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Siting GNEP at the Savannah River Site: Using Legacy and Infrastructure in a Commercial Energy Park Concept

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ABSTRACT

The Savannah River Site (SRS) was proposed as one of eleven potential sites to be included in the U.S. Department of Energy Programmatic Environmental Impact Statement (PEIS) for the Global Nuclear Energy Partnership (GNEP) program. The approach to meet siting and infrastructure requirements for possible GNEP facilities at the SRS focused on available infrastructure including land, cooling water systems, high voltage power supplies, existing heavy haul roadways, existing analytical capabilities, and existing waste handling capabilities. Additional siting criteria and existing SRS capabilities and conditions were developed to locate the GNEP within a commercial Energy Park contained within, but separate from, the SRS. Included as part of, or corollary to, existing infrastructure at the SRS was the availability of a nuclear trained workforce living within the area.

The SRS consists of approximately 803 square kilometers (310 square miles) in the Upper Atlantic Coastal Plain of South Carolina bordering along the Savannah River. Historic production reactors, processing, and laboratory facilities are currently being decommissioned and destroyed while new facilities such as the MOX facility are being built. Existing legacy infrastructure, beneficial to the potential GNEP facilities, continues to exist and operate. The SRS has a long history of processing, reprocessing and in the disposition of nuclear fuels and byproducts continuing through today with H-Canyon as the only DOE facility currently capable of uranium reprocessing. Because of ongoing operations and maintenance of historic systems, SRS has existing infrastructure immediately available for GNEP facilities in or near the proposed Energy Park. The Energy Park location was chosen to achieve maximum use of this legacy infrastructure.

INTRODUCTION

In August 2006, the U.S. Department of Energy (DOE) sought applications from eligible entities to perform detailed siting studies of prospective locations to host one or both anticipated Global Nuclear Energy Partnership (GNEP) facilities. The Central Savannah River Area Community Team (CSRA Team) proposed siting both facilities at an Energy Park located on the Savannah River Site (SRS) near Aiken, South Carolina.[1] The principal theme for siting GNEP facilities at the SRS revolved around the fact that SRS was an operational facility with well characterized land suitable for the GNEP program and that existing infrastructure at the site could be used to lower overall GNEP costs and accelerate the construction to operation timetable.

The data obtained and analyzed during the study demonstrated clearly that available infrastructure and site characteristics of an Energy Park on SRS are very well suited for all GNEP facilities. The combination of the SRS, its infrastructure, and an Energy Park within the SRS provides DOE with flexibility for meeting the GNEP objectives of constructing and operating full-scale the Nuclear Fuel Recycling Center (NFRC) and Advanced Recycling Reactor (ARR) facilities in a timely, cost effective, and environmentally safe manner. By siting GNEP facilities in an Energy Park DOE has the option to operate the facilities in either a DOE-owned or commercial-like structure. Important benefits of the SRS Energy Park are:

- An Energy Park on SRS exceeds DOE GNEP siting requirements for size, hydrology, electricity capability, population density, zoning, road access, seismic stability, and water access. GNEP facilities exceeding 3,000 MTU/year and 2,000 MWt (ARR) can be confidently sited.
- For many years SRS has constructed and operated nuclear reactors and fuel processing facilities on a scale larger than that proposed for the GNEP facilities. These existing programs and facilities have been successfully permitted by federal and state regulatory agencies, and provide a high degree of confidence that GNEP facilities can be readily licensed and permitted.
- The Nuclear Regulatory Commission (NRC) has reviewed a location for an Energy Park on SRS as the site for a commercial nuclear power plant. In addition, electric utilities have reviewed the same location for siting other nuclear power reactors. In all instances the proposed location met regulatory and operating requirements.
- The SRS is in close proximity to the GNEP customer base. Over one-half of U.S. reactors are within one day transport of SRS, thereby expediting shipment and receipt of spent nuclear fuel (SNF) and fresh fuel. In addition, there is a large and growing market in the southeast for electrical energy produced by the ARR reactor.
- There is a positive attitude toward nuclear energy in South Carolina and the areas surrounding SRS. State government is on record as supporting new nuclear power plants. The communities and citizens surrounding SRS strongly support DOE activities at SRS.
- GNEP facilities can make use of existing SRS infrastructure to reduce capital and operating costs and accelerate program schedule. Major items of potential interest include process water supply, sanitary water and sewer, railroad, environmental monitoring, emergency preparedness, medical, and technical support. Waste management, including radioactive wastes, is another SRS capability which may be of considerable value to the success of the GNEP program. Facility ownership (federal vs. commercial) may influence the mechanisms for accessing SRS infrastructure and resources.

