

Dissolved Gas-in-Oil Analysis for Preventative Maintenance of the LANSCE High Voltage Systems

K. Young, M. Rodriguez

Los Alamos National Laboratory, 3747 W. Jemez Road, Los Alamos, NM

The LANSCE linac RF system consists of four 201.25 MHz RF stations that supply RF power to the drift tube linac(DTL), and forty-four 805 MHz RF stations, that supply RF power to the coupled-cavity linac(CCL). There are four large high voltage power supplies for the DTL RF systems and seven high voltage power supplies provide the power for the 805 MHz stations. All power supplies consist of a transformer/rectifier, Inductrol Voltage Regulator (IVR) and a capacitor bank with crowbar protection. After 44 years of operation, some components are approaching the end of life. An analysis of the oil in the high voltage power supply units was done to assess their health and to determine if units require maintenance or repair. Since 1998, the oil in each unit has been sampled and tested annually, and reprocessed when required. Gas-in-oil data for these units from 1998 to present was analyzed. The levels of each gas component, trends in the data and the significance of each dissolved gas are discussed. Several units have been re-built. Case studies are presented that correlate the dissolved gas analysis with the failures found.

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