Department of Energy
Washington, D.C. 20545

Docket No. 50-537
HQ:E:82:013

MAR 24 1982

Mr. Paul S. Check, Director
CRBR Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Check:

CRBRP Fuel Cycle Safeguards Costs

On March 19, 1982, we submitted a revised CRBRP Fuel Cycle description to you. It was noted in the March 19 transmittal letter that we intended to supplement the safeguards costs portion at a later date. The enclosure to this letter contains revised information on safeguards costs, including reprocessing plant safeguards. This submission contains all of the remaining information requested at our March 2, 1982, CRBRP Fuel Cycle meeting.

We are continuing our independent review of the entire CRBRP Fuel Cycle description, as mentioned in our March 19 transmittal letter. Also, we have received some constructive comments from your staff. Consequent changes will be incorporated in the CRBRP Fuel Cycle description prior to formal issuance as an amendment to our Environmental Report.

If you have any questions or comments on this submittal, please contact me.

Sincerely,

John R. Longenecker

John R. Longenecker, Manager
Licensing and Environmental
Coordination
Office of Nuclear Energy

Enclosure

cc: Service List
Standard Distribution
Licensing Distribution

D001
s
1/1

G. Safeguards Costs

The incremental cost of safeguarding the facilities in the fuel cycle apportioned to reflect the part of the facility operations dedicated to the CRBRP fuel cycle are shown in Table 5.7-11. Costs are included for safeguarding facilities for fuel fabrication, fuel reprocessing, the CRBR plant, and transportation of special nuclear materials (SNM) among the facilities. Both initial investment and annual operating costs are given in constant FY 1982 dollars. It is evident from the totals in Table 5.7-11 that the costs of safeguarding SNM in the CRBRP fuel cycle are a small portion of the total facility costs.

Costs are given separately for physical security of the facilities, the materials control and accounting (MC&A) provisions, and the guard forces. Physical security costs include such things as perimeter and entry controls, video surveillance and internal security systems. MC&A costs are those incremental costs of upgrading normal process control and monitoring instrumentation for safeguards application, non-secure software and communications systems, and the maintenance thereof. The guard force costs include salaries, benefits, overhead and equipment. The assumptions and basis for these costs are described below for each facility.

Fuel Fabrication

The CRBRP fuel pins are planned to be fabricated at the Secure Automated Fabrication (SAF) line, located within the Fuels and Materials Examination Facility (FMEF) at DOE's Hanford Reservation. The resulting fuel pins will be transported a short distance on the Hanford site to the 308 building where they are formed into final fuel assemblies. The safeguards provisions at these facilities are described above.

The SAF line is an addition to the FMEF. Only the incremental costs for securing the SAF line are attributable to the CRBRP fuel cycle. The SAF line will share the FMEF perimeter security system, guard force center, display consoles, guard forces, etc.

The initial costs of installing the SAF physical security system include:

$0.5M - entry control portals, hand geometry controls, key card controlled doors, map displays, TV monitors, alarm processors, TV switchers, video recording equipment, electrically locked doors, sensors and closed circuit TV cameras.

$0.4M - installation of the above equipment
0.2M - software development
$1.1M

The annual cost of operating the SAF physical security system is estimated at 15 percent of the hardware costs for repair and maintenance plus one additional guard per shift over that required for FMEF. The guard force operates on a 5 shift operation, therefore the additional guard per shift is expected to cost $250,000 per year. The annual cost for repair and maintenance is estimated to total $165,000.

The initial investment for the SAF MC&A system is estimated as:

$0.5M - computer
$1.0M - software development
$0.5M - upgraded measurement capability for safeguards purposes
$2.0M

The annual cost of operating the SAF MC&A system assumes one shift operation, except the scintering furnace will continuously operate.

$ 150K - repair and maintenance at 15 percent
$ 150K - computer software improvement
$ 200K - 2 supervisors
$ 480K - 8 technicians
$ 100K - analytical services
$1080K

As the CRBRP fuel cycle utilizes about 65 percent of SAF's operational schedule, only that portion of the above costs are included in Table 5.7-11.

The 308 building is located within the 300 area at DOE's Hanford reservation. Based on discussions with the Hanford Engineering and Development Laboratory staff that operate the 308 building, the physical security system costs for the 300 area are: a) initial investment -7.5 million, b) annual repair and maintenance expense at 15 percent of the hardware cost $1.1M, and c) annual guard force expense - $3.2 million. The 300 area is manned by a staff of 70 guards.

Support of the CRBRP fuel cycle requires about 20 percent of the 300 area activities, and only that portion of the security costs are included in Table 5.7-11. The 20 percent figure is based on the 308 building being about 1/3 of the major facilities in the 300 area requiring physical security (in addition to the 324 and 325 buildings) and that CRBRP fuel cycle support requires about 65 percent of the fuel assembly capacity of 308.