In addition to the benefits of the SRS and existing infrastructure an actual operating scenario is developed to allow the GNEP program to take maximum advantage of SRS capabilities in the timely and cost effective conduct in the development, construction, and operating phases.

Conceptual Description of SRS and an Energy Park

The use of a private sector Energy Park located on SRS as the site for GNEP activities including the NFRC and ARR required the development of a conceptual model for potential permitting and licensing activities. This model was necessary to adequately describe to the DOE the approach taken, but also to analyze the siting needs for a commercial energy park located within a DOE facility. Fig. 1 shows this model. In this model, the necessary infrastructure required under any GNEP design scenario can be visualized and compared to existing legacy infrastructure at the SRS. Modifications, upgrades, or direct use of existing facilities can be compared to potential GNEP requirements and more accurate cost estimates made.

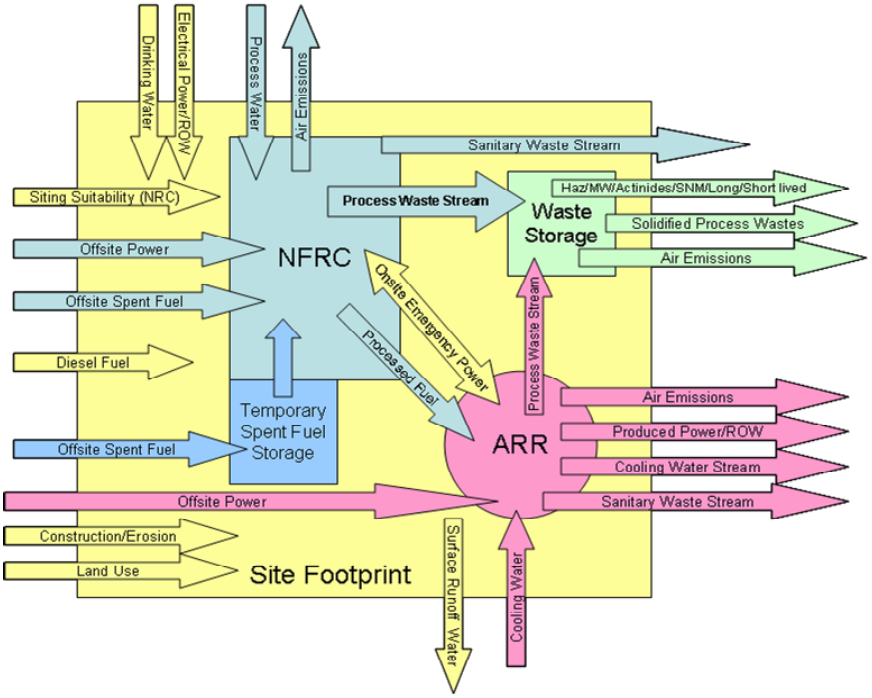

Fig. 1. Conceptual diagram showing inputs and outputs necessary to analyze the siting, licensing, and permitting activities required for a commercial Energy Park at the SRS.

The Energy Park will be located on lands wholly within the perimeter of the SRS which will be leased by DOE to a regional entity. Facilities within an Energy Park would be operated by commercial entities, federal entities, or private/public partnerships. By letter dated July 28, 2005, DOE authorized discussions with entities regarding land lease arrangements at SRS. Negotiation of a Memorandum of Understanding, which provided the basis for establishing a private sector Energy Park on SRS, is currently nearing completion.

