

Pennsylvania Technical Advisory Committee  
On Diesel Powered Equipment

71a

**Paul Borchick**

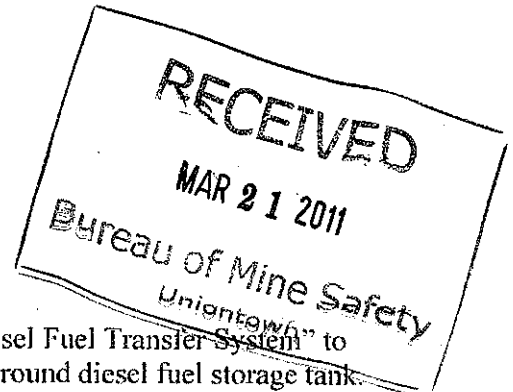
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Joseph Sbaffoni, Director  
Bureau of Mine Safety  
Fayette County Health Center  
100 New Salem Road, Room 167  
Uniontown, Pa. 15401



RE: TAC Recommendation for the Bailey BMX Mine "1 Man Diesel Fuel Transfer System" to transfer diesel fuel from the surface storage tank to the underground diesel fuel storage tank.

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**

Bailey BMX Mine submitted a request to the Bureau of Mine Safety requesting the TAC to visit and evaluate the proposed "1 Man Diesel Fuel Transfer System" that Bailey BMX Mine would like to use for transferring diesel fuel from the 10,000 gallon surface storage tank to the underground storage tank. Bailey BMX Mine currently uses an approved "2 Man Diesel Fuel Transfer System". Bailey BMX believes that the proposed 1 man system, with its redundant safety features, provides at least the same level of safety as the present approved 2 man system.

The Director requested the TAC to review the above system and advise the Department whether it meets the requirements as established in Chapter 4 of the Act. Additionally, the TAC should also evaluate whether the proposed plan ensures that the protection of miners is paramount and the alternate method is as safe as required by law.

On February 23, 2011 the TAC members and representatives from the Bureau of Mine Safety traveled to the Bailey BMX Mine to evaluate Bailey BMX's proposed "1 Man Diesel Fuel Transfer System".

## Investigation

On February 23, 2011 the TAC and DEP traveled to Bailey BMX Mine to investigate and observe the "1 Man Diesel Fuel Transfer System" in operation. We visited the surface 10,000 gallon tank facility as well as the underground diesel fuel storage/fueling facility along with Bailey BMX Mine personnel and representatives of MVI, the designer. An actual supervised 1 man fuel transfer was observed. Procedures were explained and questions were answered by Bailey BMX management and MVI representatives.

There were several questions regarding electrical equipment, components and wiring methods raised by the Department investigators. The TAC feels that the TAC is not qualified to make any determinations on the electrical system, and this should be left to the Department for evaluation. The TAC will only evaluate the proposed system based on whether it complies with Chapter 4 Sections 405 and 406 of the Act, and whether the technology provides at least the same level of protection to the miners as the currently approved system.

At the surface facility the TAC requested the 10,000 gallon tank be identified with signage to identify it as storage for "underground diesel fuel". DEP asked for fill level lights to be installed so the vendor delivering fuel to the tank does not overflow it. Inside the surface facility, the TAC requested that the manual valves between the measuring tank and the borehole be locked closed and the keys kept secure so a manual fuel dump does not occur unless supervised. Also the TAC requested the PLC cabinet be kept locked and the keys secured so only "Authorized Persons" can access the PLC control panel.

At the underground diesel fuel storage/fueling facility there was some discussion as to how to maintain the position of the main fuel shut off valve when not in use. The TAC determined that the main shut off valve on the 2 inch pipe in the underground facility should be kept closed when the fuel transfer system is not in use. The TAC and DEP asked that the "Power on" indicator light, which was a small LED type, be changed to a larger light that would more easily verify when there was power to the control panel in the underground facility.

Bailey BMX Mine requested approval to use a lighting system inside the underground diesel fuel storage facility during fueling. Chapter 4 Section 405(d)(2) states that underground diesel fuel storage facilities shall be located "at least 25 feet from trolley wires, haulage ways, power cables and electric equipment not necessary for the operation of the storage facilities". After discussions with Bailey BMX management and DEP, the TAC feels that the site specific lighting system installed in this facility, that meets DEP approval, does not reduce the level of safety provided to the miners by the Act. The TAC believes that lighting this area during operation enhances the safety of the miners.

The TAC requested Bailey BMX Mine to provide them with the written operating procedures that would be posted at both the surface and underground facilities. The TAC reviewed these procedures (Attachment 1).

