DOE/EIS-0281-SA-01

SUPPLEMENT ANALYSIS

Site-Wide Environmental Impact Statement For Sandia National Laboratories/New Mexico

Reestablishing Long -Term Pulse Mode Testing Capability at the Annular Core Research Reactor, Sandia National Laboratories, New Mexico

May 2001

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INTRODUCTION – PURPOSE OF SUPPLEMENT ANALYSIS

This Supplement Analysis (SA) has been prepared to determine if the Site-Wide Environmental Impact Statement for Sandia National Laboratories/New Mexico (SWEIS) adequately addresses the environmental effects of a proposal for reestablishing long-term pulse mode testing at the Annular Core Research Reactor (ACRR) or if additional documentation under the National Environmental Policy Act (NEPA) is needed. The need for a SA to an existing environmental impact statement (EIS) is initiated by subsequent changes in the basis upon which the original EIS was prepared and the need to evaluate whether or not the EIS is adequate in light of those changes. It is submitted according to the requirement for determining the need for supplemental environmental impact statements (10 CFR 1021.314) in the Department of Energy's regulation for implementing NEPA.

This SA specifically compares key impact assessment parameters evaluated in the SWEIS of simultaneously operating the Annular Core Research Reactor (ACRR) for the production of medical isotopes and a potential replacement pulse power reactor (the preferred or Expanded Operations Alternative) with comparable impact assessment parameters of the proposal for reestablishing long-term pulse mode testing at the ACRR. Based on this analysis, this SA will be used to make a formal NEPA determination whether (1) the existing SWEIS should be supplemented, (2) a new EIS should be prepared, or (3) no further NEPA documentation is required.

PROPOSAL DESCRIPTION

Background

Historical Use of the ACRR. The ACRR has been in use at SNL/NM since 1978 and is primarily a low-power research reactor facility. The ACRR has historically operated in a pulse mode or in a steady-state mode with a duration of about a week at a time. These operational modes are also known as the Defense Programs or DP Configuration. The later terminology will be used in this SA to reflect these operational modes. The mission of the ACRR has been to provide neutron and sustained gamma pulsed environments to perform experiments, including the testing of systems components electronics and reactor safety research. Specific research activities involve neutron effects on fissile components, radiation effects on various types of electronics, radiography, and testing of materials and systems. The ACRR is located in Technical Area V.

Isotope Production. In 1996 the ACRR was selected to produce medical and research isotopes, primarily molybdenum-99.[1] Consequently, the responsibility for the operation of the ACRR was transferred from DOE's Office of Defense Programs to its Office of Nuclear Energy, Science, and Technology. The core configuration of the ACRR was subsequently modified in 1998 to accommodate this new mission. This modified configuration is known as the Isotope Production Configuration. Operating in this configuration, the ACRR is primarily a low-power, medical isotope production reactor facility. Reconfiguration of the ACRR to do DP pulse tests as a possibility under national emergency situations is identified in the Record of Decision (ROD) for the *Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes Environmental Impact Statement* (DOE/EIS-0249F). Currently, the medical isotope production program has been suspended, and the ACRR has been returned to the DP configuration.

Isotope production would have been supported by the Hot Cell Facility (HCF), also located in Technical Area V. The HCF, like the ACRR, was modified from its original mission of support for DP testing to support the medical isotope production program. The highly enriched uranium targets that are irradiated in the ACRR are transferred to the HCF for processing. Processing consists of receipt, extraction, and separation processing of molybdenum-99 from the irradiated targets. Besides molybdenum-99, other isotopes produced in the process include iodine-131, xenon-133, and iodine-125. The HCF is currently in a standby status.