An Energy Park will be operated in a commercial environment and GNEP-performing organizations will be able to use and apply their commercial nuclear and other construction practices. Nuclear activities in an Energy Park will be subject to NRC requirements, thereby more closely achieving DOE's objectives for large-scale commercial demonstration of GNEP technologies and facilities. In addition to federal requirements, the licensing and permitting requirements for GNEP under the South Carolina Department of Health and Environmental Control can also be determined from the model. An Energy Park will allow DOE and commercial entities to capitalize on many positive SRS attributes which make it well suited for nuclear activities, including:

- A large contiguous secure land mass which offers a significant buffer between nuclear activities and the general public.
- Geology, hydrology and ecology which are well characterized and favorable to nuclear activities.
- A location in the midst of the fast growing southeast economic and population centers. The nation's nuclear renaissance is taking place in our region, and ample and growing markets exist for electrical energy produced by the ARR.

Many existing SRS support facilities can be used during the construction and operation phases saving the expense of duplicating such facilities. The availability of highly qualified personnel in the region provides opportunities to use existing resources rather than training new personnel or obtaining contracted services which slow project execution. By locating the facilities in an Energy Park, DOE can take advantage of a commercial operating environment and the benefits resulting from an existing, full-scale, modern nuclear infrastructure on the SRS.

The Energy Park location (Fig. 2) at SRS has previously been evaluated for the siting of new nuclear facilities including:

- The July 2006 Draft EIS for an Early Site Permit at the Dominion North Anna ESP Site (NUREG-1811).
- DOE Accelerator Production of Tritium Facilities (DOE/EIS-0270, March 1999).
- The NuStart Energy Development, LLC potential site.
- The Dominion Energy consortium potential site.
- South Carolina Electric and Gas in partnership with Santee-Cooper potential site.

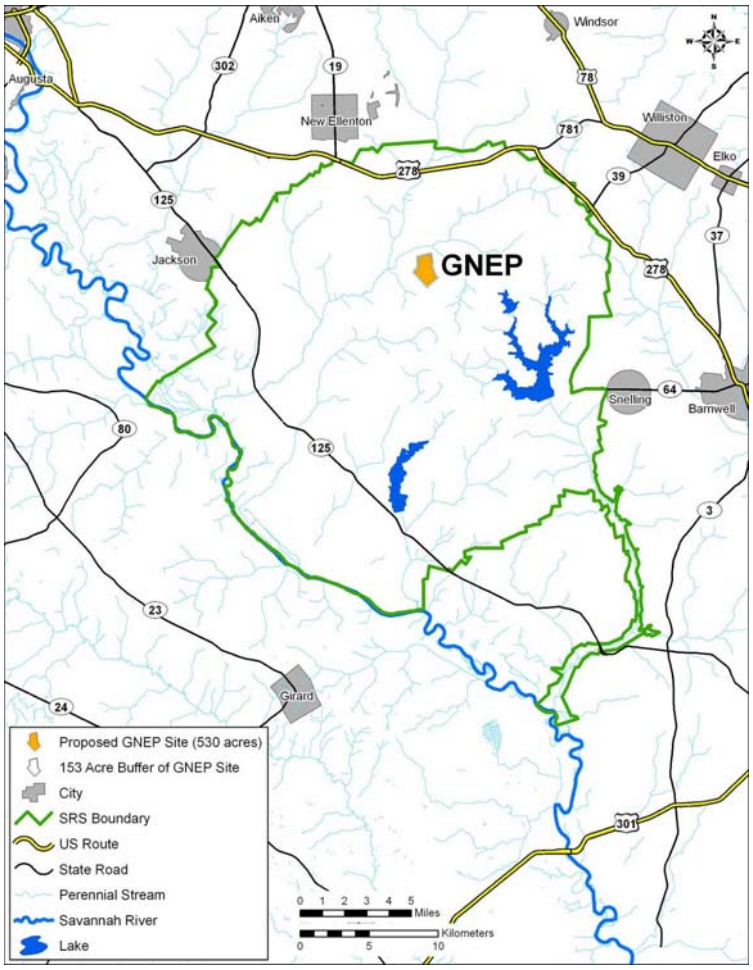

Fig. 2. Location of the Energy Park site within the SRS. GNEP can be constructed within the Energy Park site.

