DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 5, 1998

MEMORANDUM FOR: G. W. Cunningham, Technical Director
FROM: J. Kent Fortenberry / Joe Sanders
SUBJECT: SRS Report for Week Ending June 5, 1998

APSF Design Assumption - The APSF design assumes that the pure (un-alloyed) plutonium metal storage temperature limit will be increased from the current 100°C limit defined in DOE-STD-3013-96, to the plutonium-iron eutectic temperature (~ 400°C). The DOE-STD-3013-96 limit of 100°C is based on alpha-beta phase change and the accompanying volumetric expansion that could potentially rupture the container system. The technical basis for increasing this temperature limit does not currently exist.

The site is developing a test program which will evaluate whether the alpha-beta phase change can adversely impact the integrity of the container system. The current plan is to develop a finite element model of plutonium metal expansion within the container system and validate it using the limited LANL experimental test results from 1997. This model will then be used to identify limiting plutonium metal geometries to be tested at LANL. The model will then be confirmed / refined using these additional test results. This effort is intended to culminate in a final report (expected late this year) which should identify whether the current storage container system can satisfactorily accommodate alpha-beta phase changes. Based on this schedule, APSF construction will be proceeding at risk while this issue is being resolved. The test program is considered to be high-priority and funding is available.

Large-Scale Demonstration and Deployment Project (LSDDP) - Building 321-M Fuel Fabrication Facility was used to manufacture highly enriched uranium fuel/target assemblies. This facility is being prepared for minimal surveillance and monitoring until funding is available for ultimate decommissioning. Conditions within the facility requiring attention include residual highly enriched uranium and rainwater intrusion problems due to a degrading roof. In approaching the stabilization of this facility, SRS is participating with the Office of Science and Technology (EM-50) and the Office of Nuclear Material and Facility Stabilization (EM-60) to solicit new technologies developed outside DOE. This LSDDP solicits info on innovative and improved technology in four major areas: characterization, decontamination, stabilization, and dismantlement/removal. Characterization technologies (including HEU assay devices and systems) are expected to be demonstrated first. Initial selection of technologies for demonstration is scheduled for August 1, 1998.