

IN THE COMMONWEALTH COURT OF PENNSYLVANIA

PENNSYLVANIA COAL ASSOCIATION,
by its guardian ad litem,
CONSOLIDATION COAL COMPANY and
ROCHESTER & PITTSBURGH COAL COMPANY
et al.,

Petitioners

v.

COMMONWEALTH OF PENNSYLVANIA,
DEPARTMENT OF ENVIRONMENTAL
RESOURCES, and ARTHUR DAVIS,
individually and in his capacity as
the Secretary of the Department of
Environmental Resources, and
THOMAS J. WARD, individually and in
his capacity as Director, BUREAU OF
DEEP MINE SAFETY OF THE DEPARTMENT
OF ENVIRONMENTAL RESOURCES,

Respondents

No. 0082 M.D. 1990

STIPULATION OF SETTLEMENT

AND NOW this 30th day of April, 1995, the Pennsylvania Coal Association and the Commonwealth of Pennsylvania, Department of Environmental Resources stipulate and agree to settlement of this matter and submit it to the Court for approval:

1. Petitioner, the Pennsylvania Coal Association (hereinafter "PCA") is a Pennsylvania unincorporated, ~nonprofit association with its office in Dauphin County, Pennsylvania, whose members are individuals, partnerships and corporations engaged in the mining and sale of bituminous coal in Pennsylvania. PCA's guardians ad litem in this action are its member companies, Consolidation Coal Company, a Delaware corporation with its principle office in Allegheny County,

Pennsylvania and Rochester L Pittsburgh Coal Company, a Pennsylvania corporation with its principle office in Indiana County, Pennsylvania. PCA is authorized to execute this Stipulation of Settlement on behalf of its member companies who are the other petitioners to this matter.

2. PCA was formed to foster, promote and defend the interests of Pennsylvania's bituminous coal producers and their employees. The members of the PCA produce approximately 75% of the bituminous coal mined in Pennsylvania and more than 85% of the bituminous coal mined by underground mining.

3. Petitioner, BethEnergy Mines Inc., is a West Virginia corporation, which engages in underground coal mining operations in the Commonwealth.

4. Petitioner, Canterbury Coal Company, is a Pennsylvania corporation which engages in underground coal mining operations in the Commonwealth.

5. Petitioner, Consolidation Coal Company, is a Delaware corporation, which engages in underground coal mining operations in the Commonwealth.

6. Petitioner, Cyprus Emerald Resources Corporation, is a Delaware corporation, which engages in underground coal mining operations in the Commonwealth.

7. Petitioner, Doverspike Brothers Coal Company, is a Pennsylvania corporation, which engages in underground coal mining operations in the Commonwealth.

8. Petitioner, Helvetia Coal Company, is a Pennsylvania corporation, which engages in underground coal mining operations in the Commonwealth.

9. Petitioner, Keystone Coal Mining Corporation, is a Pennsylvania corporation, which engages in underground coal mining operations in the Commonwealth.

10. Petitioner, Mathies Coal Company, is a corporation, which engaged in underground coal mining operations in the Commonwealth.

11. Petitioner, Pennsylvania Mines Corporation, is a Pennsylvania corporation, which engages in underground coal mining operations in the Commonwealth.

12. Petitioner, Rochester & Pittsburgh Coal Company, is a Pennsylvania corporation which has substantial interests in underground mining in the Commonwealth.

13. Petitioner, Shannopin Mining Company, is a Pennsylvania corporation, which engaged in underground coal mining operations in the Commonwealth.

14. Petitioner, The Florence Mining Company, is a Pennsylvania corporation, which engages in underground coal mining operations in the Commonwealth.

15. Petitioner, U.S. Steel Mining Company, Inc. is a Delaware corporation, which engaged in underground coal mining operations in the Commonwealth.

16. Respondent Commonwealth of Pennsylvania, Department of Environmental Resources ("hereinafter "DER") is the Commonwealth agency charged with the responsibility for administering the Pennsylvania Bituminous Coal Mining Act, Act of July 17, 1961, P.L. 659, as amended, 52 P.S. §§701-101 - 701-706 ("the Act).

17. Respondent Arthur Davis was the Secretary of DER and the individual primarily responsible for administering the Act. James Seif is now the Secretary of DER and the individual primarily responsible for administering the Act.

18. Respondent Thomas J. Ward ("Ward") is the Director of the Bureau of Deep Mine Safety of DER. He is the individual directly responsible for the day-to-day administration of the Act.

19. PCA Petitioners use various types of electrically powered machinery and equipment to extract and transport coal in their underground mines. This machinery and equipment includes, but is not limited to, that which severs the coal from the seam, such as longwall shearers and continuous miners; machinery that transports the coal from the face, such as shuttle cars and face conveyors; and machinery that transports the coal from the mine, such as conveyor belts, locomotives and railcars. Travel or transportation of mines' employees and materials and supplies through the mines may be by electric equipment powered by a trolley wire or by batteries. Electrical power is distributed throughout Petitioners' mines by networks of power cables, transformers and load distribution centers. Other electrically powered equipment such as pumps and atmospheric monitoring systems are also operated in the mines.

20. The Federal Mine Safety and Health Administration (MSHA) approves electrical equipment used in PCA Petitioners' mines. MSHA approves categories, types of models and makes of equipment, not each individual piece of equipment within a particular category.

21. Article III of the Act, which is entitled "Rules For The Installation And Maintenance of Electrical Equipment," Sections 301-334 of the Act, as amended, 52 P.S. §§701-301-701-334, sets forth a comprehensive scheme for the installation, use, and maintenance of electrical equipment.

22. Day-to-day enforcement of the Act is carried out by means of periodic inspections performed by DER. See Sections 117-123 of the Act, as amended, 52 P.S. §§701-117 - 701-123.

23. Specifically, mine inspectors and electrical inspectors employed by DER are empowered to examine the underground mines, inspect machinery and equipment and to take action calling for the correction of unsafe conditions. Sections 117-121 of the Act, 52 P.S. §§701-117 - 701-121.

24. On October 25, 1989, Respondent Ward on behalf of DER's Bureau of Deep Mine Safety, issued "Guidelines for Equipment Approvals" which purported to apply to all underground bituminous coal mines of Pennsylvania.

25. In addition, on December 29, 1989, Respondent Ward issued supplemental guidelines concerning "rebuilt" equipment.

26. Underground mining companies are subject to the guidelines at issue here.

27. The Department intended to conduct inspections of electrical equipment pursuant to and in conformance with the guidelines and to require prior approval of electrical equipment consistent with such guidelines.

28. Petitioners routinely purchase or rebuild mining equipment to which the guidelines apply and for which prior approval pursuant to the guidelines of the equipment is necessary.

29. A dispute concerning the implementation of the guidelines developed between the Petitioners and Respondents, which resulted in the filing of this action.

30. The Department and PCA agree that this Stipulation shall constitute a full settlement of the petition for Review which are in the Nature of a complaint and Request for Declaratory Relief at Docket No. 0082 M.D. 1990, and terminate the matter.

31. This Honorable Court has jurisdiction over the parties subject matter.

32. This Stipulation of Settlement is enforceable by commencement of a separate action in this Court. Nevertheless, pursuant to Sections 117-123 of the Act, 52 P.S. §§ 701-117-701-123, officials of the Department have the authority to issue such enforcement orders, as are permitted by law and as are necessary whenever such officials find that equipment has not been approved in accordance with the terms and conditions of this Stipulation.

