



Virginia
Regulatory
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Final Regulation Agency Background Document

Agency Name:	Department of Mines, Minerals, and Energy
VAC Chapter Number:	4 VAC 25-90
Regulation Title:	Rules and Regulations Governing the Use of Diesel Powered Equipment in Underground Coal Mines
Action Title:	Final
Date:	May 30, 2001

Please refer to the Administrative Process Act (§ 9-6.14:9.1 *et seq.* of the *Code of Virginia*), Executive Order Twenty-Five (98), Executive Order Fifty-Eight (99) , and the *Virginia Register Form, Style and Procedure Manual* for more information and other materials required to be submitted in the final regulatory action package.

Summary

Please provide a brief summary of the new regulation, amendments to an existing regulation, or the regulation being repealed. There is no need to state each provision or amendment; instead give a summary of the regulatory action. If applicable, generally describe the existing regulation. Do not restate the regulation or the purpose and intent of the regulation in the summary. Rather, alert the reader to all substantive matters or changes contained in the proposed new regulation, amendments to an existing regulation, or the regulation being repealed. Please briefly and generally summarize any substantive changes made since the proposed action was published.

The Rules and Regulations Governing the Use of Diesel Powered Equipment in Underground Coal Mines are designed to ensure the health and safety of underground coal miners where diesel equipment is used. They will serve to protect miners from potential health hazards through the control of diesel engine exhaust emissions that pose potential health implications to miners. Regulation of equipment used in underground coal mining improves the overall health and safety of miners by ensuring the safe use and maintenance of diesel powered equipment in underground coal mines while encouraging productive mining.

Substantive changes have been made since the publication of the proposed regulation. The section on diesel equipment approval is being amended for clarification and to add diesel powered ambulances and diesel powered fire fighting equipment. The proposed section on diesel

equipment operation was amended to clarify the use of sanding and rerailling devices and to be more inclusive of all intake and exhaust equipment by using the term exhaust systems as opposed to exhaust couplings. The section on diesel equipment maintenance is being amended to include maintenance of all filter types rather than just fuel filters. The section on ventilation of diesel equipment is being amended to include the actual effective date of the regulation. The section on diesel emission testing and evaluation is being amended to clarify that all diesel engine exhaust streams require testing and to clarify the exhaust emission testing responsibilities of the mine operator. The section on air quality was renumbered and the section on fuel use, storage, and handling was amended to require frame grounding of equipment so that a potential does not exist during fueling. The section is also being reformatted for clarification.

A more detailed outline is presented in the section titled "Detail of Changes."

Statement of Final Agency Action

Please provide a statement of the final action taken by the agency: including the date the action was taken, the name of the agency taking the action, and the title of the regulation.

On May 30, 2001, the Director of the Department of Mines, Minerals and Energy adopted a final regulation entitled 'Rules and Regulations Governing the Use of Diesel Powered Equipment in Underground Coal Mines' (4 VAC 25-90.)

Basis

Please identify the state and/or federal source of legal authority to promulgate the regulation. The discussion of this statutory authority should: 1) describe its scope and the extent to which it is mandatory or discretionary; and 2) include a brief statement relating the content of the statutory authority to the specific regulation. In addition, where applicable, please describe the extent to which proposed changes exceed federal minimum requirements. Full citations of legal authority and, if available, web site addresses for locating the text of the cited authority, shall be provided. If the final text differs from that of the proposed, please state that the Office of the Attorney General has certified that the agency has the statutory authority to promulgate the final regulation and that it comports with applicable state and/or federal law.

The DMME has the legal authority to amend this regulation under the Coal Mine Safety Act, Sections 45.1-161.3, 45.1-161.106, and 45.1-161.206 of the Code of Virginia. Section 45.1-161.206 mandates this regulation.

The Virginia Mine Safety Act, Sections 45.1-161.3, and 45.1-161.106, give DMME the authority to promulgate these regulations in the interest of coal mine safety. The latter specifically addresses the maintenance, operation, and transportation of any mechanical or electrical equipment, device or machinery used for any purpose in the underground mining of

coal. It also cites that regulations shall relate to the “safety and health standards for the protection of life, health, and property of, and the prevention of injuries to, persons involved in or likely to be affected by any underground coal mining operations which shall include...ventilation and equipment.”

Section 45.1-161.206 states that diesel powered equipment may be used underground with the written approval of the Chief and that the Chief shall promulgate regulations necessary to carry out the provisions of this section. It also specifies that there shall be good ventilation for a safe, healthful working environment, that the minimum amount of air needed to operate must be included on the approval plate on the machine, and that the equipment must be maintained to meet the manufacturers specifications.

In addition, Section 45.1-161.107 directs the Chief to consider a number of factors in regulatory development; the federal mine safety law, standards generally recognized by the coal mining industry or set by recognized professional organizations and the results of research and other information that is available regarding the highest degree of protection and the latest technology.

The new Mine Safety and Health Administrations (MSHA) regulation on approval, exhaust gas monitoring and safety requirements for the use of diesel powered equipment in underground coal mines (30 CFR Parts 7, et. al.) was reviewed to make sure there were no conflicts with the proposed state regulation and there were no specific mandates on the State.