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– *No Action Alternative*. The No Action Alternative discussed in the SWEIS (DOE/EIS-0281) recognized the two modes that the ACRR could be operated: the Isotope Production Configuration or the DP Configuration. In the Isotope Production Configuration the ACRR would operate for 52 weeks annually to irradiate targets to produce approximately 30 percent of the United States (U.S.) demand for molybdenum-99 and other medical and research isotopes such as iodine-131, xenon-133, and iodine-125. Irradiation of eight targets was planned in the base year, increasing to 375 targets in 2003 and continuing through 2008. At the 30 percent demand production level planned for 2003 and 2008 scenarios, it was assumed that the reactor would be operated for 16 hours per day, five days per week, at a maximum power level of four megawatts (approximately 16,640-megawatt hours per year). Production needs could require varying scenarios that could range from periods of shutdown to periods of operation at 100 percent of the U.S. demand (irradiation of approximately 25 targets per week or 1,300 per year).

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[1] Department of Energy Record of Decision for the Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes, dated September 11, 1996.

Temporary reconfiguration to restore DP pulse mode operation could be accomplished to conduct limited-duration tests (12 to 18 months following the ROD). The Isotope Production Configuration would be restored following DP testing needs.

This alternative stated that DOE was evaluating the potential need for long-term DP test requirements for the ACRR, but that no plans currently existed. This alternative also recognized that any future long-term testing would undergo the appropriate NEPA reviews.

- *Preferred Alternative – Expanded Operations.*

  Annular Core Research Reactor (including the HCF). Under this alternative the ACRR medical isotopes production configuration would be operated for 24 hours per day, seven days per week, at a maximum power level of four megawatts (approximately 35,000 megawatt hours per year) to meet the entire U.S. demand for molybdenum-99 and other medical and research isotopes. This production level would require the irradiation of about 25 highly enriched uranium targets per week (1,300 per year). The HCF would continue to support the ACRR at the expanded level of operation.

  Annular Core Pulse Reactor II. The Expanded Operations Alternative assumed that there would be an ongoing need for DP testing in a pulsed-power reactor facility. To satisfy this need an additional facility would be required. This facility would be similar in design to the ACRR prior to its conversion to the medical isotopes production configuration and would be called the Annular Core Pulse Reactor II (ACPR-II). The specially designed uranium oxide-beryllium oxide fuel from the ACRR medical isotopes production configuration would be used. This fuel would be replaced with new fuel of a more standard design for the ACRR medical isotopes production configuration. Testing in the ACPR-II would consist of approximately two or three test campaigns (consisting of several individual tests) each year. Approximately two major fissile component tests and approximately six material irradiation, electronic effects tests would be performed each year. These tests would typically use the ACPR-II in either its pulse mode or steady-state operation: the later would not exceed a few days in duration. Hence, minimal amounts of resources such as uranium fuel and water would be expended for these tests as compared to high-use, steady state operation. The SWEIS recognized that if this new facility were proposed at some time in the future, the DOE would conduct a separate, project-specific NEPA review. However, the major environmental effects of such a facility were evaluated in the SWEIS.

- *Record of Decision.* DOE's decision for operating the ACRR, as reflected in the ROD, is to implement the Expanded Operations Alternative for medical isotopes production. Included in this operational mode is its short-term reconfiguration to the DP mode (up to about 18 months) to conduct limited duration tests. This limited testing period in the DP mode would terminate in September, 2001. Once the short-term testing is completed, the ACRR would be returned to its configuration for medical isotopes production. At this time, the need for reestablishing a long-term testing capability was recognized. The ROD discussed the development of the ACPR II for a pulsed-power reactor facility, but stated that this second reactor was not ripe for decision at this time. Again, a separate project-specific NEPA review would be accomplished should this additional reactor be proposed in the future.

Proposed Action.

The Department of Energy, Kirtland Area Office is proposing to reestablish long-term DP testing at the existing ACRR. As stated, the medical isotope production program has been suspended, and the ACRR has been returned to its historical configuration. Operating in the DP configuration the reactor may be operated in a steady state or may be pulsed. In addition to extensive use of the reactor for long-term pulse mode and steady state component testing, the reactor would be used to produce small quantities of radioisotopes and to support other nuclear research programs.

