



pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

84A

BUREAU OF MINE SAFETY

July 12, 2012

Mr. Gene Davis
Rosebud Mining Company
301 Market Street
Kittanning, PA 16201

RE: Rosebud Mining request for approval to use an ECS – Engine Control Systems Model AZ 27 catalyst as an alternate DOC in their fleet of previously approved Bucyrus 482D Diesel Scoops equipped with a Deutz BF4L-2011 78HP engine with a DBT Management System using a model FST-115-26 DPM filter.

Dear Mr. Davis:

Chapter 4 of the “Bituminous Coal Mine Safety Act” (the Act) provides for the use of diesel-powered equipment in underground bituminous coal mines. Section 424 of the act created a Technical Advisory Committee (“TAC”) for the purpose of advising the Department regarding implementation of Chapter 4 and evaluation of alternative technology or methods for meeting the requirements of Chapter 4.

On January 30, 2012, Rosebud Mining Company submitted a request to the TAC and the Bureau for evaluation and approval pursuant to Chapter 4 of the Act to use an alternate catalyst in the previously approved power package in their fleet of CAT 482D Diesel Scoops equipped with a Deutz BF4L-2011 78hp engine with a DBT Management System. Rosebud requested to use the ECS Model AZ 27 catalyst as an alternative to the approved ECS Model AZ 25 catalyst currently being used. The request is to be able to use either of these catalysts in their fleet of the Bucyrus 482D Scoops. Enclosed is the TAC’s report on their findings for this piece of equipment. All of their findings must be adhered to in regards to use of this equipment.

At the regularly scheduled TAC meeting on July 11, 2012, the TAC recommended approval of Rosebud's request to use either the ECS Model AZ 25 or the ECS Model AZ 27 diesel oxidation catalysts in their fleet of Bucyrus 482D diesel scoops.

If you have any questions on this request, please contact me at jsbaffoni@pa.gov or at 724-439-7469.

Sincerely,


Joseph A. Sbaffoni
Director
Bureau of Mine Safety

cc: Bowersox
Borchick

Enclosure(s)

JAS/cd

bcc: Antoon
Gaida
Elias (web)
Dunn/TAC file

\\epinsuns03\bms\$\AdvisoryCommittee\TAC - DIESEL LETTERS BY YEAR\2012\ - TAC - Rosebud - ECS - Engine Control System Model
AZ Bucyrus 482D Scoop- cd.doc

846

**Pennsylvania Technical Advisory Committee
On Diesel Powered Equipment**

Paul Borchick

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Ron Bowersox

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Email: umwarbowersox@yahoo.com

July 10, 2012

Joseph Sbaffoni, Director
Bureau of Mine Safety
Fayette County Health Center
100 New Salem Road, Room 167
Uniontown, Pa. 15401

RE: TAC recommendation on Rosebud Mining request for approval to use an ECS – Engine Control Systems Model AZ 27 catalyst as an alternate DOC in their fleet of previously approved Bucyrus 482D Diesel Scoops equipped with a Deutz BF4L-2011 78 HP engine with a DBT Management System using a model FST-115-26 DPM filter.

Dear Mr. Sbaffoni:

Chapter 4 of the “Bituminous Coal Mine Safety Act” (the Act) provides for the use of diesel-powered equipment in underground bituminous coal mines. Section 424 of the act created a Technical Advisory Committee (“TAC”) for the purpose of advising the Department regarding implementation of Chapter 4 and evaluation of alternative technology or methods for meeting the requirements of Chapter 4.

Background

On January 30, 2012, Rosebud Mining Company submitted a request to the TAC and Bureau of Mine Safety for evaluation and approval pursuant to Chapter 4 of the Act to use an alternate catalyst in the previously approved power package in their fleet of CAT 482D Diesel Scoops equipped with a Deutz BF4L-2011 78 HP engine with a DBT Management System. Rosebud requested to use the ECS Model AZ 27 catalyst as an alternative to the approved ECS Model AZ 25 catalyst currently being used. The request is to be able to use either of these catalysts in their fleet of Bucyrus 482D Scoops.

On February 8, 2012 the TAC and DEP travelled to Seldersville, PA to the Twin Rocks Mine and met with Gene Davis representing Rosebud Mining Company to discuss the request and gather

additional information. The TAC and DEP conducted emissions tests and did an inspection of the previously approved CAT 482D scoop utilizing the alternate ECS Model AZ 27 catalyst.