The Office of the Attorney General has certified that the agency has the statutory authority to promulgate the proposed regulation and that it comports with applicable state and federal laws.

Purpose

Please provide a statement explaining the need for the new or amended regulation. This statement must include the rationale or justification of the final regulatory action and detail the specific reasons it is essential to protect the health, safety or welfare of citizens. A statement of a general nature is not acceptable, particular rationales must be explicitly discussed. Please include a discussion of the goals of the proposal and the problems the proposal is intended to solve.

The Department of Mines, Minerals, and Energy (DMME) is amending the Rules and Regulations Governing the Use of Diesel Powered Equipment in Underground Coal Mines to ensure that coal mining is performed safely, efficiently and in a manner that most benefits the health, safety and welfare of the citizens of the Commonwealth. The proposed final amendments were recommended by the mining industry, stakeholders, and its customers.

The regulation is needed to ensure diesel equipment is safely operated and maintained and that underground miners are protected from the effects of diesel exhaust. The regulation

addresses general requirements, operation and maintenance, ventilation, air quality, fire protection, and diesel fuel standards.

Final amendments to the regulation are needed to address hazards not addressed by the Mine Safety and Health Administration (MSHA), reflect recent amendments to, and avoid conflicts with, MSHA regulations and federal law, reflect changes in technology, to address public comments, and eliminate duplicative requirements. Revisions to the Diesel Equipment Regulations, along with less substantive ones, were recommended by the industry and labor representatives that served on the regulatory review committee.

The goals of the final regulation are to protect miners from diesel exhaust which may pose health hazards to workers and to encourage productive mining through the efficient uses of diesel-powered equipment. Safe, productive workers and mines accrue benefits to the public's health, safety and welfare.

Substance

Please identify and explain the new substantive provisions, the substantive changes to existing sections, or both where appropriate. Please note that a more detailed discussion is required under the statement of the regulatory action's detail.

The proposed final requirements are organized under new subject headings and rewritten for clarity and ease of understanding. They are revised to address changes made in Virginia's Coal Mine Safety Act, to address hazards not addressed by the Mine Safety and Health Administration (MSHA), avoid conflicts with MSHA regulations and federal law, reflect changes in technology, and eliminate duplicative information.

Section 4 VAC 25-90-10 proposes in the final regulation to add definitions of terms used in the regulation not defined in the state mining law and which are consistent with MSHA; i.e., "threshold limit values."

The second section, 4 VAC 25-90-20, contains more substantial revisions to the regulation. It modifies the regulations stricken in the first section. It also proposes that the Chief's designated representative be authorized to approve diesel powered equipment to use in a mine provided that the equipment meets Federal requirements and the requirements of this regulation as well as meets design and performance requirements for permissible and non-permissible diesel powered equipment. It is also proposed that if a diesel particulate filter, a catalytic converter, or both, are installed on underground diesel-powered equipment, they will be installed and maintained according to manufacturer's specifications.

This section of the proposed final regulation also modifies the regulation to clarify that the Chief may impose additional requirements for the purpose of eliminating a condition or practice necessary to protect the health and safety of miners. It requires an approved plan to address ventilation, fire protection, fuel handling, storage and any other requirements as the Chief may determine when an operator uses stationary diesel equipment, portable diesel

generators, diesel powered ambulances, and diesel powered fire fighting equipment in underground coal mines. It also requires notification to the DMME-DM and emission testing after completion of diesel equipment alterations that affects emissions.

The proper operation and maintenance of underground diesel equipment contributes greatly to safety. Section 4 VAC 25-90-30 describes the minimum requirements for operating this equipment in underground coal mining. The order of the regulation is modified to improve the clarity and understanding of the regulation.

Section 4 VAC 25-90-40, maintenance of diesel equipment, information is being moved from the existing regulation 4 VAC 25-90-300 and a new section created to improve clarity and to incorporate terminology consistent with Virginia law. It proposes to set forth the qualifications of the person required to inspect equipment, to add a requirement that engines be inspected weekly by a certified diesel engine mechanic, and that all engine filters be maintained. The section incorporates the use of an hour meter for engine run time.

Ventilation is an essential component for the safe use of diesel engines underground. The final regulation section 4 VAC 25-90-50 describes the steps that must be taken to ensure ventilation of diesel powered equipment. Requirements in subdivisions A - G is being moved from existing regulatory section 4 VAC 25-90-120.

4 VAC 25-90-60, Emission Testing and Evaluation sets forth the requirements for how the mine operator will measure, monitor, evaluate, and maintain diesel engine emissions. The regulatory section also requires written procedures to develop and implement these requirements.

Air Quality requirements from existing section 4 VAC 25-90-120 are proposed in 4 VAC 25-90-70 of the final regulation. The section modifies the location and frequency of air quality measurements to more effectively measure and evaluate exhaust emissions from operating diesel equipment and to be less burdensome to operators, at the same time providing increased miner protection. Air quality measurements will be collected in the immediate return for each working section during the on-shift examination when diesel equipment is in operation in by the loading point. If a problem arises, the Chief may require additional tests.

