

811130366 800128
PDR NUREG
0629 R PDR

NUREG-0629

U. S. NUCLEAR REGULATORY COMMISSION
BUDGET ESTIMATES
FISCAL YEAR 1981

APPROPRIATION: SALARIES AND EXPENSES



JAN 28 1980

BUDGET ESTIMATE FOR
U. S. NUCLEAR REGULATORY COMMISSION
FISCAL YEAR 1981

INDEX

General Statement	Pages 1-12
Nuclear Reactor Regulation (NRR)	Pages 13-22
Standards Development (SD)	Pages 23-28
Inspection and Enforcement (I&E)	Pages 29-39
Nuclear Material Safety and Safeguards (NMSS)	Pages 40-49
Nuclear Regulatory Research (RES)	Pages 50-62
Program Technical Support (PTS)	Pages 63-65
Program Direction and Administration (PDA).....	Pages 66-69
Special Supporting Tables	Pages 70-72

U. S. NUCLEAR REGULATORY COMMISSION
FY 1981 Budget Estimates
GENERAL STATEMENT FOR SALARIES AND EXPENSES

(Dollars in thousands, except whole dollars in narrative material)

Estimate of Appropriation

The budget estimates for Salaries and Expenses for FY 1981 provide for obligations of \$468,490 to be funded in total by a new appropriation.

Estimates of Obligations and Outlays

This section provides for the summary of obligations by program on page 2; the summary of financing these obligations on page 3; the analysis of outlays on page 4; obligations by function on page 5; the proposed appropriation language and analysis of the appropriation language on pages 6 through 8; and the narrative summary of NRC programs beginning on page 9.

The summaries which address obligations include the NRC's Reimbursable program. It should be noted that the obligations related to this program are not financed by NRC's appropriated funds, but solely through reimbursable agreements with other Federal agencies.

The NRC will deposit revenues derived from the licensee fee program and indemnification fees to Miscellaneous Receipts of the Treasury. FY 1981 and 1980 revenues from this source are estimated at \$13,000,000.

The following table summarizes the total obligations for NRC's Direct and Reimbursable Programs for FY 1979, FY 1980 and FY 1981. The detailed justifications for direct program activities are presented in the same order as they appear in this summary table.

SUMMARY OF OBLIGATIONS BY PROGRAM
(Dollars in thousands, except whole dollars in narrative material)

Obligations by Activity:
Direct Program

	Actual FY 1979	Estimate FY 1980	Estimate FY 1981
Nuclear Reactor Regulation	\$ 49,823	\$ 74,217	\$ 69,385
Standards Development	13,440	15,565	16,390
Inspection and Enforcement	34,353	44,996	53,889
Nuclear Material Safety and Safeguards	29,232	31,791	43,680
Nuclear Regulatory Research	157,384	204,062	228,228
Program Technical Support	13,131	17,372	18,861
Program Direction and Administration	28,483	34,974	38,057
Total Obligations - Direct Program	\$325,846	\$422,977	\$468,490
Reimbursable Program	126	500	500
Total Obligations	\$326,042	\$423,477	\$468,990
Unobligated balance, start of year	-4,805	-5,627	0
Unobligated balance, end of year	5,627	0	0
Orders received from other Federal agencies	-263	-500	-500
Budget Authority	\$326,601	\$417,350 ^{1/}	\$468,490

^{1/} Includes \$4,810,000 for the proposed FY 1980 pay raise supplemental and \$49,200,000 for the proposed program supplement.

(Dollars in thousands, except whole dollars in narrative material)

Financing of Obligations

The financing of the estimated total obligations of \$468,490 proposed in the budget estimate for FY 1981 is summarized in the following table:

SUMMARY OF FINANCING

	<u>Actual FY 1979</u>	<u>Estimate FY 1980</u>	<u>Estimate FY 1981</u>
Sources of Funds Available for Obligations:.....			
Unobligated balance, beginning of year	\$ 4,805	\$ 5,627	\$ 0
Appropriated to NRC	326,601	417,350 ^{1/}	468,490
Orders received from Federal sources	263	500	500
Total Funds Available for Obligations	<u>\$331,669</u>	<u>\$427,477</u>	<u>\$468,990</u>
Less: Unobligated balance, end of year	-5,627	0	0
Total Obligations	<u>\$326,042</u>	<u>\$423,477</u>	<u>\$468,990</u>

^{1/} Includes \$4,810,000 for the proposed FY 1980 pay raise supplemental and \$49,200,000 for the proposed program supplement.

(Dollars in thousands, except whole dollars in narrative material)

Outlays for Salaries and Expenses

Outlays for 1981 are estimated at \$432,830,000. The following analysis identifies funds available for outlays for each of the budget periods.

This amount less the unexpended balance at the end of the period equals the outlays.

OUTLAY ANALYSIS

	Actual FY 1979	Estimate FY 1980	Estimate FY 1981
Unexpended balance, beginning of year:			
Obligated	\$124,344	\$140,630	\$212,927
Unobligated	4,805	5,627	0
Appropriation to NRC	326,601	417,350 1/	468,490
Total Funds Available for Outlays	\$455,750	\$563,607	\$681,417
Unexpended balance, end of year:			
Obligated	\$140,630	\$-212,927	\$-248,587
Unobligated	5,627	0	0
Total Outlays	<u>\$309,493</u>	<u>\$350,680</u>	<u>\$432,830</u>

1/ Includes \$4,810,000 for the proposed FY 1980 pay raise supplemental and \$49,200,000 for the proposed program supplement.

(Dollars in thousands, except whole dollars in narrative material)

SUMMARY OF BUDGET

OBLIGATIONS BY FUNCTION

	<u>Actual FY 1979</u>	<u>Estimate FY 1980</u>	<u>Estimate FY 1981</u>
<u>Direct Program</u>			
Personnel Compensation	\$ 85,362	\$ 99,692	\$112,730
Personnel Benefits	7,526	9,434	10,820
Program Support	186,592	250,969	274,094
Administrative Support	31,208	46,089	47,366
Travel	6,123	7,819	9,200
Equipment	9,035	8,974	14,280
Total Obligations - Direct Program	\$325,846	\$422,977 ^{1/}	\$468,490
Reimbursable Program	196	500	500
TOTAL OBLIGATIONS	<u>\$326,042</u>	<u>\$423,477</u>	<u>\$468,990</u>

^{1/} Includes \$4,810,000 for the proposed FY 1980 pay raise supplemental and \$49,200,000 for the proposed program supplement.

U. S. NUCLEAR REGULATORY COMMISSION
PROPOSED LANGUAGE - SALARIES AND EXPENSES
(Dollars in Thousands, except whole dollars in narrative material)

The proposed language is as follows:

Salaries and Expenses

For necessary expenses of the Commission in carrying out the purposes of the Energy Reorganization Act of 1974, as amended, including the employment of aliens; services authorized by 5 U.S.C. 3109; publication and dissemination of atomic information; purchase, repair, and cleaning of uniforms; official entertainment expenses (not to exceed \$15,000); reimbursement of the General Services Administration for security guard services; hire of passenger motor vehicles and aircraft; \$468,490,000 to remain available until expended: Provided, That from this appropriation, transfer of sums may be made to other agencies of the Government for the

performance of the work for which this appropriation is made, and in such cases the sums so transferred may be merged with the appropriation to which transferred: Provided further, That moneys received by the Commission for the cooperative nuclear safety research programs may be retained and used for salaries and expenses associated with those programs, notwithstanding the provisions of section 3617 of the Revised Statutes (31 U.S.C. 484), and shall remain available until expended.

U. S. NUCLEAR REGULATORY COMMISSION
Analysis of Proposed FY 1981 Appropriation Language

1. For necessary expenses of the Commission in carrying out the purposes of the Energy Reorganization Act of 1974, as amended;

42 U.S.C. 5841 et. seq.

42 U.S.C. 5841 et. seq. the Energy Reorganization Act of 1974, established the Nuclear Regulatory Commission to perform all the licensing and related regulatory functions of the Atomic Safety and Licensing Board Panel, the Atomic Safety and Licensing Appeal Board, and the Advisory Committee on Reactor Safeguards, and to carry out the performance of other functions including research, for the purpose of confirmatory assessment relating to licensing and other regulation, other activities, including research related to nuclear material safety and regulation under the provisions of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.) and the Energy Reorganization Act of 1974, as amended (42 U.S.C. 5801 et seq.).

2. Employment of aliens;

42 U.S.C. 2201 (d) of the Atomic Energy Act of 1954, as amended authorizes the Commission to employ persons and fix their compensation without regard to civil service laws.

3. Services authorized by 5 U.S.C. 3109;

5 U.S.C. 3109

5 U.S.C. 3109 provides in part that the head of an agency may procure by contract the temporary or intermittent services of experts or consultants when authorized by an appropriation.

4. Publication and dissemination of atomic information;

42 U.S.C. 2161b

42 U.S.C. 2161b directs the Commission that they shall be guided by the principle that the dissemination of scientific and technical information relating to atomic energy should be permitted and encouraged so as to provide that interchange of ideas and criticism which is essential to scientific and industrial progress and public understanding and to enlarge the fund of technical information.

5. Purchase, repair and cleaning of uniforms;

5 U.S.C. 5901

5 U.S.C. 5901 authorizes the annual appropriation of funds to each agency of the Government as a uniform allowance.

6. Official entertainment expenses;

47 Comp. Gen. 657

43 Comp. Gen. 305

This language is required because of the established rule restricting an agency from charging appropriations with the cost of official entertainment unless the appropriations involved are specifically available therefor. Congress has appropriated funds for official entertainment expenses to the NRC and NRC's predecessor AEC each year since FY 1950.

7. Reimbursement of the General Services Administration for security guard services;

34 Comp. Gen. 42

This language is required because under the provisions of the Federal Property and Administrative Services Act of

Analysis of Proposed Language - continued

1949, specific appropriation is made to GSA for carrying out the function of protecting public buildings and property, and therefore, NRC appropriations not specifically made available therefore may not be used to reimburse GSA for security guard services.

8. Hire of passenger motor vehicles and aircraft;

31 U.S.C. 638a

31 U.S.C. 638a provides in part - "(a) Unless specifically authorized by the appropriation concerned or other law, no appropriation shall be expended to purchase or hire passenger motor vehicles for any branch of the Government..."

9. To remain available until expended;

31 U.S.C. 718

31 U.S.C. 718 provides in part that no specific or indefinite appropriation shall be construed to be available continuously without reference to a fiscal year unless it is made in terms expressly providing that it shall continue available beyond the fiscal year for which the appropriation Act in which it is contained makes provision.

10. That from this appropriation, transfers of sums may be made to other agencies of the Government for the performance of the work for which this appropriation is made, and in such cases the sums so transferred may be merged with the appropriation to which transferred;

64 Stat 765, Sec. 1210

64 Stat 765, Sec. 1210 prohibits the transfer of appropriated funds from one account to another or working fund except as authorized by law.

11. Moneys received by the Commission for the cooperative nuclear safety research programs may be retained and used for salaries and expenses associated with those programs, and shall remain available until expended.

26 Comp. Gen. 43

2 Comp. Gen. 775

Appropriated funds may not be augmented with funds from other sources unless specifically authorized by law. These are funds received from foreign governments which in turn will participate in NRC's reactor safety research experiments. These funds will be used to pay for any costs incidental to their participation.

