UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JAN 1 1 1981

Mrs. L. D. Dupler
780 Fulling Mill Road
Middletown, Pennsylvania 17057

Dear Mrs. Dupler:

This is in reply to your letter of December 1, 1980, to the Nuclear Regulatory Commission requesting information on nuclear plant locations, waste dumps, and safe distances from nuclear plants.

Enclosed is a map of the United States showing the sites of nuclear power reactors. This was issued in 1980 by U.S. Geological Survey.

Also enclosed is an excerpt from the 1979 Annual Report of the Nuclear Regulatory Commission listing nuclear power plants in operation, under construction, or planned as of September 30, 1979. These are arranged by States, and the town nearest to each site is indicated. Since September 1979, utilities have requested withdrawal of applications for construction permits or have announced cancellation of construction for the following nuclear power plants in this list: Davis-Besse Units 2 and 3 (Ohio), Erie Units 1 and 2 (Ohio), Forked River (N.J.), Greenwood Units 2 and 3 (Mich.), Haven (Wis.), New Haven Units 1 and 2 (N.Y.), North Anna Unit 4 (Va.), and Sterling (N.Y.). No new applications for NRC construction permits for nuclear power plants have been received since 1978.

With regard to radioactive waste, enclosed is a chapter on "Waste Management" from the 1979 Annual Report of the Nuclear Regulatory Commission. On page 150 there is given the location of the previous six commercial waste disposal operations, of which only three are currently in operation.

With regard to safe distances from nuclear plants, in selecting a site for a nuclear power station it is necessary to provide for an exclusion area where there are no residents and a low population zone in which the population is sufficiently limited in number and distributed in such a way that there is a reasonable probability that appropriate measures could be taken in the event of a serious accident. In addition, the site must also meet certain requirements as to the distance from the nuclear reactor to the nearest boundary of a densely populated center containing more than about 25,000 residents. Furthermore, if the population density averaged out to 30 miles from a nuclear power station exceeds certain limits, special attention is given to the consideration of alternative sites with lower population densities.

MISC

Once a site for a nuclear power plant has been approved and the plant has been constructed and put into operation, two Emergency Planning Zones are established around the plant for coping with a serious accident. One is concerned with the exposure from a radioactive plume in the atmosphere and has a radius of about 10 miles. The other is concerned with radioactivity deposited on the ground and finding its way into food and water and has a radius of about 50 miles. Predetermined protective actions plans are required to be established for these Emergency Planning Zones.

The probability of an accident at a nuclear power plant causing any significant radioactive doses to the off-site general population is very small. Even the accident at Three Mile Island did not cause such doses, as indicated by the attached excerpt on "Health Effects" from the Report of the President's Commission on that accident.

Sincerely,

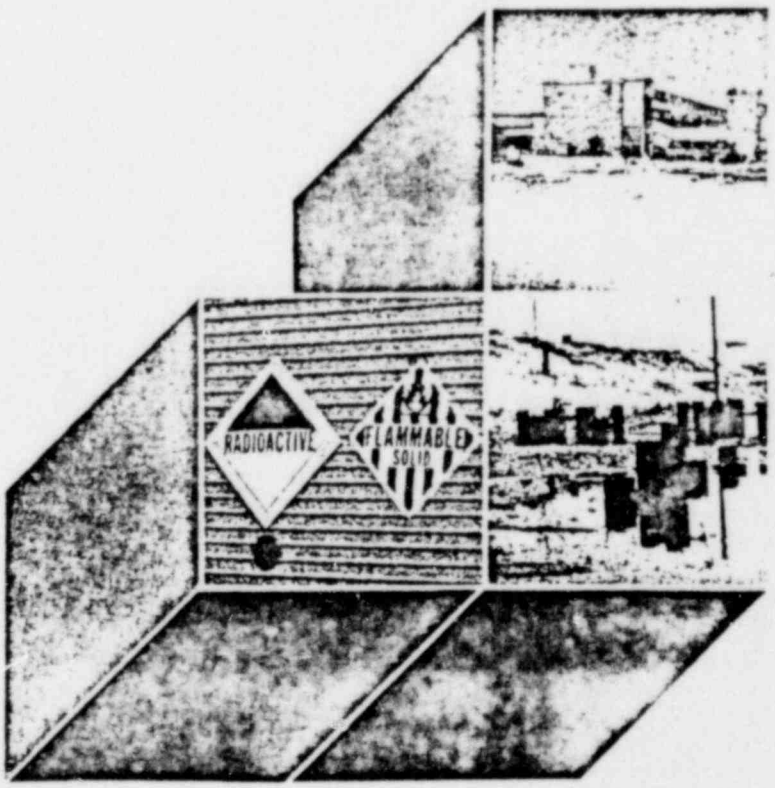
Gary G. Zech

Gary G. Zech, Chief
Technical Support Branch
Planning & Program Analysis Staff, NRR

Enclosures:
As stated

1979 Annual Report

APPENDIX 6



U.S. NUCLEAR
REGULATORY COMMISSION

Appendix 6

Nuclear Electric Generating Units in Operation, Under Construction or Planned

(As of September 30, 1979)

The following listing includes 192 nuclear power reactor electrical generating units which were in operation, under NRC review for construction permits, and ordered or announced by utilities in the United States at the end of September 1979, representing a total capacity of approximately 187,000 MWe. TYPE is indicated by: BWR—boiling water reactor, PWR—pressurized water reactor, HTGR—high temperature gas-cooled reactor, and LMFBR—liquid metal cooled fast breeder reactor. STATUS is indicated by: OL—has operating license, CP—has construction permit, UR—under review for construction permit, A/O—announced or ordered by the utility but application for construction not yet docketed by the NRC for review. The dates for operation are either actual or those scheduled by the utilities (N/S—not yet scheduled).

This listing includes 20 fewer units than a year ago, reflecting cancellations of plans for future facilities. In addition, delays in planned completion dates have been indicated during fiscal year 1979 for 47 other units. The reasons cited for delays and cancellations include (1) lower demand for electricity, (2) financial problems, (3) construction delays, (4) concerns for reactor safety, and (5) regulatory delays.

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
ALABAMA						
Decatur	Browns Ferry Nuclear Power Plant Unit 1	1,065	BWR	OL 1973	Tennessee Valley Authority	1974
Decatur	Browns Ferry Nuclear Power Plant Unit 2	1,065	BWR	OL 1974	Tennessee Valley Authority	1975
Decatur	Browns Ferry Nuclear Power Plant Unit 3	1,065	BWR	OL 1976	Tennessee Valley Authority	1977
Dothan	Joseph M. Farley Nuclear Plant Unit 1	829	BWR	OL 1977	Alabama Power Co.	1978
Dothan	Joseph M. Farley Nuclear Plant Unit 2	829	PWR	CP 1972	Alabama Power Co.	1980
Scottsboro	Bellefonte Nuclear Plant Unit 1	1,235	PWR	CP 1974	Tennessee Valley Authority	1981
Scottsboro	Bellefonte Nuclear Plant Unit 2	1,235	PWR	CP 1974	Tennessee Valley Authority	1981

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
ARIZONA						
Winterburg	Palo Verde Nuclear Generating Station Unit 1	1,270	PWR	CP 1976	Arizona Public Service Co.	198_
Winterburg	Palo Verde Nuclear Generating Station Unit 2	1,270	PWR	CP 1976	Arizona Public Service Co.	1984
Winterburg	Palo Verde Nuclear Generating Station Unit 3	1,270	PWR	CP 1976	Arizona Public Service Co.	198_
ARKANSAS						
Russelville	Arkansas Nuclear One Unit 1	850	PWR	OL 1974	Arkansas Power & Light Co.	1974
Russelville	Arkansas Nuclear One Unit 2	912	PWR	OL 1978	Arkansas Power & Light Co.	1978
CALIFORNIA						
Eureka	Humboldt Bay Power Plant Unit 3	65	BWR	OL 1962	Pacific Gas & Electric Co.	1963
San Clemente	San Onofre Nuclear Generating Station Unit 1	436	PWR	OL 1967	So. Calif. Ed. & San Diego Gas & Electric Co.	1968
San Clemente	San Onofre Nuclear Generating Station Unit 2	1,140	PWR	CP 1973	So. Calif. Ed. & San Diego Gas & Electirc Co.	1980
San Clemente	San Onofre Nuclear Generating Station Unit 3	1,140	PWR	CP 1973	So. Calif. Ed. & San Diego Gas & Electric Co.	1981
Diablo Canyon	Diablo Canyon Nuclear Power Plant Unit 1	1,084	PWR	CP 1968	Pacific Gas & Electric Co.	1980
Diablo Canyon	Diablo Canyon Nuclear Power Plant Unit 2	1,106	PWR	CP 1970	Pacific Gas & Elec. Co.	1979
Clay Station	Rancho Seco Nuclear Generating Station Unit 1	917	PWR	OL 1974	Sacramento Municipal Utility District	1975
*	Stanislaus Unit 1	1,200	BWR	A/O	Pacific Gas & Elec. Co.	Indef.
*	Stanislaus Unit 2	1,200	BWR	A/O	Pacific Gas & Elec. Co.	Indef.
COLORADO						
Platteville	Fort St. Vrain Nuclear Generating Station	330	HTGR	OL 1973	Public Service Co. of Colorado	1978
CONNECTICUT						
Haddam Neck	Haddam Neck Generating Station	575	PWR	OL 1967	Conn. Yankee Atomic Power Co.	1968
Waterford	Millstone Nuclear Power Station Unit 1	660	BWR	OL 1970	Northeast Nuclear Energy Co.	1971

* Site not selected.

