

GENERAL ELECTRIC
COMPANY

ONE RIVER ROAD, SCHENECTADY, NEW YORK 12305 . . . TELEPHONE 518 Franklin 4-2211

AGENCY AND
DISTRIBUTOR
SALES
OPERATION

May 11, 1970

TO: AGENTS AND DISTRIBUTORS:

Gentlemen:

Attached is a copy of our general letter to those utilities and industrials whose names are on our mailing list.

Please read these letters, and if you have any question call your A&D sales engineer.

We would appreciate it if you would send a copy of one of these general letters to any of your customers whom you think we may not have reached by our mailing.

Very truly yours,

R. F. Quinn

RFQ:LMB

R. F. Quinn, Manager

attach.

National Sales
Electric Utility Market

Distribution:

Independents - A-66, Code 11E
Graybar - A-67, Codes 11C, 11D, 11E
GESCo - A64, Tabs 1A, 2A and 3A
Grant Umberger, GESCo, 1250 Boston Avenue, Bridgeport, Connecticut
RB Buffinton, Graybar Electric Company, 420 Lexington Avenue,
New York City
WT Bronson, Graybar Electric Company, 420 Lexington Avenue,
New York City

Note: Messrs. Umberger, Bronson and Buffinton should receive six copies.



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**GENERAL ELECTRIC
COMPANY**

**INDUSTRIAL
SALES
DIVISION**

Open Letter to Electric Utility Customers:

We are not able to be certain from our records whether or not you have in the past purchased from us electrical apparatus containing Pyranol, an askarel liquid dielectric. If you have not, there is no need for you to be further concerned with the contents of this letter, but if you have, you will find the following to be of importance.

As you are well aware, the public concern with pollution is rapidly escalating. As time goes on, it can be expected to reach out to affect more and more materials that are even suspect of being potential pollutants and contaminants of the environment. Recently there have been indications that polychlorobiphenyls have been found at some points in marine, aquatic, and wildlife environments. While quantities are relatively small, it is a matter of growing concern as to their effect on some species of wildlife. Monsanto Chemical Company is the sole supplier to the industry of various grades of chlorinated biphenyls for use as a liquid dielectric in electrical apparatus. These materials are known as askarels or by various trademarks, including General Electric's registered trademark, Pyranol.

Monsanto has been reviewing procedures to be sure that these materials do not find their way into land or water environment. General Electric is in receipt of a letter from Monsanto expressing its concern, and a copy is attached for your information.

Although this material is sealed in electrical apparatus, there may be occasions when disposal may become necessary and the problem of environmental control arises. In order to aid you in solving the problem of disposal, we have made arrangements with Monsanto to dispose of scrap Pyranol. Should you have scrap Pyranol, it should be placed in closed drums and shipped, at your expense, to Monsanto's W.G. Krummrich Plant at Sauget, Illinois, attention Supervisor, Dept. 246. Monsanto has initially established a charge of 3¢ for each pound of scrap material returned by you.

Material which is saturated with Pyranol such as fuller's earth, sawdust, rags, solid insulations taken from apparatus, etc., should be contained and stored by you pending a better solution. We intend to bring the whole

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(over)

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disposal problem to the attention of an appropriate body in the industry with an aim to working out a long-range solution for the industry.

The industry has used askarels in apparatus for over thirty years. In our experience they have produced no ill effect on workmen in close contact with them except for temporary skin irritation in certain individuals, as noted in our instruction books.

We plan to continue the use of this excellent liquid dielectric and because it is used in sealed apparatus, we foresee no difficulties provided good judgment is exercised in handling and disposal procedures.

Very truly yours,

DIAL CODE:

MAIL ADDRESS AND DATE:

cc:

SV Corbin, 2-467

SUBJECT

Schenectady
May 5, 1970

DISTRICT MANAGERS - ISD

Gentlemen:

Monsanto Chemical Company has advised us of a growing concern that pyranol in the ground or in water, even in relatively small amounts, may be causing pollution problems. We want to send this information to all of our customers who have purchased products containing pyranol, in the form of the enclosed open letter.

The surest way to reach all necessary customers seems to be to use our Customer and Prospect lists. Accordingly, ISD sales engineers will shortly receive copies of the letter for distribution to each of their customers. It is necessary that all letters be mailed to the addressee promptly after receipt.

Will you please give instructions to your people that mailing the letters is mandatory. When the mailings in a District have been completed, I would like to receive from the District Manager a written statement to that effect. I suggest that each District Manager retain in his own files for the time being a supporting statement from each of the sales engineers reporting to him.