Also supportive of an SRS Energy Park location for GNEP are other historical large scale characterization activities including:

- The New Production Reactor.
- The Mixed Oxide Fuel (MOX) Fabrication Facility (MFFF).
- The Pit Disassembly and Conversion Facility (PDCF).
- The Waste Solidification Facility (WSF).
- The Salt Waste Processing Facility (SWPF).

GNEP Facility Description and Siting Requirements

In order to adequately assume the siting requirements for GNEP facilities within a commercial style Energy Park at the SRS, assumptions about facility design and requirements were necessary. These assumptions, including possible variations, were included in the conceptual model and are discussed below. The GNEP program for the U.S., as currently defined by DOE, has not specified facility designs, quantities, or processes. The initial facilities proposed for the United States GNEP program are:

- An NFRC - to separate the usable components contained in spent fuel from its waste products as well as fabricate actinide based fuel for the advanced recycling reactor.
- An ARR - to burn the actinide based fuel to transform the actinides in a way that makes them easier to store as waste and produces electricity.
- An Advanced Fuel Cycle Research Facility - to provide an R&D center of excellence for developing transmutation fuels and improving fuel cycle technology.

The GNEP siting studies involve only the first two facilities, the NFRC and ARR, but our Energy Park evaluations allowed for the potential inclusion of all facilities. Several assumptions were required including:

- Facility descriptions are based on DOE's program statements and some general knowledge from worldwide operating experience. This experience is based on available information for facilities using current available technology.
- It is assumed that the stringent NRC licensing guidance for new power reactors will envelope all siting, construction, and operating criteria for both the ARR and NFRC (the siting criteria for the MOX facility at SRS, performed under NRC guidelines, were very similar to current power reactor siting criteria).
- Private/commercial ownership of the NFRC and ARR facilities is assumed. If DOE ownership is adopted, some NFRC/ARR capabilities can be deleted and existing SRS infrastructure used.

Assumptions for the NFRC include an industrial facility that will treat and separate used fuel constituents into reusable and waste components. The NFRC will support two of the three key components of a used fuel recycling program:

- Separate light-water reactor SNF and fast reactor SNF into their reusable and non-reusable constituents. The UREX+ separation process is assumed.
- It will fabricate actinide/transuranic-based fuel for use in the destruction of transuranic elements in a fast reactor (the advanced recycling reactor). The process to fabricate ARR fuel has not been developed, and a ceramic-based fuel is assumed.
- For the purposes of this report for siting the NFRC at an Energy Park on SRS, we have assumed the NFRC will be rated at 3,000 MT per year.

Following are the main functions, modules, and process steps that could be envisioned for an NFRC:

- Fuel Receipt and Queuing – This module ensures safe receipt and handling of used fuel received from commercial nuclear power reactors.
- Shearing-Dissolution-Compaction – This module performs the front-end of the process by (1) shearing the used fuel bundles to provide access to the fertile material and (2) using dissolution liquors to remove the nuclear material present from the used fuel rods. The structural elements of the used fuel, such as end-fittings and cladding, are rinsed then compacted.
- Separation-Purification-Concentration – This building does the separation of the recovered nuclear materials into three separate process streams: (1) Uranium for recycling into fresh fuel for conventional reactors (2) transuranics/actinides for fabrication into a new fuel for use in Advanced Burner Reactors (with purification and concentration steps) and (3) conditioning of waste products into a stable form for storage and disposal (after a concentration step).
- Conversion and Fuel Production – This module converts the liquid stream of elements which will be used to produce new fuel for the ARR in an oxide or metal form. From there, the fuel is manufactured in the same building.
- High Level Waste Production – This sub-facility is where the high level waste stream is conditioned into a suitable matrix for permanent disposal.
- "Decay storage" waste – Sub-facilities to place 30 year half-life radioactive waste into a form suitable for 300 year storage and a storage facility suitable for storing this waste for 300 years.
- Low level radioactive, mixed waste, transuranic (TRU) wastes, and non-radioactive waste streams – These wastes will be treated into a form that is suitable for permanent disposal at another location.
- High Level Waste Cooling – Sub-facility to hold high level waste that needs to decay heat until it becomes suitable for acceptance to an optimal transportation path to a geological repository.
- Balance of Plant Facilities.