PROGRAM STATEMENT

The NRC was established by the Energy Reorganization Act of 1974. The agency is responsible for assuring that the possession, use and disposal of radioactive materials and the construction and operation of reactors and other nuclear facilities are conducted in a manner consistent with public health and safety and the common defense and security, and with proper regard for environmental quality.

The NRC 1981 Budget Highlights - The accident at the Three Mile Island Unit 2 facility on March 28, 1979 has had a major impact on NRC program areas. In the days, weeks and months following the accident, the NRC had to redirect significant resources away from on-going essential programs to respond to the safety issues associated with the TMI accident. In late FY 1979, much of this redirected effort required reprogramming requests which were provided to and approved by Congress. Congress also provided NRC with additional resources to preclude unnecessary delay to the reactor licensing effort and to provide for additional resident inspectors at operating reactor sites.

Resource estimates for FY 1981 contained in this budget request, as well as for the FY 1980 Supplemental Request previously provided to the Congress, are predominantly influenced by the TMI accident. In this regard, the FY 1980 column of our FY 1981 request assumes enactment of supplemental legislation. Fundamental changes to nuclear regulation are necessary. The NRC is currently developing a Lessons Learned action plan in support of its own investigations and the President's recommendations enumerated in his response to the Kemeny Commission investigation. The resources requested in this budget are essential if regulatory changes are to be made and the President's recommendations implemented on a timely basis to ensure a safe nuclear option. We recognize that these resources may not be adequate to carry out both the current tasks as well as those tasks anticipated as the results of all TMI investigations when they are fully evaluated. Additional FY 1981 personnel may be necessary.

In response to the President's recommendations, the NRC is accelerating the resolution of generic and specific safety issues as well as expanding inspection and enforcement functions, particularly through the addition of more resident inspectors to the program. Specific actions imposed upon the utilities will require substantial NRC oversight to evaluate and accredit industry efforts to assure that prompt and effective attention is being given to needed safety questions. Improvements in reactor operator performance necessitate the development of more rigorous criteria for operator and supervisor qualifications, expanded and improved use of simulators, and NRC examination and recertification of licensed operators. Since the TMI investigations have indicated that human error was a significant contributing factor to the TMI accident, operational safety and reliability of nuclear power plants must be improved through better control and instrumentation system design, information display techniques, and advanced training methods. All of these actions are resource dependent.

Our request for budget authority in FY 1981 amounts to \$468 million with outlays estimated at \$433 million. As previously noted, the funding increase over our revised FY 1980 estimate is primarily influenced by TMI considerations, but it also reflects the need for resources in waste management. It will also permit the NRC to pursue an Improved Reactor Safety program requested by the Congress. This program provides for the performance of relevant small-scale experiments to provide data to support development of new safety innovations and criteria. The major objectives of this program will be to examine a spectrum of suggestions for improving reactor safety, to develop functional requirements and conceptual designs, and to assess the value/impact of developing, licensing and implementation of these concepts.

In risk assessment, the accident at TMI clearly indicated the need for NRC to address safety issues involving accidents beyond those previously treated extensively. Consequently, the FY 1981 risk assessment program is being redirected and expanded to cover an increasing range of accident sequences.

The subject of waste management continues to be a national issue. Significant regulatory and research efforts are required to: address the imbalance in regional capacity for low-level waste disposal and to develop alternative disposal options; abate the emissions from uranium mill tailings; and to provide technical assistance to Agreement States for their licensing activities.

Also, NRC's current level of effort to develop a regulatory and licensing capability for high-level waste repositories must be augmented. In this regard, NRC expects to receive High-Level Waste site characterization plans on two sites by the end of 1982. This will require additional effort by NRC to provide early characterization guidance and to develop its capability to review and act on the plan with a trained, competent staff.

The highlights addressed above are described in more detail in subsequent pages. The NRC is actively pursuing the implementation of necessary regulatory changes that have been clearly indicated as a result of the TMI accident. In this context there follows a brief description of each of NRC's major programs:

Nuclear Reactor Regulation - The assurance of adequate safety and environmental protection for nuclear power plants will continue to be the primary objective of this office. Since the FY 1981 budget request was developed, NRC has been evaluating the recommendations of the various Three Mile Island (TMI) investigative groups and implementing the lessons learned. A comprehensive NRC task action plan is being developed for coordinated and phased implementation of TMI recommendations, including the prerequisites for resumption

of nuclear power plant licensing activities. It is likely that this action plan will require additional resources beyond those in the present FY 1981 request. Our highest priority continues to be in the area of operating plants, since they represent the more immediate and potential safety and environmental concerns as compared to reactors under construction or construction permit review. Major objectives associated with this activity are the efforts directed toward the elimination of the excess backlog of operating reactor actions (defined as more than ten unresolved licensing actions per reactor) by the end of FY 1984 and the completion of 21 of 22 generic tasks addressing the "Unresolved Safety Issues" identified in the 1978 NRC annual report by the end of FY 1981. This involves the continuation of NRR's program to improve the current licensing methodology and approach for amendment/actions and thereby minimizing the number to be reviewed by the staff. Also, NRR has established an interim organization specifically assigned to continue work on "Unresolved Safety Issues" in an effort to minimize the impact of the resource drain the TMI-2 accident has had. NRR will continue to apply increased efforts to improve the competency of nuclear power plant operators.

Standards Development - During FY 1981, the standards development effort will be directed at: developing detailed supporting standards to complement the broad performance requirements that are in place; developing new standards to reflect needs identified in the licensing and inspection and enforcement processes; and updating standards to reflect experience from plant operation, research results, feedback from users of standards, advances in technology and improved regulatory practices. Engineering standards will include work in the areas of qualification of equipment, inservice inspections and testing, decommissioning, transportation of radioactive materials in urban areas, and consumer and industrial products containing radioactive materials. Site and health standards work will include a major revision to reactor siting criteria, development of effective regulations for the licensing of high-level waste repositories and low-level waste burial facilities, issuance of guidance for maintaining radiation worker exposures as low as reasonably achievable, continuing review of the data base on biological effects of low-level radiation exposure, safeguards standards for physical protection and material control, and emergency planning. There will be a continuing review and assessment of NRC's positions in a number of regulations and guides as a result of the events at Three Mile Island. The Office of Standards Development will continue to coordinate the NRC involvement with the U.S. national standards program and to manage U.S. technical activities in the International Atomic Energy Agency's development of regulatory standards for nuclear power plant safety.

Inspection and Enforcement - In FY 1981, the Office of Inspection and Enforcement will continue to implement the Revised Inspection Program (initiated in FY 1978 and expanded significantly in FY

1980). Under this expanded program, sites with operating and preoperational reactors will have as many resident inspectors assigned as there are reactors in these phases, with a minimum of two residents at each such site. Resident inspector coverage at reactor construction sites will also be increased by the beginning of FY 1981 to include assignment of 24 residents to construction sites. At all reactor sites with resident inspectors, more direct observations of licensee work performance will be conducted. Also, region based inspectors will provide increased independent measurements such as environmental sampling, non-destructive testing, and verification of equipment calibrations at all reactor sites. Finally, the Revised Inspection Program will be expanded to include increased Program Appraisal inspections at fuel facilities, material licensees and vendors, and management appraisal inspections of licensees having reactors in construction, startup, and preoperational testing. New initiatives will be undertaken in the Fuel Facilities and Materials Safety program to allow inspection of new materials licensees within six months of license issuance; more frequent contact with low-risk materials licensees; and expanded radiation protection, radioactive waste processing and environmental monitoring capabilities. The Safeguards program will provide additional support to the timely implementation of the joint US/IAEA Safeguards Agreement. One lesson learned as a result of the TMI accident was that the NRC Incident Response Center facility is inadequate as a command post for dealing with events such as TMI. Accordingly, the NRC Incident Response Center will be improved to increase its capability for dealing with possible future nuclear accidents or safeguards threats.

Nuclear Material Safety and Safeguards - During FY 1981, the High-Level Waste Management Program will continue to work on fulfilling NRC's responsibilities pertaining to the national program of developing a high-level waste management capability by promulgating the final regulation, on the geological disposal of such waste (10 CFR 60) and providing detailed guidance to the Department of Energy on acceptable procedures to characterize and finally select a site in bedded or domed salt. In Low-Level Waste, work will continue on: (1) the development of a regulation for the disposal of low-level waste (10 CFR 61); (2) the licensing casework consisting of applications for new sites or amendments for existing licenses; and (3) requests from the Agreement States for assistance for their licensing activity. Uranium Recovery Licensing effort will increase as a result of additional assistance to Agreement States and requests for licensing actions to bring operating mills into compliance with EPA radiation standards. Fuel Cycle and Material Safety Licensing requirements will be broadened to include "as low as reasonably achievable" (ALARA) occupational exposure levels for radioisotopes licensees. Other new radioactivity limits and personnel exposure requirements such as the Clean Air Act will

broaden licensing requirements for fuel cycle plants and facilities. Work will continue on performing detailed accident assessments and developing radiological contingency plans for fuel cycle and materials plants and facilities. Radiological surveys of potentially contaminated former licensee sites will continue. Work will continue on the evaluation of regulations, procedures and measures of analysis with regard to severe accidents in the air, road, rail and water modes for the transportation of radioactive materials. Safeguards emphasis will concentrate on improving the timeliness, sensitivity and dependability of licensees' material control and accounting systems to detect the diversion of material. Licensees' physical security safeguards will be assessed to assure compliance with the upgrade requirements established in FY 1980. In FY 1980, NRC has consolidated within NMSS the reactor and fuel cycle safeguards licensing functions that had been divided between NRR and NMSS. This consolidation was based on an NRC review that considered the current and projected levels of safeguards activities and the maturity of the programs, and has enabled the NRC safeguards effort to be more efficiently managed under a centralized program and also allow a savings in resources.

Nuclear Regulatory Research - The FY 1981 research program for NRC will continue to be responsive to the issues raised or reemphasized by the Three Mile Island accident. Implementation of this program will be accomplished by both short-term additional effort and long-term reorientation primarily in the large Loss-of-Coolant Accidents (LOCA) and related programs to emphasize work on small LOCA and transients events. In connection with the Loss-of-Fluid-Test (LOFT) facility program, which NRC assumed full responsibility for funding in FY 1980, increased emphasis is being placed on small break LOCA's and operational transients which have been highlighted in the lessons learned from the TMI accident and recommended in the President's Commission Report. During FY 1981, research to improve reactor safety will be devoted primarily to critical studies to improve in-plant accident response and to evaluate alternate containment concepts and decay heat removal systems to support development of relevant safety requirements and criteria. In FY 1981 the risk assessment program will be expanded to evaluate accident sequences which may lead to severely damaged cores and to examine operating reactors using quantitative risk assessment methods to assess the integrated safety of overall reactors. This effort will also include analysis of equipment failure data, waste isolation studies and research to enable NRC to better define acceptable risk criteria. Research in primary system integrity, seismic and reactor environment areas will be conducted to provide rational bases for NRC decisions regarding the vulnerability of nuclear facilities to earthquakes, tornadoes, floods and other internal phenomena under normal or plant accident conditions. Further research will be carried out on the structural integrity of Light Water Reactors (LWR) primary system pressure boundary, including pressure vessels, piping and steam generators. NRC will increase its waste management research on a broad scale to

help provide timely regulatory guidance to potential licensees, and to furnish the technical bases for licensing, regulation and inspection of waste disposal sites. The advanced reactor safety research program (Fast Breeder Reactors and Advanced Converters) will be phased out by the end of FY 1981.

