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GE Power Systems

Generator

Protection of Unassembled Generator Components

During Shipment and Prior to Startup

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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To the customers of General Electric Power Systems who have Generators in installation or storage.

This document provides typical means used to protect generator components during shipment, installation, or site storage. Further, the document describes how to protect generator components during the installation and while awaiting actual operation after assembly. It also presents recommended preservation, protection and maintenance procedures to be followed during interim extended storage periods of two years or less.

This information is furnished without charge 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 MUST BE THE RESPONSIBILITY OF EACH OWNER TO DETERMINE A PLAN OF PROTECTION, AND THE CONTENTS OF THIS DOCUMENT OR ITS USE WILL NOT CREATE ANY LIABILITY WHATSOEVER ON THE PART OF THE GENERAL ELECTRIC COMPANY OR ITS EMPLOYEES, WHETHER IN WARRANTY, NEGLIGENCE, OR OTHERWISE.* Where the General Electric 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 General Electric Company's best judgment based on limited experience and knowledge.

General Electric Company service engineers will be pleased 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 General Electric Company service representative.

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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 storage of 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 six 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 reprotected. 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 packagings. 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 III on the storage of generator components for up to two years from shipment date.

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 reprotected. *It is **required** that all boxes be opened upon receipt to verify the integrity of the contents. It is also desirable, although not essential, that the parts be inventoried at this time. Following the inspection, the boxes, if used, **must** then be resoled to prevent pilferage. Plastic covers, if used, must be permanently removed from all shipping boxes immediately after receipt. These covers effectively prevent direct entry of water during shipment, but may cause moisture to accumulate in the boxes due to condensation effects.*

The protective package on generator field journals warrants special attention. Although great care is taken to ensure these journals are properly protected in shipment, minute cracks may develop in the journal packaging during shipment. In such cases moisture can rapidly cause journal pitting to occur. *It is, therefore, **required** that journal protection be removed within three weeks after arrival, and that inspection of the journals, and deflector and packing fits be made and reported. The preservation must be restored upon completion of the inspection. (See Section II)*

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 General Electric Company representative should be consulted on any questions concerning the recommendations furnished in this publication. Also, contact the local General Electric 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 GENERATOR COMPONENTS

A summary of the protection applied to the major components at the factory in preparation for shipment is given below. Also included are comments on shipping, receiving and storage methods.

To protect machined surfaces during shipment and storage, a protective coating or wrapping is applied. This provides chemical protection for those surfaces; mechanical protection may also be provided via a structure (wooden, metallic, etc.) to absorb any impact that might cause damage to those surfaces.

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.

Numbered items in Table I are the same as in Section III, Table II and Section IV, Table III.

Table I. Methods of Preservation.

1. Miscellaneous fabricated parts	
a) External unmachined surfaces	Rust inhibiting alkyd primer
b) All machined surfaces	Thin film corrosion preventative compound or light oil. May also be wrapped with a VCI (vapor corrosion inhibitive) paper compatible with base metal. Mechanical protection is also provided via mechanical structure.
c) Internal unmachined surfaces in oil-containing areas	Aluminum phenolic coating
Storage recommendation	Remove cushion boards due to possible water entrapment in joint bolt holes and between wood and machined surfaces. Block 12 in. to 18 in. above ground level. Isolate machined surfaces from wood blocking with waxed paper, or equivalent. Blind and blocked holes should be filled with cup grease or equivalent to prevent water accumulation.
2. Foundation and base plates	
a) All surfaces	Thin film corrosion preventative compound or light oil. May also be wrapped with a VCI paper compatible with base metal.
Storage recommendation	All cushion boards must be removed at site to prevent corrosion due to possible moisture entrapment. Block off ground 8 in. to 12 in. Isolate machined surfaces from wood blocking with waxed paper or equivalent.

3A. Journal bearings, thrust bearings, bearing rings

- | | |
|------------------------|--|
| a) Machined surfaces | Thin film corrosion preventative compound or light oil or VCI wrap. |
| b) Unmachined surfaces | Aluminum phenolic coating |
| c) Horizontal joint | Thin film corrosion preventative compound or light oil, or VCI wrap. |

3B. Pads for pad bearings

- | | |
|------------------------------------|--|
| a) Machined and babbitted surfaces | Thin film corrosion preventative compound or light oil and wrapped in VCI paper or plastic compatible with base metal. |
|------------------------------------|--|

4. Gibs and keys

- | | |
|---------------|--|
| Gibs and keys | Thin film corrosion preventative compound or light oil and wrapped in VCI paper or plastic compatible with base metal. |
|---------------|--|

5. Coupling studs

- | | |
|--|---|
| a) All surfaces except exposed threads | Thin film corrosion preventative compound or light oil. May also be wrapped with a VCI paper or plastic compatible with base metal. |
| b) Exposed threads | Light oil and nuts assembled |

6. Miscellaneous electrical hardware

- | | |
|-----------------|--|
| Shipping method | Packaged in heavy duty cardboard or wooden boxes and protected from mechanical damage with non-hygroscopic dunnage or VCI paper and a bag. |
|-----------------|--|

7. Motors

- | | |
|-----------------|--|
| Shipping method | Motor covered with water resistant material and boxed. |
|-----------------|--|

8. Permanent magnet generator (if shipped separately)

- | | |
|---------------------|--|
| a) Outside surfaces | Beige epoxy enamel. Wrapped in VCI paper compatible with base metal. Shrink wrap can also be used. |
|---------------------|--|

9A. Slings

Shipping method	Shipped boxed with VCI paper
-----------------	------------------------------

9B. Turnbuckles

Shipping method	Shipped boxed with VCI paper
-----------------	------------------------------