The ARR is a fast neutron spectrum reactor that will be capable of converting long-lived radioactive elements (e.g., plutonium and other transuranics) into shorter-lived radioactive elements with reduced total toxicity while producing electricity. The DOE anticipates that the reactor used will be the Sodium-Cooled Fast Reactor (SFR) system that features a fast neutron spectrum and a closed fuel cycle for efficient management of actinides and conversion of fertile uranium.

Taking into account the lack of facility design data cited earlier, the main components of the ARR are assumed to be:

- Reactor Building - contains the nuclear island and its associated auxiliary systems, along with the fuel component handling equipment, fuel decontamination facilities, and storage for new and used fuel. The reactor building will be designed to prevent the release of radioactivity and to provide radiological shielding.
- Steam Generator Building – contains steam generators.
- Auxiliary Building – contains nuclear island component cooling systems and the reactor building HVAC system.
- Turbine Generator Building – contains turbines and generators to produce electricity. The turbine generator building is connected to the steam generator building by feed water and main steam lines.
- Switchyard & Transmission lines – contains components to transfer electricity to the power grid.

- Auxiliary Building and balance of plant facilities.

For the purposes of this report for siting the ARR at an Energy Park on SRS, we have assumed the ARR will be sized at 2,000 MWt. An Energy Park at SRS is suitable for more than one ARR operating at the maximum 2,000 MWt capacity. Sufficient seismically and environmentally qualified land is available for multiple power production reactors. An Energy Park site was found suitable as an alternative site for both the North Anna and NuStart commercial power reactors. Cooling water for the ARR will depend on the final design selected, however, SRS can provide up to six million gallons per day from groundwater and/or an additional 75700 cubic meters (20 million gallons) per day from the existing river water supply system. Existing and maintained cooling canals and lakes (heat sinks) exist at SRS with the capacity to support the ARR.

DOE Minimum Site Criteria

The Energy Park on the SRS exceeded the required DOE siting criteria and is a fully qualified and suitable location for the GNEP activities, including the NFRC and ARR. DOE's basic siting requirements were met by the following Energy Park criteria:

- A total in excess of approximately 5 contiguous square kilometers (1,200 acres) is available on SRS and in an Energy Park for siting both GNEP facilities, and the potential for expansion to 8 square kilometers exists.
- The elevation of the site is 91 to 100 m (300 to 330 ft) above mean sea level. The SRS surface hydrology is well characterized and routinely monitored both by DOE and the U.S. Geological Survey. All of the acreage in the proposed site is above the 100 year flood plain.
- Both 115 and 230 kilovolt power transmission lines and a buried super-control and relay cable cross the proposed GNEP location. There is adequate power for construction and operation of GNEP facilities and routing of any produced power. The Right-of-Way for the existing power lines may be expanded for additional load capacity.
- Using the latest Census data, the population density, including weighted transient population, averaged over any radial distance out to 32 kilometers (20 miles) does not exceed 315 persons per square kilometer. The average population density in the counties surrounding the site is approximately 53 persons per square kilometer (85 persons per square mile).
- The proposed GNEP site lies within the SRS and is wholly federally owned. Land for an Energy Park will be permitted to a CSRA regional entity for commercial heavy industrial use, and will be controlled by the permit with DOE. All minerals and subsurface rights belong to DOE. There are no environmental set-asides, remediation sites, cemeteries, endangered species areas, or other long term designated land withdrawal sites within an Energy Park.
- South Carolina State Highway 125 and U.S. Highway 278 are the primary public roadways transecting SRS. Both are two lane highways with routine commercial traffic. U.S. Highway 278 lies within 7.2 kilometers (4.5 miles) of the proposed GNEP site and is capable of handling 36,300 kilogram (80,000 lb) gross vehicle weight traffic with adequate axle and wheel considerations. SRS is interlaced with public and DOE roadways which are maintained to support ongoing and future mission operations. An on-site heavy-duty construction access road originates at a barge dock on the Savannah River and terminates within two miles of an Energy Park. There is also rail access on SRS.