Program Technical Support - The organizations in this category (ACRS, Boards and Panels, Executive Legal Director, International and State Programs and the newly created Office for Analysis and Evaluation of Operational Data) directly support the safety and safeguard mission of the Commission. In FY 1981 increased efforts will be directed toward expanded safety review activity and improving the review and analysis of operational data received from NRC licensees as well as legal support to accommodate growth in the waste management program and in international export and safeguards matters. Within the Office of State Programs the major requirement continues to be the need to obtain rapid and thorough reviews of state emergency response plans. Discussions are currently underway between NRC and FEMA on the possible transfer of the emergency preparedness function. Based upon those discussions and final disposition, resources between the two agencies will be adjusted.

Program Direction and Administration - The offices under this category indirectly support the missions of the Commission and provide financial, administrative and logistic support. In FY 1981 NRC is requesting \$500,000 in program support in this area to initiate a pilot intervenor funding program to alleviate some of the financial burden of intervenors who otherwise would not be able to make constructive contributions to safety hearings. Additional resources are also directed toward expanding the Equal Employment Opportunity function, accommodating expanded legal workload within the Office of the General Counsel and increased contractual workload as a result of greater emphasis on competitive procurements.

Personnel Overview - The administration has agreed that 146 full-time temporary positions, provided to NRC over the past several years, should be converted to full-time permanent positions. This action, which is reflected in our FY 1981 request, recognizes that in the split of the Atomic Energy Commission, NRC was not treated equitably in terms of transfer of administrative and logistic support personnel, thereby severely impacting the agency's administrative support function. To provide the required support, we have used, with OMB's approval, temporary employees, some of whom have been with NRC since its inception. This situation has resulted in a gross inequity for these temporary employees, primarily women, who are not eligible for employee benefits. For comparability purposes, the FY 1979 and FY 1980 personnel levels shown in our request have been revised to reflect this change.

After adjusting for the conversion of full-time temporary personnel discussed above, the NRC is requesting an increase over FY 1980 of 150 positions, approximately half of which are for inspection and enforcement for a new ceiling of 3,390. This increase, addressed in detail in the individual program justifications, is required to handle increases in fuel facility caseload; to provide increased oversight in the areas of emergency planning, in-plant radiation protection and environmental monitoring; to permit increased effort on the inspection of licensees of industrial applications, medical facilities, and academic applications; to provide additional region based inspectors for reactor construction inspection; to provide support to an expanded Waste Management Program; to address safety issues raised as a result of the TMI incident; and to reflect increased workload in import/export licensing matters.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY COMMISSION - continued

Nuclear Reactor Regulation..... \$69,385

Summary of Nuclear Reactor Regulation Estimates by Function

	Actual FY 1979	Estimate FY 1980 ^{2/}	Estimate FY 1981
Personnel Compensation.....	\$20,615	\$24,348	\$27,230
Personnel Benefits.....	1,817	2,301	2,614
Program Support.....	17,057 ^{1/}	30,413	26,073
Administrative Support.....	9,237	15,850	12,238
Travel.....	1,053	1,305	1,230
Equipment.....	44	0	0
Total Obligations.....	\$49,823	\$74,217	\$69,385
Personnel.....	(605)	(722) ^{3/}	(722)

The Nuclear Reactor Regulation personnel requirements and program support funding requirements (primarily contractual support with DOE laboratories and private contractors), have been allocated to major programmatic functions as shown below. The narrative that follows provides justification in support of these requirements.

	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
Operating Reactors.....	\$ 4,332	175	\$ 8,873	229	\$ 9,770	252
Systematic Evaluation of Operating Reactors.....	1,265	32	1,300	32	950	32
Casework.....	4,856	211	11,185	170	6,888	182
Technical Projects.....	5,622	126	7,740	226	7,415	187
Advanced Reactors.....	982	9	1,315	5	1,050	8
Standards Assistance.....	0	11	0	11	0	13
Training and Correspondence.....	0	23	0	28	0	25
Management Direction.....	0	18	0	21	0	23
Totals.....	\$17,057	605	\$30,413	722	\$26,073	722

^{1/}Includes \$1,099,000 transferred to NMSS-Physical Security Safeguards.

^{2/}Includes \$1,179,000 for FY 1980 pay raise supplemental and \$16,290,000 for FY 1980 program support supplemental.

^{3/}Includes four positions temporarily assigned to the U.S. Army Corps of Engineers.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REACTOR REGULATION - continued

The Office of Nuclear Reactor Regulation (NRR) performs the safety, environmental, and antitrust reviews of nuclear reactors prior to licensing. This office is charged with the responsibility for reviewing applications for construction permits (CP's), operating licenses (OL's), changes to operating licenses for nuclear power plants, and the review and licensing of research and test reactors and other reactor designs. Organizationally, the licensing effort is divided among the office's four major divisions to: (1) review proposed changes in design and operation of operating reactors; (2) carry out the project management functions for safety reviews of CP and OL applications; (3) perform detailed safety reviews of reactor applications through the operating license stage; and (4) evaluate safety and environmental aspects of reactors and sites. Also, NRR has responsibility for the antitrust and indemnification aspects of nuclear facilities.

Specific objectives of the program are:

- Assure the safe operation of operating reactors.
- Assure that operating reactors are adequately protected against industrial sabotage.
- Assure that reactors are designed, constructed and operated to assure the protection of the public health and safety and the environment.
- Continue progress toward the goal of expedited reviews for standardized applications. This includes reviews of reference designs for standard application, reviews of applications utilizing previously approved standard designs, and reviews of replicate and duplicate plants.
- Conduct Early Site Reviews (ESR) to remove some or all site suitability issues from the critical path of CP reviews.

- Continue efforts to resolve generic technical issues in direct support of the licensing process. A number of generic tasks have been designated as "Unresolved Safety Issues" by the Commission. These generic tasks will receive priority in the NRC program.
- Conduct value/impact analyses to assure that the impact of each regulatory action is commensurate with the value in protecting the public and the environment.

To meet these objectives, NRR will continue to optimize its resources by internal reallocations. Additional personnel will be allocated to Operating Reactors and Technical Projects in order to reduce the unacceptable backlog of operating reactor amendment/licensing actions consistent with our goal of elimination of the excess backlog (i.e., more than ten unresolved licensing actions/plant) by the end of FY 1984; to implement needed changes to operator training and licensing and requalifications consistent with the recommendations of the Three Mile Island (TMI) accident investigations; to provide for the development, maintenance and revision of Standard Review Plans to address the increased depth and scope of staff technical review during licensing, as needed for implementation of the TMI short term lessons learned; and to reduce our dependence on vendor and licensee-submitted calculations consistent with attainment of a rapid response role in regulation, as recommended by the TMI investigations.

The necessary resources to implement the short term lessons learned from the TMI accident are detailed in the following program summaries.

Operating Reactors.....

FY 1979 = \$4,332
(175)

FY 1980 = \$8,873
(229)

FY 1981 = \$9,770
(252)

In FY 1981 NRR will give the highest priority in resource allocation to operating plants, since they represent the more immediate potential safety and environmental concerns as compared to reactors under construction or construction permit review. Continuing activities in this area included:

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REACTOR REGULATION - continued

- Assuring plants continue to operate safely by evaluation of operating experience, design information, inspection and enforcement findings, and taking necessary action in the form of licensing orders and changes in allowable operating conditions.
- Prevent unnecessary restrictions in plant operations by prompt review and modification of licensee requests for reactor fuel reload applications.
- Continue to review and evaluate operating reactor problems and events and resolve each issue in a manner consistent with continued safe plant operation.
- License "operators" and "senior operators" to assure facility personnel are adequately trained to safely operate a nuclear plant under all conditions. Renew operator licenses periodically after a verification of the individual's qualifications.

As a result of Three Mile Island investigations, a significant increase is being implemented in the scope of operator licensing exams and related supporting activities. The increases are as follows: (1) addition of simulator exams to cold and initial hot exams; (2) addition of simulator exams to power facility replacement exams; (3) auditing of requalification programs at half of the operating sites each year; and (4) auditing half of the vendor and utility operated training centers each year. We expect to administer about 135 operator licensing exams in FY 1980. In FY 1981 we anticipate completing 150 operator licensing exams.

- Continue to assure that operating experience is fed back into the licensing process including amending licenses, as necessary, to reflect the results of the TMI accident lessons learned.
- In FY 1981, NRR will continue its program to improve the current licensing methodology and approach for amendment/actions and thereby minimize the number of needed actions while increasing the efficiency of processing. Improvements to be considered include reduced technical specification requirements on reporting, administrative handling of certain actions, and use of dedicated personnel or routine action processing. Included in this program will be the effect of reduced technical

specification requirements on reporting, the use of the Office of Inspection and Enforcement for some routine requests and implemented standardized technical specifications for all older facilities.

By implementing program improvements, we expect to reduce the number of routine new actions from 15 per plant per year to 12 per plant per year by end of FY 1981. We also expect to cut the average manpower requirements per action for both staff- and contractor-processed actions by the end of FY 1981.

- As a result of the TMI accident, there will be a large increase in the operating reactors workload starting in FY 1980. This will be largely in the form of additional actions. Amendments/actions will be handled by a combination of staff effort and technical assistance from contractors. In FY 1981, about 1770 actions will be completed. This will reduce excess backlog to about 1560 actions by the end of FY 1981 and support the goal of reducing the excess backlog, including the large additional workload due to TMI, to zero by the end of FY 1984.
- With the transfer of most of NRR's Safeguards functions in this area to NMSS, a nominal effort is included in operating reactors efforts in FY 1980 and FY 1981 for safeguards-related transition and coordination efforts.

In addition to regular operating reactor efforts, nonroutine operating events require immediate attention. NRR is required to maintain a prompt response capability to review unexpected or unanticipated operating events to assure public safety. Resources for this effort are required to review and evaluate unanticipated operating reactor events and resolve each issue in a manner consistent with continued safe plant operation for the plant where the event occurs. Also, other similar facilities are evaluated to determine if they are affected. If safety margins are reduced, prompt action is taken to reestablish those margins.

The major objectives of the non-routine effort are:

- Evaluate unexpected safety and environmental problems at operating plants as they occur. Develop a regulatory position on each problem or event for the specific facility

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REACTOR REGULATION - continued

where the event occurred, and determine necessary action at all other operating reactors to assure that adequate margins of safety are maintained and identified deficiencies corrected.

- Factor lessons learned from each unexpected event back into the licensing process to assure that applications under licensing review (CP and OL) include consideration of this event and that necessary followup action is taken. Such action would then help to assure that such an event would not occur at a newly licensed plant. All facilities under licensing cognizance would be required to address this concern.

Review and analyze operational data associated with power reactors, including evaluation of licensee event reports, startup test data, and inspection reports. This effort will provide for improved tracking and documentation of operating experience, early identification of potential areas, improved and systematized review procedures, and efficient feedback of experience into the licensing process through the standardized technical specifications effort and liaison with the licensing groups.

Systematic Evaluation of Operating Reactors

Because of the recognized deficiencies in documentation of the acceptability of older licensed plants and the increasing amount of staff time being devoted to developing such documentation on an ad hoc basis, a plan and program have been developed for performing a systematic review of operating nuclear power facilities. This effort, designated the Systematic Evaluation Program (SEP), reviews operating power reactors with respect to current licensing criteria and documents the results and identifies the need for plant changes. The program was initiated in late FY 1977 and has been developed into the following phases:

- Phase I, the development of a list of topics to be used in performing the systematic evaluations, has been completed. Examples of topics include seismicity, missile protection, and reactor coolant boundary leak detection.
- Phase II, the actual evaluation of the 11 oldest facilities, has commenced and is scheduled for completion in FY 1982. This phase had been scheduled for completion in FY 1981, but slipped because resources had to be transferred to TMI-2 support activities.

