

TITLE: Standard Application Procedure for Part 18 Shearer Evaluation and Extension of Shearer Evaluation

1.0 PURPOSE

- 1.1. The purpose of this Standard Application Procedure (SAP) is to explain the basic investigative process, and specify the minimum documents and requirements necessary to initiate an investigation leading to the issuance of a Shearer Evaluation or Extension of Shearer Evaluation.
- 1.2. The Shearer Evaluation Program (SEP) provides the shearer manufacturer with a means of having their product evaluated by MSHA prior to its initial usage on a particular longwall system. This will allow the longwall applicant to specify an MSHA evaluation number (SE) and; therefore, may not be required to have a complete shearer investigation performed under the longwall approval application.

2.0 SCOPE

This SAP encompasses all applications submitted for shearer evaluation or extension of shearer evaluation under 30 CFR, Part 18.

3.0 REFERENCES

- 3.1. 30 CFR Part 18 "Electric Motor-Driven Mine Equipment and Accessories"
- 3.2. APOL1009 "Application Cancellation Policy"

4.0 APPLICATION PROCEDURE

- 4.1. All applications for a Shearer Evaluation or Extension of Shearer Evaluation must include the documentation listed in Sections 4.1.1 through 4.1.6.
 - 4.1.1. An evaluation or extension of evaluation application letter. (Refer to Enclosures A and B.)
 - 4.1.1.1. The application letter should include the Applicant's name and address; Application date; The model and voltage rating of the shearer; A six digit Company Application Code Number assigned by the Applicant (This number is used to identify the application and should not have been assigned to an application previously submitted by the Applicant); The name, address, telephone number, FAX number and e-mail address of the person MSHA is to contact regarding the application and billing.

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- 4.1.1.2. The application letter should include a date when the shearer will be completely assembled and ready for inspection. The inspection may be waived if the shearer is similar to a shearer that was previously inspected. The evaluation number of the shearer previously inspected should be referenced in the application letter. The letter should be signed by the person responsible for answering questions regarding the subject application.
- 4.1.2. One completed checklist. (Refer to Enclosure C.) Additional information may be required due to the great variety of shearers.
- 4.1.3. One copy of each drawing, bill of materials, specifications, etc., which shows the details of the design and construction of the shearer as related to the applicable requirements of 30 CFR, Part 18. Documents previously accepted by MSHA need not be submitted, unless modified.
- 4.1.4. A complete list of the drawings, bill of materials, specifications, certified components, intrinsically safe components, etc. that are submitted, referenced, or used to construct the shearer. (Refer to Enclosure D.)
- 4.1.5. A Factory Inspection Form in accordance with Title 30 CFR, Part 18 or a certified statement in lieu of the Factory Inspection Form (Refer to Enclosures E or F). The certified statement can be written in the application letter under the shearer description.
- 4.1.6. Documentation of the evaluation plate. The evaluation plate shall include the information shown on Enclosure G(i). In addition, the documentation should specify the location, method of attachment, and material of this evaluation plate.
- 4.1.7. Although the documentation required for the shearer will not include the power (trailing) cable or the outby short-circuit protection, the evaluation plate required to be mounted to the machine must include a space for the maximum effective full load current. This will allow for a selection of an adequate power cable by the longwall applicant. The maximum effective full load current refers to the total machine current necessary for normal operation of the shearer. If the specified maximum effective full load current differs from the total connected full load current (i.e. the sum of the full load currents of the various motors), then a duty cycle justification must be submitted to justify the lower value.