The section incorporates the Threshold Limit Values (TLV) for nitrogen dioxide and carbon monoxide that are most recent and protective while eliminating the TLV for nitrogen oxide. The requirement to measure sulfur dioxide, formaldehyde, and carbon dioxide is being removed. Finally, emission testing and evaluation results are required to be recorded and securely kept and available at the mine.

Section 4 VAC 25-90-80, fire protection is being moved from section 4 VAC 25-90-270 of the existing regulation and is being reworded and reordered for clarity and understanding. In A, for example, a self contained or dry chemical liquid carbon or no less effective system, is proposed to be replaced with multipurpose dry chemical type (ABC) fire suppression system or an equivalent approved system.

Fuel specifications and use and were separated into sections 4 VAC 25-90-90 and 100 respectively. Information is being moved from parts of the existing regulation and information is being consolidated and simplified. In 4 VAC 25-90-90 A, the regulation lowers the sulfur content from .25% to .05% to be consistent with national standards set by the Environmental Protection Agency and MSHA. In B a requirement is being added to require the operator to provide information on fuel sulfur content and flash point. This information is to be kept up to date, corresponding with shipments received at the mine.

In section 4 VAC 25-90-100, fuel use, storage, handling, sections A - I are being moved from parts of the existing regulation and reworded (i.e., existing sections 4 VAC 25-90-360 K and L). In addition, subsection J is being reworded with detailed requirements to clarify and organize the regulation. 4 VAC 25-90-100 J(1) is changed to require fuel storage greater than 100 gallons be ventilated with intake air to the return air course or to the surface. J(2) incorporates existing sections 4 VAC 25-90-360 K(3) and L(2), i.e., requiring an ABC type fire extinguisher and rock dust in a quantity proportionate to the quantity of fuel stored.

Final regulation section 4 VAC 25-90-100 K is being proposed to address the temporary and permanent conditions under which fuel should be stored underground. The section also clarifies and makes requirements consistent with MSHA regulations. The 48 hour and 1,000 gallon fuel storage supply limit requirement as amended is being proposed as 4 VAC 25-90-100 K(4). This is from existing regulation 4 VAC 25-90-360 K(5). Temporary storage of fuel in working sections of the mine is being added as 4 VAC 25-90-100 L(3), while concurrently incorporating existing section 4 VAC 25-90-360 L(3) requirements.

Issues

Please provide a statement identifying the issues associated with the final regulatory action. The term "issues" means: 1) the advantages and disadvantages to the public of implementing the new provisions; 2) the advantages and disadvantages to the agency or the Commonwealth; and 3) other pertinent matters of interest to the regulated community, government officials, and the public. If there are no disadvantages to the public or the Commonwealth, please include a sentence to that effect.

The primary advantage of the regulation is that it provides increased health and safety to miners while simplifying and reducing the cost of exhaust monitoring. The disadvantage is an increased cost to a small number of operators using diesel equipment. A discussion follows.

In MSHA's publication, *Practical Ways to Reduce Exposure to Diesel Exhaust in Mining - A Toolbox*, it is pointed out that diesel-powered equipment is widely used in mining operations because its more powerful than battery-operated equipment and does not use cables which can restrict mobility. However, the use of this equipment is also a source of concern because of the health hazards posed by emissions, e.g., carbon monoxide, carbon dioxide, and oxides of nitrogen. The particulate matter in these emissions can be inhaled and kept in the lungs and may increase the risk of disease. Therefore, it is important to reduce miners' exposure to diesel exhaust emissions, especially in underground mines.

How this reduction is achieved and to what degree, is an important issue being discussed on the national level. MSHA and NIOSH have been working with the mining community to address the potential health risks, look at ways to measure and limit diesel exhaust emissions in mines, and approaches to achieve a safe and healthy work environment where diesel powered equipment is in operation. The result of this effort supports these conclusions:

- Engine emissions are governed by engine design, work practices, duty cycle, fuel quality and maintenance. Reducing engine emissions will decrease the amount of diesel particulate matter that needs to be controlled by other means and will reduce the exposure of miners.
- There is no single emission control strategy that is a panacea for the entire mining community.
- Diesel engine maintenance is the cornerstone of a diesel emission control program.

Findings were considered along with other scientific information stemming from development of similar regulations in neighboring states. The studies found that using catalytic converters and filters on diesel equipment could reduce the amount of toxic gases generated by diesel equipment by 90-95% and eliminate one third of the particulate matter emitted. When used with a filter, the particulate matter is reduced still more. Thus, a catalytic converter or filter or both are referenced in the regulation because it can provide an effective method for reducing the hazards of diesel equipment, especially when combined with clean fuel and good ventilation.

The regulation will also be of benefit to miners and operators in that the regulations now reflect changes in law and improvements in mining technology, address areas not currently addressed by MSHA and avoid conflicts with federal law and regulations. They are also clearer and easier to understand, which benefits those regulated as well as the agency who must enforce the regulation. Safer mines and healthier miners generate benefits to the public at-large. Localities affected are those in southwestern Virginia in which coal mining with diesel-powered equipment occurs.

