APPENDIX U-4

EXECUTIVE SUMMARY OF INVESTIGATION OF LONGWALL COMMUNICATION SYSTEM COMPONENTS

U.S. Department of Labor

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

November 23, 2011

MEMORANDUM FOR NORMAN G. PAGE
Accident Investigation Team Leader

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

SUBJECT: Executive Summary of Investigation of Longwall Communication System Components 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 Longwall Communication System Components recovered from a fatal mine explosion at the Upper Big Branch Mine-South on April 5, 2010.

The components received were:

1. Exhibit No. PE-0140, Battery.
2. Exhibit No. PE-0142, Battery.
3. Exhibit No. PE-0148, Battery.
4. Exhibit No. PE-0192, Battery.
5. Exhibit No. PE-0227, Comtrol Phone Printed Circuit Board.
6. Exhibit No. PE-0249*, Pelican Case.
7. Exhibit No. PE-0249A*, Comtrol Power Supply.
8. Exhibit No. PE-0249B*, Comtrol Start-Up Alarm Control Unit.
9. Exhibit No. PE-0276*, Pelican Case.
10. Exhibit No. PE-0276A*, Comtrol Phone.
11. Exhibit No. PE-0276B*, Comtrol Phone.
12. Exhibit No. PE-0280, Comtrol Phone Side Panel.
13. Exhibit No. PE-0281, Comtrol Phone Side Panel.
14. Exhibit No. PE-0285, Comtrol Phone Enclosure.
15. Exhibit No. PE-0336, Comtrol Phone.

16. Exhibit No. PE-0337, Comtrol Phone.
17. Exhibit No. PE-0338, Comtrol Phone.
18. Exhibit No. PE-0344, Communication Cable.
19. Exhibit No. PE-0479, Comtrol Phone Printed Circuit Board.
20. Exhibit No. PE-0480, Comtrol Phone Speaker.
21. Exhibit No. PE-0481-A, Comtrol Phone Terminal Strip.
22. Exhibit No. PE-0484*, Evidence Bag.
23. Exhibit No. PE-0484-A*, Comtrol Phone Internal Mounting Bracket.
24. Exhibit No. PE-0484-B*, Comtrol Phone Speaker.
25. Exhibit No. PE-0487, Comtrol Phone.
26. Exhibit No. PE-0489*, Evidence Bag.
27. Exhibit No. PE-0489-A*, Comtrol Phone Speaker.
28. Exhibit No. PE-0489-B*, Comtrol Phone Printed Circuit Board.
29. Exhibit No. PE-0489-C*, Pyott-Boone Page Phone Printed Circuit Board.

*Note: Multiple pieces of evidence that arrived at the A&CC under one exhibit number (e.g. Exhibit No. PE-0249 consisted of a Comtrol Power Supply and a Comtrol Start-up Alarm Control Unit in a Pelican Case) was expanded into new unique exhibit numbers containing a suffix letter (e.g. Exhibit No. PE-0249A and Exhibit No. PE-0249B).

The West Virginia Office of Miners' Health Safety and Training recovered several pieces of evidence from the longwall communication system. This evidence was inspected and tested as part of this investigation and is listed below. The West Virginia Office of Miners' Health Safety and Training retained custody of these exhibits:

1. Exhibit No. CMTL 02.22.11-S110: Identified as a Comtrol Line Termination Unit.
2. Exhibit No. CMTL 02.22.11-HG-1: Identified as a Comtrol Line Termination Unit with a mounting bracket.
3. Exhibit No. CMTL 02.22.11-S24: Identified as a mounting bracket for a Comtrol Line Termination Unit.
4. Exhibit No. CMTL 02.22.11-S105: Identified as a mounting bracket for a Comtrol Line Termination Unit.
5. Exhibit No. CMTL 02-22-11-S171: Identified as the back, top, bottom and left side of a Comtrol phone enclosure.
6. Exhibit No. CMTL 02.22.11-S104: Identified as the back, top and bottom of a Comtrol phone enclosure.

7. Exhibit No. CMTL 02.22.11-S106A: Identified as the left side of a Comtrol phone enclosure.
8. Exhibit No. CMTL 02.22.11 S85: Identified as the right side of a Comtrol phone enclosure.
9. Exhibit No. CMTL 02.22.11-S61: Identified as a right side of a Comtrol phone enclosure.
10. Exhibit No. CMTL 02-23-11 Spad 22567: Identified as a terminal strip mounting bracket with terminal strip label of a Comtrol phone enclosure.
11. Exhibit No. CMTL 02.22.11-S77: Identified as a front cover of a Comtrol phone enclosure.
12. Exhibit No. CMTL 02.22.11-S109: Identified as a back, top, bottom, and left and right sides of a Comtrol phone enclosure.
13. Exhibit No. CMTL 02.22.11-S106: Identified as a front cover of a Comtrol phone enclosure.
14. Exhibit No. CMTL 02.22.11-S114: Identified as a back, top, bottom and left side of a Comtrol phone enclosure.

The first phase of the investigation began with a preliminary inspection of all the exhibits. The preliminary inspection included documenting observations and photographing as-received conditions of the exhibits. The second phase of the investigation included performing spark ignition and operational tests of the applicable exhibits. The third phase of the investigation included detailed inspection of all exhibits and additional spark ignition tests.

The inspections and tests found:

- There were no signs of internal heating, arcing, or sparking on any of the exhibits.
- Several minor discrepancies were noted when the exhibits were compared to approval documentation. These discrepancies did not affect operation, safety features, or the intrinsic safety of the exhibits.
- Some of the exhibits collected by the West Virginia Office of Miners' Health Safety and Training were physically matched to and therefore were part of the exhibits collected by MSHA.
- The spark ignition testing of the applicable exhibits did not result in any failures; therefore, these exhibits are not considered an ignition source for a methane-air atmosphere.

- The operational tests indicated that the applicable components operated as designed except for Exhibit No. PE-0276B. This component had a relatively low audio level when transmitting a page.