INSPECTION OF LICENSED NUCLEAR POWER PLANTS IN THE UNITED STATES

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Inspection of licensed nuclear power plants in the United States is performed by the Office of Inspection and Enforcement (IE), United States Nuclear Regulatory Commission. IE has several key functions:

- Inspection of licensees and investigation of incidents, occurrences and allegations.
- Detection and correction of safety and security problems.
- Enforcement of rules, regulations, and Commission orders.
- Feedback to the industry and others regarding safety experience.
- Informing the public and others.

Major enforcement actions and events involving operating power reactors for the past several years will be summarized.

Inspection of licensed nuclear power plants in the United States is the responsibility of the United States Nuclear Regulatory Commission (NRC). This responsibility has in turn been delegated to the Office of Inspection and Enforcement (IE), which is one of the line offices in the NRC. (Slide 1) The Office of Nuclear Reactor Regulation (NRR) has the responsibility for issuing licenses and taking other licensing actions related to nuclear power plants. The Office of Nuclear Materials Safety and Safeguards (NMSS) has the responsibility for licensing all other nuclear facilities related to nuclear safety and safeguards.

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- Detection and correction of safety and security problems.
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- Feedback to the industry and others regarding safety experience.
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IE inspection embraces nuclear safety, radiation protection for the workers and the public, radiation waste disposal, plant protection, and environmental protection.

IE has five regional offices; Region I in Philadelphia, Region II in Atlanta, Region III in Chicago, Region IV in Dallas, and Region V in (Slide 2) San Francisco. IE Headquarters is located in Washington, D. C. (Bethesda, Maryland). The field inspection is performed in the regional offices and policy, program management, and technical guidance is supplied from Headquarters. Regions I, II, and III have the largest total staffs (~100 while Regions IV and V have total staffs of from 50 to 60 people). Headquarters has a total staff of ~100 people. In terms of inspectors and supervisors inspections of operating reactors the breakdown is as follows:

Region I 31
Region II 25
Region III 19
Region IV 5
Region V 9

The IE inspection program has two major components:

- Routine-preventive program.
- Nonroutine-reactive program.

Inspection Program

The routine preventive program is designed to provide a sampling of all of the major areas related to reactor safety and security to determine if the licensee's operations are adequate to protect the public health, safety and security and to determine if the licensee is operating in compliance with the Federal Rules and Regulations and with license requirements. Normally inspections are unannounced and are performed by teams of inspectors, including specialists in the various related disciplines. For many years the scheduled frequency of inspections has been four per year per faculty. In practice the average approaches eight. The routine-preventive program is planned to consume approximately 80% of IE's inspection efforts for operating reactors.

The nonroutine-responsive program is designed to react to incidents, occurrences, and allegations which occur or are brought to the attention of the NRC. The objective is to determine what has happened, who may have been involved, the impact on public safety and security, what actions must be taken to correct the situation, enforce the Federal regulations and license conditions, feed information back to the industry and others (particularly if there is potential for a similar occurrence elsewhere), and to inform the public. This program is targeted to consume approximately 20% of IE's inspection efforts.

The IE inspection program is described in the IE Inspection Manual and includes the following areas:

- Reactor Operations
- Quality Assurance for Operations
- ECCS and Safety System Testing
- Management and Administrative Controls
- Inservice Inspection
- Maintenance and System Changes
- System Chemistry
- Radiation Protection
- Radiation Waste Disposal
- Environmental Monitoring
- Physical Security

An index to the specific inspections procedures for operating reactors in the IE Manual is presented in Enclosure 1. Each inspector has at least 20% of his time free to look into areas of his choosing in search of safety problems. (Slide 3)

The program for enforcement of operating reactors is performed in accordance with general IE enforcement procedures as described in another NRC paper. A summary of enforcement experience will be discussed below.

We are currently moving toward a change in the NRC inspection program - assignment of resident inspectors at each reactor site. When the program is fully implemented in the calendar year 1981 at least one resident IE inspector will be assigned to each licensed power reactor site where significant construction activities have begun or where reactor operations are underway. Resident inspectors will also be assigned to other types of major licensed nuclear facilities.

