

to receptacles. Since the provisions of existing section 18.41(f) do not reflect the latest state-of-the-art technology, mine operators file petitions for modification under Section 101(c) of the Mine Act to take advantage of the technological advancements. Since 1980, there have been approximately 300 petitions filed and granted under Section 101(c) requesting modification to 30 CFR 75.503 (Permissible electric face equipment; maintenance) and 18.41(f) (Plug and receptacle-type connectors) to allow the use of alternate locking devices. The means of securing battery connectors permitted under this direct final rule allows for the use of padlocks and other equally effective mechanical devices that preclude the inadvertent separation of the battery plug from the receptacle.

In some operations, mine operators encountered difficulties with padlocks in both normal and emergency situations. The use of padlocks requires the maintenance of keys by authorized personnel. Due to the nature of mining operations, padlocks may be filled with mining debris, rendering them difficult or impossible to open with a key. Padlock keys can be misplaced, broken, or bent and may become unusable. This can go unnoticed by the operator until an emergency occurs, when the key may be unavailable or unusable. The removal of a padlock to permit the disconnection of a battery plug in an emergency situation, such as a battery fire, requires a longer period of time and greater effort than the removal of any of the other locking devices permitted in this direct final rule. However, where keys are accessible and padlocks are relatively free from accumulation of dust, padlocks have proven to be effective.

In 1987, to address the problems encountered with the use of padlocks, MSHA issued a policy allowing use of an alternative to padlocks. This policy permits the use of a device that is captive and requires a special tool to disengage and allow separation of the connector. A device is captive when a mechanical connection is made permanent by a locking device that is confined in its mounting location in a manner where, once installed, it cannot be inadvertently removed. The mechanical connection can only be made non-permanent by direct and intervening action using a special tool. A special tool is one that is not normally carried by miners and is used to ensure that constant pressure is maintained to prevent inadvertent separation of the plug from the receptacle.

Since 1980, mine operators have also been granted permission, through the petition for modification process, to use

a spring-loaded locking device. MSHA determined that spring-loaded locking devices provide at least the same measure of protection as padlocks and captive locking devices. These devices maintain constant pressure on the threaded ring or equivalent mechanical fastening to prevent the plug from accidentally disengaging from the receptacle.

For both alternate locking devices, the captive locking device and the spring loaded locking device, a warning tag is also required to alert the user that the connector must not be disengaged under load. Withdrawal of a battery plug from the receptacle while the machine is energized (*i.e.*, under load) can create incandescence arcing and sparking that could result in a personal injury, explosion, or fire. The requirement for the warning tag, along with part 48 new task training requirements, provide for appropriate hazard recognition when using alternative locking devices. MSHA is unaware of any adverse incidents involving alternate locking devices.

By issuing this direct final rule, MSHA is responding to the requirements of the Regulatory Flexibility Act and Executive Order 12866 that agencies review their regulations to determine their effectiveness and to implement any changes indicated by the review that will make the regulation more flexible and efficient for stakeholders and small businesses while maintaining needed protections for workers. This rule maintains the protection afforded by the existing standard.

III. Discussion of Alternative Locking Devices on Mobile Battery-Powered Machines

A. Paragraph 18.41

Section 18.41 addresses connectors used on battery and non battery-powered machines. Section 18.41(f) specifies requirements for plug and receptacle-type connectors used on mobile battery-powered machines employed in underground gassy mines. This direct final rule modifies paragraph (f) of 30 CFR 18.41 by adding two new provisions allowing the use of devices that provide at least the same measure of protection as that afforded by the existing standards. The Agency recognizes that battery-powered machine designs differ from conventional machine designs employing trailing cables. The energy to battery-powered equipment is carried on-board the machine with rechargeable battery assemblies, rather than being transmitted via a trailing cable from a

section power center. Because of the inherent design limitations of battery-powered machines, there is no practical way to automatically remove all electrical power from battery-powered machines. Machines powered by trailing cables have circuit-interrupting devices that can be used to de-energize them, whereas most battery-powered machines rely on a plug and receptacle for de-energization. The proper procedure for removing power from a battery-powered machine is to first open the main machine disconnect device and then to disengage the plug from the receptacle. This effectively isolates the battery power from the machine.

B. Subparagraph 18.41(f)(1)

Subparagraph 30 CFR 18.41(f)(1) retains the existing provision that a plug padlocked to the receptacle will be acceptable in lieu of an interlock provided the plug is held in place by a threaded ring or equivalent mechanical fastening in addition to the padlock. This paragraph also retains the provision that a connector within a padlocked enclosure will be acceptable.

A padlock used on a battery plug and receptacle-type connector serves a dual purpose. It secures the threaded ring or equivalent mechanical fastening in place. A padlock is also used as a means to prevent the removal of the plug from the receptacle by unauthorized personnel. In this respect, only those persons having keys are considered authorized to remove the plug from the receptacle.

C. Subparagraph 18.41(f)(2)

Subparagraph 30 CFR 18.41(f)(2) is a new provision which provides for an alternate method for securing the battery plug to the receptacle. The rule provides that a plug which is held in place by a threaded ring or equivalent mechanical fastening will be acceptable provided that the threaded ring is secured in place with a device that is captive. It also requires a special tool to disengage the device and allow for the separation of the connector. It further requires a warning tag that states: "DO NOT DISENGAGE UNDER LOAD."

D. Subparagraph 18.41(f)(3)

Subparagraph 30 CFR 18.41(f)(3) is a new provision which provides for another alternate method for securing the battery plug to the receptacle. The rule states that a plug held in place by a spring-loaded or other locking device that maintains constant pressure against a threaded ring or equivalent mechanical fastening will be acceptable provided that it secures the plug from accidental separation. It further requires