

Kothur, Bheem

From: Jessica Pennington [jessica@floridatransformer.com]
Sent: Thursday, May 03, 2012 9:54 AM
To: Kothur, Bheem
Subject: Florida Transformer, Inc Additional Information
Attachments: RFAI FDEP 050212.doc

Good Morning Bheem,

As we discussed yesterday, please find the attached information sufficient for your review.

I addressed two items in the attached. Item 1 - a more detailed description of the handling of Non PCB contaminated, as well as, PCB contaminated oil in addition to a detailed description of the dechlorination system itself.

Item 2 - a summary of permits that would be applicable to Used Oil Processing at the FTI facility.

Please feel free to call and discuss or send additional questions my way if needed.

Thank you,

Jessica Pennington
Environmental Compliance
Florida Transformer, Inc.
850-892-2711

May 3, 2012

Re: The State of Florida Department of Environmental Protection
Used Oil Processing Facility Permit Application Request for
Additional Information

Attention: Bheem Kothur

Item 1

In an effort to further describe the PCB Dechlorination process that Florida Transformer, Inc. wishes to achieve approval to operate, please see the following.

Used oil (2-49ppm PCB) and PCB oil up to 1,500ppm PCB treatment process includes dechlorination by a chemical reaction between oil and sodium reactant. The process starts with degasification followed by reagent dispersion, mixing, condensate removal and centrifuge.

The theoretical basis of the of the FTI PCB destruction process is to convert used dielectric mineral oil with PCB concentrations of 2 – 1500ppm PCB to dielectric mineral oil with non detectable (<2ppm) levels of PCB concentration for the availability to specific vendors for transfer to approved processing facilities for further recycling. The goal of processing is aimed at making material offered for purchase more amenable with other products for the purposes of recycling and manufacturing of quality product for distribution back into the market. Additionally, the intended processing will offer means of service longevity and continued use of structurally sound PCB electrical equipment without major disruption of power distribution.

Processes are described for the PCB-1000 dechlorination unit as *on site* or *off site*.

Note: On Site will be defined as processing taking place at FTI facility.

Off Site will be defined as processing taking place away from the Demonstration Site at a FTI customer facility or property.

General

Used dielectric mineral oil with PCB concentrations from 2 – 1500ppm PCB treatment process will include dechlorination by a chemical reaction between oil and alkali metal reactant. The process will start with degasification followed by reagent dispersion, mixing, condensate removal and centrifuge. Additional processing will include the use of the PCB-1000 add on feature fuller's earth system to further purify and decolorize the processed oil in an effort to enhance the products favorability. Other processing may also include the use of the DBPC additive system as part of the dechlorination unit to reduce oxidation rate of transformer oil in an effort to extend its useful life.

The product of the PCB-1000 plant will be PCB free (<2ppm PCB) mineral oil. Byproducts of the PCB-1000 plant include NaCl (salts) and Hydrocarbon molecules. The byproducts are the constituents of the sludge that is formed as a result of the sodium and chlorine reaction to replace the chlorine with hydrogen in the polychlorinated biphenyl molecule. The sludge byproduct and dechlorinated oil will both be PCB free and Non Halogenated. Byproducts may also include saturated fuller's earth from further purifying the mineral oil after dechlorination. The fuller's earth will be considered caustic as a main function of the absorbent is to aid in the removal of acids from the oil in addition to the removal of tar.

The PCB-1000 incorporates a nitrogen system which allows operation of all pneumatic valves within the system and aids in transport of the reagent throughout the system.

Air pollution from the PCB-1000 is controlled by the use of charcoal and alumina filters placed in line in the exhaust stream from the Nitrogen system component and the Degasifier vacuum chamber. Filter integrity is monitored by differential pressure gauges. Once back pressure is indicated, the filter is to be replaced.

The PCB-1000 will be completely housed within a container trailer. The trailer shall serve as secondary containment in the event of a release of liquid at any time. However, additional spill prevention methods (i.e. containment mats with drive-in berm) will be in place at customer locations during off site use of the PCB-1000 to prevent liquid pollution to soil, surface or groundwater. Liquid pollution monitoring methods will be accounted for as requirements of the Spill Prevention Control and Countermeasure Plan for the system along with pre and post operational system checks.

Item 2

Permits that Florida Transformer, Inc. (FTI) currently holds that may be applicable to the requested approval of the Used Oil Processing Facility Permit are:

- an EPA Region 4 Approval to Commercially Store PCB Waste,
- FL DEP Used Oil Transporter/Transfer Facility Registration,
- FL DEP Aboveground Storage Tank Facility Registration

Additionally, FTI has submitted the Permit Application and Demonstration Test Plan for PCB Disposal by Non Thermal Alternative Methods to EPA Headquarters, Office of Resource Conservation and Recovery Director, Ms. Suzanne Rudzinski and Division Chemical Engineer, Mr. Winston Lue for the purposes of approval of a Mobile PCB Dechlorination unit to travel within Region 4, as well as, nationally.