If you have any question on the above, please call me or John R. Mackenzie.

Very truly yours,

Woods McCall, Counsel

WMC:md
Enclosure



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GENP 003768

**GUIDELINES FOR HANDLING AND DISPOSAL
OF CAPACITOR AND TRANSFORMER-GRADE ASKARELS
CONTAINING POLYCHLORINATED BIPHENYLS**

SECTION 3 - TRANSFORMER GUIDELINES

I. General Guidelines

A. Definitions - Types of Transformer Askarels

The term askarel generally describes a broad class of nonflammable synthetic halogenated hydrocarbon insulating liquids widely used in transformers, reactors, and accessory equipment operated at power frequencies. Askarels of various compositional types are in use (for the general properties and types see ASTM D-2283). Under arcing conditions the gases produced, while consisting of predominantly non-combustible hydrogen chloride, can contain varying amounts of combustible gases depending upon the askarel type.

The following trademarks are used by electrical manufacturers to designate the askarels used in their products:

Asbestol
Chlorextol
Elemex
Inerteen W
No-Flamol
Pyranol G.E.
Saf-T-Kuhl

B. Safety Precautions

Based on about 40 years of safe industrial usage, askarels have been considered as relatively harmless materials to humans. There has been no known instance of human injury when askarels are used under the normally prescribed conditions of precaution and handling.

Although it has been generally thought that exposure to transformer askarels is not hazardous, provided simple precautions are taken, exposure should still be avoided and minimized.

1) Vapors

The odor of askarel is noticeable -- well below the maximum safe air concentrations. From 0.5 to 1.0 mg per cubic meter of air has been determined to be the maximum safe level of exposure during an eight-hour work day. (See American Industrial Hygiene Association Hygienic Guide Series - January/February, 1965.) The procedures for performing the necessary analyses are contained in Section 5, "A Tentative Procedure for the Determination of Airborne-Polychlorinated Biphenyls." This procedure or its equivalent shall be used.



SECTION 3 - (Cont'd)

B. Safety Precautions

1) Vapors - (Cont'd)

Breathing vapor or fumes from heated askarels should be avoided. High concentration of vapors can cause irritation of the eyes, nose, throat and upper respiratory tract. Provisions shall be made for adequate ventilation and regulation of manufacturing operations to avoid open exposure of hot askarels (55C or higher). The gases produced when askarel is decomposed by very high temperatures (such as that of an electric arc) in the presence of air or organic insulating materials, contain a high percentage of hydrogen chloride, and small percentages of other gases. Minute concentrations of this combination of gases are very unpleasant and irritating, thus giving ample warning of their presence. If exposure to high concentrations of askarels or its arced products is necessary under emergency conditions, an acceptable gas mask of the organic canister-type or self-contained breathing apparatus must be worn. Such exposure should be under the surveillance of other personnel capable of rescue in case of accident. If the odor of askarel or its arced products is detected by the person wearing protective equipment, he should immediately go into fresh air. All gas masks, respirators and replacement parts should have Bureau of Mines approval, and be maintained on a regular schedule in accordance with the manufacturer's recommendation.

2) Fluid

Unlike mineral insulating oil, there is no fire hazard in handling askarels. A limited solvent action (similar to that for paint thinner) on the fats and oils of the skin with prolonged contact may lead to drying and chapping of the skin. As with insulating oil, some people are allergic to askarel and continued exposure may result in skin irritation. Both the liquid and vapor are moderately irritating to eye tissue.

Operating procedures should avoid contact with any askarels. The use of porous gloves which can absorb and retain askarels is to be avoided. Resistant gloves and aprons of the Neoprene, polyethylene, Viton type should be used if contact is unavoidable. In case of spillage on the clothing, the clothing should be removed as soon as practical, the skin washed and clothing laundered.

Medicinal washes or mild detergents followed by application of cold cream will reduce irritation resulting from askarel contact with an open cut or abrasion.

Safety glasses with side shields or a face shield should be worn when handling askarels. Eyes exposed to liquid askarel should be irrigated immediately with large quantities of running water for 15 minutes and then examined by a physician if the irritation persists. (A drop of castor oil has been found to reduce irritation caused by eye contact.)

SECTION 3 - (Cont'd)

B. Safety Precautions

2) Fluid - (Cont'd)

Persons developing a skin irritation or respiratory tract irritation while working with askarels should be placed under supervision of a physician.