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
CONNECTICUT—Continued						
Waterford	Millstone Nuclear Power Station Unit 2	830	PWR	OL 1975	Northeast Nuclear Energy Co.	1975
Waterford	Millstone Nuclear Power Station Unit 3	1,159	PWR	CP 1974	Northeast Nuclear Energy Co.	1985
FLORIDA						
Florida City	Turkey Point Station Unit 3	693	PWR	OL 1972	Florida Power & Light Co.	1972
Florida City	Turkey Point Station Unit 4	693	PWR	OL 1973	Florida Power & Light Co.	1973
Red Level	Crystal River Plant Unit 3	825	PWR	OL 1977	Florida Power Corp.	1977
Ft. Pierce	St. Lucie Plant Unit 1	802	PWR	OL 1976	Florida Power & Light Co.	1976
Ft. Pierce	St. Lucie Plant Unit 2	842	PWR	CP 1977	Florida Power & Light Co.	1983
GEORGIA						
Baxley	Edwin I. Hatch Plant Unit 1	786	BWR	OL 1974	Georgia Power Co.	1975
Baxley	Edwin I. Hatch Plant Unit 2	795	BWR	OL 1978	Georgia Power Co.	1978
Waynesboro	Alvin W. Vogtle, Jr. Plant Unit 1	1,100	PWR	CP 1974	Georgia Power Co.	1984
Waynesboro	Alvin W. Vogtle, Jr. Plant Unit 2	1,100	PWR	CP 1974	Georgia Power Co.	1985
ILLINOIS						
Morris	Dresden Nuclear Power Station Unit 1	200	BWR	OL 1959	Commonwealth Edison Co.	1960
Morris	Dresden Nuclear Power Station Unit 2	794	BWR	OL 1969	Commonwealth Edison Co.	1970
Morris	Dresden Nuclear Power Station Unit 3	794	BWR	OL 1971	Commonwealth Edison Co.	1971
Zion	Zion Nuclear Plant Unit 1	1,040	PWR	OL 1973	Commonwealth Edison Co.	1973
Zion	Zion Nuclear Plant Unit 2	1,040	PWR	OL 1973	Commonwealth Edison Co.	1974
Cordova	Quad-Cities Station Unit 1	789	BWR	OL 1972	Comm. Ed. Co.-Iowa-Ill. Gas & Elec. Co.	1973
Cordova	Quad-Cities Station Unit 2	789	BWR	OL 1972	Comm. Ed. Co.-Iowa-Ill. Gas & Elec. Co.	1973
Seneca	LaSalle County Nuclear Station Unit 1	1,078	BWR	CP 1973	Commonwealth Edison Co.	1979
Seneca	LaSalle County Nuclear Station Unit 2	1,078	BWR	CP 1973	Commonwealth Edison Co.	1980

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
ILLINOIS—Continued						
Byron	Byron Station Unit 1	1,120	PWR	CP 1975	Commonwealth Edison Co.	1982
Byron	Byron Station Unit 2	1,120	PWR	CP 1975	Commonwealth Edison Co.	1983
Braidwood	Braidwood Unit 1	1,120	PWR	CP 1975	Commonwealth Edison Co.	1982
Braidwood	Braidwood Unit 2	1,120	PWR	CP 1975	Commonwealth Edison Co.	1983
Clinton	Clinton Nuclear Power Plant Unit 1	950	BWR	CP 1976	Illinois Power Co.	1982
Clinton	Clinton Nuclear Power Plant Unit 2	950	BWR	CP 1976	Illinois Power Co.	1988
Savannah	Carroll County Station Unit 1	1,150		A/O	Commonwealth Edison Co.	1988
Savannah	Carroll County Station Unit 2	1,150		A/O	Commonwealth Edison Co.	1989
INDIANA						
Westchester Town	Bailly Generating Station	660	BWR	CP 1974	Northern Indiana Public Service Co.	1984
Madison	Marble Hill Unit 1	1,130	PWR	CP 1978	Public Service of Indiana	1982
Madison	Marble Hill Unit 2	1,130	PWR	CP 1978	Public Service of Indiana	1984
IOWA						
Pala	Duane Arnold Energy Center Unit 1	538	BWR	OL 1974	Iowa Elec. Light & Power Co.	1975
KANSAS						
Burlington	Wolf Creek	1,150	PWR	CP 1977	Kansas Gas & Elec. Co.	1983
LOUISIANA						
Taft	Waterford Steam Electric Station	1,165	PWR	CP 1974	Louisiana Power & Light Co.	1981
St. Francisville	River Bend Station Unit 1	934	BWR	CP 1977	Gulf States Utilities Co.	1984
St. Francisville	River Bend Station Unit 2	934	BWR	CP 1977	Gulf States Utilities Co.	N/S
MAINE						
Wiscasset	Maine Yankee Atomic Power Plant	790	PWR	OL 1972	Maine Yankee Atomic Power Co.	1972
MARYLAND						
Lusby	Calvert Cliffs Nuclear Power Plant Unit 1	845	PWR	OL 1974	Baltimore Gas & Elec. Co.	1975
Lusby	Calvert Cliffs Nuclear Power Plant Unit 2	845	PWR	OL 1976	Baltimore Gas & Elec. Co.	1977

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
MASSACHUSETTS						
Rowe	Yankee Nuclear Power Station	175	PWR	OL 1960	Yankee Atomic Elec. Co.	1961
Plymouth	Pilgrim Station Unit 1	655	BWR	OL 1972	Boston Edison Co.	1972
Plymouth	Pilgrim Station Unit 2	1,180	PWR	UR	Boston Edison Co.	1985
Turners Falls	Montague Unit 1	1,150	BWR	UR	Northeast Nuclear Energy Co.	N/S
Turners Falls	Montague Unit 2	1,150	BWR	UR	Northeast Nuclear Energy Co.	N/A
MICHIGAN						
Big Rock Point	Big Rock Point Nuclear Plant	72	BWR	OL 1962	Consumers Power Co.	1963
South Haven	Palisades Nuclear Power Station	805	PWR	OL 1971	Consumers Power Co.	1971
Lagoona Beach	Enrico Fermi Atomic Power Plant Unit 2	1,123	BWR	CP 1972	Detroit Power Co.	1980
Bridgman	Donald C. Cook Plant Unit 1	1,054	PWR	OL 1974	Indiana & Michigan Elec. Co.	1975
Bridgman	Donald C. Cook Plant Unit 2	1,100	PWR	OL 1977	Indiana & Michigan Elec. Co.	1978
Midland	Midland Nuclear Power Plant Unit 1	492	PWR	CP 1972	Consumers Power Co.	1982
Midland	Midland Nuclear Power Plant Unit 2	818	PWR	CP 1972	Consumers Power Co.	1981
St. Clair County	Greenwood Energy Center Unit 2	1,200	PWR	UR	Detroit Edison Co.	N/S
St. Clair County	Greenwood Energy Center Unit 3	1,200	PWR	UR	Detroit Edison Co.	N/S
MINNESOTA						
Monticello	Monticello Nuclear Generating Plant	545	BWR	OL 1970	Northern States Power Co.	1971
Red Wing	Prairie Island Nuclear Generating Plant Unit 1	530	PWR	OL 1973	Northern States Power Co.	1973
Red Wing	Prairie Island Nuclear Generating Plant Unit 2	530	PWR	OL 1974	Northern States Power Co.	1974
MISSISSIPPI						
Port Gibson	Grand Gulf Nuclear Station Unit 1	1,250	BWR	CP 1974	Mississippi Power & Light Co.	1982
Port Gibson	Grand Gulf Nuclear Station Unit 2	1,250	BWR	CP 1974	Mississippi Power & Light Co.	1984

