the generator

THE TRAVELERS ENGINEERING DIVISION

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ASKARELS

That name "askarel" may not ring a bell. But the brand names "Pyranol" (General Electric) and "Inerteen" (Westinghouse) certainly should. Lumped under the generic askarel name, these are both askarel transformer fluids. Along with other liquid fire-resistant dielectrics, they are used in transformers and capacitors. They are predominately formulations of PCB (polychlorinated biphenyls) which is sometimes mixed with chlorobenzene to give particular viscosity characteristics.

Of late, there has been quite a flap in industry over PCB. It is altogether possible that an Environmental Protection Agency inspector may call to inquire if your plant uses or handles PCB in any shape or form. This is because PCB appears on the Toxic Pollutant List. This list is used by the E.P.A. to control the release of toxic pollutants into the environment. If you receive a visit, don't panic. The U.S. Government's Task Force on PCB[1] (Commission 72-10419) has taken the stand that, for the future, continued use of PCB in transformers and capacitors is necessary. (After all, these are sealed systems.) However, methods of handling and disposing are indeed matters of concern.

The liquids are fire-resistant, noncorrosive, inert, have high dielectric strength, and chemically they are INCREDIBLY STABLE. This is the rub. PCB doesn't readily degrade. It persists and, if discarded in the environment in sufficient volumes, this could result in a gradual accumulation in certain ecological systems. This was the reason PCB was put on the EPA list. There are many industrial materials more dangerous to handle and more immediately harmful which do not appear on the Toxic Pollutant List.

However, PCB does persist when it is turned loose. The very high stability and inertness that makes askarels invaluable in transformers and capacitors is the reason that their disposal must be properly controlled. Because of their stable and fire-resistant qualities, askarel transformers can be used, without firewalls, inside buildings at load centers. With minimum attention or maintenance, it is capable of operating at rated loads and working silently for many years.

In short, the fact is askarels are persistent. The fiction is that askarel transformers are ruled out under new regulations. What is necessary is the proper disposition of askarel after its many years of service as a fire-resistant dielectric.

Monsanto Company is the sole United States manufacturer of polychlorinated biphenyls and is in complete cooperation with government agencies in the regulation of PCB. There presently is no other equivalent dielectric liquid in sight and since the

regulatory agencies sanction the continued use of askarel, Monsanto has issued a guidance bulletin[2] (No. IC/FF-38) for users of askarel transformers. It covers storing, handling precautions, opening a transformer (care necessary due to gases), and disposing procedures to avoid environmental pollution. Guidelines are given for carefully controlled high temperature incineration of liquids and soaked materials and for controlled dry land fill of solid wastes. The ANSI[3] guide lists the location of disposal facilities which conform to requirements; among them is one operated by Monsanto. For a modest fee, arrangements can be made for scrap liquid disposal.

At present, askarel transformers continue to serve the needs for fire-resistant, low noise level, overload-tolerant electrical distribution at load centers. Monsanto continues to supply PCB for askarel transformer fluids but exclusively to transformer makers. The transformer manufacturers supply make-up requirements that may, on rare occasions, be needed. The superior qualities, especially the flammability rating, make askarel transformer fluids mandatory in specific electrical systems. (See the following rating of two PCB's, Aroclor® "1242," "1254" and "1016".)

Underwriters Laboratories Flammability Rating(1)

Fluid	Flammability Rating
Ether	100
Gasoline	90-100
Ethyl Alcohol	60-70
Kerosene (100°F.P.)	30-40
Mineral Oil	10-20
Aroclor 1242, 1254 & 1016	2-3

Aroclor is a trademark of Monsanto Company.

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BIBLIOGRAPHY

(1) "PCBs and the Environment, " Report #ITF-PCB-72-1m, The United States Government Task Force on PCBs, Com.-72-10419 distributed by the National Technical Information Service, United States Department of Commerce, Springfield, Virginia 22151 at $6.00 per copy.

(2) "Transformer, Askarel, Inspection & Maintenance Guide," Bulletin #IC/FF-38 Monsanto Industrial Chemicals Company, a unit of Monsanto Company, 800 N. Lindberg Boulevard, St. Louis, Missouri 63166.

(3) "Guidelines for Handling and Disposal of Capacitor and Transformer Grade Askarels, Containing Polychlorinated Biphenals," American National Standards Institute, Committee C107, 155 East 44 Street, New York, New York 10017.

(4) "IEEE Guide for Acceptance and Maintenance of Transformer Askarel in Equipment," IEEE Standard 76-1974, Published by IEEE, 345 East 47th Street, New York, New York 10017.