10. Wrenches and tools

Shipping method	Shipped boxed with VCI paper
-----------------	------------------------------

11. Lagging

- | | |
|------------------------|----------------------------------|
| a) Inside surfaces | Rust inhibiting alkyd primer |
| b) Outside surfaces | Rust inhibiting alkyd primer |
| Storage recommendation | Stack with metal side to weather |

12. Stator

- | | |
|--|--|
| a) External and internal surfaces except machined surfaces | Rust inhibiting alkyd 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 |
| Shipping method | Metal covers on end shield openings and cooler openings sealed with RTV compound with desiccant bags added to containers in each end steel cover. (See Section VI). For generators shipped with end shields mounted, no desiccant is supplied because there is no easy way to examine and possibly refill the container. |

13A. End shields with assembled bearings (2-poled machines only)

- | | |
|--|---|
| a) External and internal surfaces, except as noted in b, c and d below | Rust inhibiting alkyd primer |
| b) All machined surfaces | Thin film corrosion preventative compound, light oil, or VCI wrap |
| c) Oil pockets | Aluminum phenolic coating. Pipes and hidden areas oil fogged. |
| d) Insulated surfaces | Light oil or equivalent |

13B. End shields (unassembled)

- | | | |
|----|---|---|
| a) | External and internal surfaces, except as noted in b, c and d below | Rust inhibiting alkyd primer. The entire assembly is wrapped in VCI paper, bolted down to a skid through the outer bolt pattern and covered in an enclosed box. |
| b) | All machined surfaces | Thin film corrosion preventative compound or light oil or VCI wrap. |
| c) | Oil pockets | Aluminum phenolic coating. Pipes and hidden areas oil fogged. |
| d) | Insulated surfaces | Light oil or equivalent |

13C. Bearing and rings

- | | | |
|----|---|---|
| a) | Machined surfaces except insulated surfaces | Thin film corrosive preventative compound or light oil. May also be wrapped with a VCI (vapor corrosion inhibitive) paper compatible with base metal. |
| b) | Unmachined surfaces | Aluminum phenolic coating |
| c) | Insulated surfaces | Light oil |

14. Stator feet

- | | | |
|----|---------------------------|---|
| a) | All machined surfaces | Thin film corrosion preventative compound or VCI wrap |
| b) | All non-machined surfaces | Rust inhibiting alkyd primer |
| | Storage recommendation | All cushion boards must be removed at site to prevent corrosion due to possible moisture entrapment. |

15. Hydrogen coolers

- | | | |
|----|-------------------------|---|
| a) | Inside header surfaces | Rust inhibiting alkyd primer |
| b) | Outside header surfaces | Rust inhibiting alkyd primer |
| c) | Fin areas | Exposed areas covered with plywood. |
| d) | Nozzles | Thin film corrosion preventative compound or oil and openings plugged with pipe covers. |

16. High voltage bushing boxes (lower frame extension)

- | | | |
|----|------------------|--|
| a) | Inside surfaces | Rust inhibiting alkyd primer. May also be wrapped with a VCI paper compatible with base metal. |
| b) | Outside surfaces | Rust inhibiting alkyd primer. May also be wrapped with a VCI paper compatible with base metal. |

-
- | | |
|----------------------|--|
| c) Machined surfaces | Wax based coating or light oil. May also be wrapped with a VCI paper compatible with base metal. |
| d) Structure | Skid with removable box top. May be boxed. |
-

17. Stator cooler domes and GENERREX* domes

- | | |
|--------------------------|---|
| a) External surfaces | Rust inhibiting alkyd primer and completely wrapped with a VCI paper. |
| b) Internal surfaces | Rust inhibiting alkyd primer |
| c) All machined surfaces | Thin film corrosion preventative compound or light oil. |
| d) Structure | Must be boxed. |
-

18. Bushing current transformers

- | | |
|-----------------|--|
| Shipping method | Wrapped in plastic protective cover or VCI paper and blocked in a box. |
|-----------------|--|
-

19. Stator cooling water unit

- | | |
|----------------------|---|
| a) External surfaces | Rust inhibiting alkyd primer |
| Shipping method | All pipe openings capped (do not use carbon steel caps). Motors shipped separately on skid. |
-

20. Hydrogen seal oil unit

- | | |
|----------------------|---|
| a) External surfaces | Rust inhibiting alkyd primer |
| b) Internal surfaces | Aluminum phenolic coating. |
| c) Pipes | Oil fogged with light oil or equivalent |
| Shipping method | All pipe openings capped and valves greased. Motors and loose parts shipped separately on skid. |
-

21. Float trap

- | | |
|----------------------|---|
| a) External surfaces | Rust inhibiting alkyd primer |
| b) Internal surfaces | Aluminum phenolic coating |
| Shipping method | All pipes oil fogged with light oil or equivalent and capped. Valves greased. Loose parts in wood crate banded to piping. |
-

*Trademark of General Electric Company

22. Hydrogen and stator water control cabinet

- | | |
|----------------------|------------------------------|
| a) External surfaces | Polane HS A.S.A. 61 gray |
| b) Internal surfaces | Polane HS white gloss F63W56 |

