

Supplemental Application Procedures Under Part 36 for Machines Containing Integral Electrical Systems, 30 CFR 36



U.S. Department of Labor
Mine Safety and Health Administration
Approval and Certification Center

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U.S. Department of Labor
R.R.# 1, Box 251
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Triadelphia, West Virginia 26059

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December 9, 1985

MSHA POLICY MEMORANDUM NO. 85-42-TSF

MEMORANDUM FOR MANUFACTURERS OF DIESEL-POWERED EQUIPMENT

FROM: GEORGE J. DVORZNAK
Chief, Division of Mechanical and Material Safety

SUBJECT: Revised "Supplemental Application Procedures Under
Part 36 For Machines Containing Integral
Electrical Systems"

On November 10, 1982, the Mine Safety and Health Administration, Approval and Certification Center, distributed a document titled "Supplemental Application Procedures Under Part 36 For Machines Containing Integral Electrical Systems". These procedures were intended to provide diesel equipment manufacturers with detailed instructions regarding the type of information required in order to evaluate electrical systems designed for incorporation on Part 36 equipment.

During the past two and one-half years, several Part 36 approvals have been issued for machines containing integral electrical systems. An analysis of the types of electrical systems used on this equipment suggests that additional refinements to the "Supplemental Procedures" could further simplify the format of the required information and provide a basis to standardize electrical system designs so they may be applicable to different machine configurations.

Experience has shown that typical electrical systems for Part 36 equipment consist of an engine-driven alternator, a headlight switch, and headlights. Furthermore, equipment manufacturers generally utilize the same or very similar electrical system designs on practically all machine configurations. Variations between electrical system designs include differences in intercomponent cable sizes and the number and rating of headlights.

The original "Supplemental Procedures" required information specific to the installation of the electrical system for each machine. This information included references to an overall machine outline and dimensions, cable lengths, and headlight guard details. This situation limited the applicability and

compatibility of an electrical system design for use on other machines or even similar machine designs.

A more general procedure has been developed which eliminates machine design and electrical system installation details from the design information submitted for the electrical system. References to a machine outline and dimensions, cable lengths, and headlight guard details have been eliminated from the procedures. Compliance with electrical system installation requirements will be evaluated as part of the machine approval investigation. Information such as headlight guard details and electrical system permissibility checklists will be required as part of the machine approval evaluation and, therefore, not required to be submitted as part of the electrical system design information. This delineation between the electrical system design requirements and installation requirements in addition to the elimination of specific machine design features from the "Supplemental Procedures" was necessary in order for a given electrical system design to be applicable and compatible with many machine designs and configurations.

Equipment manufacturers are strongly encouraged to take advantage of the generic procedures by standardizing the design of electrical systems in order to minimize the number of unique electrical system evaluations necessary. Once a machine has been approved and the electrical system has been assigned a "DE-0000" Identification Number, an equipment manufacturer need only reference the DE Number on subsequent applications for Part 36 approvals as long as the electrical system design remains the same. If slight differences exist between a new electrical system design and a previous design, it is recommended that the applicant site the previous DE Number for reference purposes. These references should reduce unnecessary and redundant reviews of previously evaluated electrical system designs.

Additional refinements have been made to the "Supplemental Procedures" in order to minimize the number of documents required to be submitted for the electrical system evaluation. It is believed that by adding more general notes on the summary sheet drawing, many supplemental drawings could be eliminated. For example, a general note indicating that all unused glands are plugged and tack-welded could suffice instead of providing this information on a separate document for each electrical enclosure having unused lead entrances. Other notes of this type have been provided in the revised procedure for use as a guide in preparing the required summary sheet drawing.

A copy of these revised procedures is attached. They may be considered to be in effect immediately. In addition, a letter dated November 10, 1982, to manufacturers of diesel-powered equipment is also included for reference purposes.

Every attempt has been made to refine the "Supplemental Procedures" as much as possible. Please address any questions or comments to Robert C. Boring at the letterhead address above or by calling (304) 547-0400, extension 403.

DIVISION OF MECHANICAL AND MATERIALS SAFETY

APPROVAL AND CERTIFICATION CENTER

SUPPLEMENTAL APPLICATION PROCEDURES UNDER PART 36
FOR MACHINES CONTAINING INTEGRAL ELECTRICAL SYSTEMS

FORWARD

This document incorporates changes which have been made to the Part 36 machine approval evaluation process. These revisions include:

1. A notation concerning the requirement for an electrical system permissibility checklist.
2. A notation concerning the guarding of electrical system components such as headlights.
3. Changes to the information required on the electrical system summary sheet, such as the elimination of a machine outline and overall dimensions; deletion of cable length information; and the addition of more general notes.

SUPPLEMENTAL APPLICATION PROCEDURES UNDER PART 36
FOR MACHINES CONTAINING INTEGRAL ELECTRICAL SYSTEMS

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In addition to the requirements indicated in the "Mobile Diesel-Powered Equipment Approval Applications, 30 CFR 36", dated January 1981, an application for machine approval which contains an integral electrical system must include the following documents:

1. One additional copy of the Part 36 approval application letter.
2. One copy of an "Electrical System Summary Sheet". (See Appendix A)
3. One copy of an "Electrical System Schematic Diagram". (See Appendix B)
4. One copy of a Caution Statement, if not previously accepted by the Approval and Certification Center. (See 30 CFR, 18.6(j)).
5. One copy of a Factory Inspection Form (electrical), if not previously accepted. (See 30 CFR, 18.6(k)).
6. Any other drawings listed on the "Electrical System Summary Sheet" which are not on file at the Mine Safety and Health Administration and are necessary to describe the electrical system and related components.