Energy Park Siting Requirements

There are minimal siting requirements associated directly with establishing an Energy Park on SRS. An Energy Park will consist of up to 8 square kilometers (2,000 acres) of land (expandable), access roads to

public highways, interior roads to individual sites, tie-in to commercial communication systems (telephone and fiber optic), sanitary water/sewer and electric power to an Energy Park substation. Communications, water/sewer and electric power will be sized to meet the "household" requirements for an estimated Energy Park population of 5,000 persons. Park tenants, such as GNEP, will provide the specialized infrastructure required for its specific processes.

The DOE Savannah River Operations Office (DOE/SR) has, by letters of August 31, 2006 and April 11, 2007 stated that it will make SRS lands available for an Energy Park to support GNEP facilities, including right-of-ways for transportation and utility corridors. DOE/SR has further stated that they will impose no requirement on GNEP activities located in an Energy Park other than adherence to the requirements of Federal, State and Local law and regulation.

DOE lease of lands for an Energy Park will be reviewed under the National Environmental Policy Act (most likely an Environmental Assessment). It is anticipated that the access road(s) to an Energy Park will require the most attention – potentially traversing wetlands and areas in proximity to rare and endangered species and cultural resources. These NEPA concerns will be mitigated by assessing alternate road corridors.

At DOE's option there are many opportunities to use existing SRS infrastructure for support of GNEP facilities in an Energy Park. Utilization of SRS infrastructure will require additional easements between an Energy Park and SRS for items such as access roads, utility corridors and a railroad spur.

The SRS environmental program operates under an Environmental Management System (EMS) that conforms to all DOE federally mandated metrics. Additionally, SRS has been third-party certified to conform to International Standard (ISO) 14001 "Environmental Management System", Executive Order 13148, "Greening of Government Through Leadership in Environmental Management"; and DOE Order 450.1, "Environmental Protection Program." These existing programs can be used for Energy Park and GNEP development.

GNEP in an Energy Park at SRS Operating Scenarios

It is the policy of the DOE that all activities at SRS are carried out in full compliance with applicable federal, state, and local environmental laws and regulations, and with DOE Orders, notices, directives, policies, and guidance. This will continue with all proposed GNEP activities operating under DOE and DOE/Commercial auspices, and will be the guideline for all commercial operations within SRS. Compliance with environmental regulations and with DOE Orders related to environmental protection is a critical part of the operations at SRS and will be so for GNEP facilities at SRS.

Assuming the GNEP facilities will be operated as a commercial entity, it is conservative to estimate that all required permits will be issued as new applications rather than as modifications to existing SRS permits. All needed permits described in the sections above are considered likely to be required to ensure similar compliance levels to those already existing at SRS. Minor exceptions are possible (for example, if GNEP chooses to use an extension of SRS's domestic and Sanitary Wastewater systems); however, these exceptions should not increase the difficulty of securing of permits. Using SRS domestic and sanitary permits is similar to new commercial and industrial parks "hooking on" to pre-existing community water and sewer systems.

Ownership of GNEP facilities can have an impact on the evaluation of siting criteria. Ownership or control by the federal government allows the potential for ready access to existing DOE infrastructure with construction and operating cost savings, thereby increasing the value of locating GNEP facilities on a DOE site. This advantage must be evaluated against the desire to operate the GNEP facilities in a 'near-

commercial-like' business situation. Near-commercial operation can be achieved at either DOE or non-DOE locations.

