April 9, 1994

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(59FR6792)

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COMMENTS OF OHIO CITIZENS FOR RESPONSIBLE ENERGY, INC. ("OCRE") ON PROPOSED RULE, "CERTIFICATION OF GASEOUS DIFFUSION PLANTS," 59 FED. REG. 6792 (FEBRUARY 11, 1994)

This proposed rule would establish standards for certification and operation of the gaseous diffusion uranium enrichment plants owned by the Department of Energy and located in Portsmouth, OH and Paducah, KY.

OCRE supports this proposed rule. OCRE believes that the lack of independent regulatory oversight is one of the root causes of the poor practices and widespread environmental contamination associated with DOE nuclear production sites. This proposed rule would establish much-needed NRC regulatory oversight over two DOE facilities. Subject to the specific comments set forth below, OCRE believes this proposed rule is essential for the protection of the public health and safety and the environment.

Specific Comments

1. Public Participation Rights

OCRE is pleased that proposed 10 CFR 76.39 provides the option for a public meeting in connection with an application. However, OCRE believes that a public meeting should be mandatory for the initial certification process for each gaseous diffusion plant ("GDP"), and for the complete review that the NRC anticipates performing every 10 years.

While informal public meetings are helpful, they are no substitute for formal adjudicatory hearings conducted by the Atomic Safety and Licensing Board. OCRE believes that there must be the opportunity for a formal adjudicatory hearing on the initial certification applications and at the complete review that the NRC anticipates performing every 10 years. Note that OCRE is only advocating the opportunity for a formal hearing, not that one must be held, even if the case is uncontested. OCRE would envision the same standards used in these cases as are used for nuclear power plant operating license and operating license amendment cases, where there is simply the opportunity for a hearing. If the petitioner meets the procedural and standing requirements, then a hearing is in fact held. Also, OCRE is not advocating that there be the opportunity for an adjudicatory hearing every year, only initially and every 10 years thereafter.

The Federal Register notice states that "Congress has not required formal adjudication . . . " 59 FR 6794. However, there is nothing to prevent the NRC from going beyond what Congress has required. As defined in 10 CFR 50.2, the two GDPs are "produc-

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tion facilities," and, if they were being initially licensed under Part 50, adjudicatory hearings would be required. Formal adjudication is also desirable given the age and operating history of the plants, which has not been favorable from an environmental standpoint. OCRE has attached an excerpt from Deadly Defense, Radioactive Waste Campaign, New York, 1988, which details the environmental contamination caused by the two GDPs. This excerpt also documents several near-critical events at the Portsmouth plant. OCRE is also aware of persons residing near the Portsmouth plant who suffer from health problems, including cancer and birth defects, which they attribute to releases from that plant. Persons whose interests may be affected by the operation of these facilities should have the right to contest the certification, and consequent further operation, of these facilities and to ensure that corrective actions will be taken to avoid the recurrence of past problems. An adjudicatory hearing is the ideal procedural mechanism for public scrutiny of these facilities and to hold their operators accountable.

The Federal Register notice indicates that the public comment period after the publication in the Federal Register of the notice of receipt of the application for certification would be at least 30 days. OCRE would recommend that this comment period be at least 60 days for the initial certification and the 10-year complete review certification. Thirty days is a brief period of time in which to respond to a Federal Register notice (which interested persons may not be aware of in a timely fashion (see discussion below)) on a such complex matter.

OCRE also has concerns about the procedures contained in proposed 10 CFR 76.62 and 76.64 for Commission review of a Director's decision granting or denying, respectively, an application for a certificate of compliance. These sections permit an affected person to file a petition for review of the Director's decision within 15 days after publication of the Federal Register notice. Persons may file a response to the petition for review within 10 days after the filing of the petition. OCRE is concerned that these time periods for response are too short. Unless the Director's decision is served upon all persons who submitted comments on the application, they may not even know that the Federal Register notice has been published until the 15 days have passed. (1) Similarly, unless the petition for Commission review of the Director's decision is served upon all commenters, how will they

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(1) Unless one subscribes to the Federal Register, a costly proposition for most individuals and public interest groups, one must depend on libraries for access to it. Many libraries are slow in making the Federal Register available, and in some cases, it is not available within 15 days of the publication date. OCRE is aware that by June 1994, the Federal Register will be available online in full text; however, it remains to be seen whether this option will be affordable for small entities.

even know such a petition has been filed, let alone be able to respond to it within 10 days? While OCRE appreciates the need for timely decisions, especially with an annual certification process, OCRE would advocate lengthening these time periods by at least an extra 10 days, such that the petition for review would have to be filed within 25 days of the Federal Register notice and the response to the petition within 20 days. OCRE would recommend that the NRC serve the Director's decision to all persons providing comments on the application for certification, and to find some remedy that would provide timely notice of the filing of a petition for review without requiring the petitioner to serve the petition on all commenters. If the petitioner is an individual citizen or a public interest group, the cost of mailing the petition to commenters who may number in the hundreds is prohibitive. Perhaps the NRC could establish a telephone information line with recorded message on the status of the case or a BBS by which interested persons could receive notice that the decision and petitions for review have been filed.

