NRC [redacted]

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

June 18, 1980

Ms. Linda Henry
5432 Hermitage Avenue
No. Hollywood, California 91607

Dear Ms. Henry:

This is in reply to your letter of May 22, 1979, regarding the Three Mile Island accident and precautions to prevent such accidents. I am sorry for the long delay in responding but we have been very busy with the aftermath of the TMI accident.

As to health effects, the President's Commission on the Accident at Three Mile Island stated:

> "Just how serious was the accident? Based on our investigation of the health effects of the accident, we conclude that in spite of serious damage to the plant, most of the radiation was contained and the actual release will have negligible effect on the physical health of individuals. The major health effect of the accident was found to be mental stress."

With regard to your question about what precautions are taken, nuclear power plants are designed to prevent accidents, with protective systems provided to place and hold the plants in a safe condition if deviations from normal operations occur. In addition, engineered safety features are installed to mitigate the consequences of certain postulated accidents. Further, considerations of safety are involved in evaluating the suitability of proposed sites for nuclear power plants. Finally, there are plans for emergency actions such as sheltering or evacuation of personnel if necessary.

An NRC Action Plan has been developed to provide a comprehensive and integrated basis for the actions now judged necessary to correct or improve the regulation and operation of nuclear facilities as a result of the experience from the Three Mile Island accident and official studies and investigations of the accident.

As to your questions about inspection of nuclear facilities, there are inspectors who are NRC employees as described in the enclosed Chapter 7 of the NRC Annual Report for 1979, which has just been published.

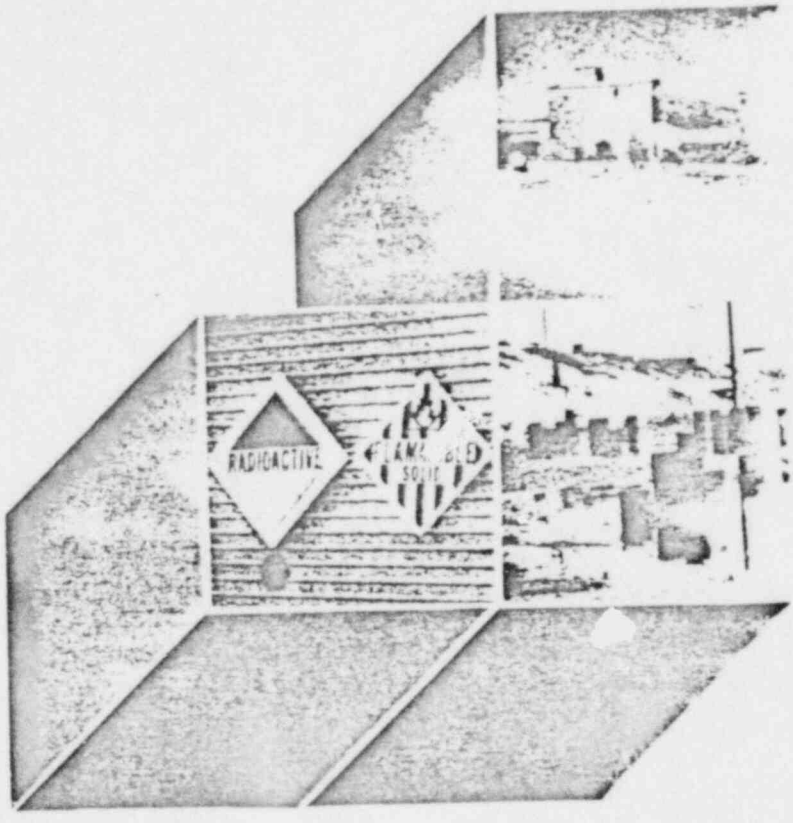
Every effort is being made to protect the public health and safety at all nuclear power plants that are currently in operation or that may start operation in the future.

Sincerely,

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

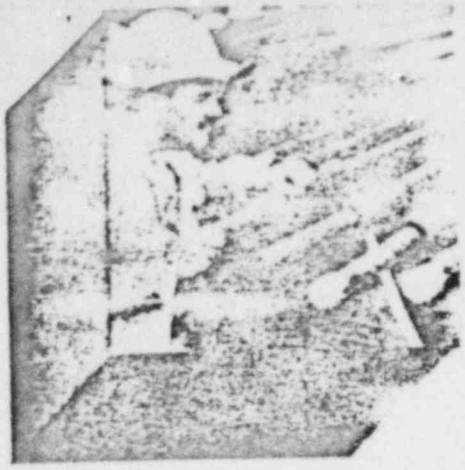
Enclosure:
As stated

1979 Annual Report



EXCERPT

U.S. NUCLEAR
REGULATORY COMMISSION



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Inspection and Enforcement

New emphasis was given in 1979 to direct NRC inspection of design, analytical and other technical activities of contractors.

During 1979, the NRC continued to implement the plan calling for resident inspectors at each operating power reactor plant, at those plants in the later stages of construction, and at selected fuel cycle facilities. The accident at Three Mile Island (TMI) led to a decision to increase the number of resident inspectors to a level of one inspector for each unit at a multireactor site. Single unit sites will have two resident inspectors. By December 31, 1979, 60 inspectors were stationed as residents at 48 power reactor and fuel facility sites. Table 1 provides a listing of these sites. This additional effort has required an increase in the number of personnel from a staff ceiling of 715 in 1979 to 861 in 1980 for the NRC Office of Inspection and Enforcement. By the end of fiscal year 1980 there will be 157 resident inspectors on site compared to the original goal of 76. The reactor training provided for operations inspectors will be increased from a minimum of seven weeks to 10 weeks during 1980, with additional simulator and special plant observation training.

TMI impacted heavily on the planned inspection program. Special teams were sent to all operating pressurized water nuclear plants to review with licensee management the actions required as a result of the TMI accident. Review groups were formed to study the TMI accident and the lessons learned from it that would affect future inspection programs. An augmented 24-hour surveillance program was established at TMI that has required staffing support from all five NRC regional offices. From April through July of 1979, a 24-hour watch was established in each region and at the NRC Operations Center in Bethesda, Maryland, to provide the capability for responding immediately to any incidents or accidents. A direct "hotline" telephone system was installed in the Operations Center. This provides a direct line to each operating reactor power plant and all fuel processing facilities in the country. The system provides conference call capability between the NRC Operations Center, a plant, and the regional NRC office. In August, the 24-hour duty Officers in the regions were replaced by a communications system connected directly to the NRC Operations Center where 24-hour duty officer coverage is maintained. All calls to regional offices during non-duty hours are now diverted to the NRC Duty Officer at the Operations Center, who can promptly respond to the situation.

As a result of these actions associated with the TMI accident and related inspections, the number of routine inspections in 1979 was less than originally planned. Table 2 summarizes the inspections conducted during fiscal year 1979.

One or more noncompliance items were found in 33 percent of the more than 6,000 inspections and in 36 percent of the 121 investigations. The more severe sanctions imposed on licensees for failure to comply with NRC requirements included nine civil penalties and three orders to "cease and desist" operations, or for modifications, or suspensions of licenses (see Tables 4 and 5).

THE INSPECTION PROGRAM

The inspection and enforcement program is directed by NRC's Office of Inspection and Enforcement (IE), with a headquarters staff located in Bethesda, Maryland, and a field staff deployed in NRC's five regional offices located in or near Philadelphia, Atlanta, Chicago, Dallas, and San Francisco. About 80 percent of the total office on-board staff of 730 is assigned to the regions.

