

DISCUSSION

The following questions (Q) were raised at the symposium presentation of this paper, and the authors' answers (A) follow:

Q: You indicated that the sample preparation was done elsewhere and that you do analyses of plutonium-containing material. What plutonium limit do you have for the samples that come to your ICP facility?

A: We extract the uranium and plutonium for our samples prior to analysis by ICP atomic emission spectrometry. There is virtually complete removal of uranium but plutonium persists to about 5 to 10 ppm in the final solutions. This is not a problem for us.

Q: You said earlier that there is a safety interlock mechanism in place on the argon gas inlet system to the plasma. Is there any such mechanism on the exhaust streams from the plasma?

A: Yes. There are actually two systems to guard against failure of the exhaust streams from the plasma. The flow of gases (air and argon) up the exhaust is monitored by a flow switch. The flow switch is wired in series with the argon pressure sensor (formerly contained in the torch box). If the flow drops below the set point of the flow switch, the plasma is automatically extinguished and the flow of argon is stopped. Also, the flow into the plasma exhaust is powered by the general building exhaust as well as by the dedicated squirrel cage. The system can be operated safely using only the general building exhaust. Personnel immediately evacuate the laboratory if the hood exhaust fails.

Q: What are the dose rates of dissolver solutions?

A: Dissolver solutions are extraordinarily radioactive, which is why samples are prepared in a semiremote facility. One or two millilitres of dissolver solution will exceed 20 to 30R at contact. After extraction and dilution, the solution activity is reduced to about 1R at contact. We have shielding in place in the hood to reduce operator exposure at the front of the hood. Levels at the hood face are below 40mR/h and can be further reduced with appropriate shielding.