There have been three major groups investigating the TMI-2 accident (Long Term Lessons Learned-NRR, the Special TMI Investigation Group-NRC, and the Presidential Investigative Group) in addition to the Congressional investigative groups. As these groups complete their investigations, it is anticipated that their recommendations will generate a significant number of operating license actions. Presently, it is not possible to accurately identify the number of actions that will result from the investigative groups. Therefore, a "planning wedge" is included to provide resources to complete a portion of the anticipated actions that will surface as the results of the investigative groups are completed. The contingency (\$3,700,000 in program support) will enable NRR to complete an additional 385 licensing actions in FY 1981. An additional major action that we plan to undertake is the implementation of emergency planning procedures for all operating and near term OL plants in accordance with the lessons learned from TMI. The details of these procedures are presently being developed as a part of the TMI-2 Action Plans.

FY 1979 = \$1,265
(32)

FY 1980 = \$1,300
(32)

FY 1981 = \$950
(32)

- Phase III, application of the SEP to the remaining operating facilities, will commence as Phase II is completed. Details of this phase are currently under development.

Regulatory Requirements Review Committee (RRRC) decisions which affect operating reactors will be implemented as part of the SEP.

The major objectives of this program are:

- The SEP will assess the safety adequacy of the design and operation of currently licensed nuclear power plants, and will provide the technical basis for the conversion of Provisional Operating Licenses to Full Term Operating Licenses.
- The program will establish documentation which shows how each operating plant reviewed compares with current criteria on significant safety issues, and will provide a rationale for acceptable departure from these criteria.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REACTOR REGULATION - continued

- The program will provide the capability to make integrated and balanced decisions with respect to any required backfitting.
- The program will incorporate procedures which assure early identification and resolution of any significant safety deficiencies.

The work is carried out primarily by a dedicated staff group in a separate organizational component and is supported by contractors in specialized disciplines as needed. This assures consistent interpretation of the regulations and continuous access to those knowledgeable of prior licensing criteria.

Casework.....

Casework is that effort associated with the safety, environmental, and antitrust application reviews of Construction Permit (CP), Operating License (OL), standard plant design, and early site applications. The CP covers the applicant's proposed site and preliminary design of a nuclear facility and also includes a detailed review of the site selection process, and the safety and environmental aspects of the proposed site. This review must be completed prior to the start of major construction. A limited work authorization (LWA) may be issued prior to issuance of a CP if all environmental and site suitability considerations are satisfied. The OL review involves the review of the final design of the plant. This phase starts approximately three years prior to the expected fuel load date. The standard plant design concept offers an opportunity for reactor designers and architect engineers to submit standard designs for review that can be referenced by future license applicants. Early Site Reviews (ESR) are conducted to evaluate the environmental and site suitability aspects of sites to be used in future CP applications. The issuance of approval from NRC following these standard plant and site reviews is an affirmation early in the licensing process that the designs and the sites identified by the applicants will provide the necessary assurance for adequate protection of the public health and safety while the sites satisfy the National Environmental Policy Act (NEPA) criteria for preserving the quality of the environment. Efforts are being directed to improve the licensing process by implementing new procedures aimed at increasing the efficiency and effectiveness of the staff in processing licensing applications. In addition, efforts are included in this unit to perform

Of 1500 review topics identified in Phase II, about 550 either were completed or a course of action determined at the end of FY 1979. An additional 700 were under review. All of the remaining topics will be completed by FY 1982 and Phase III will be implemented in FY 1982.

FY 1979 = \$4,856 (211)	FY 1980 = \$11,185 (170)	FY 1981 = \$6,888 (182)
----------------------------	-----------------------------	----------------------------

additional internal audits of the staff's review of licensing applications and to identify where further improvements can be made in implementing the standardization concepts of preliminary design approval (PDA) extensions, standard design approvals (SDA), and final design approvals (FDA).

The major objectives of the casework effort are:

- CP's - Continue to recommend appropriate actions regarding CP's for nuclear power plants after a satisfactory review of safety, environmental, and antitrust matters. Continue to work toward shorter average safety and environmental review schedules for new cases. Implement a number of recommendations contained in a staff study (NUREG-0292) directed toward development of early staff positions and issuances of safety evaluation reports (SER's) six months after docketing an application. New CP applications received in FY 1980 and beyond will have a target review schedule of 24 months from docketing to preliminary decision date by the Atomic Safety and Licensing Board (ASLB) on CP issuance. Continue to perform antitrust reviews on a schedule so that decisions resulting from these reviews are reached in a time frame consistent with the prospective decision date for safety and environmental matters affecting CP's.
- OL's - Continue to grant operating licenses for nuclear power plants after satisfactory review of the final design of the application to assure the facility can operate

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REACTOR REGULATION - continued

without endangering the public health and safety and in accordance with applicable environmental regulations. Continue to schedule OL reviews in a timely manner to assure the review process will not be a critical path item that would delay the reactor fuel load and startup testing.

- Continue to perform selected early site reviews (ESR) to remove some or all site suitability issues from the critical path of CP reviews. These reviews can decrease portions of the site/ environmental reviews when the applicant subsequently submits a CP application. Such early reviews can also accelerate the issuance of a Limited Work Authorization (LWA) which enables the applicant to start some construction prior to issuance of the CP.
- Standard Plant Designs - Continue to review and approve various standard plant designs that will provide impetus to the industry to utilize one of the various standardization concepts. This will increase the predictability of the acceptability of plant design from the licensing review standpoint. Pursue potential efficiencies of standardization in trying to achieve the goal of a shorter average CP safety review. The use of standard plant designs in concert with a previously approved site should result in significant savings in time and money to the nuclear industry with no adverse impact on overall safety.
- Continue to improve the stability and predictability of the licensing process by increased use of rulemaking and review of changing requirements by the Regulatory Requirements Review Committee (RRRC).
- Significant impacts of the Three Mile Island accident occur in the reviews of OL's, CP's and Standard Plants. The effort applied to casework is not to resolve the problems identified by TMI, but to implement the lessons learned into the actual reviews. This results in increased review scope and depth in certain of the review areas as listed below, for every licensing case.
 - Enhanced emergency planning activities,
 - Implementation of new and/or revised accident analysis requirements,

- New and/or expanded environmental qualification requirements for safety grade equipment within containment,
- Implementation of atmospheric transport models to forecast and hindcast release impacts,
- Pump and valve operability and reliability assurance,
- Revised criteria on hydrogen generation and requirements on hydrogen recombiners,
- New requirements for containment atmosphere sampling,
- Revised containment isolation criteria.

The following table summarizes new applications and planned licensing action completions in FY 1979 - FY 1981.

		FY 1979	FY 1980	FY 1981
CP	incoming	2	1	0
	under review	19	18	16
	completed	2	0	3
OL	incoming	4	16	7
	under review	37	53	52
	completed	0	8	9
Std Plant	incoming	1	0	3
	under review	10	10	9
	completed	0	4	4
ESR	incoming	2	1	0
	under review	6	7	2
	completed	0	5	2

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REACTOR REGULATION - continued

Technical Projects.....

FY 1979 = \$5,622
(126)

FY 1980 = \$7,740
(226)

FY 1981 = \$7,415
(187)

The Technical Projects effort encompasses several different types of technical activities necessary to directly support licensing activities. The types of activities included in this program are described below.

- a. Topical Report Reviews - NRR reviews reports submitted by industry organizations (usually reactor vendors or architect/engineers) on generic technical subjects. Efficiencies are derived by conducting these reviews independent of construction permit or operating license reviews. Generic technical positions result from these reviews that are then incorporated by reference in the staff's evaluation of individual license applications, and need not be further considered in individual case reviews; thus, both staff and applicant resources are utilized more effectively.
- b. Contract Management - This effort involves the selection of contractors and the review of the technical progress on NRR contracts for technical support on specific licensing applications and generic activities. NRR responsibilities include the technical direction of programs performed at DOE national labs, universities and private firms.
- c. Non-NRR Support - This effort includes direct technical assistance to other NRC offices (with the exception of the Office of Standards Development), principally the Office of Nuclear Material Safety and Safeguards, other Federal agencies, and support of international technical exchange programs.
- d. Research Coordination - This effort involves several NRR activities related to interfacing with the Office of Nuclear Regulatory Research (RES) including the development of NRR research needs to support licensing activities, participation in research review groups, reviewing contract proposals, assisting in contractor selection, and providing technical guidance for research contracts. In addition, manpower is budgeted to assure that research results are documented and introduced into the licensing decisionmaking process.
- e. Generic Issues - This effort involves the conduct of activities to develop technical positions on issues that relate to the safety, or environmental aspects of nuclear power plant design, construction, or operation. These tasks are conducted in direct support of licensing activities and are analyzed within the framework of NRR's generic issues program (described in a report submitted to Congress as NUREG-0410, "NRC Program for the Resolution

of Generic Issues Related to Nuclear Power Plants"). Seventeen issues in the NRC program have been identified as "Unresolved Safety Issues" by the Commission and their progress is discussed yearly in the NRC Annual Report as required by Section 210 of the Energy Reorganization Act of 1974, as amended. These generic tasks will receive priority in the NRC program.

The objectives of the Technical Projects effort are:

- Topical Report Reviews - To review industry submitted topical reports that are incorporated by reference in license applications by providing the basis for staff acceptance in particular review areas at a pace consistent with maintaining licensing schedules.
- Contract Management - To provide effective contract management to assure that the proper programs and contractors are selected, that the scope of work is being accomplished, and that the information needs are being met in the most efficient and effective manner.
- Non-NRR Support - To provide direct technical assistance to outside organizations (primarily to the Office of Nuclear Materials Safety and Safeguards to perform portions of their reviews of fuel cycle facilities, such as reviews in the earth sciences area for the high and low level waste disposal facilities) when the particular technical expertise is available only in NRR.
- Research Coordination - To maintain coordination with the Office of Nuclear Regulatory Research to assure that research efforts properly consider NRR's needs and that research results are factored into NRR licensing activities.
- Generic Issues - To resolve generic technical issues and thus provide added assurance of plant safety and improve the perception of the public that NRC is responsibly meeting its regulatory obligations. In addition, to provide the NRC staff with adequate calculational capabilities to perform independent analyses and to update the Standard Review Plan to enhance the discipline and efficiency of the review process.