Ingestion or swallowing of askarels is not generally regarded as a problem of the industry. Should accidental ingestion occur, a physician should be consulted. Hands should be washed with warm water and soap before eating, drinking, smoking or use of toilet facilities.

C. Transport Container Marking

Any transformer askarels, new or used, as shipped in tank cars, tank trucks, drums, cans, etc., should be labeled with the following:-

C A U T I O N

THIS PRODUCT CONTAINS POLYCHLORINATED BIPHENYLS WHICH SOME STUDIES HAVE SHOWN MAY BE AN ENVIRONMENTAL CONTAMINANT. CARE SHOULD BE TAKEN TO PREVENT ENTRY INTO THE ENVIRONMENT THROUGH SPILLS, LEAKAGE, USE, VAPORIZATION, OR DISPOSAL OF LIQUID OR CONTAINERS. AVOID PROLONGED BREATHING OF VAPORS OR MISTS. AVOID CONTACT WITH EYES OR PROLONGED CONTACT WITH SKIN. IF SKIN CONTACT OCCURS, REMOVE BY WASHING WITH SOAP AND WATER. FOLLOWING EYE CONTACT, FLUSH WITH WATER. IN CASE OF SPILLAGE ONTO CLOTHING, THE CLOTHING SHOULD BE REMOVED AS SOON AS PRACTICAL, SKIN WASHED, AND CLOTHING LAUNDERED.

D. Receiving, Handling and Storage of Askarels

Askarels are shipped in tank cars, tank trucks, steel drums, metal cans and test sample containers. When received all containers should be inspected for leaks.

1) Storage Tanks

Storage tanks should be erected so that inspection can be made for leaks or spills. Construction should be such that inadvertent leakage or spills are prevented from reaching streams and sanitary or storm sewers.

2) Tank Car and Tank Trucks

All bulk shipment equipment should be inspected for leaks immediately upon receipt. Drain pans must be provided to prevent spillage from unloading hoses and connections. Askarel fluid collected in drain pans should be placed in "Scrap Askarel" drums for disposition.

SECTION 3 - (Cont'd)

D. Receiving, Handling and Storage of Askarels

3) Steel Drums, Cans, and Test Sample Containers

On delivery all such shipments will be carefully inspected for leaks. The containers should be stored indoors in an area especially selected for this purpose. A cement curb should enclose the area to provide a basin for containing the askarel from one or more containers, should the container be damaged. The area must not have a drain which is connected to a sanitary or storm sewer.

If an indoor storage area is not possible, the containers should be stored under a lean-to.

E. Water Effluents - Sampling, Concentration Limits, Analytical Procedures

1) Control of Water Effluents

The industry goal is to eliminate askarel in plant water effluent streams. However, it is recognized that existing drain systems from manufacturing plants, repair shops and installation sites may be contaminated as a result of past practices. Other sections of this Guide provide that no askarel wastes of any kind be disposed of in any water effluent streams, and that accidental spills be prevented from getting into such streams.

a. Concentration Limits

The 1972 EPA proposals are to keep PCB levels in rivers and lakes below 0.01 parts per billion. Plant effluent streams should be managed and controlled in a manner consistent with this goal.

b. Monitoring Streams

All plant effluent streams should be monitored on a regular basis, consistent with plant situations, to determine compliance with the goals proposed above. The procedures for performing the necessary analyses are contained in Section 5, "Analysis of Water and Sediment for Polychlorinated Biphenyls." This procedure or its equivalent shall be used.

c. Methods for Minimizing Effluent Stream Contamination

The ideal approach is to totally isolate all effluent streams that could be contaminated with askarels during manufacturing processes and prevent them from being discharged from the plant.

SECTION 3 - (Cont'd)

F. Disposal Procedures and Services

1) Sources of Materials Requiring Special Handling and Disposal Procedures

Liquids containing PCB's and solids containing or contaminated with PCB's may be obtained from any of the following sources:- transport containers, transformer manufacturing processes, in-test failures, liquids contaminated beyond reclamation, in-service transformer leaks and failures, askarel-filled transformers scrapped for any reason, etc.