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
MISSISSIPPI—Continued						
Yellow Creek	Yellow Creek Unit 1	1,285	PWR	CP 1978	Tennessee Valley Authority	1985
Yellow Creek	Yellow Creek Unit 2	1,285	PWR	CP 1978	Tennessee Valley Authority	1991
MISSOURI						
Fulton	Callaway Plant Unit 1	1,150	PWR	CP 1976	Union Elec. Co.	1982
Fulton	Callaway Plant Unit 1	1,150	PWR	CP 1976	Union Elec. Co.	1987
NEBRASKA						
Fort Calhoun	Fort Calhoun Station Unit 1	457	PWR	OL 1973	Omaha Public Power District	1973
Brownville	Cooper Nuclear Station	778	BWR	OL 1974	Nebraska Public Power District	1974
NEW HAMPSHIRE						
Seabrook	Seabrook Nuclear Station Unit 1	1,194	PWR	CP 1976	Public Service of N.H.	1983
Seabrook	Seabrook Nuclear Station Unit 2	1,194	PWR	CP 1976	Public Service of N.H.	1985
NEW JERSEY						
Toms River	Oyster Creek Nuclear Power Plant Unit 1	650	BWR	OL 1969	Jersey Central Power & Light Co.	1969
Forked River	Forked River Generating Station Unit 1	1,070	PWR	CP 1973	Jersey Central Power & Light Co.	1984
Salem	Salem Nuclear Generating Station Unit 1	1,090	PWR	OL 1976	Public Service Elec. & Gas Co.	1977
Salem	Salem Nuclear Generating Station Unit 2	1,115	PWR	CP 1968	Public Service Elec. & Gas Co.	1979
Salem	Hope Creek Generating Station Unit 1	1,067	BWR	CP 1974	Public Service Elec. & Gas. Co.	1984
Salem	Hope Creek Generating Station Unit 2	1,067	BWR	CP 1974	Public Service Elec. & Gas Co.	1986
NEW YORK						
Indian Point	Indian Point Station Unit 1	265	PWR	OL 1962	Consolidated Edison Co.	1962
Indian Point	Indian Point Station Unit 2	873	PWR	OL 1971	Consolidated Edison Co.	1973
Indian Point	Indian Point Station Unit 3	965	PWR	OL 1975	Consolidated Edison Co.	1976
Scriba	Nine Mile Point Nuclear Station Unit 1	610	BWR	OL 1969	Niagara Mohawk Power Co.	1969

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
NEW YORK—Continued						
Scriba	Nine Mile Point Nuclear Station Unit 2	1,080	BWR	CP 1974	Niagara Mohawk Power Co.	1984
Ontario	R.E. Ginna Nuclear Power Plant Unit 1	490	PWR	OL 1969	Rochester Gas & Elec. Co.	1970
Brookhaven	Shoreham Nuclear Power Station	854	BWR	CP 1973	Long Island Lighting Co.	1980
Scriba	James A. FitzPatrick Nuclear Power Plant	821	BWR	OL 1974	Power Authority of State of N.Y.	1975
Long Island	Jamesport Unit 1	1,150	PWR	CP 1979	Long Island Lighting Co.	1988
Long Island	Jamesport Unit 2	1,150	PWR	CP 1979	Long Island Lighting Co.	1990
*	New Haven 1	1,250	PWR	UR	N.Y. State Elec. & Gas Co.	Indef.
*	New Haven 2	1,250	PWR	UR	N.Y. State Elec. & Gas Co.	Indef.
Sterling	Sterling Power Project Unit 1	1,150	PWR	CP 1977	Rochester Gas & Elec. Co.	1988
NORTH CAROLINA						
Southport	Brunswick Steam Electric Plant Unit 2	821	BWR	OL 1974	Carolina Power & Light Co.	1975
Southport	Brunswick Steam Electric Plant Unit 1	821	BWR	OL 1976	Carolina Power & Light Co.	1977
Cowans Ford Dam	Wm. B. McGuire Nuclear Station Unit 1	1,180	PWR	CP 1973	Duke Power Co.	1980
Cowans Ford Dam	Wm. B. McGuire Nuclear Station Unit 2	1,180	PWR	CP 1973	Duke Power Co.	1982
Bonsal	Shearon Harris Plant Unit 1	915	PWR	CP 1978	Carolina Power & Light Co.	1983
Bonsal	Shearon Harris Plant Unit 2	915	PWR	CP 1978	Carolina Power & Light Co.	1985
Bonsal	Shearon Harris Plant Unit 3	915	PWR	CP 1978	Carolina Power & Light Co.	1989
Bonsal	Shearon Harris Plant Unit 4	915	PWR	CP 1978	Carolina Power & Light Co.	1987
Davie Co.	Perkins Nuclear Station Unit 1	1,280	PWR	UR	Duke Power Co.	1988
Davie Co.	Perkins Nuclear Station Unit 2	1,280	PWR	UR	Duke Power Co.	1991
Davie Co.	Perkins Nuclear Station Unit 3	1,280	PWR	UR	Duke Power Co.	1993
OHIO						
Oak Harbor	Davis-Besse Nuclear Power Station Unit 1	906	PWR	OL 1977	Toledo Edison-Cleveland Elec. Illum. Co.	1977
Oak Harbor	Davis-Besse Nuclear Power Station Unit 2	906	PWR	UR **	Toledo Edison-Cleveland Elec. Illum. Co.	1988

* Site not selected.

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
OHIO—Continued						
Oak Harbor	Davis-Besse Nuclear Power Station Unit 3	906	PWR	UR **	Toledo Edison-Cleveland Elec. Illum. Co.	1990
Perry	Perry Nuclear Power Plant Unit 1	1,205	BWR	CP 1977	Cleveland Elec. Illum. Co.	1982
Perry	Perry Nuclear Power Plant Unit 2	1,205	BWR	CP 1977	Cleveland Elec. Illum Co.	1984
Moscow	Wm. H. Zimmer Nuclear Power Station Unit 1	810	BWR	CP 1972	Cincinnati Gas & Elec. Co.	1979
Berlin Hgts.	Erie Unit 1	1,260	PWR	UR	Ohio Edison Co.	1989
Berlin Hgts.	Erie Unit 2	1,260	PWR	UR	Ohio Edison Co.	1991
OKLAHOMA						
Inola	Black Fox Unit 1	1,150	BWR	UR **	Public Service Co. of Oklahoma	1983
Inola	Black Fox Unit 2	1,150	BWR	UR **	Public Service Co. of Oklahoma	1985
OREGON						
Prescott	Trojan Nuclear Plant Unit 1	1,130	PWR	OL 1975	Portland General Elec. Co.	1976
Arlington	Pebble Springs Unit 1	1,260	PWR	UR	Portland General Elec. Co.	1986
Arlington	Pebble Springs Unit 2	1,260	PWR	UR	Portland General Elec. Co.	1989
PENNSYLVANIA						
Peach Bottom	Peach Bottom Atomic Power Station Unit 2	1,065	BWR	OL 1973	Philadelphia Elec. Co.	1974
Peach Bottom	Peach Bottom Atomic Power Station Unit 3	1,065	BWR	OL 1974	Philadelphia Elec. Co.	1974
Pottstown	Limerick Generating Station Unit 1	1,065	BWR	CP 1974	Philadephia Elec. Co.	1983
Pottstown	Limerick Generating Station Unit 2	1,065	BWR	CP 1974	Philadelphia Elec. Co.	1985
Shippingport	Shippingport Atomic Power Unit 1	90	PWR	— [1]	Duquesne Light Co. & DOE	NA
Shippingport	Beaver Valley Power Station Unit 1	852	PWR	OL 1976	Duquesne Light Co. Ohio Edison Co.	1976
Shippingport	Beaver Valley Power Station Unit 2	852	PWR	CP 1974	Duquesne Light Co. Ohio Edison Co.	1983

** Limited work authorization issued.

[1] Operable but OL not required.