We intend to assign resident inspectors at eight sites by October 1, 1977 and move forward in stages to the goal of full implementation by calendar year 1981. Needless to say, this entails major planning and implementation efforts. These efforts are now underway.

The goal is to provide greater safety assurance by placing resident inspectors on-site to provide greater independent verification that licensees are conducting their operations in compliance with requirements and without undue risk to the public. The resident inspectors at operating nuclear power plants will observe reactor operations, radiation protection activities, environmental protection activities, quality assurance activities, and plant protection activities.

Specialists from the Regional offices will continue to perform technical evaluations of the licensee's programs in the areas outlined above. The resident inspectors will report to the Regional offices.

Special Performance Audit Teams from IE Headquarters will perform annual inspections to evaluate licensee performance with a focus on licensee management level at the site and at the coporate level. These teams will also evaluate the effectiveness of the Regional tandem of resident inspectors and teams of Regional specialists. Resident inspectors will be rotated periodically to help insure inspector objectivity.

Increased safety assurance will also be provided by an increased emphasis on independent measurements by IE personnel and contractors and by increased independent evaluation by IE personnel. Studies are now underway in these areas.

The above program developments underway are the product of the IE Study instituted by Dr. Volgenau, Director, Office of Inspection and Enforcement. The study is broad and aimed at focusing sharply on IE goals improving IE effectiveness. The IE Study will be discussed more fully by Dr. Volgenau.

Operating Experience

NRC operating reactor inspection experience can be summarized by considering the following factors:

- Amount of inspection effort expended.
- Results of inspections and enforcement actions taken.

We are presently studying methods for evaluation of licensee and IE performance using the available data and information on a more systematic basis.

As indicated above, we presently have approximately 100 inspectors involved in the performance of inspections of 65 operating reactors in the United States. In FY 1977, we performed 1,356 inspections with those resources. Of those 1,356 inspections, noncompliance was found during 608. This data is summarized for FY 1975, 1976, 1977 in the enclosed Table 1. (Slide 4)

Table 1 also contains a summary of enforcement results of severity of items of noncompliance. Violations are those items of noncompliance where significant safety consequences occurred or could have occurred because of the noncompliance. Infractions are those items of noncompliance where significant consequences chould have occurred, but where safety margins (of protective systems) still existed. Deficiencies are items of noncompliance that do not have direct safety significance. Major enforcement actions involving operating power reactors is shown in Table 2. (Slide 5)

Licensees are required to report incidents, abnormal occurrences, and related events in accordance with their license requirements. These events have a wide range of severity.

The more significant matters are designated as abnormal occurrences. Requirements for reporting Abnormal Occurrences (AOs) are established in Section 208 of the Energy Reorganization Act of 1974, as amended. The primary points provided in this section are as follows:

1. An AO is defined as "an unscheduled incident or event which the Commission determines is significant from the standpoint of public Health and safety."

2. The format and general content of the AO reports are established by specifying that each report shall contain:

   a. The date and place of each occurrence.
   b. The nature and probable consequence of each occurrence.
   c. The cause or causes.
   d. Any action taken to prevent recurrence.

3. Directs the Commission to report AOs to Congress each quarter.

4. Directs the Commission to disseminate sections a and b to the public within fifteen (15) days after receiving information of an AO.

5. Directs the Commission to disseminate sections c and d to the public as soon as such information becomes available.

Interim criteria for determination of AOs were approved in September, 1975 and the first Report to Congress covering the first six months of 1975 was approved by the Commission in October, 1975. Revised "permanent" criteria were approved on February 8, 1977, and published in the Federal Register on February 24, 1977. The Fourth Quarter, 1976 Report to Congress was the first report formulated using the revised criteria.

The criteria state "an event will be considered an AO if it includes a major reduction in the degree of protection of the public health or safety."

Table 3 is a listing of Abnormal Occurrences reported to Congress as required by law. (Slide 6)

The NRC requires power reactor licensees to submit periodic reports regarding safety, security, and environmental matters. The NRC also requires that licensees report unusual occurrences, other matters, events, conditions, or occurrences that impact directly or indirectly on public safety, safeguards, and environmental protection.

