MGO for early exploitation.	DGOS	All
3	Cartridge 105 mm IFG with Black Patches	Rep OFA intimated that a pilot lot of 500 Nos. of chromate passivated Cartg cases have already been manufactured . Out of which 400 Nos. have been checked and found OK. However certain <i>visually differential appearances defects</i> have been observed in the remaining which are under rectification. ADGQA (A) directed CQA(A) to check the serviceability of cartg case in line with recommendations of Task Force for further action.	CQA(A) Kirkee	All
4	Cartg 130 mm: Hairline Crack on Cartridge Case	Rep CQA(A) intimated that samples from all commands except 08 samples from Eastern Command have been positioned at CPE Itarsi and dynamic firing is scheduled from 08 Dec 2016 onwards. ADGQA(A) intimated that further call on the issue will be taken up after the dynamic firing.	CQA(A) Kirkee	All
5	Cu-Ni DB Material: 130 mm	Rep OFB intimated that the back loading of defective samples is in progress for spectro analysis. Rep DGOS has also confirmed the back loading.	DGOS OFB	All
6	Use of defective Paint and OB	Rep DGOS confirmed that instructions for back loading has been received and will be followed on priority.	DGOS	All

**APPENDIX 'B'**

	material		
<b>Sr. No.</b>	<b>Agenda Point</b>	<b>Action</b>	<b>Info</b>
7	Defect/ Accident investigation of 105 mm FSAPDS (Tank) Amn	MGO	All
8	Balance Qty of Amn lot involved in DI held with DGOS not being informed.	DGOS, MGO	All
9	Capping extension of shelf Life of Amn	DGOS	All
10	HT Cast code	OFB CQA(A)	All

**Discussion/Decision during 27<sup>th</sup> QRM**

The issue regarding non receipt of any reply from ARDE has been deliberated. ADGQA(A) asked MGO rep to take a call on this issue. ADGQA(A) also asked MGO rep to take a decision at their end.

Rep DGOS intimated that directives have already been issued to all Commands regarding mentioning of storage condition, balance qty of amn, temperature limit etc in the MGAOC report wef 01 Jan 2017. Rep MGO stated that the revision of SAO/2/S/2006/MGO is almost completed and the draft is under approval of Mod. The information regarding balance Qty is also covered in revised SAO. It was assured that the MGAOC report will cover all the aspects in this regard.

As per decision taken during the meeting, requisite data was forwarded to MGO by CQA(A) during Oct 2016. However, DGOS to provide data concerning 1<sup>st</sup> Depot Proof and exploitation of the selected stores if the shelf life is capped. The aspect of Inventory Management of these stores, needs to be commented upon by DGOS. Rep DGOS informed the house that action is in hand to collect the requisite data and the same will be forwarded to CQA(A) in due course.

Rep OFB confirmed that the new Heat Treatment Plant is likely to be supplied by Nov 2017 and production will commence wef ~~Jan 2018~~ the financial year 18-19. Rep OFB stated that till then, status quo to be maintained. ADGQA(A) ~~directed~~ asked OFB to maintain the track.

**APPENDIX 'B'**

11	Early Exploitation of Amm	Point has already been covered during the discussion on points against Sr No. 9 above.	DGOS	All
12	First Depot Proof	Rep DGOS intimated that only one case is pending at their end. The requisite information will be forwarded to CQA(A) in due course of time after implementation of revised SOP on Defect Investigation.	DGOS	All

**APPENDIX 'B'**

Sr. No.	Agenda Point	Action	Info
13	<p>Replacement of Unserviceable BBU Unit</p> <p>Rep DGOS has raised the issue regarding replacement of unserviceable BBU and the same is not advisable due to safety constraints. He further stated that action is in hand to backload all the affected shells by railway to <del>CAD-Pulgaon</del> OFCH. <del>OFB mentioned that as per the decision of previous QRM, BBU unit of one lot (Qty 2000) to be carried out to OFCH and the reps of DGOS to be associated during dismantling of BBU unit for training at OFCH and the dismantling fixtures to be issued to DGOS.</del> ADGQA(A) asked OFB to finalise the schedule for all the activities related to replacement of BBU and inspection after the replacement. He further directed COA(A) to inspect all the shells after the replacement. <del>Rep OFB stated that once the stores received at CAD Pulgaon, the requisite schedule will be forwarded to all concerned.</del></p>	OFB	All
14	<p>First and last round of the day should invariably be fired using RVC. As per MoM held at Arty Dte on 20 Mar 2015, FVC should not be fired as warmer / first round:</p> <p>Advisory in this regard has already been issued by COA(A).</p>	-	All
15	<p>The Drawings of Component under metallurgical Investigation to be provided by AHSPs to COA(Met)</p> <p>Point was implemented.</p> <p>Point is closed</p>		All
16	<p>Heavy Pitting in Barrel of 120mm Mortars</p> <p>Controller COA(W) has intimated that the firing scheduled at CPE Itarsi on 06-08 Dec 2016. OFB has already been intimated to place the Mortars and ammunition at CPE Itarsi before firing.</p> <p>ADGQA(A) asked Controller COA(W) to show before and after bore measurement details during the said trial. He also directed that the trial report along with analysis be submitted to all concerned at the earliest.</p>	COA(W)	All

## APPENDIX 'B'

Sr. No.	Agenda Point	Discussion/Decision during 27 <sup>th</sup> QRM	Action	Info
17	Excessive wear in Barrel of LFG / IFG	The issue was deliberated in detail in which Rep MGO stated that range at School of Arty, Devlali is not feasible due to safety concern. ADGQA(A) reiterated that the subject firing can also not be undertake at CPE due to safety constraints. Rep MGO stated that firing at MFFR is feasible. ADGQA(A) directed CQA(W) to deliberate and discuss the issue with MGO so as to conclude a concrete decision.	CQA(W) MGO	All
18	Accident / Defect of 105 / 37 mm LFG:	Rep OFB intimated that they will supply 20 Nos. of Buffer Rod by 31 Mar 2017 and balance will be supplied by Jun 2017.	OFB	All
19	Exudation of 155 mm Shell ERFB	Rep CQA(A) intimated that the locations of all affected shell lots have been received from DGOS. Team Ex OFBL and SQAE(A) Bolangir will be reporting at the locations for visual inspection and drawl of samples. Rep DGOS confirmed that after segregation, the affected shells will be backloaded after inspection by the Team. Further action will be taken after inspection.	CQA (A) DGOS	All
20	Implementation of action pls by OFB on Defect Investigation .	The issue was deliberated in depth and ADGQA(A) <del>expressed his concern on implementation of the suggested remedial measure by OFB asked CQA(A) to confirm the implementation. Rep of OFB mentioned that the implementation status of remedial measures received for quarter ending Dec. 15 was already presented in 26<sup>th</sup> QRM. No further report of remedial measures has been received at OFB. He directed OFB to give PPT presentation on implementation measures during the 28<sup>th</sup> QRM...</del>	OFB HQ DQA(A)	All
21	The quarterly report on progress of DI cases to be given to OFB.	The first report for QE Sep 2016 has already been forwarded to OFB on 12 Oct 2016. The reports for previous quarters are under compilation at CQA(A) and will be forwarded at the earliest.	CQA(A)	All