The objectives of inspections are:

- To determine whether licensees are complying with NRC requirements.
- To identify conditions that may adversely affect public health and safety, the common defense

Table 1. Sites Manned by Resident Inspectors During 1978 and 1979

Facility	*Location*	*Licensee*
*Arkansas Nuclear Plant	Russelville, Ark.	Arkansas Power & Light Co.
Beaver Valley Power Station	Shippingport, Pa.	Duquesne Light Co.
Bellefonte Nuclear Plant	Scottsboro, Ala.	Tennessee Valley Authority
*Browns Ferry Nuclear Plant	Decatur, Ala.	Tennessee Valley Authority
Brunswick Steam Electric Plant	Southport, N.C.	Carolina Power & Light Co.
Callaway Plant	Fulton, Mo.	Union Electric Co.
Calvert Cliffs	Lusby, Md.	Baltimore Gas & Electric Co.
*Comanche Peak Steam Electric Station	Glen Rose, Tex.	Texas Power & Light, Dallas Power & Light, Texas Electric Service
Davis-Besse Nuclear Power Station	Oak Harbor, Ohio	Toledo Edison Co.
*Donald C. Cook Plant	Bridgman, Mich.	Indiana & Michigan Electric Co.
*Diablo Canyon Nuclear Power Plant	San Luis Obispo, Cal.	Pacific Gas & Electric Co.
*Dresden Nuclear Power Station	Morris, Ill.	Commonwealth Edison Co.
*Edwin I. Hatch Plant	Baxley, Ga.	Georgia Power Co.
Fort St. Vrain Nuclear Station	Platteville, Colo.	Public Service Co. of Colorado
Hartsville Nuclear Power Plant	Hartsville, Tenn.	Tennessee Valley Authority
*Indian Point Station	Indian Point, N.Y.	Consolidated Edison Co.
Joseph M. Farley Nuclear Plant	Dothan, Ala.	Alabama Power Co.
LaSalle County Nuclear Station	Seneca, Ill.	Commonwealth Edison Co.
Limerick Generating Station	Pottstown, Pa.	Philadelphia Electric Co.
Marble Hill Plant	Madison, Ind.	Public Service of Indiana
*Midland Nuclear Power Plant	Midland, Mich.	Consumers Power Co.
*Millstone Nuclear Power Station	Waterford, Conn.	Northeast Nuclear Energy Co.
North Anna Power Station	Mineral, Va.	Virginia Electric & Power Co.
*Oconee Nuclear Station	Seneca, S.C.	Duke Power Co.
Palisades Nuclear Power Station	South Haven, Mich.	Consumers Power Co.
Palo Verde Nuclear Station	Winterburg, Ariz.	Arizona Public Service Co.
*Peach Bottom Atomic Power Station	Peach Bottom, Pa.	Philadelphia Electric Co.
*Prairie Island Nuclear Plant	Red Wing, Minn.	Northern States Power Co.
Quad Cities Station	Cordova, Ill.	Commonwealth Edison Co.
Rancho Seco Nuclear Station	Sacramento, Cal.	Sacramento Municipal Utility District
*Salem Nuclear Generating Station	Salem, N.J.	Public Service Electric & Gas Co.
*San Onofre Nuclear Station	San Clemente, Cal.	Southern California Edison Co. & San Diego Gas & Electric Co.
Seabrook Nuclear Station	Seabrook, N.H.	Public Service Co. of N.H.
Sequoyah Nuclear Power Plant	Daisy, Tenn.	Tennessee Valley Authority
Shoreham Nuclear Power Station	Suffolk County, N.Y.	Long Island Lighting Co.
South Texas Nuclear Project	Bay City, Tex.	Houston Lighting & Power Co.
Summer Nuclear Station	Broad River, S.C.	South Carolina Electric & Gas Co.
*Surry Power Station	Gravel Neck, Va.	Virginia Electric & Power Co.
*Susquehanna Steam Electric Station	Berwick, Pa.	Pennsylvania Power & Light Co.
*Trojan Nuclear Plant	Prescott, Ore.	Portland General Electric Co.
Turkey Point Station	Florida City, Fla.	Florida Power & Light Co.
Washington Nuclear #2	Richland, Wash.	Washington Public Power Supply System
*Watts Bar Nuclear Plant	Spring City, [illegible]	Tennessee Valley Authority
William H. Zimmer Nuclear Power Station	Moscow, Ohio	Cincinnati Gas & Electric Co.
Zion Nuclear Plant	Zion, Ill.	Commonwealth Edison Co.
*B&W-Apollo & Leechburg** (Fuel Facility)	Apollo, Pa.	Babcock & Wilcox Co.
*Westinghouse-Cheswick** (Fuel Facility)	Parks Township, Pa.	Westinghouse Electric Corp.
*Nuclear Fuel Services (Fuel Facility)	Erwin, Tenn.	Nuclear Fuel Services, Inc.

*Assigned during calendar year 1978.
**Inspector stationed at Apollo, Pennsylvania, acts as inspector on a rotating basis at B&W's Apollo and Leechburg facilities and Westinghouse's Cheswick facility.

and security, the environment or the safeguarding of nuclear materials and facilities.

- To provide information to assist in developing a basis for issuance, denial, or amendment of an authorization, permit or license.
- To determine whether licensees and their contractors and suppliers have implemented adequate quality assurance programs.

When an inspection or investigation discloses events or conditions that present a potential or actual threat to public health and safety, the environment, or the safeguarding of nuclear materials and facilities, the NRC takes prompt action and routinely communicates with other parts of government, licensees and the public.

During fiscal year 1979, 174 new inspection procedures and/or instructions were issued and 123 were revised. In the area of construction inspection, for example, 22 extensively revised inspection procedures pertaining to welding were issued.

Reporting Defects and Noncompliance

On June 6, 1977, the NRC published in the *Federal Register* a regulation (10 CFR Part 21) setting forth the requirements for implementing Section 206 of the Energy Reorganization Act of 1974. Individual directors or responsible officers of a firm involved in the nuclear industry are required to report noncompliance with NRC regulations or the existence of defects which could create a substantial health and safety hazard. Any such person who knowingly and consciously fails to provide the required reports to the NRC is subject to a civil penalty not to exceed $5,000 for each failure and a total amount not to exceed $25,000 within any 30-day period. The regulation became fully effective on January 6, 1978.

About 150 Part 21 Reports have been received by the NRC since the regulation became effective. The reports are reviewed to assess the reported deficiency, the adequacy of the proposed corrective action and the possibility of generic problems. IE inspectors ensure that appropriate followup actions are taken.

Types of Inspections

NRC's inspections are of two basic types: routine and reactive. In routine inspections, NRC inspectors concentrate on determining the effectiveness of quality assurance systems by direct observation and verification of licensee activities, and by reviewing procedures, checking records, interviewing people, and, where appropriate, making direct measurements. Reactive inspections are conducted in response to information received by NRC regarding conditions or events affecting licensed facilities or material under NRC jurisdiction. Such information may come from routine NRC inspections; from an applicant, licensee, contractor or supplier; or from licensee employees or other members of the public.

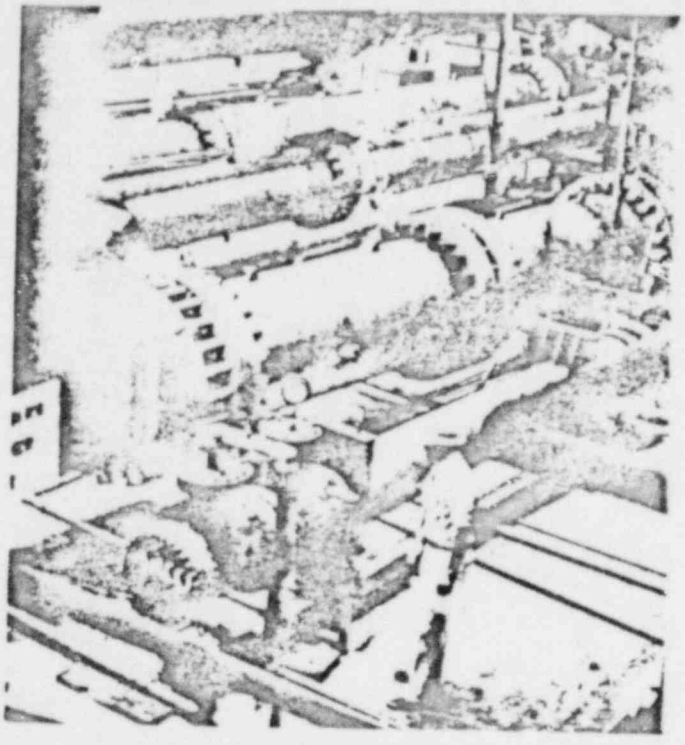
Inspections cover the entire range of NRC licensed activities. Reactor-related inspections cover all phases of nuclear power plants (preconstruction activities, construction, preoperational testing and startup, operation, shutdown and decommissioning) and similar phases of research and test reactors. In addition, NRC inspects the quality assurance programs of contractors and vendors who supply safety-related equipment, components and services to power reactors under construction or in operation.