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
PENNSYLVANIA—Continued						
Goldsboro	Three Mile Island Nuclear Station Unit 1	819	PWR	OL 1974	Metropolitan Edison Co.	1974
Goldsboro	Three Mile Island Nuclear Station Unit 2	906	PWR	OL 1978	Metropolitan Edison Co.	1978
Berwick	Susquehanna Steam Electric Station Unit 1	1,052	BWR	CP 1973	Pennsylvania Power & Light Co.	1980
Berwick	Susquehanna Steam Electric Station Unit 2	1,052	BWR	CP 1973	Pennsylvania Power & Light Co.	1982
RHODE ISLAND						
No. Kingston	New England Unit 1	1,150	PWR	UR	New England Power Co.	1987
No. Kingston	New England Unit 2	1,150	PWR	UR	New England Power Co.	1989
SOUTH CAROLINA						
Hartsville	H.B. Robinson S.E. Plant Unit 2	700	PWR	OL 1970	Carolina Power & Light Co.	1971
Seneca	Oconee Nuclear Station Unit 1	887	PWR	OL 1973	Duke Power Co	1973
Seneca	Oconee Nuclear Station Unit 2	887	PWR	OL 1973	Duke Power Co.	1974
Seneca	Oconee Nuclear Station Unit 3	887	PWR	OL 1974	Duke Power Co.	1974
Broad River	Virgil C. Summer Nuclear Station Unit 1	900	PWR	CP 1973	So. Carolina Elec. & Gas Co.	1980
Lake Wylie	Catawba Nuclear Station Unit 1	1,145	PWR	CP 1975	Duke Power Co.	1983
Lake Wylie	Catawba Nuclear Station Unit 2	1,145	PWR	CP 1975	Duke Power Co.	1985
Cherokee County	Cherokee Nuclear Station Unit 1	1,280	PWR	CP 1977	Duke Power Co.	1986
Cherokee County	Cherokee Nuclear Station Unit 2	1,280	PWR	CP 1977	Duke Power Co.	1988
Cherokee County	Cherokee Nuclear Station Unit 3	1,280	PWR	CP 1977	Duke Power Co.	1988
TENNESSEE						
Daisy	Sequoyah Nuclear Power Plant Unit 1	1,140	PWR	CP 1970	Tennessee Valley Authority	1979
Daisy	Sequoyah Nuclear Power Plant Unit 2	1,140	PWR	CP 1970	Tennessee Valley Authority	1980
Spring City	Watts Bar Nuclear Plant Unit 1	1,165	PWR	CP 1973	Tennessee Valley Authority	1979

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
TENNESSEE—Continued						
Spring City	Watts Bar Nuclear Plant Unit 2	1,165	PWR	CP 1973	Tennessee Valley Authority	1980
Oak Ridge	Clinch River Breeder Reactor Plant	350	LMFBR	UR	U.S. Government	Indef.
Hartsville	TVA Plant A Unit 1	1,205	BWR	CP 1977	Tennessee Valley Authority	1982
Hartsville	TVA Plant A Unit 2	1,205	BWR	CP 1977	Tennessee Valley Authority	1983
Hartsville	TVA Plant B Unit 1	1,205	BWR	CP 1977	Tennessee Valley Authority	1988
Hartsville	TVA Plant B Unit 2	1,205	BWR	CP 1977	Tennessee Valley Authority	1989
Phipps Bend	Phipps Bend Unit 1	1,220	BWR	CP 1978	Tennessee Valley Authority	1983
Phipps Bend	Phipps Bend Unit 2	1,220	BWR	CP 1978	Tennessee Valley Authority	1986
TEXAS						
Glen Rose	Comanche Peak Steam Electric Station Unit 1	1,150	PWR	CP 1974	Texas P&L, Dallas P&L, Texas Elec. Service	1981
Glen Rose	Comanche Peak Steam Electric Station Unit 2	1,150	PWR	CP 1974	Texas P&L, Dallas P&L, Texas Elec. Service	1983
Wallis	Allens Creek Unit 1	1,150	BWR	UR	Houston Lighting & Power Co.	1985
Bay City	South Texas Nuclear Project Unit 1	1,250	PWR	CP 1975	Houston Lighting & Power Co.	1983
Bay City	South Texas Nuclear Project Unit 2	1,250	PWR	CP 1975	Houston Lighting & Power Co.	1985
VERMONT						
Vernon	Vermont Yankee Generating Station	514	BWR	OL 1972	Vermont Yankee Nuclear Power Corp.	1972
VIRGINIA						
Gravel Neck	Surry Power Station Unit 1	822	PWR	OL 1972	Va. Electric & Power Co.	1972
Gravel Neck	Surry Power Station Unit 2	822	PWR	OL 1973	Va. Electric & Power Co.	1973
Mineral	North Anna Power Station Unit 1	907	PWR	OL 1976	Va. Electric & Power Co.	1978
Mineral	North Anna Power Station Unit 2	907	PWR	CP 1971	Va. Electric & Power Co.	1979

Site	Plant	Capacity (Net MWe)	Type	Status	Utility	Commercial Operation
VIRGINIA—Continued						
Mineral	North Anna Power Station Unit 3	907	PWR	CP 1974	Va. Electric & Power Co.	1985
Mineral	North Anna Power Station Unit 4	907	PWR	CP 1974	Va. Electric & Power Co.	1986
*	Central Virginia 1	1,150		A/O	American Electric Power Co.	1990
*	Central Virginia 2	1,150		A/O	American Electric Power Co.	1990
WASHINGTON						
Richland	N-Reactor/WPPSS Steam	850	GR	—[1]	Wash. Public Power Supply System	
Richland	WPPSS No. 1 (Hanford)	1,267	PWR	CP 1975	Wash. Public Power Supply System	1983
Richland	WPPSS No. 2 (Hanford)	1,103	BWR	CP 1973	Wash. Public Power Supply System	1981
Satsop	WPPSS No. 3	1,242	PWR	CP 1978	Wash. Public Power Supply System	1984
Richland	WPPSS No. 4	1,267	PWR	CP 1978	Wash. Public Power Supply System	1984
Satsop	WPPSS No. 5	1,242	PWR	CP 1978	Wash. Public Power Supply System	1985
Sedro Wooley	Skagit Nuclear Power Project Unit 1	1,277	BWR	UR	Puget Sound Power & Light Co.	1985
Sedro Wooley	Skagit Nuclear Power Project Unit 2	1,277	BWR	UR	Puget Sound Power & Light Co.	1987
WISCONSIN						
Genoa	Genoa Nuclear Generating Station (LaCrosse)	50	BWR	OL 1967	Dairyland Power Coop.	1969
Two Creeks	Point Beach Nuclear Plant Unit 1	497	PWR	OL 1970	Wisconsion Michigan Power Co.	1970
Two Creeks	Point Beach Nuclear Plant Unit 2	497	PWR	OL 1971	Wisconsin Michigan Power Co.	1972
Carlton	Kewaunee Nuclear Power Plant	535	PWR	OL 1973	Wisconsin Elec. Power Co.	1974
Ft. Atkinson	Haven Nuclear Plant	900	PWR	UR	Wisconsin Elec. Power Co.	1987

* Site not selected.

[1] Operable but OL not required.

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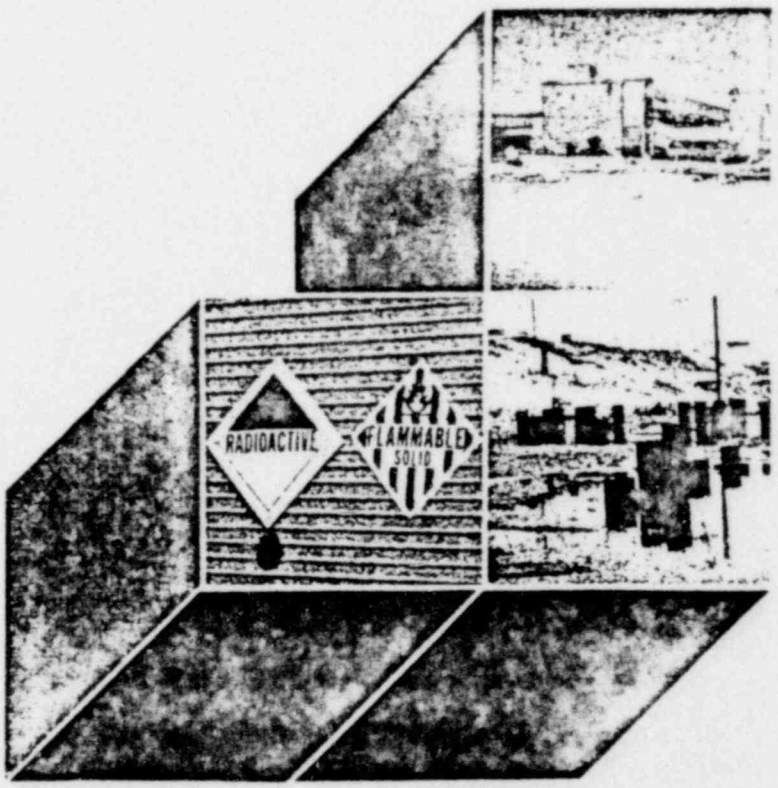
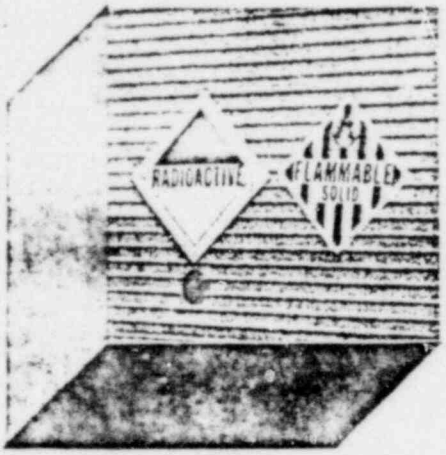
CHAPTER 6



U.S. NUCLEAR
REGULATORY COMMISSION



6 Waste Management

Waste shipments are clearly identified by NRC-approved placards.