2. Timely Renewal

The NRC has invited commenters to address the timely renewal provision of proposed 10 CFR 76.55. OCRE supports this provision, as it is consistent with the timely renewal clause of the Administrative Procedure Act, 5 USC 558. The timely renewal provision will also allow the times for filing of public comments and a petition for review of a Director's decision, and responses to the petition, to be extended, as recommended above, without adverse impact on the applicant in certifications subsequent to the initial.

3. Backfitting

Proposed 10 CFR 76.76 would incorporate the standards of the Backfit Rule, 10 CFR 50.109, and make them applicable to GDPs. OCRE opposes the application of the Backfit Rule to these facilities.

The two GDPs in question were designed and built in the early to mid-1950s. As noted above and in the attached excerpt, their operations have not been trouble-free and environmentally benign. The NRC has no previous experience with these plants. Given this set of circumstances, application of the Backfit Rule is absolutely unjustified and irresponsible.

Application of the Backfit Rule to the GDPs would essentially "freeze" the plant design and operational practices of the troubled past into the future. This situation provides little improvement over the old, DOE way of doing business. Obviously Congress, in giving the NRC authority over these plants, was not satisfied with the way these plants were run and wanted change. The NRC must be free to demand changes in the design and operation of these plants if the agency is to fulfill its Congressional mandate.

If the NRC insists on establishing any backfit standard for GDPs, it should be the standard of Executive Order 12866: "a reasoned determination that the benefits of the intended regulation justify its costs." (See Commissioner Rogers' Additional Comments.)

4. The Corporation's Proposed Standards

The U.S. Enrichment Corporation submitted proposed standards, which were included as Appendix A to the Federal Register notice. The NRC has invited comment on these standards.

OCRE finds that some of the standards proposed by the Corporation should be adopted by the Commission. These standards are outlined below. OCRE finds that the remainder of the Corporation's proposed standards have either already been incorporated in the NRC's proposed rule or are such that their incorporation would be inappropriate.

a) The Corporation's Proposed 10 CFR 76.24

The NRC should incorporate the Corporation's proposed 10 CFR 76.24(a)(3) and (b), as these provisions give a measure of added protection and preparedness for criticality accidents.

b) The Corporation's Proposed 10 CFR 76.32(b)(5)

This provision would prohibit the Corporation from using source, byproduct, or special nuclear material to construct an atomic weapon or any component thereof. If the Corporation thought this prohibition to be necessary, then it should be included. Inclusion of this provision would also necessitate the incorporation of the definition of "atomic weapon" given in the Corporation's proposed 10 CFR 76.4.

c) The Corporation's Proposed 10 CFR 76.31(f) and (g)

These provisions would require the Corporation to prepare and maintain a safeguards contingency plan and an emergency plan. The effectiveness of these plans could not be decreased by the Corporation without Commission permission. These provisions are valuable and necessary for the protection of the public.

d) The Corporation's Proposed 10 CFR 76.36 and 76.38

These sections, Inalienability of Certificates and Expiration and Termination of Certificates, respectively, address important matters which are not contained in the NRC's proposed rule.

e) The Corporation's Proposed 10 CFR 76.39

This section, Submission, Review, and Approval of Department Compliance Plans, is necessary because the NRC's proposed rule does not explicitly address compliance plans, despite the language of the NRC's proposed 10 CFR 76.21, which would permit the GDPs to operate with either a certificate of compliance or an approved compliance plan.

f) The Corporation's Proposed 10 CFR 76.51, 76.53, and 76.54

OCRE finds these material balance and reporting provisions, as customized for the GDPs, to be appropriate for inclusion in the NRC's regulations.

g) The Corporation's Proposed 10 CFR 76.59

This provision, which would establish semiannual effluent reporting requirements, is absolutely essential, given the history of environmental contamination caused by the GDPs, as documented in the attached excerpt.

CONCLUSION

Subject to the specific comments above, OCRE finds this proposed rule to be vital for the protection of the public and should be adopted without delay. OCRE believes that all of the provisions of the proposed rule are essential and do not exceed the requirements necessary to protect the public health and safety.