There are several additional safety features included in the proposed system:

- The installation of level indicators in both the metering tank on the surface and the storage tank underground limit the capacity of these tanks when in automatic mode.
- The underground storage tank main fill valve will stay in the closed position at all times except when fuel transfer is being done by the person operating the "1 Man Diesel Fuel Transfer System". This valve can continue to be the main cutoff for fuel being dumped

- into the underground storage tank, giving the operator total control on transferring fuel into the underground tank.
- There are 3 level switches installed in the system to prevent overflow. These systems back up each other to provide added protection over the present system.
  - There will be a timer in the system that limits the run time of the fill pump so that it shuts off after enough time has elapsed to fill the measuring tank. This time will be determined during the "30 day trial period".
  - The position of the motorized valve that controls the fuel dump from the metering tank to the underground storage tank can be shown on the computer screen to show if it is open or closed.
  - The proposed system will only operate if the level of the underground storage tank is low enough to accept all the fuel in the metering tank and completely empty the borehole piping to maintain a dry line system.
  - The proposed 1 man fuel transfer system will only operate if it is initiated by the operator at the underground storage tank, unlike the current system where a person on the surface could fill the metering tank and dump fuel into the borehole piping. The manual valves on the surface will be locked closed for 1 man operation.
  - The proposed system would be inspected weekly and the results recorded in a book to be kept at the mine.
  - The operating procedures for fueling the underground tank will be posted at the controls underground and at the surface facility. (see Attachment 1)
  - All operators required to transfer fuel to the underground storage tank using the proposed system will be trained in the operation and procedures. The record of this training will be kept at the Mine.
  - All system alarms will only be reset from the HMI screen at the storage tank on the surface.
  - The proposed system would have a "30 day trial period" from the date of the TAC recommendation. This would allow for necessary close monitoring by qualified mine personnel and the ability to make any adjustments needed to the process for optimal performance and safety. After this time the TAC and the Department would be notified of any changes made to the system before a final recommendation is made.

### **Recommendation**

This TAC recommendation is **site specific** to the proposed Bailey BMX Mine "1 Man Diesel Fuel Transfer System".

The TAC has reviewed the proposed "1 Man Diesel Fuel Transfer System" for the Bailey BMX Mine. Based on the TAC's observations during the visit to the mine, information received from mine personnel and MVI, and review of the proposed operating procedures the TAC believes that the Bailey BMX Mine proposed "1 Man Diesel Fuel Transfer System" meets the requirements of Chapter 4 Sections 405 and 406 of the Act.

Additionally, the TAC believes that this 1 man system and operating procedures maintain at least the same level of safety as provided by the currently approved 2 man system. The TAC believes that the site specific lighting system installed in this facility, that meets DEP approval, does not reduce the level of safety provided to the miners by the Act. The TAC believes that lighting this area during operation enhances the safety of the miners.

The TAC recommends temporary approval for the "30 day trial period" for this site specific "1 Man Diesel Fuel Transfer System" and operating procedures for the Bailey BMX Mine, including all stipulations and requests as provided in this recommendation. After the conclusion of the trial period, the TAC will review the results with Bailey BMX to determine if any necessary changes will be made to the system. At that time the TAC may recommend final approval prior to the next TAC meeting on April 13, 2011.

  
Paul Borchick

  
Ron Bowersox

BMX  
One Person Diesel Fueling Station

**Procedures for Fueling the Underground Tank**  
**All of the following 11 Points shall be controlled from**  
**the UG Diesel Pump Control Panel**

1. If the UG diesel pump control panel **Fuel Tank Low** (red) light is on, then a fueling cycle can be performed. The mine tank shall be below 25% for a fueling cycle. The level on the mine tank is determined by a Rosemount 3300 continuous level transmitter that is submersed in the tank.
2. Open the main fuel shut off valve.
3. Press the **Start** push button to begin the fueling cycle. The 10,000 gallon pump will start and fill the outside meter tank.
4. During this cycle the **Fuel Tank Low** (red) light will blink fast to confirm normal fueling operation. The outside meter tank is being filled from a pump inside the 10,000 gallon bulk tank. The pump shall fill the meter tank until it reaches 68%. A Rosemount 3300 continuous level transmitter is submersed in the tank.
5. Once the outside meter tank is filled, the pump will shut off.
6. Once the **OK to Open MOV** (green) light comes on then press the **Open the MOV Start Timer** push button.
7. The motor operated valve and spring return valve will open to release the fuel to underground tank. This shall take about 12 minutes.
8. During this fueling cycle the **OK to Open MOV** (green) light will blink fast to confirm normal fueling operation.
9. If during the fueling cycle the **Fuel Tank Low** (red) light blinks slow 2 second on/off intervals and the **OK to Open MOV** (green) light blinks slow 2 second on/off intervals there is an alarm which shall cause the system to stop. Go to the procedure for recovering from an alarm section below.
10. Once the fueling cycle is finished the **Fuel Tank Low** (red) light and the **OK to Open MOV** (green) light will turn off and will not come on again until the mine tank is below 25%.
11. Then close the mine tank manual valve.