33. Upon approval of this Stipulation, the Court shall mark the matter closed and discontinued.

34. Pursuant to this Stipulation, DER may require the approval of all underground equipment, surface substations feeding power underground, fans, and personnel conveyances (elevator, man hoists and escape capsules) connected to the underground mine. Such equipment is grouped as follows for the purposes of approval:

A. Bituminous Face Equipment (BFE)- Permissible Equipment

B. Bituminous Open Type Equipment (BOTE) – Non-Permissible Equipment

C. Bituminous Power Distribution Equipment (BPDE) - Non-Permissible Power Equipment

D. Surface Installations

(MM-S) Mine Power Substations

(MN-F) Fans I

(MM-P) Personnel Conveyances

E. Mine Wide Monitoring Systems (MWMS)

35. “Permissible equipment,” as applied to electric face equipment, is all electrically operated equipment taken into or used in by the last open crosscut of an entry or a room of any coal mine the electrical parts of which, including, but not limited to, associated electrical equipment, components, and accessories, are designed, constructed, and installed, in accordance with the specifications of the Secretary of Labor, to assure that

such equipment will not cause a mine explosion or mine fire, and the other features of which are designed and constructed, in accordance with the specifications of the Secretary, to prevent, to the greatest extent possible, other accidents in the use of such equipment.

36. Such approvals are specifically limited by the provision that permissible equipment approved by the MSHA Approval and Certification Center which is not in conflict with and which meets the requirements of the Act shall be deemed to be approved by the Department of Environmental Resources.

37. The procedures for approval of underground and surface equipment are as follows:

A. Approvals shall be limited to electrical systems, safety systems required by the Act, and specifications developed by the task force established by the parties and described hereafter.

B. Newly purchased permissible equipment shall be constructed in a fashion as to provide accessibility for inspection of permissible components.

C. The general language of Sections 302(8) or 103(26) of the Act alone shall not constitute a basis for denial of approval.

D. The evaluation to determine whether the equipment should be approved shall be based strictly on the specific criteria set forth in the Act and the performance specifications described below. In the absence of performance specifications for equipment or specific provisions of the Act addressing such equipment, and if the Department considers that the equipment as designed or built poses an unacceptable risk to the health or safety of miners, the following procedure will be applied:

1. The Department, in a written report, shall specify the unacceptable risk, based upon objective ascertainable data and/or criteria approved by a nationally recognized standards organization.
2. The Department, with the assistance of PCA, will immediately convene a task force as described in item 38 to develop specifications for the equipment in an expedited fashion.
3. If the task force is unable to develop applicable performance standards within seventy-

five (75) days, the Department may continue to withhold approval based upon non-compliance with a mandatory safety standard of a nationally recognized standards organization that has been shown to be appropriate for mining.

Both DER and PCA are committed to developing performance specifications within a reasonable period of time. The use of such objective data, or standards in the absence of performance specifications or specific provisions of the Act addressing the equipment is a temporary measure pending development of specifications.

E. For new equipment, the prototype of which has not been previously approved, a manufacturer or operator shall submit to DER an application requesting approval. Such request for approval shall include four (4) schematics, a description, and any other pertinent information for the equipment.

F. The application shall be reviewed within 15 working days after receipt. Within such period DER shall communicate verbally and in writing to the applicant all discrepancies between the application and the equipment performance specifications. If DER does not communicate to the applicant within the 15 days as described herein, the application will be deemed approved. If the applicant submits additional schematics or information, DER will have an additional 15 days to communicate, as described herein, concerning such additional schematics or information.

G. When the application review is complete, an inspector will be assigned to evaluate the equipment and the operator or manufacturer notified of said assignment. The equipment inspection will be scheduled within 20 working days of the DER (inspector) being notified. If the inspector gets to the inspection site and the equipment is not in conformance with the specific criteria set forth in the Act and the performance specifications described below, the time frame will stop. When the equipment has been modified to conform, the operator will notify DER for a re-inspection and DER will

schedule the re-inspection within ten (10) working days. If the equipment is in conformance with the specific criteria set out in the Act and the performance specifications described below, but the schematics are not, the equipment can be used but the operator or manufacturer will have ten (10) working days to resubmit the corrected schematics or the equipment shall be taken out of service.

H. For previously approved equipment that has been modified, the approval procedure set for new equipment that has not been previously approved is to be applicable. The approval process will address only the modification that has been made and will not require changes to the components of the equipment that were initially approved. For the purpose of this provision, modification shall not include changes to equipment in which components are changed and replaced with components that provide equivalent protection. Modifications subject to approval shall include only those changes to equipment which affect whether the equipment still satisfies the applicable performance specifications as described below or set out specifically in the Act.

I. Approved equipment and repaired equipment which has not been modified are outside the scope of the approval process and shall be handled under the mine inspection program of the DER.

J. Any direction to take corrective action shall be in writing and shall specify the provision of the Act or the performance specifications upon which DER relies.

K. DER has the right to inspect equipment to determine that it is in compliance with applicable requirements of the Act and the equipment performance specifications. Such inspections shall be performed in the normal course of inspecting the mine and shall, to the extent feasible, minimize the disruption of production.

L. Pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, the

Environmental Hearing Board shall have the jurisdiction to hear appeals from corrective action orders as specified in Paragraph J or denials of applications for approval, subject to the right to seek enforcement of this Stipulation in Commonwealth Court as set out in Paragraph 32 above.

M. New or rebuilt equipment that has been approved, but has not been inspected by an approval inspector will be inspected by a mine electrical inspector. The operator will give reasonable notice to the mine electrical inspector for an inspection prior to equipment entering the mine. If the mine electrical inspector cannot inspect the equipment or it is not feasible for the mine operator to notify the mine electrical inspector, the mine electrical inspector will inspect the equipment during his regular inspection of the mine. Such inspection shall be performed in the normal course of inspecting the mine and shall, to the extent feasible, minimize the disruption of production.

38. A task force shall be established to develop written criteria for equipment performance specifications.

A. The task force shall be comprised of equal numbers of representatives, not less than two or more than four, selected by DER and by members of Pennsylvania Coal Association.

Final consensus on performance specifications will be determined by a majority of the task force.

B. The task force shall develop performance specifications for approval of equipment and reserves the right, for just cause, to add or delete from the developed equipment performance specifications.

C. Specifications which have been developed for high voltage transmission systems,

enforcement and compliance with Section 331(h) of the Act, load centers and track mounted personal carriers, are attached hereto as Exhibits I, II, III and IV.

39. The undersigned counsel for the PCA are authorized to execute this Stipulation on behalf of PCA, as indicated in the attached resolution of the board of Directors of PCA. These undersigned counsel are also authorized to execute this stipulation on behalf of the other Petitioners as identified in paragraphs 3 - 15 above.

40. Robert C. Dolence is the Deputy Secretary for Mineral Resources. The Deputate for Mineral Resources includes the Bureau of Deep Mine Safety. Deputy Secretary Dolence is authorized to execute this Stipulation on behalf of the Commonwealth. Terry R. Bossert, Chief Counsel, and Marc A. Roda, Assistant Counsel, as counsel for the Department are authorized to execute this Stipulation.

41. The Department agrees to bear its fees and litigation costs in this matter arising prior to the execution of this Stipulation; likewise, PCA agrees to bear its fees and litigation costs in this matter arising prior to the execution of this Stipulation.

