Title/Subject:	Policy for Motor Overload Protection	
EDDS No. : APOL2153	Version Date: 2005-02-02	Signature/Initial: *David C. Chirdon* /s

1.0 PURPOSE

The purpose of this policy is to provide guidance to Electrical Safety Division (ESD) investigators when evaluating the overcurrent protection of motors as required by Title 30 Code of Federal Regulations (30 CFR), Part 18, Section 18.51(b). This policy addresses only the specific overcurrent condition known as overload.

2.0 SCOPE

This policy encompasses equipment submitted to MSHA for evaluation under 30 CFR Part 18.

3.0 REFERENCE

This document references 30 CFR 18.51(b).

4.0 DEFINITIONS

There are no terms in this document which need to be defined.

5.0 POLICY

5.1 30 CFR, Part 18, Section 18.51(b) requires each motor to be protected by an automatic overload device. In the event that two motors of the same design and rating operate simultaneously and perform virtually the same duty, one protective device for both motors will be acceptable. The single protective device shall be set based on the sum of the full load currents of both motors.

5.2 The overload device shall be current and time dependent. Guidelines for overload device settings are listed in 5.3. The investigator may require the applicant to document the overload device trip curves and the motor damage curve if the investigator suspects an overload device within these guidelines will not adequately protect the motor. The applicant may justify the use of an overload device with a trip point greater than these guidelines or with a trip point based on a motor current other than the continuous full load current. The justification must show that this trip point will prevent damage to the motor and its insulation system. One

method of justifying a higher overload setting is to submit the overload device trip curves and the motor damage curve. The overload device trip curves must indicate that the device will trip prior to the motor damage curve at all times.

5.3 Overload Device Guidelines

5.3.1 OVERLOAD TRIP DEVICE – The manufacturer, part number and ultimate trip point of the overload device must be specified. The current ratio of any current transformers associated with the device must be specified.

5.3.2 TRIP POINT – The ultimate trip point of the overload protective device must be set at not more than 125% of the motor full load continuous current rating for the motor.

5.3.3 VARYING OR INTERMITTENT DUTY DC MOTORS – For varying or intermittent duty DC motors, the ultimate trip of a time dependent overload device may be increased to 150% of the motor full load continuous current rating of the motor. The instantaneous overcurrent protection for this motor must be set no higher than 400% of the motor full load current.

5.3.4 WHEN SOLID STATE SPEED CONTROLS ARE USED –
A discrete overload device shall be located on the load side of the solid state speed controller and shall remove power from the solid state controller. When the overload device is incorporated into the machine control microprocessor or Programmable Logic Controller (PLC), it must comply with the CDS No. NCRI2001, Design Criteria for Microprocessor Based Motor Overload Protection Systems.

5.4 The overload device shall require a manual restart of the motor after the overload conditions are removed.

5.5 For three-phase AC motors, the overload device shall sense current in at least two phases and shall trip if the current in any of the three phases exceeds the trip point. The overload device shall remove power from all ungrounded conductors supplying the motor.

5.6 For a DC motor, the overload device must remove power from a sufficient number of ungrounded conductors to interrupt the current flow to the motor. If the overload device only opens one conductor, the applicant must document a method of assuring the motor can not be reconnected so

this conductor becomes the grounded conductor.

5.7 The overload device shall require a cool down period before the motor can be restarted after an overload trip.

5.8 The overload device must de-energize the circuit prior to failure of the motor cable insulation.

5.9 All machines issued an approval or extension of approval must meet this policy. Those approvals issued in the past will not be extended unless the machine meets this policy. All motor overload protection modified by a Field Modification or RAMP application must also meet this policy. Machines in the field will not be removed from service or retrofitted.