



**GEK 110146a**  
**Revised February 2002**

**GE Power Systems**  
**Generator**

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**Protection of Assembled Generators**  
**During Shipment, Storage and Prior to Startup**

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*These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes the matter should be referred to the GE Company.*

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**ATTENTION**

**To the customers of GE Power Systems who have Generators in installation or storage.**

This document provides guidance on the protection of assembled generators placed in storage, and prior to unit commissioning and startup. Requirements are also presented regarding the necessary preservation, protection and maintenance procedures to be followed during extended storage periods of two years or less.

This information is furnished to serve as a guide in giving proper protection in a given situation. In no case should it be considered a complete instruction. Protection of this kind of equipment can be complex and subject to so many variables that owners must consider their individual circumstances. *THEREFORE, IT IS THE RESPONSIBILITY OF EACH CUSTOMER TO DETERMINE A PLAN OF PROTECTION. THE CONTENTS OF THIS DOCUMENT OR ITS USE WILL NOT CREATE ANY LIABILITY WHATSOEVER ON THE PART OF THE GE COMPANY OR ITS EMPLOYEES, WHETHER IN WARRANTY, NEGLIGENCE, OR OTHERWISE.* where the GE Company furnishes protection services and materials, the rights of the parties, including the applicable warranty, shall be as provided in that contract under which the work is to be done.

It should be recognized that the preservation and packaging methods listed herein are current as of the date of this publication. However, since improved methods and materials are constantly being introduced, the protective means described herein should be considered representative rather than specific. The preservation, protection and maintenance procedures for extended storage represent the ge company's best judgment based on limited experience and knowledge.

GE Company service engineers are available to help any customer set the frequency of monitoring deemed necessary and lay out an appropriate surveillance plan. Questions and interpretations with respect to the contents of this publication should be referred to the local ge company service representative.

## I. INTRODUCTION

The information provided herein is for the guidance and use of generator purchasers to assist them in protecting the equipment both during normal installation periods and during non-operation periods. In Section II, the various methods used for protection during shipment are outlined. They are designed to protect the equipment during shipment and normal installation involving storage for periods up to 6 months, *provided* the equipment is received, stored and maintained after arrival in accordance with the requirements of this document.

Protective coatings and packaging will deteriorate over time; the rate of deterioration will vary with the local environment and actual storage conditions. Degradation of equipment could then occur unless it is re-protected. Deterioration would be particularly likely on electrical equipment, machined surfaces and piping. Therefore, if the equipment is expected to be stored, the purchaser must plan and carry out a regular inspection and upgrading of the protective coatings and packaging. This program must start at the time of arrival of the first part and continue throughout the entire storage period. Requirements are given in Sections III through VII and Appendices I through II on the storage of assembled generators.

Before storing any equipment, a thorough inspection for damage to the packaging and protective coatings must be performed. Any damage must be recorded with digital pictures, reported and repaired or re-protected.

In general, the protective methods described in this publication are acceptable to commercial carriers for domestic shipment without special shipping precautions. However, when barge or ship carriers are used, the equipment should be placed below deck to protect against water spray. Immediate inspection and cleaning are required on arrival should any contamination occur. (See Section IV)

The local GE Company representative should be consulted on any questions concerning the recommendations furnished in this publication. Also, contact the local GE Company representative if any indication of deterioration is detected during receipt or storage of the generator components.

### NOTE

The term "storage" as used throughout this document refers to the entire period between shipment and startup of the generator.

## II. METHOD OF PRESERVATION OF ASSEMBLED GENERATORS PRIOR TO SHIPMENT

Fully assembled generators are shipped as assembled with the following components in place:

1. Complete Stator
2. Complete Rotor, including Fan Blades
3. Stator Feet
4. End Shields
5. Bearings and Bearing Rings
6. Oil Deflectors

7. Oil Seal Rings for Hydrogen Cooled Generators
8. Inner Gas Shields
9. Coolers
10. Piping supported by frame
11. Hardware to Position the Rotor Assembly
12. High Voltage Bushings if applicable

A summary of the protection applied to the major components at the factory in preparation for shipment is given in Table 1. Also included are comments on shipping, receiving and storage methods. There is a separate similar document dealing with the shipment of unassembled generator components, GEK 103616, for all other generators and components.