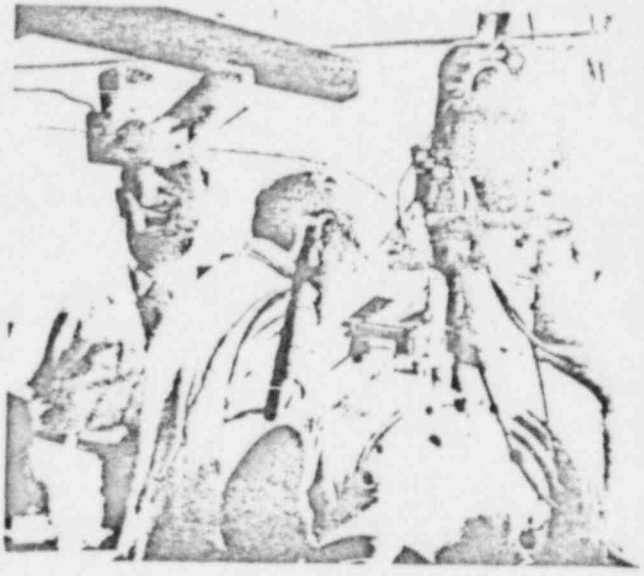
Licensee, Contractor and Vendor Inspection Program

Approximately one-half the work associated with constructing a nuclear facility is accomplished off-site.

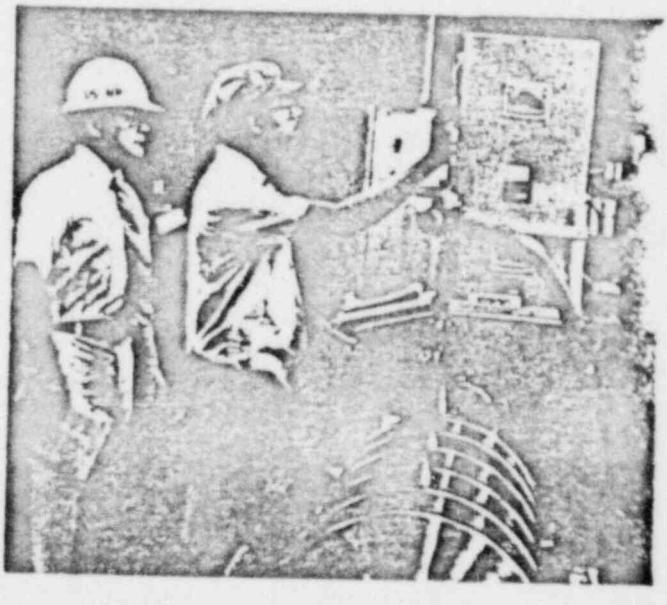
Table 2. Inspections Conducted in Fiscal Year 1979

Program	*Number of Licenses*	*Number of Inspections*
Power Reactor Construction	114	1,787
Operating Power Reactors	70	1,761
Other Reactors	94	93
Fuel Facilities	39	203
Materials	8,586	1,976
Vendors	248	228
Safeguards	203	526





Starting above and reading clockwise, an inspector is shown during an inspection of pump vendor facilities, as he reads and records data during reactor coolant pump test, checks gas-metal arc welding being performed on a pump rotor, observes machining of pump rotor housing, watches vendor technician balance a pump rotor, and (below) reviews records of material identification and traceability.



This includes facility design and the fabrication of components of safety-related systems. Inspections of nuclear steam system suppliers, architect-engineers and vendors of safety-related components are performed by NRC's Licensee, Contractor and Vendor Inspection Branch (LCVIB) inspectors, located in the Region IV (Dallas) office. During fiscal year 1979, some 250 inspections were performed by the 21 LCVIB inspectors. Approximately 30 percent of these inspections were special reactive inspections involving component fabrication or design-related problems.

During the coming year, a modest shift in inspection emphasis is expected in the LCVIB. Activities experiencing change will include:

- Performing more reactive inspections.
- Redirecting emphasis toward the inspection of technical activities performed by contractors.
- Followup on Part 21 Reports, Bulletins and Circular issues.
- Inspecting and witnessing environmental qualification of electrical, instrumentation and control equipment.
- Inspecting design and analytical work performed by licensee contractors.

Performance Appraisal Program

During fiscal year 1979, five licensee management appraisal inspections and one IE program appraisal inspection series (pertaining to surveillance testing) were completed. Nine management appraisal inspections and four IE program appraisal inspections are planned for fiscal year 1980. Objectives of the program are to:

- Evaluate performance of utility management.
- Analyze effectiveness of the NRC inspection program.
- Confirm objectivity of NRC inspectors.

Three Performance Appraisal Team (PAT) inspectors participated in the IE investigation of the TMI accident; PAT inspectors also participated in other investigations and special inspections.

Independent Measurement/Verification Program

IE has increased its efforts associated with direct verification of licensee/ contractor activities during the construction phase. NRC periodically uses contractors to perform non-destructive testing activities, and, in August 1979, selected a contractor to perform destructive testing of selected materials used in safety-related structures and systems. Continued effort in these areas is planned for fiscal year 1980.

Inspections related to nuclear materials include inspection of the construction and operation of uranium mills; fuel fabrication, processing and reprocessing plants; waste disposal facilities; and the industrial, educational and medical uses of radioactive material. NRC inspections also include measures for safeguarding nuclear material from theft and sabotage, for physical protection of reactors and fuel cycle facilities, and for transportation of nuclear materials.

The number of inspections carried out during fiscal year 1979 (ending September 30) for each of these activities is shown in Table 2.