2) Classification for Disposal of Materials Containing PCB's

In general, there are three types of materials for disposal; liquids, burnable solid materials containing PCB's and non-burnable solid materials contaminated with PCB's.

a. Liquids

Liquids containing PCB's requiring disposal by high-temperature incineration may consist of the following:

1. PCB's contaminated with mineral oil.
2. Mineral oil contaminated with PCB's.
3. Non-reclaimable contaminated transformer askarels, arced askarels, askarels from manufacturing spills, and sump accumulation, etc., rich in PCB's, and askarels from holding basins, drip and drain pans, washings, sample jars and containers, etc.

b. Burnable Solid Waste Material Containing PCB's

These materials can be disposed of by high temperature incineration and consist of cellulosic materials, rags, pressboard, wood, sawdust, fuller's earth in bulk or in cloth bags, blotter papers, nitrile or cork gaskets, etc.

c. Non-burnable Solid Waste Materials Containing or Contaminated with PCB's

These materials may consist of coil structures, steel, copper, aluminum filter units of the steel mesh construction type, askarel drums, cans, etc.

Materials of this nature should be allowed to drain with the liquid collected in drip pans, etc. Further removal of adhering PCB's can be accomplished by washing or solvent extraction with kerosene or other approved washing liquids such as perchloroethylene or trichloroethylene. Accumulated liquids can be disposed of as indicated in "a" above. Solid materials may be handled as normal scrap.

SECTION 3 - (Cont'd)

F. Disposal Procedures and Services

3) Shipment of Scrap Liquids for Disposal

All liquid scrap material should be placed in appropriate metal transport drums, properly labeled, for shipment to a company offering an acceptable disposal service.

4) Shipment of Burnable Solid Waste Material Containing PCB's for Disposal

Material of this type should be placed in open head drums with suitable closures and with the drum properly labeled for shipment to a company offering an acceptable disposal service.

5) Liquid and Solid Waste Disposal Service Organizations

a. General

Disposal of askarels and askarel-soaked materials must be accomplished by means in which there is no significant release of askarel to the environment. At present, disposal is accomplished by carefully-controlled incineration of liquids and soaked software, and by controlled land-fill burial of apparatus and other hardware from which askarel has been previously drained and washed.

Present knowledge indicates that proper incineration must involve a suitable balance between dwell time and temperature in the incinerator plus oxygen availability and finally suitable scrubbers to remove HCl formed; e.g., (1) two-second dwell time at 2000°F and 3% excess oxygen in stack gas; (2) 1-1/2 second dwell time at 2700°F and 2% excess oxygen in stack gas.

Controlled land-fill or deep-well disposal can be used where permitted by Federal, State and local regulations.

b. Costs

In addition to the normal costs of collecting scrap liquids and solids for disposal, additional costs borne by the owner of such scrap include shipping container, cost of transport to the disposal service organization and a disposal fee usually based upon a per gallon or per pound charge.

c. Disposal Services

Organizations offering disposal services are listed in Section 4, including location, facilities available, types of material handled, and disposal procedures used. Specific shipping directions, disposal procedures and costs should be obtained from the company.

II. Specific Guidelines

A. Transformer Manufacturers, Service Shops, etc. - Housekeeping

1) Plant Area for Filling Equipment with Askarel

It is necessary to assume that in filling equipment with askarel and further handling of this equipment that an askarel spill may occur. Therefore, it is necessary to provide facilities and a procedure for clean-up to prevent contamination.

a. Askarel Filling Area

1. The location of the askarel filling area should be adjacent to the test area and final shipping area to minimize the danger of damage of units during handling.
2. The main manufacturing area provided for filling of equipment with askarel should be cement floors so constructed that any inadvertent leakage or spills are prevented from reaching streams, sanitary, or storm sewers. All askarel-handling equipment such as pumps, hoses, etc., shall be of the askarel-resistant type.
3. Drip pans shall be provided for hose connections and filling valves.

b. Special Containers for Scrap Materials

1. Drums labeled "Scrap Askarel" must be available for handling all spilled and waste askarel from sumps, failed units, drip pans, sample jars, etc.
2. Open-head drums with suitable closures and labeled "Scrap Burnable Askarel Waste" must be available for handling contaminated cellulose insulation, rags, paper pressboard, wood, gaskets, sawdust, etc.
3. Separate containers for handling steel, copper, and aluminum, each adequately marked, shall provide for the components of contaminated core and coil assemblies. These containers are required for the various materials when repairing or scrap-ping assemblies.
4. Containers for supplies of sawdust for absorbing small askarel spills or clean-up of larger spills should be provided.

c. Conditioning of Askarels

1. Askarel Conditioning Equipment

- a. The conditioning unit should be located either in the storage tank area or the main transformer manufacturing area for filling with askarel.

