

Pennsylvania Technical Advisory Committee On Diesel Powered Equipment

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July 7, 2008

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

RE:

Brookville Equipment Corporation Model ULPC 15 Man / 9 Ton Locomotive with a Deutz BF4M2012 100 HP Diesel Engine request for Alternate Emissions Test Procedure for Sections 217-A and 218-A.

Dear Mr. Sbaffoni:

Article II-A of the Pennsylvania Bituminous Coal Mine Act (the act) provides for the use of diesel-powered equipment in underground bituminous coal mines. Section 224-A of the act created a Technical Advisory Committee ("TAC") for the purpose of advising the Department regarding implementation of Article II-A and evaluation of alternative technology or methods for meeting the requirements of Article II-A.

Background

On May 29, 2008, Brookville Equipment Corporation (Brookville) submitted a request to the Bureau of Mine Safety for an alternative test procedure for the five minute carbon monoxide (CO) tests required under Sections 217-A and 218-A of the act for the Brookville Model ULPC 15 Man / 9 Ton Locomotive with a Deutz BF4M2012 100 HP Diesel Engine and M30 DST Management System. On June 4, 2008 the Director requested the TAC to advise the Department concerning Brookville's request for an alternate test procedure for CO tests required under Sections 217-A and 218-A of the Act. The engine and emission system was previously approved as a unit by the Department based upon the TAC's recommendation and assigned a BOTE-DEES Approval No. 36-06.

Investigation

On June 26, 2008 the TAC members traveled to the Brookville facilities to evaluate Brookville's request for the need for an alternate test procedure. Both 5 minute and 90 second tests were observed and the results recorded (Attachment 1).

The 5 minute CO test was conducted first without the use of an external water cooler for the transmission oil. The test was run for the full 5 minutes and the results were recorded. Three minutes and three seconds into the test the Transmission Oil Temperature warning light came on. This warning was set at 240 degrees F. At 4 minutes and 5 seconds into the test the Transmission Oil Shutdown temperature (250 degrees F) was reached and the bypass button was held to finish the 5 minute test. The maximum transmission oil temperature recorded was 260 degrees F, which exceeded the manufacturer's recommendations. Based on these observations and information provided by Brookville on the readings obtained, the need for the Alternate 90 second CO test was shown.

During this time the maximum surface temperature observed was 260 degrees F. The maximum engine exhaust temperature observed was 173 degrees F.

The 90 Second alternate Tests were conducted and the results are shown in Attachment 1. The results of the 5 minute and 90 second tests were comparable.

Recommendation

The TAC recommends approval of the Alternate 90 Second Test Procedure for the Brookville Model ULPC 15 Man / 9 Ton Locomotive with Deutz BF4M2012 100 HP diesel engine and M30 DST Management System. The TAC believes that need for the Alternate Test Procedure was shown and the results of both CO tests were comparable. The General Specifications list (Attachment 2) should be strictly adhered to.

Also should the Operator request temporary approval to use this equipment prior to the next TAC meeting, the TAC recommends temporary approval if the Director so agrees.