Respectfully submitted,

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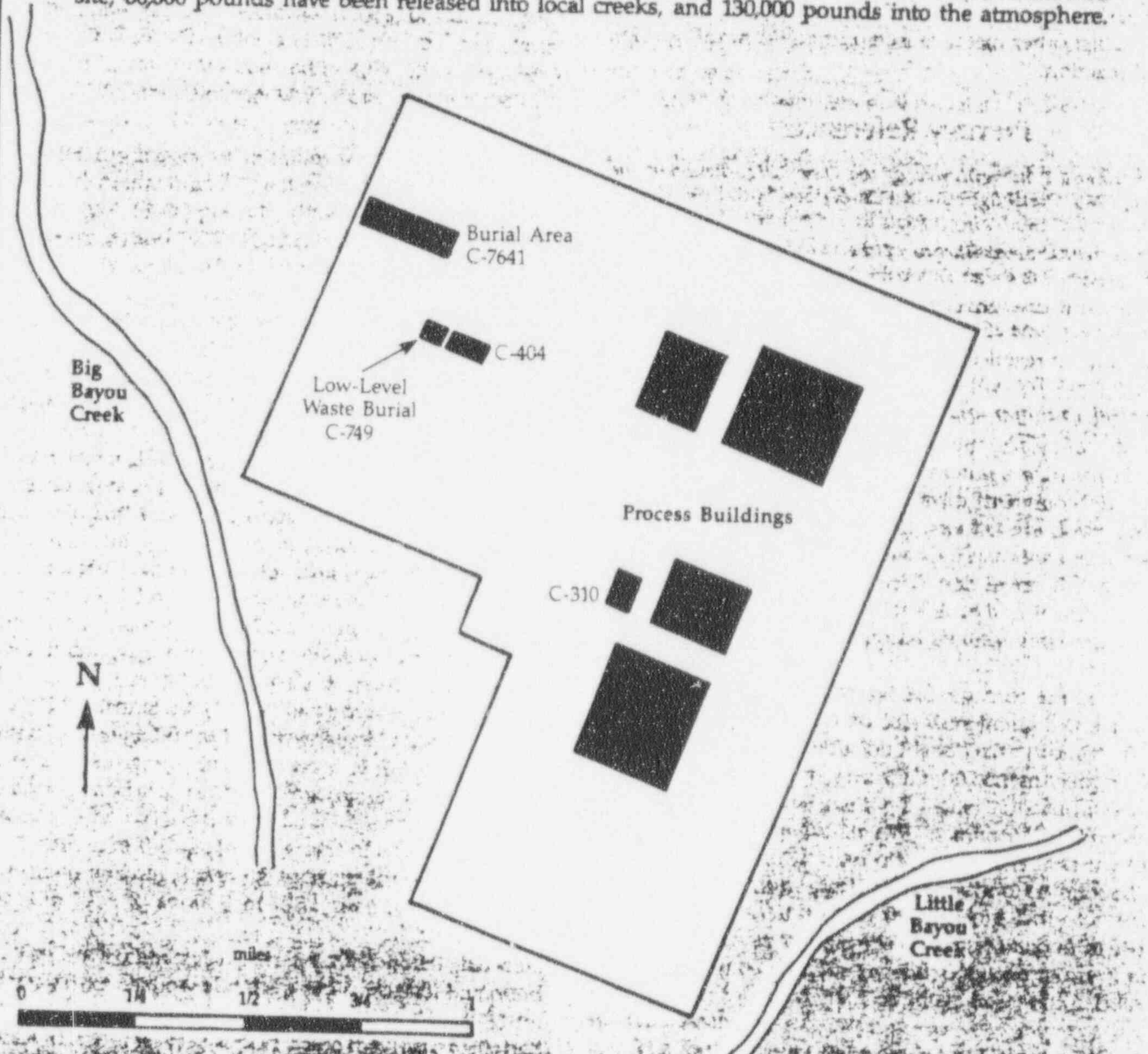
Paducah Gaseous Diffusion Plant

The Paducah Gaseous Diffusion Plant is located 11 miles west of Paducah (pop. 35,000) and about three miles south of the Ohio River and the Illinois border in western Kentucky. The Paducah Plant enriches uranium for use in the Portsmouth Gaseous Diffusion Plant and the Hanford plutonium production reactor (via Fernald). Since 1952, over seven million pounds of uranium have been buried on site, 60,000 pounds have been released into local creeks, and 130,000 pounds into the atmosphere.



Site Size

The Plant takes up 750 acres and is surrounded by a buffer zone. The enrichment facility comprises 74 acres in five buildings. There are 30 permanent buildings on site.

Age

Operations began in 1953 and construction was completed in 1954.

Employees

1300 (in 1987)

Contractor

Martin Marietta Energy Systems, Inc.

