

The following information was provided by Mr. Robert Johnson, BWXT Y-12, in response to a data call from Mr. Jay Rose, Tetra Tech, on January 20, 2006.

The UPF would replace multiple existing enriched uranium (EU) and other processing facilities. The current operating and support areas occupy approximately 633,000 square feet in multiple buildings, while a UPF would result in approximately a 33 percent reduction, to approximately 400,000 square feet in one building. Once a UPF were operational, some existing facilities would be available for decontamination and decommissioning (D&D), while other facilities could be used for non-EU processes.

UPF Construction

The new structures and support facilities that would constitute a UPF complex include:

- UPF building;
- UPF electrical switching center;
- chiller building and chiller building switch center;
- cooling tower;
- aboveground water tank for a seismic-qualified firewater system with a firewater pumping facility;
- electrical generators; and
- modified PIDAS to encompass the UPF complex.

The design life of a UPF would be 50 years. It would be equipped with safety support systems to protect workers, the public, and the environment, and would be housed in a multistory, reinforced concrete building designed for safety and security. The main building would be a concrete structure with reinforced exterior walls, floor slabs, and roof. The preliminary schedule for the project calls for site preparation beginning in approximately 2010, with completion by approximately 2016, and operations beginning by approximately 2018. Construction of a UPF would require approximately 35 acres of land, which includes land for a construction laydown area and temporary parking. Once constructed, the UPF facilities would occupy approximately 8 acres. Table 1 lists the construction material requirements and wastes for the UPF.

Table 1 — UPF (based on a HEUMF) Construction Requirements and Estimated Waste Volumes

Requirements	Consumption
Materials/Resource	
Peak Electrical energy (MWe)	2.2
Concrete (yd ³)	200,000
Steel (tons)	27,500
Liquid fuel and lube oil (gallons)	250,000
Water (gal)	4,000,000
Aggregate (yd ³)	5,000
Land (acres)	35
Employment	
Total employment (worker years)	2,900

Peak employment (workers)	900
Requirements	Consumption
Construction period (years)	6
Low-level Waste	
Liquid (gallons)	0
Solid (yd ³)	70
Hazardous (tons)	4
Nonhazardous (Sanitary) (tons)	800

UPF Operations

The core operations of a new UPF would be assembly, disassembly, quality evaluation, specialized chemical and metallurgical operations of EU processing, and product certification and inspection. The material processing areas within a UPF would use gloveboxes, inert atmosphere, negative air pressure, and other engineered controls, supported by administrative controls, to protect workers and the public from exposure to radiological and hazardous materials. Exhaust emissions for the facility would comply with applicable Federal and state requirements. In conjunction with other engineered containment measures, the ventilation system barriers would provide a layered system of protection.

Other systems in a UPF for facility operation and Environment, Safety and Health (ES&H) protection include:

- Criticality Accident Alarm System
- Emergency Notification System
- Alarm System
- Fire Suppression Alarm Systems
- Telephone and public address system
- Classified and unclassified computer network
- Personnel Monitoring System
- Security-related sensors
- Automated inventory system with continuous real-time monitoring

Table 2 lists the operations requirements the UPF.

Table 2 — UPF Annual Operation Requirements and Estimated Waste Volumes

Requirements	Consumption
Materials/Resource	
Electrical energy (MWh/yr)	168,000
Peak electrical demand (MWe)	18.4
Natural gas (yd ³)	894,000
Water (gallons)	105,000,000
Plant footprint (acres)	8
Employment	
Total Workers	600

Requirements	Consumption
Radiation Workers	315
Waste Generated	
Low-level	
Liquid (gallons)	3,515
Solid (yd ³)	7,800
Mixed Low-level	
Liquid (gallons)	3,616
Solid (yd ³)	21
Hazardous (tons)	14
Non-hazardous (Sanitary) (tons)	7,125
Non-hazardous liquid (gallons)	50,000

Upgrade Existing Enriched Uranium Facilities at Y-12

NNSA could upgrade the existing EU facilities. In that case, there would be no UPF and the current high-security area would not be reduced. The upgrade projects would be internal modifications to existing facilities and would improve protection for worker health and safety and extend the life of existing facilities. For continued operations in existing facilities, major investments would be required for roof replacements; structural upgrades; heating, ventilating, and air conditioning (HVAC) replacements; and fire protection system replacement/upgrades (see Appendix A for a detailed discussion of the specific upgrades). The projects would improve airflow controls between clean, buffer, and contamination zones; upgrade internal electrical distribution systems; and reinforce a number of structures to comply with current natural phenomena criteria (DOE-STD-1023-95).

Upgrades would be performed over a 10-year period. This would enable NNSA to spread out the capital costs associated with the upgrades, and minimize disruption of operations. Conventional construction techniques would be used for upgrade projects. Table 3 lists the construction requirements associated with the upgrades. In terms of operations, there would be no change from the No Action Alternative.

Table 3 — Construction Data for Upgrading Existing Uranium Facilities

Requirements	Consumption
Materials/Resource	
Electrical energy use (MWh)	No significant change compared to current site use
Concrete (yd ³)	No significant change compared to current site use
Steel (tons)	No significant change compared to current site use
Water (gallons/year)	4.2 million
Aggregate (yd ³)	No significant change compared to current site use
Land (Laydown Area)	<7 acres
Employment	
Total employment (worker years)	1,000
Peak employment (workers)	300
Construction period (years)	10

Wastes	
Hazardous	
Liquid (gallons)	No significant change compared to current site use
Solid (tons)	14

Note: "No change from current" represents estimated 2006 usage.