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- 4.1.8. The evaluation plate for shearers with on board high voltage switching (referenced 18.53) will include spaces for the conditions of use in addition to the information previously specified (see Enclosure G(ii)). These conditions include the minimum and maximum three-phase bolted short-circuit current, the outby breaker setting and its clearing time.
- 4.2. Upon receipt of the application package by the Approval and Certification Center (A&CC), a letter estimating the maximum anticipated fee to complete the investigation and a tentative starting date will be mailed to the applicant.
- 4.2.1. An authorization response form will also be included which indicates agreement, by the applicant, to pay expenses up to the maximum estimated fee for the investigation or requests cancellation of the application. This form must be returned to the Approval and Certification Center, by the applicant, before any further action can be taken on the application. If the form letter is not returned by the date specified in the fee estimate letter, the application will be canceled.
- 4.2.2. When unforeseen circumstances encountered during the investigation result in exceeding the estimated fee, the applicant will be contacted and given the option of either canceling the action or accepting a revised fee estimate.
- 4.3. During the investigation, the MSHA Investigator assigned to evaluate the application will review the application and contact the person designated in the application letter to discuss any discrepancies. The Applicant will receive a discrepancy letter listing additional documentation and components for evaluation and/or test necessary to continue the investigation. If the Applicant does not resolve all of the discrepancies listed in the letter within the time specified in the discrepancy letter, the investigation of the application will be cancelled per A&CC APOL1009 "Application Cancellation Policy".
- 4.4. After all of the technical documents are evaluated, a factory inspection may be required if the shearer is a new design. Once this is completed and any changes required as a result of the inspection are finalized, the official evaluation number will be issued, unless specific circumstances dictate otherwise.

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- 4.5. The final Evaluation or Extension of Evaluation letter and drawing list will be mailed to the applicant when the investigation is completed.
- 4.6. The Applicant will receive an invoice for the cost of the investigation after the investigation is either completed or cancelled.

ABC Company, 950 Mining Road, Pittsburgh, PA 15293

July 1, 2006

Chief, Approval and Certification Center
RR #1, Box 251, Industrial Park Road
Triadelphia, West Virginia 26059

Gentlemen:

This is a request for a new shearer, Model 100, 950 volt, 3 phase, 60 hertz, alternating current, Company Code No. 010100.

We are requesting approval of the subject shearer assembled according to Layout Drawing 100.

The subject shearer consists of two (2) 300 hp cutter motors, one (1) 20 hp hydraulic motor, one (1) starter, and two (2) pushbutton stations.

Since this is a prototype shearer, it will be completely assembled and available for inspection on November 1, 2006, at the ABC Company, 950 Mining Road, Pittsburgh, Pennsylvania 15293.

Enclosed are all the new or revised drawings and specifications pertinent to this application. If there are any questions, please contact Mr. John Smith at (555) 555-0001.

Sincerely,

John Doe
Design Engineer

Enclosure

(Enclosure A)

DEF Company, 440 Mining Road, Pittsburgh, PA 15293



July 1, 2006

Chief, Approval and Certification Center
RR #1, Box 251, Industrial Park Road
Triadelphia, West Virginia 26059

Gentlemen:

This is a request for an extension of Shearer Evaluation No. SE-8990, Investigation No. SE-8990, to include the subject Model 550A, 550 volt, 3 phase, 60 hertz, alternating current, shearer, Company Code No. 040200.

We are requesting an extension of shearer evaluation of the subject shearer assembled according to Assembly Drawing A-550.

This shearer is similar to the Model 440A, 440 volt, 3 phase, 60 hertz, alternating current, shearer built according to Assembly Drawing A-440, Evaluation No. SE-8990-0, Investigation No. SE-8990, letter dated July 1, 1995, except as follows:

1. Voltage increased from 440 to 550 volts.
2. Horsepower decreased from 45 to 35 horsepower.

Enclosed are all the new or revised drawings and specifications pertinent to this application. If there are any questions, please contact Mr. John Doe at (555) 555-9191.

Sincerely,

John Doe
Design Engineer

Enclosure

(Enclosure B)

EVALUATION/EXTENSION OF EVALUATION CHECKLIST

Complete all of the following by adding a check mark or N/A on the lines provided. The check mark signifies the item has been positively addressed. N/A signifies the item is not applicable to the design of the shearer.