Budget

$660 million (fiscal year 1987)

Location and Setting

The Paducah Gaseous Diffusion Plant is situated in McCracken County in western Kentucky, near the Illinois border. The plant is less than 4 miles south of the Ohio River, 11 miles west of Paducah (pop. 35,000), and 5 miles southwest of Metropolis, Illinois (pop. 5,000), across the Ohio River. There are people living just a third of a mile away from the facility, and a number of towns are located within a 5-mile radius. These include Rossington, Grahamville, Heath and Kevil, all in Kentucky, and Joppa, in Illinois. In all, there are 45,000 people within 10 miles of the plant and 500,000 within 50 miles. Beyond the site boundary is an extensive wildlife management area. Two local tributaries, Little Bayou Creek and Big Bayou Creek, connect the plant site with the Ohio River. The town of Joppa sits on the river, downstream from the facility.

The plant is built upon relatively flat land about 370 feet above sea level.

Geology and Hydrology

Soil in the area is silty clay which is almost impenetrable by water. Drainage from the site is to the east into Little Bayou Creek and to the west into Big Bayou Creek, then into the Ohio River via the Tennessee Valley Authority Shawnee Plant Reservation. The site sits on two aquifers: a shallow one 10 to 30 feet below the surface made up of sand and gravel pockets; and a deep one, considered to be a "good yielding aquifer." The latter is 50 to 60 feet below the surface, made up of sand, gravel and traces of silt. Groundwater in the shallow aquifer moves at a rate of 6 inches a year, while in the deep aquifer, groundwater moves at 2 to 5 feet a year. Area rainfall is 48 inches a year.

Function

Like the Portsmouth Plant, Paducah enriches uranium through the gaseous diffusion process (see discussion on page 84). Paducah enriches natural uranium (about 0.7 percent uranium-235) and slightly depleted uranium (less than 0.7 percent) to about 1 percent uranium-235.

Radioactive Waste

Waste Management

There are two primary burial areas for radioactive waste: the C-746F Burial Area and the C-404/C-749 Low-Level Radioactive Waste Burial Area.

There are also sanitary landfills at Paducah, as well as an equalization pond.

What Is Buried

About 13 percent (by mass) of all Department of Energy/military uranium waste is buried at Paducah, making it second only to the Y-12 Plant at Oak Ridge.

During 1984 and 1985, over 300 pounds of uranium were discharged into surface streams. Over a curie of technetium was also discharged during these same years. And in 1985, 13,000 pounds of uranium were buried on site in areas C-404 and C-746F.

There are also contaminated hazardous wastes at Paducah. In 1959, fifteen 30-gallon drums of uranium contaminated with trichloroethylene were buried in area C-749. An excavation in 1984 found just four of the drums, only one of which was intact. Furthermore, several dozen other 55-gallon drums were found in the area. These, however, were in good condition, with only one showing trichloroethylene contamination.

Pathways By Which Radioactivity Is Escaping

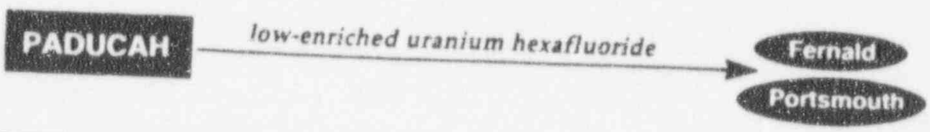
Creeks downstream from the plant are contaminated with radioactivity. For example, in 1985 the uranium readings in Big Bayou Creek sometimes reached more than 400 times the background level.

Similarly, radiation in the Ohio River was higher downstream from the plant compared to upstream values. In 1984, the maximum alpha radioactivity concentrations downstream in the Ohio River were six times the upstream levels.

Uranium in the soil at the plant perimeter and 5 miles from the perimeter sometimes reached four times the background level in 1984 and 1985.

Of the two aquifers which run under the plant, only

Paducah
Nuclear Transportation



"Low-Level" Waste Released
PADUCAH GASEOUS DIFFUSION PLANT
1952 - 1986

volume	270,000 cubic feet
mass of uranium	7,300,000 pounds (solid) 61,000 pounds (liquid) 130,000 pounds (gas)
radioactivity	20,500 curies (solid) 48 curies (liquid & gas)

Sources:
Integrated Data Base for 1987, *U.S. Department of Energy, Sept. 1987 (DOE/RW-0006)*
Knoxville-News Sentinel, *Frank Munger, June 26, 1985*
Jerry Klein, Department of Energy, Oak Ridge, December 15, 1987

the deep one has enough water to be a good water source. Wells monitoring the groundwater in this aquifer have indicated the presence of radioactive contamination downgradient from the Paducah dumps.

In addition, some of the monitoring wells near the dumps are suspected of contributing to groundwater contamination.

