DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 20, 1998

TO: G. W. Cunningham, Technical Director

FROM: M. T. Sautman, R. F. Warther

SUBJECT: RFETS Activity Report for Week Ending August 21, 1998

B779 Contamination Incident. An individual assigned to B779 conducting size reduction operations suffered a puncture wound which was contaminated with Pu and Am-241. The individual was wearing liners, two pairs of rubber surgeon's gloves, a Level B suit with gloves (taped), and leather gloves over the rubber gloves. Apparently, the leather glove partially rolled down the individual's hand while sliding the glovebox floor into a crate which allowed a metal sliver on the glovebox to puncture his hand. The edges of the box were taped.

Medical personnel decontaminated his hand and excised some of the tissue. This reduced the contamination from 12 nCi to 5.7nCi. Medical then administered chelating agent DPTA (see 7/24/98 weekly report) which may reduce exposure further. Chelating agents are administered if the levels are above 4 nCi. The peak potential whole body CEDE is about 5-20 Rem. The worker has been removed from rad work until a final dose can be determined in about one year following multiple bioassays. Later counts with more precise equipment found 0.85 nCi Pu and 0.34 nCi Am.
The building has stood down and will conduct safety briefs. Immediate compensatory measures include longer leather gloves and additional training for the workers. The Site Reps are concerned that the workers still do not fully recognize how little Pu is required for a substantial uptake. The 12 nCi of Pu injected into the worker's hand equates to 0.2 µgram of Pu-239 equivalent. Although building personnel followed procedures, there seems to be an attitude that these things may occasionally occur. It is important to note that SSOC executives do not share this attitude.

B776 Contamination Incident. Operators were removing raschig rings from a tank that contained residual oil and solvents. When an operator could not reach a few stuck rings, he pulled off his plastic sleeve and leather glove and tried again. Not only did the procedure require both leather gloves and plastic sleeves, but the pre-evolutionary brief did not address placing arms inside the tank. Unfortunately, his arm contacted some solution, which soaked through his Tyvek suit and contacted his sweaty anti-contamination coveralls. Initial skin contamination levels were 800,000 dpm on his arm. No oil was seen on his skin, but CCl_4 is believed to have penetrated his coveralls. The skin was repeatedly washed with detergents, covered with Vaseline and wrapped with plastic to sweat it out, and wiped with alcohol. However, there was still 350 dpm on his arm 24 hours later. Decontamination will likely continue for a few more days. B776 management is treating this as a serious conduct of operations issue and is conducting training, adding a hold step in the procedure, and looking at additional ways to control the spread of contamination.

Recommendation 94-1/Readiness Reviews. The RFETS safeguards termination limit variance for residue received final approval by DOE-HQ Monday.

DOE issued an amended Record of Decision for the storage and disposition of weapons-usable fissile materials in order to support the early closure of RFETS. K-Reactor will be modified to accommodate the early receipt and storage of RFETS surplus plutonium. The plutonium will not be moved to SRS unless DOE decides to immobilize the non-pit surplus weapon-usable plutonium at SRS. In addition, plutonium cannot be shipped to SRS until it is stabilized and packaged to meet DOE Standard 3013-96. The exception would be classified metal and/or parts which will be declassified using FB-Line and then packaged in APSF to meet 3013.

The Dry Residue Repack Management Review team had 2 pre-start findings, 4 findings that must be resolved before specific activities can occur, and 1 post-start finding. An additional readiness review will be required once the nondestructive assay equipment is installed since this will significantly modify the process and controls. One pre-start finding addressed the Configuration Control Authorities (i.e., Shift Managers) who had not been trained on the scope of the dry repack operation, on its hazards, and the methods/controls used by this activity. Other findings addressed implementation of criticality controls, procedure deficiencies, and operation of the drum dump. The Site Reps are concerned that the same findings are repeatedly occurring in readiness reviews at RFETS, often within the same building. This topic and recent problems with facilities prematurely declaring themselves ready to start readiness reviews were discussed by the Site Reps with the new K-H Executive Vice President.

Since shipment of residues to WIPP will likely be delayed, the Site Reps reviewed RFETS' compliance with the Interim Safe Storage Criteria (ISSC). With the exception of combustibles, all residues will be packaged in compliance with ISSC, have an approved exemption from ISSC, or will be packaged to DOT and SRS requirements until they are processed at SRS. As a result of staff questions, the contractor is working on a technical strategy to address ISSC compliance for combustibles. K-H is currently packaging filter media residues into a noncompliant package and had planned to start 2 new repack lines that would also produce noncompliant packages. The Site Reps stated that our position was that all residues were required to be packaged in accordance with ISSC until they begin shipping residues to WIPP. Another result of the review is that K-H and SSOC decided to update and implement their post repackaging/ stabilization inspection and surveillance plan. The original plan has never been implemented despite being written more than 2 years ago.

Residue characterization found that Ca Metal residues contained as much as 90% Ca metal. There is only 5 kg of this residue at RFETS. K-H has decided to treat this material by dissolving it with nitric acid inside B559 followed by precipitation in the B371 CWTS. Testing is scheduled to start shortly and processing is expected to be completed by January 1999.
cc: Board members