The timing requirement for routine periodic reports ranges from yearly to monthly. The timing of Licensee Event Reports ranges from immediate to 30 days. NRC reporting requirements are compiled in NRC Regulatory Guide 10.0, Compilation of Reporting Requirements for Persons Subject to NRC Regulations.

Plant technical specifications include a section on reporting requirements detailing the types of events that should be reported (a) as expeditiously as possible (within 24 hours) or (b) within 30 days. The data from these reports are stored in the Commission's License Event Report (LER) File for further analysis and evaluations and public dissemination. In general the reporting requirements for these two types of events may be briefly summarized as follows:

Prompt notification:

(1) Failure of the reactor protection system or other systems subject to limiting safety-system settings to initiate the required protective function by the time a monitored parameter reaches the setpoint specified in the technical specifications or failure to complete the required protective function.

(2) Operation of the unit or affected systems when any parameter or operation subject to a limiting condition for operation is less conservative than the least conservative aspect of the limiting condition for operation established in the technical specifications.

(3) Abnormal degradation discovered in fuel cladding, reactor coolant pressure boundary, or primary containment.

(4) Reactivity anomalies involving disagreement with the predicted value under steady-state conditions during power operation greater than or equal to 1% Δ k/k; a calculated reactivity balance indicating a shutdown margin less conservative than specified in the technical specifications; short-term reactivity increases that correspond to a reactor period of less than 5 seconds or, if subcritical, an unplanned reactivity insertion of more than 1.5% Δ k/k; or occurrence of any unplanned criticality.

(5) Failure or malfunction of one or more components which prevents or could prevent, by itself, the fulfillment of the functional requirements of system(s) used to cope with accidents analyzed in the SAR.

(6) Personnel error or procedural inadequacy which prevents or could prevent, by itself, the fulfillment of the functional requirements of systems required to cope with accidents analyzed in the SAR.

(7) Conditions arising from natural or manmade events that, as a direct result of the event, require plant shutdown, operation of safety systems, or other protective measures required by technical specifications.

(8) Errors discovered in the transient or accident analyses or in the methods used for such analyses as described in the safety analysis report or in the bases for the technical specifications that have or could have permitted reactor operation in a manner less conservative than assumed in the analyses.

(9) Performance of structures, systems, or components that require remedial action or corrective measures to prevent operation in a manner less conservative than that assumed in the accident analyses in the safety analysis report or technical specification bases; or discovery during plant life of conditions not specifically considered in the safety analysis report or technical specifications that require remedial action or corrective measures to prevent the existence or development of an unsafe condition.

Thirty Day Reports:

(1) Reactor protection system or engineered safety feature instrument settings which are found to be less conservative than those established by technical specifications but which do not prevent the fulfillment of the functional requirements of affected systems.

(2) Conditions leading to operation in a degraded mode permitted by a limiting condition for operation, or plant shutdown required by a limiting for operation.

(3) Observed inadequacies in the implementation of administrative or procedural controls which threaten to cause reduction of degree of redundancy provided in reactor protection systems or engineered safety feature systems.

(4) Abnormal degradation of systems designed to contain radioactive material resulting from the fission process.

The safety significance of LER's range from that of the events reported to the Congress as unusual Occurrence Reports to LER's dealing with reports of drifting set points. LER experience for the calendar years 1974 and 1975 has been reported in detail in NUREG-0227, Nuclear Power Plant Operating Experience 1974-1975.

For calendar year 1976 LER experience can be summarized as indicated in the attached Tables 4, 5, and 6.