Statement of Changes Made Since the Proposed Stage

Please highlight any changes, other than strictly editorial changes, made to the text of the proposed regulation since its publication.

Substantive changes have been made since the publication of the proposed regulation. The section on diesel equipment approval is being amended for clarification and to add diesel powered ambulances and diesel powered fire fighting equipment. The proposed section on diesel equipment operation was amended to clarify the use of sanding and rerailling devices and to be more inclusive of all intake and exhaust equipment by using the term exhaust systems as opposed to exhaust couplings. The section on diesel equipment maintenance is being amended to include maintenance of all filter types rather than just fuel filters. The section on ventilation of diesel equipment is being amended to include the actual effective date of the regulation. The section on diesel emission testing and evaluation is being amended to clarify that all diesel engine exhaust streams require testing and to clarify the exhaust emission testing responsibilities

of the mine operator. The section on air quality was renumbered and the section on fuel use, storage, and handling was amended to require frame grounding so that a potential does not exist of equipment during fueling. The section is also being reformatted for clarification.

Public Comment

Please summarize all public comment received during the public comment period and provide the agency response. If no public comment was received, please include a statement indicating that fact.

Agency Response to Comments

DMME Public Hearing on Regulations Governing the Use of Diesel Powered Equipment in Underground Coal Mines

Comment: One commenter asked to clarify who is an “Authorized Person”.

Response: Authorized person is defined in section 45.1-161.8 of the Coal Mine Safety Act as “a person assigned by the operator or agent to perform a specific type of duty or duties or to be at a specific location or locations in the mine who is trained and has demonstrated the ability to perform such duty or duties safely and effectively”. This definition has the same meaning in this regulation. DMME does not include in the regulation definitions established in the law to avoid the possibility of conflict between the law and the regulation.

Comment: One commenter believes the fuel handling system grounds should be common to each other or to a common point when fuel is being transferred from storage to the tank as in 4 VAC 25-90-100 D.

Response: The regulation is being clarified. The words, “so that the difference in potential does not exist” have been inserted after, “frame grounded”. The final language in the first sentence of 4 VAC 25-90-100 D will read, “ *The fuel handling system and the diesel-powered equipment shall be frame grounded so that a difference in potential does not exist while fuel is being transferred from the storage compartment to the fuel tank*”. The new wording will appear in the final regulation.

Comment: Three commenters are concerned with maintenance being conducted properly on diesel engines to control diesel exhaust. There is also a concern for carbon monoxide levels being exceeded, causing CO alarm system trips. In addition the commenters believe the diesel exhaust should be tested at the tailpipe outlet. One of the commenters added that if the equipment is found to be out of compliance it should be taken out of service.

Response: Maintenance, ventilation, and air quality are three sections of the Diesel Equipment regulations that address these concerns. The maintenance of emission components on diesel

powered equipment is to be conducted by a certified diesel engine mechanic in accordance with the manufacturer's specifications and applicable federal and state requirements. The maintenance must be documented and records must be maintained. This will ensure that maintenance will be conducted properly.

Diesel exhaust emissions (particulate, carbon monoxide, nitrogen oxides) will be controlled to a lower level as new maintenance, air quality and control requirements are in place. This lower level of emissions in the mine environment will reduce exposure to diesel emissions and should reduce the number of CO alarm trips. It is felt that this will also provide a healthier and more productive environment.

Undiluted exhaust is proposed in 4 VAC 25-90-60 to be tested and evaluated weekly by an authorized person. Also, 4 VAC 25-90-30 requires an operator to take equipment out of service if the equipment is not being operated in compliance.

Specific mine ventilation standards and approval plates must be affixed to each piece of equipment. The standards reflect the air quantity necessary to ventilate areas of the mine where diesel equipment will be operated.

Comment: Two commenters ask for a change in the 4 VAC 25-90-60 testing requirement. They would like to see a daily testing of undiluted exhaust emissions as opposed to a weekly testing.

Response: Properly maintained engines, increased ventilation to remove harmful exhaust emissions and more stringent air quality standards are proposed to reduce miner's exposure to diesel exhaust emissions and provide a more healthful environment. The requirement to test undiluted exhaust emissions on a weekly basis is sufficient. There is not enough change in the diesel equipment emissions over one day's time to warrant daily testing.

These are the minimum requirements that must be addressed to comply with the regulation. In instances when engine exhaust becomes more noticeable than normal, an emission test must be performed. If the results of this test indicate emission levels of carbon monoxide out of compliance with the level established in the written procedures for that specific diesel unit, actions shall be taken to remove the equipment from service until such condition or practice is corrected.

Comment: One commenter asked if a jack and bar will suffice as a re-railing device and if sanders required on all mobile equipment?

Response: Each piece of equipment will be required to have adequate rerailing devices. A jack and bar would be sufficient for most types of equipment if the tool is capable of safely rerailing the equipment.

