

**Fayette County Health Center
100 New Salem Road, Room 167
Uniontown, PA 15401**

November 5, 2008

Bureau of Deep Mine Safety

724-439-7469

Mr. Jeremy Rohrbaugh
Rohmac, Inc.
P. O. Box 335
Mt. Storm, WV 26739

Re: Request for approval of a Diesel Fire/Water Car Powered by a Deutz F2L2011 Engine
and a ROHMAC ENK Disposable DPM Filter

Dear Mr. Rohrbaugh:

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 Bituminous 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 technology 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.

On July 21, 2008, ROHMAC Inc. requested approval of a Model FWC 1430 Fire / Water car that is rail mounted. This fire/water car includes an engine exhaust dump port to be used only during a fire fighting emergency. Additionally, ROHMAC requested an alternative test procedure for the five minute carbon monoxide (CO) tests required under Sections 217-A and 218-A of the act. The Deutz F21 2011 engine and ENK exhaust emission control system were not tested as a unit, therefore the request was forwarded to the TAC for evaluation.

On September 4 and Sept. 12, 2008, these engine and emission systems were evaluated at the ROHMAC facilities in Mount Storm, WV. The initial evaluation produced CO readings greater than 100 ppm. In order to reduce the CO to an acceptable level, RHOMAC changed the catalyst and reused the catalyst coating material with an OEM recommended patch to maintain surface temperatures below 302 degrees as required by the Act. The new catalyst with the coating produced acceptable results.

Due to the design of the equipment, a normal stall could not be achieved. RHOMAC, the DEP and the TAC agreed that the pump discharge bypass valve should be fully open to recirculate water and achieve the desired operating rpm (2000) for this engine. This provides maximum work for the pump and would provide similar results to the standard engine stall procedures.

The results of the evaluation and emission tests showed that the ENK disposable filter with a 95% filter efficiency will emit .064 mg/m³ which is well below the .12mg/m³ as required by Section 203-A of Article II-A. Test results show that the engine was operating within MSHA's approval specifications.

This system produced exhaust gas temperatures of 99 degrees F and a maximum surface temperature of 260 degrees F which are well within the acceptable limits.

The need for the Alternate Test procedure was also evaluated by the TAC. Both the 5 minute and 90 second tests were conducted, showing similar results. However, because of the nature of this equipment, a fire/water car with a centrifugal water pump and the ability of the engine to run the pump at maximum load for extended periods of time, the TAC believes that there is no need for the alternate test procedure. There are no components that could be damaged by the 5 minute test procedure, and no other need was shown for the 90 second test.

Because of the nature of this piece of equipment, a combination fire/water car, and the possibility of limited usage, this piece of equipment presents unusual conditions for use. The TAC had concerns over bypassing the emissions system with the exhaust dump port during non emergency operation for use as a water car. The exhaust dump for fire fighting emergencies is accomplished by removing a 2 inch pipe plug that dumps the exhaust to the atmosphere before it enters the ENK Filter.

Due to this issue, the following stipulations are included in the TAC's recommendation.

- A warning label should be attached near the exhaust dump port stating that the plug should only be removed if an exhaust back pressure shut down occurs during emergency fire fighting.
- Operators of the fire/water car should be trained in the operation and pre-op checks, as well as when the exhaust dump port could be used to bypass the engine exhaust treatment system only in a fire fighting emergency.
- Pre-op checks should include inspecting the dump port to ensure that the lead seal is intact and recording the result in the pre-op check list. This should also be part of the 100 hour inspection and recorded in the inspection record.
- Training on the procedure to lug the engine during the baseline and 100 hour tests should be provided to the diesel mechanics for this piece of equipment. This would include bringing the engine up to normal operating temperature prior to testing, fully opening the water pump discharge line bypass valve to re-circulate the water back into the tank, and running the engine at the preset maximum RPM's to obtain maximum work from the engine.
- The patch material used on the catalyst permanent coating should be visually inspected during each pre-op check until the new permanent coated catalysts are installed.
- The patched coated catalysts should be replaced with the permanently coated catalysts as soon as they are received, but no later than January 1, 2009.

- The DEP should be notified when the catalysts are changed to the permanently coated catalysts.

Based on the results of on-site testing and information provided in the request, the TAC recommended approval of the Deutz F21 2011 30.2 HP engine (MSHA Certification No. 07-ENA040010) with a RHOMAC ENK 25-19175-7197 disposable DPM filter (Dry System) in the fire / water car.

The Department approves the TAC recommendations because the alternative method will not reduce or compromise the level of health and safety protection afforded by Article II-A of the Act.

Pennsylvania approval number BOTE-DEES-144-08 has been assigned to this engine and emission system. The ventilation rate for this engine and emission system is 1,500 cfm. Both of these numbers are to be permanently attached to a metal plate attached to the engine.

Should you have any questions concerning this, please contact me at jsbaffoni@state.pa.us or the above telephone number.

Sincerely,

Joseph A. Sbaffoni
Director
Bureau of Mine Safety

cc: P Borchick, TAC
R Bowersox, TAC

bcc: Walker
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Martin
Gaida/TAC and Brookville Files

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