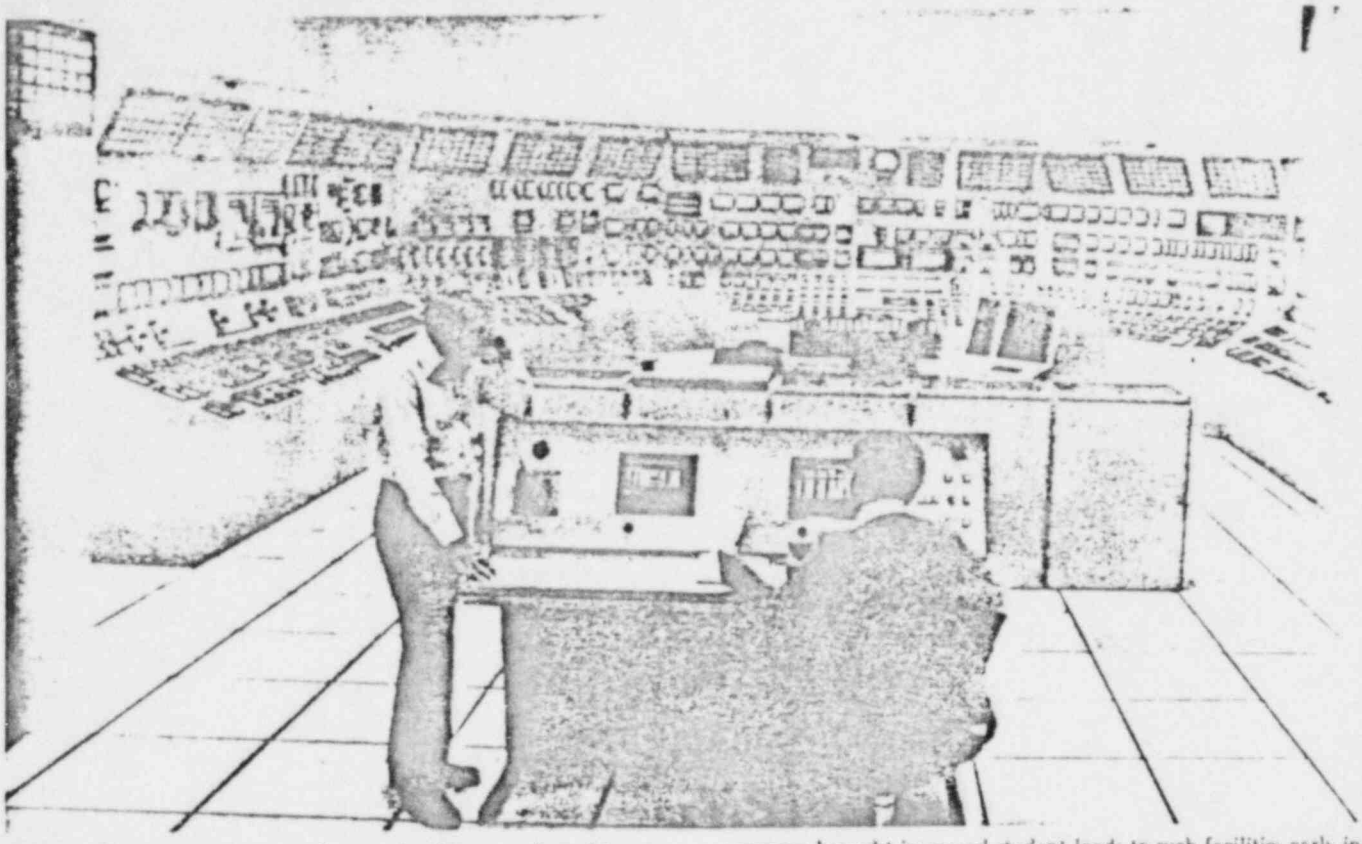
Government-Industry Efforts

The NRC inspection program is based on the premise that the licensee is responsible for carrying out licensed activities safely and in compliance with NRC requirements. NRC determines whether the licensee has established the management control systems necessary to meet regulatory responsibilities. The inspection pattern for large, complex nuclear facilities is pyramidal, with each level of activity verified, inspected or audited by those above. The NRC inspection effort is essentially the apex of the pyramid, i.e., NRC performs the last in the series of inspections and audits conducted by many different groups. Since NRC inspection manpower is usually far less than that of licensees and contractors, NRC inspectors cannot inspect all components and activities; thus, they probe the "pyramid" to determine whether the licensees' and contractors' activities are properly performed. In addition, the IE inspection program provides for independent effort by NRC inspectors whenever the inspector determines such action is necessary.

Inspection Activities Resulting from TMI

Shortly after the Three Mile Island (TMI) accident, a series of Inspection and Enforcement (IE) Bulletins were issued to all operating power reactor licensees addressing the early lessons learned. The IE Bulletins provided licensees with information about the series of events that occurred at TMI and directed each licensee to make changes to certain equipment and operating procedures consistent with the reactor design, and to conduct special operator training. In response to the Bulletins, licensees provided details for completion of immediate actions and plans for completion of longer term actions. Special follow-up inspections were conducted to verify that licensees had taken appropriate action.

During the period April 18–23, 1979, six specially trained NRC teams visited all operating pressurized water nuclear power plants, except those designed by Babcock and Wilcox, designer of the TMI plant. These



Pressurized water reactor control room simulators, such as this one at the Tennessee Valley Authority's Sequoyah Nuclear Power Plant, came into greatly increased use in 1979. The training of new inspectors to accommodate the growing NRC resident inspector program brought increased student loads to such facilities early in the fiscal year, and the training was intensified even more in the later months as deficiencies in operator training highlighted by the Three Mile Island accident became apparent.

teams reviewed and discussed with licensee operations personnel and station management the TMI accident chronology and licensee actions that had been specified in the IE Bulletins. For the Babcock and Wilcox designed facilities, the resident inspector, with assistance from regional-based inspectors, conducted this special briefing.

By April 2, following the TMI accident, resident inspectors had been assigned to all operating Babcock and Wilcox designed plants where resident inspectors had not previously been assigned. In addition to responsibilities normally assigned resident inspectors, inspectors at these sites performed additional inspections to assure plant safety in light of the events at TMI.

Impact of TMI on Inspection Program

The impact on the routine inspection program for the first several months following the TMI accident was significant. Efforts expended by inspectors at the TMI site, the expedited assignment of inspectors to all Babcock and Wilcox power reactor facilities and the requirements imposed by the need for special inspections of all operating power reactor facilities caused a thinner coverage, and in many cases deferral or deletion of portions of the routine inspection program activities.

On a continuing basis, increased emphasis has been placed on identifying isolated plant problems and generic issues and managing their resolution. To accomplish this, the headquarters staff has been augmented with a group of highly specialized systems engineers whose responsibilities include more in-depth review and follow-up on plant events.

Long-term inspection program changes to reflect lessons learned from the TMI accident are still in various formative stages. Specific problems requiring program changes have generally been diagnosed. Program modification, implementation and attendant

process evaluations have been done to the extent possible for changes that represent an expansion of current programs, such as resident inspection.

Studies to evaluate certain major changes in emphasis of the inspection program have been initiated to determine the effectiveness and efficiency of these changes as implemented. The results of the IE Special Review Group on lessons learned from Three Mile Island have provided a basis for the integration of lessons learned into the current inspection program.

Resident Inspector Program

During 1979, the NRC made further progress in the program to station inspectors full time at the sites of nuclear power reactors and major fuel cycle facilities.

Experience with resident inspection results and licensee events and actions have led to plans for further expansion of the resident inspector program. The program is being accelerated in consonance with the President's message of December 7, 1979 on the Kemeny Commission Report. Steps to upgrade its effectiveness also are being taken in response to recommendations in a General Accounting Office report issued to Congress in November 1979. As noted above, approval has been given to assigning, in addition to the site resident inspector, resident inspectors to nuclear power reactor plant units (many sites have more than one unit). The total number of resident inspectors at any site will generally equal the number of units at that site, with a minimum of two inspectors per site. This augmented coverage will provide additional safety assurances through increasing NRC presence, including the number of independent observations of licensee safety-related activities and equipment.

By December 31, 1979, 60 inspectors were deployed to the sites of 45 nuclear power stations—including several power reactor plants under construction—and of three fuel facilities. By June 1980, each site with an operating or preoperational reactor should have at least one resident inspector. Each such site is expected to have its full complement of at least two inspectors by September 30, 1980, at which time some 130 resident inspectors will be deployed at 60 sites. Thereafter, resident inspectors will be assigned to reactors as they reach the pre-operational stage.

The NRC also is assigning resident inspectors to sites where nuclear plant construction is in the final stage. Further, resident inspectors will be assigned to sites where problems are evident in earlier stages of plant construction.

Bulletins, Circulars and Information Notices

During 1979, the NRC's issuance of Bulletins, Circulars and Information Notices was increased both in number and significance. The NRC's Office of Inspection and Enforcement has issued Bulletins since 1971, Circulars since 1976 and Information Notices for the first time in 1979.

The IE Bulletin is used to notify licensees of specific actions to be taken. It usually requires that the licensees provide a report to the NRC describing the actions they take in response to the Bulletin. The Bulletin addresses matters of concern or events related to reactor safety, material safeguards, radiological safety or environmental protection.

Bulletins usually, although not always, require the action on a one-time only basis. However, Bulletins are not intended to substitute for new or revised license conditions or requirements. If a licensee refuses to perform an action set forth in the Bulletin, the requirement for the action may be imposed on the licensee by an Order.

