

"Corrosion Product Sampling"



Corrosion Product Samplers (CPS) are used to assess the amount, and identify types of material in solution and particulate form within the system. They have been shown to be effective, but require that a representative sample be delivered to the monitor. Current literature indicates that several sample line design parameters can significantly effect the accuracy of CPS measurements.

The Electric Power Research Institute, EPRI, has published a report titled "Survey of Corrosion Product Generation, Transport, and Deposition in Light Water Nuclear Reactors" EPRI Report NP-522 dated March 1979. This report discusses some effects of the sample tube in delivering a sample to the monitor. This report discusses deposition and erosion of particulate within the sampling tube. It indicates that deposition of some material will occur within all sampling lines. The most representative sample is obtained when the amount of material deposited on the tube wall is equal to the amount of material which is eroded from the wall.

The following are suggested as criteria to improve sampling using Corrosion Products Samplers:

1. Reduce sample line length to as short as reasonable. Several operating plants have obtained credible readings with lines of 100 to 200 feet.
2. Keep tubing flow vertically downward as much as possible. Reduce the amount of horizontal tubing runs. Studies have shown that particulate will have minimal deposits in downward runs.
3. Sample inlet connections from the main line should be with a nozzle directed into the flow stream with sample nozzle velocities near the main pipe velocity. Avoid sampling from the top or bottom of a larger pipe. An isokinetic sampling nozzle is the preferred sample port.
4. Maintain a sample tube velocity near 6 ft/sec to minimize deposition within the sample line.
5. Make sure that momentum of particulate will not cause the flow to separate. Specifically do not use the branch connection of a tee as the sample outlet, as heavy particulate can be driven into the run connection by its momentum.
6. Sample at full system pressure. Pressure reducers function by using a small orifice, a tortuous path or long lengths to obtain pressure drop. Small orifices can act as a filter preventing larger particles from passing through. Tortuous paths typically have numerous changes in direction which can separate, and lose particles by momentum. Long lengths lose accuracy by deposition and erosion of particles upon the tube wall.

***Every Employee an Owner,
Every Customer a Commitment***

SENTRY EQUIPMENT CORP • PO Box 127 • Oconomowoc, WI 53066
Phone: 262.567.7256 • Fax: 262.567.4523 • **E-mail:** sales@sentry-equip.com