DISCUSSION

This section discusses and compares key impact assessment parameters associated with the two reactor facilities (including the HCF) discussed as features of the Expanded Operations Alternative in the SWEIS with the key parameters of the current proposal. For the purposes of impact assessment the SWEIS assumed the existence of the ACPR II (to provide a pulse power reactor facility) and that this facility would be operating concurrently with the existing ACRR in the medical isotopes configuration. A matrix is provided to enable a rapid, comprehensive comparison of coverages provided. The last column of the matrix provides comments regarding coverage of the impact assessment parameter for the proposed action within the scope of the SWEIS.

The key assessment parameters evaluated and compared are the following:

- Reactor Operations – Pulse Mode and Steady State
- Nuclear Fuel Consumption – Enriched Uranium
- Nuclear Materials Inventory
  - enriched uranium
  - cobalt-60
  - plutonium-239
- Spent Fuel
- Explosives Inventory
- Fission Products Inventory
- Waste – Radioactive
  - low-level
  - low-level mixed
  - transuranic
  - mixed transuranic
- Waste - Hazardous

- Radioactive Air Emissions
- Process Water Consumption
- Process Wastewater
- Staffing

Reactor Operations – Pulse Mode and Steady State

Testing involves both pulse mode and steady-state operations. The number of tests is described in terms of both the number of test campaigns (a test campaign consists of a series of individual tests that may number from 10 to 50) conducted annually and the number of hours of steady state operation annually. The number of campaigns analyzed in the SWEIS for the ACPR II was two to three (including pulse mode or steady state operations that would not exceed a few days in duration), and for the ACRR the number of hours of steady state operation was 8,400 annually (24 hours/day x 7 days/week x 50 weeks/year). The proposed action would entail four to five campaigns, 10 to 15 single short-term tests, and about 950 hours of steady-state operation. The reactor configuration under the proposed action is the configuration described in the SWEIS ACRR Defense Programs Configuration (page FD-50).

A comparison of the scopes of operational levels associated with the proposed action and that of the Expanded Operations Alternative in the SWEIS demonstrates that the operational level of the proposed action is well within that described and analyzed in the SWEIS.

Nuclear Fuel Consumption

Nuclear fuel consumption is the amount of enriched uranium (uranium-235) that is or would be consumed during operation of a reactor. The amount of enriched uranium projected to be consumed annually by operation of the ACPR II and ACRR in the Expanded Operations Alternative was two grams and 16,000 grams respectively. Nuclear fuel consumption is not an element of HCF processing. The amount of enriched uranium projected to be consumed annually by the proposed action is estimated to be 50 grams or less. The relatively small amount of enriched uranium that would be consumed by the proposed action is well within the amounts discussed and analyzed in the SWEIS.

Nuclear Materials Inventory

The nuclear materials inventory is the amount (both quantity and activity level) of nuclear materials on hand and associated with reactor operations. They are of concern from a potential accident scenario. The three materials of concern and discussed in the SWEIS are enriched uranium, plutonium-239, and cobalt-60.

- *Enriched Uranium.* The amount of enriched uranium that the proposed ACPR II, ACRR, and HCF would have in inventory under the Expanded Operations Alternative is 85 kilograms, 56.7 kilograms, and 0.125 kilograms respectively. The amount the ACRR would have for DP testing is the same as the ACPR II – 85 kilograms.

- *Plutonium*-239. The amount of plutonium-239 that the proposed ACPR II would have in inventory is 8,800 grams (the ACRR and the HCF would not have plutonium-239). The amount of plutonium-239 that the ACRR would have for DP testing is the same as the ACPR II – 8,800 grams.

- *Cobalt*-60. The ACPR II would have 33.6 Curies of cobalt-60 in inventory (the ACRR and HCF would not have cobalt). The amount of cobalt-60 that the ACRR would have for DP testing is the same as the ACPR II - 33.6 Curies.