NUCLEAR REACTOR REGULATION - continued

Substantial reprogramming of NRR manpower resources into operating reactors and casework was necessary in FY 1978 and FY 1979. In addition, substantial further reprogramming has taken place in the second half of FY 1979 to address the high priority efforts associated with the Three Mile Island accident. This reprogramming resulted in substantial manpower reductions in the Technical Projects area in FY 1978 and FY 1979. Further, several additional generic issues have been identified from the TMI lessons learned and are part of the workload starting in FY 1980. A number of "Unresolved Safety Issues" are likely to be identified as a result of further investigations of the Three Mile Island accident. Task Action Plans to address these issues will be developed as these issues are identified (probably in FY 1980). The expected accomplishments in this decision unit are as follows:

- Topical Report Reviews - In FY 1979, the NRR staff completed reviews of approximately 30 topical reports. However, about 30 topical reports have been submitted for review during this time frame and this rate of submission is expected to continue through FY 1983. Through increased allocations of resources plus increases in efficiency in review procedures, completion of 40 topical report reviews per year can be achieved beginning in FY 1981, thereby permitting NRR to reduce the backlog of unreviewed topical reports beginning in FY 1981.
- Contract Management - An information retrieval system has been established that summarizes the scope and anticipated use of the results from all recent Program Support contracts. A system has also been established for forwarding program briefs to provide guidance for the preparation of work statements by contractors. Due to resource limitations, technical direction of contracts has been maintained at the minimum level that is acceptable for assuring that the work is responsive to NRR needs.
- Non-NRR Support - NRR will continue to provide technical assistance as needed to State and Federal agencies and other NRC offices, particularly to NMSS in the areas of waste management and siting reviews for fuel cycle facilities and high and low level waste disposal sites, thereby increasing the effectiveness of resource utilization within NRC.

Research Coordination - Twenty-four research requests were transmitted to RES in FY 1978 and 26 have been transmitted in FY 1979. Research Information letters have been

received from RES, and NRR personnel have participated in the research review group meetings and RES program reviews. NRR personnel, in concert with RES and the Office of Management and Program Analysis, have established a system to track and document the products of the RES programs and their subsequent use in the licensing process. This system will continue to be used to increase the quality and efficiency of the licensing process in FY 1981.

Generic Issues - The NRC identified 17 "Unresolved Safety Issues" in the 1978 NRC Annual Report, which are addressed by 22 high priority generic tasks in the NRR generic issues program. By the end of FY 1980, 13 of these generic tasks are expected to be completed. Eight of the nine remaining generic tasks are expected to be completed in FY 1981. Nine new "Unresolved Safety Issues" are expected to be identified during FY 1980 and FY 1981. Generic tasks to address these new issues will be initiated as they are identified. In addition, special generic studies of low probability-high consequence accident scenarios such as core melt, hydrogen generation and behavior and steam explosion phenomena will be started.

Standard Review Plans - Significant revisions to the Standard Review Plans, delayed by the impact of the Three Mile Island accident, will be accomplished in FY 1980 and FY 1981.

Audit Calculations - Audit calculations were accomplished on a limited scale because of the unavailability of adequate resources for this purpose in FY 1979. The requested resources will permit this function to be carried out on a slightly larger scale in FY 1981.

Licensing Improvements - During FY 1979, the improved CP review procedures were implemented successfully on the Palo Verde 4 & 5 application with the completion of the safety evaluation report in six months. A major reassessment and revision of the standardization program was completed to increase its effectiveness. Development and implementation of improvements will continue, directed towards reducing the number of amendments and other actions for Operating Reactors.

As a result of the short-term TMI lessons learned, a number of issues have been identified for resolution. In FY 1980, NRR will begin the implementation of the lessons learned through a series of studies such as control room design with regard to human factors engineering, review of regulatory requirements for plant systems, emergency preparedness, hydrogen behavior, monitoring and control, and radiological consequence accident models.

(Dollar in Thousands, except whole dollars in narrative material)

NUCLEAR REACTOR REGULATION - continued

Advanced Reactors.....

FY 1979 = \$982
(9)

FY 1980 = \$1,315
(5)

FY 1981 = \$1,050
(8)

The Advanced Reactor effort involves the NRC's review and evaluation of proposed and operating reactors which utilize novel or developmental concepts (including DOE sponsored advanced reactor concept studies). Within this program, amendments/actions are processed relating to Fort St. Vrain, an operating High Temperature Gas Reactor (HTGR), and to review the safety analyses for and operating conditions of DOE-owned reactors such as the liquid metal cooled Fast Flux Test Facility (FFTF). As needed, criteria that have been developed for light water reactors are modified or new design criteria are developed to provide guidance in these reviews.

The major objectives of the Advanced Reactor effort are:

- Provide licensing review capability for NRC for advanced reactors in analyzing and evaluating characteristics and processes unique to these reactors.
- Provide adequate support to other Federal agencies for advanced reactor technologies that will exchange the long-range goals of the nation's energy needs.

- Monitor the operation of the Fort St. Vrain reactor (HTGR) and of the FFTF to assure protection of the health and safety of the public.
- Perform licensability studies in support of DOE alternate fuel cycle efforts (Nonproliferation Alternative System Assessment Program, (NASAP)).

The accomplishments in the Advanced Reactor area are:

- Completed three years of monitoring the safety of operation of Fort St. Vrain and one year of FFTF operation.
- Completed most of the NASAP Preliminary Safety and Environmental Information Document (PSEID) review and follow-on effort;
- Completed review of the modifications to the Brookhaven National Laboratory High Flux Beam Reactor;
- Completed review of some portions of the Gas Cooled Fast Reactor (GCFR) PSEID amendments and the HTGR preapplication.

Standards Assistance.....

FY 1979 = \$0
(11)

FY 1980 = \$0
(11)

FY 1981 = \$0
(13)

Regulatory Guides and standards describe and make publicly available methods acceptable to the NRC staff for implementing specific parts of the Commission's regulations and provide guidance for applicants concerning information needed by the staff in its review of applications for CP's and OL's. Internally, NRR participates in the preparation of NRC Regulatory Guides and standards. The NRR effort is mainly one of technical assistance to the Office of Standards Development to assure NRR's experience is factored into the standards development process. Externally, NRR staff members participate as

members of industry code committees providing staff technical input to the development of industry codes and standards.

The major objective of the Standards program is to provide NRR support needed for standards development consistent with resources allocated to assure that guides and standards that are developed can and will be utilized by NRR in the discharge of its regulatory responsibilities. This effort will enhance the stability and predictability of the licensing process through published Regulatory Guides, codes and standards.

Training and Correspondence.....

FY 1979 = \$0
(23)

FY 1980 = \$0
(28)

FY 1981 = \$0
(25)

Training - Resources are required to provide formal and informal training to the NRR staff to assure the staff remains knowledgeable in the technical fields associated with nuclear reactors. Also

included are the normal training requirements for the administrative and supervisory staff.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REACTOR REGULATION - continued

Correspondence - Resources are required to respond to Freedom of Information Act (FOIA) requests and to outside inquiries from the Administration, Congress, other Federal Agencies and the general public.

The major objectives of these programs are:

Training:

To assure employees are kept abreast of new technological developments, new NRC and Governmental regulations, new office requirements and policies, and to be responsive to GAO recommendations that the staff should receive more training so that their effectiveness is maximized.

- Maintain a high degree of professional competence within the staff by authorizing personnel to attend formal and informal training. This is especially necessary for the technical staff since many of the technical requirements and innovations in the technical fields require periodic updating.

Management Direction.....

The resources for this effort include the Director's Office and the Program Support staff. The Director provides overall management and guidance on major program objectives and goals. The Program Support staff provide technical assistance and support to the Director in evaluating proposed Office activities or positions and in the administration of highly technical and diversified licensing projects. This function is responsible for: the planning, coordination, direction and execution of the administrative affairs of the Office which includes resource management, the budget formulation and execution; the development, planning and implementation of programs to assess and improve the effectiveness and efficiency of the licensing process; the coordination of confirmatory research programs and the assessment of the effectiveness of such programs, and the development, planning and coordination and implementation of generic technical assessments of existing and proposed Office safety and environmental criteria and requirements.

Continue to provide necessary support to the Director and Divisions and develop more effective ways to carry out the mission of the office to achieve the following objectives:

Correspondence:

Respond in a timely manner to FOIA requests and inquiries from the Administration, Congress, and the general public.

The major accomplishments of these programs are:

Training - During FY 1979, NRR sent about 250 individuals to technical courses, and about 30 individuals to management, supervisory, administrative, and clerical courses.

Additionally, 173 individuals took part in the reactor systems and simulator courses conducted by the Office of Inspection and Enforcement. Courses of this nature provide the staff with "ON THE JOB" experience which enhances their capabilities as technical reviewers to increase their abilities to perform better analyses.

Correspondence - In addition to the large volume of routine correspondence processed during FY 1979, NRR responded to approximately 143 FOIA requests requiring 581 professional, technical and clerical staff hours.

FY 1979 = \$0
(18)

FY 1980 = \$0
(21)

FY 1981 = \$0
(23)

- Assure that operating reactors continue to operate in a safe and environmentally acceptable manner.
- Assure that the Systematic Evaluation Program progresses satisfactorily.
- Assure that appropriate safeguards requirements are implemented on reactors.
- Assure that casework reviews are thorough and carried out in an expeditious manner.
- Assure that the generic issue program is given proper policy direction and resources.
- Assure that research results are widely distributed within NRR and utilized in the licensing process.
- Assure that appropriate planning, coordination, and direction of the affairs of the Director's Office are carried out by the staff in a cost effective, expeditious and efficient manner.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY COMMISSION - continued

Standards Development \$16,390

Summary of Standards Development Estimates by Function

	Actual FY 1979	Estimate ^{2/} FY 1980	Estimate FY 1981
Personnel Compensation	\$ 4,655	\$ 5,723	\$ 6,070
Personnel Benefits	410	544	583
Program Support	6,673	7,012	7,150
Administrative Support	1,529	2,036	2,347
Travel	173	250	240
Equipment	0	0	0
Total Obligations	\$13,440	\$15,565	\$16,390
Personnel	(134) ^{1/}	(160)	(161)

The Standards Development personnel and program support funding requirements (primarily contractual support with DOE laboratories and private contractors) have been allocated to major programmatic functions as shown below. The narrative that follows provides justification in support of these requirements:

	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
Power Facility Standards.....	\$ 1,284	36	\$ 1,365	45	\$ 995	46
Fuel Facility and Materials Standards.....	773	34	1,555	42	1,350	40
Operation and Utilization Standards.....	2,130	37	1,785	42	2,805	46
Safeguards Standards.....	2,486	12	2,307	14	2,000	13
International Standards.....	0	4	0	5	0	4
Management Direction and Support.....	0	11 ^{1/}	0	12	0	12
Totals.....	\$6,673	134 ^{1/}	\$7,012	160	\$7,150	161

^{1/} Includes four full-time permanent positions actually filled by six part-time employees in an experimental part-time employment program with SD that was authorized by OMB.

^{2/} Includes \$277,000 for FY1980 pay raise supplemental and \$1,595,000 for FY1980 program supplemental.

STANDARDS DEVELOPMENT - continued

1. Introduction

The primary function of the Office of Standards Development (SD) is the development of standards, i.e., technical regulations and regulatory guides, that NRC needs to regulate nuclear facilities and commercial uses of nuclear materials.

Standards improve the effectiveness and efficiency of regulation by defining enforceable requirements and providing supplementary detailed guidance to achieve acceptable levels of safety, safeguards, and environmental protection; by addressing issues in a systematic way to ensure uniformity of consideration and review; and by using acceptable consensus-development processes to assure a broad technical review of engineering and regulatory practices proposed for standardization. Standards help NRC's efficiency by reducing uncertainties in the areas addressed, stabilizing requirements, improving predictability of the regulatory process, shortening review times for licensing decisions and providing bases for inspection.

The NRC's process for developing standards enhances openness and public confidence in the regulatory process by making the bases for regulatory requirements available for public scrutiny and providing for public participation in their development. Proposed NRC standards are issued initially for public comment. Comments received and staff experience are considered when revising and issuing a final standard.