Dangers

Who Is At Risk

Aside from the workers, those in greatest danger are people who live within 5 to 10 miles of the plant, principally to the north and northeast. Studies have suggested that cancer mortality rates around Paducah and west of the plant are higher than average. In addition, people who are on the Ohio River downstream from the plant, or who rely on the deep aquifer for their water, are at risk. Finally, individuals who eat plants, animals, or aquatic life in the vicinity of the plant are likely to have an increased risk.

Greatest Dangers On Site

As with the Portsmouth Plant, the greatest dangers are from airborne uranium, and from uranium and technetium contamination of streams and the Ohio River. Uranium hexafluoride explosions, as have occurred at Kerr-McGee's Sequoyah and Allied Chemical's Metropolis conversion facilities, also present a potential hazard to workers and the general public. Uranium hexafluoride mixes with moisture in air to form deadly hydrofluoric acid.

Accidents

From 1980 through 1985 there were two reported accidental releases of radioactivity that were significant.

Over 3 pounds of uranium were accidentally released on October 18, 1983, during a routine venting of a production cylinder.

On May 11, 1984, 1200 gallons of decontamination solution, containing 4.5 pounds of uranium, were inadvertently released down a building drain.

Primary References

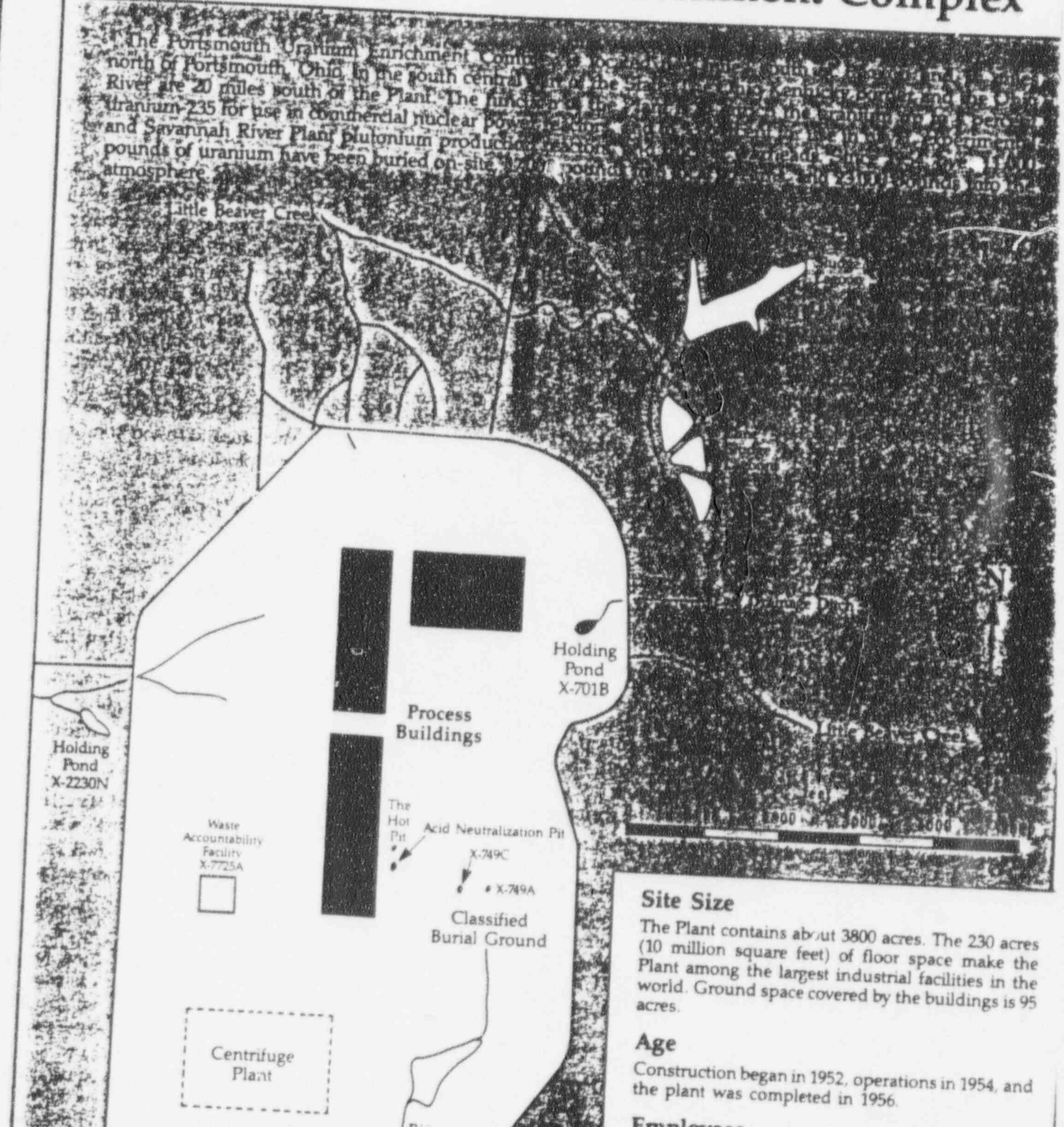
ORGDP Uranium Discharges, L. Long and J. Rogers, Martin Marietta Energy Systems, U.S. Department of Energy, May 1985 (K/HS-69).