From the above comparison, the quantity of nuclear materials that would be in the inventory of the proposed action is within the quantities and activity levels analyzed in the SWEIS.

Explosives Inventory

The explosives inventory is the quantity of explosives on hand and associated with reactor operations. Similar to the nuclear materials inventory, the explosives inventory is of concern from a potential accident scenario. The quantity of explosives associated with both the ACPR II and the ACRR in the Expanded Operations Alternative is 500 grams each (the HCF would not have explosives). The explosives inventory of the ACRR operating in the DP configuration is also 500 grams. Consequently, this quantity is contained within the scope of the SWEIS.

Spent Fuel

Spent fuel is the residual material resulting from fuel consumption. There would not be an appreciable amount of residual material resulting from long-term DP operation of the ACRR. Consequently, spent fuel is not an issue.

Fission Products Inventory

Fission results in the production of by products, many of which are radioactive. Gases are potentially the most hazardous because they could potentially escape if an accident occurred. Noble and halogen gases were used in the analysis of impacts resulting from potential accident scenarios in the SWEIS because they are responsible for the dose to the public when mixed fission products are released by an accident. The accident scenario analyzed in the SWEIS and summarized in Appendix F assumed 150,000 Curies of noble and halogen fission products generated from the ACPR-II. The maximum release was determined from the nuclear inventory in the reactor. This amount does not change under the proposed action. For medical isotope production, additional inventories of fission products from 37 targets would be in the reactor at any given time. The analysis in the SWEIS of one target rupture in the reactor resulted in 3,500 Curies of noble and halogen gases released. For the proposed action, 3,500 Curies of noble and halogen fission products (mostly Xe-125) would be in inventory at any given time during a production run associated with the proposed isotopes production (mainly I-125). Because the quantity of noble and halogen fission products generated by the proposed action is less than the inventory in a single target analyzed in the SWEIS, this parameter is within the scope of the SWEIS.

The Expanded Operations Alternative for the HCF is 54,100 Curies in inventory at any given time; however, in an accident scenario involving the ACRR, the HCF would not be included in the impact analysis because of its distance from the ACRR. Consequently, the 54,100 Curies in the HCF was not included in the analysis comparison.

Waste – Radioactive

Radioactive waste generated at SNL/NM includes low-level waste (LLW), low-level mixed waste (LLMW), transuranic waste (TRU), and mixed transuranic waste (MTRU). Radioactive waste is characterized as either TRU or LLW, according to its radiological characteristics. Either type is considered mixed waste (MTRU or LLMW) if it also contains a Resource Conservation and Recovery Act (RCRA) hazardous waste component (see definition of hazardous waste that follows).

- *Low-level waste.* LLW is defined as waste that contains radioactivity and is not classified as high-level waste, transuranic waste, or spent nuclear fuel or by-product tailings containing uranium or thorium from processed ore. LLW generated at SNL/NM is shipped offsite for disposal. Under the Expanded Operations Alternative about five cubic feet, 1,090 cubic feet, and 5,000 cubic feet annually were forecast and analyzed for the ACPR II, ACRR, and HCF respectively, for a total of 6,095 cubic feet. Under the proposed action about 8.3 cubic feet of LLW would be produced. This increase of 3.3 cubic feet is substantially within the estimated 6,095 cubic feet of LLW that would be produced by reactor operations under the Expanded Operations Alternative and represents about 0.0003 percent of the cumulative 10,220 cubic feet of radioactive waste used in the analysis of selected facilities in the SWEIS.