42. This Stipulation shall constitute the entire integrated agreement of the parties as to the settlement of the matter pending at 0082 M.D. 1990. No contemporaneous communications or prior drafts shall be relevant or admissible for the purposes of deleting the meaning or extent of any provision herein in any litigation or other proceeding. It is recognized that the task force has developed and will develop certain specifications for the approval of particular electrical equipment. Subject to the provision set forth in Paragraph 43 below, such specifications will become part of this Stipulation. Use of specifications over and above those developed by the task force by the Department will constitute a breach of this Stipulation.

43. No changes, additions, modifications, or amendments to this Stipulation shall be

effective unless they are set out in writing and signed by the parties hereto. Specifications developed by the task force shall be agreed to by the parties, set forth in writing and signed by the members of the task force. Such specifications may not be implemented or enforced without compliance with such requirement.

IN WITNESS WHEREOF, the parties hereto have caused this Stipulation to be executed by their duly authorized representatives.

(Minutes reflect proposed and seconded)

RESOLUTION
of the
BOARD OF DIRECTORS
of the
PENNSYLVANIA COAL ASSOCIATION

RESOLVED, the Board of Directors of the Pennsylvania Coal Association, approves settlement of the litigation against the Commonwealth of Pennsylvania, Department of Environmental Resources, Arthur Davis, Secretary of the Department, and Thomas J. Ward, Director, Bureau of Deep Mine Safety of the Department, pending in Commonwealth Court at No. 0082 M.D. 1990. The Board further authorizes its counsel, Buchanan Ingersoll Professional Corporation, Henry Ingram and R. Henry Moore, to execute the Stipulation of Settlement to be entered in the litigation which embodies such settlement on behalf of the Pennsylvania Coal Association.

Adopted this 16th Day of December 1994.

High Voltage Transmission System Branch Circuits and Taps

Section 331(h) of the Bituminous Coal Mine Laws of Pennsylvania requires that taps or branch circuits from the high-voltage feeder will be made through circuit breakers or suitable load break switches. For the purpose of interpretation and compliance with Section 331(h) and with Section 313(h), the following definitions will be used:

Branch Circuit

A branch circuit is a sub-portion of the high-voltage system, serving one or more loads. The branch circuit begins at the junction or splitting of the high-voltage system. The junction consists of three distinct elements;

1. Input feeder, which delivers power from the source.
2. Output feeder, which may extend the feeder to other parts of the high-voltage system.
3. The branch circuit.

The output feeder is not considered as a branch circuit and is not required to have electrical protection at the junction, but receives electrical protection either at the source substation or at some place between the source substation and the junction. The branch circuit is required to have protection at the junction.

Tap

A tap supplies power to the high-voltage loads located entirely within the enclosure where the connection is made.

Where no splitting of the feeder cable occurs, neither a tap nor branch is created.

Suitable Load Break Switch

A suitable load break switch, which may be used in lieu of a circuit breaker, is defined as a gang operated switch with a voltage rating not less than the system voltage, capable of interrupting a current equal to its continuous full load rating, and to be used in conjunction with fuses to provide overload and short circuit protection for the load being served.

POLICY FOR ENFORCEMENT AND COMPLIANCE

WITH SECTION 331(h)

1. Circuit breakers shall be used to provide electrical protection of a branch circuit. Such circuit breakers will be equipped with relays to provide instantaneous and inverse time limit phase overcurrent, undervoltage, and ground fault.
2. Since a branch circuit extends outside of the enclosure where the junction is made, the circuit breaker will be equipped with a ground continuity check circuit.
3. Circuit breakers may be used to provide electrical protection of a tap. Suitable load break switches may, at the mine operator's option, be used to protect taps if all of the following conditions are met.
 - a. Barriers will be installed in the enclosure separating the high-voltage load and the load break switch. Such barriers will be permanently installed or interlocked with the source circuit pilot to prevent access to the load break switch while energized.
 - b. The load break switch will be used in conjunction with fuses on the load side, adequate for protection of the load being served.
 - c. The load break switch will include an electrical interlock to open the pilot wire of the source circuit and trip the outby circuit breaker prior to the opening of the main contacts of the load break switch or interlocked to remove the load by opening the transformer secondary main breaker or by operating a primary high-voltage contactor.
 - d. The high-voltage system will be configured such that each working section of a mine will be served by a branch circuit from the main feeder with circuit breaker protection. The working section branch circuit may supply more than one load center if multiple load centers are necessary for the operation of the working section; such as section belt load centers, pump and auxiliary power centers, and face equipment power centers.
 - e. In the case of a mine with only one working section, the outside substation circuit breaker may provide all required high-voltage electrical protection for the high-voltage cable and the single power center. However, when a second unit of high-voltage equipment is connected to the transmission system, a high-voltage circuit breaker must also be installed in the mine.
4. Undervoltage and ground fault relays will not be required on load break switches used in lieu of circuit breakers for tap circuits.
5. Control transformers and potential transformers used for control and metering of circuit breakers and suitable load break switches are not required to have tap circuit protection, but must have adequate fuse or circuit breaker protection and be rated not more than 25KVA.

Exhibit I -- High Voltage Transmission System Branch Circuits and Taps Section 331(h)
3-19-99

Exhibit II -- Policy for Enforcement and Compliance With Section 331(h) 3-19-99

Drawing -- Taps and Branches page 8 of 10 3-19-99

Drawing -- Typical Tap of the High-Voltage Feeder page 9 of 10 3-19-99

Drawing -- Typical Mine Power Distribution System page 10 of 10 3-19-99

STANDARDS FOR LOAD CENTER APPROVAL

1. Input will be through a coupler.
2. Input coupler to meet requirements of Section 331(c) of the Act.
3. A positive visible disconnect can be:
 - a. Air disconnect load break switch (LBS).
 - b. Vacuum disconnect LBS.
 - c. A circuit breaker with a cut-out.
4. If an air disconnect LBS (see 3a) is chosen, it can be designed to disconnect power on the outby feeding circuit breaker (see Section 332 (2) (ii) of the Act; or, as an alternative, it can be designed to open the load center's main secondary breaker. This alternative is detailed in the Dilworth Mine Section 334 Commission, titled "Alternative Circuitry for Section 332 Load Centers" dated November 9, 1987.
5. If a vacuum LBS (see 3b) is chosen, the design shall include the following:
 - a. A vacuum bottle and a non-load break cut-out switch.
 - b. A set of electrical interlocks to remove the load as stated in Item 4.
 - c. A mechanical interlock to trip the vacuum contacts before the visible contacts open.
6. If a circuit breaker (see 3c) is chosen, no other requirements are necessary.
7. Protection:
 - a. If a circuit breaker is used, it shall be equipped with instantaneous and inverse time limit phase overcurrent and undervoltage relaying protection (see Section 332 (2) (I) of the Act).
 - b. If a fuse is used, it shall be sized to provide for adequate short circuit and overload protection.
 - c. If the load center has high-voltage feel-thru circuit breakers and suitable load break switches used as visual positive disconnects shall conform to the agreement on Section 331 (h).
8. An emergency stop switch which requires manual reset will be included.
9. Barriers and interlocks are to work together to provide protection from inadvertent access. Barriers and interlock switches will be so arranged to prevent inadvertent contact with energized components of a voltage of greater than 1,000 volts nominal. These provisions apply to both the incoming and outgoing circuits. For multiple voltages, barriers and interlock switches must be used to isolate circuits of greater than 1,000 volts nominal from utilization circuits.
 - a. Cover switches for top and side covers will be used and arranged which, when removed, expose energized components of greater than 1,000 volts nominal.
 - b. Switches will be arranged so that the cover cannot be opened to allow access to energized components of greater than 1,000 volts nominal.
 - c. Barriers are required when choosing the design alternative discussed in Item 4 (see Section 334 Commission for Dilworth Mine). No other application requires the use of barriers. When used, a barrier should be

rigidly mounted substantial enough to prevent inadvertent access.

