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GE POWER GENERATION
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GE POWER GENERATION
CUSTOMER SERVICE

TIL 1052-4
GE SECTION

TECHNICAL INFORMATION LETTER

November 10, 1989

ASBESTOS CONTAINING MATERIALS IN TURBINE-GENERATORS

Applicable to: Steam Turbine-Generators

Purpose:

The purpose of this TIL is to advise customers of the potential locations of asbestos-containing materials in Utility and Industrial steam turbine-generators and to provide information relative to non-asbestos substitutes which are now commercially available.

Summary of actions to be taken by PGSD & ISSD:

1. Transmit the customer's section of this TIL to all Utility and Industrial Steam Turbine-Generator customers.

2. Become familiar with the contents of this TIL in order to support customer related questions that may arise.

Discussion:

In view of recent regulatory trends with regard to asbestos, it may be important for customers to know where asbestos containing materials could be present in turbine-generators. This generic information is provided in the customer section of this TIL. This information is based on the factory practices at the time a unit was shipped and does not reflect any changes resulting from the replacement of any materials after shipment. The information is general in nature because factory records may not be representative of the unit now in place; materials could have been replaced by customers without GE's knowledge.

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The goal of totally eliminating the use of all materials containing any asbestos in the manufacture of steam turbine-generators has been completed following phase-out which began in the early 1970's.

This TIL is for information only and no specific actions are recommended or implied regarding the replacement of material containing asbestos. Regulatory compliance, such as maintenance and parts replacement, remains the customer's responsibility.

The following provides general guidance to assist in answering customer questions regarding the elimination of the asbestos containing material from their units:

(1) Heat retention materials for new installations are usually purchased and field installed by GE to functional factory specifications. In some cases this material has been in the customer's scope of supply. Since the early 1970's, product department specifications have stated that all such heat retention material must be asbestos free.

If the customer requests assistance in replacing heat retention materials with asbestos free materials, the following general specifications can be utilized:

Schenectady Specification Drawings:

233A9930 - Heat Retention Material.
233A9931 - Removable Shell Joint Blankets.
233A9932 - Removable Insulated Covers.

Lynn Specification Drawings:

1179J42 - Heat Resistant Material.
1179J43 - Removable Shell Joint Blankets.
1179J44 - Removable Insulated Covers.

(2) The sprayed-on sound insulation (sound deadening compound) on the inside surfaces of metal lagging can be removed and simply left off. Where sound insulation treatment is still desired, the best long-term approach is a treatment with asbestos-free materials mechanically fastened to the inside surfaces. Metal lagging drawings can be made available for the purpose of sourcing these materials from local suppliers.

(3) Asbestos free spiral wound and flat sheet gaskets, stem packing and shaft seals are now available and other non-asbestos material substitutes are continuously being added to the stock of spare materials.

(4) Non-asbestos electrical insulation materials are available for all applications and have been supplied for the past several years. Such material for repairs or replacement will be asbestos free when obtained from or specified by the factory.

Expense Policy:

All expenses related to actions taken as a result of this TIL are to be to the customer's account.

Priority Code:

This -3a TIL contains technical information that is of importance to the long term availability-reliability of the units.

List of Attachments:

-Customer Section of the TIL.
-Table 1 (4 pages) - Asbestos Containing Material in Turbine-Generators.
-Schenectady and Lynn Specifications noted on page 2 of this TIL.

Index No:

T.1.E. & G.1.A.

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- PSD, IMD and CGE Management

(Reference: TIL Distribution List maintained by PSD Technical Support, Building 36-1E.)

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CSD 100A

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CUSTOMER SERVICE

TIL 1052-4

TECHNICAL INFORMATION LETTER

ASBESTOS CONTAINING MATERIAL IN TURBINE-GENERATORS:

Applicable to: Steam Turbine-Generators

Purpose:

The purpose of this Technical Information Letter is to inform our customers of the possible locations of asbestos containing materials in General Electric steam turbine-generators manufactured for Utility and Industrial applications. This information is being provided so that appropriate actions may be taken by each customer to comply with regulatory trends on this subject. The information provided is generic and applies to units in the "as-shipped" condition.