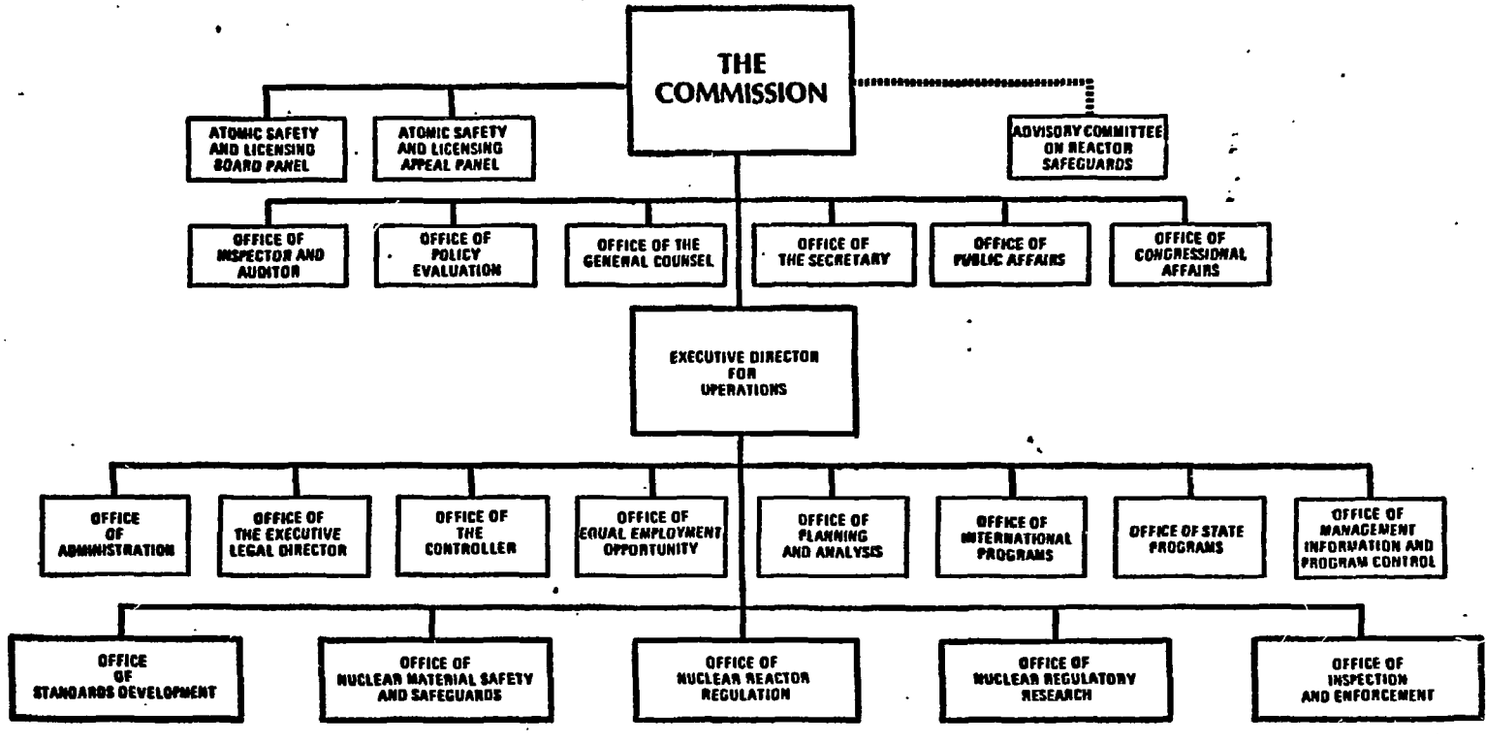
In calendar year 1976, 2,531 LER's were reported involving 64 operating reactors. The total number of LER's reported by calendar year since 1969 is shown in the attached Table 7. LER information for calendar year 1976 is further summarized in Tables 7, 8, and 9 ans indicated above.

Examination of the published LER data for calendar years 1974 and 1975 referenced above and the LER data for other years indicates a general consistency from year to year in terms of reported cause and systems involved.

Reactor operating experience in the United States has been good in the sense that the number of incidents and occurrences with consequences has been low and the extent of consequences has also been low. As a regulator, it is not my job to expound on the state of the industry. It is my job, however, to call for unceasing vigilance and good performance on the part of the licensees.