The staff performs a value/impact analysis of each new and revised standard with respect to such questions as: What is the need for this standard? What alternative solutions exist for this particular safety, safeguards, or environmental problem? What will be the impact of the standard on safety, safeguards, or environmental protection? What will be the impact on NRC's workload, on other Government agencies, on industry, and on the public? This value/impact analysis is proving to be a valuable tool in improving safety, the quality of NRC standards, in establishing priorities, and in eliminating unnecessary regulatory requirements.

In addition to the work done directly by the NRC staff in developing standards, program support in the form of contractual expertise in

technical specialties is used where it would not be practical or efficient to recruit permanent NRC staff for short term, one-of-a-kind projects. (Half of SD's budget is for staff, half is for technical assistance.) Contractual program support is often used to analyze existing data to form a technical basis for the development or revision of a guide or regulation. It is also used to help prepare environmental impact statements for some rulemaking actions and, in some cases, to provide input to the staff analyses for regulations and guides.

Another function of the Office of Standards Development is to coordinate NRC participation in both national and international standards development activities. This involvement is providing direct benefits to NRC since about half of NRC's regulatory guides refer to or endorse national (consensus) standards. NRC technical staff members from all offices participate in standards development committees to provide a regulatory safety perspective to professional societies developing national standards and to encourage the development of standards that will enhance safety and be useful in the regulatory process. NRC's decision on how or whether to use a national standard in the regulatory program involves independent review by the staff and public comment on NRC's consideration of endorsing the national standard.

NRC participation in international standards development activities is principally associated with management of U.S. technical activities associated with the International Atomic Energy Agency (IAEA) development of internationally acceptable regulatory standards for nuclear power plant safety for use by developing nations. While the NRC manpower required for this activity is small, it is important because it enables us to assure that U.S. nuclear safety and other interests are appropriately considered in these standards.

The accident at the Three Mile Island power plant has required SD, along with the rest of NRC, to revise its ongoing program to take into account health and safety needs that became apparent at that time and during subsequent staff review of the event. This budget reflects only SD's initial response to the TMI accident and the short term recommendations of NRC's "Lessons Learned" task force.

2. Power Facility Standards.....

FY 1979 = \$1,284	FY 1980 = \$1,365	FY 1981 = \$995
(36)	(45)	(46)

Power facility standards are prepared to assist applicants for, or holders of, nuclear power plant licenses, and license reviewers in ensuring protection of the health and safety of the public, including workers, and of the environment. These standards establish the criteria for siting, design, construction, and decommissioning of nuclear power plants.

The overall objective is to codify and maintain the primary criteria and detailed engineering, siting and health standards. These standards are the cornerstone of the regulation of nuclear power facilities and are the bases against which license applications are reviewed.

STANDARDS DEVELOPMENT - continued

2. Power Facility Standards (continued)

NRC has already issued regulations that provide general design criteria, quality assurance criteria, and siting criteria for nuclear power facilities. Now its principal activity is to develop more detailed standards (principally by involvement with the national standards program and development of regulatory guides) that describe and make available to the public one or more methods acceptable to the staff for implementing these broad criteria (regulations). These detailed standards (guides) accelerate the licensing review and decision-making process by making clear to the applicant and to the public what the NRC staff expects of applicant/licensees with respect to site safety, environmental protection, safety engineering, and quality assurance for nuclear power facilities. In addition, the Office of Standards Development (SD) responds to petitions for rulemaking filed by the public on matters relating to the siting and safety of nuclear plants.

Major accomplishments anticipated during FY 1980 in the power facilities area include a rule to require that nuclear power licensees maintain an updated Final Safety Analysis Report (FSAR), a rule to specify fire protection requirements for all nuclear power plants, a guide specifying instruments to follow the course of an accident and design criteria for such instruments, a guide on design requirements for residual heat removal systems; draft guides on criteria for operator qualification including requirements for operator education, experience, and training; and assessment of the need to change NRC's regulations and guides to assure consistent treatment of fission product release resulting from fuel clad failure.

More than half of SD's effort in the Power Facility Standards area is being applied to maintenance of existing standards to assure that they are current. As part of the maintenance effort, steps are being taken to refine and clarify existing standards, and to make changes that will reduce the regulatory burden on the public where this can be done without sacrifice to safety.

Additional accomplishments expected in FY 1980 are the issuance of proposed rules relative to alternate site reviews and emergency

preparedness planning. Site safety standards in geology/seismology, and meteorology are being developed to codify licensing experiences, and in hydrology to maintain existing standards. SD also supported regional workshops with State and local government on proposed emergency planning rule changes and developed the bases for issuance of effective regulation amendments revising 10 CFR Part 50 emergency planning requirements.

During FY 1981, planned accomplishments include issuing new or updated standards in many areas covered by our present regulations and regulatory guides including design and fabrication of fluid system components and supports; design and construction of structures and containments; qualification for operability of electrical and mechanical equipment; design criteria for electrical systems; quality assurance (QA), including personnel selection, qualification and training, simulator design and use, handling of records, guidance on QA for specific aspects of nuclear power plant construction, and application of QA criteria to all structures, systems and components important to safety; reporting requirements for specific design and construction deficiencies; protection from natural and man-made hazards such as earthquakes, fires, and tornadoes; radwaste processes; decontamination and decommissioning of nuclear power plants; emergency core cooling systems (ECCS); and accident analysis, accident monitoring instrumentation, and shielding. Work will be completed on one Task Action Plan directed toward generic solution of the problem of flaw detection. Petitions for rulemaking will be dealt with as appropriate.

Additional accomplishments in FY 1981 will be the issuance of proposed changes to the emergency protection rule (Part 50 Appendix E) and associated guides and reports; a major revision of reactor site criteria (10 CFR Part 100), particularly relative to demographic requirements; and publication of NUREG reports in evaluation of reactor site selection procedures, early site review, alternate site review, and meteorology.

3. Fuel Facility and Materials Standards

FY 1979 = \$ 773	FY 1980 = \$1,555	FY 1981 = \$1,350
(34)	(42)	(40)

Fuel facility and materials standards are prepared to assist applicants for fuel cycle facility licenses and for licensees to possess source material, special nuclear material, and byproduct material. These standards also assist license reviewers to assure the basic

criteria are met to maintain the health and safety of the public and to protect the environment. Fuel facility standards establish the criteria for design, procurement, and construction of fuel cycle facilities, including facilities for the storage of spent fuel and

(Dollars in Thousands, except whole dollars in narrative material)

STANDARDS DEVELOPMENT - continued

3. Fuel Facility and Materials Standards (Continued)

storage of wastes. Materials licensing standards establish regulations, guides, and procedures for: (a) packaging, transporting, and storage in transit of all types of licensed materials; and (b) safety and environmental control in the design, manufacture, and distribution of industrial, medical, and consumer products that contain radioactive material.

Performance standards are still needed for some classes of industrial products and for uranium mills. Also needed are standards for waste management including facilities for away-from-reactor storage of spent fuel and standards for decommissioning activities at all types of nuclear facilities. NRC transportation regulations need continued coordination with the U.S. Department of Transportation and the International Atomic Energy Agency. In most of these areas, the primary standards in place are simply the basic rules for safety and environmental protection. The detailed standards needed are those which would cover matters such as controlling radioactive releases, nuclear material criticality controls, design of facilities for decommissioning, quality assurance, and training of personnel. For high-level waste management, EPA is promulgating generally applicable environmental radiation protection standards being developed for the licensing of geologic repositories.

In FY 1980, new or updated standards are anticipated to include an updated environmental impact statement on transportation of radioactive material to and from nuclear reactors, a final rule and environmental impact statement implementing present IAEA transportation standards in our regulations; guidance on licensing for manufacturing medical products and on qualification of paramedical personnel administering or using radioisotopes; and reports on decommissioning of uranium fuel fabrication plants and of facilities used for manufacturing products containing radioactive materials.

Additional accomplishments include: the publication of effective procedural regulations and proposed technical regulations for the licensing of high-level waste (HLW) repositories; the development of the supporting

Environmental Impact Statement (EIS) for the HLW technical regulations; development of a standard format and content for DOE's Site Characterization Report; development of the standard review plan for the review of the Site Characterization Report; development of proposed regulations for the licensing of low-level waste (LLW) disposal facilities; development of the supporting EIS for these LLW regulations and the holding of public meetings to obtain public input concerning the regulation of nuclear wastes.

In FY 1981, new or updated standards will be issued dealing with quality assurance, licensing guidance and packaging for transportation of radioactive materials; licensing for manufacturing medical devices; use of radioactive materials in consumer and industrial products; decommissioning of fuel cycle facilities; design of independent spent fuel storage installations; uranium solution mining; and uranium oxide fuel fabrication. Several petitions for rulemaking will be dealt with; the priority assigned to each will be consistent with the importance of the issue. We also plan to develop needed changes to international transportation standards and to study the shipping environments associated with various transportation modes.

Other planned accomplishments for FY 1981 include the issuance of effective rules, supporting guides, and technical positions for the licensing of high-level waste repositories and low-level waste burial facilities, continued effort on the implementation of the Clean Air Act; the issuance of a rule change specifying the environmental impact of the fuel cycle for National Environmental Policy Act (NEPA) review; publication of reports on fuel cycle site suitability and on standardized environmental impact of the fuel cycle for NEPA review; and on standardized environmental dose assessment.

4. Operation and Utilization Standards.....

FY 1979 = \$2,130 (37)	FY 1980 = \$1,785 (42)	FY 1981 = \$2,805 (46)
---------------------------	---------------------------	---------------------------

Operation and utilization standards are prepared to provide licensing conditions and regulatory guidance on health, safety, and environmental protection for operation of nuclear power plants and fuel cycle facilities and for utilization of nuclear materials by NRC licensees and the public. Operation standards establish criteria for startup, operation, testing, maintenance, repairs, modification, and decommissioning operations for nuclear reactors and fuel cycle facilities. Utilization standards establish criteria for the transportation, utilization and

ultimate disposal by industry and the public of industrial, medical, and consumer products that contain radioactive material.

The overall objective is to codify and maintain the primary and detailed standards against which the operation and decommissioning of reactors, fuel cycle facilities, and waste management facilities, the transportation, production, and use of licensed materials and products containing

STANDARDS DEVELOPMENT - continued

4. Operation and Utilization Standards (Continued)

licensed materials are reviewed and inspected to assure continued protection of the health and safety of the public, including workers, and environmental protection.

Accomplishments during FY 1980 in this area are anticipated to include: (1) for nuclear power plants, revised rules on pressure vessel material fracture toughness to reflect changes in the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code; revision of the rule on containment leakage testing to reflect actual experience with containment airlock leakage testing; several guides on initial startup and periodic testing programs, quality assurance for operations, and worker training in radiation protection; (2) a draft generic environmental impact statement and policy statement on decommissioning operating reactors and fuel cycle facilities; (3) for transportation, an environmental impact statement on transportation of radioactive materials in urban areas; (4) for radioactive products, guidance on medical applications, industrial uses, and laboratory testing and instrumentation measurements; (5) a policy statement concerning the protection of individuals who supply information to NRC; and (6) a review of NRC enforcement policy on licensee violations of safety in nuclear power plant operations due to human or procedural error. Criteria was also developed for the design of nuclear power plant simulators for use in operator training.

