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DATE: 5/22/57 INIT. J.E.B.

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CAUSES AND CURES OF REJECTS

MOUND LABORATORY-MONSANTO
Central File No. 57-8-51

Introduction

A thorough analysis of reject causes for Mound 1E26 production Lots 5011 through 5038 has been made. These data include only those rejects which occur in operations subsequent to lot numbering. Results are summarized in the attached table. The following paragraphs contain a brief discussion of reject causes and some proposals for ways of reducing rejection rates.

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Discussion

1. Head or Wire Assembly - 0.39% rejection rate

   No detailed discussion necessary.

2. Well Depth - 5.0% rejection rate

   a. Cause

      This relatively high rejection rate is due to a non-flat condition of heads used in fabrication of our early lots. This has since been corrected. A summation of the last five lots in this study, 5034 through 5038, shows a rejection rate of 2.45 per cent.

   b. Proposal

      A rejection rate of 2 - 3 per cent for an operation of this type seems normal to us. We, therefore, have no specific proposal to offer at this time.

3. PETN Loading - 2.0% rejection rate

   a. Cause

      The two major defects in our PETN loading operation are chipped PETN surface (1.15 per cent) and foreign material in the PETN (0.49 per cent). The summation of Lots 5034 through 5038 indicates no improvement in the rejection rate for chipped PETN and a reduction in the rejection rate for foreign material in the PETN to 0.13 per cent. This has been effected by more care in handling and improvements in operating technique.

GROUP 1
Excluded from automatic downgrading and declassification

MOUND DECLASSIFICATION REVIEW
1ST REVIEW-DATE 4/2/98
AUTHORITY ☐AOC ☒ADC ☐ADD
NAME T. M. FLANAGAN
2ND REVIEW-DATE: 4/8/98
AUTHORITY: ADD
NAME: [illegible]
DETERMINATION
1. CLASSIFICATION RETAINED
2. CLASSIFICATION CHANGED
3. CONTAINS NO DOE CLASSIFIED
4. COORDINATE WITH:
5. CLASSIFICATION CANCELLED
6. CLASSIFIED INFO BRACKETED
7. OTHER (SPECIFY):

b. Proposal

Chipped PETN is due normally to defects in the loading tools causing the stemple to pick up powder. Closer control over the condition of the stemples may help to allevinate this difficulty.

4. Tetryl Pellet - 2.3% rejection rate

a. Cause

Rejects for these reasons are due entirely to handling the pellets for gaging, assembling, storing, and other operations.

b. Proposal

We have recently started using a new type of handling tray for this pellet and are exercising extreme care in all operations involving the tetryl pellet.

5. Operating Techniques - 6.3% rejection rate

a. Cause

Major causes for rejects due to assembly techniques are loose disks (3.90 per cent) and glue in the well (1.30 per cent).

b. Proposal

Many of the rejects due to gluing faults occur in the first day or two an operator is on this particular job. The rejection rate for any one operator usually decreases as she becomes more proficient in the techniques of gluing.

We have continually urged the workers to use more glue in the disk-assembly operation. This they have done until, at present, we are getting some few rejects for excessive glue on the surface of the detonator.

We feel that the present method of inspecting for loose disks is unsatisfactory to all concerned. It lacks uniformity from inspector to inspector. Neither do we feel that all slight movements of the disk under probing indicate the lack of a seal.

6. Assembly Gaging - 0.28% rejection rate

No detailed discussion necessary.

7. PBX Pellet - 8.4% rejection rate

a. Cause

Rejects for these reasons are due primarily to handling of the pellet in gaging, assembling, storing, and other operations and to damage incurred in seating tools and gluing fixtures. In several of these lots cracks in the PBX pellet were a major cause for rejection but these accounted for only 0.6 per cent of the rejects in Lots 5034 through 5038.

b. Proposal

We have made a determined effort to decrease chipping and other damage to these pellets with no marked success. We propose that a study be made to ascertain whether a relaxation in the specifications for chips and minor defects in this pellet would have a detrimental effect on the detonator.

8. Disk - 0.72% rejection rate

a. Cause

Most of the rejects are caused by damage in gluing fixtures or by chipping or cracking the edges while probing for loose disks.

b. Proposal

Closer control over sharp edges in gluing fixtures and a revision in method of inspecting for loose disks.

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Summation of Rejects in Inert Assembly, HE Assembly,
Final Inspection for Lots 5011 through 5038

	No. of Rejects
1. Head or Wire Assembly	
Foreign matter in head plastic	2
Illegible engraving	5
Faults in wire-cuts, nicks, scratches	1
High bridge wire	1
Bridge wire not straight	7
External HV breakdown	114
Resistance infinite	1
Internal HV breakdown	2
Poor cladding	3
Head cracks or chips	43
Type not legible	4
Lot number not legible	27
Serial number not legible	6
Contact pins not properly formed	3
Total	219 (0.39%)
2. Well Depth	
Too deep	1,520
Too shallow	75
Not parallel	1,174
Foreign matter (not glue) in well	24
Total	2,793 (5.0%)
3. PETN Loading	
Too heavy	2
Too light	10
Too high	92
Too low	74
Foreign matter in PETN	279
Chipped surface	656
Smeared in tool	24
Total	1,137 (2.0%)
4. Tetryl Pellet	
Chipped bottom ID	77
Chipped top ID	719
Chipped top OD	168
Surface defects	345
Total	1,309 (2.3%)

	No. of Rejects
5. Operating Techniques	
Glue in well	771
Glue on PETN	2
Poor head-pellet glue bond	3
Loose disk	2,183
Glue on OD of large pellet	235
Evidence of poor workmanship	4
Groove in disk	167
Glue on disk	57
Excessive glue, head-pellet	14
Wrong PETN batch	94
Dropped in assembly	15
Dropped in final inspection	11
Total	3,556 (6.3%)
6. Assembly Gaging	
Assembly too low	6
Disk too deep	1
Disk above flush	9
Disk not level	140
Total	156 (0.2%)
7. PBX Pellet	
Chipped	166
Surface defects	75
OD large	1
OD small	2
Minor defects	1,412
Numerous small defects	152
Cracks	1,211
Inclusions in edges	8
Inclusions outside corner areas	279
Chips outside corner areas	1,093
Numerous small porous areas	24
Hole in OD	128
Not uniform in appearance	191
Water and oil marks	3
Total	4,710 (8.4%)

	No. of Rejects	
8. Disk		
Cracks	92	
Edges not sharp, chipped	43	
Not uniform in appearance	1	
Water and oil marks	10	
Inclusions	40	
Hole	208	
Scratched	13	
Total	402	(0.72%)
Grand Total	14,202	(25.5%)