Particular considerations which might require the issuance of a Bulletin include events in which the safety significance is of such a magnitude as to result in an immediate impact on all of a certain type of licensee. The Three Mile Island accident represents such an event, and it was addressed by multiple Bulletins. Other considerations include events having a potential generic problem impact and where the event requires action by a particular class of license or permit holder.

The IE Circular is used to notify licensees of actions which the NRC recommends be taken. These matters are generally of lesser significance than those address-

NRC resident inspector checks a weld in a reactor vessel thermal sleeve at the Susquehanna Steam Electric Station at Berwick, PA.

Table 3. IE Bulletins, Circulars, and Information Notices Issued in 1979

BULLETINS

Bulletin No.	*Subject*	*Date Issued*	*Issued to*
79-01	Environmental Qualification of Class IE Equipment	2/8/79	All power reactor facilities with an OL or CP
79-01A	Environmental Qualification of Class IE Equipment (Deficiencies in the Environmental Qualification of ASCO Solenoid Valves	6/6/79	All power reactor facilities with an OL or CP
79-02	Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts	3/2/70	All power reactor facilities with an OL or CP
79-02 (Rev. 1)	Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts	6/21/79	All power reactor facilities with an OL or a CP
79-02 (Rev. 1)	Pipe Support Base Plate Designs Using Concrete (Supplement 1)	8/20/79	All power reactor facilities with an OL or a CP
79-03	Longitudinal Welds Defects in ASME SA-312 Type 304 Stainless Steel Pipe Spools Manufactured by Youngstown Welding and Engineering Co.	3/12/79	All power reactor facilities with an OL or CP
79-04	Incorrect Weights for Swing Check Valves Manufactured by Velan Engineering Corporation	3/30/79	All power reactor facilities with an OL or CP
79-05	Nuclear Incident at Three Mile Island	4/2/79	All power reactor facilities with an OL and CP
79-05A	Nuclear Incident at Three Mile Island	4/5/79	All B&W power reactor facilities with an OL
79-05B	Nuclear Incident at Three Mile Island	4/21/79	All B&W power reactor facilities with an OL
79-05C&06C	Nuclear Incident at Three Mile Island - Supplement	7/26/79	To all PWR power reactor facilities with an OL

BULLETINS

Bulletin No.	*Subject*	*Date Issued*	*Issued to*
79-06	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/11/79	All pressurized water power reactors with an OL except B&W facilities
79-06A	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/14/79	All pressurized water power reactor facilities of Westinghouse design with an OL
79-06A (Rev. 1)	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/18/79	All pressurized water power reactor facilities of Westinghouse design with an OL
79-06B	Review of Operational Errors and System Misalignments Identified During the Three Mile Island Incident	4/14/79	All Combustion Engineering designed pressurized Water power reactor facilities with an OL
79-07	Seismic Stress Analysis of Safety-Related Piping	4/14/79	All power reactor Facilities with an OL or CP
79-08	Events Relevant to BWR Reactors Identified During Three Mile Island Incident	4/14/79	All BWR power reactor facilities with an OL
79-09	Failures of GE Type AK-2 Circuit Breaker in Safety Related Systems	4/17/79	All power reactor facilities with an OL or CP
79-10	Requalification Training Program Statistics	5/11/79	All power reactor facilities with an OL
79-11	Faulty Overcurrent Trip Device in Circuit Breakers for Engineered Safety Systems	5/22/79	All power reactor facilities with an OL or a CP
79-12	Short Period Scrams at BWR Facilities	5/31/79	All GE BWR facilities with an OL
78-12B	A Typical Weld Material in Reactor Pressure Vessel Welds	3/19/79	All power reactor facilities with an OL or CP

Table 3. IE Bulletins, Circulars, and Information Notices Issued in 1979—Continued

BULLETINS—Continued

Bulletin No.	*Subject*	*Date Issued*	*Issued to*
79-13	Cracking in Feedwater System Piping	6/25/79	All PWRs with an OL for action; all BWRs with a CP for information
79-14	Seismic Analyses for As-Built Safety-Related Piping System	6/2/79	All power reactor facilities with an OL or a CP
79-15	Deep Draft Pump Deficiencies	7/11/79	All power reactor licensees with a CP and/or OL
79-16	Vital Area Access Control	7/26/79	All holders of and applicants for OL
79-17	Pipe Cracks in Stagnant Borated Water Systems at PWR Plants	7/26/79	All PWR's OL
79-18	Audibility Problems Encountered on Evaluation	8/7/79	All power reactor facilities with an OL
79-19	Packaging Low-Level Radioactive Waste for Transport and Burial	8/10/79	All power and research reactors with OLs, fuel facilities except uranium mills, and certain materials licensees
79-20	Packaging Low-Level Radioactive Waste for Transport and Burial	8/10/79	All materials licensees who did not receive Bulletin No. 79-19
79-21	Temperature Effects on Level Measurements	8/13/79	All PWRs with an OL
79-22	Possible Leakage of Tubes of Tritium Gas in Timepieces for Luminosity	9/5/79	To each licensee who receives tubes of tritium gas used in timepieces for luminosity
79-23	Potential Failure of Emergency Diesel Generator Field Exciter Transformer	9/12/79	All power reactor facilities with an OL or a CP
79-24	Frozen Lines	9/27/79	All power reactor facilities which have either OLs or CPs and are in the late stage of construction

CIRCULARS

Circular No.	*Subject*	*Date Issued*	*Issued to*
79-01	Administration of Unauthorized Byproduct Material To Humans	1/12/79	All holders of licenses except teletherapy medical Licenses and Each Radiopharmaceutical Supplier

Circular No.	Subject	Date Issued	Issued to
79-02	Failure of 120 Volt Vital AC Power Supplies	2/16/79	All holders of reactor OLs and CPs
79-03	Inadequate Guard Training Qualification and Falsified Training Records	2/23/79	All holders of and applicants for special nuclear material licenses in safeguards Group
79-04	Loose Locking Nut on Limitorque Valve Operators	3/16/79	All holders of reactor OLs or CPs
79-05	Moisture Leakage in Stranded Wire Conductors	3/20/79	All holders of reactor OLs or CPs
79-06	Failure to Use Syringe and Bottle Shields In Nuclear Medicine	4/19/79	All holders of medical licenses except teletherapy licenseesIssued to
79-07	Unexpected Speed Increase of Reactor Recirculation MG Set Resulted in Reactor Power Increase	5/2/79	All holders of BWR OLs or CPs
79-08	Attempted Extortion Low Enriched Uranium	5/18/79	All fuel facilities licensed by NRC
79-09	Occurrences of Split or Punctured Regulatory Diaphragms in Certain Self Contained Breathing Apparatus	6/22/79	All materials priority I, fuel Cycle and Operating reactor licenses
79-10	Pipefittings Manufactured from Unacceptable Material	6/26/79	All power reactor licensees with a CP and/or OL
79-11	Design/Construction Interface Problem	6/27/79	All applicants for, and holders of Power Reactors CPs
79-12	Potential Diesel Generator Turbocharger Problem	6/28/79	All power reactor operation facilities and all utilities having a CP
79-13	Replacement of Diesel Fire Pump Starting Contactors	7/10/79	All power reactor Operations facilities and all utilities having a CP
79-14	Unauthorized Procurement and Distribution of XE-133	7/13/79	All medical licensees except teletheraphy medical licensees and to all radiopharmaceutical supplies

Table 3. IE Bulletins, Circulars, and Information Notices Issued in 1979—Continued

