Zipf, Richard K. (Karl) (CDC/NIOSH/PRL)

From: Tim.Harvey@Anglocoal.com.au
Sent: Friday, March 09, 2007 9:05 AM
To: Zipf, Richard K. (Karl) (CDC/NIOSH/PRL)
Subject: RE: Review of "Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines"

Attachments: NIOSH Manuscript review.pdf

NIOSH Manuscript review.pdf (1...

Karl Enclosed are my comments for what they are worth over all I though it was a well presented argument. But I wonder if lack of monitoring and inertisation has made has made it more conservative than required. Once inert in a seam making gas then with reasonable seals Oxygen should not get into goaf even with Barometer as seals will say under positive pressure. (our experience in gassy mines. I look forward to receiving the final report but not some of the backwash from this report.

I will try and fax original as well but it might not get through.

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-----Original Message-----
From: Zipf, Richard K. (Karl) (CDC/NIOSH/PRL) [mailto:rbz3@cdc.gov]
Sent: Friday, 9 February 2007 7:28 AM
To: Tim Harvey
Subject: Review of "Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines"

Dear Tim,

I hope all is well with you since our last communications several months ago.

Attached is a copy of the NIOSH draft report entitled, "Explosion Pressure Design Criteria for New Seals in U.S. Coal Mines." I would like to ask for your review of this draft report.

This report addresses two critical issues: 1) what explosion pressures can develop during an explosion within a sealed area?, and 2) what are appropriate design criteria for seals that will withstand these pressures?

Based on fundamental knowledge of explosion chemistry and physics and knowledge about sealed areas in mines, NIOSH engineers recommend a three-tiered explosion pressure design criteria for seals in coal mines.
1) For unmonitored seals where there is a possibility of

methane-air detonation behind the seal, the recommended design pulse rises to 4.4 MPa (640 psi) and then falls to the 800 kPa (120 psi) constant volume explosion overpressure.
2) For unmonitored seals with little likelihood of detonation, a less severe design pulse that simply rises to the 800 kPa (120 psi) constant volume explosion overpressure, but without the initial spike, may be employed.
3) For monitored seals where the amount of potentially explosive methane-air is strictly limited and controlled, engineers can use a 345 kPa (50 psi) design pulse if monitoring can assure 1) that the maximum length of explosive mix behind a seal does not exceed 5 m (15 ft) and 2) that the volume of explosive mix does not exceed 40% of the total sealed volume.

Based on these explosion pressure loads, NIOSH engineers used a dynamic computer modeling program and other methods to determine minimum seal thickness to resist these explosion pressure loads. The analyses show that resisting the worst case 4.4 MPa (640 psi) design pulse is reasonable using modern materials. For example, a 6.1 m (20 ft) entry that is 1.5 m (60 in) high requires a 0.9 m (36 in) concrete seal, whereas a 2.4 m (96 in) high seam would require a 1.2 (48 in) concrete seal.

The report also provides an alternative to these worst-case scenarios, if the atmosphere behind the seals is monitored and inerted, as is done in many mines abroad. In that case, seals to withstand a pressure of 345 kPa (50 psi) may be adequate.

At this time, I ask for your thoughtful review of this draft report. Please use the attached review form and attach additional comments. I'd like to receive your comments no later than Friday 9 March 2007.

Thank you very much for your time and consideration. I look forward to receiving your comments on this important topic.

Best regards,

Karl Zipf

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