- *Low-level mixed waste.* LLMW is waste that contains both LLW and hazardous waste that is regulated under RCRA (see definition of hazardous waste that follows). Some LLMW is treated at SNL/NM. LLMW for which there is no treatment is shipped offsite for treatment and disposal. Under the Expanded Operations Alternative about 170 cubic feet were forecast to be generated annually by the ACPR II, none for the ACRR, and 40 cubic feet for the HCF. The amount of LLMW estimated to be generated by the proposed action is increased to about 270 cubic feet since the number of campaigns generating this waste would be increased from two or three to four or five. This increased amount is within existing onsite mixed waste treatment and storage capabilities. Permitting limits would not be exceeded. The additional 60 cubic feet of LLMW is approximately 0.005 percent of the cumulative 10,220 cubic feet of radioactive waste that was estimated to be produced annually by the Expanded Operations Alternative. This amount would not change environmental consequences and would remain within the scope of the SWEIS.

- *Transuranic waste.* TRU is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years. Transuranic isotopes are those elements having an atomic number greater than that of uranium (90). TRU wastes are stored onsite. The quantity of TRU production forecast under the Expanded Operations Alternative was five cubic feet for the ACPR II and none for the ACRR and HCF. The amount of TRU waste estimated to be generated by the proposed action is also increased to about 8.3 cubic feet since the number of campaigns generating this waste would be increased from two or three to four or five. This TRU waste generated by the proposed action would be stored onsite with existing TRU waste for subsequent transferal to Los Alamos National Laboratory for certification, and then disposed of at the Waste Isolation Pilot Project (as indicated in the 1998 ROD for the Waste Management Programmatic Environmental Impact Statement). The quantity of TRU waste that would be produced by the proposed action is 3.3 cubic feet greater than that estimated for the ACPR II in the Expanded Operations Alternative. This small amount can be accommodated within existing storage capabilities. This additional amount of waste represents about 0.0003 percent of the estimated 10,220 cubic feet of radioactive waste that would be produced annually by the Expanded Operations Alternative and was analyzed in the SWEIS for selected facilities at SNL/NM. This amount would not result in any changes to environmental effects and would remain within the scope of the SWEIS.

- *Transuranic mixed waste.* MTRU is waste that contains both TRU and hazardous waste and is regulated under RCRA (see definition of hazardous waste that follows). The quantity of MTRU production forecast under the Expanded Operations Alternative was five cubic feet for the ACPR II and none for the ACRR and HCF. As with all waste production the estimated amount of MTRU that would be generated by the proposed action is increased to about 8.3 cubic feet because of the increased number of campaigns. The additional 3.3 cubic feet of MTRU represents about 0.0003 percent of the 10,220 cubic feet of radioactive waste that was estimated to be produced annually by the Expanded Operations Alternative. This amount would not change environmental consequences and would remain within the scope of the SWEIS.

<u>Waste – Hazardous</u>

Hazardous waste is any solid waste (definition includes semisolid, liquid, or gaseous material) having the characteristics of ignitability, corrosivity, toxicity, or reactivity as defined by RCRA. The hazardous waste generated at SNL/NM is predominantly chemical laboratory trash generated from experiments, testing, other research and development activities, and infrastructure fabrication and maintenance. Hazardous waste is shipped offsite for disposal. The quantity of hazardous waste production forecast under the Expanded Operations Alternative was 14 cubic feet for the ACPR II, 30 cubic feet for the ACRR, and 22 cubic feet for the HCF. Approximately 23.3 cubic feet of hazardous waste is forcast to be generated by the proposed action due to the increased number of campaigns. This quantity is within the scope analyzed in the SWEIS.