Paul Borchick

Ron Bowersox

Brookville Model ULPC 15 man/ 9 Ton Locomotive June 26, 2008

	-												
15 Man 5 Minute Time(h:m:s)		00/4441	KIOVAAAA	NIO 2/	NIO	500/1	Out to core	nonim)					
09:00.0	O2(%) 17.5	CO(ppm)			NOx(ppm)	SUZ(ppm)	CXHy(%)						
10:00.0	8,8	94 99		26 31	250 605			2.6					
12:11:00 PM	8,7	91		31	643			8.9 9.					
12:12 PM	8.5	95		29	686			9.2	•				
12:13 PM	8.3	101		27	710			9.3					
12:14 PM	8.4	133		25	730			9.2					
•													
15 Man 90 secon	d Raw												
Time(h:m:s)	02(%)	CO(opm)	NO(ppm)	NO2(ppm)	NOx(ppm)	SO2(ppm)	CxHy(%)	CO2(%)					
25:30.0	8.3	109		22	640			9.3					
26:00.0	8.4	101		24	666			9.2					
12:26:30 PM	8.4	99		24	673			9.2					
12;27:00	8.3	100	657	24	681			9.3					
#2008-06-26 12:0	7.50#												
#2000-00-20 12.0 Time(h:m:s)	O2(%)	CO(ppm)	NO(ppm)	NO2/onm)	NOx(ppm)	SO2iona	COHMON	CO2(%)	T Gas(F)	T Amb(F) ETA		Lambda	Comments:
0:00:01	17.7	1		28	256	OCEOPING 0			78	69.4	98.9	6.36	Comments.
0:00:11	17.7	2		28	257	0	O.		78	69.4	98.9	6.36	
0:00:21	17.7	2		28	259	0	ō		79	69,4	98.8	6:36	
0:00:31	17,7	2	235	29	264	-0	.Q	2.4	79	69.4	8.89	6.36	
0:00:41	17.7	0		29	265	Ö	٥	2,4	79	69.5	98.9	6.36	
0:00:51	17.7	1		29	267	0	0		79	69.3	8.86	6.36	
0:01:01	17.7	1		29	269	0	.0		79	69.4	98.8	6.36	
0:01:11	17.7	.1		28	269	0	0		79	69.4	98.8	6,36	
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0:02:11	9	15		78	690	ő	ő	-,	79	69.3	99.7	1.75	start o law Olega
0:02:21	9	7		87	704	ō	õ		79	69.4	99.7	1.75	
0:02:31	9	5		93	710	0	Ó		78	69.5	99.7	1.75	
0:02:41	9	5	623	97	720	Ó	Ó	8.8	78	69.4	99.7	1.75	
0:02:51	9	4	625	100	725	0	0	8.8	78	69.5	99.7	1.75	
0;03:01	9	4		104	738	0	O		79	69.6	99.7	1.75	
0:03:11	9	1		105	741	0	,0		79	69.6	99.7	1,75	
0:03:21	. 9	3		106	743	0	0	4.5	79	69.5	99.7	1.75	
0:03:31	8.9	3 2		106	740	0	0		79	69.4	99.7	1.74	
0:03:51	8.8 8.8	2		106 106	750 760	0	0		78 78	69.5 69.5	99.7 99.7	1.72 1.72	
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0:04:21	8.7	2		103	796	ō	ő		79	69.5	99.7	1.71	
0:04:31	8.7	2		102	796	0	0		80	69.5	99.7	1.71	
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BROOKVILLE EQUIPMENT CORP. MODEL ULPC 15 Man / 9 Ton Diesel Locomotive

General Specifications of the Diesel-Powered Equipment Package

Engine Ma	anufacturer		Deutz					
Engine Mo	odel		BF4M2012					
Horsepow	e r		100 HP					
Rated Spe	ed		2500 RPM	2500 RPM				
	rer's Maximum Reco ure (In H₂O)	mmended Exhaus	40.15 Inches Water Gauge 302 deg F					
Maximum	Exhaust Out Temper	ature						
MSHA Eng	gine Approval		MSHA Part 7	MSHA Part 7				
MSHA Cer	tification No.		7E-ENA040002-0 (Pa	rt 7)				
Rated Spec	ed		2500 RPM	•				
Rated Hors	sepower		100 HP					
Exhaust G/	AS Flow (SCFM)		703 CFM @ 500 deg (· D				
ISO 8178-1	Average DPM (gr/hr) .	4.51 gr/hr					
Average Ar	mblent DPM Level (m	g/m3)	0.0137 mg/m3					
MSHA Vent	tilation Rate (CFM)		6,000 CFM (Part 7)	CFM (Part 32)				
Pa. State V	entilation Rate (CFM	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	.					
Emissions	Control System		DST Management Sys	DST Management System				
Fuel Injection	Make	Bosch						
Pump	P/N	0.440.0004.157						
Oxidation	Make	0 118 2384 KZ		The state of the s				
Catalyst	wake	Syncat Corp.						
•	P/N	M113-210-02						
Heat	Make	Paas Tech.						
Exchanger	P/N	M150-301-01						
DPM Filter	Make	Dry Systems	Model	M 30				
	P/N	Technology M 30	Outer Filter Size	16 x 12 in Diameter				
	Air Rating (CFM)	2100 CFM	Inner Filter Size	10 x 6 in Diameter				
	Surface Area (in3)	42,231 in3	Filter Length	20 in				
	Efficiency			96%				
	Recommended Exha	usf Back-Pressure		25 Inches Water Gauge				
			Commission of the Commission o					



