APPENDIX U-6

EXECUTIVE SUMMARY OF THE INVESTIGATION OF POWER SUPPLY, AMPLIFIER BATTERY, TRACKING TAG, AND TAG READER COMPONENTS ASSOCIATED WITH PYOTT-BOONE TRACKING BOSS TRACKER SYSTEM AND MINECOM UHF LEAKY FEEDER SYSTEM

U.S. Department of Labor

Mine Safety and Health Administration
Approval and Certification Center
765 Technology Drive
Triadelphia, West Virginia 26059

November 17, 2011

MEMORANDUM FOR NORMAN G. PAGE
Accident Investigation Team Leader

FROM: JOHN P. FAINI
Chief, Approval and Certification Center

SUBJECT: Executive Summary of the Investigation of Power Supply, Amplifier Battery, Tracking Tag, and Tag Reader Components Associated with the Pyott-Boone Tracking Boss Tracker System and Minecom UHF Leaky Feeder System Recovered from Performance Coal Company's Upper Big Branch – South Mine

The Approval and Certification Center (A&CC), as requested by Upper Big Branch Mine Accident Investigation Team Leader, Norman Page, conducted a laboratory investigation of power supply, amplifier battery, tracking tag, and tag reader components associated with the Pyott-Boone Tracking Boss Tracker System and Minecom UHF Leaky Feeder System recovered from a fatal mine explosion at the Upper Big Branch Mine-South on April 5, 2010.

The following components were examined. Their locations are as reported on the associated evidence identification tags and/or chain of custody forms, and the administrative file log and/or the physical evidence location map maintained by the accident investigation team:

1. Exhibit No. PE-0087, tracking tag 595, recovered between survey spads 22649 and 22625.
2. Exhibit No. 5-5-10-2, tracking tag 805, recovered off a miner's belt.
3. Exhibit No. PE-0239, tracking tag 584, recovered at the edges of shields 94 and 95.
4. Exhibit No. PE-0072, tracking tag 780, recovered near survey spad 19871, crosscut 102, 15 feet from the track.
5. Exhibit No. B-1-C, tracking tag, recovered from Exhibit No. B1, victim personal effects.
6. Exhibit No. A-23-A, tracking tag* 818, collected at the Ellis portal when victims were brought to the surface.

7. Exhibit No. A-23-B, tracking tag* 793, collected at the Ellis portal when victims were brought to the surface.
8. Exhibit No. A-23-C, tracking tag* 138, collected at the Ellis portal when victims were brought to the surface.
9. Exhibit No. A-23-D, tracking tag* 707, collected at the Ellis portal when victims were brought to the surface.
10. Exhibit No. A-23-E, tracking tag* 826, collected at the Ellis portal when victims were brought to the surface.
11. Exhibit No. A-23-F, tracking tag* 514, collected at the Ellis portal when victims were brought to the surface.
12. Exhibit No. A-23-G tracking tag* 807, collected at the Ellis portal when victims were brought to the surface.
13. Exhibit No. A-23-H, tracking tag* 625, collected at the Ellis portal when victims were brought to the surface.
14. Exhibit No. A-23-I, tracking tag* 569, collected at the Ellis portal when victims were brought to the surface.
15. Exhibit No. A-23-J, tracking tag* 288, collected at the Ellis portal when victims were brought to the surface.
16. Exhibit No. A-23-K, tracking tag* 503, collected at the Ellis portal when victims were brought to the surface.
17. Exhibit No. A-23-L, tracking tag* 810, collected at the Ellis portal when victims were brought to the surface.
18. Exhibit No. B-9-A, tracking tag 546, removed from Exhibit No. B9, victim personal effects.
19. Exhibit No. B-15-D, tracking tag 564, removed from Exhibit No. B15, victim personal effects.
20. Exhibit No. B-10-A, tracking tag 540, removed from Exhibit No. B-10 at the Ellis portal on 04/10/10.
21. Exhibit No. B-11-A, tracking tag 547, removed from Exhibit No. B11, victim personal effects.
22. Exhibit No. B-19-D, tracking tag 526 believed to be personal items.
23. Exhibit No. B-22-B, tracking tag 769, removed from Exhibit No. B22, believed to be personal items.
24. Exhibit No. PE-0196, power supply (initially identified as a tag reader on the Exhibit ID tag), recovered at survey spad 19895.
25. Exhibit No. PE-0196B, sample of dust removed from Exhibit No. PE-0196 at the A&CC intrinsic safety lab.

