

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 final rule. However, where keys are accessible and padlocks are relatively free from accumulation of dust and other materials, 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 (e.g. allen wrench) 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 whereby, once installed, it cannot become inadvertently removed. The mechanical connection can only be made non-permanent by a 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, beyond that which may be achieved by hand pressure, is maintained to prevent inadvertent separation of the plug from the receptacle. 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. A warning tag is also required to alert the user that the connector must not be disengaged under load.

The requirement for the warning tag, along with part 48 task training requirements, provide for appropriate hazard recognition when using alternative locking devices in lieu of a padlock. Existing § 48.7 (Training of miners assigned to a task in which they have had no previous experience; minimum courses of instruction), requires that miners be instructed in safe operating procedures applicable to new or modified machines or equipment to be installed or put into operation in the mine, which require new or different operating procedures. A padlock not only serves as a mechanical means to prevent inadvertent separation of the plug from the receptacle; it also precludes the disconnection of the battery plug from the receptacle by unauthorized persons, unfamiliar with the potential hazards associated with disconnecting the plug from the receptacle under load. The warning tag serves as a deterrent, like the padlock, for separation of the plug and receptacle under load. For the purposes of this final rule, a warning tag

can be either a metal plate or a label with permanent lettering on a wear-resistant material. It must be prominently displayed on or attached to an exterior surface of the battery connector housing.

Since 1980, mine operators have also been granted permission, through the petition for modification process under section 101(c) of the Mine Act, to use a spring-loaded locking device. MSHA has 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. The use of this method also requires that a warning tag be attached near the locking device to remind the user not to disengage the plug from the receptacle under load. MSHA is unaware of any adverse incidents involving alternate locking devices.

By issuing this 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. The final rule will maintain the protection afforded by the existing standard.

## **II. 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 permissible mobile battery-powered machines employed in underground gassy mines. This 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 protection as that afforded by the existing standards, and does not reduce safety. 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.

Another acceptable alternative to padlocked connectors, permitted under existing § 18.41(a), is the use of connectors in which the mating or separation of the male and female electrodes occurs within an explosion-proof enclosure and an electrical interlock circuit is provided to cause automatic interruption of the circuit before the male and female electrodes are separated. These types of connectors do not require a warning tag or a locking ring held captive by an external device.

Public comments have been received under the proposed rule and resulted in a change to the rule language. The change is made in §§ 18.41(f)(2) and (f)(3). An explicit statement for use on warning tags is provided in the two paragraphs. However, equivalent statements comparable to "DO NOT DISENGAGE UNDER LOAD," which indicates a hazard exists when disengaging plugs from receptacles, are allowed. Judgement of an alternate statement as to the equivalency in safety will be provided by the MSHA's Approval and Certification Center during the standard approval process of equipment.

### ***B. Section 18.41(f)(1)***

30 CFR 18.41(f)(1) retains the existing provision that a plug padlocked to the receptacle is 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 is 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 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. No comments were received on § 18.41(f)(1). Therefore the final