23. Field

- | | |
|------------------------|--|
| a) Journals | <p>Thin film corrosion preventative compound coated and wrapped in waxed paper. A second heavy coat of thin film corrosion preventative compound is added and again wrapped in waxed paper. A final coat of thin film corrosion preventative compound is applied and then wrapped with two layers of Textolite secured by tape. Exposed butt joints taped to seal out water.</p> <p>CAUTION : <i>Use extreme care</i> when removing or reapplying coverings/coatings. Journals are precision ground and must not be marred.</p> |
| b) Collector | Same as for journals except one less coat of thin film corrosion preventative compound. |
| c) Field body | <p>Coated with thin alkyd paint (yellow or blue). Aluminum lifting covers are installed and strapped to body. The field body is wrapped with tape and then field is placed in an environmental heavy duty shipping container with desiccant bags and humidity indicators at both ends. (See Section V, Field.)</p> <p>NOTE : The field body may be coated with a tagging compound in addition to the paint.</p> <p>NOTE : A hardboard cover wrap is placed around the field body to protect the reusable or disposable bag during handling. <i>Do not remove</i> until ready to install the field.</p> |
| Storage recommendation | <p>The field journals and deflector fit surfaces should be thoroughly inspected within three weeks after arrival at the job-site. If the field is to be in storage for more than six months, it is required that the journal tape be removed and the journals and deflector fits be thoroughly inspected and reprotected at least every three months.</p> |

24. Alternator

- | | |
|------------------------|---|
| a) Shaft and couplings | Thin film corrosion preventative compound coating |
| b) Collectors | Thin film corrosion preventative compound coating and wrapped in heavy waxed paper. |

c) Stator frame	Rust inhibiting alkyd primer
d) Bearings	Thin film corrosion preventative compound coating or light oil.
e) Coolers	Gasketed and covers installed over openings.
f) All other openings	Cap and/or plug.
Storage recommendation	Connect heaters to power source at site after assuring that alternator is free of water internally.

25. Excitation control cubicle and rectifier sections

a) Inside surfaces	White gloss A.S.A. 61 gray
b) Outside surfaces	A.S.A. 61 gray
Storage recommendation	Connect heaters to power source at site

26. Brush holder rigging

a) Base	Rust inhibiting alkyd 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.

27. Exciter housing

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

28. Miscellaneous parts and hardware

Shipping method	Boxed in non-hygroscopic dunnage or VCI wrapped and bagged.
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29. GENERREX* components

a) Assembled transformer	Blue epoxy enamel
b) Machined surfaces and electrical bus connections	Thin film corrosion preventative compound coating, wrapped with Kraft paper.

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Shipping method

Transformer assemblies are placed in a flexible vinyl container with desiccant and shipped skidded and boxed.

NOTE : After removal of assemblies from flexible vinyl container, it is to be returned to
Enviropak, Inc.
110 Maryland St.
El Segundo, CA 90245

30. Stator Bars

Shipping method

Shipped boxed, wrapped in plastic with desiccant taped to bar ends.

Unique skid design and packaging required. Special handling, inspection, and storage required.

III. REQUIRED STORAGE ENVIRONMENTS FOR GENERATOR COMPONENTS

Ideally, generator equipment should be stored indoors in a controlled environment immediately upon receipt at the jobsite. Since this is not always possible, a categorization of *minimum* recommended storage environments is presented in this section. Basically, all electrical and other delicate equipment is recommended for 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.

A number of items require shelter during storage but are relatively unaffected by humidity changes. These are classified in the “Indoor Unheated” category. **HOWEVER, WHEN INDOOR STORAGE FACILITIES ARE NOT AVAILABLE, THESE ITEMS MAY BE STORED OUTDOORS IF WEATHERPROOF TEMPORARY SHELTERS ARE EMPLOYED TO PROVIDE THE SAME PROTECTION AFFORDED BY AN UNHEATED BUILDING.**

As stated in this section, some components can generally be stored outdoors.

Careful consideration must be given to the selection of storage location for each piece of equipment. The type of equipment, its function, and its susceptibility to degradation from exposure to the elements are basic factors about which the purchaser must be concerned when choosing the optimum location for each item. There are a number of specific precautions that must be taken to ensure a successful storage program. Some of these precautions are:

- A. Outdoor storage areas are well drained and not subject to flooding.
- B. Access to equipment for surveillance and maintenance is provided.
- C. Where equipment is supported on timbers with steel shims, neoprene is used to isolate the support surfaces from the blocking in the contact area.
- D. Components rest on timbers or other supports to keep them above the ground or the floor, at a height to permit visual inspection of all joint surfaces.
- E. Equipment is supported from unmachined or other noncritical surfaces where possible.
- F. Care is taken to ensure that equipment stored outdoors cannot trap and accumulate rain water in concave surfaces or other pockets.
- G. Equipment stored outdoors requires less maintenance if it is covered with a waterproof material which allows space for air circulation under it and room for inspection. Provision is made for drainage in the event that the covering should develop a leak.
- H. Exclude wildlife habitation.
- J. Remove all cushion boards to prevent corrosion due to possible moisture entrapment and represerve as necessary.
- K. Boxed materials are always stored indoors, and upon receipt, plastic covers should be permanently removed.

Table II lists the *minimum* storage environment recommended for all components of Section II, Table I.

Table II. Minimum Required Storage Environment.

