DEFENSE NUCLEAR FACILITIES SAFETY BOARD

March 7, 1997

MEMORANDUM FOR: G. W. Cunningham, Technical Director

FROM: J. Kent Fortenberry / Joe Sanders

SUBJECT: SRS Activity Report for Week Ending March 7, 1997

Todd Davis was onsite this week observing discussions between SRS and ORNL on the transfer of Am-Cm and Np to Oak Ridge.

Proposed Delay in Combined Sludge-Precipitate Operation at DWPF - WSRC has proposed a new schedule for combined sludge-precipitate operations at DWPF that delays initial operation of the Late Wash Facility (LWF) and the DWPF Salt Process Cell until December 1998. The proposal is to run two cycles at ITP, rather than one cycle, before sending the product from Tank 49 to DWPF via the Late Wash Facility (LWF). The primary driver for this proposed change is the need to establish a 90,000 gallon heel in both Tanks 48 and 49 to allow pump operation in accordance with the newly developed ITP safety basis. Subtracting this 90,000 gallon heel, there would not be enough material from ITP Cycle 1 (only 50 canisters of glass) to sustain combined processing until Cycle 2 from ITP is ready and so DWPF would either have to be shutdown or returned to sludge-only operations for a period of time. Delay of DWPF and LWF precipitate startup until Cycle 2 is ready should not result in an increase in the number of glass canisters produced since 750±100 of the projected 5,950 canisters will contain only radioactive sludge and only ~350 canisters will be poured by the end of 1998.

Total Cost of ITP (to date) - The modifications to an existing HLW tank for the ITP process began in 1985. The total cost of construction, construction support, and operation (including recent safety upgrades) of the ITP facility through February 1997 is about $438 million.

Pu-238 Technology Transfer to ORNL - ORNL will be taking up the Pu-238 work previously performed at SRS, including Np-237 target fabrication, target irradiation in the High Flux Isotope Reactor (HFIR), processing, and waste recycling. The target feed material for this Pu-238 production will be the H-Canyon Np-237 solution. Current plans are to start vitrifying the Np- 237 solution in 2001 for subsequent shipment to ORNL. However, ORNL needs to produce its first Pu-238 in 2003. Assuming 6 months for target fabrication, 2 years for irradiation, and 6 months for processing, ORNL will need readily useable Np oxide by 2001. If the Np were received in a vitrified form, ORNL estimates a 2 year delay (to recover the Np from the glass) and an additional $15 million (in additional equipment cost). ORNL would prefer that the Np be delivered as an oxide, a glassy boric oxide (a water soluble solid form recently suggested by ORNL), or as an oxysulfate (produced by calcining loaded resin).

Consolidated Incineration Facility (CIF) Readiness Assessment (RA) and Tank Overflow Incident - The WSRC and DOE assessments, completed this week, indicate that this facility is marginally ready to operate, especially in light of last weekend's occurrence (discussed below). The conclusions and recommendations from the assessment take credit for the phased startup of the facility whereby the complexity of radiological

operations will ramp up slowly. The assessment report states, "It is the conclusion of this team that CIF can be safely operated for the scheduled first campaign . . . [however] the team believes that increased management attention is needed for the foreseeable future to ensure that operator proficiency is improved and that programmatic issues do not reoccur." The first CIF campaign involves burning depleted uranium-contaminated solid waste boxes. Continued improvement will be necessary to support safe incineration of increasingly hazardous materials (i.e, tritium-contaminated materials and canyon solvent).

On Saturday, March 1, an overflow incident occurred at CIF when the offgas quench tank drain line became plugged. The 300 gpm water spray used to cool the combustion gases continued to fill this offgas quench tank. Unfortunately, the quench tank's overflow line ties into the same header as the drain line, a design deficiency which had been previously identified. With both the drain line and the overflow line plugged, several vent lines, including the line from the ash receiving tank, filled with water. The ash receiving tank overflowed and hot, contaminated water (hazardous constituents only) overflowed into the room. An operator was hospitalized for heat stress while trying to contain the spillage. Recovery was eventually achieved by performing an emergency temporary modification to bypass the plugged line.

The primary root cause of this incident, the inadequate design of the tank overflow line, was identified in a similar incident which occurred last fall. In this previous incident, an operator mistakenly closed a manual valve in the drain line. However, recovery (opening the valve) was achieved prior to any tank overflows. Subsequent to this first incident, the susceptibility of this system to single point failure was noted but was not corrected. This second incident should be a lesson in correcting deficiencies before incidents reoccur, sometimes with much more significant consequences. It also points to the importance of tracking corrective actions to closure. The decision has now been made to correct this design flaw, and modifications have begun.

Board Members