NUCLEAR REGULATORY COMMISSION

Slide 1



NRC REGIONAL OFFICES

REGION I	PHILADELPHIA
REGION II	ATLANTA
REGION III	CHICAGO
REGION IV	DALLAS
REGION V	SAN FRANCISCO

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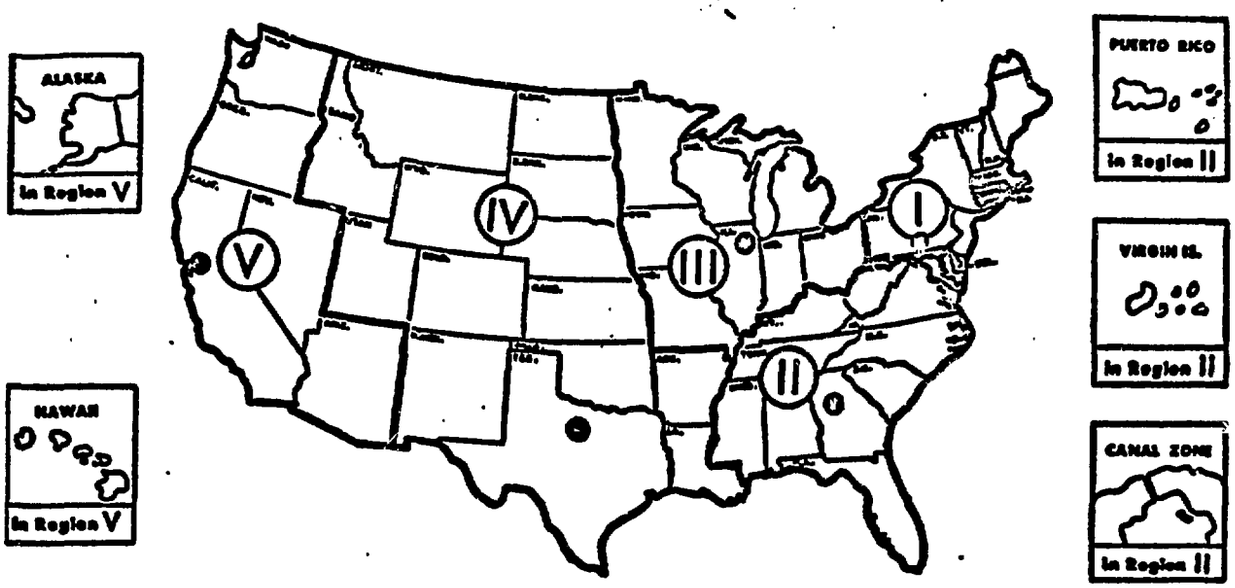
UNITED STATES NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
REGIONAL OFFICES



Region	Address	Telephone
I Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont	Region I, Office of Inspection and Enforcement, USNRC, 631 Park Avenue, King of Prussia, Pennsylvania 19406	215-337-5150
II Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, Panama Canal Zone, Puerto Rico, South Carolina, Tennessee, Virginia, Virgin Islands, and West Virginia.	Region II, Office of Inspection and Enforcement, USNRC, Suite 1217, 230 Peachtree Street, N.W. Atlanta, Georgia 30303	404-221-4503
III Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.	Region III, Office of Inspection and Enforcement, USNRC, 799 Roosevelt Road, Glen Ellyn, Illinois 60137	312-858-2660
IV Arkansas, Colorado, Idaho, Kansas, Louisiana, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Wyoming.	Region IV, Office of Inspection and Enforcement, USNRC, Suite 1000, 611 Ryan Plaza Drive, Arlington, Texas 76012	817-334-5531
V Alaska, Arizona, California, Hawaii, Nevada, Oregon, Washington, and U.S. territories and possessions in the Pacific.	Region V, Office of Inspection and Enforcement, USNRC, Suite 202, 1990 N. California Blvd. Walnut Creek, California 94596	415-486-3941

INSPECTION PROCEDURES, LIGHT WATER REACTORS - OPERATIONS PHASE

Inspection Procedure Number	Title	Inspection Frequency
30700B	Management Meeting - Third Corporate Management Meeting	Once
30702B	Management Meetings - As Needed and 3 Years	W +
30703B	Management Meeting - Entrance and Exit Interviews	Each Inspection
35030B	IE Input to NRR Review of QA Topical Reports	W+
35701B	QA Program - Annual Review	A
36700B	Organization and Administration	A *
37700B	Design, Design Changes and Modifications	A *
37701B	Modifications	W +
38700B	Procurement	A *
39700B	Records	A *
40700B	Review and Audits	A *
41700B	Training	A *
41701B	Requalification Training	A *
42700B	Procedures	A *
42702B	Fire Prevention/Protection	A *
54700B	Cleanliness	A *