The NRC waste management function was elevated to divisional status in 1979 under the NRC Office of Nuclear Material Safety and Safeguards (NMSS). The new Division of Waste Management consists of five branches which carry out a number of functions that were formerly among those of the Division of Fuel Cycle and Material Safety:

- *The High-Level Waste Technical Development Branch*—responsible for high-level waste regulatory development and development of the technical bases for high-level waste licensing and regulation.
- *The High Level Waste Licensing Management Branch*—responsible for licensing high-level waste commercial repositories.
- *The Low-Level Waste Licensing Branch*—responsible for low-level waste licensing and regulation.
- *The Uranium Recovery Licensing Branch*—responsible for licensing and regulation of uranium mills, heap-leach operations, commercial scale solution mining operations, and research and development (R&D) uranium recovery operations. These types of operations represent the first step of the nuclear fuel cycle. Since large amounts of waste are generated as a result of these operations, especially uranium milling, it was decided that these operations should come under the Division of Waste Management.
- *The Licensing Process and Integration Branch*—responsible for coordinating and integrating the entire NRC waste management program. In order to do this, the branch works with elements within NMSS, with other NRC offices, and with other governmental agencies having waste management responsibilities, to ensure that the entire NRC program is well focused and proceeding on established schedules.

Overview of 1979 Activity

The main focus of NRC effort in 1979 for the high-level waste program was in regulatory development. The NRC is developing a comprehensive regulation for high-level waste repositories—to be Part 60 of the NRC regulatory code—in two parts, procedural and technical. The procedural part was published as a proposed rule for comment in December 1979. The technical part is expected to be published in early 1980 pursuant to an advance notice of proposed rulemaking.

The main focus of NRC work in 1979 for the low-level waste program has also been in regulatory development. The NRC is developing a comprehensive regulation for low-level waste disposal. This regulation will be Part 61 of the code. A preliminary draft of the regulation has been completed and sent to various organizations for review. The draft will be made available to the public in 1980.

A large part of NRC effort under the uranium recovery program has been concerned with the licensing of uranium recovery facilities, and a significant number of licenses were issued, renewed, and amended. In addition, a draft regulation for uranium mills (Amendment to Part 40) was issued for public comment in August 1979. The supporting generic environmental impact statement (GEIS) on uranium milling was issued for public comment in April 1979.

A number of notable events in nuclear waste disposal took place in 1979. There were only three low-level waste disposal sites in operation at the beginning of the year, all of them located in Agreement States. Two of the sites closed and then reopened, and a curtailment was placed on the amount of waste that could be received at the third site. These actions further demonstrated the large regional imbalance in low-level waste disposal locations and induced a

On July 16, 1979, a tailings dam near Grants, N.M., gave way, releasing nearly 100 million gallons of radioactive water and sediment into the Rio Puerco. Flow from the break reached into Arizona, some 75 miles down river. The break occurred as efforts were being made to reinforce the dam, and heavy equipment on site for that purpose enabled workers to stop the flow in a few hours.

number of States to seriously consider the desirability of regional burial sites. Also, on July 16, 1979, a tailings impoundment failure occurred at the United Nuclear Corporation uranium milling operation at Church Rock, N.M. (New Mexico is also an Agreement State.) A major effort was undertaken by the NRC to assist the State in correcting the situation. (See discussion under "Technical Assistance to Agreement States," later in this chapter.)

It is important to note three studies which have affected and will affect the course of the NRC waste management program. These studies are the Interagency Review Group (IRG) Study on Nuclear Waste Management, the Congressionally requested NRC Study on Regulation of Federal Radioactive Waste Activities; and the Congressionally requested NRC study on Means for Improving State Participation in the Siting, Licensing and Development of Federal Nuclear Waste Facilities. Also of potential importance to the NRC waste management program is the "confidence hearing" on radioactive waste disposal to be held by the Commission in 1980.

Interagency Review Group. As reported in the 1978 NRC Annual Report (pp. 93 and 94), the NRC staff participated in the IRG study on Nuclear Waste Management. (Because of NRC's status as an independent regulatory agency, the agency participated as a non-voting member.) The IRG draft report was issued in 1978 and the final report was issued in 1979. Many of its recommendations affect the NRC, which has reviewed the impact of these recommendations on its program in 1979 and will continue to do so in 1980.

Federal Radioactive Waste Study. The NRC's Authorization Act for fiscal year 1979 (P.L. 95-601) required the NRC to prepare a study on the regulation of Federal radioactive waste activities. The study was completed in 1979 and it was issued as NUREG-0527, entitled "Regulation of Federal Radioactive Waste Activities." Two principal recommendations came out of the study. The first was that NRC licensing authority should be extended to cover all new Department of Energy (DOE) facilities for disposal of transuranic waste and non-defense low-level waste. This recommendation was consistent with one of the IRG recommendations. The second was that a pilot program should be established to test the feasibility of extending NRC regulatory authority on a consultative basis to DOE waste management activities not now covered by NRC's licensing authority, or to the new facilities cited in the first recommendation. The pilot program would focus on a few specific DOE waste management activities and would result in a report to Congress on the feasibility of an NRC consultative role in existing DOE waste disposal and storage activities. The decision on whether to extend NRC regulatory authority and to establish the pilot program and on what waste management activities the program should include was considered one for the Congress to make. If the Congress decides that the NRC should implement these recommendations, it will significantly affect NRC's current and future waste management programs. The exact impact cannot be assessed until specific legislation is proposed and implemented.

Improving State Participation. The NRC's Authorization Bill for fiscal year 1979 (P.L. 95-601) also required the NRC to prepare a study on means for improving the opportunities for State participation in the process for siting, licensing, and developing nuclear waste storage or disposal facilities. The study was completed in 1979 and it was issued as NUREG 0539, entitled "Means for Improving State Participation in the Siting, Licensing, and Development of Federal Nuclear Waste Facilities."

There were a number of recommendations as a result of the study. The Commission recommended the establishment of a planning council consisting of Federal and State representatives, to be supported by a small administrative staff and Federally financed. A review capability should be established under the

direction of the planning council in order to enable the States to make technical evaluations of waste management technology and Federal waste management activities. The review capability should also be Federally funded. These recommendations were consistent with the IRG recommendations. In addition, the Commission recommended that measures be taken to involve the States throughout the process for planning, siting, developing, and licensing nuclear waste storage disposal facilities. It is also recommended that the Congress establish a grant program to allow the States to participate more fully in the Federal Waste Management program. Federal agencies should consider such transportation related issues as shipping routes, emergency planning, enroute liability, shipping containers, and the like, in their overall waste management activities and should develop institutional arrangements as appropriate for consulting with

NRC continued to study ways to improve Federal/State cooperation in waste storage matters in 1979, as visits to Agreement-State activities were stepped up. Representatives of several NRC program offices are shown here during a briefing on low-level waste storage monitoring techniques by officials of the Barnwell, S.C., storage site and South Carolina State offices.

the States in a timely manner. Lastly, the Commission recommended that legislation for improving State participation in the Federal Waste Management Program should provide recognition of the legitimate concerns of host States; considerations affecting a State concurrence or veto, if authorized by law, were identified.

If the Congress elects for the NRC and other Federal agencies to implement any or all of these recommendations, these actions will affect NRC's current and future waste management programs. The exact impact cannot be assessed until specific legislation is proposed and implemented.