Ventilation holes can be used, provided these holes are sized to prevent a person's finger from passing through them.

10. There will be no wye-wye connections unless there is a tertiary winding. At least one of these windings must be a delta connection.
11. The load center shall be of essentially fireproof construction. Viewing windows may be made out of glass or a polycarbonate, such as Lexan 940 tm or equivalent. Acrylics, such as Plexiglas, are prohibited.
12. Ground limiting resistor.
 - a. a. Use Section 332 (4) as amended for language structure.
13. Main breaker tripping devices, which must include:
 - a. Overload and short circuit.
 - b. Ground fault by current protector.
 - c. Ground fault by potential protector in the event of an open ground resistor.
 - d. Continuous monitoring of the ground resistor is acceptable in lieu of potential protector.
 - e. Time delay tripping for coordination of tripping is allowed.
14. Individual machine breakers (secondary).
 - a. Each output circuit shall have the following protective features.
 - i. Phase fault (with lockout).
 - ii. Overload (with lockout).
 - iii. Ground fault (with lockout).
 - iv. Undervoltage*
 - v. Ground monitor.
 - b. A ground monitoring system or alternative method approved by MSHA.
15. Secondary receptacles
 - a. Grounding through a contact of the coupler and receptacle or coupler threads.
 - b. Ground connection to each output receptacle will be solidly connected to the ground limiting resistor without relying on the power center frame as the conductor.
16. Ground fault interrupter on all 100 volt and 220 volt receptacles.

* Load center output receptacles will be de-energized upon loss of power. Upon restoration of power, circuits supplying power to face equipment and equipment on return air will remain de-energized until manually reset.

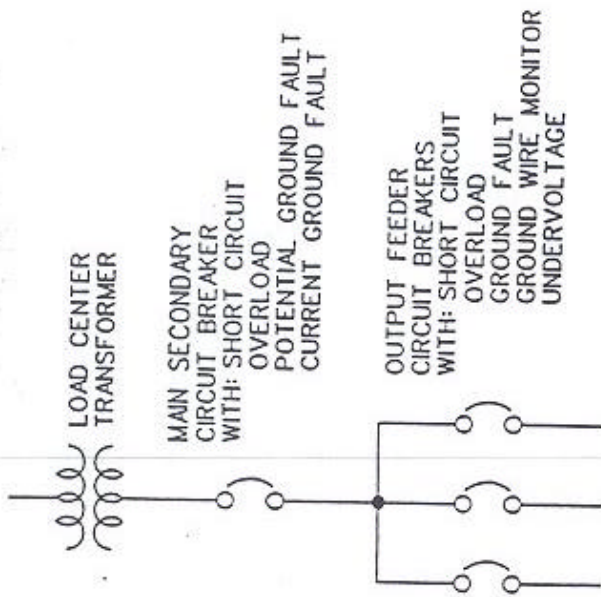
17. Drawings 1 – 7 are intended to illustrate these specifications.

STANDARDS FOR TRACK MOUNTED PERSONNEL CARRIER APPROVAL

Definition: **Man trip** -- A vehicle designed to transport more than five persons.

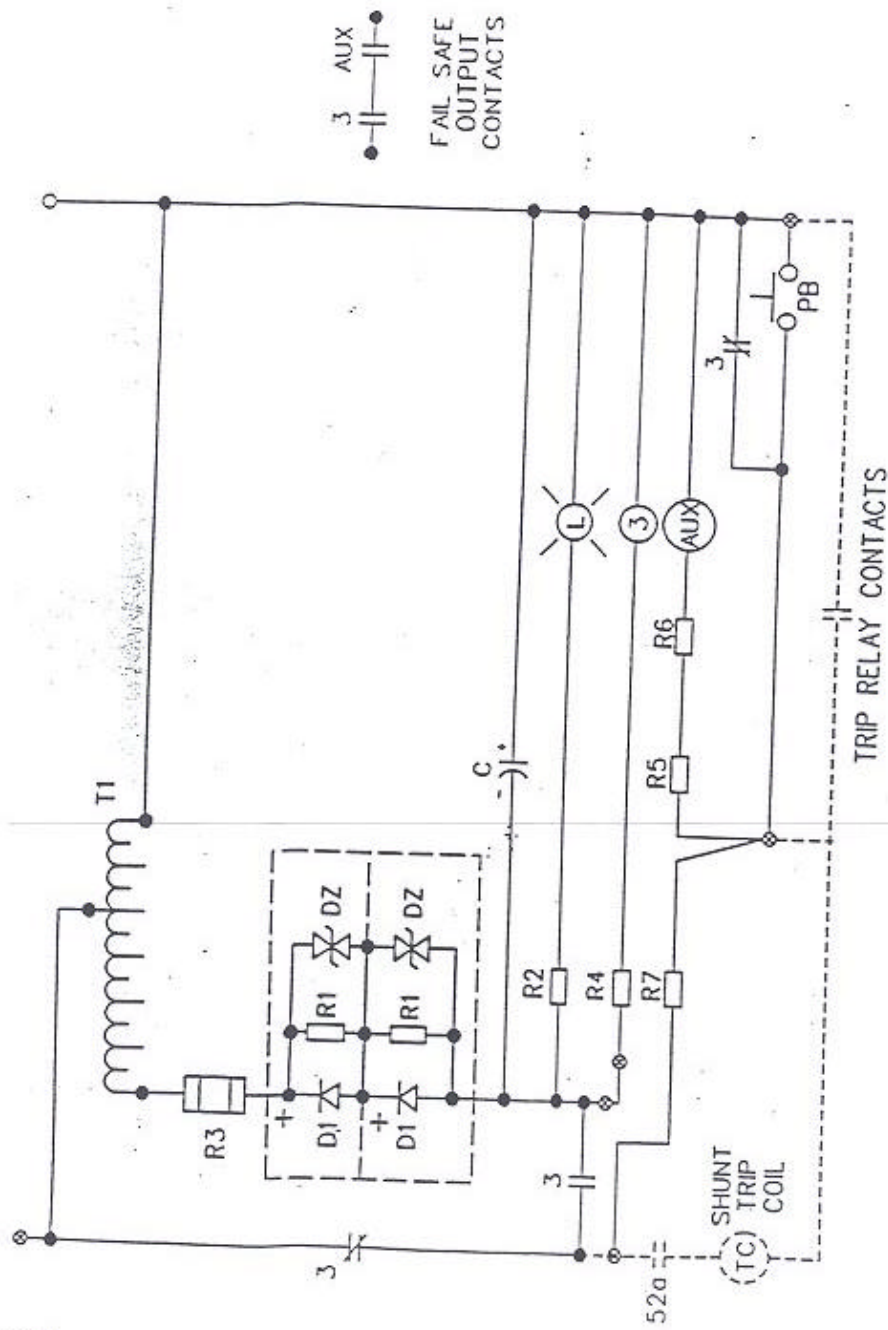
1. Safety chains shall be installed at passenger access points on man trips.
2. If vehicle is equipped with trolley pole, the pole must not be capable of turning in a 360 degree radius.
3. Cable must be protected by either a fuse or a circuit breaker on the pole or in the panel.
4. Controller must either have a dead man function or have a self-centering tramming control.
5. Vehicle shall have two independent service braking systems and a parking brake. The parking brake can be one of the service braking systems if it is capable of slowing a fully loaded vehicle to a stop. The service brake can be the parking brake if it is capable of holding a fully loaded vehicle at rest. One of the required braking systems may be an electric brake.
 - a. If dynamic braking is utilized, it will not be required to bring the vehicle to a complete stop.
 - b. If plug braking is utilized, it will be designed to prevent automatic reversing of the vehicle.
6. Sanders are required on all man trips. Each wheel used in driving and/or braking shall have sander discharge.
7. Vehicles shall be equipped with lights on both ends. Reflectors are required on both ends and both sides.
8. Any seating position under trolley wire must have a protective cover per Section 272(b).
9. Guards or covers shall protect all rotating parts.
10. End and side panels of man trips shall be of sufficient height to contain passengers within the vehicle during derailment.
11. Vehicles must be provided with an audible warning device.
12. The electrical components shall be arranged so that the trolley harp cannot become energized by an on-board battery. All uninsulated electrical components will be properly enclosed or guarded to prevent incidental contact.
13. All operator controls and access panels shall be clearly marked.
14. Man trips shall be so designed to accommodate a stretcher.
15. All battery powered equipment shall have an emergency disconnect.
 - a. Service circuit breaker is acceptable as the disconnect if properly sized.
 - b. Emergency disconnect must be accessible from the operator's normal position.
 - c. Emergency disconnect must operate without the use of undervoltage shunt trip coils or mechanical linkage.
16. All battery plugs must be interlocked so as to prevent disconnecting under load.
17. All motors and electrical circuits will have power short circuit and overload protection.