Administrative

- _____ 1. The appropriate Evaluation or Extension of Evaluation application letter is enclosed.
- _____ 2. A drawing list, checklist, Factory Inspection Form is enclosed.
- _____ 3. All correspondence, specifications and lettering on documents are in English or translated into English and legible.
- _____ 4. All documents are titled, numbered, dated, and show the latest revision or date. If multiple pages are submitted, this information is on each page.
- _____ 5. There are no pencil or ink notations, or correction fluid (white-out) on the documents.
- _____ 6. All documents include a note "Do not change without approval of MSHA" on each page or sheet.
- _____ 7. All submitted drawings, including sheet numbers, are traceable (referenced) back to the one or more drawings to which the equipment is built.
- _____ 8. All wiring diagrams showing intrinsically safe circuits include a warning statement "Any change(s) in the intrinsically safe circuitry or components may result in an unsafe condition"?
- _____ 9. The applicant shall submit a sample caution statement (reference 30 CFR, Part 18, Sec. 18.6 (j), see Figure 3 in Appendix II) specifying the conditions for maintaining permissibility of the equipment.

Technical

- _____ 8. The assembly drawing(s) includes the following:
 - _____ a. The overall length, width and height of the shearer.
 - _____ b. Location of all electrical enclosures and intrinsically safe components.
(Enclosure C)

- _____ c. Location of the evaluation plate and method of attachment.
- _____ d. An insulated strain relief device where the trailing cable enters the shearer, and at both ends of all cables leading to components not on a common frame.

Note: A drawing of the device must be submitted or referenced if on file with MSHA. Cable grip type strain relief devices are not accepted where the cable is placed alternately in tension.

_____ 9. The location of all cables entering/exiting electrical enclosures is shown.

10. All inter component cables are identified by:

- _____ a. Conductor size, (e.g., 1/0 A.W.G.).
- _____ b. Type of cable, (e.g., G-GC).
- _____ c. Number of conductors, (e.g., 3).
- _____ d. Electrical rating, (e.g., 2KV).
- _____ e. Outer diameter, (e.g., 1.65", \pm .04").
- _____ f. Conductor temperature rating in degrees centigrade (e.g., 90⁰C) and the ampacity.

11. All explosion-proof electrical enclosures are identified by:

- _____ a. Manufacturer.
- _____ b. Model/Type Number (for motors, specify frame number).
- _____ c. Electrical Rating (if applicable). For motors, specify voltage, phase, hertz, a.c., or d.c., horsepower and full load amperes; and for headlights, specify voltage and wattage.
- _____ d. Function, (e.g., pump motor, controller).
- _____ e. Certification/approval number, including extension number. If the original issuance is used, indicate (-0).

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Note: If no certification/approval number was issued, indicate the approval number and extension number under which it was accepted.

- _____ f. Quantity.
- 12. All intrinsically safe circuits/components are identified by:
 - _____ a. Manufacturer.
 - _____ b. Model/Type Number.
 - _____ c. Quantity.
 - _____ d. MSHA Evaluation Number, including extension number. If the original issuance is used, indicate (-0).
- _____ 13. If the shearer's nameplate rating is from 661 to 1000 volts, a shielded trailing cable is provided at 2000 volts or more.
- _____ 14. All plugs and receptacles are explosion-proof or mechanically or electrically interlocked unless used in an intrinsically safe circuit.
- _____ 15. All remote control cables are intrinsically safe or constructed of a heavy jacket with conductors no smaller than No. 14 (AWG), if not enclosed in hose conduit. If enclosed in hose conduit, the cable tensile strength is not less than No. 16 (AWG) 3 conductor.
- _____ 16. The ampacity rating for each inter component cable is adequate for the full load current of its load or a justification for the use of the cable is enclosed with the application.
- _____ 17. If the shearer is equipped with a methane monitor, the methane monitor power shut-off relay deenergizes all motors, lighting circuits and power take-off receptacles.
 - _____ a. The shut-off relay is connected into the control circuitry so that it is not possible to defeat the methane monitor by holding down or blocking any reset (start) switch in the start position.
 - _____ b. The control circuitry is connected so that none of the electrical motors will restart automatically when the methane monitor shut-off relay is deactivated.

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Note: Intrinsically safe circuits and the methane monitor may remain energized.