NOTE: A permissibility checklist (electrical) will be required for the electrical system. This checklist must be submitted as part of the machine approval application documents. It is not a required document for the electrical system evaluation.

It is requested that the "Electrical System Summary Sheet" and the "Electrical System Schematic Diagram" contain certain specific information related to the electrical system design. A brief explanation of each of these drawings is included in Appendix A and Appendix B.

Please note that the drawings, specifications, wiring schematic, and descriptions submitted must be adequate in number and sufficient in detail to fully describe the complete electrical system and related components. Furthermore, all drawings must be titled, numbered, dated, and show the latest revision. Each drawing must include a warning statement that changes in design must be authorized by the Mine Safety and Health Administration before they are applied to approved equipment.

All applicants desiring a Part 36 approval for machines containing an integral electrical system are encouraged to review 30 CFR, Part 18, before submitting an application. A copy of Title 30, Mineral Resources, Code of Federal Regulations (30 CFR), which contains Part 18 can be purchased from:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
(303) 783-3238

If additional information or clarification is required, applicants should contact the Chief, Division of Electrical Safety, Approval and Certification Center at (304) 547-0400, extension 301.

Appendix A. Electrical System Summary Sheet

The "Electrical System Summary Sheet" should show the electrical components in their relative position on the machine. An outline of the machine is not required. Cable entrance glands of components shall be shown along with the associated cable routing paths between components. All cables and electrical components should be assigned an item number. Packing gland assemblies should be given a letter designation.

An itemized material list should be part of the summary drawing. All components, entrance glands, and cables must be identified by an item number or letter designation reference. Headings of the material list and a brief description are as follows:

Item: This number designation should correspond with the number shown on the component outline. Gland assemblies should be given the letter designation of the component. For example, if a light switch enclosure with three different sized gland assemblies is specified, the switch enclosure could be item 8. The gland assemblies would be 8A, 8B, and 8C.

Quantity: Indicate the number of items used. If any item is used all of the time, list the quantity only. If an item may be used "in place of" another item, indicate the quantity and designate this item as an alternate. For example, if a light switch is designated as item number 8 with a quantity of one (1), alternate light switch would be indicated as "alt." to item 8 with a quantity of one. In those cases where an item may or may not be used or supplied with a machine, the item should be designated as an option and the quantity noted. Item and quantity references for alternate options are similarly designated.

Manufacturer: Identify the manufacturer of the electrical components. Cable and hose conduit do not have to be identified by manufacturer.

Manufacturers Part Number: List the model number or part number as assigned by the manufacturer of the part(s). GLAND PARTS NEED NOT BE INDIVIDUALLY SPECIFIED IF THE GLAND ASSEMBLY WAS IDENTIFIED AND INCLUDED AS PART OF THE CERTIFICATION ISSUED FOR THE ELECTRICAL ENCLOSURE. Otherwise, part number/ drawing number references for each component of the gland assembly must be listed. Part number references for cable and hose conduit are not required.

General Description: List the names and electrical ratings of components. List the cables to show size, number of conductors, voltage ratings, and minimum/maximum outside diameters. The cable entrance glands should reference the item numbers of the cables used. List flame-resistant hose conduit with the I.D. On the same line as the cable it encloses.

Acceptance Number: Each electrical enclosure or component must have an acceptance number. The certification number of each enclosure must be indicated. Intrinsically safe components must be identified as such and show the ISC acceptance designation. Specific cable and hose conduit acceptance number references are not required.

The "Electrical System Summary Sheet" must reference or note the drawing numbers of the "Electrical System Schematic Diagram", a caution statement and a factory inspection form.

Other notes that should be listed on the summary sheet, as they apply to a particular machine design, include:

- a. "All hose conduit is flame resistant as per 30 CFR, 18.65", and, when used in applications where it may be exposed to engine heat and oil, "oil resistant".
- b. "All electrical cables are enclosed in hose conduit." or "All machine cables which are not enclosed in hose conduit are flame-resistant as per 30 CFR, 18.64". It should be noted that all cables between machine components must meet the applicable requirements of 30 CFR, 18.36, and be specified as oil resistant when used in applications where exposed to engine heat and oil. Additional design details, specifications, and/or notes may be required in order to establish compliance with Section 18.36 of Part 18.
- c. "Headlights are protected by guards or by machine location".

NOTE: The actual methods utilized to provide adequate guarding will be evaluated for compliance with 30 CFR 36.33(a) during the machine approval evaluation. Guarding details are not required for the electrical system evaluation.

- d. "All unused glands are plugged and tack-welded."

- e. "All electrical cables are isolated from hydraulic lines."
- f. "All intercomponent cables are clamped in place to prevent undue movement."

Appendix B. Electrical System Schematic Diagram

The Schematic Diagram must show the complete electrical system of the machine in schematic form. Short circuit protection of all branch circuits and cables between machine components must be shown. The electrical rating of all circuit breakers, fuses, overload relays, etc., must be noted. Adjustments of settings of these protective devices must be tabulated or noted if fixed.

All electrical devices must be identified by the item number of the component which houses the device. The item number is listed on the Electrical System Summary Sheet. Intrinsically safe circuits must be identified by manufacturer, model or part number, and acceptance number. A note that any changes in the intrinsically safe circuitry of components may result in an unsafe condition must be indicated.