Rosebud Mining requested a 100 hour test period to operate this CAT 482D diesel scoop utilizing the AZ 27 catalyst to determine if the new system would perform to their expectations. The issue was that the new larger diameter exhaust pipe system was not polyimide coated to maintain the maximum surface temperature below 302 degrees F. Rosebud wanted to utilize a fire wrap system on these uncoated pipes for the duration of the 100 hour test period. The polyimide coating would take from 6-8 weeks, and the uncoated parts will be replaced with coated parts prior to using the scoop. The DEP will inspect the equipment prior to being used underground.

Investigation

The CAT 482D Diesel Scoops equipped with a Deutz BF4L-2011 78 HP engine with a DBT Management System had been previously approved by the TAC and DEP and was assigned a BOTE-D Number by the DEP. The **previous approval** included the following diesel engine and emissions package:

- Deutz BF4L 2011 78HP engine MSHA Certification number 07 ENA040004-1 (Part 7)
- Engine Control Systems AZ25 oxidation catalyst
- Bucyrus Cooling Systems Model 399823 Heat Exchanger
- Filter Service & Testing Model FST-115-26 DPM filter (95% efficient)

Rosebud's request is to have the option to use either the ECS Model AZ 25 diesel oxidation catalyst as shown above or the ECS Model AZ 27 DOC in the power package on their fleet of Bucyrus 482D diesel scoops.

The following is the **alternate** diesel engine and emissions package:

- Deutz BF4L 2011 78HP engine MSHA Certification number 07ENA040004-1(Part 7)
- Engine Control Systems AZ 27 oxidation catalyst
- Bucyrus Cooling Systems Model 399823 Heat Exchanger
- Filter Service & Testing Model FST-115-26 DPM filter (95% efficient)

More detailed information on the specifications for the Model 482D Scoop diesel power packages are included on the General Specification Sheet attached. (Attachment1)

Emissions testing of the engine and after-treatment system utilizing the ECS Model AZ 27 were performed, as well as exhaust gas temperature monitoring and stall test procedure. The results of the emission tests showed the engine was performing within MSHA's approval specifications.

Monitoring of the exhaust gas temperature produced a high exhaust gas temperature reading below the 302° F allowed by Section 403 (b)(4) of the Act. The maximum surface temperature observed was 190° F which is below the 302° F allowed by Section 403 (b)(3) of the Act. There was one isolated spot > 302° F that was detected, but an adjustment to the fire wrap blanket covered the area to eliminate the problem.

The TAC discussed the request for a 100 hour evaluation period for Rosebud to evaluate the emission and operating data collected during the test. The TAC agreed that the fire wrap portions of the exhaust system maintained the surface temperature below 302° F, but was concerned if they could be maintained for the duration of the test period. It was agreed that the operators would do a visual inspection of the fire wraps during each pre-op check for the duration of the test period and be included in the pre-op checklist. The TAC also agreed that the treated side emissions test would be checked and recorded every 25 hours of operation during the 100 hour test, and the results would be submitted to the TAC to verify the emissions were within acceptable limits. (Attachment 2)

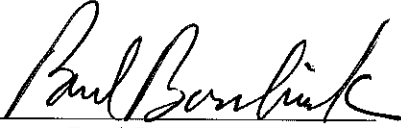
Recommendation

Based on the information received during our investigation and our discussions, the TAC believes that the **alternate** diesel power package utilizing the ECS Model AZ 27 diesel oxidation catalyst is capable of meeting all requirements of Section 403 of Chapter 4 of the Act without reducing or compromising the level of health or safety afforded by the act.

The TAC has determined that the CAT 482D Diesel Scoops equipped with a Deutz BF4L-2011 78 HP engine with a DBT Management System using an Engine Control Systems Model AZ 27 oxidation catalyst and a model FST-115-26 DPM filter meets all requirements of Section 403 of Chapter 4 of the Pennsylvania Bituminous Coal Mine Safety Act. As such, we are recommending approval of the above described diesel power package.

The TAC recommends approval of Rosebud's request to use either the ECS Model AZ 25 or the ECS Model AZ 27 diesel oxidation catalysts in their fleet of Bucyrus 482D diesel scoops.

This recommendation is provided with the understanding that the General Specification Sheet (Attachment 1) be strictly adhered to.