To protect machined surfaces during shipment and storage, a protective coating or wrapping is applied. This provides chemical protection for those surfaces. Mechanical protection of the machined surfaces is often required as well and may be provided by a structure (wooden, metallic, etc.) to absorb any impacts that might otherwise damage that surface.

A tabulation of approved preservation materials and where they may be purchased is in Appendix I. When cushion boards are removed from any support surfaces, it is expected that a portion of the preservative may come off from these surfaces. The surfaces must then be inspected, cleaned where necessary, and re-preserved.

**Table 1. Methods of Preservation Applied at Factory.**

|   |  |
|---|--|
| <b>1A. Journal bearings, thrust bearings, bearing rings - Internal to Assembled Generator</b> |  |
| a) Machined surfaces  | Thin film corrosion preventative compound or light oil   |
| b) Unmachined surfaces  | Aluminum phenolic coating  |
| c) Horizontal joint   | Thin film corrosion preventative compound or light oil   |
| d) Insulated surfaces   | Light oil or equivalent  |
| <b>1B. Pads for pad bearings - Internal to Assembled Generator</b>                            |  |
| a) Machined and babbitted surfaces  | Thin film corrosion preventative compound or light oil.  |
| <b>2. Gibs and keys - Integral with Assembled Generator</b>                                   |  |
| Gibs and keys   | Thin film corrosion preventative compound or light oil and wrapped in VCI paper or plastic compatible with base metal. |
| <b>3. Permanent magnet generator - Internal to Assembled Generator</b>                        |  |
| a) Outside surfaces   | Beige epoxy enamel. Wrapped in VCI paper compatible with base metal. Shrink wrap can also be used.                     |
| <b>4. Stator - Primary Component of Assembled Generator</b>                                   |  |
| a) External and internal surfaces except machined surfaces                                    | Rust inhibiting primer   |

b) End windings and inside diameter of core (including tops of wedges) Blue or beige epoxy enamel, epoxy ester or phenolic alkyd

**NOTE**

End windings and inside diameter of core may be of various colors due to tagging compounds. (Generators shipping after January 31, 1978)

c) All machined surfaces Thin film corrosion preventative compound or light oil

**5. End shields - Integral to Assembled Generator**

a) External and internal surfaces, except as noted in b, c and d below Rust inhibiting primer

b) All machined surfaces Thin film corrosion preventative compound or light oil

c) Oil pockets Aluminum phenolic coating. Pipes and hidden areas are VSI oil fogged.

**6. Stator feet -Integral to Assembled Generator**

a) All machined surfaces Thin film corrosion preventative compound or VCI wrap

b) All non-machined surfaces Rust inhibiting primer

Storage recommendation All cushion boards must be removed at site to prevent corrosion due to possible moisture entrapment.

**7. Air or Hydrogen coolers - Internal to Assembled Generator or in Roof Structure (if carbon steel)**

a) Inside and Outside header surfaces Rust inhibiting primer

b) Inlet/Outlet flanges Thin film corrosion preventative compound or oil and openings plugged with pipe covers.

**8. Field - Internal to Assembled Generator**

a) Journals Thin film corrosion preventative compound coated is applied. The bearing cavity is later flooded with VSI oil.

**CAUTION**

*Use extreme care when removing or reapplying coverings/coatings. Journals are precision ground and must not be marred.*

b) Collector and turbine end coupling Thin film corrosion preventative compound, covered in impact resistive weather resistive wrapping

c) Field body Coated with thin paint (yellow or blue).

**NOTE**

On generators shipping after January 31, 1978, the field body may be coated with a tagging compound in addition to the paint.

