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

**Paul Borchick**

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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



May 29, 2008

**BROOKVILLE EQUIPMENT CORP.  
MODEL ULPC  
15 Man / 9 Ton Diesel Locomotive**

General Specifications of the Diesel-Powered Equipment Package

Engine Manufacturer		Deutz		
Engine Model		BF4M2012		
Horsepower		100 HP		
Rated Speed		2500 RPM		
Manufacturer's Maximum Recommended Exhaust Backpressure (In H <sub>2</sub> O)		40.15 Inches Water Gauge		
Maximum Exhaust Out Temperature		302 deg F		
<b>MSHA Engine Approval</b>		<b>MSHA Part 7</b>		
MSHA Certification No.		7E-ENA040002-0 (Part 7)		
Rated Speed		2500 RPM		
Rated Horsepower		100 HP		
Exhaust GAS Flow (SCFM)		703 CFM @ 500 deg C		
ISO 8178-1 Average DPM (gr/hr)		4.51 gr/hr		
Average Ambient DPM Level (mg/m <sup>3</sup> )		0.0137 mg/m <sup>3</sup>		
MSHA Ventilation Rate (CFM)		6,000 CFM (Part 7)	CFM (Part 32)	
Pa. State Ventilation Rate (CFM)				
<b>Emissions Control System</b>		<b>DST Management System</b>		
Fuel Injection Pump	Make	Bosch		
	P/N	0 118 2384 KZ		
Oxidation Catalyst	Make	Syncat Corp.		
	P/N	M113-210-02		
Heat Exchanger	Make	Paas Tech.		
	P/N	M150-301-01		
DPM Filter	Make	Dry Systems Technology	Model	M 30
	P/N	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 (in <sup>3</sup> )	42,231 in <sup>3</sup>	Filter Length	20 in
	Efficiency			
Recommended Exhaust Back-Pressure				25 Inches Water Gauge



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 29<sup>th</sup>, 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 [jsbaffoni@state.pa.us](mailto:jsbaffoni@state.pa.us).

Sincerely,



Joseph A. Sbaffoni  
Director  
Bureau of Mine Safety

# Brookville Equipment Corporation

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



Manufacturers Since 1918

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 01 2008

Pennsylvania Department of Environmental Protection  
Bureau of Deep Mine Safety

**APPROVAL APPLICATION FOR DIESEL-POWERED EQUIPMENT**

Applicant/Manufacturer: Brookville Equipment Corporation		
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 Personnel Carrier		
Model Number: ULPC	Serial Number: 9325 thru 9337	
Minimum PA Air Quantity (CFM), if previously approved:	Max. Utilized Horsepower Rating at RPM: 100 HP @ 2500 RPM	
MSHA Part 7 Approval Number: 7E-B084-0	MSHA Part 7 Ventilation Rate and Particulate Index: 6,000 CFM	
Drawing Number:	09-1456B-1	
Modification: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	Original PA Approval Number: BOTE-D 139-06	
Comments: This machine will utilize the 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:	Comments:	
Addendums:		





Pennsylvania Department of Environmental Protection

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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.

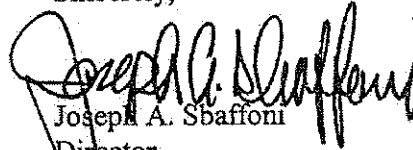
Based on the information provided and the TAC's recommendation, the Department approves the Deutz BF4M2012, 100HP turbo charged diesel engine with a DST Model M30 exhaust emissions system. The General Specifications Sheet dated Oct. 12, 2005 shall be strictly complied with. The TAC also recommended approval 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](mailto:jsbaffoni@state.pa.us).

Sincerely,



Joseph A. Scaffoni  
Director  
Bureau of Mine Safety

Enclosure

cc: Todd Shultz- Brookville