+When required
*Eligible for conduct at reduced frequency

Inspection Procedure Number	Title	Inspection Frequency
55700B	Welding	W +
56700B	Calibration	A *
56701B	Calibration	A *
57700B	Nondestructive Examination	W +
60705B	Preparation for Refueling	R °
60710B	Refueling Activities	R °
61700B	Surveillance	A *
61701B	Surveillance	W +
61702B	Surveillance of Core Power Distribution Limits	A *
61703B	Calibration of the Local Power Range Monitoring System	A *
61704B	APRM (Average Power Range Monitor) Calibration	A *
61705B	Incore/Excore Detector Calibration	A *
61706B	Core Thermal Power Evaluation	A *
61707B	Determination of Reactor Shutdown Margin	A *
61708B	Isothermal Temperature Coefficient of Reactivity Measurement (PWR)	A *
61709B	Power Coefficient of Reactivity (PWR)	A *
61710B	Control Rod Worth Measurement (PWR)	A *
61711B	Target Axial Flux Difference Calculation (W-NSSS)	A *
61721B	Surveillance of Pipe Support and Restraint Systems	A *
62700B	Maintenance	A *

+When required
*Eligible for conduct at reduced frequency
° Refueling

Inspection Procedure Number	Title	Inspection Frequency
851103	Material Control & Accounting - Inventory	3 years
85112B	Material Control & Accounting - Records and Reports	3 years
85114B	Material Control & Accounting - Management of Materials Control System	3 years
86700B	Spent Fuel Packaging and Shipping	W +
86701B	Other Radioactive Material Packaging & Shipping	W +
90712B	Inoffice Review of Event Reports	W +
90720B	Review of Startup Report	S **
90730B	Review of Annual Reports or Equivalent	A
90740B	Review of Containment Leak Rate Testing Report - 1LRT	W +
90741B	Review of Containment Leak Rate Testing Report - Type B & C Tests	W +
92700B	Licensee Event Followup	W +

+When required
** As scheduled by licensee or technical specifications

Inspection Procedure Number	Title	Inspection Frequency
92701B	Followup on Inspector-Identified Problems Unresolved Items	W +
92702B	Followup on Items of Noncompliance/ Deviations	W +
92703B	IE Bulletin/ Circular/Immediate Action Letter Followup	W +
92704B	Followup on Headquarters Requests	W +
92705B	Followup on Regional Requests	W +
92706B	Independent Inspection Effort	Each Inspection
92709B	Followup on Licensee's Plans for Coping with Strikes	W +
92710B	Followup on Initial Licensee Implementation of Strike Plan	W +
92711B	Followup on Continued Licensee Implementation of Strike Plans During an Extended Strike	W +
92712B	Followup on Resumption of Normal Operations After a Strike	W +

+When required

Inspection Procedure Number	Title	Inspection Frequency
93700B	Inspector Dispatched to Site	W +
93701B	Followup on Significant Event that Occurs During Inspection	W +
94700B	Participation in ACRS Meetings	W +
94701B	Recommendations Regarding License Modification	W +
94702B	Participation in NRR/Licensee Meeting	W +

+When required

Inspection Procedure Number	Title	Inspection Frequency
62701B	Maintenance	Refueling
63700B	Construction Testing	W+
70700B	Preoperational Testing	W+
71710B	Review of Plant Operations	Q
71711B	Review of Plant Operations	Each Refueling
71712B	Review of Plant Operations	After Each Refueling
71720B	Review of Safety Limits, Limiting Safety System Settings, and Limiting Conditions for Operation	A *
72700B	Startup Testing - Refueling	Each Refueling
72701B	Startup Testing - New or Modified System	W+
73051B	Inservice Inspection - Review of Program	Tech/Spec
73052B	Inservice Inspection - Review of Procedures	Tech/Spec
73753B	Inservice Inspection - Observation of Work and Work Activities	Tech/Spec
73755B	Inservice Inspection - Data Review and Evaluation	Tech/Spec
80710B	Environmental Protection	A *