In addition during 1980, an epidemiology feasibility/planning study on low-level radiation effects will be completed and recommendations made to the Congress to assist in the planning for epidemiologic studies of low-level radiation effects. The findings of these efforts will be used to support the scientific basis for NRC health related regulatory activities. New regulations to further protect the radiation safety of patients will be issued to implement NRC's medical policy statement. New regulations are under development in the areas of occupational dose limits, survey instrument calibration, and performance testing of personnel dosimetry processors, bioassay laboratories, and survey instruments. SD responded to requests from the Office of Nuclear Reactor Regulation (NRR) and the Office of Inspection and Enforcement (IE) for assistance with occupational respiratory protection activities as recovery operations at Three Mile Island proceed.

In the radiation protection area, efforts in FY 1980 include cooperating with EPA on basic radiation policy guidance and participating in a joint hearing on standards to limit radiation exposures to workers.

It also includes coordination with EPA and other Federal agencies on implementation of the Clean Air Act and the Toxic Substances Control Act.

The development and maintenance of ALARA guidance for occupational exposures and other worker and environmental radiation protection standards for licensed nuclear facilities and activities will continue in FY 1981. The maintenance of effluent and environmental monitoring standards will also continue. Guidance to license applicants and licensees is planned in the areas of: radiation protection training, radiation personnel qualifications, techniques to minimize occupational exposure at medical institutions, bioassays, radiation protection surveys, instrument calibration, dosimeters with audible alarms, protection against neutron radiation, occupational radiation risks, and the use of respirators under both routine and emergency conditions. The review of the data base on biological effects of low-level radiation exposure, including reexamination and evaluation of epidemiology studies performed by others, will continue.

In FY 1981, other planned accomplishments include (1) for nuclear power plants, development of new and updated standards dealing with inservice inspection and preoperational and initial startup testing and periodic test programs; (2) a proposed rule on decommissioning operating reactors and fuel cycle facilities; (3) for transportation, guidance on emergency response to transportation accidents, and guidance on State and local initiatives in regulating the transportation of radioactive materials; (4) for material utilization, guidance on radioactive products; guidance on medical applications; and standards for industrial uses. Effort on regulations for protection of individuals supplying information to NRC will be confined to review of comments and related maintenance.

SD also plans to continue the development and maintenance of standards related to medical licensing, and radiological health (with emphasis on low-level radiation effects), and issuance of guidance on decommissioning of uranium mills.

5. Safeguards Standards.....

FY 1979 = \$2,486 (12) FY 1980 = \$2,307 (14) FY 1981 = \$2,000 (13)

The Safeguards Standards program is directed toward developing a body of regulations for licensee safeguards systems and supplementing these regulations with guides and technical reports to assist in their implementation.

Accomplishments in FY 1980 are anticipated to include the issuance of generic standards for: strengthened physical protection requirements for fuel cycle facilities; strengthened material control and accounting requirements; rules for personnel access controls at nuclear power plants; rules for reporting of safeguards events; issuance of a general license for carriers of irradiated reactor fuel; transportation requirements for Category II and III special nuclear material; an access authorization program for fuel cycle facilities; implementation of the US/IAEA Safeguards Agreement; a measurement quality assurance program; and maintenance of consistent, comprehensible and technically current

safeguards standards. In addition, there is substantial participation in national standards writing efforts to encourage the development of consensus standards for safeguards. A number of standards have been issued in this area and several are in progress with an anticipated FY 1980 publication date.

Planned Safeguards Standards development accomplishments in FY 1981 are to provide generic standards for: definition of protection and response requirements for alternative fuel cycle facilities; security system designs and operational procedures to implement the strengthened physical protection requirements published in FY 1980; issuance of an effective rule for upgraded material control and accounting systems; publication of the guidance documents needed to support the material control and accounting upgrade rule; continued work with national standards writing organizations; and maintenance of consistent, comprehensible and technically current safeguards standards.

6. International Standards.....

FY 1979 = \$0 (4) FY 1980 = \$0 (5) FY 1981 = \$0 (4)

The SD activities with the International Atomic Energy Agency (IAEA) provide U.S. input and solicit public comment on the IAEA development of internationally acceptable standards on reactor safety for use by developing nations embarking on a nuclear power program. These standards are intended to draw on the reactor safety and regulatory experience of industrial nations such as the United States, the Federal Republic of Germany, France, Japan, Great Britain, Canada, and the Soviet Union. SD is the focal point for U.S. participation in this program. Maximum use is made of public and industry participation in order to minimize NRC resource needs. NRC manpower for this activity is small from a budget standpoint, but it does include a significant involvement by key NRC staff.

In addition, NRC staff members have participated in Advisory Groups to the IAEA that prepared guidance for IAEA member states on (1) monitoring airborne and liquid effluents from nuclear facilities and (2) the principles and procedures for establishing limits for releases of radioactive materials into the environment, and has worked with IAEA

expert groups to develop safety standards for transport of radioactive materials.

A senior SD staff member participated, with State Department support, in preparation of updated United Nations Scientific Committee on the Effects of Atomic Radiation reports on the assessment of world-wide and regional radiological impacts and the risks from radiation and radioactive materials.

NRC staff members have participated on expert groups to: (1) assess the radiological impact of effluents from the nuclear fuel cycle; (2) develop a general standard related to consumer products; (3) develop a standard for radioluminous time pieces; and (4) develop a standard for ionization type smoke detectors.

The resources requested for FY 1981 are needed to continue to ensure that safety considerations and other U.S. interests are adequately considered in the IAEA development of internationally acceptable nuclear power plant safety standards for use by developing countries that are embarking on a nuclear power program.

7. Management Direction and Support.....

FY 1979 = \$0 (11) FY 1980 = \$0 (12) FY 1981 = \$0 (12)

This activity provides the central management and coordination of the overall Office of Standards Development. It also provides the central administrative support necessary to manage SD activities which includes support in preparation of the budget, contracts control, financial reports, personnel matters, facility and logistics administration, mail control, Freedom of Information Act requests, and other administrative matters.

(Dollars in thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY COMMISSION (Continued)

Inspection and Enforcement.....\$53,889

Summary of Inspection and Enforcement Estimates by Function

	Actual FY 1979	Estimate 1/ FY 1980	Estimate FY 1981
Personnel Compensation.....	\$20,731	\$24,681	\$29,640
Personnel Benefits.....	1,828	2,336	2,844
Program Support.....	3,876	5,660	6,691
Administrative Support.....	4,346	7,627	6,214
Travel.....	3,193	3,455	4,520
Equipment.....	379	1,237	3,980
Total Obligations.....	\$34,353	\$44,996	\$53,889
Personnel.....	(727)2/	(874)2/	(947)2/

The Inspection and Enforcement personnel requirements and program support funding requirements (primarily contractual support with DOE laboratories and private contractors) have been allocated to major program elements as shown below. The narrative that follows provides justification to support these requirements.

	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
Reactor Construction Program.....	\$ 146	149	\$ 540	153	\$ 605	183
Reactor Operations Program.....	415	196	615	327	600	327
Vendor and Contractor Program.....	0	26	180	29	0	32
Fuel Facilities and Materials Safety Program.....	1,387	152	1,590	153	2,165	184
Safeguards Program.....	925	90	1,000	90	1,166	93
Specialized Technical Training Program.....	346	17	790	25	1,268	25
Management Direction and Support.....	657	97	945	97	887	103
Total.....	\$2,376	727	\$5,660	874	\$6,691	947

1/ Includes \$1,193,000 for the FY 1980 pay raise supplemental and \$2,720,000 FY 1980 program supplemental.

2/ Includes two personnel in FY 1981 converted to full-time permanent with corresponding comparability adjustment in FY 1979 and FY 1980.

INSPECTION AND ENFORCEMENT (Continued)

The mission of the Office of Inspection and Enforcement is to insure through field inspection, investigation, and enforcement that facilities and materials under NRC jurisdiction are constructed, operated and used in a manner which protects the public and the environment. The functions of the Office are: to inspect, investigate, enforce, evaluate and inform.

The inspection, investigation, enforcement, evaluation and information activities are primarily concerned with: (1) reactor facilities - nuclear power plants (under construction, testing or in commercial operation), test reactors, and research reactors; (2) fuel facilities and nuclear materials licensees; and (3) vendors - nuclear steam system suppliers, nuclear architect/engineers and other major nuclear system components suppliers.

Activities performed by the Office include: (a) inspecting licensees and their contractors to ascertain compliance with Commission regulations, rules, orders and license provisions; (b) inspecting license applicants as a basis for recommending issuance or denial of an authorization, permit, or license; (c) inspecting suppliers of safety-related services, components, and equipment to determine if these suppliers have established systems to assure the quality of their services and products; (d) investigating incidents, accidents, allegations, and other unusual circumstances to ascertain the facts and to take or recommend appropriate action; (e) enforcing Commission regulations, rules, orders, and license provisions; (f) evaluating the results of inspections, investigations, inquiries and reports to determine the effectiveness of the Commission's programs and, where necessary, recommending corrective regulatory action; (g) evaluating information concerning incidents and accidents to assure adequacy of the overall response and to provide continued response by appropriate NRC staff; and (h) informing the Commission, other NRC offices, other government agencies, licensees, and the public through notices or reports of occurrences.

Inspection and Investigation

The NRC inspection program includes two components: routine (scheduled) inspection and reactive (unscheduled) inspection/investigation. Both are based on the premise that during the conduct of regulated activities the licensee is responsible for complying with NRC requirements for safeguarding nuclear facilities and materials and protecting both the environment and the health and safety of the public. The NRC inspection program is designed to provide assurance that the licensee is properly discharging these responsibilities.

The routine component is a carefully constructed program of inspection performed on a continuing basis to evaluate the licensee's activities within the context of his ultimate responsibility for public protection. The thrust of this effort is to critically examine, by systematic selection, licensee controls designed to prevent conditions that might threaten

the public and/or the environment. To insure uniformity of inspection, this program is documented by written guidance, which provides a consistent path for assurance of licensee performance and problem identification and generally involves three basic types of inspection activity:

Reviewing the licensee's basic systems and procedures to be certain they conform with requirements, are technically sound and are properly implemented.

Analyzing the licensee's records of operation and interviewing licensee personnel to confirm that actions called for by the prescribed systems and procedures are routinely followed.

Directly verifying licensee and system performance by means of direct observation and independent measurement.

The reactive component is the response or "reaction" to some influence outside the above described program. The reactive component often consists of an in-depth investigation in response to an event or allegation which may arise from routine inspections, required licensee contractor or vendor reports, or allegations made by licensee employees, members of the public, and/or public interest groups. The objective of the NRC's reactive program is to establish the facts, determine the significance of the particular condition, and take appropriate corrective action.

Enforcement

The enforcement program is aimed at achieving public safety by (a) assuring operation within requirements, (b) correcting areas of noncompliance or poor practice and (c) deterring further noncompliance. The enforcement program includes a clearly delineated and evenly applied series of deterrents that escalate according to the nature of the offense and the past history of licensee performance. Sanctions available to the NRC include Notices of Violation, Civil Monetary Penalties, Orders to Cease and Desist, and Orders to Suspend, Modify, or Revoke Licenses. Enforcement actions are taken to insure compliance with NRC rules, regulations, orders, and license provisions.

To strengthen the enforcement process, the NRC has requested increased civil penalty authority from Congress and approval is expected. This request proposes substantial civil penalties of up to \$100,000 for each safety violation (including licensee's failure to submit required reports of safety related information) with no upper limit on combined violations. Furthermore, the NRC is revising its enforcement policy and criteria including identification of the types of safety violations that require escalated enforcement.