Confidence Hearing. The NRC decided in 1979 to conduct a generic proceeding to reassess the Commission's degree of confidence that radioactive wastes produced by nuclear facilities will be safely disposed of, and to determine when any such disposal will be available, and whether such wastes can be safely stored until they are disposed of. Notice of the proceeding appeared in the Federal Register in October 1979, and the hearing will take place in 1980 and 1981. The proceeding has been initiated in response to the decision of the U.S. Court of Appeals for the District of Columbia Circuit in *State of Minnesota v. NRC*, 602 F.2d 412,but is also a continuation of proceedings previously conducted by the Commission in this area. The notice described the procedures the Commission will employ and how members of the public can participate. The results of the hearing and any rules issuing therefrom may have an effect on NRC's current and future waste management program. (See also "Commission Decisions," in Chapter 13.)

The three sections which follow describe the 1979 accomplishments of the NRC waste management programs dealing with high-level waste, low-level waste, and uranium recovery. Each section discusses near-term objectives of the program and activity during the report period in regulatory development, licensing, and associated matters.

HIGH-LEVEL WASTE MANAGEMENT

Regulatory Development

NRC continued its high-level waste regulatory development effort in 1979 with the objective of developing and publishing a draft regulation (10 CFR Part 60) and supporting environmental impact statement (EIS). The regulation as currently envisioned will be published in two parts: the procedural requirements and the technical requirements. The procedural portion would contain sub-parts covering general provisions, licenses, and participation by State governments. The technical portion would contain sub-parts covering performance objectives and technical criteria, physical protection, quality assurance, and emergency plans. Particular emphasis is being placed on waste form performance requirements and geologic site characterization issues. In December 1979, the procedural portion of the regulation was published as a proposed rule for public comment. The technical portion of the rule is expected to be published in early 1980 pursuant to an advanced notice of proposed rulemaking. Work is also continuing on a supporting environmental impact statement which would be published with the proposed technical rule in 1980.

Work began in 1979 in developing regulatory guides to support the regulation. These include format and content guides for the safety analysis report, the environmental report, and reports detailing DOE plans for site characterization work. These guides will be published for public comment in 1980.

Additional regulatory guidance will be provided to DOE in the form of technical directives. The technical directives that were under development in 1979 and which will be issued in 1980 will cover generic topics addressing site selection and characterization, repository design, and waste form. Work also continued in 1979 on identifying research needs.

In 1979, work was begun on outlining license review procedures both to aid the staff in establishing priorities for research and regulatory guides and to provide DOE with guidance on how NRC will conduct its review.

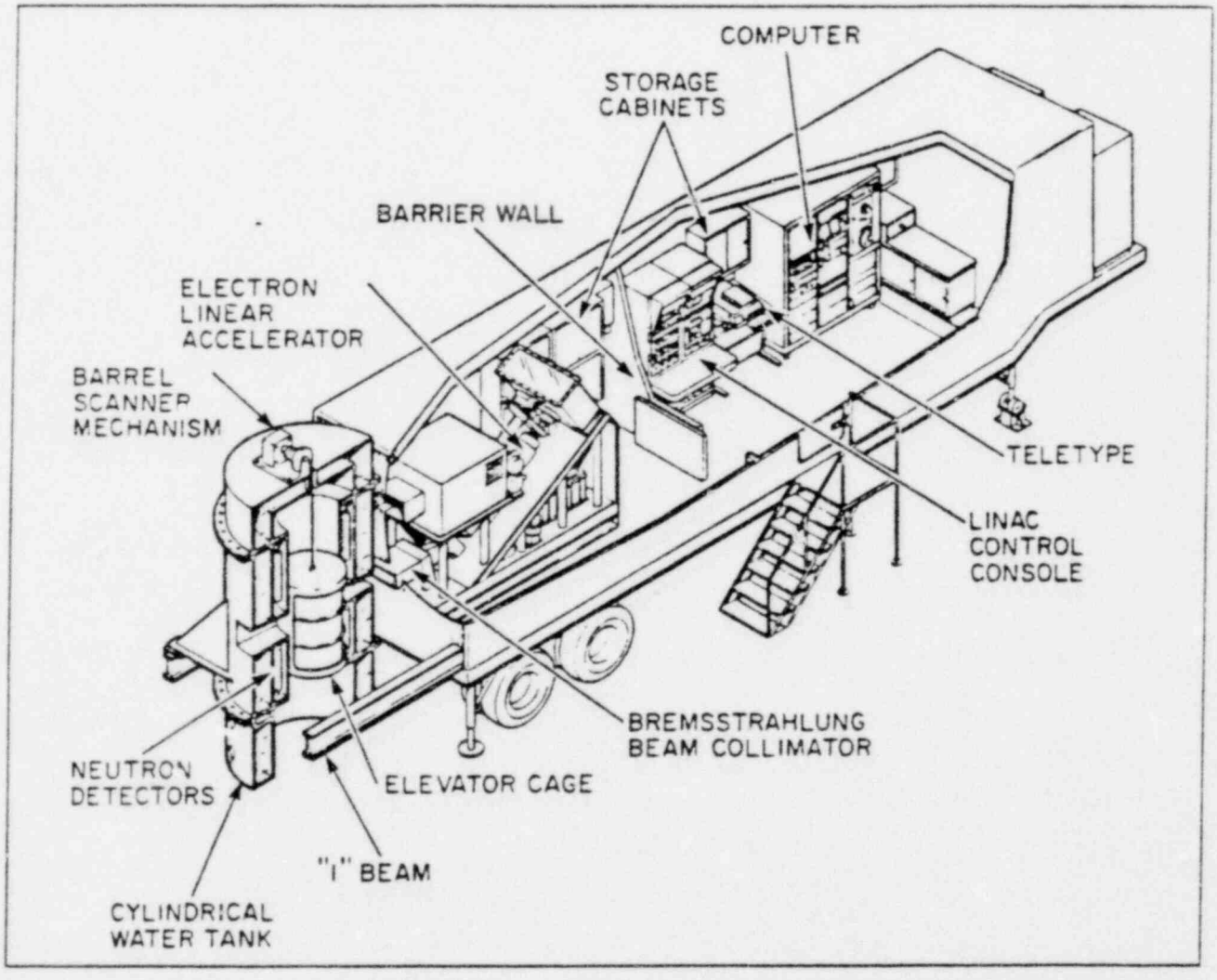
Licensing

NRC continued its efforts in 1979 to develop a capability to review a license application for a high-level waste repository. The development of models for assessing radionuclide transport in bedded salt was continued and is expected to be completed in 1980. A model for assessing the safety and environmental risks of a repository after sealing was delivered to the NRC by the contractor so that NRC could test and evaluate the model.

Assessment of DOE High-Level Waste Management Program

The NRC has continued its assessment of the DOE high-level waste management program in 1979. The NRC reviewed and provided comments to DOE on the draft EIS for the proposed Waste Isolation Pilot Plant (WIPP) and the draft GEIS on the management of commercially generated radioactive waste.

The NRC initiated in 1979 a program to critically assess the DOE high level waste management pro-



One of NRC's continuing objectives is the improvement of nuclear material inventory and accounting techniques. This cutaway drawing shows the main features of a mobile measurement system used to identify, measure and record uranium and plutonium contents of metal waste drums. The barrel scanner at rear (left) of the mobil unit remotely places, lifts and "reads" the container, and transmits readings through analytical devices to the recording instruments in the manned area of the trailer.

gram. DOE and its contractors have made formal presentations to NRC on various phases of the DOE program. On November 15-16, a meeting was held with the Office of Nuclear Waste Isolation and other DOE contractors at Columbus, Ohio, to formally inaugurate NRC's assessment program. Arrangements are being made to maintain an overview of all DOE activities in high-level waste management by systematically receiving and reviewing all documents generated by the DOE program. Task groups have been established to perform an initial, limited assessment of DOE activities in waste packaging, repository siting, and repository design. Comparisons will be made between needs identified in NRC's draft regulation and information expected to be generated by DOE programs. Finally, plans have been prepared for conducting a comprehensive critical assessment of the DOE repository siting and in-situ testing programs.

LOW-LEVEL WASTE MANAGEMENT

Regulatory Development

NRC continued its low-level waste regulatory development effort in 1979 with the objective of publishing a draft regulation (10 CFR 61) on low-level waste disposal. An environmental impact statement (EIS) will be prepared to support the rulemaking action. Work was also continued on supporting regulatory guides and staff positions.