_____ 18. All energy storage devices (not including batteries) housed in explosion-proof enclosures have a means of being discharged before they are accessible to personnel. The maximum discharge time of the device is specified on the drawing.

_____ 19. The cross-sectional area(s) of the grounding conductor(s) is at least 50 percent of one of the power conductors on No. 6 (AWG) or larger cables, and at least the same size on cables smaller than No. 6 (AWG).

_____ 20. There are no insulating materials in the enclosures that give off flammable or explosive gases when decomposed electrically. Additionally, all parts coated or impregnated with insulating materials were heat treated to remove any combustible solvents before assembly.

Note: Air drying insulating materials are excepted.

_____ 21. The temperature of the external surfaces of the mechanical or electrical components does not exceed 150⁰C (302⁰F) under normal operating conditions.

_____ 22. If the shearer is equipped with fiber optic cable(s), which do not contain current-carrying electrical conductors must meet the following criteria.

_____ a. The cable is MSHA accepted flame-resistant unless totally enclosed within an MSHA flame-resistant hose conduit or other MSHA flame-resistant material, or totally contained within an explosion-proof enclosure.

_____ b. A strain relief device is provided at both ends of the cable where it enters an explosion-proof enclosure not on a common frame.

_____ c. All the conductive members are grounded on cables which contain noncurrent-carrying conductive members, such as metallic strength members and metallic vapor barriers.

_____ d. Any cable exiting an explosion-proof enclosure was explosion tested in a gland arrangement similar to that being used and in an MSHA tested enclosure at a pressure of approximately 150 psi or the tests were waived based on a previously accepted similar design.

_____ e. The cable manufacturer, type and outside diameter (including tolerance) is specified.

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Note: Cables which contain both optical fibers and current-carrying electrical conductors will be classified as electrical cables and must meet the requirements of 30 CFR Part 18.

- _____ 23. All circuit-interrupting devices can be reset without opening the compartment in which they are enclosed and no explosion-proof enclosure is required to be opened to operate a switch, rheostat or other device. A circuit-interrupting device does not need a method for external operation if the following criteria are met:
1. the circuit-interrupting device is not required by 30 CFR 18.51(a);
 2. the circuit-interrupting device protects only control circuit wire(s) or device(s);
 3. the circuit-interrupting device provides protection only for cables or components internal to the explosion-proof enclosure; and
 4. the circuit-interrupting device can be re-closed without exposing personnel to any energized power circuit.
- _____ 24. All components and quantities (motors, solenoids, lights, ISC components, etc.) listed on the bill of materials, etc., are also shown on the layout and schematic/wiring diagram(s).
- _____ 25. The schematic/wiring diagram(s) includes/specifies the following, where applicable.
- _____ a. Short-circuit protective devices for all cables exiting explosion-proof enclosures, including their electrical ratings and trip settings, in amperes.

Note: If one protective device is used to protect several cables, the protective device must protect the smallest cable.
 - _____ b. Primary and secondary transformer voltages and any voltage change from AC to DC.
 - _____ c. Labels for all major switches (as to functions), example, emergency stop switch, pump start, light switch, etc.
 - _____ d. Separate grounding conductors to indicate all headlight and luminaire assemblies are grounded by a separate conductor.
 - _____ e. The shearer input voltage(s).

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_____ f. The voltage of the control circuit.

Note I: The voltage cannot exceed nominal 120 volts line-to-line alternating current.

Note II. Not applicable for direct current.

_____ g. A single circuit-interrupting device by means of which all power conductors, including lighting conductors, can be deenergized at the shearer.

Note: The device shall simultaneously open all phase conductors on an alternating current shearer, and both line conductors on a single phase, alternating current or direct current shearer. The interrupting of all conductors shall occur in a single enclosure.

_____ h. Overload protection for all motors, including the trip settings in amperes.

Note I: The overload devices must be in at least two phases of an AC motor circuit, the activation of one device must open all three phases.

Note II: If current transformers are used in conjunction with overload devices, the turns ratio must be specified.