The section of the regulation addressing installation of sanders on diesel equipment is being amended to be consistent with current MSHA personnel carrier standards in 30 CFR § 75.1403-

6. These do not require sanding devices for rail equipment designed to transport five or fewer people.

Comment: One commenter requests that after 6 months of the publication, each new diesel engine, and after 24 months each diesel engine, be equipped with a filtration system with an average 80% or greater reduction (Within 3 years this standard should be increased to 95%.) of diesel particulate matter measured by the ISO 8178-1 test, and that the average results from the three tests of diesel particulate emissions do not exceed 0.12 mg/m³.

Response: The proposed regulation states that the operator may install an oxidation catalytic converter, a diesel particulate filter, or both. The catalytic converter, if used, would allow the use of engine heat to reduce emission pollutants generated by diesel combustion. This can be effective only if the engine is kept at optimum temperature. Due to varied mine conditions that the equipment is operated in, keeping the engine at optional temperature may not be possible. Therefore, the operator should have flexibility with the use of different types of emission controls based on the conditions in the mine.

However, if the chief determines that any condition or practice in an underground coal mine is unsafe or threatening to the safety and health of the employee, the chief may impose additional requirements to eliminate the unsafe or unhealthy condition or practice. This flexibility allows for a more stringent standard if needed.

If alterations are made to the equipment that may increase diesel emissions, the DMME is to be notified, must approve changes, and may require additional emission testing. Also, the operator is required to use low sulfur fuel and keep fuel specification records to show that the fuel being used in diesel powered equipment will not contribute additional pollutants to the mine environment.

All requirements will be in effect 30 days after publication of the final rule. Miners will benefit from immediate implementation rather than from a phased approach.

Comment: One commenter stated the regulation should require all systems addressed in the regulation must be maintained in accordance with manufacturer's recommendations, 30 CFR and DMME approval specifications. He also requested that during each regular inspection, DMME conduct testing of the diesel equipment to determine if the equipment is being operated in accordance with the approved specifications.

Response: Section 4 VAC 25-90-40 requires that engines shall be maintained, in accordance with the manufacturer's requirements, the Coal Mine Safety Act and these regulations. This maintenance must be performed by a certified diesel engine mechanic. Compliance must be verifiable by the operator and maintenance records must be kept. Engine intake and exhaust systems are to be inspected visually by an authorized person each day that the equipment is operated and the operator is required to keep a record of the number of hours of use of the equipment.

It is the responsibility of the mine inspector, during a complete inspection to inspect all diesel equipment. If equipment is determined to not be maintained in accordance with the manufacturer's standards, the Coal Mine Safety Act and these regulations, it must be brought back into compliance or be removed from service, 4 VAC 25-90-30 E.

Comment: One commenter asks that within six months after the publication of the final rule and during the period prior to the effective date, all equipment be tested and a diesel particulate index ventilation plate be affixed to the tested equipment showing the ventilation necessary to dilute diesel emissions to no greater than 0.30 mg/m³.

Response: The regulation requires in 4 VAC 25-90-50, that approval plates must be affixed to each piece of equipment. These plates, reflecting MSHA engine approval data designed to control particulates and gaseous emissions contain exhaust dilution ventilation rates, rated power and speed, high idle, maximum altitude before deration and engine model number. In addition and as required by the DMME in the final regulation, approval plates will reflect the air quantity necessary to ventilate the last open crosscut of a working section, the working face of a long wall operation, or the intake end of a pillar line. This ventilation is to ensure necessary dilution and removal of diesel emissions.

Comment: One commenter requested that the minimum quantities of air in any split where any individual unit of diesel powered equipment is being operated shall be at least that specified on the diesel particulate index ventilation approval plate and the ventilation approval plate rating for that equipment. Air quantity measurements to determine compliance with this requirement shall be made at the individual unit. Another commenter requested that minimum ventilation rates on the same split of air be set at 100% of the ventilation plate and 75% of the next highest and 50% of each of the remaining equipment on the split be required.

Response: The regulation requires in 4 VAC 25-50, that the minimum quantity of air to ventilate individual diesel equipment pieces is to be the sum of the quantity of air specified on the approval plate of each piece of equipment. The air quantity is to be maintained in any entry and in any air course with single or multiple entries and in any additional locations that the chief may require.

Air quantity measurements taken at the equipment would not be a good indicator of air needed to ventilate. If air quantity measurements are collected at the unit or piece of equipment, the reading being collected would not be representative of emissions in the area where the equipment is being used

Comment: One commenter requested that the undiluted exhaust emissions of diesel engines in diesel powered equipment used in underground coal mines should be tested and evaluated daily by an authorized person.

Response: The regulation section 4 VAC 25-90-70 requires the mine air quality (CO and NO) is to be tested during on-shift examinations. In addition, it is required that records be maintained and that the testing be conducted by a mine foreman authorized by the operator. Also, undiluted emissions from diesel powered equipment are to be tested weekly by an authorized person. Additional daily testing of diesel powered equipment would place an unnecessary and excessive burden on the operator. It is protective to miners to both daily monitor emissions in the working environment and weekly test undiluted emissions.

Comment: One commenter requested that all miners at a mine covered by this subpart who can reasonably be expected to be exposed to diesel emissions on that property shall be trained annually in:

- The health risks associated with exposure to diesel exhaust
- The methods used in the mine to control diesel particulate matter concentrations
- Identification of the personnel responsible for maintaining those controls; and
- Actions miners must take to ensure the controls operate as intended.