Components	Minimum Storage Environment Required		
	Outdoors	Indoor Unheated	Indoor Heated
1. Miscellaneous fabricated parts		X	
2. Foundation and base plates		X	
3A. Journal bearings, thrust bearings, bearing rings			X
3B. Pads for pad bearings			X
4. Gibs and keys		X	
5. Coupling studs		X	
6. Miscellaneous electrical hardware		X	
7. Motors (if shipped separately)			X
8. Permanent magnet generator (if shipped separately)			X
9. Slings and turnbuckles		X	
10. Wrenches and tools		X	
11. Lagging	X		
12. Stator		X	
13A. End shields with assembled bearings			X
13B. End shields (unassembled)			X
13C. Bearings and bearing rings			X
14. Stator feet		X	
15. Hydrogen coolers		X	
16. High-voltage bushing boxes		X	
17. Stator cooler domes and GENERREX* domes		X	
18. Bushing current transformers		X	
19. Stator cooling water unit		X	
20. Hydrogen seal oil unit		X	
21. Float trap		X	
22. Hydrogen and stator water control cabinets			X
23. Field			X
24. Alternator			X
25. Excitation control cubicle and rectifier section			X

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Components	Minimum Storage Environment Required		
	Outdoors	Indoor Unheated	Indoor Heated
26. Brush holder rigging		X	
27. Exciter housing		X	
28. Miscellaneous parts and hardware		X	
29. GENERREX* components			X
30. Stator Bars		X	

NOTE

If components **required** for indoor storage are temporarily stored outdoors, it is **required** that such components be protected from the elements by completely covering them with waterproof material. To prevent condensation on the components, waterproof coverings should allow complete air circulation around the component.

IV. RECEIVING, SURVEILLANCE AND MAINTENANCE OF GENERATOR COMPONENTS FOR STORAGE

This section contains recommendations for receiving, surveillance and maintenance of generator components. Since storage conditions at each jobsite vary, the purchaser must plan a schedule suited to his particular situation. 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 transportation **must** be inspected for signs of damage due to humping (stators, fields, etc.). The other primary source of damage to these components is the tied down method. If any damage to parts or skidding is noted, it should be reported immediately to the local General Electric Company representative.

All truck shipments of boxed components from the General Electric Company will be tarpaulin-protected at the time of departure. Upon arrival at site, these shipments should be similarly well tarpaulined. *At that time, if any damage is noted or the tarpaulin is missing, this should be noted when receipting the bill of lading. The customer or his representative should immediately notify the local General Electric Company representative.*

Upon arrival, inspect all unboxed 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 reprotected before storage. If any damage is noted, record with digital pictures and report it immediately to the local General Electric Company representative.

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Upon arrival, inspect all boxes for external damage and move immediately indoors. Before storage, open all boxes to verify that the parts have not been damaged and that the protective materials are not wet or otherwise deteriorated. It is desirable, but not essential, that the parts be inventoried at this time. Any damage or deterioration that is noted should be reported immediately to the local General Electric Company representative. Following the initial inspection, replace the covers of the boxes to prevent pilferage.

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 washing down with liberal amounts of “clean” water.
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 reprotect with the appropriate preservative.

B. Surveillance and Maintenance

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

It is recommended that the purchaser prepare a check list for each major component, crate, or box in storage. List the specific points that must be checked at each inspection — for example, the machined surfaces, rotor and field journals, key and deflector fit surfaces, megger readings, humidity readings, condition of coverings and preservations, etc. The check list should also include a column for the observer to note any adverse conditions to be corrected.

Table III can be used as a guide in establishing such a plan. Recognize that this tabulation is based on experience to date. However, 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.

C. Summary of Required Surveillance Frequencies for Generator Components During Storage (After Initial Inspection)

This section contains the *minimum required* surveillance frequencies. If prior experience shows unsatisfactory conditions exist at site, the surveillance frequencies should be increased.

Table III. Minimum Required Surveillance Requirements

COMPONENTS	MINIMUM SURVEILLANCE REQUIREMENTS
1. Miscellaneous fabricated parts	Check after one month, and then every three months.
2. Foundation and base plates	Check after one month, two months, then every three months.
3A. Journal bearings, thrust bearings, bearing rings	Check after one month, then every three months.
3B. Pads for pad bearings	Check after one month, then every three months.
4. Gibs and keys	Check after one month, then every three months
5. Coupling studs	Check after one month, then every three months.
6. Miscellaneous electrical hardware	Check after one month, then every three months
7. Motors	Check after one month, then every two months check and rotate shaft by hand.
8. Permanent magnet generator (if shipped separately)	Check after one month, then every two months check and rotate generator by hand.
9. Slings and turnbuckles	Check every three months
10. Wrenches and tools	Check every three months
11. Lagging	Check every three months
12. Stator	Check exterior condition monthly. Check interior and desiccant through access covers in steel covers every three months. Megger and polarization index monthly, per GEK 7613.
13A. End shields with assembled bearings	Check after two weeks, one month, then every month.
13B. End shields (unassembled)	Check after one month, then every three months.
13C. Bearings and bearing rings	Check after one month, then every three months
14. Stator feet	Check after one month, two months, then every three months
15. Hydrogen coolers	Check after one month, two months, then every three months

COMPONENTS	MINIMUM SURVEILLANCE REQUIREMENTS
16. High voltage bushing boxes (lower frame extension)	Check after one month, two months, then every three months
17. Stator cooler domes and GENERREX* domes)	Check after one month, two months, then every three months
18. Bushing current transformers	Check after one month, two months, then every three months
19. Stator cooling water unit	Check monthly. Rotate pumps monthly.
20. Hydrogen seal oil unit	Check monthly. Rotate pumps monthly.
21. Float trap	Check after one month, two months, then every three months.
22. Hydrogen and stator water control cabinets	Check monthly.
23. Field (including journals and deflector fits)	Check and reprotect three weeks after arrival, then every three months. Megger and polarization index test monthly. (Refer to GEK 7613, Insulation Testing of Generator Windings, found in the Instruction Book.)
24. Alternator	Check monthly. Megger and polarization index test monthly per GEK 7613. Inspect machined surfaces monthly. Check humidity level monthly.
25. Excitation control cubicle and rectifier sections	Check monthly.
26. Brush holder rigging	Check after one month, two months, then every three months.
27. Exciter housing	Check monthly.
28. Miscellaneous parts and hardware	Check every three months.
29. GENERREX* components	Check monthly. Megger and polarization index test monthly, per GEK 7613.
30. Stator bars	Check desiccant every three months. Check skid and internal support monthly for deterioration.