18. All exposed conductors or cables will be protected from mechanical damage by conduit. Hose conduit is acceptable.



**TYPICAL COMPLIANCE WITH LOAD CENTER REQUIREMENTS
#13 AND #14 USING A MOLDED CASE CIRCUIT BREAKER WITH UVR
FOR EACH OUTPUT**

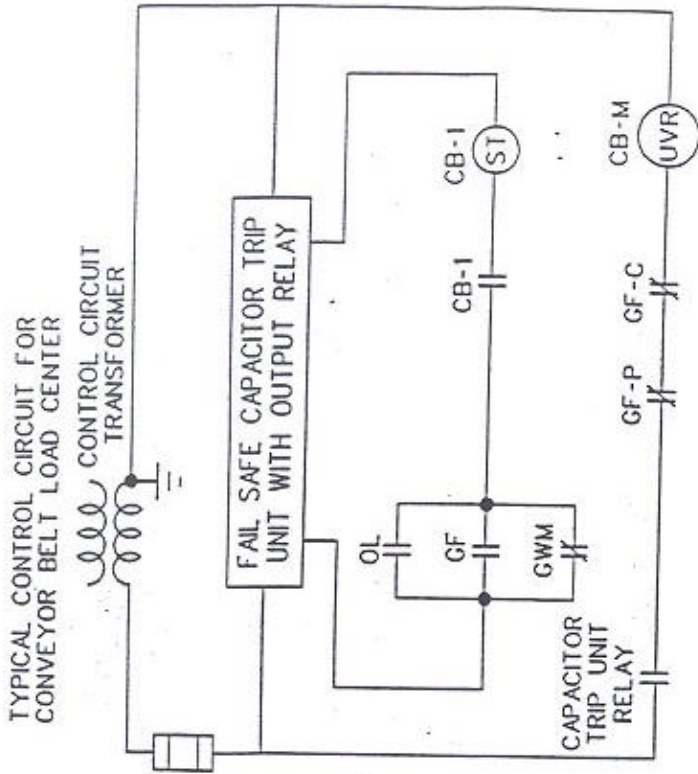
7-13-94 Page 1 of 10



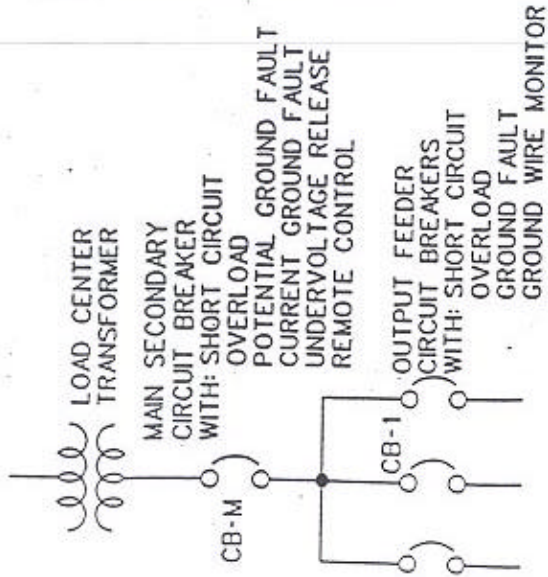
TYPICAL FAIL SAFE CAPACITOR TRIP UNIT
7-13-94 Page 3 of 10

7-13-94

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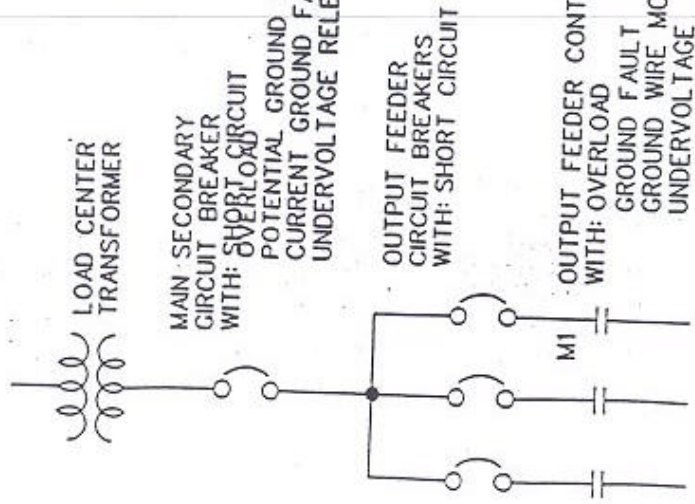


TYPICAL CONTROL CIRCUIT FOR CONVEYOR BELT LOAD CENTER



LOAD CENTER TRANSFORMER
 MAIN SECONDARY CIRCUIT BREAKER WITH: SHORT CIRCUIT OVERLOAD
 POTENTIAL GROUND FAULT
 CURRENT GROUND FAULT
 UNDERVOLTAGE RELEASE
 REMOTE CONTROL
 OUTPUT FEEDER CIRCUIT BREAKERS WITH: SHORT CIRCUIT OVERLOAD
 GROUND FAULT
 GROUND WIRE MONITOR

TYPICAL COMPLIANCE WITH LOAD CENTER REQUIREMENTS #13 AND #14 USING A MAIN MOLDED CASE CIRCUIT BREAKER WITH UVR AND OUTPUT MOLDED CASE CIRCUIT BREAKERS WITH SHUNT TRIP UNITS