Additionally, it is the intention of FTL to offer field service to electrical cooperatives, municipals and utilities by making the mobile dechlorination system available for onsite tasks. The mobile unit will be used to remove used Non PCB (2-49ppm PCB) digressed insulating fluid from large electrical equipment and to replace processed, regenerated, PCB free oil back into the equipment. This service is primarily for customers without the affordability of shutting down a still useful transformer to replace only the insulating fluid to extend the longevity of its service life. In contrast, the mobile service will also be provided for large PCB contaminated electrical equipment in an effort to remove the PCB contaminated oil (up to 1500ppm PCB), process the fluid to non detectable PCB concentration (<2ppm) and replace with PCB free oil to minimize liability of the equipment.

PCB-1000 System

The chemical reaction utilized by the PCB-1000 Mobile Processing Plant is that of the mixing of an alkali metal reagent with the PCB contaminated (up to 1500ppm PCB) mineral oil.

The PCB oil enters the system through a pre-treatment, degasifying stage. The degassifier efficiently removes moisture and vapor from the oil and ensures it is the correct viscosity to travel through the entire system.

The oil is then heated to the appropriate reaction temperature.

The oil enters one of two mixing tanks which is also heated to maintain the proper reaction temperature. The oil will pass from one mixing tank to another while continuously being agitated to achieve proper mixing and reaction. Reaction is achieved by the alkali metal stripping the chlorine atoms and replacing the chlorine with hydrogen. Reaction time is twenty minutes. After the reaction time is complete the processed oil is transferred to the centrifuge after being passed by an air cooler component to aid in lowering the temperatures of the oil post reaction.

The centrifuge process removes sludge byproduct consisting of chlorine free biphenyl molecules and NaCl(salt).

Consumables required for this process to take place are

- Nitrogen gas
- Activated Carbon
- Water
- Reagent
- Particulate Filter

The PCB-1000 mobile plant is a Batch process designed to treat 1,000 litres (264 gallons) per hour.

The PCB-1000 Mobile Processing plant will be used at the FTI facility (on site) as well as at FTI customer locations (off site). FTI customer locations include substations or other electrical distribution property owned by that of electric cooperatives, municipalities, electric membership cooperatives, industrial companies, military installations. These customer locations are primarily located in the Southeast (FL, GA, MS, AL) but may extend Nationwide. Intended locations for use of the PCB-1000 unit will include all the aforementioned customer locations, as well as, the FTI facility location.

Process Overview

Electrical equipment is received at Florida Transformer, Inc. by the Inprocessing Department. PCB analysis by Gas Chromatography is performed at the onsite laboratory unless current, valid PCB results are provided by the customer prior to pick up.

Non PCB oil (2-49ppm PCB) is pumped from Non PCB contaminated units into one of two aboveground storage tanks. This oil awaits pick up from the designated vendor.

Non PCB oil (2-49ppm PCB) will be processed via dechlorination for PCB removal for transfer to an approved vendor for further processing and recycling. Regenerated oil (less than 2ppm PCB) from processed used oil (2-49ppm PCB) may also be used for insulating liquid in repaired transformers given FTI receives prior approval from the owner of the equipment.

At the time a unit is determined PCB or PCB contaminated (>49ppm), it is relocated to the EPA Region 4 approved PCB Commercial Storage Area designated for equipment tested to contain oil with PCB concentrations greater than 49ppm PCB. PCB contaminated oil is pumped from PCB contaminated and PCB units into approved aboveground storage containers.

PCB contaminated oil (50-499ppm PCB) is transferred from the equipment into one of four 1,295 gallon aboveground storage tanks. PCB oil (≤ 1500 ppm PCB) will be pumped into a fifth 1,295 gallon aboveground storage tank. In the event space is limited and additional storage is required for heavy influx of PCB contaminated dielectric fluid, additional structurally sound, non leaking 55 gallon drum containers will be utilized for sufficient storage. All of the aforementioned oil storage takes place in the approved PCB Commercial Storage area.

When the PCB storage tanks have reached capacity and tanker load volume has been met, the Mobile Unit Supervisor and PCB Area Supervisor will coordinate the transfer of PCB contaminated oil to the PCB-1000. There will be no other steps of preparation of the fluid before it reaches the Mobile unit. Regenerated oil from processed PCB Contaminated oil (50-499ppm PCB) proven to have a post process concentration of <2ppm will also be transferred to a holding tank until picked up by an appropriate vendor for further recycling.