II. Specific Guidelines - (Cont'd)

A. Transformer Manufacturers, Service Shops, etc. - Housekeeping

1) Plant Area for Filling Equipment with Askarel - (Cont'd)

c. (Continued)

2. Fuller's Earth

- a. Conditioning of new askarel or recycled askarel requires fuller's earth treatment. The spent fuller's earth in cartridges or bags when replaced should be allowed to thoroughly drain over drip pans to remove as much liquid askarel as possible. The cartridge units of steel mesh construction should be placed in the "Steel Contaminated with Askarel" container for disposition. Cloth bags filled with fuller's earth shall be placed in the "Scrap Burnable Askarel Waste" container for disposition.

d. Teardown of Units for Repair or Scrap

1. Teardown Procedure

- a. Drain all askarel from the unit either into a holding tank for reuse or into the drum labeled "Scrap Askarel" for disposition, then allow sufficient time for all the askarel to drain from the core and coils.
- b. Remove the core and coil assembly from the transformer and place it on the floor. Sufficient sawdust should be placed on the floor to absorb any askarel fluid that still drips from the transformer.
- c. Place all materials in the appropriate salvage containers during the dismantling for later disposition.
- d. All used materials, including rags, sawdust, tape, etc., regardless of quantity, shall be put into the appropriate containers for disposition.

B. Transformer Labeling

1) New Transformers

All new transformers that contain PCB's shall have a label of adequate durability permanently and prominently attached to the tank by the manufacturer, giving adequate warning and instructions. A suggested label would include the following:-

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II. Specific Guidelines - (Cont'd)

B. Transformer Labeling

1) New Transformers - (Cont'd)

C A U T I O N

THE INSULATING FLUID IN THIS TRANSFORMER CONTAINS POLYCHLORINATED BIPHENYLS, WHICH SOME STUDIES HAVE SHOWN MAY BE AN ENVIRONMENTAL CONTAMINANT. CARE SHOULD BE TAKEN TO PREVENT ENTRY INTO THE ENVIRONMENT. IN CASE OF MALFUNCTION OR LEAKS, CONSULT THE INSTRUCTION MANUAL OR THE MANUFACTURER.

2) In-Service Transformers

The transformer manufacturer should make suitable labels available with a similar warning as in B-1 above for use on existing transformers.

C. Transformer Users - Shipping, Installation, Maintenance, Sampling, Apparatus Disposal

1) General

Askarel-filled transformers are delivered to customers as sealed units from which there is no escape of askarel under normal operation. While certain types of equipment failures can permit loss of some askarel to the environment, such cases are extremely rare.

2) Transportation and Receiving

Immediately upon receipt of the equipment and following any transportation or handling accident which could affect the integrity of the tank, bushings or radiators, examine the transportation vehicle, tank and fittings for any leakage or spillage that may have occurred in shipping. If leakage is evident, correct the cause and soak up spillage with absorbent materials such as sawdust, following with clean-up of the affected area with rags soaked with kerosene or other approved solvent such as perchloroethylene or trichloroethylene. Collect all materials used for proper disposition as described in Section 3 I F, "Disposal Procedures and Services."

3) Installation and Periodic Inspection

Following installation, the unit should again be inspected for any damage or leakage. It is recommended that periodic in-service inspections be made for any leaks.

4) Filling, Filtering, or Drying Askarel

Most askarel units are shipped with the proper amount of askarel but if it becomes necessary to top off a unit, follow the manufacturer's instructions.

II. Specific Guidelines - (Cont'd)

C. (Cont'd)

4) Filling, Filtering, or Drying Askarel - (Cont'd)

If necessary to dry or fuller's earth treat an askarel unit, follow the manufacturer's instructions. When filtering or conditioning askarel, all of the same precautions previously described apply as to drip pans, proper disposal of filter media, etc.

5) Sampling

It is common practice to sample askarel from a transformer for periodic maintenance testing. As previously described, such samples should be taken in a manner to avoid any contamination of the environment. Washings should be collected for proper disposal. Field and laboratory test samples, washings, etc., should also be collected for proper disposal.

6) Transformer Disposal

The ultimate disposal of an askarel-filled transformer may be accomplished in either of two ways.

- a. Complete drainage and dismantling with the proper disposal of the askarel and askarel-soaked components as described earlier in the section "Disposal Procedures and Services."
- b. Disposition of askarel transformers by means of junk or scrap dealers should be avoided unless a transformer is first drained, followed by soaking of the interior with a suitable solvent. Accumulated liquids and washings are to be disposed of as described earlier.