Discussion:

The properties of asbestos make it desirable for applications such as in heat retention and sound deadening materials, electrical insulation systems, gasketing, stem packings, and shaft seals. Non-asbestos containing materials with equivalent needed properties have not always been available for many applications. As the health hazards of asbestos were recognized, new non-asbestos materials for all turbine-generator applications became available that enabled the current turbine-generator shipments to be asbestos free.

Table 1 generically lists the potential locations of materials containing asbestos in turbine-generators, as manufactured. The table is structured by material type, general locations, specific locations and with summary comments.

Applications of the previously used asbestos and/or the presently used non-asbestos substitution are described as follows:

1. Heat retention material used for thermal insulation has been typically purchased to functional specifications from insulation vendors and field installed. In the early 1970's, non-asbestos equivalent materials became available and the GE specifications were subsequently revised to prohibit the use of asbestos. The bulk of asbestos applied in turbine generators was used for heat retention application. Several types of asbestos free material are now commercially available for this application.

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2. Sprayed-on sound insulating non-asbestos materials were developed but they had poor adhesion characteristics. Current metal lagging designs do not require sound insulation. Other non-asbestos sound insulating materials are available for existing metal laggings if sound deadening is a requirement.

3. Spiral wound gaskets have a filler material captured by the metal strip. In the new unused condition, the filler is captive but after service and disassembly the metal strip may be broken and the filler material exposed. Spiral wound gaskets with non-asbestos filler materials have been developed to replace the asbestos type and are now available from many sources.

4. Flat sheet gaskets are used extensively for low pressure and low temperature sealing applications. As with the spiral wounds, asbestos containing materials have been used exclusively and the industry has only recently developed suitable non-asbestos replacements. Because of the wide range of environments (which include steam, water, oil, air, and hydrogen) where flat gaskets are used, several different asbestos containing materials have been utilized. Similarly, the industry has developed a variety of non-asbestos replacements but none are exact substitutes. Typically the non-asbestos products cannot be directly substituted for the asbestos gaskets and long term specific application must be confirmed by laboratory tests and actual usage.

5. Stem packing (soft) and shaft seals have also become available for asbestos free applications.

6. Non-asbestos insulating materials for electrical insulation applications have been developed and used for the past several years.

Recommendation:

Generic information regarding possible locations of materials containing asbestos in turbine-generators has been provided as an aid to resolve any actions that may arise as a result of this document. It is suggested that if non-asbestos material substitution is desired that the local GE Field Service Representative be contacted for specific material substitution definition and/or recommendations.

When ordering replacement material, describe and/or provide as much detail information as possible that will help determine the correct replacement. In situations where the old-type asbestos containing materials are ordered by an old drawing number or as a non-catalog item, the correct replacement non-asbestos materials will be provided. Catalog ordering numbers should be used whenever possible to assure the quickest response and delivery.

- END -

TABLE 1

ASBESTOS CONTAINING MATERIAL IN TURBINE-GENERATORS

ASBESTOS CONTAINING MATERIAL TYPE	POTENTIAL LOCATIONS		COMMENTS
	GENERAL	SPECIFIC	
HEAT RETENTION MATERIAL (i.e. Thermal Insulation, Lagging)	Hot Surfaces (≥ 140°F)	-HP/IP casings -Main steam piping -Main steam valves -Auxiliary steam valves -Non return valves -Moisture separator and moisture separator reheaters -Steam packing exhauster -Steam seal evaporator -Secondary steam piping and valves -Steam driven oil pumps and regulators	Asbestos eliminated from GE specifications early 1970's. Several asbestos free types of material available commercially
SOUND INSULATING (Sprayed-on)	Metal Lagging Internal Surfaces	-Turbine enclosure -Emphasis lagging -Generator lagging -Excitation equipment lagging	Sound insulation material eliminated on current shipments. Can be removed and left off existing metal laggings. If sound deadening is still required, non-asbestos, non-sprayed-on material is available.
GASKETS - Spiral Wound	HP/IP Casings	-Balance hole access covers -Gib access covers -Inspection hole access covers -Borescope flange connections	Asbestos-free replacement gaskets available.
	LP Inner Casing(s)	-Hand hole access covers -Borescope flange connections -Internal piping	
	Main Steam Piping	-HP shell flanges -RHT shell flanges -Crossover flanges -Crossaround flanges -Crossaround relief valve mounting flanges -Crossaround piping manways -Jumper pipes	