CIRCULARS

Circular No.	*Subject*	*Date Issued*	*Issued to*
79-15	Bursting of High Pressure Hose and Malfunction of Relief Valve "O" Ring in Certain Self-Contained Breathing Apparatus	8/8/79	All materials Priority 1, fuel cycle and operating power reactor licensees
79-16	Excessive Radiation Exposures To Members of the general Public and a Radiographer	8/16/79	All radiography licensees
79-17	Contact Problem in SB-12 Switches on General Electric Company Metal Clad Circuit Breakers	8/14/79	All power reactor licensees with a CP and/or OL
79-18	Proper Installation of Target Rock Safety-Relief	8/10/79	All holders of power reactors OLs and CPs
79-19	Loose Locking Devices on Ingersoll-Rand Pumps	9/13/79	All holders of power reactors OLs and CPs
79-20	Failure of GTE Sylvania Relay, Type PM Bulletin 7305, Catalog 5&12-11-AC	9/24/79	All holders of power reactors OLs and CPs

INFORMATION NOTICES

Information Notice No.	*Subject*	*Date Issued*	*Issued to*
79-01	Bergen-Paterson Hydraulic Shock and Sway Arrestor	2/2/79	All power reactor facilities with an OL and or CP
79-02	Attempted Extortion of Low Enriched Uranium	2/2/79	All fuel facilities
79-03	Limitorque Valve Geared Limit Switch Lubricant	2/9/79	All power reactor facilities with an OL or a CP
79-04	Degradation of Engineered Safety Features	2/16/79	All power reactor facilities with an OL or a CP
79-05	Use of Improper Materials in Safety-Related Components	3/21/79	All power reactor facilities with an OL or CP
79-06	Stress Analysis of Safety-Related Piping	3/23/79	All holders of reactor OLs or CP
79-07	Rupture of Radwaste Tanks	3/26/79	All power reactor facilities with an OL or CP
79-08	Interconnection of Contaminated Systems with Service Air Systems Used as the Source of Breathing Air	3/28/79	All power reactor facilities with an OL and Pu processing fuel facilities

Information Notice No.	*Subject*	*Date Issued*	*Issued to*
79-09	Spill of Radioactively Contaminated Resin	3/30/79	All power reactor facilities with an OL
79-10	Nonconforming Pipe Support Struts	4/16/79	All power reactor facilities with a CP
79-11	Lower Reactor Vessel Head Insulation Support Problem	5/7/79	All holders of reactor OLs and CPs
79-12	Attempted Damage to New Fuel Assemblies	5/11/79	All fuel facilities, research reactors,and power reactors with an OL or CP
79-13	Indication of Low Water Level in the Oyster Creek Reactor	5/29/79	All holders of reactor OLs and CPs
79-14	NRC Position on Electrical Cable Support Systems	6/11/79	All power reactor facilities with a CP
79-15	Deficient Procedures	6/7/79	All holders of reactor OLs and CPs
79-16	Nuclear Incident at Three Mile Island	6/22/79	All research reactors and test reactors with OLs
79-17	Source Holder Assembly Damage from Misfit Between Assembly and Reactor Upper Grid Plate	6/20/79	All holders of reactor OLs and CPs
79-18	Skylab Reentry	7/5/79	All holders of reactor OLs
79-19	Pipe Cracks in Stagnant Borated Water Systems At PWR Plants	7/17/79	All holders of reactor OLs and CPs
79-20	NRC Enforcement Policy NRC LIcensed Individuals	8/10/79	All holders of reactor OLs and CPs and production licensees with licensed operators
79-21	Transportation and Commercial Burial of Radioactive Material	9/7/79	All power and research reactors with OLs
79-22	Qualification of Control Systems	9/14/79	All power reactor facilities with OLs and CPs
79-23	Emergency Diesel Generator Lube Oil Coolers	9/25/79	All power reactor facilities holding OLs and CPs
79-24	Overpressurization of Containment of a PWR Plant After a Main Steam Line Break	9/28/79	All power reactor facilities with a CP

ed by a Bulletin, and a written response by the licensee is not required. The licensees may or may not initiate the recommended action. However, if further analysis and/or information regarding the matter indicates increased significance, it may result in the issuance of a Bulletin.

The particular concerns which might require issuance of a Circular include those for which a Bulletin is applicable, except that the impact is of less significance and is not sufficient to warrant specific actions by license or permit holders.

The Information Notice was first put in use in 1979. It is a mechanism by which the NRC is able to rapidly transmit information applicable or potentially applicable to license and permit holders. The information may or may not have been analyzed by NRC. It does not require acknowledgment or response but licensees are instructed to take appropriate action if the information applies to their facility. The concerns which might require issuance of an Information Notice include those for which a Bulletin or Circular may be applicable, but for which significance of the event or condition does not warrant issuance of a Bulletin or Circular. Of course, a Bulletin or Circular may be issued subsequent to an Information Notice on a particular concern as a result of problem evolution and further evaluation. Information Notices may also be used to transmit additional information on previously issued Bulletins or Circulars to license and permit holders.

A listing of the Bulletins, Circulars, and Information Notices issued from January 1, 1979, through September 30, 1979, is included in Table 3 to indicate the types of conditions addressed by these different publications.

Other Reactive Effort

During fiscal year 1979, the effort expended on reactive inspections, investigations and related work has increased considerably, in addition to that expended on investigation and evaluation of the TMI accident.

Some construction sites have required between 50 and 250 man-days of unplanned reactive effort resulting in some cases in the postponement of routine inspection activities. A considerable amount of this reactive effort relates to inspection, investigation and follow-up effort, associated with allegations, Part 21 Reports and Bulletin, Circular and Information matters. The following construction problems have required substantial reactive effort by both headquarters and regional personnel:

- Pipe support base plate/anchor bolts
- Weld integrity (pipe welds)
- Pump performance
- Piping analysis and as-built conditions
- Steam generators
- Structural concrete
- Foundations

ENFORCEMENT ACTIVITIES

The regulatory program is designed to assure that licensees perform in accordance with NRC regulations, licenses and permits and with applicable sections of Federal statutes. NRC is empowered to take enforcement action when licensees are not satisfying these requirements or are conducting operations in a way that might endanger the public health and safety or the environment, or adversely affect the common defense and security.

Enforcement action may be taken, for example, when certain significant safety-related matters not meeting NRC requirements have escaped the licensee's attention or when procedures are improperly controlled and the fact is first discovered during an NRC inspection. Such situations reflect adversely on the effectiveness of the licensee's management or quality assurance program. Enforcement action requires the licensee to correct the particular problems and establish measures to preclude reoccurrence—including deficiencies in his quality assurance program if such deficiencies allowed the problem to occur, continue or reoccur.

The severity of NRC enforcement actions varies with the seriousness of the matter and the licensee's previous compliance record. Several levels of NRC action are provided:

- Written Notices of Violation are provided for instances of noncompliance with NRC requirements.
- Civil penalties are considered for licenses who evidence significant or repetitive items of noncompliance, particularly when a Notice of Violation has not been effective. Civil penalties may also be imposed for particularly significant first-of-a-kind violations.
- Orders to "cease and desist" operations, or for modification, suspension, or revocation of licenses, are used to deal with licensees who do not respond to civil penalties or to deal with violations that constitute a significant threat to public health and safety or to the common defense and security. In the latter case, an order may be made effective immediately.

Tables 4 and 5 summarize the enforcement actions taken during the report period.

Table 4. Civil Penalties Imposed—Fiscal Year 1979

Licensee	*Amount*	*Reason*
Wisconsin Public Service Corporation Green Bay, Wisconsin (Kewaunee Plant)	$7,000 (reported as Pending in FY 78)	Failure to perform a survey required by regulations to assure control of personnel exposures. Licensee requested a hearing; however, a negotiated settlement was accepted by the licensee and the licensee paid the $7,000 penalty.
Jersey Central Power and Light Company Morristown, New Jersey (Oyster Creek Plant)	$26,000	Failure to follow radiation safety procedures and noncompliance items in the safeguards area.
Twin City Testing and Engineering Labs., Inc. St. Paul, Minnesota (Radiographer)	$2,500	Exposure to the lower back of an individual. Failure to perform necessary radiation surveys.
Niagara Mohawk Power Corporation (Nine Mile Point Unit 1)	$18,000 (pending)	Noncompliance items in the physical security area.
United Nuclear Corporation Wood River Junction, Rhodelsland (Fuel Processor)	$15,750 (pending)	Noncompliance items in the physical security area.
University of Wisconsin Madison, Wisconsin (Academic Broad License)	$2,300	Inadequate training of personnel, failure to evaluate internal exposures of personnel and releases of airborne material to unrestricted areas.
Virginia Electric and Power Company (Surry Unit 2)	$15,000 (pending)	Whole body exposure of an individual and failure to follow procedures.
Nuclear Pharmacy, Inc. Milwaukee, Wisconsin (Radiopharmaceutical Distributor)	$24,000 (pending)	Distribution of radioactive material not intended for [illegible] an use to medical [illegible]sees, relabeling and misrepresenting the material as suitable for human use.
University of Minnesota Minneapolis, Minnesota	$4,300	Exposures of three individuals to airborne radioactive material and other noncompliance items in the health and safety area.