There are three broad options for ownership of GNEP facilities: (1) public, (2) private commercial and (3) private not for profit. Included in these options are the establishments of public/private partnerships. There are many implications associated with this form of ownership, including capital and operating costs, schedule, and achievement of program objectives. All envisioned forms of ownership can be accommodated in an Energy Park on SRS. In all ownership cases, it is assumed that the facilities will be licensed by the NRC (note: The MOX facility on SRS is precedent for an NRC-licensed facility being owned by DOE, located on a DOE site and utilizing host site infrastructure).

Part of the GNEP vision is that the NFRC and ARR are commercial facilities, which can be adopted directly and deployed by the commercial nuclear industry. Operating the NFRC and ARR in a commercial-like manner directly supports this objective. Commercial-like operation implies (1) private sector ownership and operation of the NFRC and ARR facilities and (2) operation in a 'stand-alone' mode with contracted support limited to that expected to be available at commercial nuclear sites.

Federal ownership of the GNEP facilities may potentially ease the treatment and storage of radioactive wastes. If the GNEP facilities have federal ownership, all of the SRS waste treatment and disposal capabilities are available to support GNEP operations. To the extent that existing SRS capabilities are used to support GNEP activities, construction and operating cost savings will result. The Atomic Energy Act places restrictions on DOE receipt of radioactive waste from non-federal government facilities/operators. Unless specific legislative provisions are enacted, radioactive waste from commercially owned GNEP facilities must be treated in the GNEP facilities and disposed using commercial facilities (low level and mixed waste) or the National Repository (high level waste). These wastes could not be transferred to SRS and utilize existing treatment and disposal facilities (e.g. low level waste burial ground, TRU treatment/packaging).

The GNEP facilities include a 'decay-storage' strategy for management and disposal of some radioactive wastes (wastes with 30 years or longer half-life). Storage of these wastes for 10 half-lives with subsequent disposal as a low-level radioactive waste is being considered. Establishment and permitting of this storage capability may be difficult. An option may be for the GNEP owner to contract with DOE for storage services (title to waste remains with the commercial entity).

Construction and Operating Costs: There are three primary cost implications associated with this form of ownership for GNEP facilities:

- Private ownership may place the facilities on the local tax roles. However tax liability will probably be significantly mitigated by (1) negotiation of special tax rates and other state/local incentives and (2) the imputed value of basic infrastructure provided by others in an Energy Park
- Capital and operating costs for radioactive waste management will be lower with Federal ownership. GNEP facilities will be able to use existing SRS capabilities instead of constructing/operating their own.
- The cost of other contracted SRS services will be slightly higher if GNEP facilities are not federally owned (the DOE added factor for support to non-governmental entities). GNEP facility operators will make a business decision on (1) which services to provide in-house vs. contracted, and (2) contracting for SRS services vs. contracting with another vendor.

The DOE can achieve significant time and cost advantages and reduce technology risk by fully utilizing SRS capabilities in support of GNEP program objectives. The purpose of this section is to briefly

describe how SRS capabilities can support all aspects of the GNEP program, development, construction and operations.

Under a potential construction and operations scenario the benefits of a Commercial Energy park at the SRS include:

1. The availability of F Canyon (currently deactivated but capable of being restarted) and H Canyon (active) provide flexible facilities to (1) develop and test individual items of equipment and (2) test and prove large-scale integrated systems using radioactive wastes. This capability does not exist anywhere else in the DOE Complex.
2. SRS has unique water supply resources to provide process and cooling water for the ARR and NFRC with minimal impact on Savannah River water quality and water usage. Major features of the existing SRS reactor cooling water system as proposed for GNEP include:
   - River water system. This system is within 2,400 meters (8,000 feet) of an Energy Park and has the capacity of pumping over 3000 cubic meters (800,000 gallons) per minute – sufficient for multiple ARR reactor units.
   - Ample supplies of groundwater exist to supplement/replace requirements for water from the Savannah River. Current SRS ground water usage is 13,250 cubic meters (3.5 million gallons) per day, down from a peak usage of 41,000 cubic meters (10.8 million gallons) per day in the 1980s.
   - Two reactor secondary water cooling ponds exist on SRS. The largest pond can operate in a recirculating mode, with overflow/discharge via surface streams to the Savannah River. The second cooling pond is a once-through with discharge to the Savannah River. The largest pond has capacity to cool water discharges from 5,000 MWt heat sources. An Energy Park can be tied into the cooling ponds allowing for water discharge with a minimum of evaporative losses.