Pennsylvania Department of Environmental Protection

Fayette County Health Center 100 New Salem Road, Room 167 Uniontown, PA 15401 June 4, 2008

Bureau of Mine Safety

724-439-7469 Fax: 724-439-7324

Mr. Ron Bowersox Technical Advisory Committee Member P.O. Box 200 Lucernemines, PA 15754

Mr. Paul Borchick Technical Advisory Committee Member 1800 Washington Road Pittsburgh, Pa 15241-1421

Dear Mr. Bowersox and Mr. Borchick:

The Technical Advisory Committee's ("TAC") as established under Section 224-A of the Pennsylvania Bituminous Coal Mine Act was created to evaluate and advise the Department regarding implementation of any article on diesel-powered equipment.

Section 203-A (3) states "An exhaust emissions control and conditioning system may be approved for multiple diesel engine applications through a single series of laboratory tests, known as the ISO 8178-1 test, only if data is provided to the advisory committee that reliably verifies that the exhaust emissions control and conditioning system will meet, for each diesel engine, the in-laboratory diesel particulate matter standard established by this subsection. Data provided to satisfy this provision shall include diesel particulate matter production rates for the specified engine as measured during the ISO 8178-1 test, if available. If ISO 8178-1 test data for diesel particulate matter production is not available for a specified engine, comparable data may be provided to the advisory committee that reliably verifies that the exhaust emissions control and conditioning system will meet, for the specified diesel engine, the in-laboratory diesel particulate matter standard established by this subsection. This standard shall only be used for in-laboratory testing for approval of diesel-powered equipment for use underground."

The Bureau received a request from Brookville Equipment Corp. dated May 29th, 2008 to modify a Brookville Model ULPC. Brookville previously had a Daimler Chrysler engine and DST emission control system and is now planning to use the previously approved Deutz BF4M2012 with the DST emission control system (BOTE-DEES 003606). Brookville is requesting an alternate method to comply with the 5 minutes test as required under Sections 217A and 218A of the Act for this piece of equipment.



The engine and emission system are assigned approval number BOTE-DEES-0036-06. The minimum ventilating air quantity for this specific piece of diesel powered equipment is 6000 cfm. This approval number and ventilation rate must be stamped on an approval plate that must be attached to the diesel powered engine and emission system.

If you have any questions on this approval, please contact me at the above telephone number or e-mail me at isbaffoni@state.pa.us.

Sincerely,

oseph A. Sbaffor

Director

Bureau of Mine Safety

Brookville Equipment Corporation



175 Evans Street: PO Box 130: Brookville, PA 15825 USA

Brookville Equipment Corporation 175 Evans Street P.O. Box 130 Brookville, PA 15825 Phone: 814 849 2000

May 29, 2008

Bill Bookshar Bureau of Deep Mine Safety Fayette County Health Center 100 New Salem Road, Room 167 Uniontown, PA 15401

Subject:

Brookville Equipment Corporation

Request for Approval

Dear Sir:

Brookville Equipment Corporation is applying for an approval modification of a Brookville Model ULPC with the Pennsylvania Deep Mine Safety. This model, ULPC, was originally approved with a Machine approval number BOTE-D 139-06, and Engine / Exhaust Package approval number BOTE-DEES NO. 135-06. Brookville Equipment Corporation is seeking approval to install an alternate engine / exhaust package, that has already been tested and reviewed by the Technical Advisory Committee, BOTE-DEES 36-06.

Please review this request, and if you have any questions, please call me.