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V. PROTECTION OF GENERATOR COMPONENTS FOR STORAGE

Generator 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 eliminates the need for costly repairs later.

A surveillance and maintenance inspection schedule will help to detect possible problems before they become serious. The local General Electric Company representative will be pleased to make recommendations based on developments during the storage period. Graphs of megger readings with time are very helpful in these cases. 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.

Tables I, II and III list the major generator components along with a brief description of the preservatives and storage **requirements**. The purchaser should give specific consideration (as discussed in this section) to these components since they are particularly susceptible to degradation during storage. Replacement and restoration costs can be very high.

A. Stator

The generator stator is prepared for foreign or domestic land routes or water shipment and/or long-term storage for six months. By following the inspection, storage and surveillance **requirements** of this GEK; the storage period can be extended to 24 months from the ship date.

(All megger checks to be done with a 500 volt megger, readings taken at one and ten minutes for comparison with factory data. See Appendix III) (Refer to GEK 7613).

Some generators are shipped with steel covers and RTV compound seal. The two steel end shield covers contain perforated baskets which are filled with a desiccant at the time of shipment. These baskets are located on the back of manhole covers in the center of each plate. These manhole covers are provided for desiccant removal and for internal inspection of the stator. Desiccant can be reactivated in the bags at 245°F to 275°F (118°C to 135°C) for 12 hours. Each end cover has provisions for the introduction of an inert gas, such as dry nitrogen. If the purchaser should desire this type of protection, it will be at his expense. Such expenses would include the resealing of all covers at the storage site, cost of the gas during storage, and surveillance.

Other units are shipped with the end shields assembled and sealed with RTV. Desiccant can be provided at an additional cost. Heaters are also provided on these units and should be energized **immediately**.

The gasketed steel covers on the stator effectively seal against moisture and the elements for periods up to 24 months if undamaged in handling. For periods in excess of 24 months, the stator can no longer be expected to withstand the elements since the RTV compound seal will deteriorate in time and cease to form adequate seals. Therefore, if periods of storage in excess of 24 months are expected, it is necessary that the stator be placed indoors or reprotected. The building need not be heated; however, it **must** be completely enclosed and provided with lighting for inspection, power for tests, and heaters which are necessary during the storage period. Leads brought out through a gland in the protection cover allow megger checks of the winding insulation. Necessary tests and inspections are delineated in the maintenance schedule (Section IV).

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. Therefore, the maintenance schedule includes requirements for periodic recoating of these surfaces.

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 General Electric Company representative should be contacted for further recommendations.

B. Field

All generator fields shipped separate from the stator will utilize reusable or disposable shipping containers. These containers have the following advantages:

1. Both containers are tough and are held to General Electric Material Specifications.
2. The reusable container is fitted with moisture-proof zippers which allow for easy installation and access without destroying its integrity. It is **required** that a silicone lubricant be sprayed on the zipper teeth before opening container. The disposable container may be slit open and retaped for inspection.
3. Inspection windows and humidity indicators are provided for inspection ease on the reusable container. Humidity indicators are provided on the disposable container.

Lift the field in the container the same as before — with a cable sling around the center body section. Suitable protective material is provided in the lift area and located in place at the factory. No other lift points shall be used. Use care while the cables are being positioned on the field to prevent damage to the container in the unprotected areas.

Perform the following inspections and operations when the field arrives at the jobsite :

1. Observe and record on the Generator Arrival Report (see Appendix III) the general condition of the skid, blocking and field container.
2. If you have an environmental heavy duty container, use the inspection windows on the container and a flashlight to look for signs of rust or moisture on the field surfaces. Two of the windows will be positioned such that the area of the field between the fans and retaining rings can be observed. This area will have a coating of paint so signs of rust will be readily discernible. These windows and the third window near the collector fan reveal a representative sample of the field surface. If you have a disposable container, the same inspections should be performed on the field by cutting the wrapping open and then retaping with shrink tape afterwards.
3. Observe and record in the Generator Arrival Report (see Appendix III) the relative humidity in percent on the two or three humidity indicators that are externally mounted in the side of the reusable or disposable container. These humidity indicators (Figure 1) are one inch in diameter and contain three color changing segments, spaced 120° 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 percent value (see Table IV).

When the 40% relative humidity segment turns pink or when the 60% segment is lavender or pink, the desiccant in the container should be changed. After changing dessicant, allow two days before reading again to allow humidity introduced during changeout to reach equilibrium.

4. If the field is intended to be stored beyond six months from shipment, and it has been shipped with shrink wrap protection, the customer must request environmental bags to extend the storage period.

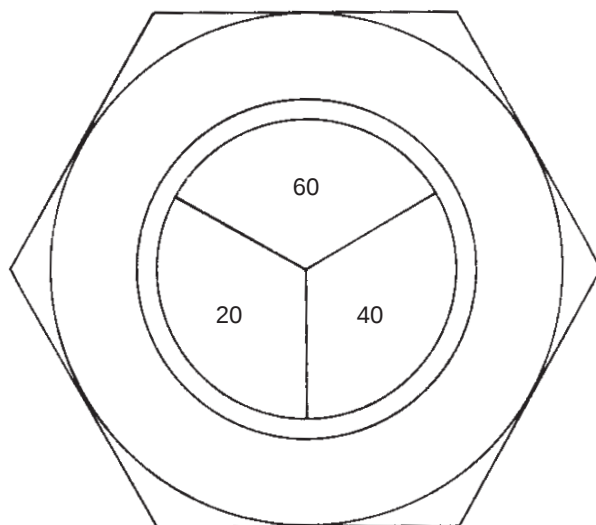


Figure 1. Humidity Indicator Plug

Table IV. 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

5. The amount of desiccant in the container will be determined by the factory, based on the size of the container and known storage time (approximately 100-300, 16 unit bags). For normal shipments and installations, changing of the desiccant is not necessary. Should changing be required, all the desiccant can be removed through the two short access zippers at the areas between the fans and the retaining rings and the one short access zipper in the collector area. Replace with an equal number of 16

unit bags. Desiccant can be reactivated in the bags by heating at 245°F to 275°F (118°C to 135°C) for 12 hours.