The draft regulation as currently envisioned will consist of basic performance objectives applicable to the disposal of low-level waste on land by various methods. These objectives will be met by establishing appropriate requirements for siting a disposal facility and assuring adequate operations site closure and decommissioning and adequate institutional arrangements. Technical details specific to the individual disposal techniques of shallow-land burial and other alternative disposal methods will be contained in appendices to the regulation and in regulatory guides. A preliminary draft of the regulation was completed in 1979 and made available to a wide cross section of persons for informal review. The draft will be made available to the public in 1980.

The regulatory guides associated with the regulation are also under development and are currently envisioned to cover waste form and content; site design and operations; site monitoring and surveillance; site closure, stabilization, and post-operational care; standard contents for license application and environmental report; records and reports; and funding.

In addition to the above work, NRC has contracts with various organizations to develop a base of supporting technical information. Contractual studies are underway in such areas as systems analysis, waste classification, and volume reduction. The systems analysis contractor is developing models for analyzing radioactive waste disposal by shallow-land burial. The waste classification contractor is characterizing wastes, waste forms, and waste sources in addition to recommending requirements for safely disposing the waste. The volume reduction contractor is investigating various volume reduction techniques including compaction and incineration. The contractor is also performing economic analysis for the various techniques.

Other contractual efforts are planned to develop specific technical criteria for disposal of wastes in mined cavities and engineered structures, and to investigate in detail requirements for disposal of waste generated as a result of decontamination and decommissioning of nuclear facilities.

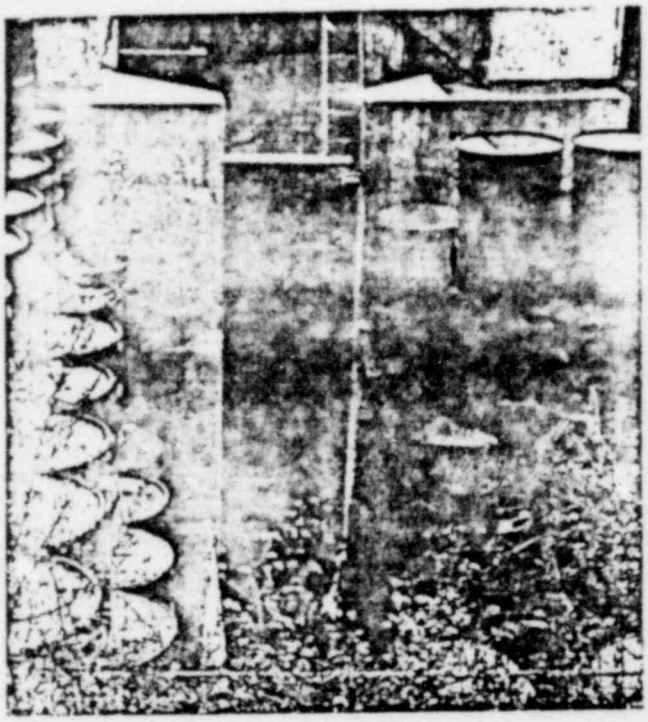
This "fish pole" radiation survey meter permits inspectors to accurately assess the radioactivity of low-level waste material in trenches prior to burial. Containers have just been delivered and dumped by trucks in background and will be covered by earth-moving equipment as soon as radiation levels and distribution have been recorded.

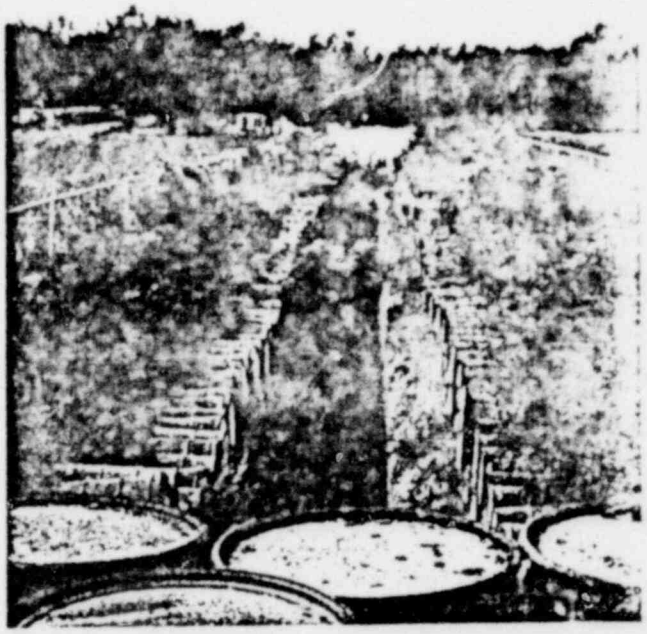
NRC's work in regulatory development in 1979 has been focused on development of requirements that can apply to a broad range of disposal alternatives. It has become increasingly clear to the NRC during 1979 that alternative disposal methods are critically needed and a regulatory base should be put in place in timely manner.

Licensing

NRC continued its licensing activity in low-level waste management in 1979. The NRC license for disposal of special nuclear material (SNM) at Hanford, Wash., was renewed in November 1979. This license was closely coordinated with the State of Washington and contains many upgraded requirements for operations at the site.

An environmental assessment was continued in 1979 for decommissioning of the Sheffield, Ill., facility and should be completed in 1980. The licensee applied for an expansion and continued operation of the site.





Low-level waste containers that contain higher-activity materials (or that emit higher levels of radioactivity) than those dumped in standard low-level disposal trenches are deposited in trenches or containment holes which offer greater depths and heavier shielding. Two types of such containments are shown here: (left) a reinforced concrete lined pit, and (right) a narrow, deep trench shielded by the filled barrels along the top. Both such containments are in protected, posted areas at a supervised site.

However, the licensee subsequently petitioned to withdraw the renewal and expansion application. The Atomic Safety and Licensing Board approved the withdrawal of the expansion request but the renewal will be subject to hearings. The applicant's withdrawal of the operating/expansion application was based on recognized technical problems for which the solution proposed by the licensee was not acceptable to the NRC. In addition to the above, five license amendments were granted for existing sites.

Since two of the previous six commercial disposal operations have closed, (West Valley, N.Y. and Maxey Flats, Ky.) and the Sheffield, Ill., disposal operation is effectively closed, only three commercial operations currently exist (Barnwell, S.C.; Beatty, Nev.; and Richland, Wash.). Thus the present disposal capacity is primarily located in the West and Southeast and represents an undesirable regional imbalance. The waste from reactors and other waste generators located in the Northeast and Midwestern United States must be transported either to the Southeastern United States or to the West.

A number of significant events occurred in 1979 that affect low-level waste disposal operation. It became obvious that more attention should be paid to decontamination and decommissioning wastes, from the viewpoint of low-level waste disposal operations. Some of these activities pose unique problems, such as the TMI waste and the waste from the decontamination of the Dresden I reactor. It also became obvious that further work is required for liquid scintillation waste. The State of South Carolina decided in 1979 not to accept any more shipments of this type of waste, and the waste must presently be shipped to the disposal operations in the West. NRC is investigating various alternatives for the treatment and disposal of this type of waste.

Lastly, it became obvious that NRC must take a more active role in upgrading packaging requirements and waste form for certain types of waste and increase inspection and enforcement of existing regulations covering the shipment of waste. For example, a fire occurred on a truck containing waste packages at the Beatty, Nev., site and large volumes of free-standing liquids were found upon inspection of packages of solidified wastes received at various low-level waste disposal sites. As a result of such events, the governors of the three States having commercial low-level waste disposal operations sent a joint communique dated July 10, 1979, to NRC demanding action by NRC and the Department of Transportation to improve packaging requirements and increase inspection and enforcement of existing regulations. In response, NRC issued a bulletin to all licensees stressing the need to give

careful attention to the packaging and transportation of waste and instituted action, with the cooperation of the States and the DOT, to inspect shipments on a more frequent basis and take more stringent enforcement actions. (See also Chapter 4.)

As mentioned above, a severe regional imbalance has emerged from the locations of today's low-level waste burial grounds. This imbalance was aggravated in 1979 when two of the sites closed and then reopened and a curtailment was placed on the amount of waste that could be received at the third site. As a result, NRC went on record to state its judgment that low-level waste disposal is the responsibility of the States, for the States receive the benefits of the operations which generate the waste. NRC has worked with a number of States in 1979 and will continue to do so in 1980, to help the States explore the possibility of establishing new sites. The NRC effort took the form of assistance in setting forth licensing and regulatory requirements; however, NRC cannot promote the opening of new sites. This is a responsibility of the States, with assistance available from the Department of Energy should the States request such assistance.

