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Bureau of Mine Safety
Uniontown

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

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September 17, 2010

Sbaffoni

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

Bookshaw

Martin

McCaffrey

Anton

Gaida

original/Dunn

RE: Johnson Industries request for using an ECS AZ 26 diesel oxidation catalyst to use alternatively in the currently approved Johnson Industries Supersteer with a Deutz BF4L2011 74HP diesel engine.

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 June 29, 2010 Johnson Industries submitted a request to the Technical Advisory Committee ("TAC") for approval to use an ECS AZ 26 diesel oxidation catalyst alternatively in the currently approved Johnson Industries Supersteer with a Deutz BF4L2011 74HP (derated) diesel engine with an ECS AZ 27 diesel oxidation catalyst.

On July 17, 2010 Johnson Industries submitted a request to the TAC to conduct a maximum 100 hour evaluation and test period to evaluate the performance and maintenance requirements on the Johnson Industries Supersteer utilizing the ECS AZ 26 diesel oxidation catalyst.

On July 19, 2010 the TAC made a recommendation to the Director to approve the 100 hour evaluation and test period to evaluate the AZ26 catalyst.

On July 21, 2010 the Director gave tentative approval of the AZ26 catalyst 100 hour evaluation period.

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The evaluation began on July 19, 2010 when initial emissions data was recorded. On September 13, 2010 the TAC and DEP traveled to the Cherry Tree Mine to do the follow up evaluation of the Model SS Rubber Tire Mantrip utilizing the AZ26 catalyst upon the completion of the evaluation and test period.

Investigation

The TAC and DEP reviewed the emission test data obtained during the 100 hour evaluation period on the #11 Johnson Industries Supersteer equipped with an AZ26 catalyst. The test data (see Attachment 1) was collected on July 19, 2010 before putting the mantrip in service, on August 16, 2010 after 25 hours of operation, on August 30, 2010 after 55 hours of operation, and on September 13, 2010 after 82 hours of operation. The TAC and DEP agreed that this was adequate information and data to make a determination on the performance of the AZ26 catalyst in the emissions control system.

The emissions records from the evaluation period were reviewed by the TAC and DEP. The data showed that the engine and emissions control package utilizing the ECS Model AZ26 diesel oxidation catalyst performed within the limits as required by Section 418 of the act. Additionally, after talking with Mr. Gene Davis there were no maintenance or performance issues associated with the use of the AZ26 catalyst.

The TAC and DEP conducted additional testing to measure the maximum surface temperature on the coated catalyst and exhaust manifold, and also conducted a smoke dot test. The maximum surface temperature observed on the catalyst and manifold was 205 degrees F, which is well below 302 degrees F as required in Section 403(b) of the Act. The result of the smoke dot test was a one on the scale.

Recommendation


Based on the emissions data reviewed from the evaluation period and testing that was conducted during our investigation and our observations, the TAC believes that Johnson Industries request to use an ECS Model AZ 26 diesel oxidation catalyst alternatively in the currently approved Johnson Industries Supersteer with a Deutz BF4L2011 74HP diesel engine is capable of meeting all requirements of Section 403 of Chapter 4 of the act.

As such, the TAC is recommending approval of the above described diesel power package. This recommendation is provided with the understanding that the General Specification Sheet (Attachment 2) be strictly adhered to.

Should the Director receive a request for tentative approval to use this engine and emissions control power package prior to the next scheduled TAC meeting on October 13, 2010, the TAC will recommend temporary approval.



Paul Borchick



Ron Bowersox

JOHNSON INDUSTRIES SUPERSEER
ECS MODEL AR26 CANNIST

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Bureau of Mine Safety
Uniontown, PA 15001

#11 Johnson 9-13-10 52 HRS

* ECOM - J2KN *

Date Time
07.19.10 08:06 AM

Gas analysis

Fuel type		
Diesel Oil		
T. Air	74	°F
T. Gas	81	°F
T. Sensor	74	°F
O2	8.6	%
CO	12	PPM
NO	379	PPM
NO2	2	PPM
NOx	381	PPM
CO2	9.1	%
Eff.	99.8	%
Losses	0.2	%
Exc. air	1.69	%

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Toll-Free 877-326-6411
www.ecomusa.com

8-16-10
#11 JI 25 HRS

ECOM-AC Plus

Date Time

08.16.10 07:38:33 AM

Gas analysis

Fuel type		
Diesel Oil		
T. Air	79	°F
T. Gas	81	°F
O2	7.9	%
CO	16	PPM
NO	330	PPM
NO2	7	PPM
NOx	337	PPM
CO2	9.6	%
Eff.	99.9	%
Losses	0.1	%
Exc. air	1.60	%
Sen. temp.	81	°F

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5027 HRS.

ECOM-AC Plus

Date Time

08.30.10 07:38:36 AM

Gas analysis

Fuel type		
Diesel Oil		
T. Air	73	°F
T. Gas	75	°F
O2	8.8	%
CO	14	PPM
NO	297	PPM
NO2	2	PPM
NOx	299	PPM
CO2	8.9	%
Eff.	99.9	%
Losses	0.1	%
Exc. air	1.72	%
Sen. temp.	76	°F

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Date Time

09.13.10 09:28:04 AM

Gas analysis

Fuel type		
Diesel Oil		
T. Air	70	°F
T. Gas	69	°F
O2	8.7	%
CO	7	PPM
NO	305	PPM
NO2	9	PPM
NOx	314	PPM
CO2	9.0	%
Sen. temp.	74	°F

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ATTACHMENT 1

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General Specification Sheet

Johnson Super Steer PC

I. Engine

Manufacturer	Deutz	High Idle (RPM)	3100
Manufacturer Address	3883 Steve Reynolds Blvd. Norcross, Ga. 30093	Particulate Index (PI)	2500 cfm
Model Number	BF4L20H	Gaseous Ventilation Rate (CFM)	6000 cfm
Serial Number	TBD	Raw DPM (gr/hp)	3.7 g/hr
Horse Power	87@ 2800 rpm Derated to 74 hp	MSHA 7E Approval Number	07-ENA040004
Max. dirty Intake Air Restriction (H²O)	26" wg	Type of Aspiration	Turbocharged
Max. Allowed Backpressure H²O	20" wg	Fuel Delivery System	Mechanical Injection
Turbocharger Boost Pressure	18.5 psi	Low Idle (RPM)	900

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II. Filter System

Manufacturer	Engine Control System
Manufacturer Address	165 Pony Drive Newmarket, Ontario, Canada, L3Y7V1
Model Number	ECS S/9 Silicone Carbide (Sic)
System Type	Non- Catalyzed - Off Board Regeneration
System Composition	Silicone Carbide
Efficiency Rating	87%
Type of Regeneration	Off- board - electrical

III. Catalyst

Manufacturer	Engine Control System
Manufacturer Address	165 Pony Drive Newmarket, Ontario, Canada, L3Y7V1
System Name	A-Z Severe Duty
Model Number	AZ 27 or AZ 26