LOAD CENTER TRANSFORMER

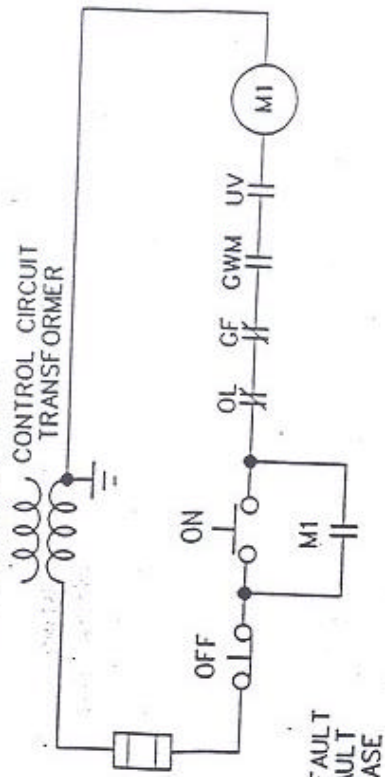
MAIN SECONDARY CIRCUIT BREAKER WITH: SHORT CIRCUIT

POTENTIAL GROUND FAULT CURRENT GROUND FAULT UNDERVOLTAGE RELEASE

OUTPUT FEEDER CIRCUIT BREAKERS WITH: SHORT CIRCUIT

OUTPUT FEEDER CONTACTORS WITH: OVERLOAD GROUND FAULT GROUND WIRE MONITOR UNDERVOLTAGE

TYPICAL CONTROL CIRCUIT FOR SECTION LOAD CENTER



CONTROL CIRCUIT TRANSFORMER

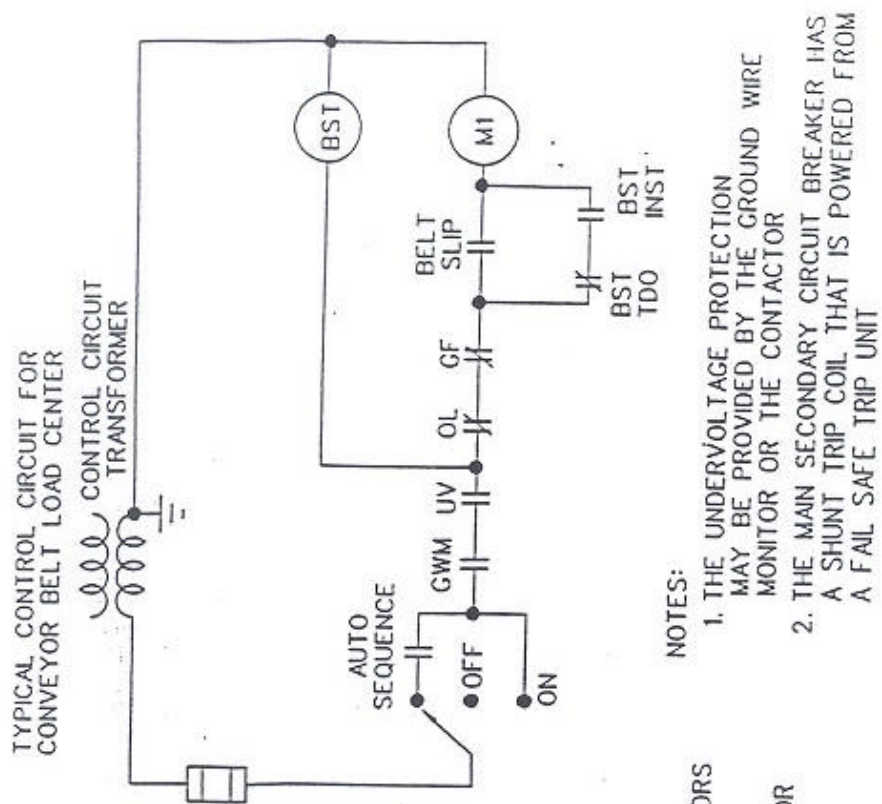
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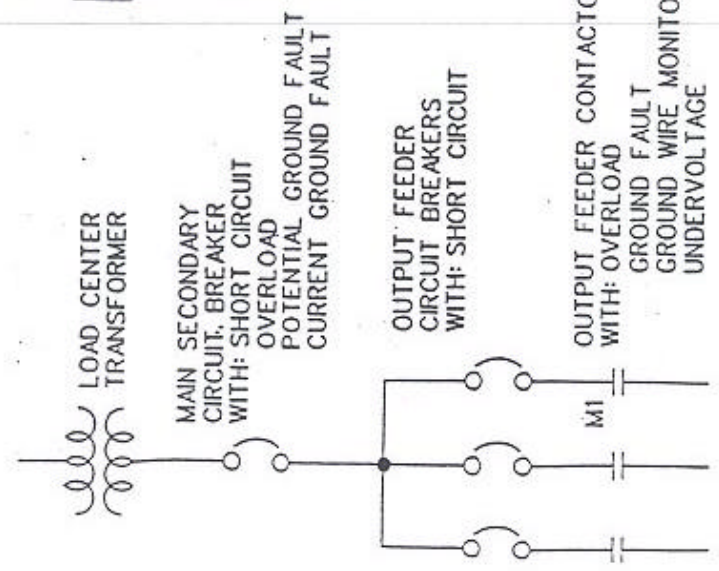
POTENTIAL GROUND FAULT CURRENT GROUND FAULT UNDERVOLTAGE RELEASE

NOTE: THE UNDERVOLTAGE PROTECTION MAY BE PROVIDED BY THE GROUND WIRE MONITOR OR THE CONTACTOR

TYPICAL COMPLIANCE WITH LOAD CENTER REQUIREMENTS #13 AND #14 USING A MOLDED CASE CIRCUIT BREAKER AND A CONTACTOR FOR EACH OUTPUT

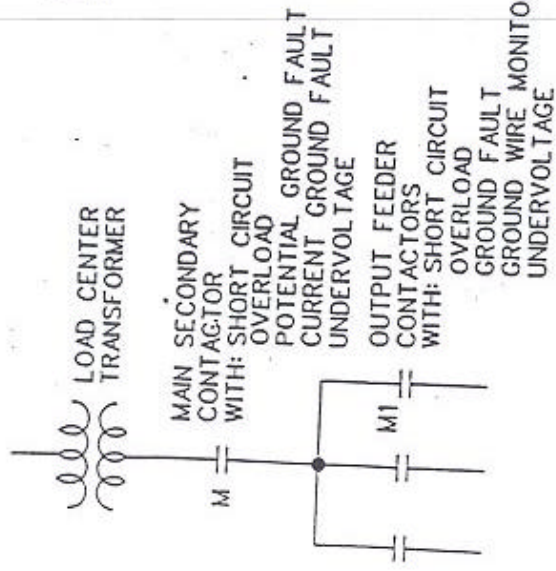


- NOTES:
1. THE UNDERVOLTAGE PROTECTION MAY BE PROVIDED BY THE GROUND WIRE MONITOR OR THE CONTACTOR
 2. THE MAIN SECONDARY CIRCUIT BREAKER HAS A SHUNT TRIP COIL THAT IS POWERED FROM A FAIL SAFE TRIP UNIT