+When required

*Eligible for conduct at reduced frequency

Inspection Procedure Number	Title	Inspection Frequency
81100B	Physical Protection	A
81300B	Physical Protection - SNM in Transit	W+
82710B	Emergency Planning - Agreements & Coordination with Offsite Agencies	A *
82711B	Emergency Planning - Facilities & Equipment	A *
82712B	Emergency Planning - Test & Drills	A *
83740B	Radiation Protection - Operation	A *
83745B	Radiation Protection - Refueling	W+
84710B	Radioactive Waste Systems, Operation	A *
84711B	Radioactive Waste Systems, QC and Confirmatory Measurement	A *
85102B	Material Control & Accounting - Facility Organization and Operation	3 years
		3 years
85104B	Material Control & Accounting - Measurement and Controls	3 years
85106B	Material Control & Accounting - Shipping and Receiving	3 years
85108B	Material Control & Accounting - Storage and Internal Control	3 years

+ When required
*Eligible for conduct at reduced frequency

TABLE 1

FY 1976 Operating Reactors

(B2 & C)

Violations = 7

Infractions = 721

Deficiency = 527

Inspections Clear = 613

Not Clear = 528

Total = 1141

FY 1977 Operating Reactors

Violations = 2

Infractions = 796

Deficiency = 380

Inspection Clear = 748

Not Clear = 1356

FY 1975 Operating Reactors

Violations = 8

Infractions = 784

Deficiency = 320

Inspection Clear = 463

Not Clear = 380

Total = 843

NOTE: FY 1977 July 76 thru May 77

Totals for reactors on summary sheets equal these B2&C (Power Reactors) plus AO, etc. Research, Test, Deactivated PWR Reactors

HQ ENFORCEMENT ACTION FOR POWER REACTORS IN 1976 & 1977

1) Baltimore Gas & Electric
Calvert Cliffs 1, (50-317), HQ letter 5/5/77 (3/14/77)

2) Carolina Power & Light
Brunswick 2, (50-324), Civil Penalty 2/18/76

3) Commonwealth Edison
Dresden 1,2,&3 (50-10, 237, 249), Notice 8/19/76 (6/16/76)
Zion 1 (50-295), Civil Penalty 5/25/76 (3/22/76)
Dresden 2 (50-237), Notice 6/14/77 (2/28/77)

4) Consolidated Edison
Indian Point 1,2,&3 (50-03, 247, 286), HQ letter 1/14/77 (10/20/76)
Indian Point 2 (50-247), Civil Penalty 6/21/76 (4/6/76)

5) Consumers Power Co. of Mich.
Palisades (50-255), Notice 4/23/76 (2/27/76)

6) Duke Power
Oconee 1,2,&3 (50-209, 270, 287),Civil Penalty 3/29/77 (12/20/76)

7) Jersey Central Power & Light
Oyster Creek (50-219), Civil Penalty 6/28/76

8) Metropolitan Edison
Three Mile Island 1, (50-289), Civil Penalty 3/15/76 (2/5/76)

9) Niagara Mohawk Power
Fitzpatrick (50-333), Civil Penalty 7/16/76

10) Northeast Nuclear
Millstone Point 1, (50-245), Civil Penalty 1/21/77 (11/12/76)

11) Northern States Power
Monticello (50-263), Notice 6/14/77 (2/17/77)

12) Pacific Gas & Electric
Humbolt Bay (50-133), Civil Penalty 5/16/77 (3/7/77)

13) Public Service of Colorado
Fort St. Vrain, (50-267), Civil Penalty 5/11/77 (4/18/77)

14) Tennessee Valley Authority
Browns Ferry 1&2 (50-259,260), HQ letter 6/8/76 (5/6/76)

15) Virginia Electric & Power
North Anna 1&2 (50-338, 339), Civil Penalty 12/6/76 (8/13/76)