Radioactive Air Emissions

As analyzed in the SWEIS, ten sources at SNL/NM contribute to the air emissions that in combination produce an annual effective dose equivalent (EDE) to the maximally exposed individual of 0.51 mrem/yr and an annual 50-mile population collective dose of 15.8 person-rem. The primary radionuclides of concern from reactor operations and the HCF are argon-41 (Ar-41), tritium (H-3), and isotopes of iodine, krypton, and xenon. The annual contribution of Ar-41 projected from the ACPR-II under the Expanded Operations Alternative was 7.8 Curies. The annual contribution of Ar-41 and H-3 from the ACRR was 2.2 Curies each. The annual contributions of iodine, krypton, and xenon from the HCF are listed below. The annual EDE resulting from these emissions from the ACPR-II, ACRR, and the HCF was 0.0013, 0.00042, and 0.50 mrems respectively. The emissions contributed by activity level of the proposed action operating in the DP configuration is forecast to be about 13 Curies of Ar-41 and about 390 Curies of Ar-41 when operated to produce radioisotopes (generally for iodine) and to support other nuclear research programs. The annual EDE resulting from these forecast emissions is 0.08 mrem. Comparing the annual EDE of 0.08 mrem forecast for the proposed action with the total of 0.50172 mrem resulting from the three facilities presented under the Expanded Operations Alternative (0.0013 + 0.00042 + 0.50 = 0.50172) demonstrates that the EDE that would result from the proposed action is well within the EDE described and analyzed in the SWEIS.

	Radionuclide	Expanded Operations (Ci/yr)	Proposed Action (Ci/yr)
ACPR-II	Ar-41	7.8	(ACRR-DP) 13.0
ACRR	Ar-41	2.2	(ACRR-Isot) 390.0
	H-3	2.2	0.0
HCF	Iodine-131	3.9	0.0
	Iodine-132	10.0	0.0
	Iodine-133	18.0	0.0
	Iodine-134	0.72	0.0
	Iodine-135	11.0	0.0
	Krypton-83m	660.0	0.0
	Krypton-85	0.63	0.0
	Krypton-85m	970.0	0.0
	Krypton-87	190.0	0.0
	Krypton-88	1600.0	0.0
	Xenon-131m	5.9	0.0
	Xenon-133	7200.0	0.0
	Xenon-133m	340.0	0.0
	Xenon-135	6900.0	0.0
	Xenon-135m	1200.0	0.0

Process Water Consumption

Water for use at SNL/NM facilities is obtained from groundwater via wells. The annual quantity of water projected to be consumed for the ACPR II, the ACRR, and the HCF under the Expanded Operations Alternative was 100,000 gallons, 11,000,000 gallons, and zero gallons respectively, for a total of 11,100,000 gallons. The quantity projected to be consumed by the proposed action is 200,000 gallons. This quantity is well within the scope analyzed in the SWEIS.

Process Wastewater

Process wastewater is water resulting from use in reactor operations. The annual quantity of wastewater that was projected to be generated for the ACPR II, the ACRR, and the HCF under the Expanded Operations Alternative was 50,000 gallons, 2,190,000 gallons, and zero gallons respectively, for a total of 2,240,000 gallons. The quantity of wastewater that is forecast to be generated by the proposed action is the same as the ACPR II - 50,000 gallons. This quantity is well within the scope analyzed in the SWEIS.

Staffing

The number of personnel that would be required to operate the ACPR II, the ACRR, and the HCF under the Expanded Operations Alternative was 8, 22, and 55 respectively, for a total of 85. The number that would be required to operate the ACRR under long-term testing is 15. This number is within the scope analyzed in the SWEIS.

COMPARISON MATRIX
(annual estimates)