The commenter also requested that the operator be required to retain at the mine site for one year after completion of the training a record that the training required by this section has been provided. Such record may be retained elsewhere if the record is immediately accessible from the mine site by electronic transmission.

Response: State and federal mine safety laws and regulations already contain hazard training, record keeping, and numerous health and safety training requirements. The DMME is required to establish curriculum and teaching materials for training programs, which shall be consistent with the requirements of the federal mine safety law.

Also, the DMME will be working with the operators to establish the procedures to test diesel equipment emission levels and to establish emissions baselines. The Department will provide training on these procedures as well as record keeping and associated regulatory requirements.

Detail of Changes

Please detail any changes, other than strictly editorial changes, that are being proposed. Please detail new substantive provisions, all substantive changes to existing sections, or both where appropriate. This statement should provide a section-by-section description - or crosswalk - of changes implemented by the proposed regulatory action. Include citations to the specific sections of an existing regulation being amended and explain the consequences of the changes.

The proposed final regulatory requirements are organized under new subject headings and rewritten for clarity and ease of understanding. They are revised to address changes made in Virginia's Coal Mine Safety Act, to address hazards not addressed by the Mine Safety and

Health Administration (MSHA), avoid conflicts with MSHA regulations and federal law, reflect changes in technology, and eliminate duplicative information.

Section 4 VAC 25-90-10 is adding definitions of terms used in the regulation not defined in the state mining law and which are consistent with MSHA; i.e., “threshold limit values.”

Section, 4 VAC 25-90-20, contains more substantial revisions to the regulation. It modifies the regulations stricken in the first section.

It also proposes in subsection 4 VAC 25-90-20 A, that diesel equipment may be approved by the chief’s designated representative, not just the chief.

Subsection 4 VAC 25-90-20 A(2) states the operators must meet federal requirements and the requirements of this regulation as well as meet design and performance requirements for permissible and non-permissible diesel powered equipment.

In accordance with 4 VAC 25-90-20 A 3, the Chief of DMME’s Division of Mines must approve diesel equipment before it is allowed underground. As proposed, this approval would have been based upon an evaluation by the Division of Mines of the equipment, undiluted exhaust emissions, the adequacy of ventilation, fire protection *and air quality for the type of equipment*. The term, “*and air quality for the type of equipment*” is being removed from the subsection in the final regulation. Approval of the equipment is not based on “air quality” but on the emission level generated by the piece of diesel equipment. Minimum requirements for air quality are addressed in Section 4 VAC 25-90-70.

Subsection 4 VAC 25-90-20 A(4) states that if the operator installs a diesel particulate matter filter, a catalytic converter, or both, on underground diesel-powered equipment it is required to be maintained in accordance with the manufacturer’s specifications.

Subsection 4 VAC 25-90-20 B of the final regulation modifies the regulation to clarify that the Chief may impose additional requirements for the purpose of eliminating a condition or practice necessary to protect the health and safety of miners.

Subsection 4 VAC 25-90-20 C requires an approved plan to address ventilation, fire protection, fuel handling, storage and any other requirements as the Chief may determine when an operator uses stationary diesel equipment in underground coal mines.

4 VAC 25-90-20 C is being amended in the final regulation to add *diesel powered ambulances and fire fighting equipment* to the list of equipment that requires prior approval by the department. These were added to the list of diesel powered equipment that is not permitted underground without an approved plan. It was found that there was a need to recognize these special categories of diesel powered equipment in the regulation.

Subsection 4 VAC 25-90-20 D requires notification to the DMME-DM and emission testing after completion of diesel equipment alterations that affects emissions.

The proper operation and maintenance of underground diesel equipment contributes greatly to safety. Section 4 VAC 25-90-30 describes the minimum requirements for operating this equipment in underground coal mining.

In the operation of diesel equipment section, the first requirement is modified to be to improve the order of the regulation. The section A was section I of the existing regulation. Additional requirements for mobile diesel equipment use are being added to be consistent with MSHA regulations.

Subsection 4 VAC 25-90-30 A (2) of the final regulation required that diesel equipment be operated with a rerailing device. This has been reworded to be consistent with MSHA and in response to public comment. It now requires that all mobile underground diesel powered equipment shall be operated safely and shall meet specific requirements including that it have a *“proper lifting device for the rerailing of such equipment (self propelled rail equipment only),”* 4 VAC 25-90-30A 2(d).

Subsection 4 VAC 25-90-30 A (2) of the final regulation is being amended in response to public comment. The requirement addressing sanding devices on self propelled rail equipment was separated from the requirement for rerailing devices. The final amended subsection, 4 VAC 25-90-30 A 2 (e) requires that mobile underground diesel equipment have *“sanding devices, except for personnel carriers that transport not more than 5 personnel (self-propelled rail equipment only).”*

Subsection 4 VAC 25-90-30 A 2(i) of the proposed regulation required that diesel powered equipment be operated with intake and exhaust couplings in good condition. The subsection is being amended in the final regulation to require that diesel powered equipment be operated with intake and exhaust *systems* in good condition. The use of the terminology *“systems”* is inclusive of the intake and exhaust couplings and other engine equipment necessary to maintain and properly operate the engine.