**9. Brush holder rigging -Integral to Assembled Generator**

|                           |  |
|---------------------------|--|
| a) Base                   | Rust inhibiting primer   |
| b) Machined surfaces      | Thin film corrosion preventative compound coating  |
| c) Electrical connections | Thin film corrosion preventative compound coating. May be wrapped with a VCI paper compatible with base metal. |

**10. Exciter housing -Integral to Assembled Generator**

|                                |                                      |
|--------------------------------|--------------------------------------|
| a) Inside and outside surfaces | Rust inhibiting alkyd primer         |
| Storage recommendation         | Inspect and turn to upright position |

**11. Assembled Generator**

|                 |   |
|-----------------|---|
| Shipping method | Alkyd primer. Thin film corrosion preventative compound on machined surfaces. VCI paper or preservative oil in threaded holes covered with plastic caps.<br>Desiccant and a humidity detector may be included in the end shield upper half manhole cover. End shields are not typically part of an air-cooled generator and so this feature is not typically supplied on air cooled generators. On air cooled machines, desiccant and humidity indicators may be installed on an access cover |
|-----------------|---|

**III. REQUIRED STORAGE ENVIRONMENTS FOR ASSEMBLED GENERATORS**

The assembled generator is required to be in storage classified as “Indoor Heated”, temperature 60°F to 120°F (16°C to 49°C) with relative humidity maintained at less than 70% for all temperatures. As an alternative, generators may be stored in an indoor, unheated facility with the frame heaters fully energized with rated voltage to reduce the relative humidity inside the frame to acceptable levels, or generators may be stored in an indoor, unheated facility with relative humidity controlled to less than 50%. Air cooled machines should be checked internally by removing appropriate access covers for the presence of water prior to energizing the heaters.

**IV. RECEIVING, SURVEILLANCE AND MAINTENANCE OF ASSEMBLED GENERATORS FOR STORAGE**

This section contains recommendations for receiving, surveillance and maintenance of generator components when they arrive at storage or at job site. The frequency of inspection and upgrading of the protective packages can be adjusted to fit the conditions, as experience is gained at each storage location.

**A. Receiving**

Damage to the protective materials can occur during transit; thus it is imperative that the parts be inspected, when received, for any type of visible damage or deterioration of the protective materials due to shipment. If required, parts should be cleaned and reprotected before storage.

Upon arrival, all parts shipped by rail must be inspected for signs of damage due to humping. The hardware used to position the rotor axially must be thoroughly inspected for signs of deformation to determine if the rotor could have shifted during shipment. If damage to that hardware is noted, then an internal inspection of the generator rotor, rotor journals, bearings, oil seals, and hydrogen seal rings, if so equipped, is required. The other primary source of damage to these components is due to improperly

securing them to the transport vehicle. If any damage to parts or skidding is noted, it should be reported immediately to the local GE Company representative. Use form in Appendix III.

Upon arrival, inspect all parts for damage or deterioration of protective coverings. Inspect all components for damage due to tie down methods. Any deterioration of protective coverings on machined surfaces requires the areas be cleaned and re-protected before storage. If any damage is noted, record with digital pictures and report it immediately to the local GE Company representative.

Upon arrival, inspect for external damage and move immediately indoors. Before storage for all air cooled units, open all inspection covers to verify that the parts have not been damaged and that the protective materials are not wet or otherwise deteriorated. For units equipped with desiccant and humidity indicators, check that the humidity indicator indicates less than 40% relative humidity inside of the frame. Remove covers and replace desiccant packs if humidity exceeds 40%. Any damage or deterioration that is noted should be reported immediately to the local GE Company representative. Following the initial inspection, replace the covers.

If parts that are wrapped or sealed with VCI (vapor corrosion inhibitor) papers or plastic are inspected, they must be promptly and completely rewrapped or sealed for adequate corrosion protection. If parts are to be handled for inspection they should be handled with clean gloves to avoid fingerprints that can lead to corrosion.