Environmental Monitoring Report for 1985, Paducah, Martin Marietta Energy Systems, Department of Energy, May 1986 (KY 755).

"DOE plants release tons of uranium," ***Knoxville Sentinel-News***, Frank Munger, June 26, 1985.

"Ohio accident revealed hazards at uranium plants," ***Knoxville Sentinel-News***, Frank Munger, June 26, 1985.

Portsmouth Uranium Enrichment Complex



Site Size

The Plant contains about 3800 acres. The 230 acres (10 million square feet) of floor space make the Plant among the largest industrial facilities in the world. Ground space covered by the buildings is 95 acres.

Age

Construction began in 1952, operations in 1954, and the plant was completed in 1956.

Employees

2100 (in 1987)

Contractor

Martin Marietta Energy Systems (since Nov. 1986).

Budget

$270 million (fiscal year 1987)

Location and Setting

The Portsmouth Gaseous Diffusion Plant is located in Pike County, in south central Ohio. The two largest communities in the area are Chillicothe (pop. 23,000), which is about 26 miles to the north, and Portsmouth (pop. 26,000), 16 miles to the south. Smaller towns located close to the plant include Piketon (pop. 1900), Jasper (pop. 150), Wakefield (pop. 135), Waverly (pop. 5100) and Jackson (pop. 7000). The population within 5 miles of the plant is 6000, and within 50 miles of the plant is 600,000.

The terrain is characterized as a gently rolling area with hills along the eastern edge. Grass covers the rolling area, while the surrounding hills are covered with hardwood trees. Prior to construction of the plant, most of the area was crop land. The plant is one mile east of the Scioto River Valley and 120 feet above the Scioto River floodplain. The Scioto River Valley is farmed extensively, particularly with grain crops. Two local tributaries, Little Beaver Creek and Big Run Creek, connect the plant with the Scioto River.

Geology and Hydrology

The gravel and sand deposits filling the bed over which the Scioto River now runs are highly porous and form an aquifer which is an abundant source of fresh water. The aquifer is the primary water source for the plant. During the spring, the river frequently overflows its banks and occasionally floods a large portion of the valley.

Geologic formations near the surface in Pike County consist of 1) consolidated layers of limestone, shale and sandstone, and 2) unconsolidated deposits of sand, gravel, clay and silt. Bedrock units underlie the entire property.

Groundwater is only available in very limited quantities (less than 5 gallons per minute) due to the impermeable nature of geological materials in which it is contained. The nearest source of groundwater of appreciable quantity is contained in the unconsolidated deposits in the former Newark River Valley, where the Scioto River runs.

Function

Natural uranium contains only 0.7 percent of the readily fissionable isotope uranium-235. The rest is in the form of uranium-238. For uranium to be used in commercial nuclear power reactors, the uranium-235 assay must be enriched to 3 or 4 percent. For use in nuclear submarines, certain experimental reactors, and nuclear weapons, the uranium must be enriched to more than 93 percent uranium-235. Portsmouth is presently the only facility in the U.S. capable of enriching uranium to that level.

The primary means of enriching uranium is the gaseous diffusion process. Uranium is brought to Portsmouth in the form of solid uranium hexafluoride. At the plant, it is heated to a gaseous state and then pumped through a series of cascades made up of porous tubes which act as strainers. Uranium-235 and uranium-238 have different masses, so they move through the tubes at different speeds. In this way, uranium-235 is slowly sorted from uranium-238. The more cascades the uranium hexafluoride passes through, the more it sorts the enriched uranium (greater than 0.7 percent uranium-235) from depleted uranium (less than 0.7 percent uranium-235). Once removed from the cascade, the uranium hexafluoride is converted back into a solid and shipped out. The depleted uranium is used for making plutonium and as a shell around fusion bombs to give extra blast in the nuclear explosion.