Paul Borchick


Ron Bowersox

Bucyrus
MODEL 482D
Diesel Scoop

April, 2008

Amended - 1-30-12

General Specifications of the Diesel-Powered Equipment Package

Engine Manufacturer	Deutz
Engine Model	BF4L 2011
Horsepower	78 HP
Rated Speed	2800 RPM
Manufacturers Maximum Recommended Exhaust Backpressure (H ₂ O)	35 Inches Water Gage
Maximum Exhaust Out Temperature	300° F
MSHA Engine Approval	MSHA Part 7
MSHA Certification No.	07 ENA040004-1
Rated Speed	2800 RPM
Rated Horsepower	78 HP
Exhaust Gas Flow (CFM)	553 CFM
ISO 8178-1 Average DPM (gr/hr)	3.50 gr/hr
Average Ambient DPM Level	.02 mg/m ³
MSHA Ventilation Rate (CFM)	6000 CFM (Part 7)
PA State Ventilation Rate (CFM)	

Emission Control System		DBT Management System
Fuel Injection Pump	Make P/N	Bosch S/N Specific
Oxidation Catalyst	Make Model #	Engine Control Systems AZ25 47% DPM removal eff.
Heat Exchanger	Make P/N	Bucyrus / Cooling Systems 399823
DPM Filter	Make Model # Efficiency	Filter Service & Testing FST -115-26 95% DPM removal eff.
System DPM Eff.		105%
Flame Arrestor	Make Model Description	CIC 804/D-IL-C4C 304 Stainless Steel Element for Group D Vapor Service

Alternate Oxidation Catalyst	
Make	ECS -Engine Control Systems
Type	AZ Sever Duty
Model	AZ 27

ATTACHMENT 1

To: Paul J. Borchick
(412) 831-4414 (Office)
(412) 736-9105 (Cell)
email: paulborchick@consolenergy.com

Ron Bowersox
(724) 726-8987 (Home)
(724) 479-8692 (Office)
e-mail umwarbowersox@yahoo.com

February 28, 2012

Dear Sirs:

On January 30th Rosebud Mining ask for a 100 hour evaluation period for a new Oxidation catalyst for the Bucyrus 482 diesel Scoop and on February 8th the TAC approved the evaluation period with the stipulation that the treated side emissions be taken approximately every 25 hours of operation during this period. We have completed the evaluation period and are in the process of removing the new system and installing the old system. A copy of the treated side CO readings are attached to this document. Also the test was a success and Rosebud Mining is asking for a recommendation for approval for the system, of course the catalyst and the exhaust piping will be sent out for polyimide coating prior to final approval by the State. Since the polyimide coating will take about 6 to 8 weeks we will not need a temporary approval of the system. If you need any further information please contact Gene Davis at 724 737-5213.

Thank You

Gene Davis

ATTACHMENT 2-1

TOLL FREE
www.ecomusa.com

ECOM-AC Plus

Date Time
02.14.12 07:58:51 AM

Gas analysis *Treated*

Fuel type
Diesel Oil
T. Air 59 °F
T. Gas 58 °F
O2 8.9 %
CO 1 PPM
NO 386 PPM
NO2 19 PPM
NOx 485 PPM
CO2 8.9 %
Sen. temp. 65 °F

ECOM America Ltd.
1628 Oakbrook Drive
Gainesville
Georgia 30507
Tel. 770-532-3288
Fax: 770-532-3628

50 HRS

* ECOM - J2KN *

Date Time
02.08.12 11:57 AM

Gas analysis

Fuel type
Diesel Oil

T. Air 60 °F
T. Gas 51 °F
T. Sensor 61 °F
O2 9.7 %
CO 4 PPM
NO 382 PPM
NO2 16 PPM
NOx 398 PPM
CO2 8.3 %

ECOM America Ltd.
1628 Oakbrook Drive
Gainesville
Georgia 30507
Tel. 770-532-3288
Fax: 770-532-3628

*START OF
TEST PERIOD*

ECOM-AC Plus

Date Time
02.10.12 08:08:23 AM

Gas analysis

Fuel type
Diesel Oil
T. Air 43 °F
T. Gas 58 °F
O2 9.6 %
CO 3 PPM
NO 375 PPM
NO2 34 PPM
NOx 489 PPM
CO2 8.4 %
Eff. 99.5 %
Losses 0.5 %
Exc. air 1.84
Sen. temp. 49 °F

25 HRS

ECOM-AC Plus

Date Time
02.17.12 06:39:48 AM

Gas analysis

Fuel type
Diesel Oil
T. Air 47 °F
T. Gas 51 °F
O2 8.9 %
CO 4 PPM
NO 353 PPM
NO2 29 PPM
NOx 373 PPM
CO2 8.9 %
Eff. 99.9 %
Losses 0.1 %
Exc. air 1.74
Sen. temp. 55 °F

ECOM America Ltd.
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ECOM-AC Plus

Date Time
02.18.12 08:09:22 AM

Gas analysis

Fuel type
Diesel Oil
T. Air 54 °F
T. Gas 57 °F
O2 9.0 %
CO 4 PPM
NO 357 PPM
NO2 21 PPM
NOx 378 PPM
CO2 8.9 %
Eff. 99.9 %
Losses 0.1 %
Exc. air 1.75
Sen. temp. 61 °F

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ATTACHMENT 22