Components shipped by barge, or by truck over salted roads, require special handling and inspection to counteract the highly corrosive salt-water atmosphere they have been exposed to during transit. It is required that the following additional actions be taken on all such shipments immediately after unloading from the carrier:

1. Remove all traces of salt-water atmosphere which could cause corrosion on the components by wiping down with liberal amounts of “clean” water or solvent by hand.
2. Check thoroughly each component to determine that no residual pools of water are left in crevices, pockets, etc.
3. On components which have had wooden shipping blocks attached to machined surfaces, remove the wood blocks at the earliest opportunity, clean the machined surface under the block and check its condition. If there are signs of moisture having been in contact with the metal surfaces, clean and re-protect with the appropriate preservative.

## **B. Surveillance and Maintenance**

A planned program for surveillance and maintenance on the assembled generator is essential to properly preserve the equipment during storage periods. The local GE representative can be contacted to assist in preparing a suitable plan.

It is recommended that the purchaser prepare a checklist for the assembled generator. The items on the generator arrival report in appendix II should be monitored per the surveillance requirements of this document as a minimum. List the specific points that must be checked at each inspection — for example, the machined surfaces, field journals, key and deflector fit surfaces, megger readings, humidity readings, condition of coverings and preservations, etc. The checklist should also include a column for the observer to note any adverse conditions to be corrected.

Through the application of a proper surveillance and maintenance program, a purchaser is able to store his equipment for extended periods, provided the recommendations in this publication are utilized.

Assembled generators and their components, for the most part, are vulnerable to moisture. The combination of time and exposure could very likely leave some of the equipment in need of reconditioning. Experience shows this reconditioning to be very expensive. Taking the proper precautions upon arrival of the equipment reduces the likelihood for costly repairs later.

A surveillance and maintenance inspection schedule will help to detect possible problems before they become serious. The local GE Company representative will be pleased to make recommendations based on developments during the storage period. Graphs of megger readings over time are very helpful in these cases. For a fully assembled generator, it is important to determine if there is an indication of reducing stator or rotor insulation resistances. Of particular importance is the need for an effective rodent control system. A professional exterminator may be a sound investment in keeping generator component insulation intact.

**Table 2. Minimum Required Surveillance Requirements**

| COMPONENTS           | MINIMUM SURVEILLANCE REQUIREMENTS   |
|----------------------|---|
| Assembled Generators | <p>Within 6 months of ship date, replenish the bearing cavity with VSI oil. Remove blank flange and gasket from bearing oil drain pipe. Drain old VSI oil (approx 5 gallons on hydrogen cooled units and 2–3 gallons on air cooled units per end). Reinstall gasket and flange. Pour in a new charge of VSI oil equal to the amount removed through one of the instrumentation ports in the top of the bearing cap.</p> <p>VSI oil must be replenished every additional 6 months that the unit is in storage.</p> <p>Upon arrival, and every 6 months:<br/>                     Record the interior humidity level, if so equipped.<br/>                     Remove the special access cover on air cooled units if the humidity level is greater than 40%. Using a flashlight, inspect as much of the interior as possible for signs of moisture and rust. Replace desiccant bags if so equipped, if humidity level is greater than 40%</p> <p>Megger and polarization index test the stator and rotor windings monthly, per GEK 7613.</p> |

The assembled generator is prepared for foreign or domestic land routes or water shipment and/or long-term storage for 6 months. By closely following the inspection, storage, and surveillance requirements of this document, the storage period can be extended to 24 months from the ship date. If storage for periods of more than 24 months is expected a GE Company representative should be contacted for additional storage and preservation recommendations. A more involved preservation program may be required, including a requirement to rotate the field.

The periodic megger checks will indicate the condition of the stator insulation with respect to moisture. If there is any deterioration of the megger readings, the local GE Company representative should be contacted for further recommendations. All megger checks to be done with a 500 volt megger, readings taken at one and 10 minutes for comparison with factory data. See Appendix III (Refer to GEK 7613).

The exposed machine surfaces are treated with a thin film corrosion preventative compound before shipment. This is an effective short-term coating which prevents surface corrosion. This coating, however, will wear off with time and exposure to the elements. Also, these surfaces should be inspected for mechanical damage, which may remove the chemical protection of the thin film corrosion preventative compound. Therefore, the maintenance schedule includes requirements for periodic recoating of these surfaces.