6. In line with present practice, the field winding insulation should be meggered with a 500 volt megohmmeter. Megger leads are provided; however, they are not brought out through the container. Provisions are made to allow the leads to be brought out through the collector access zipper on the reusable container. Be sure to close the zipper securely after the test. (Refer to GEK 7613). On the disposable type, the container is slit open to access the leads and then be retaped after meggering with shrink tape.

C. Alternator Exciter

The completely assembled alternator is an air-cooled, totally enclosed synchronous machine. This must be stored indoors in a temperature and humidity controlled environment. (Heaters are available as an extra cost accessory). Megger check the field and stator in accordance with the surveillance schedule. Periodically recoat machined surfaces according to the maintenance schedule. (Refer to GEK 7613). On the disposable type, the container should be slit open to access the leads and then be retaped with shrink tape after meggering.

D. Alterrex Control Cabinet

The control equipment is contained in a four-section cabinet. Do not expose this equipment to the elements for even short periods of time. Store in a dry, heated building protected from rodents. (Heaters are available in these cabinets as an extra cost accessory).

E. Alterrex Rectifier Sections

Do not store these sections outdoors for even short periods of time. (Factory installed heaters are available as an extra cost accessory).

F. Stator Cooling Water Unit

Store this unit indoors. The most critical area is the two pump assemblies. Motors are shipped separately and must be stored indoors heated.

The lubrication system associated with each pump should be assembled and filled. Hand rotate the pump in accordance with the maintenance schedule.

Heater in junction box energized, if supplied, with thermostat to maintain temperature above ambient.

G. Hydrogen Seal Oil Unit

Store this unit indoors. The most critical area of concern is the two pump assemblies. Motors are shipped separately and must be stored indoors heated.

The system shall be filled with pure, operating grade oil to a point just below the tank. This will protect most of the system from corrosion. Rotate all pumps by hand periodically according to the maintenance schedule.

Heater in junction box energized, if supplied, with thermostat to maintain temperature above ambient.

H. Alternator Exciter Housing

The housing ships with all its openings covered with wood and water-resistant paper. It may be stored outdoors if protected with tarps or heavy polysheet, and there are no sign of damage to the wood covers. Indoor storage is always preferred, but is required if any damage has been noted in the as arrived condition. These conditions should be reported immediately to General Electric company representative. The doors are held closed for shipment by an internal wood structure. Remove the wood structure to allow easy access for inspection. Heating the house is not necessary.

J. Stator Bars

Stator bars are shipped boxed with all openings covered in wood. They **must** be stored indoors. A heated warehouse is not necessary, but is preferred.

VI. PROTECTION OF GENERATOR AND EXCITER DURING INSTALLATION

Generator and associated components are prepared for shipment in a manner which is designed for the normal transit time and off loading periods prior to installation. Adequate protection during storage can be obtained with additional preparation at the factory along with the adherence to **requirements** concerning storage facilities. However, these protective measures do not cover the time during the installation period. During this time, many of the covers used will be discarded. This leaves these components vulnerable to damage from the elements if proper precautions are not taken.

Of particular concern is the generator field and the exciter. The machined surfaces are extremely susceptible to rusting. The field body and retaining rings will begin to show signs of rusting after exposure to moist air for only a short time. This situation is greatly aggravated when rapid changes in temperature accompany the moist air. Under such conditions, it is very likely that moisture will condense on the field and other large components such as the stator core, alternator rotor and core. The presence of moisture on these parts will result in rapid rusting. The end result will be considerable time and effort expended to return these components to as-shipped condition.

Establish the installation schedule to minimize the time between unwrapping the generator field and closing the stator with the field installed. During this time the field and open stator must be protected from moisture, particularly rain. This is of obvious concern when the power plant is outdoors, but it is sometimes overlooked on indoor installations. The permanent building may not be completely finished or large doorways may be left open. Under these conditions the building may not provide adequate protection. As in the outdoor plant, supplemental covers will be needed.

To minimize the possibility of condensing water vapor on generator and exciter parts, the temperature of these parts **must** be kept at least 5°F above ambient. This is not always easily attained at the power plant. It should be remembered that the greater the temperature difference between ambient and any component (ambient being higher), the greater the possibility of condensing water vapor. An example of this would be removing the field from a cold warehouse and placing it in the heated turbine room. If the packaging material is immediately removed and if the moisture vapor content of the air is sufficiently high, moisture will condense on the field. If, however, the field were allowed to remain packaged in the room for several days, condensation of moisture would be minimized following the removal of the package.

Normal daily variations in ambient temperature can cause moisture to condense on the unpackaged field body. To prevent condensation, the field body must be maintained above the ambient temperature at all times.

If heating the field is necessary to keep it dry due to existing atmospheric conditions during installation, it should be done by passing current through the windings. This method is more effective and less likely to result in condensation than trying to heat the unit by use of external fan heaters; however, there is a certain risk in this method (that of burning the collector rings where current is applied) and precautions must be observed. Values of current and method of connection are found on the Generator Dryout Sheet issued for every unit shipped. (Heat should never be applied to the field while it is in the shipping bag)

Since conditions at the plant sites vary, no specific rules can be established to cover the installation period. The preceding discussion should aid in the formulation of an effective protection method. However, the responsibility for successfully protecting the generator components during installation rests with the purchaser. Any unusual storage conditions or questions related to generator protection during installation should be referred to the local General Electric Company representative.

