Furan Analysis Imperative for Power Stations

Techenomics International is now offering Furan Analysis, as demand for this service increases from Power Stations who are quickly identifying the importance of Furan Analysis as part of their preventative maintenance programs.

All power stations have transformers that over time will wear out, become damaged and eventually fail. Furan testing is a way of determining the life of a transformer before this occurs.

According to Chris Adsett, Techenomics General Manager, “like all Preventative Maintenance tools regular Furan Analysis can help prevent major damage or failure of a transformer before it occurs and shows when to rewind or retire a transformer. Having this knowledge can consequently help companies estimate life expectancy so that replacement or repair costs can be managed”.

The solid insulation of a power transformer consists basically of paper in the form of sheets, tapes and other pressed shapes. Heat, moisture and oxygen primarily cause degradation (aging) of cellulose insulation, which adversely affects the life of the paper.

Degradation of this paper causes it to lose its tensile strength and results in the release of furans.

The main goal of furan testing is to determine whether the paper in a given transformer has been or is being damaged by heat.

Furans produced from temperature buildups are generated in two ways; the first being a localized area of high heat and paper damage, and the second being the general overall heating of the entire transformer. Early detection of paper insulation breakdown can prevent major damage or failure to the power transformer.

Prior to Furan Analysis, Dissolved Gas Analysis in oil was the only non-invasive test performed on transformers that could indicate internal problems. By monitoring the ration on CO and CO2 found dissolved in the oil, the paper condition was thought to be determined. The major disadvantage of this method is that CO and CO2 generation is not entirely specific to spare degradation.

The systematic use of furan analysis to monitor paper insulation condition is a useful and complementary technique to dissolved gas analysis (DGA) and other monitoring techniques.
The preferred method of furanic analysis is by HPLC (High Performance Liquid Chromatography), and ASTM Standard (D5837-95) has been approved which outlines methodology. It is now possible to measure furanic compounds in the parts per billion levels.

Damage to as little as a few ounces of paper is discernible in an oil sample, even in large transformers.

A furan test should be included with annual oil testing programs and trends developed to monitor the condition of the paper so company’s can know the present aged condition of their transformers

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