The next two sections discuss some inspection concerns for different generator types. One critical issue that applies to both machine types is that the inspectors must assure that nothing was left inside the machine during the inspection. This is extra important if the item left behind is metallic and magnetic. Most hand tools and often things in a person's pocket fit that general description. If something is left behind, then there is a potential that the item may cause a fault in the winding insulation

### **Hydrogen-Cooled Generators**

Assembled hydrogen-cooled generators are shipped with their internal components in place and as a result need special attention to insure that during storage period no degradation of those components occurs. Moisture is the major concern as it can cause rusting and can degrade the stator and rotor insulation. Heaters are provided on these units and should be energized as soon as possible after being put into long term storage. The upper end shields at each end have manholes for some internal inspection. As an aid in the protection of the generator internal components, desiccant bags and humidity indicators may be provided, and must be monitored per the requirements of this GEK. These features are required when the storage period is known to be more than 6 months. Typically, covers with desiccant bags are painted yellow. Desiccant bags should be replaced when the humidity indicators reach 40%, or desiccant can be reactivated by baking the bags at 245 to 275F (118 to 135C) for 12 hours. See section 3 below for further description of the humidity indicators.

### **Air-Cooled Generators**

Air-cooled generators typically do not have end shields or access covers in the end shields as described in the Hydrogen cooled section above. However, if they do then that is still the best way to perform the required inspections. The covers of an air-cooled generator typically have gaskets. Therefore, it might be advantageous to prepare for the possibility of ruining the gaskets during cover removal.

If the generator does not have end shields, but rather has separate bearing pedestal, then two options are available to do inspections. Most air-cooled generators have an access cover on the side of the machine at the turbine and at the collector end end winding bays. These must be removed for inspections. If the generator does not have these, then the air shield may be removed. As with the inspections of hydrogen-cooled generators, care is required to return the machine to the as shipped condition after each of these inspections. For that, it may be necessary to have gaskets ready should any be damaged during cover removal. Inspection for presence of water must be performed prior to energizing the frame heaters..

### **Humidity Indicators**

The humidity indicators (Figure 1) are one inch in diameter and contain three color changing segments, spaced 120 degrees apart and indicating 20%, 40% and 60% relative humidity. The segment color is blue when the relative humidity is below the respective percent value, but will become lavender in color when the 20%, 40% and 60% relative humidity is reached, and is pink when the relative humidity is above the 60% value (see Table III). When the 40% relative humidity segment turns pink, the desiccant in the container should be changed or reactivated.

Table 3. Relative Humidity Chart

| % Actual Relative Humidity | RELATIVE HUMIDITY % |             |             |
|----------------------------|---------------------|-------------|-------------|
|                            | 20% Segment         | 40% Segment | 60% Segment |
| 10                         | B                   | B           | B           |
| 20                         | L                   | B           | B           |
| 30                         | P                   | B           | B           |
| 40                         | P                   | L           | B           |
| 50                         | P                   | P           | B           |
| 60                         | P                   | P           | L           |
| 70                         | P                   | P           | P           |

B = Blue, L = Lavender, P = Pink

## V. PROTECTION OF ASSEMBLED GENERATOR AND COMPONENTS DURING INSTALLATION

The recommendations relative to storage and surveillance should be followed during the installation phase at the site.

## VI. PROTECTION OF ASSEMBLED GENERATOR AND ASSOCIATED EQUIPMENT AFTER INSTALLATION AND PRIOR TO STARTUP

### A. Assembled Generator

- To maintain an atmosphere that will not support rusting of the various generator internals, the stator heaters should be energized. Another possible way to minimize water condensation inside an assembled generator is to pressurize it with dry nitrogen gas. A slight positive pressure is all that is required (0.5 psig). However, to effectively hold this pressure, the seal oil system must be kept in continuous operation. This requires active monitoring by the customer to assure the nitrogen pressure is maintained and the seal oil operation is maintained properly. The seal oil system may require manual operation to prevent flooding of the generator with oil, see appropriate GEK on the Hydrogen Seal Oil System.
- The hydrogen coolers (if equipped) must be completely drained and dried.
- Setup a maintenance schedule to coat periodically any exposed machined surfaces with rust preventative.
- Leave the collector rings as originally prepared, if possible. Do not install brushes in the magazines.
- Roll the unit once a month with lube oil operational, always leaving the pole face axis in the vertical.