VII. PROTECTION OF ASSEMBLED GENERATOR AND ASSOCIATED EQUIPMENT PRIOR TO STARTUP

A. Stator and Field Assembly

1. The liquid-cooled windings of the generator **must** be completely drained and dried. (See GEK 7602 for draining instructions.) An effective way to assure this is to postpone the hot flush of the liquid system until a time just prior to initial startup of the unit.
2. To maintain an atmosphere that will not support rusting of the various generator internals, the stator can be pressurized 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. A source of heat can be used in place of nitrogen. Energize the stator heaters if provided.
3. The hydrogen coolers **must** be completely drained and dried.
4. Setup a maintenance schedule to coat periodically any exposed to machine surfaces with rust preventative.
5. Leave the collector rings as originally prepared, if possible. Do not install brushes in the magazines.
6. Roll the unit once a month, always leaving the pole face axis in the vertical.
7. Meggering the field once a month will serve to monitor the atmosphere in the frame and give assurance to its dryness.
8. Passing water through the stator windings as a means of warming the assembled generator is not recommended.
9. Avoid prolonged operation on turning gear.
10. Operate lube and seal oil pumps for one hour per week for coating of machined surfaces.

B. Alternator

1. Drain and dry the alternator air-to-water heat exchanger.
2. Periodically coat all exposed machined surfaces with rust preventative.

3. Install strip heaters in the alternator frame and operate at half voltage continuously. Locate the heaters such that no danger of damage to alternator parts exists.
4. Treat the alternator collector rings in a manner similar to the main generator.
5. A monthly megger check of the field is recommended.

C. Exciter Control Cubicles and Hydrogen and Water Control Cabinet

1. Install 250 watts of heat at each section of all control cabinets. Take precautions to prevent rodents from entering any of the cabinets. Inspect the cabinets on a regular basis. Energize the heater circuit.

D. Stator Cooling Water System

1. Drain and dry this system, as mentioned before. Also drain and dry the raw water side of the coolers.
2. Disconnect the air lines to the regulator valves and plug the connections.
3. An alternative method is to maintain the stator cooling water system in operation. Refer to the Instruction Book.

E. Seal System

Service the seal oil system and maintain as it would be during normal operation. Refer to the Instruction Book.

F. 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.

APPENDICES

APPENDIX I

SOURCES FOR PROTECTIVE MATERIALS FOR GENERATOR COMPONENTS

I. PERMANENT PROTECTIVE PAINTS

DESCRIPTION	SOURCE
<u>Rust Inhibiting Alkyd Primer</u>	
<i>C1815-B (turbine grade) beige water reducible alkyd primer.</i> A beige colored water reducible alkyd primer, generally used over previously primed surfaces.	Glyptal, Inc. 305 Eastern Ave. Chelsea, MA 02150
<i>AD15001 alkyd primer - beige, gray, and light blue</i> A solvent based rust inhibiting primer. Generally applied to bare steel surfaces.	C. A. Reeve Paint Co. 619 W. Fayette St. Syracuse, NY 13204
<u>Aluminum Phenolic Coating</u>	
<i>Aluminum phenolic paint HTA-297/298 or 3177 - NS</i> A solvent based oil resistant paint generally used on all unmachined surfaces in lube oil containing areas.	International Paint Co. 400 S. 13th St. Louisville, KY 40203 or C. A. Reeve Paint Co. 619 W. Fayette St. Syracuse, NY 13204
<u>Epoxy Enamel Paint</u>	
<i>Beige epoxy enamel 74004/74010, 4015-NS or 890</i> An extremely hard paint used in heavy-duty applications or where the surface is likely to become contaminated with oil or EHC hydraulic fluid.	Glyptal, Inc. 305 Eastern Ave. Chelsea, MA 02150 or C. A. Reeve Paint Co. 619 W. Fayette St. Syracuse, NY 13204 or Carboline 350 Hanley Industrial Ct. St. Louis, MO 63144
<u>Control Cabinet Paint</u>	
<i>Polane HS A.S.A. 61 gray</i> Forms a hard protective surface. Used on the external surfaces of the Hydrogen and Stator Water Cooling System Instrumentation Cabinets.	Sherwin-Williams Co. Chemical Coatings Div. Cleveland, OH 44101
<i>Polane HS white gloss F63W56</i> Forms a hard protective surface. Used on the internal surfaces of the Hydrogen and Stator Water Cooling System Instrument Cabinets.	Sherwin-Williams Co. Chemical Coatings Div. Cleveland, OH 44101

Rotor Body – Alkyd*C-1175 transparent blue alkyd*

Used on generator field bodies. Not compatible with Reeves #2968.

Glyptal, Inc.
305 Eastern Ave.
Chelsea, MA 02150*Reeves #2968 yellow paint.*

Used on generator field bodies. Not compatible with Brassoline.

C.A. Reeves Paint Co.
619 W. Fayette St.
Syracuse, NY 13204**Phenolic Alkyd Coating***Water reducible phenolic alkyd, CA-5222*

Used on generator end windings and inside diameter of core.

C. A. Reeve Paint Co.
619 W. Fayette St.
Syracuse, NY 13204**II. TEMPORARY PROTECTIVE COATINGS****DESCRIPTION****SOURCE****Light Oil***Gulf Oilcoat VT or Mobil Vaprotec Light.*

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.

