Dan Heister in cooperation with Furan Production Co. present:

GOOD TO KNOW STUFF ABOUT
ELECTRICAL EQUIPMENT AND PCB'S
OR: “DUDE, I JUST FOUND A TRANSFORMER AT MY SITE. IS IT PCB?”
Polychlorinated biphenyls (PCBs)
- Class of industrially useful chemicals
- Clear to yellow oily liquid or solid

1.4 billion lbs produced or imported from 1920s to 1977
- 99% by Monsanto Corp
Chemically and thermally stable

Nonvolatile

Nonflammable

Dielectric (electrical insulator)

Nonpolar (behaves like oil)

Dense (sinks in water)
PCB OVERVIEW - INDUSTRIAL USES OF PCBS

- Capacitors and transformers (77%)
- Hydraulic systems (6%)
- Heat transfer systems (2%)
- Other uses (15%)
Huge-Ass Distribution Transformer, as in:
Typical Substation Transformer
Old “Pot” Style Substation Transformers
Subsation Circuit Breakers
Rack of Capacitors in Substation
Capacitors Come in Different Shapes and Sizes
They Hold 1-5 Gallons of 90% PCB.

(They can hold a charge for up to 2 years after being taken off line, so never pick them up by the bushings)
Pole Mount “Can” Transformers
IDENTIFYING PCB, PCB CONTAMINATED, AND NON-PCB EQUIPMENT

- PCB Equipment: >500 ppm, Most Stringently Regulated In Service and at Disposal, Marking Requirements

- PCB Contaminated: <499 ppm, Regulated if Spilled and at Time of Disposal

- Non-PCB: <50 ppm, Regulated if Spilled, Oil May Be Recycled or Burned for Energy Recovery (Conditions Apply)

- Dilution to Change Category is Prohibited, Retro-Fills Allowed.
IDENTIFYING PCB, PCB CONTAMINATED, AND NON-PCB EQUIPMENT

FACT: The Vast Majority of Electrical Equipment is in the Non-PCB Category.

FACT: PCB Equipment is Most Commonly Found in Heavy Industry: Smelters, Saw Mills, Metal Fabrication, Die Casting, etc..

FACT: Utilities Typically Have Sample Results for All of Their Liquid Filled Equipment on a Database.


FACT: Metal Scrappers, Junk Yards, Abandoned Buildings Not So Much. AND,
FACT: The general public find PCB’s more terrifying than Scary Clowns and Godzilla COMBINED!

“Gosh Dan, can you help us ID equipment so we can protect the public?” Why yes I can.
Always Look For The Yellow Label
(!CUIDADO! Este Transformador es muy caliente.)
TRADE NAMES FOR PCB DIELECTRIC FLUIDS

- (1) Pyranol, GE
- (2) Inerteen, Westinghouse
- (3) Askarel, Generic
- Asbestol
- Dykanol
- No-Flamol
- Chlorinol, Sprague
- Kanechlor
- Pyralene
- Elemex
- Kanechlor
- Saf-T-Kuhl
- Hi Temp 227
- Hyvol
- Therminol
- Chlorphen
- Clorextol
- Kennechlor
- Euracel
- Pyroclor
- Diachlor
- Inclor
- Pydraul
- Phenoclor
- Santovac 1 and 3
- Sanotherm
PYRANOL DISTRIBUTION CAPACITORS

Individual Pole-type Units—Class ID

For 2300-, 4000-, 6900-, and 11,950-gr-Y-volt Circuits

For improving the power-factor of feeders, and gaining kw capacity on the entire system, back to the generators, the Class ID individual pole-type capacitor units enable more effective distribution of the corrective kva, in smaller blocks and at more points over the entire feeder, than hitherto possible.

The Class ID individual unit is offered in sizes 10 and 15 kva for 2300- and 4000-volt circuits, and 15 kva for 4000-, 6900-, and 11,950-gr-Y-volt circuits. Compact and readily installed with either crossarm mounting or direct bolting to the pole, the Class ID design is entirely new. However, all the fundamental features and vital processes of manufacture embodied in other G-E Pyranol capacitors are maintained, thus assuring the same exceptionally high degree of reliability that distinguishes this product.

GENERAL ELECTRIC
A Name Plates Is Worth A Thousand Words
Big Things Come In Small Packages. Small High Voltage Equipment Have Small Name Plates. (Post 1979 Caps will almost always say “Non-PCB”)
ASSUMPTION RULE

- If the word "OIL" is found on the name plate it can be treated as PCB contaminated equipment <499 ppm.

- You may not use a crayon or sharpie to write "OIL" on the nameplate.

NO "OIL" OR NO NAME PLATE OR UNREADABLE

- Equipment must be assumed to be PCB equipment and accorded all the honors that are required under TSCA.

ALL ASSUMED TO BE EQUIPMENT MUST BE SAMPLED PRIOR TO DISPOSAL.
Non-PCB Labeling or

“It Don’t Mean a Thing If It Ain’t Got That Sampling.”
Dan’s Rule of Thumb:

Brown Bushing

More Suspect Than

Grey Bushing

Brown bushings indicate older equipment and therefore higher risk of PCB.
Small PCB Equipment. A Different Beast Altogether.

“A Different Beast”
If it doesn’t say “No PCB’s” or the label is unreadable, it’s a PCB ballast and chuck it in the drum.
These things never leak.
OTHER SOURCES OF SMALL PCB EQUIPMENT

- Microwave Ovens
- Refrigerators and Freezers
- Toy Train and Car Sets
- X-Ray Equipment
- Domestic Well Pumps
- Arc-Welders
- Electric Cranes
- Neon Signs
MODES OF RELEASE

- Transformer, capacitor, and switch gear container leak or failure
  - Lightning strike, corrosion, struck by accident
  - Fire may produce PCDDs and PCDFs
MODES OF RELEASE

- Fill and drain spills
  - Manufacturing and maintenance facilities
  - Electrical substations
  - Hydraulic systems
MODES OF RELEASE

- PCB-contaminated soil
  - Drain and fill residual
  - TSCA and RCRA limit is 50 ppm

- Salvage operations
  - Break open and recover copper
  - Burn pits / PCDDs and PCDFs

Dec 2010
Cu $3+ per lb
MODES OF RELEASE

- Manufacturing outfalls
  - Wastewater outfalls and sludges
  - Stormwater

- Demolition debris
  - Inadequately cleaned spills
  - Fluorescent lighting ballast

- Disposal sites
  - Direct disposal allowed until 1979
“Six-Pack Abs Hell! I’ve Got Pony Keg Abs.”