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TABLE 3

ABNORMAL OCCURRENCES AT NUCLEAR POWER PLANTS

January - June 1975

Date	Event Type	Event	Facility
February 26, 1975	Single	Steam Generator Tube Failure (Update: NUREG-0090-1 Appendix B-1 July - Sep '75)	Point Beach 1
March 22, 1975	Single	Fire in Electrical Cable Trays (Updates: NUREG-0090-1 Appendix B-2 July - Sep '75, NUREG-0090-3 Appendix B pgs 13 & 14 Jan - March '76, NUREG-0090-4 Appendix B pg 8 April - June '76)	Browns Ferry 1 & 2
May 1, 1975	Single	Loss of Main Coolant Pump Seals (Update: NUREG-0090-1Appendix B-3 July - Sep '75)	H. B. Robinson 2
January 25, 1975 and May 3, 1975	Recurring	Improper Control Rod Withdrawals-Maintenance (Update: NUREG-0090-1 Appendix B-4 July - Sep '75)	Dresden 2 Quad-Cities 1
Various: September'74 to January, 1975	Generic	Cracks in Pipes at Boiling Water Reactors (Updates: NUREG-0090-2 Appendix B-1 & B-2 Oct - Dec '75, NUREG-0090-3 Appendix B pg 14 Jan - March '76)	Dresden 2, Quad-Cities 1 & 2, Millstone 1, Monticello, and Peach Bottom 3
April, 1975	Generic	Fuel Channel Box Wear at Boiling Water Reactors	Duane Arnold, Cooper, Peach Bottom 2 & 3, Browns Ferry 1 & 2, Brunswick 2, Hatch 1, FitzPatrick, & Vermont Yankee
Various: October 1972 to May 1975	Generic	Steam Generator Feedwater Flow Instability at Pressurized Water Reactors (Updates: NUREG-0090-1 Appendix B-8 July - Sep '75 NUREG-0090-6 Appendix B pgs 18-19 Oct - Dec '75)	Surry 1, Turkey Point 3 & 4, Indian Point 2, & Calvert Cliffs 1

(Note: For the recurring and generic events, the circumstances surrounding the events varied from plant to plant.)

TABLE 3 (Cont)

ABNORMAL OCCURRENCES AT NUCLEAR POWER PLANTS

1976

Date	Event Type	Event	Facility
January, 1976	Generic	76-1 Deficiencies in the 'Mark I' Containment Systems of Certain Boiling Water Reactors (Updates: NUREG-0090-4 April - June '76 pg 8 NUREG-0090-6 Oct - Dec '76 pg 19)	See List 76-1 pg 1 & 2, NUREG-0090-(
March 18, 1976	Single	76-2 8 Rem Occupational Whole Body Exposure	Zion Unit 1
April 5, 1976	Single	76-6 10 Rem Occupational Whole Body Exposure	Indian Point Unit 1
July 5 & 21, 1976	Single	76-9 Failure of Undervoltage Trip Logic and Consequent Loss of Safeguard AC Power (Update: NUREG-0090-6 Oct - Dec '76, pg 20)	Millstone Unit2
July 8, 1976	Single	76-10 Nuclear Core Power Distribution Anomaly	St. Lucie Unit 1
September 15, 1976	Single	76-11 Steam Generator Tube Integrity	Surry Unit 2
November 12, 1976	Single	76-15 Improper Control Rod Withdrawals and Unplanned Reactor Criticality	Millstone Unit 1
December, 1976	Generic	76-16 Feedwater Nozzle Cracking in Boiling Water Reactors (Update: NUREG-0090-7, Jan-Mar '77 pg 7)	See List 76-16, pg 3 NUREG-0090-6

TABLE 4

Reactor LER's by Event Year

1969	-	44
1970	-	88
1971	-	179
1972	-	446
1973	-	896
1974	-	1566
1975	-	2198
1976	-	2531

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TABLE 5

Most Frequently Reported Systems
1976

(Five of Total of Fourteen Systems Reported)

	Per Cent of Reports
Engineered Safety Features	22.2
Reactor Coolant Systems and Connected Systems	17.6
Instrumentation and Control Systems	15.0
Electric Power Systems	9.6
Reactor Systems	6.2

TABLE 6

Slide 9

Cause of LER's

1976

Cause	Per Cent of Reports
Component Failure	51.0
Personnel Error	16.4
Design/Fabrication Error	9.4
Defective Procedures	6.3
External Cause	3.6
Other	13.6

TABLE 7

Most Frequent Reactor Status
At Time LER Reported
CY 1976

Plant Status	Per Cent of Reports
Steady State Operation	39.4
Routine Test or Inspection	49.4
Special Test or Inspection	6.4
External Source	3.0
Other	1.0