



BULLETIN B900-05066

ALERT

Leading Mineral Oil Supply Identified to Contain Corrosive Sulfur Transformer Failures Result

Situation:

NYNAS, one of the world's leading suppliers of transformer mineral oil, has issued an interim report notifying users of a small but growing number of power transformer failures caused by sulfur components in certain production batches of their naphthenic mineral oil¹. The sulfur components cause copper corrosion and copper sulphide formation, resulting in failure of the transformer.

CPS has received a copy of this report directly from NYNAS. It is highly likely that this letter or a similar letter may also have been sent to your customers.

Q&A:

The following Q&A has been prepared to help you answer common questions that you may be asked.

Q. What type of transformers have been affected?

A. The problem to date is limited to power transformers using bare (non-varnished) copper conductors with wrapped insulating paper.

Q. Are CPS distribution transformers susceptible to this problem?

A. No. All CPS distribution transformer winding materials are either aluminum, which does not react with corrosive sulfur compounds, or enameled copper wire. The enamel coating protects the copper from this phenomena even it the mineral oil contains corrosive sulfur compounds.

Q. Does CPS use NYNAS fluid?

A. No. CPS has not and does not purchase its mineral oil from NYNAS.

Q. Are sulfur compounds unusual in mineral oil?

A. No. All available mineral oils contain some sulfur and sulfur compounds with levels as high as several hundred parts per million. It is the corrosive nature of the compounds found in certain batches of NYNAS fluid that are unusual.

Q. Does FR3 fluid contain sulfur compounds?

A. While vegetable oils contain trace amounts of sulfur, typically in the 1 ppm range, there is no evidence to date from either laboratory testing per ASTM or from the field that the trace amount of naturally occurring sulfur in FR3 base oil is in any way corrosive.

COOPER Power Systems

¹ Transformer mineral oils are classified as being naphthenic or paraffinic, indicating the dominant molecule structure of the oil. Naphthenic mineral oil is the overwhelmingly predominant form of mineral oil used in transformers.

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Q. What is CPS doing to make sure this is not going to be a latent problem for FR3 fluid?

A. CPS is running additional tests on FR3 fluid that are much more aggressive than the current ASTM standard to confirm that no problem will occur. Results are expected before year end.

It is expected that the results of these tests will add to the already long list of benefits offered by FR3 fluid. Until results are available, remember that Envirotemp FR3 is an alternative to mineral oil that offers numerous other advantages such as improved fire safety, a better environmental profile, transformer life extension, and the opportunity to use a renewable resource in lieu of petroleum.