The 308 building MC&A system accounts for discrete, numbered items only. No liquid or powder process steps are involved and no volume, density or concentration measurements are required. As such, no costs are estimated for upgraded measurement capability. The initial investment for the 308 building MC&A system is estimated at $0.5 million for MC&A equipment.

The annual cost of operating the 308 building MC&A system is estimated as follows:

$ 75K	- repair and maintenance at 15 percent of hardware
$100K	- 1 MC&A supervisor
$180K	- 3 MC&A technicians
$355K	

Support of the CRBRP fuel cycle requires about 65 percent of the 308 building fuel assembly capacity, and only that portion of the MC&A costs are included in Table 5.7-11.

The total fuel fabrication safeguards system costs in Table 5.7-11 are a summation of the appropriate portions of the costs for the SAF and 308 building.

Reprocessing

The safeguards provisions for the reprocessing plant where CRBRP fuel is eventually processed will be similar to those described earlier for the DRP. Only very preliminary design information is available for the DRP. Detailed estimates of the DRP costs, including the safeguards provisions, have not been made. The following estimates of the costs of the DRP safeguards provisions are the best now available.

The initial cost of the DRP physical security system is expected to cost about $35 million. Maintenance and repair of this system is expected to cost approximately $1.5 million annually. The guard force is expected to consist of about 75 personnel at an annual cost of about $3.5 million.

The DRP MC&A system is estimated to cost $15 million initially. Operation and maintenance of this system is estimated to cost $5 million annually.

Support of the CRBRP fuel cycle will require about 8 percent of the DRP 150 tonne annual capacity. Thus, 8 percent of the above costs are included in Table 5.7-11.

Plant

The CRBRP safeguards provisions are described in PSAR Section 13.7. The following is a breakdown of the physical security system costs.

	Initial Investment	Maintenance and Operating
Electronic Security System (includes CCTV, alarms, computers, access control electronics)	$ 1.80 M	$ 90 K
Gate House (less access control electronics) and Central Alarm Station	0.42 M	8 K
Fencing and Related Items Such As Sewer Pipe Grating and Derailers	0.19 M	4 K
Electrical (wiring, conduit, uninterruptible power supply, batteries)	1.33 M	66 K
Communications	0.12 M	6 K
	$ 3.86 M	$174 K

Accountability of fissile and fertile material is inherent in the design of the CRBRP refueling system for reasons other than security. After inspection at receipt, the assemblies are not visually identified again until shipment of the irradiated assemblies. The assemblies are mechanically identified prior to insertion into the core and subsequent to removal from the core as part of the reactor safety program. All motions of fuel within the plant are monitored and/or recorded on the refueling system computer for inventory purposes and to insure reactor safety during core configuration changes. No incremental cost is assumed for safeguards accountability at the plant.

The CRBRP security force consists of:

1 - Unit Chief
1 - Operations Captain
1 - Administration Captain
1 - Training Officer
5 - Shift Supervisors
5 - Alarm System Monitors
55 - Public Safety Officers
3 - Clerk-Typists
72 Personnel

The initial investment of hiring, training and equipping this force is estimated to cost $47,000. The bulk of the security force will be onsite when the fuel arrives, approximately 9 months prior to fuel load. The cost of guards during the year prior to criticality is estimated at $1.1 million. From the year of criticality onward, the guard force is estimated to cost about $2.1 million annually.

Transportation

The number of shipments per year for the different materials in the CRBRP fuel cycle are given on Table 5.7-9. Special safeguards measures are provided for the shipment of fresh fuel, PuO_2, spent fuel and spent blanket assemblies. The other materials transported within the CRBRP fuel cycle do not contain sufficient quantities of SNM to warrant special safeguards measures.

Transportation of new fuel and PuO_2 is planned using DOE's Safe Secure Transport (SST) system. As this system will have sufficient capacity and communications capability to accommodate CRBRP transportation requirements, no initial investment costs are anticipated. Operating costs for SST shipments are estimated to cost $18,000 per 2500 mile shipment, round trip.

Transportation of spent fuel and spent blanket assemblies require two escorts and appropriate communications devices. The incremental cost per escort for these 13 provisions estimated to be $50,000 per year.

The safeguards cost of transportation within the CRBRP fuel cycle is summarized below:

Material	Shipments/Yr.	Cost/Shipment	Annual Cost
PuO_2	14	18,000	252,000
Fresh Fuel	14	18,000	252,000
Spent Fuel	14	N/A	100,000
Spent Blankets	12	N/A	100,000
			$704,000

Table 5.7-11
CRBRP Fuel Cycle Security Costs By Plant Type
($ in millions)

Item	CRBRP Plant		Fuel Fabrication Plant		Reprocessing Plant	
	Capital	Annual Operating	Capital	Annual Operating	Capital	Annual Operating
Physical Security System	3.86	0.17	2.2	0.3	2.8	0.12
Material Control and Accounting	-	-	1.6	0.9	1.2	0.4
Security Force	0.05	2.1	-	0.8	-	0.28
	3.91	2.27	3.8	2.0	4.0	0.8