Radioactive Waste

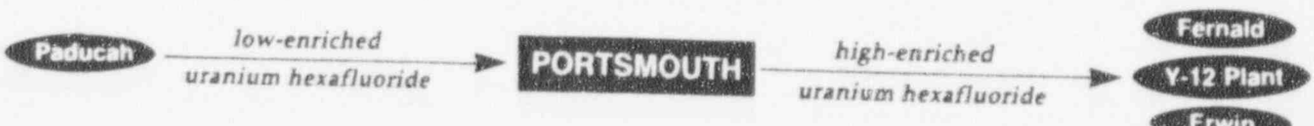
Waste Management

Most radioactive waste at Portsmouth is placed into one of two primary areas. The first, the Holding Pond (X-701B), is for liquid wastes. This pond is not lined but relies on local clay for retention. Waste water is neutralized and precipitated with lime. Solids that accumulate on the bottom of the pond are periodically removed, filtered and treated to remove most of the toxic materials. The remainder is discharged into the East Drainage Ditch, which flows to Little Beaver Creek, and then into the Scioto River.

The second waste area is the Contaminated Materials Disposal Facility (X-749), known as the "Hot Yard," which is for solid wastes.

In addition to the above two waste management areas, there are others. These include two "classified" solid waste landfills (X-749A and X-749C); a "hot pit" for up to 500 gallons of radioactive liquid wastes; an acid neutraliza-

Portsmouth
Nuclear Transportation



"Low-Level" Waste Released PORTSMOUTH URANIUM ENRICHMENT COMPLEX

1953 - 1986

volume	350,000 cubic feet (solid)
mass of uranium	11,000 pounds (solid) 17,000 pounds (liquid) 23,000 pounds (gas)
radioactivity	22 curies (solid) 21 curies (liquid & gas)

Sources
Integrated Data Base for 1987, *U.S. Department of Energy*, Sept. 1987 (DOE/RW-0006)
Knoxville-News Sentinel, *Frank Munger*, June 26, 1985

tion pit for up to 5000 gallons of chemically treated liquid effluents; a waste oil biodegradation plot; and sludge drying beds from the Sewage Treatment Facility (X-615), which discharges into the Little Beaver Creek and then the Scioto River.

Furthermore, a Contaminated Solid Waste Disposal Area (X-7730), consisting of a 20-acre shallow-land burial for "low-level" radioactive solid wastes, was being constructed for the now canceled centrifuge plant. Two holding ponds (X-2230N and X-2230M) for the centrifuge plant have been built. There is also a sanitary landfill (X-735) for the centrifuge. Beginning in 1983, hazardous waste falling under regulations of the federal Resource Conservation and Recovery Act has been shipped to Williamsburg, Ohio, the site of a commercial disposal facility.

What Is Buried

Since 1955, "low-level" radioactive waste has been buried on-site or disposed of in the waste treatment pond. This waste includes uranium, plutonium, technetium, thorium, protactinium, neptunium and bismuth. However, it is uranium and technetium which contribute the most to the volume and radioactivity, respectively, of "low-level" waste released to the environment at Portsmouth.

The major source of liquid "low-level" waste is raffinate (liquid residue) from the uranium recovery process, which comes from the decontamination and cleaning solutions. About 75 percent of the radioactive effluent is discharged from the Waste Water Treatment Plant (X-6619) directly into the Scioto River. Another 22 percent is discharged through the East Drainage Ditch, Little Beaver Creek, Big Beaver Creek to the Scioto River.

About 3000 pounds of solid radioactive waste (20 percent being uranium) are generated each year by the decontamination and recovery facility (X-705). This, together with the alumina traps from the process buildings and the toll enrichment facility (X-344), compose essentially all the uranium at the burial site (X-749).

Over 300,000 pounds (3.3 curies) of "low-level" waste were buried at X-749 in 1985. Most of the solid radioactive waste buried at X-749 is contained in steel drums. But some waste, such as broken lab glassware and floor sweepings, have no containers. The classified burial grounds (X-749A and X-749C) contain several tons of classified waste, such as barrier tube sheets, seal parts and floor sweepings. The government considers the radiation minimal.

Each year the Holding Pond (X-701B) gets 880 pounds of uranium, though much of it is recovered. While most of the weight is in the form of uranium-238, most of the radioactivity is in the form of uranium-234. About 150 pounds a year are discharged into the Scioto River.

Technetium is a fission product resulting from the recycling of uranium and plutonium from production reactors, experimental reactors or submarine fuel. It adheres tightly to internal piping and equipment, rather than being released at purge cascades. According to a 1977 Portsmouth report, about 10 curies of technetium-99 a year are discharged into the X-701B Holding Pond and then into the Scioto River. Because of high technetium contamination, the ion exchange resin is not suitable for "low-level" waste disposal. It requires greater confinement and is being stored on-site awaiting a final disposal location.

Each year about a curie of thorium-234 and a curie of protactinium-234m are released into the environment.

