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Polychlorinated Biphenyl Inspection Manual

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Appendix G

PCBs in Natural Gas Pipelines

Background

Major interstate natural gas pipelines (NGPs) transport natural gas from production areas on the Gulf Coast and western US to local distribution companies (LDCs) that distribute the natural gas to industrial and urban customers. PCBs were used in turbine and air compressors as a hydraulic/lubricant and a plug valve sealant by some large interstate natural gas transmission pipeline companies and by some smaller LDCs. Some pipeline companies may have had PCB Transformers and/or PCB Capacitors at large compressor stations and/or maintenance facilities.

Between 1950 and the early 1970's, Monsanto manufactured and sold several brands of hydraulic/lubricant oils containing PCBs. These included Turbinol 153 that contained 6.4% Aroclor 1221 and 81.5% Aroclor 1242, Santovac 1 and 2 containing 100% 1248 and 1254, respectively. In addition, several Pydraul-brand oils containing both PCBs and PCTs (poly-chlorinated terphenyls) containing Aroclors 1221, 1242, 1248, and 1254 with PCB content ranging between 20% and 70%. Note that the early PCT oils were found to be contaminated with PCBs between 2 and 10% and therefore should be assumed to contain PCBs.

At some compressor stations, the PCBs above were used in large turbine compressors. As part of the normal operation, PCB compressor lubricants could leak or blow by pressure seals and enter the transmission pipeline. These PCBs would generally mix with the “pipeline liquids” already in the transmission lines. The main components of pipeline liquids are water and heavier hydrocarbons that condense-out (“condensate”) of the natural gas as pressure drops along the pipeline. Pipeline liquids may also contain metal-based corrosion inhibitors and other liquids (methanol) that were added to the pipeline when cleaning (“pigging”) the lines. These liquids traveled through the pipeline and entered other companies' pipelines via numerous interconnections. The liquids/condensate are removed downstream at compressor stations and other condensate collection ("drip") points along the pipeline. PCBs pipeline liquids were illegally disposed of in unlined earthen pits, vented to the atmosphere and surface soils at various equipment blowdowns, used as herbicides on station fence-lines, and used for dust control on roads. Examples of past cases/settlements involving the use of PCBs in turbine compressors include the Texas Eastern Gas Pipeline Company and Transwestern Gas Pipeline Company.

At some compressor stations, Monsanto-brand Pydrauls were used in reciprocating air compressors to start the main natural gas compressors or turbines and to power hand tools. These air compressors were not directly connected to the pipeline. PCBs used as air compressor-lubricants did not normally enter into the gas pipeline and were used in much smaller quantities than PCBs used in the large natural gas turbine units. Air compressor "water & condensate" containing PCBs was routinely formed in air receiver tanks or bottles. This "water & condensate" mixture was vented to the atmosphere and surface soils from receiver tank or bottle blowdown valves. PCBs may have also been captured by the wastewater drainage control or treatment systems at some compressor stations, thereby contaminating the systems. Some examples of past cases or settlements involving the use of PCBs in reciprocating air compressors include the Tennessee Gas Pipeline Company, Columbia Gas Pipeline Corporation, and Transcontinental Gas Pipeline Company. Note that these air compressor and air compressor systems were required to be decontaminated via alternate disposal permit and/or air compressor system decontamination guidance.

Rockwell made a plug valve sealant (No 860 and 991) that contained PCB Aroclor 1268 sometime prior to the mid-1970s. The PCB sealant or grease was apparently dissolved by transmission pipeline condensate and spread to other downstream locations.

PCBs are also present in natural gas pipelines as a result of the historical practice of oil fogging. Oil fogging was a gas conditioning technique used in natural gas pipelines in the late 1940s through the late 1960s. This technique minimized dust entrainment in the gas stream and reduced leaks in cast iron pipe joints by keeping the packing material moist. Reclaimed transformer and waste oils, probably containing PCBs, were used in the oil fogging process at some pipelines. By the late 1960s the practice of oil fogging had largely disappeared. Welded steel pipe now replaces cast iron pipe in most pipelines, and the remaining cast iron joints may be sealed with bell joint clamps. Dry filters now in use remove dirt and rust entrained in the gas stream. Nevertheless, the residues from prior oil fogging may still remain in parts of natural gas pipelines.