26. Exhibit No. PE-0138, tag reader recovered outby survey spad 19657 as indicated on the physical evidence location map.
27. Exhibit No. PE-0193, power supply (initially identified as a tag reader on the Exhibit ID tag) recovered at survey spad 20059.
28. Exhibit No. PE-0139, amplifier battery transferred to the A&CC on 11/01/10, recovered outby survey spad 19659 as indicated on the physical evidence location map.
29. Exhibit No. PE-0449, tag reader transferred to the A&CC on 03/02/11, recovered near survey spad 19882 as indicated by the Chain of Custody form.
30. Exhibit No. PE-0450, tag reader transferred to the A&CC on 03/02/11, recovered near survey spad 19643 as indicated by the Chain of Custody form.
31. Exhibit No. PE-0483, tracking tag 570 transferred to the A&CC on 05/09/11, recovered at shield 109.

*These 12 tracking tags were received at A&CC in one box identified as Exhibit No. A-23. To facilitate identification of the individual tag, they were arbitrarily assigned Exhibit Nos. A-23-A, A-23-B, A-23-C, A-23-D, A-23-E, A-23-F, A-23-G, A-23-H, A-23-I, A-23-J, A-23-K, and A-23-L. The administrative file log states that these tags were collected "on 4/9/10 at the Ellis portal when Victims were brought to the surface."

The investigation began with preliminary inspections of the exhibit items numbered 1 to 27 listed above on October 13, 2010. The preliminary inspections included decontamination of items that were considered hazardous material, documenting visual observations, and photographing as-received conditions of the components. The preliminary inspection of item 28 was conducted on November 2, 2010, and the preliminary inspection of items 29 and 30 was conducted on March 9, 2011. The preliminary inspection of item 31 was conducted on May 16, 2011.

Detailed inspections and performance tests were conducted after the preliminary inspections. Pyott-Boone representatives Adam Godsey and Gary Sergent witnessed some of the inspections and agreed to bring the equipment necessary to evaluate the operation the equipment recovered from Upper Big Branch. Performance testing of the first 27 exhibit items, with the exception of the dust sample identified as Exhibit No. PE-0196-B was conducted as part of the detailed inspections with the assistance of the Pyott-Boone representatives. One tracking tag was non-operational. A representative of Pyott-Boone returned on May 18, 2011, to conduct performance testing on the tracking tag identified as Exhibit No. PE-0483. This exhibit was transferred to the A&CC on May 9, 2011. It was found to be non-operational. After changing out the communications printed circuit board, the tag reader identified as Exhibit No. PE-0138 operated properly. Both power supplies operated properly.

Exhibit Nos. PE-0139, PE-0449, and PE-0450 were not performance tested. The

condition of the amplifier battery identified as Exhibit No. PE-0139 precluded performance testing. The tag readers identified as Exhibit Nos. PE-0449 and PE-0450 were transferred to the A&CC in March 2011. Pyott-Boone was requested to recover any tracking data that may be stored in the tag reader memories. However, Pyott-Boone explained that any stored data is non-recoverable once all power is removed from the tag reader. Since any tracking data that might have been recorded post-accident was non-recoverable, performance testing of these two tag readers was deemed unnecessary.

The comparison to approval drawings was conducted following the detailed inspections. A few minor discrepancies between the exhibits and the respective approval documentation on file were noted.

No signs of arcing, sparking, or electrical heating were observed in inspections of any of the exhibits. There is no evidence that any of these exhibits were a source of spark or thermal ignition.