Enforcement Improvements

The Office of Inspection and Enforcement is seeking continued improvement in enforcement. In December 1979 the enforcement criteria concerning the transportation of radioactive material were upgraded. The Commission also has forwarded to Congress a request to increase NRC's statutory authority to impose civil penalties. If this request is implemented by amendment of the Atomic Energy Act, NRC's maximum allowable penalties will increase from $5,000 to $100,000 for a single violation and from $25,000 to no limit for all violations committed by a licensee within 30 days. Such an increase would provide greater incentives for major NRC licensees to comply with the regulatory requirements. A greater range would also permit the penalties to be imposed by NRC to reflect more equitably the different classes of licensees and the seriousness of offenses. The Commission approved a proposal that copies of escalated enforcement orders and civil penalties be routinely forwarded to State public utility regulatory groups and to State attorneys general for their information. Routine mailing of these communications started in December 1979.

NRC is continuing efforts to develop better methods for the evaluation of the regulatory performance of major licensees. By identifying licensees whose performance may require improvement, NRC hopes to anticipate potential safety and security problems and avert them through prompt remedial action. This would also improve the effectiveness of NRC's use of inspection resources. Identifying valid measures of licensee performance is a complex and controversial process. Measures considered to date include licensees' compliance records, evaluations of licensees by NRC inspectors, and detailed trend analysis of reportable licensee events.

NRC Operations Center

The NRC Operations Center was activated on three occasions during 1979. This center is the focal point for NRC's initial response to significant incidents involving NRC-licensed activities. The 2,000 square-foot center presently in use includes: a conference room for briefing NRC management; an operations room for monitoring and evaluating information about the incident; a secure communications room; word processing and computer support areas; and a library to house necessary information resources. The center is equipped with a specially-designed communications system and a variety of audiovisual aids.

The first activation occurred in January as a result of an extortion threat against the General Electric Fuel Fabrication Facility in Wilmington, North Carolina. A letter demanded money for return of stolen uranium or the extortionist claimed he would disperse the material in an unnamed U.S. city. Although the Federal Bureau of Investigation (FBI) had the lead in the case, the NRC was concerned about the possible radiological consequences of the threatened act and provided technical support to the FBI. In this case, the FBI quickly apprehended a suspect and located the stolen material.

The other major incident involved the NRC response to the Three Mile Island accident. The center did function as a major focal point for the NRC, as intended, but the limited facilities were quickly overextended during this event. As a result of TMI and increased emphasis on responding to future incidents, major revisions to the NRC incident response program will be made.

The third incident for which the Operations Center was activated occurred in October when a release of radioactive gases from the Prairie Island nuclear plant took place.

The Operations Center is manned 24 hours-per-day by a qualified senior engineer.

INVESTIGATIONS

An important adjunct to NRC's inspection effort is the investigative program which covers not only in-depth probes of irregularities revealed during inspections, but also investigations of incidents, accidents, allegations or any unsual circumstances occurring at or related to NRC-licensed facilities or activities. A heightened public awareness and interest in nuclear power has resulted in an increase in the number of allegations received by NRC. As each allegation must be carefully investigated to determine its possible impact upon the public health and safety, NRC has more than doubled the number of trained investigators in its employ within the past year.

Investigations are conducted by experienced investigative personnel located in each of the five NRC regional offices. Investigators are assigned to the immediate staff of the regional director, both to emphasize the importance of the investigative program and to provide better support to the various functional branches in the region. Since NRC investigations are usually technical in nature and may involve several scientific or engineering disciplines, the investigator frequently works with and coordinates the activities of technical personnel who may be assigned to provide assistance. Investigators also maintain close liaison with Federal, State and local law enforcement agencies and work closely with them on investigations of mutual interest. Within the past year, IE investigators have provided assistance to agencies having primary jurisdiction in investigations involving the theft of special nuclear material, the intentional damaging of fuel elements at an operating nuclear power plant, the attempted bombing of a nuclear power station, and the falsification of records relied upon by NRC.

Table 5. Enforcement Orders—Fiscal Year 1979

License	*Date*	*Reason*
Radioassay Systems, Inc. Southfield, Michigan (Materials Licensee)	11/30/78	Order terminating proceedings. Reason: Licensee disposed of all material and requested termination of the licensee. On 7/13/78, the licensee was issued an Order to show cause for processing and distributing material without authorization.
Arkansas Power & Light Company Little Rock, Arkansas (Arkansas Nuclear One Unit 1)	6/15/79	Order authorizing resumption of operations. Reason: Licensee satisfied the conditions of the 6/2/79 Order.
Public Service of Indiana Plainfield, Indiana (Marble Hill Units 1 & 2)	8/15/79	Order confirming suspension of construction. Reason: Serious problems with respect to the adequacy of concrete placement and the licensee's quality assurance program.

Oversight of the NRC investigations program is accomplished by a small investigative staff located at headquarters. During fiscal year 1979, 121 investigations were conducted by inspection and enforcement personnel. Of these, 76 were prompted by allegations dealing with reactor construction or operational events at licensed facilities. Other investigations were conducted into events involving loss or theft of licensed material, overexposures, and general public interest. In 78 of the investigations, licensees were cited for failure to meet NRC requirements.

Significant special investigations conducted during the year are described below.

Wolf Creek Generating Station

The Wolf Creek Generating Station of the Kansas Gas and Electric Company is located in east-central Kansas in Coffey County. The site is approximately 50 miles south of Topeka and three miles northeast of Burlington, Kansas.

On March 15, 1978, the licensee reported to the NRC that concrete samples tested for compressive strength at the age of 90 days had not all met the specified 5,000 lbs.-per-square-inch (psi) design strength. The samples represented 6,600 cubic yards of concrete placed in a continuous two-day operation to construct the reactor containment building base mat. The licensee initiated a series of studies to determine the cause of the low strength in samples and to determine whether the base mat met the construction permit criteria. The licensee concluded, in a final report in October 1978, that the base mat was acceptable and met specifications for 5,000 psi compressive strength concrete on the basis of supplemental tests. The apparent low-strength samples were attributed to faulty testing procedures by the licensee.

The NRC initiated an investigation that resulted in the licensee's halting the placement of all safety-related concrete on December 19, 1978. Numerous deficiencies which could have contributed to the apparent low-strength concrete were found, as well as quality assurance problems. The NRC concluded that the faulty testing was not the cause of the apparent low-strength samples. Additional studies were initiated by the licensee. The NRC retained an independent consultant and a test laboratory to provide additional information independent of the licensee.

While this work was underway, voids were found in the containment wall in two locations when forms were removed in December 1978. These defects and their causes were reviewed by IE inspectors. Repair was subsequently accomplished, utilizing approved procedures.

On March 6, 1979, after changes related to quality assurance had been made, the licensee was permitted to resume the placement of concrete in safety-related structures except for the reactor containment building. It was not until July 12, 1979 that concrete placement was permitted in the containment, because of the unresolved questions concerning the base mat. Placement was allowed as a result of reanalyses of the reactor containment building by the licensee using the lowered concrete strength values as the actual as-built strength of concrete. The reanalysis showed that enough margin remained in the design to accommodate the low-strength concrete, since the Wolf Creek unit is one of a series of standardized plants which are designed for more severe site conditions than exist at Wolf Creek. As a result of the studies and investigations, greater assurance has been obtained that the structure will perform adequately.