6. Meggering the field once a month will serve to monitor the atmosphere in the frame and give assurance to its dryness.
7. Avoid prolonged operation on turning gear.
8. Operate lube and seal oil pumps for one hour per week for coating of machined surfaces.

**B. Conclusion**

Normally there is not any great difficulty with this equipment when installation is completed several months ahead of startup, provided the turbine building is capable of protecting the unit from the elements and extreme changes in temperature. However, it is required that the equipment not be left completely unattended. A conscientious inspection and maintenance schedule will insure the generator's integrity during storage and also help to uncover possible problems before they become serious.

**I. APPENDIX I - SOURCES FOR PROTECTIVE MATERIALS FOR GENERATOR COMPONENTS**

**A. Permanent Protective Paints**

| DESCRIPTION   | SOURCE   |
|---|--|
| <p><b><u>Rust Inhibiting Alkyd Primer</u></b></p> <p><i>C1815-B (turbine grade) beige water reducible alkyd primer.</i><br/>A beige colored water reducible alkyd primer generally used over previously primed surfaces.</p> <p><i>AD15001 alkyd primer - beige, gray, and light blue</i><br/>A solvent based rust inhibiting primer. Generally applied to bare steel surfaces.</p> | <p>Glyptal, Inc.<br/>305 Eastern Ave.<br/>Chelsea, MA 02150</p> <p>C. A. Reeve Paint Co.<br/>619 W. Fayette St.<br/>Syracuse, NY 13204</p>                 |
| <p><b><u>Aluminum Phenolic Coating</u></b></p> <p><i>Aluminum phenolic paint HTA-297/298 or 3177 - NS</i><br/>A solvent based oil resistant paint generally used on all unmachined surfaces in lube oil containing areas.</p>   | <p>International Paint Co.<br/>400 S. 13th St.<br/>Louisville, KY 40203<br/>or<br/>C. A. Reeve Paint Co.<br/>619 W. Fayette St.<br/>Syracuse, NY 13204</p> |
| <p><b><u>Epoxy Enamel Paint</u></b></p>   |  |

| DESCRIPTION   | SOURCE  |
|---|---|
| <p><i>Beige epoxy enamel 74004/74010, 4015-NS or 890</i><br/>An extremely hard paint used in heavy-duty applications or where the surface is likely to become contaminated with oil or EHC hydraulic fluid.</p>   | <p>Glyptal, Inc.<br/>305 Eastern Ave.<br/>Chelsea, MA 02150<br/>or<br/>C. A. Reeve Paint Co.<br/>619 W. Fayette St.<br/>Syracuse, NY 13204<br/>or<br/>Carboline<br/>350 Hanley Industrial Ct.<br/>St. Louis, MO 63144</p> |
| <p><b><u>Control Cabinet Paint</u></b></p> <p><i>Polane HS A.S.A. 61 gray</i><br/>Forms a hard protective surface. Used on the external surfaces of the Hydrogen and Stator Water Cooling System Instrumentation Cabinets.</p> <p><i>Polane HS white gloss F63W56</i><br/>Forms a hard protective surface. Used on the internal surfaces of the Hydrogen and Stator Water Cooling System Instrument Cabinets.</p> | <p>Sherwin-Williams Co.<br/>Chemical Coatings Div.<br/>Cleveland, OH 44101</p> <p>Sherwin-Williams Co.<br/>Chemical Coatings Div.<br/>Cleveland, OH 44101</p>   |
| <p><b><u>Rotor Body - Alkyd</u></b></p> <p><i>C1175 transparent blue alkyd</i><br/>Used on generator field bodies. Not compatible with Reeves #2968.</p> <p><i>Reeves #2968 yellow paint.</i><br/>Used on generator field bodies. Not compatible with Brassoline.</p>   | <p>Glyptal, Inc.<br/>305 Eastern Ave.<br/>Chelsea, MA 02150</p> <p>C.A. Reeves Paint Co.<br/>619 W. Fayette St.<br/>Syracuse, NY 13204</p>  |
| <p><b><u>Phenolic Alkyd Coating</u></b></p> <p><i>Water reducible phenolic alkyd, CA-5222</i><br/>Used on generator end windings and inside diameter of core.</p>   | <p>C. A. Reeve Paint Co.<br/>619 W. Fayette St.<br/>Syracuse, NY 13204</p>  |