ATTACHMENT 1-1

## **Procedures for recovering from an alarm**

1. Call Maintenance and ask to bring up the Diesel Fueling Station Overview screen for the alarm or check for alarms at the local HMI screen.
2. If an alarm is active, correct the problem.
3. All alarms must be reset from the HMI screen (touch screen in diesel control panel) inside the surface control building.

## **Diesel Fueling System Alarms that will cause the Diesel Fueling System to Stop.**

Any of the below alarms will cause the Motor Operated Valve to Close.

Any of the below alarms will cause the 10,000 Gallon Transfer Pump to Shut Off.

- 10,000 Gallon Tank Control Power Alarm
- 250 Gallon Surface Meter Tank High Level Alarm(Rosemount)
- 250 Gallon Surface Meter Tank Overflow Alarm(Rosemount)
- 10,000 Gallon Tank Pump Off Delay Alarm – Set for 5 Minutes (If the pump runs for 5 minutes it shall shut off)
- 10,000 Gallon Tank Pump Fail to Start – Set for 5 Seconds (If the pump is commanded to start and does not for 5 seconds than a alarm shall be set)
- Underground Emergency Stop Push Button
- 450 Gallon Underground Mine Tank High Alarm(Rosemount)
- 450 Gallon Underground Mine Tank Overflow Alarm(Rosemount)
- 250 Gallon Surface Rosemount Meter Tank Level Transmitter Out of Range Alarm (If the level transmitter wire becomes broken)
- 450 Gallon Underground Rosemount Mine Tank Level Transmitter Out of Range Alarm (If the level transmitter wire becomes broken)
- Spring Return Valve Control Power Alarm
- Spring Return Valve Safety Disconnect Alarm
- Spring Return Valve Stuck in Mid Travel Alarm
- Spring Return Valve Manual Timer (This timer times when the valve is open and shall alarm after 750 seconds)
- Motor Operated Valve Control Power Alarm
- Motor Operated Valve Safety Disconnect Alarm
- Motor Operated Valve Stuck in Mid Travel Alarm

## **The Spring Return Valve Shall Close on the following alarms**

- Spring Return Valve Control Power Alarm
- Spring Return Valve Safety Disconnect Alarm
- Underground Emergency Stop Push Button

## **10,000 Gallon Bulk Tank Operational Description**

The 10,000 Gallon Bulk Tank shall be filled by a tanker truck. The level shall be monitored by Rosemount 3300 continuous level transmitter. At the point where the tanker truck fills the diesel line there are 3 stack lights each light indicating upper levels of the 10,000 gallon bulk tank. When the Green stack light comes on this represents the 10,000 gallon bulk tank is 75% full. When the Amber stack light comes on this represents the 10,000 gallon bulk tank is 85% full. When the Red stack light comes on this represents the 10,000 gallon bulk tank is 95% full and the 3" fill valve shall close. The 3" fill valve shall stay closed until the 10,000 gallon tank is below 90%.

If the 3" fill valve is closed from an alarm or failure, the bypass system may be used. If the bypass system is used please follow these steps to fill the 10,000 gallon bulk tank.

- Mine management shall contact the diesel fuel delivery company to work with them to unload the truck.
- Check the analog level indicator (float style indicator) on the 10,000 gallon tank to confirm there is room for diesel fuel.
- Change the valves for the fuel to bypass the 3" fill valve.
- The truck driver shall release the diesel fuel.
- A person shall watch the analog level indicator to confirm the 10,000 gallon bulk tank is not going to overflow.

### **10,000 Gallon Bulk Tank Alarms that will cause the 3" Fill Valve to Close.**

- Rosemount 3300 continuous level transmitter reads 95% level in 10,000 gallon bulk tank.
- Rosemount Level Transmitter Out of Range Alarm (If the level transmitter wire becomes broken)
- 3" Fill Valve Control Power Alarm
- 3" Fill Valve Safety Disconnect Alarm
- 3" Fill Valve Stuck in Mid Travel Alarm

## Diesel Fuel System Manual Operation

If the One Person Diesel Fueling Station fails the only way to drop fuel is manually. Follow these steps:

- The fuel may be dropped into the mine using a 2 man approach.
- One man on the surface at the diesel fueling station and one underground at the mine tank.
- Once communications are established via the local loud mouth mine phone. The fuel may be dropped manually.
- The man on the surface may fill the meter tank manually by selecting the selector switch on the panel to manual. The selector switch is a spring return to off. This shall fill the meter tank. The current setting for the pump to run in the 10,000 bulk tank is 2 minutes. This pump is being controlled from a timer in the panel. Once the man is satisfied with level in the meter tank he needs to call to the man in the mine at the mine tank.
- The man beside the mine tank needs to open the manual valve.
- The man on the surface may open the required valves to release the fuel into the mine.
- Once fueling cycle is complete the man in the mine needs to close the manual valve.