_____ i. A separate two-pole switch to deenergize all power conductors to headlights and luminaires.

Note I. Relay actuated contactors are not acceptable as the sole means of providing this function.

Note II: More than one separate two-pole switch may be used; however, each switch must only control a lighting circuit.

Note III: On three phase lighting circuits, a three-pole switch must be used.

_____ j. Identification of all intrinsically safe circuits by the MSHA evaluation number, including extension number. If the original issuance is used, indicate (-0).

_____ k. The note "Any change(s) in the intrinsically safe circuitry or components may result in an unsafe condition."

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Note: For each schematic/wiring diagram(s) that contains intrinsically safe circuits.

_____ l. Cover interlocks on covers providing access to power fuses (other than headlight and control circuit fuses). The interlock must interrupt the electrical circuit in the explosion-proof enclosure and prevents automatic reenergization of the circuit until the explosion-proof integrity of the enclosure is reestablished. The power fuses are located on the load side of the circuit interrupting device.

_____ m. The location of the basic electrical parts such as the circuit breakers, overloads, fuses, switches and contactors in relationship to the enclosures.

26. Where applicable the following information shall be provided (notes/statements are acceptable).

_____ a. All electrical cables are isolated from hydraulic lines.

_____ b. All headlights and luminaires are protected by guarding or location.

_____ c. All moving parts are guarded (rotating belts/chains, fan blades, etc.).

_____ d. Wiring for non-intrinsically safe circuit conductors and intrinsically safe circuit conductors is not intermingled with wiring for other intrinsically safe circuit conductors.

Note: Unless the circuit was evaluated in that mode.

_____ e. The magnesium content of any external aluminum alloy fans, pulleys, or other rotating devices does not exceed 0.6%.

_____ f. The shearer has a load-locking valve system that meets the Load-Locking Valve that meets the following criteria:

i. The load locking valve must be attached directly to the cylinder port that is subject to the hydraulic pressure induced by the weight of the boom or cutting head, or directly to a section of steel tubing welded to the cylinder port and attached to the cylinder. In either case the load locking valve shall be attached directly to the cylinder in a manner that precludes disconnecting the line between the load locking valve and the cylinder without first detaching the load locking valve from the cylinder.

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- ii. The rated working pressure of the load locking valve must be greater than the maximum system operating pressure.
- iii. If the load locking valve has overpressure relief capability, the overpressure relief setting shall be sufficient to allow proper operation of the load locking valve.
- iv. If the load locking valve is pilot operated, the hydraulic system shall be designed to ensure that the residual pilot pressure or line back pressure will not hold the load locking valve open when the control valve is in the neutral position.
- v. Adequate hydraulic filtration shall be provided to ensure that the load locking valve will operate properly throughout its normal service life, when the hydraulic system is subjected to rigorous everyday mining conditions.

Note: This statement must be signed (original signature) by a registered, professional engineer and must be submitted when the shearer uses hydraulic cylinders to elevate cutting heads on shearers.

- _____ g. The voltage ratings of all conductors and cables within the enclosures is compatible with the impressed voltage.
- _____ h. All components on a common frame are solidly frame grounded when the inter component cable(s) to those components do not have separate grounding conductors.
- _____ i. All electrical cables/cords are MSHA accepted flame-resistant or enclosed in MSHA accepted flame-resistant hose conduit. The conduit must completely enclose the cable. Clamping the hose conduit to the cable is not acceptable.

Note: This includes intrinsically safe cables.

- _____ j. An MSHA accepted ground wire monitor will monitor the ground connection to the shearer and components not on a common frame.

Note: For shearers rated in excess of 660 volts.

- _____ k. No sintered metallic friction materials are used on the equipment unless used in conformance with the exceptions stated in the Approval and Certification Center's policy letter dated May 22, 1979. A&CC's policy is to restrict the use of sintered metallic friction materials to enclosures

(Enclosure C)

considered explosion proof or to enclosures that prohibit the outside atmosphere from entering the enclosure. A totally enclosed clutch type brake system is considered acceptable.