In 1981, EPA discovered PCBs in pipeline liquids in Long Island, NY. Consequently, EPA, the states and industry formed a cooperative task force to address this problem. Extensive sampling of pipeline transmission liquids revealed that 13 major natural gas interstate transmission companies and a number of regional LDCs had PCB contamination greater than 50 ppm in their transmission lines. EPA Headquarters retained the responsibility for implementing remedial programs with the interstate gas transmission companies. EPA regional offices worked with states, public service commissions, and the local utilities to determine the extent of PCB contamination and established remedial monitoring programs with the LDCs.

In late 1981, EPA Headquarters instituted a Compliance Monitoring Program (CMP) for the 13 interstate companies with PCBs greater than 50 ppm in their pipelines. The CMP had four basic objectives: (1) contain the contamination to limited areas; (2) eliminate any further entry of

PCBs into the pipeline system; (3) remove known contamination from the system and ensure its proper handing and disposal; and (4) perform periodic monitoring of each companies pipeline system.

In 1981, the use of PCBs at greater than 50 ppm in a non-totally enclosed manner was prohibited by 40 CFR §761.20(a). EPA decided that it would not bring enforcement actions against the 13 companies for the improper use of PCBs as long as they participated in EPA's CMP and undertook measures to reduce PCBs in their pipeline systems. The 13 CMP companies were required to comply with all other aspects of the PCB rule and other applicable laws and regulations. Thus, the 1981 CMP allowed the use of PCBs in natural gas transmission lines subject to certain conditions, including the proper disposal of PCB wastes and compliance with applicable federal and state laws. *The 1981 CMP did not grant immunity to any of the participating companies from enforcement if violations were discovered.* The 1981 CMP has not prevented EPA from taking judicial or administrative enforcement actions against participating companies such as Texas Eastern Gas Pipeline Company, Transwestern Gas Pipeline Company, Tennessee Gas Pipeline Company, Columbia Gas Pipeline Corporation and Transcontinental Gas Pipeline Company. Several states have also taken enforcement actions against companies participating in the CMP.

The CMP was revised in 1996 for ten remaining companies still participating in the program. A detailed description of the 1981 and 1996 revised CMP was sent to the Regions on December 24, 1996. Under the revised CMP, each participating company was required to submit their Annual "PCB Condensate" Compliance Monitoring Report to EPA by June 15th of each year. Promulgation of 1998 PCB disposal amendments terminated the 1996 PCB CMP. The 1998 rule revised the use authorization for natural gas pipelines at 40 CFR Part 761.30(i) to permit the use of PCBs in natural gas pipelines at greater than 50 ppm under certain conditions.

Regulatory Requirements

The regulations governing the use of PCBs in natural gas pipeline systems are found at Section 761.30(i)(1). See also Section 4.1.9 Natural Gas Pipeline Systems Chapter Four.

Inspection Focus

The general inspection procedures detailed in this manual should be followed when conducting PCB inspections of natural gas pipeline sites. The inspector should evaluate the following likely PCB locations (sources of PCB contamination) for evidence of potential violations of PCB regulations:

- PCB Sources
  - Natural Gas Turbine Compressors
  - Air Compressors
  - Condensate Drip Points

  - Condensate Scrubbers (oil scrubbers may have PCBs)
  - Pig Launchers and Receivers.
  - Wastewater/Oils Treatment System

- PCB Storage
  - Condensate Storage Tanks
  - Condensate and Oil Scrubber Storage Tanks
  - Waste Oil Storage Tanks
  - Wastewater Storage Tanks

- PCB Disposal
  - Blowdown Vents (all types of compressors and equipment)
  - Burn Pits
  - Burn Barrels
  - Surface Disposal (Soil, Drains, Floor)
  - Condensate Disposal
  - Condensate Scrubber Disposal
  - Dehydration Material Disposal
  - Wastewater and Storm Water Discharge Points.