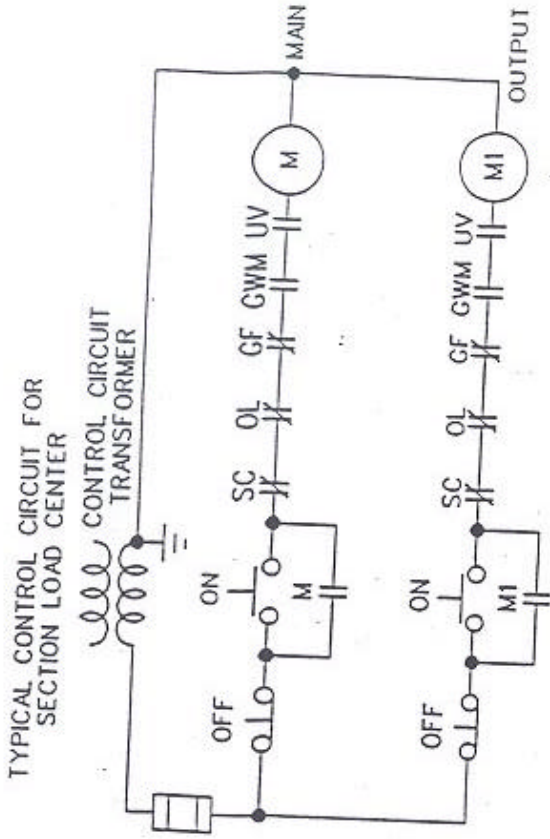


TYPICAL COMPLIANCE WITH LOAD CENTER REQUIREMENTS #13 AND #14 USING A MOLDED CASE CIRCUIT BREAKER AND A CONTACTOR FOR EACH OUTPUT

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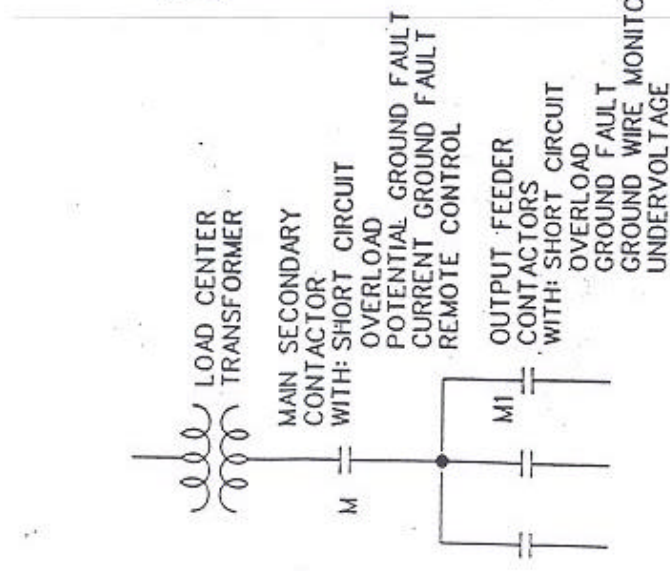
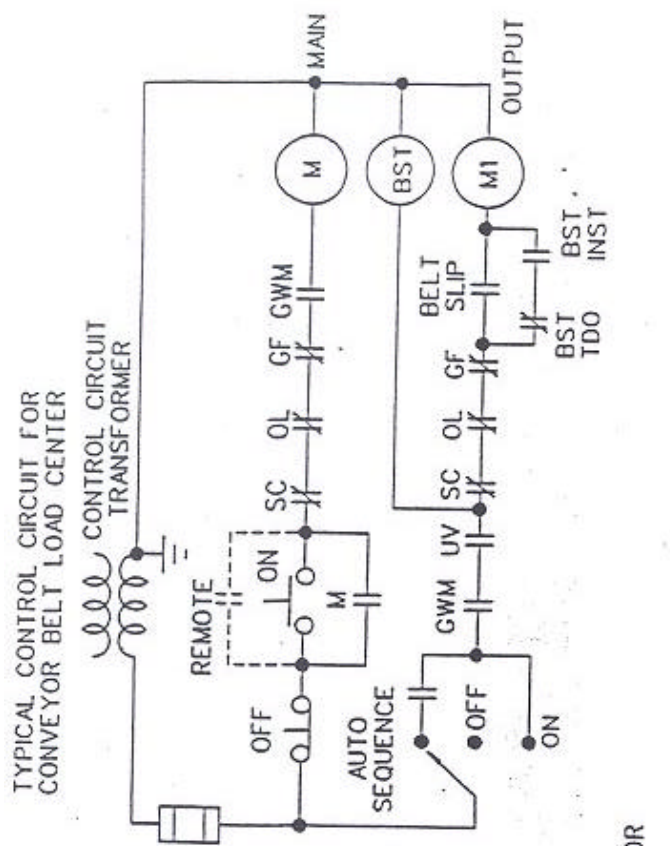


NOTE: EACH CONTACTOR MUST HAVE AN INTERRUPTING RATING IN EXCESS OF THE POWER SYSTEM SHORT CIRCUIT CAPACITY



NOTE: THE UNDERVOLTAGE PROTECTION MAY BE PROVIDED BY THE GROUND WIRE MONITOR OR THE CONTACTOR

TYPICAL COMPLIANCE WITH LOAD CENTER REQUIREMENTS #13 AND #14 USING A MAIN SECONDARY CONTACTOR AND A CONTACTOR FOR EACH OUTPUT