Marble Hill Nuclear Generating Station

The Marble Hill Nuclear Generating Station of Public Service of Indiana is located in southeastern Indiana in Jefferson County. The site is approximately nine miles northeast of Milton, Ky.

Beginning in April 1979, a series of noncompliances associated with concrete construction were identified by IE inspectors. In May, the NRC met with the licensee to request additional information on in-place concrete. Many of the noncompliances were attributed to inadequate implementation of quality assurance/control programs by the licensee and his contractor. In June, a series of allegations related to concrete construction were made by a former worker at the site. These allegations indicated that voids in the concrete had been found but not properly reported nor properly repaired.

An NRC investigation, with the aid of the worker, found additional areas which were deficient because of voids. In June, the licensee agreed to stop safety-related concrete work until certain QA actions were completed to the NRC's satisfaction. On the basis of observation by IE inspectors of a large non-safety-related concrete placement, safety-related concrete work was allowed to resume.

In July 1979, the National Board of Boiler and Pressure Vessel Inspectors reported several deficiencies at the site (not related to concrete) and recommended suspension of the utility's American Society of Mechanical Engineers Owner's Certificate for apparent Code violations of Section III, Division 1, of the ASME Boiler and Pressure Vessel Code. As a result of further investigation by IE inspectors, which identified contruction management problems, an order confirming the suspension of work was issued on August 14, 1979. A series of corrective actions must be completed before construction of safety-related items will be allowed to resume.

McGuire Nuclear Plant

The McGuire Nuclear Plant of Duke Power Company is located 17 miles northwest of Charlotte, N.C., adjacent to the Catawba River.

In March 1978, the NRC received telephone calls and a letter from an individual regarding alleged safety problems at the McGuire facility. A meeting of NRC staff with the individual resulted in reduction of the concerns to 12 allegations. IE investigators worked on the case through July and were able to resolve all but one allegation. This one allegation pertained to calculations completed by Duke Power Company to ascertain whether a fuel cask could fall into the spent fuel pool under various hypothetical circumstances. Additional investigatory effort identified a conservative calculation—not previously shown to the NRC—which showed that the cask could enter the spent fuel pool. The license has taken corrective action to prevent the occurrence of such an event.

Midland Nuclear Plant

The Midland Nuclear Plant, which is owned by Consumers Power Co., is located just south of Midland, Michigan, adjacent to a large industrial complex of the Dow Chemical Co.

In September 1978 the licensee reported greater than expected settlements had occurred in the diesel generator building complex. IE investigations disclosed that many of the commitments the licensee had made at the construction permit stage had been revised without changes in the safety analysis reports. Matters related to revised criteria and remedial action were transferred to NRC's Office of Nuclear Reactor Regulation (NRR).

Joint IE-NRR efforts are still underway to define what corrective measures need to be taken.

Surry Nuclear Power Station

The Surry Nuclear Power Station, which is owned by the Virginia Electric and Power Company (VEPCO), is located about eight miles south of Williamsburg, Va.

On May 7, 1979, while conducting inspections of new fuel for Surry Unit 2, the licensee found that plastic protective liners on 62 of 64 nuclear fuel assemblies had been tampered with. Further inspection revealed that a white crystalline substance had been poured on the assemblies. Preliminary analysis by VEPCO indicated that the substance was sodium hydroxide. The new fuel is stored in a building which is locked and alarmed, and to which access is controlled by the issuance of specially coded access cards.

Investigation of this incident by the FBI culminated in the surrender of two VEPCO employees to Surry County authorities on June 19, 1979. Charges of breaking and entering with intent to damage electrical facilities (felony) and willful destruction of utility company equipment (felony) were lodged against the two employees. Two additional charges against both men were introduced for conspiracy regarding the two felonies, for a total of four felonies and one misdemeanor against each man. These charges were filed on behalf of the Commonwealth of Virginia, since current Federal statutes do not provide penalties for such acts of vandalism. Pending legislation may result in making intentional damage to a reactor facility a Federal crime.

The two individuals, who were later tried, convicted on charges of willfully destroying utility company equipment and sentenced to two years' imprisonment, claimed that they had damaged the fuel rods to call attention to poor security practices and unsafe conditions at the VEPCO facility. Subsequent to their trial, they were interviewed by NRC investigators and an investigation into their allegations is currently underway.

Abnormal Occurrences—Fiscal Year 1979

An "abnormal occurrence" is defined in Section 208 of the Energy Reorganization Act of 1974 as "an unscheduled incident or event which the Nuclear Regulatory Commission determines to be significant from the standpoint of public health or safety." The same Act requires that such events be reported quarterly to the Congress by the NRC and also be included in the Annual Report. The four quarterly reports covering fiscal year 1979 are published as NUREG-0900, Vol. 1, No. 4, and Vol. 2, Nos. 1, 2 and 3, and are available from the Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 and from the National Technical Information Service, Springfield, Va. 22161.

In reports on the first three quarters of the fiscal year, eight abnormal occurrences were covered, including the accident at Three Mile Island (see Chapter 2). Three additional events were under consideration for reporting in the fourth quarter (July—September 1979) but had not been officially identified as abnormal occurrences at the end of the report period and are, therefore, omitted in the listing below. Abnormal occurrences which took place during the fiscal year at facilities under the jurisdiction of Agreement States are treated in Chapter 8, "State Programs."

Loss of Containment Integrity. The occurrence involved a loss of containment integrity at two nuclear power plants—Millstone Unit 2 and Salem Unit 1—reported in July and September of 1978 respectively. The issue is discussed in Chapter 3, under "Mechanical Operability of Containment Purge Valves," in the section, "Other Technical Issues."

Electrical System Deficiencies. The occurrence concerned degraded engineered safety features at the Arkansas Nuclear One site, involving both Units 1 and 2 there, and disclosed serious deficiencies in electrical distribution system operation and design. It was reported in September 1978 and is treated in NUREG-0090, Vol. 2., No. 1

Piping Reanalysis at Five Plants. The occurrence derived from the discovery that certain piping systems and pipe suports in five nuclear plants had been constructed according to a faulty calculation. The issue is covered in Chapter 3, under "Shutdown and Seismic Reanalysis of Five Operating Reactors," in the section, "Other Technical Issues."

Extortion Attempt. The occurrence arose from an extortion attempt in the form of an anonymous letter sent to officials of the General Electric Company's fuel fabrication facility at Wilmington, N.C., alleging that the sender was in possession of an amount of low enriched uranium oxide and threatening to send portions of it to various persons and to release the materal in certain cities if payment was not made. The extortionist was apprehended and the material recovered. (See Chapter 5, under "Safeguards Events—Fiscal Year 1979.)

Loss of Feedwater Transient. The occurrence took place on May 2, 1979, at the Oyster Creek facility, where a loss of feedwater transient resulted in a significant reduction of the water inventory above the reactor core area, as measured by one set of water level instruments. It was later determined that the water level had fallen below the safety limit, but that no part of the core was uncovered and no fuel damage occurred.

Vandalizing New Fuel Rods. The occurrence involved the pouring of sodium hydroxide on new fuel assemblies and is discussed above under the heading "Surry Nuclear Power Station."

Emergency Feedwater Unavailable. In June 1979 at Unit 1 of Arkansas Nuclear One, an NRC inspector found that, as preparations were made for startup of the facility the controls for the emergency feedwater system were so positioned that the system could not automatically respond if needed. It was later ascertained that there was no procedural requirement that the system status be checked before startup. The plant was returned to cold shutdown for 12 days, until procedures could be reexamined and revised. All holders of reactor operating licenses and construction permits were informed of the event and its implications.