Subsection 4 VAC 25-90-30 B replaces existing section J and is changed to reflect only the operation of diesel equipment because self-rescuers are required for all employees, not just those subject to this regulation. Sections C and D are added and section E is proposed to be consistent with MSHA regulations; it now delineates the steps to be taken when diesel equipment is not in compliance with the regulation. The old section L was changed to D and the old section M is being moved to section 4 VAC 25-90-20 C because it is more appropriate to the subject matter.

In section 4 VAC 25-90-40, maintenance of diesel equipment, information is being moved from 4 VAC 25-90-300 and a new section to improve clarity and to incorporate terminology consistent with Virginia law. Section 4 VAC 25-90-40 A proposes to set forth the qualifications of the person required to inspect equipment and makes an authorized person responsible for inspections each day rather than that of a competent person. Sections B and D propose to add a requirement that diesel powered equipment be inspected weekly by a certified diesel engine mechanic.

Subsection, 4 VAC 25-90-40 C is being amended in the final regulation to read that *“all”* filters on diesel engines shall be maintained or replaced as recommended by the manufacturer or more often if necessary, rather than just fuel filters. This change was made because after field testing

of exhaust systems, the Department found an increase of exhaust emissions from diesel engines if air filters were not properly maintained. “All” filters would include: fuel, air, and oil filters and any additional filters that would affect proper engine function.

Section 4 VAC 25-90-40 E is being proposed in the final regulation to be modified as a stand alone requirement for diesel powered equipment to be fitted with an hour meter that will accurately reflect the engine run time important for maintenance. Section F remains as is and section G is the old section D.

Ventilation is an essential component of safe use of diesel engines underground. Section 4 VAC 25-90-50 describes the steps that must be taken to ensure ventilation of diesel powered equipment. Requirements in subdivisions A - G are being moved from original section 4 VAC 25-90-120 and changed to reflect current mine ventilation practices where diesel powered equipment is used.

As proposed, 4 VAC 25-90-50 E (1) and (2) are being amended in the final regulation to include the actual date the regulation is effective rather than to state the “*effective date of these regulations.*”

4 VAC 25-90-60, Emission Testing and Evaluation sets forth the requirements for how the mine operator will measure, monitor, evaluate, and maintain the control of diesel engine emissions. The regulatory section also requires written procedures to develop and implement these requirements.

The first sentence in proposed section 4 VAC 25-90-60 is being amended in the final regulation. The section states that “Undiluted exhaust emissions of diesel engines, *to include each side of a dual exhaust system*, in diesel powered equipment used in underground coal mines shall be tested and evaluated weekly by an authorized person.” The additional language was made to clarify the requirement that the operator must test the emissions from each exhaust stream regardless whether the engine is equipped with a single or dual exhaust system.

Subsection 4 VAC 25-90-60 (3) as proposed stated that the mine operator must have written procedures that address, “Instrumentation calibrated and used to accurately detect, measure and monitor the air emission concentrations in section 4 VAC 25-90-70.” It is being amended in the final regulation to state, “*Instrumentation and calibration of instrumentation capable of accurately detecting carbon monoxide in the expected concentrations*”. This change is in response to public comment and to be more consistent with current MSHA language. The reference to section 4 VAC 25-90-70 is being removed because the focus of the section is to test the emissions of the equipment, not the air quality in the mine.

Subsection 4 VAC 25-90-60 (4) was amended from “The evaluation and interpretation of air quality testing and sampling results” to say “*The method of evaluation and interpretation of sampling results*”. This is in response to public comment and to be more consistent with MSHA language. The reference to air quality is being removed because the focus of the section is to test the emissions of the equipment, not the air quality in the mine.

Subsection 4 VAC 25-90-60 (5) required the operator's plan to address, "The concentration or changes in concentration of carbon monoxide that will indicate a change in engine performance and an action plan to address changes in performance. The operator will compare the MSHA engine approval data with the first four emission tests at the mine and establish an acceptable level of carbon monoxide emissions, subject to approval by the Chief. Carbon monoxide emissions shall not exceed two times the established level and at no time exceed 2500 parts per million." The language is being amended and clarified to require *"The concentration or changes in concentration of carbon monoxide that will indicate a change in engine performance and an action plan to address changes in performance. The operator will establish a baseline level of diesel exhaust emissions, subject to approval by the Chief, based upon the MSHA engine approval data and the average of the first four undiluted exhaust emission tests required by this section. This plan will establish an action level not to exceed the lesser of two times the baseline or 2500 parts per million (ppm) of carbon monoxide. Should the action level be exceeded, the machine shall be removed from service and engine performance improved."* As amended, the operator must establish an emission baseline after evaluating the average of the first four exhaust emission tests from each exhaust and the MSHA engine approval data. The section was also clarified to ensure that the carbon monoxide emissions not exceed the lesser of two times the established baseline level or 2500 ppm.

Subsection 4 VAC 25-90-60 E is being proposed to require that maintenance records must be kept by the operator to track diesel equipment engine performance.