_____ l. All cables are protected from mechanical damage and clamped in place to prevent undue movement.

_____ m. If the shearer is use on an inclined face, one of the following statements or equivalent is used to describe the parking brakes.

i. The parking brake provided holds the shearer stationary up to its maximum gradeability despite any contraction of the brake parts, exhaustion of any non-mechanical source of energy, or leakage of any kind.

ii. The design of the driving mechanism will preclude accidental movement of the shearer when parked.

_____ n. All non-certified, accepted explosion-proof enclosures are identified by a permanent marking that consists of the following capital letters, "US MSHA", "US MESA" or "USBM" (not less than 1/4" in height) and enclosed in a circle not less than 1.00" in diameter.

Note: For enclosures that meet all applicable requirements of Part 18, but have not been issued a separate certification number, that is, they have been evaluated and accepted under the total approval investigation. A drawing of the marking must be submitted.

_____ o. Electrical clearances within enclosures are in accordance with 30 CFR 18.24.

INVESTIGATION NO. SE-(leave blank)

DRAWING LIST

GHI Company
Model 100, 440/550 Volt, 3 Phase, 60 Hertz, Alternating Current,
Shearer
Built According to Assembly Drawing A-500
Evaluation No. SE-(leave blank)-0

<u>TITLE</u>	<u>DRAWING</u>	<u>PART NO.</u>	<u>REVISION</u>
Assembly Drawing	A-500	-	A
Bill of Material	B-500, 3 Shts	-	A
Electric Diagram	C-500	-	A
(Alt.) Electric Diagram	D-500	-	A
Strain Clamp *	E-500	2	3
Factory Inspection Form	G-500	-	E

* VWX Company Drawing

(Enclosure D)

FACTORY INSPECTION FORM

Date Inspected
Inspector

Designation _____ Serial No.
Type/Model No. _____ MSHA Approval No.

MOTOR

Manufacturer _____ H.P.
Serial No. _____ Volts
Frame _____ MSHA No.
RPM
Full Load Current
Winding

STARTER

Manufacturer _____ Type/Model No.
Serial No. _____ MSHA No.

PORTABLE CABLE

Manufacturer _____ Voltage Rating
Size _____ Length
Type _____ Outer Diameter
No. of Conductors _____ MSHA Acceptance No.

Are all packing glands properly packed so that 1/8-inch minimum clearance remains between packing nut and stuffing box?

Are lockwashers (or equivalent) provided for all explosion-proof enclosure fastenings?

Are all plane joints securely fastened so that a ____ inch feeler gage cannot be inserted?

Are all threaded covers secured?

Are all electrical connections secure and properly insulated where necessary?

Do Not Change Without Approval of MSHA

SJM Company Rev A. Drawing No. 1989 Date: 6-11-06

(Enclosure E)

MNO Company, 550 Mining Road, Pittsburgh, PA 15201

July 4, 2006

MNO Company
550 Mining Road
Pittsburgh, Pennsylvania 15201

SUBJECT: Model RB1 - Shearer
Company Application Code No. 141989

I, John Bolter, Design Engineer, certify that the MNO Company will conduct regular inspections of the subject shearer manufactured by MNO Company to insure that this product is made and assembled in strict accordance with the drawings and specifications approved by MSHA.

Sincerely,

John Bolter
Design Engineer

(Enclosure F)

XYZ MANUFACTURING COMPANY
SHEARER

Shearer Evaluation SE- _____

Type or Model _____

Serial No. _____

Evaluated as complying with 30 CFR, Part 18.

Maximum Effective Full Load Current _____

(i)

XYZ MANUFACTURING COMPANY
SHEARER

Shearer Evaluation SE- _____

Type or Model _____

Serial No. _____

Evaluated as Complying with 30 CFR, Part 18.

Maximum Effective Full Load Current _____

Restrictions

H-V Encl. 30 Short Ckt. Min. _____ Max. _____

Maximum Clearing Time

Outby 30 Short Ckt. Setting _____ of Outby 30 Short Ckt. _____

(ii)

(Enclosure G)