ASBESTOS CONTAINING MATERIAL TYPE	POTENTIAL LOCATIONS		COMMENTS
	GENERAL	SPECIFIC	
GASKETS - Spiral Wound (cont'd)	Main Steam Valve Assemblies (Main Stop, Control, Reheat and Intercept Valves) Non Return Valves	-Valve heads -Bolted-in seats -Bolted inlet flanges -Bolted outlet flanges -CV stand -Bolted stem bushing guides -Leakoff flanges -Yoke to casing -CV head -Equalizer valve flanges -SV bypass seat	Asbestos-free replacement gaskets available.
	Auxiliary Steam Valves (Equalizer, Blowdown, Ventilator, Bypass, CV Starting, Speed Matching, Cross-over Admission, Extraction, Steam Seal Regulator)	-Valve heads -Bolted-in seats -Bolted inlet flanges -Bolted outlet flanges -Bolted stem bushing guides -Leakoff flanges -Yoke/stand to casing	
	Moisture Separator (MS) and Moisture Separator Reheaters(MSR)	-MS/MSR manways -MS/MSR drain tank manways -Leak detection orifice flanges	
	Heat Exchangers (Steam Packing Exhauster, Steam Seal Evaporator)	-SPE shell drain -SSE drain tank inlet -SSE drain tank pipe connections	
	Secondary Steam Piping and Valves (Steam Seal, External Drain, Heating & Cooling Steam, Bypass Systems, Vacuum Breaker Piping)	-Flanged piping connections -Valve inlet flanges -Valve outlet flanges -Valve bonnet to body -Relief valve test lever attachment	

ASBESTOS CONTAINING MATERIAL TYPE	POTENTIAL LOCATIONS		COMMENTS
	GENERAL	SPECIFIC	
GASKETS - Flat Sheet (*or Woven Cloth)	LP Casings	-Inner casing access* -Exhaust hood manways -Last stage orifice assembly -Bearing cap access openings -Exhaust flange -Sight flow opening	Woven cloth gaskets can be replaced with non-asbestos materials or suitable non-asbestos spiral wound gaskets. Non-asbestos flat sheet gasket materials available.
	Packing Casings	-Bolting flanges -Pipe flanges	
	Valve Chest	-Valve chest cover	
	Heat Exchangers (Steam Packing Exhausters, Steam Seal Evaporators, Oil Coolers, EHC Coolers, Stator Bar Coolers, Air Coolers, Hydrogen Coolers)	-Shell to tubesheet -Shell outlet flange -Header to cover -Manway cover -Waterheader to cover -Waterheader to tubesheet -Waterbox to cover -Shell flange to seal ring -Seal ring to waterbox	
	Hydraulic Applications (Hydraulic Mechanisms (HMC) at Front Standard, Hydraulic Enclosures, Separate Hydr. Cylinder Assemblies, Lube Oil Tank, Lift Pump Assemblies, Front/Mid Standards, Turning Gear Housings, Thrust Bearing Wear Detector, Oil Conditioners, Filters)	-Hydraulic mechanisms bolted joints -Housing access covers -Lube and hydraulic pipe flanges -Oil pumps mounting flanges -Booster pump cover -Lube oil transfer valve mounting flange -Gage mountings -Switchbox cover	
	Air Applications	-Air cylinders -Air valves -Air filter regulators	
	Generator	-Access covers	