Section 4 VAC 25-90-70, air quality requirements are being moved from the existing section 4 VAC 25-90-120. The section modifies the location and frequency of air quality measurements to more effectively measure and evaluate the exhaust emissions from operating diesel powered equipment and to be less burdensome to operators but providing increased miner protection. Air quality measurements will be collected in the immediate return for each working section during the on-shift examination when diesel equipment is in operation in by the loading point. If a problem arises, the Chief may require additional tests.

The section incorporates the Threshold Limit Values (TLV) for nitrogen dioxide and carbon monoxide that are most recent and protective while eliminating the TLV for nitrogen oxide. The requirement to measure sulfur dioxide, formaldehyde, and carbon dioxide was removed as well. Finally, emission testing and evaluation results will be required to be recorded and securely kept and available at the mine.

Section 4 VAC 25-90-70; proposed subsections B through E are being numbered for clarity in 4 VAC 25-90-70 A of the final regulation.

Section 4 VAC 25-90-80, fire protection is proposed to be moved from existing section 4 VAC 25-90-270 in the regulation, reworded and reordered for clarity and understanding. In A, for example, a self contained dry chemical or liquid carbon or no less effective system is proposed to be replaced with multipurpose dry chemical type (ABC) fire suppression system or an equivalent approved system.

Sections 4 VAC 25-90-90 and 4 VAC 25-90-100, fuel specifications and use and were separated from existing section 4 VAC 25-90-90. Information is being moved from other parts of the

regulation and information is proposed to be consolidated and simplified. In 4 VAC 25-90-90 A, the regulation lowers the sulfur content from .25% to .05% to be consistent with national standards set by the Environmental Protection Agency and MSHA. In 4 VAC 90-90 B a requirement is being added to require the operator to provide information on fuel sulfur content and flash point. This information is to be maintained up to date, corresponding with shipments received at the mine.

Section 4 VAC 25-90-100, fuel use, storage, handling; sections A - I are being moved from parts of the existing regulation and reworded (i.e., existing sections 4 VAC 25-90-360 K and L). In addition, subsection J is being reworded with detailed requirements to clarify and organize the regulation. 4 VAC 25-90-100 J(1) is changed to require fuel storage greater than 100 gallons be ventilated with intake air to the return air course or to the surface. J(2) incorporates existing sections 4 VAC 25-90-360 K(3) and L(2), i.e., requiring an ABC type fire extinguisher and rock dust in a quantity proportionate to the quantity of fuel stored.

Subsection 4 VAC 25-90-100 D of the final regulation did not provide that equipment be frame grounded during fueling. It was requested during public comment that the subsection be amended to include this requirement. The final language is being changed to require that *“the fuel handling system and the diesel-powered equipment shall be frame grounded so that a difference in potential does not exist while fuel is being transferred from the storage compartment to the fuel tank.”*

Subsection 4 VAC 25-90-100 K of the final regulation is being proposed to address the temporary and permanent conditions under which fuel should be stored underground. The section also clarifies and makes requirements consistent with MSHA regulations. The 48 hour and 1,000 gallon fuel storage supply limit requirement as amended is being proposed as 4 VAC 25-90-100 K(4). This is from existing regulation 4 VAC 25-90-360 K(5). Temporary storage of fuel in working sections of the mine is being added as 4 VAC 25-90-100 L(3), while concurrently incorporating existing section 4 VAC 25-90-360 L(3) requirements.

Section 4 VAC 25-90-120 of the existing regulation is being repealed. Information from this section has been incorporated into other sections of the regulation.

Section 4 VAC 25-90-270 of the existing regulation is being repealed. Information from this section has been incorporated into other sections of the regulation.

Section 4 VAC 25-90-300 of the existing regulation is being repealed. Information from this section has been incorporated into other sections of the regulation.

Section 4 VAC 25-90-340 of the existing regulation is being repealed. Information from this section has been incorporated into other sections of the regulation.

Section 4 VAC 25-90-360 of the existing regulation is being repealed. Information from this section has been incorporated into other sections of the regulation.

Family Impact Statement

Please provide an analysis of the regulatory action that assesses the impact on the institution of the family and family stability including the extent to which the regulatory action will: 1) strengthen or erode the authority and rights of parents in the education, nurturing, and supervision of their children; 2) encourage or discourage economic self-sufficiency, self-pride, and the assumption of responsibility for oneself, one's spouse, and one's children and/or elderly parents; 3) strengthen or erode the marital commitment; and 4) increase or decrease disposable family income.

The regulation is essential to protect workers by preventing health problems, accidents and fatalities in work that is inherently dangerous. Improper conditions and actions are a significant cause of injuries and fatalities.

The regulation governs working conditions at coal mines. A safe work environment and work practices reduces accidents that may result in reduced family income and increased family stress. Reducing accidents decreases these factors and has positive family impact. Ensuring that workers and operators know how to perform their jobs safely and efficiently has a generally positive effect in areas around coal mines through protection of the public health, safety and welfare from adverse effects of mining operations. The regulation has no effect on family formation, stability, or autonomy.