## B. Temporary Protective Coatings

| DESCRIPTION   | SOURCE                   |
|---|--------------------------|
| <p><b><u>Light Oil</u></b></p> <p><i>Mobil Vaprotec Light.</i><br/>A turbine lubricating oil containing a vapor space inhibitor. Used where heavy-duty contact preservatives would be difficult to remove since the oil need not be removed. Compatible with regular turbine oils. Will not tolerate direct outdoor exposure. Indoor protection about 6 – 8 months.</p> | <p>Mobil Oil Company</p> |
| <p><b><u>Thin film corrosion preventive Coating</u></b></p>   |                          |

| DESCRIPTION  | SOURCE  |
|--|---|
| <p><i>Tectyl 506.</i><br/>Used on various exposed machined surfaces.</p>   | <p>Ashland Industrial Products<br/>P.O. Box 14000<br/>Lexington, KY 40512</p>                             |
| <p><i>Tectyl 891.</i><br/>Used as outer coating on journals and thrust collars and other heavy-duty applications. Shield from direct sunlight to prevent crazing and cracking of hardened Tectyl.</p>  | <p>Ashland Chemical Company<br/>P.O. Box 14000<br/>Lexington, KY 40512</p>                                |
| <p><b><u>VCI Paper</u></b><br/><i>Vapor corrosion inhibitor (VCI) paper and plastic</i></p>  | <p>Daubert Coated Products<br/>Weschester, IL 60154</p>   |
| <p><i>3M-Y335 tape.</i><br/>A pink tape used on generator fields to afford additional protection if the vinyl shipping container is torn during shipment.</p>  | <p>W.N. Van Alstine &amp; Sons<br/>100 N. Mohawk Street<br/>Cohoes, NY</p>                                |
| <p><i>Permacel P-306.</i><br/>A black heavy-duty plastic film tape having the property of removal from surfaces cleanly after long-term outdoor exposures. Used on machined surfaces to cover inaccessible areas such as small or blind holes that are themselves protected by a light-duty, contact preservative.</p> | <p>Permacel<br/>New Brunswick, NJ 08903</p>   |
| <p><i>Shrink Wrap</i><br/>A plastic material shrunk onto the machine surface by use of warm air</p>  | <p>Connecticut Packaging<br/>South Windsor CT 06074</p>   |
| <p><i>Nitrogen.</i><br/>Used in stators in storage and/or prior to startup to prevent corrosion.</p>   | <p>Any source of dry nitrogen.<br/>99.5% pure with a dew point of -60 F or below.</p>                     |
| <p><i>Snoop.</i><br/>A soap solution used for check for nitrogen leaks in generator stator if the stator is charged with nitrogen.</p>   | <p>Nupro Co.<br/>15635 Saranac Road<br/>Cleveland, OH</p>   |
| <p><i>Leak-Tec.</i><br/>Same use as "Snoop".</p>   | <p>American Gas &amp; Chemical Inc.<br/>Leak-Tec Division<br/>511 B East 72nd Street<br/>New York, NY</p> |
| <p><i>Texaco cup grease #2 or #3.</i><br/>Used to fill and seal small drilled and tapped holes in support surfaces which are blanked-off by the support blocking and not provided with drainage.</p>   | <p>Texaco Inc.<br/>P.O. Box 509<br/>Beacon, NY 12508</p>  |
| <p><i>Mobil cup grease #2.</i><br/>Same use as Texaco cup grease #2 or #3.</p>   | <p>Mobil Oil Co.</p>  |