Gulf Oil Company
Mobil Oil Company**Thin Film Corrosion Preventive Coating***Tectyl 506.*

Used on various exposed machined surfaces.

Ashland Industrial Products
P.O. Box 14000
Lexington, KY 40512*Tectyl 891.*

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.

Ashland Chemical Company
P.O. Box 14000
Lexington, KY 40512**Desiccant***Desiccant MIL-D-3464 Type 1*

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

Engelhard Corp.
Edison, NJ 08818**VCI Paper***Vapor corrosion inhibitor (VCI) paper and plastic*Daubert Coated Products
Weschester, IL 60154

3M-Y335 tape.

A pink tape used on generator fields to afford additional protection if the vinyl shipping container is torn during shipment.

W.N. Van Alstine & Sons
100 N. Mohawk Street
Cohoes, NY

Permacel P-306.

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.

Permacel
New Brunswick, NJ 08903

Shrink Wrap.

A plastic material shrunk onto the machine surface by use of warm air.

Connecticut Packaging
South Windsor, CT 06074.

Nitrogen.

Used in stators in storage and/or prior to startup to prevent corrosion.

Any source of dry nitrogen.
99.5% pure with a dew point
of -60 F or below.

Snoop.

A soap solution used for check for nitrogen leaks in generator stator if the stator is charged with nitrogen.

Nupro Co.
15635 Saranac Road
Cleveland, OH

Leak-Tec.

Same use as "Snoop".

American Gas & Chemical Inc.
Leak-Tec Division
511 B East 72nd Street
New York, NY

Texaco cup grease #2 or #3.

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.

Texaco Inc.
P.O. Box 509
Beacon, NY 12508

Mobil cup grease #2.

Same use as Texaco cup grease #2 or #3.

Mobil Oil Co.

Marine lube "A" grease.

A heavy duty water resistant grease that can be used as a sealant on main-steam valve stems.

Fisk Bros. Refining Co.
129 Lockwood Street
Newark, NJ

Grade C Paper — Milpack #12 (Waxed paper)

MIL-B-121, Grade C, Type 1, Class 2.

Ludlow Packaging Corp.
Holyoke, MA

NOTE

Before application of any of the above preservatives, the surfaces must be thoroughly cleaned. Contact the local General Electric Company representative for cleaning and preservative application procedures.

NOTE

Some materials listed in Section II and Appendix I are flammable and safety regulations covering fire hazards must be observed. Obtain Material Safety Data Sheets for specific information.

APPENDIX II

CLEANING, PROTECTION AND SHIPPING PREPARATION FOR OIL AND WATER PIPING

I. PREPARATION OF PIPING

Station piping is prepared for shipment from the vendor by pickling in phosphoric acid and then immersing in an oil bath. The piping thus processed is passivated both inside and outside. The outside of all guard piping and all individual piping (except that destined for use inside larger oil piping) is painted with beige alkyd primer. The inside of this piping will be oil coated. However, the smaller piping inside the guard piping, if shipped separately, is painted with an aluminum phenolic coating.

Lube oil system piping is then capped with tightly fitting metal caps over all openings and the ends of the caps sealed with tape. Large diameter guard piping shipped as subassemblies (with smaller diameter piping placed inside the larger piping and protruding outside the larger piping) has a heavy-duty Grifylon bag placed over the ends of the pipe assemblies, steel banded and sealed with tape.

II. CONTAINERIZATION OF PIPING

In order to insure that the piping remains clean during shipment, it is placed in wooden containers. These are constructed of heavy timber (steel rod reinforced) with plywood sides that extend 4 ft up from the container floor. The top portion of the sides is left open to facilitate loading. After loading, a water resistant plywood cap is fastened in place. This is covered with heavy plastic which extends down the sides to cover the open area and is secured in place with wooden strips.

III. PROCEDURE FOR RECEIVING AND PROTECTION AT DESTINATION

When the piping boxes arrive at the jobsite, the following is **required**:

- A. Inspect shipping container for damage. If structural damage is found, file damage claims. Take steps to guard the piping against corrosion. This can be done by resealing the box and storing the piping indoors in a clean dry place. Permanently remove the plastic cover.
- B. It is **required** that the piping boxes be stored inside as soon as possible. Experience has shown that it is very difficult to maintain the weatherproof integrity of the pipe boxes when they are subjected to the many unknown variables in an outside storage area. Surveillance of the equipment **must** be conducted according to the schedule in Section IV.

IV. FURTHER PRECAUTIONS

A planned program for maintaining the piping in a clean condition during installation is also necessary to ensure a clean lubrication system. The many variables that exist at each installation prevent the recommendation of protective measures to apply for each case. However, generally each purchaser must consider the length of the storage and installation, the climatic conditions that will exist, and the condition of the piping as installed in evaluating the need for taking protective measures to minimize the danger of extensive rusting and scaling of the piping. It generally requires less effort to prevent rusting and contamination during storage and installation than to remove these products by extensive flushing later. The use of any inhibitors or coatings other than those described in this section should be referred to the local General Electric Company representative for evaluation for compatibility with the lubricating oil before use.

APPENDIX III

GENERATOR ARRIVAL REPORT (PAGE 1 OF 2)

PURCHASER: _____ STATION _____

RATING: ATB — _____ poles, _____ KVA, _____ rpm, _____ volts

REQUISITION NO. _____ GENERATOR NO. _____

ARMATURES

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 (Motor Driven (Electronic		Range _____	

2. Condition of end protective covers

3. Type of storage which will be used until time of erection. (Heated or not)

FIELD

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 (Motor Driven (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)

SUGGESTIONS

Signed _____ Date _____

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



GE Power Systems

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