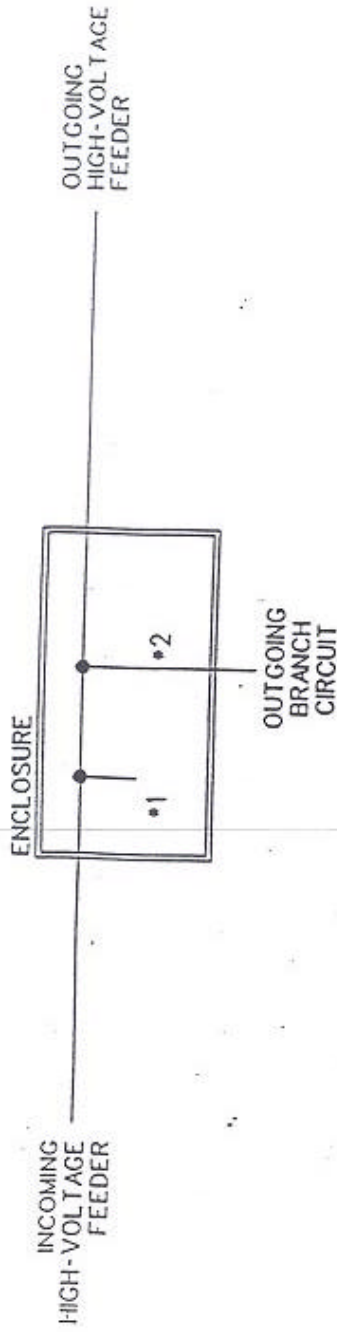


NOTE: THE UNDERVOLTAGE PROTECTION MAY BE PROVIDED BY THE GROUND WIRE MONITOR OR THE CONTACTOR

NOTE: EACH CONTACTOR MUST HAVE AN INTERRUPTING RATING IN EXCESS OF THE POWER SYSTEM SHORT CIRCUIT CAPACITY

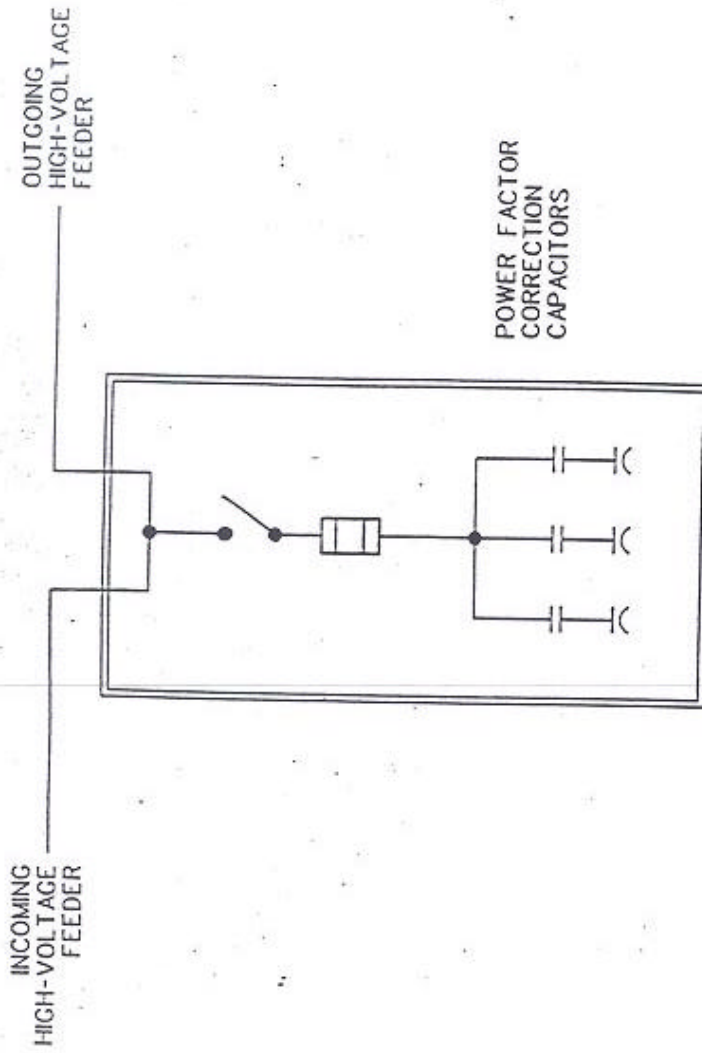
TYPICAL COMPLIANCE WITH LOAD CENTER REQUIREMENTS #13 AND #14 USING A MAIN SECONDARY CONTACTOR AND A CONTACTOR FOR EACH OUTPUT

7-13-94 Page 7 of 10



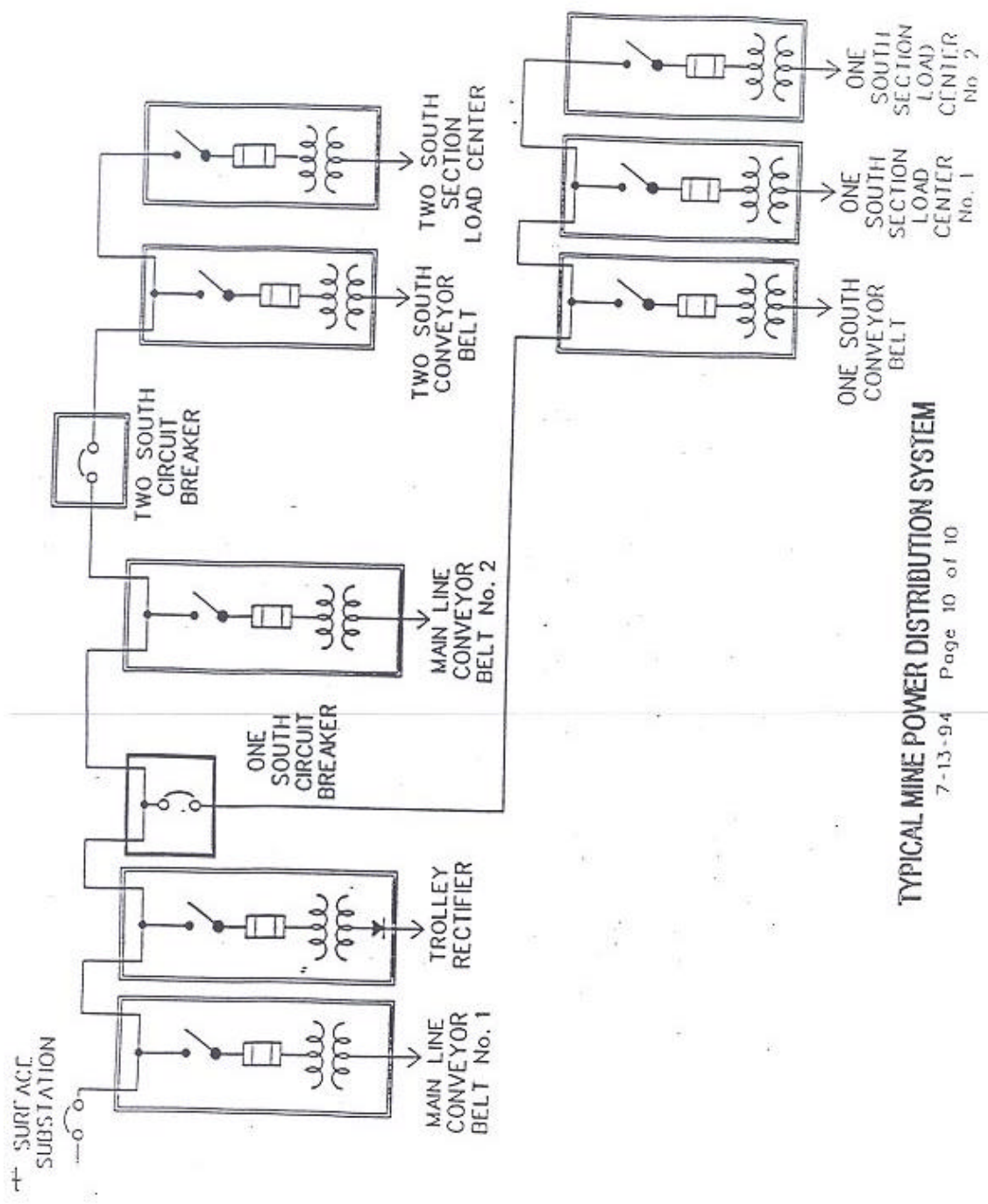
NOTES:

- A. THE INCOMING HIGH-VOLTAGE FEEDER MUST BE PROTECTED BY A CIRCUIT BREAKER.
- B. THE OUTGOING HIGH-VOLTAGE FEEDER IS A CONTINUATION OF THE INCOMING HIGH-VOLTAGE FEEDER AND ADDITIONAL ELECTRICAL PROTECTION IS NOT REQUIRED.
- C. *1 IS A CONNECTION TO THE HIGH-VOLTAGE FEEDER THAT DOES NOT LEAVE THE ENCLOSURE AND DOES NOT SPLIT THE HIGH-VOLTAGE DISTRIBUTION SYSTEM. THEREFORE, CONNECTION *1 IS A TAP AND MAY BE PROTECTED BY EITHER A CIRCUIT BREAKER OR A SUITABLE LOAD BREAK SWITCH.
- D. *2 IS A CONNECTION TO THE HIGH-VOLTAGE FEEDER THAT ALLOWS SPLITTING OF THE HIGH-VOLTAGE DISTRIBUTION SYSTEM. CONNECTION *2 ESTABLISHES A BRANCH CIRCUIT THAT MUST BE PROTECTED BY A CIRCUIT BREAKER.



TYPICAL TAP OF THE HIGH-VOLTAGE FEEDER

7-13-94 Page 9 of 10



TYPICAL MINE POWER DISTRIBUTION SYSTEM