Hazardous, but non-radioactive, wastes are stored in a 1070-square foot enclosed on-site area which was completed in 1983. Included are polychlorinated biphenyls, which are stored in 55-gallon drums. According to the environmental monitoring report for 1985, there were 80 drums of liquid PCB waste, 9 drums of co-contaminated PCB waste, and 120 drums of PCB-contaminated solids in storage. Eventually, all the drums are to be shipped off-site to Williamsburg, Ohio.

Radioactive Releases

Most radioactive releases occur through liquid effluents. Most of these liquid effluents are discharged into Little Beaver Creek, which ultimately reaches the Scioto River. There is some discharge into Big Run Creek, the West Drainage Ditch, and two pipelines, which also run into the Scioto River.

In 1984, the concentration of uranium per gram of sediment at the plant boundary upstream in Little Beaver Creek was 3.6 micrograms uranium/gram sediment. Downstream at the boundary it was 16 micrograms uranium/gram sediment. The Department of Energy does not have a sediment guideline, though 35 picocuries/gram dry weight is customarily taken as the guideline for uranium in soil.

Monitoring has revealed that the groundwater near the burial sites is contaminated with radioactivity. Apparently, in recent years some of the monitoring wells have inadvertently contributed to groundwater contamination. Consequently, monitoring was suspended in 1984 in order to plug the offending wells, clean out others, and install new ones.

Dangers

Who Is at Risk

Aside from the workers at the plant, those who are most threatened are residents in communities within 5 to 10 miles of the plant, principally to the north and northeast; people who use the aquifer for their water supplies; people along the Scioto River south of the plant; and people who eat plants, animals, or aquatic life in the vicinity of the plant.

Greatest Danger On Site

According to a General Accounting Office study, "the primary health physics concern at Portsmouth is controlling exposures to soluble uranium."

However, an even greater danger may be the presence of technetium. As noted above, this nuclide is introduced by uranium recycled as spent fuel from nuclear reactors. It follows uranium almost quantitatively as it changes from a solid to a gaseous state. Technetium does not cause problems during normal operation of the gaseous diffusion plant. However, when equipment is opened for repair or upgrading, workers have been exposed. A large amount of technetium has been buried as solid waste or released as liquid effluent. No non-toxic cleaning agent has been found to reduce technetium to less than 0.4 millirems/hour in skin pores of exposed personnel

After removal of technetium from X-705 effluents, the ion exchange resins are placed in 55-gallon drums. Heat and radiation from the technetium degrade the nitric acid, causing the internal pressure of the drums to increase rapidly. This creates the possibility of an explosive chemical reaction.

A half-life of 210,000 years makes the management of technetium extremely difficult. According to Dr. Marvin Resnikoff of the Radioactive Waste Campaign, "technetium has proven to be a major hazard at Portsmouth, and has led to high radioactive releases and to an unresolved disposal problem."

Accidents

In 1973, a near-critical event (self-sustaining nuclear chain reaction) occurred.

In 1975, 83 curies of technetium were released from the Decontamination Building (X-705) to a local creek. The weekly sample in the East Drainage Ditch was over 300,000 times the radiation limit specified by Ohio regulations.

On March 7, 1978, a 14-ton uranium hexafluoride feed container dropped 10 inches, creating an 8-inch long and 1/2-inch wide rupture. The entire contents of the cylinder—21,000 pounds of uranium hexafluoride—were released into the environment.

From 1980 to 1984, cracks and potholes were allowed to remain on the floor of a Portsmouth facility used to store containers of uranium-contaminated solutions. Some authorities have suggested that spills or leaks could have resulted in a sufficient accumulation of solution in the cracks and potholes to create a situation conducive to having a spontaneous self-sustaining nuclear reaction.

In July of 1982, two purge cells at the X-326 Process Building shut down because of equipment problems, and uranium hexafluoride was released.

In December of 1983, there was a "reverse pressure differential in the purge cascade recycle," again resulting in a release of uranium hexaflouride.

Every year from 1982 to 1984, Portsmouth had what the government classifies as an "incident"—an event which might have resulted in a criticality accident if it had not been discovered in time.

In January 1986, at the X-333 Process Building, overloaded traps and a faulty monitoring device allowed 109 pounds of uranium to escape from a vent.

According to the General Accounting Office, the industrial accident rate at Portsmouth from 1980 to 1985 was only half the average rate at Department of Energy facilities. However, accidents that do occur are more severe. In 1980, an oil fire burned over 40 percent of an employee's body. And a construction accident in the early-1980's caused the death of an employee.

Primary References

Final Environmental Statement, Portsmouth GDP Expansion, Energy Research and Development Administration, 1977.

Environmental Monitoring Report for 1985, Goodyear Atomic, Piketon, OH, May 1986 (GAT 1138).

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"Information on Three Ohio Defense Facilities," U.S. General Accounting Office, Washington, DC, November 1985 (RCED-86-51 FS).