Best regards,

Todd Schultz Engineer

En: Approval Modification Application
General Specifications
Model ULPC Approval Letter, BOTE-D 139-06
Engine / Exhaust Package Approval Letter, BOTE-DEES 36-06

JUN Q 2 200

Pennsylvania Department of Environmental Protection Bureau of Deep Mine Safety

APPROVAL APPLICATION FOR DIESEL-POWERED EQUIPMENT

Applicant/Manufacturer: Brookville Equips	ment Corporation	and the state of t					
Contact Person: Todd Schultz		Signature:					
Address: 175 Evans Street							
PO Box 130							
Brookville	PA	15825					
City	State	Zip Code					
Phone: (814) 849-2000 Fax:	(814) 849-2010	E-Mail: t_schultz@BrookvilleEquipment.com					
Equipment Description: 9-Ton Locomotive / 15-Man Perso	nnel Carrier						
Model Number: ULPC	Serial Number: 9	325 thru 9337					
Minimum PA Air Quantity (CFM), if previously ap	proved: M	Max. Utilized Horsepower Rating at RPM: 100 HP @ 2500 RPM					
MSHA Part 7 Approval Number:	MSHA Part 7 Ven	1 7 Ventilation Rate and Particulate Index;					
7E-B084-0		6,000 CFM					
Drawing Number: 09-1456B-1							
	nal PA Approval Number: B						
Comments: This machine will utilize the	ne approved engine	/ exhaust conditioning package,					
BOTE-DEES NO. 36-06 instead of	the original engine	: / exhaust conditioning package,					
BOTE-DEES NO. 135-06.							
BDMS Use Only							
Submittal Date:	Co	Comments:					
Addendums:							



Pennsylvania Department of Environmental Protection

Fayette County Health Center 100 New Salem Road, Room 167 Uniontown, PA 15401 March 31, 2006

Bureau of Mine Safety

724-439-7469 Fax: 724-439-7324

Todd Shultz Brookville Mining Corp. 175 Evans Street Brookville, Pa 15825

Re:

ITEM: Deutz 100 HP BF4M2012 Engine with DST Model 30 Exhaust Emission

System

APSID NO: 580221

APPROVAL OF BOTE-DEES 0036-06

Dear Mr. Shultz:

This letter is a response to the Technical Advisory Committee's ("TAC") recommendation for approval of the Deutz BF4M2012, 100HP turbo charged diesel engine with a DST Model M30 exhaust emissions system. The emission system includes a Bosch fuel injection pump, a Syncat Corp., oxidation catalyst, a Pass Technologies Heat Exchanger, and a Fleet Guard particulate filter.

The standards and procedures for using diesel-powered equipment in Pennsylvania's underground bituminous coal mines are established by Article II-A of the Pennsylvania Coal Mine Act (Act). Section 224-A of the Act establishes the Technical Advisory Committee on Diesel-Powered Equipment (TAC) whose duties include reviewing requests to use alternative technologies or methods to comply with the requirements of the Act. Any alternative technologies or methods recommended by the advisory committee and approved by the secretary shall not reduce or compromise the level of health and safety protection afforded by Article II-A.

Based on the information provided and the TAC's recommendation, the Department approves the Deutz BF4M2012, 100HP turbo charged diesel engine with a DST Model M30 exhaust emissions system. The General Specifications Sheet dated Oct. 12, 2005 shall be strictly complied with. The TAC also recommended approval of the alternate test procedure for Section 217-A and 218-A. The Secretary approves the TAC's recommendations because the alternative methods will not reduce or compromise the level of health and safety protection afforded by Article II-A of the Pennsylvania Bituminous Coal Mine Act.

Please advise the Department regarding your recommendations on whether or not the 5-minute test is required and any recommendations for alternate test procedures if required.

If you have any questions on this request, please contact me at the above telephone number or e-mail me at jsbaffoni@state.pa.us.

Sincerely,

oseni A. Sbaffoni

Director

ureau of Mine Safety

Enclosure

cc: Todd Shultz-Brookville