Technical Assistance to Agreement States

NRC has provided technical assistance to Agreement States in the licensing and regulation of low-level waste disposal operations in their jurisdiction. NRC has provided in 1979, assistance to the State of Washington as part of their renewal action for the State disposal license at Richland. In addition, NRC has provided,and will provide in 1980, assistance to the State of Kansas in evaluating an application for a new disposal site license at Lyons. Technical assistance was also given to the State of Nevada in 1979, and NRC is expecting to provide further assistance to Nevada in 1980 regarding renewal of the State license for the Beatty site. The NRC technical assistance supplements the State's resources and assures that the technical criteria used to license and regulate a low-level waste disposal operation in an Agreement State are compatible with the criteria used to license and regulate a low-level waste disposal operation under NRC's jurisdiction. In 1979, NRC worked with the States of South Carolina, Nevada and Washington to develop and implement new requirements at existing sites to upgrade and define acceptable waste forms.

URANIUM RECOVERY MANAGEMENT

Regulatory Development

NRC continued its uranium recovery regulatory development effort in 1979 with the objective of upgrading its regulations for uranium milling in 1980. The NRC published a draft generic environmental impact statement (GEIS) in April 1979 covering the U.S. uranium milling industry to the year 2000, with particular emphasis on mill tailings. In addition, NRC published draft regulations in August 1979, deriving from the environmental statement, and conducted extensive public meetings on the proposed regulations. The final GEIS and the final regulations are expected to be published in 1980.

The proposed regulations cover radioactive airborne emissions during operation, mill tailings disposal, decommissioning of mill structures and sites, supplementary institutional and procedure requirements, implementation of proposed requirements at existing sites, and heap leaching and small processing sites.

Licensing

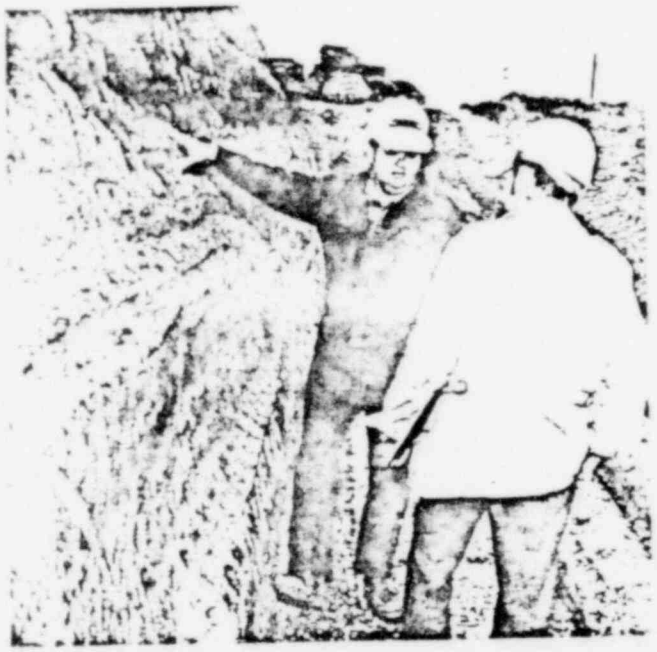
NRC continued its licensing effort in 1979. Twelve new uranium recovery facilities were licensed and one facility license was renewed. In addition, five major amendments were issued based upon licensee requests for facility modifications. There were 15 uranium mills, 5 heap leach/ore buying stations, 2 solution mining operations and 16 research and development (R&D) operations under NRC license in 1979.

Similar facilities exist in Agreement States. All these types of facilities are expected to grow numerically in the future. It is currently projected that in 1981 there will be 22 operating mills, 8 heap leach operations and ore buying stations, 6 commercial scale solution mining operations, and 23 R&D operations under NRC jurisdiction. A similar growth is expected in the number of these types of operations in Agreement States. Thus, the NRC and Agreement State workload in this area will experience a substantial growth in the next few years.

Technical Assistance to Agreement States

During 1979, NRC provded technical assistance to the States of Washington, Oregon, Colorado, New Mexico, Arizona, California and Nevada in the licensing and regulation of uranium recovery operations under Agreement State jurisdiction. A total of six project reviews were completed. These reviews covered uranium mills, heap leach operations, solution mining operations, and R&D operations. The NRC assistance assures that the technical criteria used to license and regulate uranium recovery operations in Agreement States are compatible with those criteria used to license and regulate similar operations under NRC jurisdiction.

The Uranium Mill Tailings Radiation Control Act of 1978 was amended in 1979 to provide further clarification of the NRC/Agreement States interface with respect to the licensing and regulation of mill tailings. The Commission will continue to license tailings in non-Agreement States and the Agreement States will continue to license the mill tailings under State



A State inspector and a State Agreements program reviewer examine a waste burial trench at Barnwell, S.C. Low-level radioactive wastes are deposited in such trenches and covered with backfill. Only three low-level waste burial sites are now operating in the United States. Barnwell is the only site in the eastern part of the country. The other two sites are at Hanford, Washington and Beatty, Nevada.

jurisdiction. NRC will provide technical assistance to the States in carrying out their responsibilities under the Act.

Technical assistance to the Agreement States by NRC will continue to cover non-routine safety and environmental assessment. For example, a tailings impoundment failure occurred at the United Nuclear Corporation uranium milling operation at Church Rock, N.M., on July 16, 1979. New Mexico is an Agreement State and the milling complex was licensed by the State in May 1977. Estimates of the amount of tailings released have varied, but it appears that about 100 million gallons of acidic tailings solutions and 1,100 tons of tailings solids escaped from the tailings impoundment area before the breakin the dam could be closed. The State of New Mexico requested technical assistance from NRC and NRC personnel were dispatched to the site to aid the State. Extensive technical studies and analyses were also performed by NRC. Technical assistance to the State of New Mexico will continue to be provided by NRC in 1980.

NRC Assessment of DOE Remedial Action Plans

NRC initiated in 1979 its evaluation of DOE remedial action plans for inactive sites. This will be a five year program which implements NRC's part of Title I of the Uranium Mill Tailings Radiation Control Act of 1978. DOE is responsible for remedial action at 21 inactive mill tailings sites and one other former ore processing site as specified in the Act. NRC is required to review DOE's proposed remedial actions and determine whether the remedial action plans are acceptable.

Report Of
The President's Commission On

THE ACCIDENT AT THREE MILE ISLAND

EXCERPT

The Need For Change:
The Legacy Of TMI

October 1979 Washington, D.C.

B. HEALTH EFFECTS

1. Based on available dosimetric and demographic information:

a. It is estimated that between March 28 and April 15, the collective dose resulting from the radioactivity released to the population living within a 50-mile radius of the plant was approximately 2,000 person-rems. The estimated annual collective dose to this population from natural background radiation is about 240,000 person-rems. Thus, the increment of radiation dose to persons living within a 50-mile radius due to the accident was somewhat less than one percent of the annual background level. The average dose to a person living within 5 miles of the nuclear plant was calculated to be about 10 percent of annual background radiation and probably was less.

b. The maximum estimated radiation dose received by any one individual in the off-site general population (excluding the plant workers) during the accident was 70 millirems. On the basis of present scientific knowledge, the radiation doses received by the general population as a result of exposure to the radioactivity released during the accident were so small that there will be no detectable additional cases of cancer, developmental abnormalities, or genetic ill-health as a consequence of the accident at TMI.

c. During the period from March 28 to June 30, three TMI workers received radiation doses of about 3 to 4 rems; these levels exceeded the NRC maximum permissible quarterly dose of 3 rems.

d. The process of recovery and cleanup presents additional sources of possible radiation exposure to the workers and the general population.

2. There were deficiencies in instrumentation for measuring the radioactivity released, particularly during the early stages of the accident. However, these deficiencies did not affect the Commission staff's ability to estimate the radiation doses or health effects resulting from the accident.

The [illegible] effects of radiation dose levels of [illegible] or less are not known. Estimates of the potential health effects of the TMI accident are based on extrapolations from the known health effects of higher levels of radiation.

4. The major health effect of the accident appears to have been on the mental health of the people living in the region of Three Mile Island and of the workers at TMI. There was immediate, short-lived mental distress produced by the accident among certain groups of the general population living within 20 miles of TMI. The highest levels of distress were found among adults a) living within 5 miles of TMI, or b) with preschool children; and among teenagers a) living within 5 miles of TMI, b) with preschool siblings, or c) whose families left the area. Workers at TMI experienced more distress than workers at another plant studied for comparison purposes. This distress was higher among the nonsupervisory employees and continued in the months following the accident.