   By using this unique water management infrastructure, GNEP facilities can operate with little or no impact to the Savannah River. Water quality can be maintained and water losses will be minimized.
3. Over one-half of U. S. reactors are within one-day transport of an Energy Park within SRS, facilitating receipt of SNF and shipment of fresh fuel. Approximately 20 new nuclear power reactors are planned for the southeast region.
4. An Energy Park location is within 8 miles of an existing 230 kV transmission line and within 25 miles of an existing 500 kV transmission line. Rights of way capable of being upgraded currently exist between these regional transmission circuits and an Energy Park. Local utilities have indicated interest in either (1) obtaining an equity position or (2) establishing a purchase power agreement for nuclear plants located on SRS.
5. Additional immediate and operational infrastructure benefits of the Energy Park at SRS include:
6. SRS has experience in supporting large and complex construction activities. Its past experience-base includes over 6,000 construction personnel on-site performing multiple nuclear projects simultaneously. This level of activity is directly relatable to expected GNEP construction activity.
7. There are many infrastructure programs which are available for use by the GNEP program. Use of existing capability will save both construction and operating funds. The following is an expanded listing of infrastructure of potential value to the GNEP program:
   - Established Energy Park 36,300 kilogram (80,000 lb) access road from Hwy 278 along existing SRS Road 2-1-1 ands E-2 (8540 m, 28000 feet).
   - Maintained commercial control corridor (457 m, 1500 ft) on either side of an Energy Park access roadways.

- Utilize 115Kv power line through energy park for site power supply (exists on Energy Park site).
- Developed upgradient well field in Cretaceous aquifers for freshwater supply for processing at NFRC and make-up water for ARR. There are existing regional test wells within 914 m (3000 ft).
- Use site water supply system for domestic use water for NFRC and ARR. Tie in to S/Z areas along existing roadway at a distance of only 2440 m (8000 ft) away.
- Use site sewer system for NFRC and ARR. Tie in to S/Z areas along existing roadway at a distance of only 2440 m (8000 ft) away.
- Extend SRS rail line "Main Line" spur along Road E-2 at a distance of only 2440 m (8000 ft) away.
- Utilize existing geotechnical study from APT siting (existing reports).
- Utilize existing monitoring wells from APT site and Clemson Hydro Site (existing, on Energy Park Site).
- Utilize Hawthorn seismic station as local seismic monitoring station at a distance of only 5486 m (18,000 ft).
- Energy Park site is upgradient from all existing groundwater plumes and contaminated soils and will not impact existing remediation and monitoring efforts. Nearest plume is 2743 m (9,000 ft) from site.
- Energy Park site is away from high security and NNSA areas (3048 m or 10,000 ft away).
- Data from the H-Area Meteorological Tower can be used for siting and monitoring. The tower is 3048 m (10,000 ft) from the site.
- Potentially store waste canisters in glass waste storage building in space leased from DOE. Buildings exist, NQA-1 qualified and seismically qualified. The storage building is only 2743 m (9,000 ft) from the site.
- Use existing C-Lab and SRNL radionuclide analytical capability for process testing. The lab is only 4572 m (15,000 ft) from the site.
- Use existing SRNL and SREL environmental and ecological monitoring to insure clean operations and future funding for these operations.

SUMMARY

Requirements for potential or conceivable GNEP facilities can be met using the existing facilities and infrastructure of the SRS. A potential commercially operated Energy Park located within the existing boundaries of the SRS can use existing site infrastructure to lessen the overall construction costs and decrease the start up time for our national GNEP program.

REFERENCES

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