| DESCRIPTION   | SOURCE  |
|---|---|
| <p><i>Marine lube "A" grease.</i><br/>A heavy duty water resistant grease that can be used as a sealant on main-steam valve stems.</p> <p><i>Grade C Paper — Milpack #12 (Waxed paper)</i><br/>MIL-B-121, Grade C, Type 1, Class 2.</p> | <p>Fisk Bros. Refining Co.<br/>129 Lockwood Street<br/>Newark, NJ</p> <p>Ludlow Packaging Corp.<br/>Holyoke, MA</p> |

### C. Other Protective Items

#### *Desiccant*

##### *Desiccant MIL-D-3464 Type 1*

Used in generator field preservation package and generator stators (using steel covers).

Engelhard Corp.  
Edison, NJ 08818

#### **HUMIDITY INDICATOR**

Humidity indicators are used to monitor the relative humidity shipping enclosures and generators.

Reference Drawing 323B5810 (20/40/60 %Humidity)

The above Paints and Protective coatings can be purchased from

**HENKEL SURFACE TECHNOLOGIES**

**CHEMICAL MANAGEMENT**

**1-800-400-5918 Extn - 230**

[www.chemmgt.com](http://www.chemmgt.com)

II. APPENDIX II - GENERATOR ARRIVAL REPORT (PAGE 1 OF 2)

PURCHASER: \_\_\_\_\_ STATION \_\_\_\_\_

RATING: ATB — poles, KVA, rpm, volts

REQUISITION NO. GENERATOR NO.

**STATOR FRAME**

- 1. Condition of
  - (a) Blocking
  - (b) Windings (Reference GEK 7613)

|                          | Megger Readings |           | Polarization Index |           |
|--------------------------|-----------------|-----------|--------------------|-----------|
|                          | 1 minute        | 10 minute | 1 minute           | 10 minute |
| Phase 1                  | _____           | _____     | _____              | _____     |
| Phase 2                  | _____           | _____     | _____              | _____     |
| Phase 3                  | _____           | _____     | _____              | _____     |
| Type Megger(Hand Crank   | Range           |           |                    |           |
| Type Megger(Motor Driven |                 |           |                    |           |
| Type Megger(Electronic   |                 |           |                    |           |

- 2. Condition of end protective covers
- 3. Type of storage which will be used until time of erection. (Heated or not)
- 4. Relative humidity readings

**ROTOR**

- 1. Condition of
  - (a) Blocking
  - (b) Journals
  - (c) Body

(d) Windings

|  | Megger Readings |           | Polarization Index |           |
|--|-----------------|-----------|--------------------|-----------|
|  | 1 minute        | 10 minute | 1 minute           | 10 minute |
| Phase 1  | _____           | _____     | _____              | _____     |
| Phase 2  | _____           | _____     | _____              | _____     |
| Phase 3  | _____           | _____     | _____              | _____     |
| Type Megger(Hand Crank<br>Type Megger(Motor Driven<br>Type Megger(Electronic | Range           |           |                    |           |

**GENERATOR ARRIVAL REPORT (PAGE 2 OF 2)**

2. Condition of wrapper and protective covers
  
3. Type of storage, which will be used until time of erection. (Heated or not)
  
4. Relative humidity readings
  
5. VSI replaced

**SUGGESTIONS**

Signed \_\_\_\_\_ Date

Complete upon arrival and submit to the local GE Company representative, who will forward same to Mgr., Steam Turbine Installations, GE Company, CSD, Bldg. 36-619, Schenectady NY 12345.



**GE Power Systems**

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*General Electric Company  
One River Road, Schenectady, NY 12345  
518 • 385 • 2211 TX: 145354*