Impact Assessment Parameter	Proposed Action	SWEIS Expanded Operations ACPR-II[1]	SWEIS Expanded Operations Isotope Production[1]		Comment
			ACRR	**HCF**	
Reactor Operations – Pulse Mode and Steady State	4 to 5 campaigns, 10-15 short-term tests, and 950 hrs steady-state operation@2MW	2 to 3 campaigns[2]	1,300 targets irradiated 8,400 hrs steady state operations @4MW[3]	1,300 targets[3] not applicable	Parameters within the scope of SWEIS
Nuclear Fuel Consumption – Enriched Uranium	50 grams	2 grams	16,000 grams	-0-	Parameter within the 16,002 gram scope of SWEIS
Nuclear Materials Inventory - enriched uranium - plutonium-239 - cobalt-60	 85 kilograms 8,800 grams 33.6 Curies	 85 kilograms 8,800 grams 33.6 Curies	 56.7 kilograms -0- -0-	 0.125 kilograms -0- -0-	Parameters within scope of SWEIS
Explosives Inventory	500 grams	500 grams	500 grams	-0-	Parameter within 1,000 gram scope of SWEIS
Spent Fuel	Negligible	N/A	399 kilograms	-0-	Not an issue
Fission Products Inventory	153,500 Curies	150,000 Curies[4]	3,500 Curies[5]		Parameter equal to 153,000 Curie scope of SWEIS
Waste – Radioactive - Low Level - Low Level Mixed - Transuranic - Transuranic Mixed	 8.3 cubic feet 270 cubic feet 8.3 cubic feet 8.3 cubic feet	 5 cubic feet 170 cubic feet 5 cubic feet 5 cubic feet	 1,090 cubic feet -0- -0- -0-	 5,000 cubic feet 40 cubic feet -0- -0-	 Parameter within 6,095 cubic foot scope of SWEIS Parameter within 10,220[6] cubic feet of radioactive waste analyzed in SWEIS. Parameter within 10,220 cubic feet of radioactive waste analyzed in SWEIS. Parameter within 10,220 cubic feet of radioactive waste analyzed in SWEIS.
Waste – Hazardous	23.3 cubic feet	14 cubic feet	30 cubic feet	22 cubic feet	Parameter within 66 cubic foot scope of SWEIS
Radioactive Air Emissions (effective dose equivalents)	0.08 mrem[7]	0.0013 mrem[8]	0.00042 mrem[8]	0.50 mrem[8]	Parameter within 0.50172 mrem scope of SWEIS
Process Waste Water	50,000 gallons	50,000 gallons	2,190,000 gallons	-0-	Parameter within 2,240,000 gallon scope of SWEIS
Process Water Consumption	200,000 gallons	100,000 gallons	11,000,000 gallons	-0-	Parameter within 11,100,00 gallon scope of SWEIS
Staffing	15 full time	8 full time	22 full time	55 full time	Parameter within 85 person scope of SWEIS

[1]Unless otherwise noted, figures are derived from SWEIS, Chapter 3, Table 3.6-1, pages 3-35 through 3-37.
[2]SWEIS, Chapter 3, Section 3.3.4.4, page 3-18.
[3]SWEIS, Chapter 3, Section 3.3.4.5, page 3-19.
[4]SWEIS, Appendix F, Accident AR-5.
[5]Environmental Impact Statement for Medical Isotopes Production Project: Molybdenum-99 and Related Isotopes, Table 5-22, page 5.48.
[6]SWEIS, Chapter 3, Table 3.6-2, page 3-45
[7]Sandia National Laboratories letter dated March 16, 2001 from Joe Guererro to Sharon Walker, subject: Information Sheet for the Supplemental Analysis for the Annular Core Research Reactor (ACRR) Long Term Pulse Mode Testing at Sandia National Laboratories, New Mexico for Defense Programs (DP).
[8]SWEIS, Chapter 5, Table 5.4.7-5, page 5-119 (summary of these estimates).

CONCLUSION

DOE has not identified any other differences in parameters relevant to the analysis of environmental impacts between the proposed reestablishment of DP testing at the ACRR and the actions analyzed in the SWEIS for the Expanded Operations Alternative. The scope of the proposed federal action has not changed (in ways that would significantly affect human health or the environment) from the scope of proposed reactor actions described in previously cited NEPA documentation.

Impacts of the proposed activity have been bounded by the impacts analyzed in the SWEIS, and no further NEPA review is considered necessary for proposed ACRR activities described. Reliance on the information presented for the operation of the two reactors described in the SWEIS is reasonable, and this information was publicly disclosed. The information used in the SWEIS is also up to date. Any changes in approaches in the proposed action have been identified in this SA.