INSPECTION AND ENFORCEMENT (Continued)

Revised Inspection Program

In FY 1978, the Commission initiated a modified approach for inspecting nuclear reactors and major fuel plants designed to improve the effectiveness of the IE inspection program. This Revised Inspection Program has three components: the Resident Inspector Program, increased direct verification, and the Performance Appraisal Team.

- The original Resident Inspector Program plan called for one resident inspector at each power reactor operating site, one resident at selected late stage construction sites and one resident at each of two major fuel facilities. The plan was to achieve this coverage by phasing in resident assignments over a four year period ending in FY 1981. It was decided to expand the program after the Three Mile Island accident and Congress appropriated an additional 146 positions (98 inspectors and 48 support) and about \$4.5 million for FY 1980. With these additional resources, more resident inspectors will now be assigned to reactor sites having one or more units in pre-operation, startup, or operation. Reactor sites with either one or two of these units will have two resident inspectors, whereas all sites having three or more units will have residents equal to number of units at these sites. In all cases, each site will continue to have a senior resident inspector with the balance of the residents being less experienced personnel whose primary focus will be direct observation of plant operations and safety equipment operability. In addition to expanding the program, IE is also accelerating the assignment of resident inspectors and expects to have all operating sites fully staffed with residents by the end of FY 1980.

For reactor construction sites, the original plan called for the assignment of fifteen (15) resident inspectors at construction sites by the end of FY 1980 and twenty (20) by the end of FY 1981. That plan has now been accelerated so that IE will have twenty (20) residents assigned to construction sites by the end of FY 1980. Furthermore, it has been expanded to include the assignment of four (4) additional residents at problem construction sites to bring the FY 1980 total of construction resident inspectors assigned to twenty-four (24).

In the safeguards area, the current plan calls for keeping one resident at each of two major fuel facilities.

Throughout the implementation period of the expanded/accelerated program, IE will maintain a balanced program that will increase the number of resident inspectors and concurrently maintain the region based inspection effort. A sufficient number of region based inspectors must and will be maintained to provide necessary level of specialized technical support.

The Revised Program also increases the degree of emphasis placed on direct verification of licensee activities, primarily at reactor sites. This is achieved by expanding both direct observation and independent measurement activities. Direct observation consists of an NRC inspector observing either work-in-progress, licensee measurements, or that work has been properly completed. Independent measurements are technical measurements, equipment calibrations, and environmental sample analyses performed either by IE inspectors, contractors, DOE laboratories or state personnel.

Increased direct observation will be achieved through the assignment of additional resident inspectors. While region-based inspectors will continue to provide a minimal amount of direct observation, resident inspectors will spend a great deal of their time observing licensee activities. In fact, the additional residents assigned in FY 1980 will spend virtually all their time directly observing plant operations and checking safety equipment operability.

Independent measurements will also be expanded at both operating reactor and construction sites. At operating sites independent measurements will be conducted by:

- using NRC environmental monitoring vans,
- obtaining contractor laboratory analyses of environmental samples,
- and expanding the use of state contracts for the analysis of environmental samples, as well as in the deployment and retrieval of radiation measuring devices at these sites.

At construction sites, independent measurements will be expanded in the area of both destructive and non-destructive testing of contractor work products. Non-destructive examinations will be performed by NRC inspectors, normally at the site, whereas destructive examinations will be performed in contractor laboratories.

It is believed that by increasing the amount of direct verification at reactor sites a direct positive effect on how the licensee conducts his activities will result and thus improve the safety of reactor facilities.

A more detailed discussion of initiatives being undertaken to expand direct observation and independent measurements is outlined below in each of the related program areas.

Finally the Revised Inspection Program includes a centralized Performance Appraisal Team that will evaluate licensees from a

(Dollars in Thousands, except whole dollars in narrative material)

INSPECTION AND ENFORCEMENT (Continued)

national perspective, evaluate the effectiveness of the IE inspection program, and confirm inspector objectivity. During FY 1981 this Team will be expanding its activities to include program appraisal inspections at fuel facilities, materials licensees and vendors and management appraisal inspections of licensees having reactors in construction, startup, or pre-operational testing.

In evaluating the performance of licensees, IE will seek to identify those qualities that determine better performance thus enabling IE to better allocate its inspection work force and to make available to industry the qualities that lead to better performance.

Specific program descriptions are provided below for each of the seven program elements.

Reactor Construction Program.....	FY 1979 = \$146 (149)	FY 1980 = \$540 (153)	FY 1981 = \$605 (183)
-----------------------------------	--------------------------	--------------------------	--------------------------

NRC rules and regulations require licensees to construct nuclear reactors in such a manner that when they become operational they will pose no threat to the public and the environment. The resources reflected in this Program are required to: (a) adequately inspect, enforce, and evaluate the construction of nuclear power plants thereby assuring the public that licensees are fulfilling this aspect of their responsibilities; and (b) carry out the functions of a national Performance Appraisal Team focusing on licensee performance, inspection program effectiveness, and inspector objectivity.

The reactor construction inspection program consists of conducting both routine inspections (scheduled) and reactive (unscheduled) inspections/investigations. The routine component consists of a series of preplanned audit type inspections designed to assure that licensees have the required controls in place to prevent adverse situations from occurring. It is comprised of multidisciplinary inspections conducted on a schedule consistent with the licensee's construction activities plus inspections of reactors that have progressed beyond the construction phase. For these reactors, the inspections are conducted during baseline and in-service examinations as well as during periods of major modification. The reactive component consists of both inspections and investigations conducted in response to events and conditions that generally emanate from either licensee reported events, allegations of licensee noncompliance, or generic problems.

Nuclear reactors inspected are those in the stage prior to receiving a construction permit but authorized to proceed with construction work under a limited work authorization (LWA), those in early construction (first two years), mid-construction (third and fourth years), late construction (fifth and sixth years), and those in pre-operational testing as well as those with operating licenses.

Reactor construction inspections are performed by both region-based and resident inspectors. Construction residents assume a small portion of the inspection activity previously conducted by region based inspectors and provide a substantial increase in direct verification of licensee performance through direct observation and independent measurements. The region based support consists of in-depth, specialized technical inspections.

The Performance Appraisal Team provides the capability to assess regulatory performance of nuclear power plant licensees on a national basis. It also provides the NRC with a capability to obtain additional assurance of inspection program consistency and inspector objectivity.

The reactor construction enforcement program consists of a clearly delineated series of deterrents that escalate according to the severity of the noncompliance(s) found and the past history of licensee performance. Enforcement actions are taken both to correct situations and to assure future compliance with NRC regulations and license provisions.

The reactor construction evaluation program consists of reviews of licensee performance, inspection and enforcement experience, and data relating to the licensee's compliance with NRC rules and regulations, to improve both licensee performance and regulatory effectiveness.

Activities include developing and administering inspection programs and policies, conducting inspections; investigating incidents, accidents, allegations and unusual circumstances; enforcing NRC orders, rules, regulations and license provisions; recommending changes in licenses and standards; evaluating licensee performance nationally; and notifying licensees of generic problems. This Program includes all field resources applied to construction and Performance Appraisal inspections/investigations -- inspectors, branch and section chiefs, direct clerical support personnel and technical equipment funds. It also includes headquarters personnel in the Reactor Construction Inspection Division and Program Support funds dedicated to this program.

(Dollars in Thousands, except whole dollars in narrative material)

INSPECTION AND ENFORCEMENT (Continued)

The workload of nuclear reactor units inspected is displayed below:

Phase	Workload Volume		
	FY 1979 ^{1/}	FY 1980 ^{2/}	FY 1981 ^{2/}
Pre-construction Permit Units	16	5.50	7.50
Early Stage Units	19	25.50	21.00
Mid Stage Units	30	28.00	20.50
Late Stage Units	21	22.75	25.50
Pre-operation Test Units	12	15.50	15.75
Units with Operating Licenses	75	86.75	100.00

^{1/}Workload for FY 1979 reflects plant status as of the end of the fiscal year.

^{2/}Workload for these fiscal years is determined on a quarterly basis to incorporate any phase changes that are projected within each year. For example, a reactor unit projected to be in the pre-operation test phase in the first quarter is counted as .25 units against that phase with the remaining .75 counted against reactor units with an OL. This method of workload identification makes manpower planning more precise.

A critical element of IE's Revised Inspection Program is and will continue to be to increase direct observation and independent measurement of construction work as it is being performed at the site. A major portion of this increased effort will be achieved through the assignment of resident inspectors. FY 1979 resident assignments and the plan for FY 1980 and FY 1981 are as follows:

Reactor Operations Program.....

NRC rules and regulations require licensees to operate their facilities and use nuclear material in a safe manner. The resources reflected in this Program are required to adequately inspect, enforce, and evaluate the operational safety of nuclear reactors thereby assuring the public that licensees are fulfilling this aspect of their responsibilities.

The reactor operations inspection program consists of conducting both routine (scheduled) and reactive (unscheduled) inspections/investigations. The routine component consists of a series of pre-planned, audit type inspections designed to assure that licensees have the required controls in place to prevent adverse situations from occurring. The reactive component consists of both inspections and investigations conducted in response to events and conditions that generally emanate from either licensee reported events, allegations of licensee noncompliance, or generic problems.

Nuclear reactors inspected are: power reactors in pre-operational testing, startup testing, and commercial power operation and non-power reactors.

Construction residents assigned by EOY -

	FY 1979	FY 1980	FY 1981
	10	24	24

In addition to region based and resident inspections, licensee problems/corrective actions and performance will be routinely evaluated. Other activities such as improved field feedback to Headquarters, licensee performance evaluation from a national perspective, and evaluation of inspection program implementation will be accomplished. Program Support and technical equipment funds will be used to conduct additional independent measurements such as: ultrasonic testing of welds and joints; radiography analysis; testing of environmentally sensitive equipment; chemical, metallurgical and physical tests of concrete, steel, and safety related piping; composition, strength, and fracture toughness of materials used in construction; sensitization tests of stainless steel material samples to determine if they are susceptible to intergranular attacks; and weld metal tests for typical lots and heats of welding materials. The increases in this funding area are primarily due to increases in the scope of ongoing projects. An additional thirty (30) positions are requested for FY 1981. Twenty (20) will be used to adequately conduct the resident inspection program and support the increase in reactive inspection/investigation effort required since the Three Mile Island accident. Ten (10) positions will be used to expand the Performance Appraisal Team (PAT) to include program appraisal inspections at fuel facilities, material licensees, and vendors and management appraisal inspections of licensees having reactors in construction, startup, or pre-operational testing.

FY 1979 = \$415	FY 1980 = \$615	FY 1981 = \$600
(196)	(327)	(327)

Reactor operational safety inspections are being performed by both region based and resident inspectors. Resident inspectors not only assume a portion of the inspection activity previously conducted by region-based inspectors, but also provide increased verification of licensee performance through direct observation. The region based support consists of in-depth, specialized technical inspections.

The operational inspections performed at power reactors are "phase" oriented. During the pre-operational and startup testing phases, inspection emphasis is placed on test management, procedures and results. Licensee tests are witnessed, test results are independently evaluated and licensee evaluations of test results are reviewed. During the commercial power operation phase, the inspection program focuses on: reviews of basic systems and procedures that licensees follow to be

(Dollars in thousands, except whole dollars in narrative material)

INSPECTION AND ENFORCEMENT (Continued)

certain that they conform with requirements and are technically sound and properly implemented; analyses of records of licensee operations and interviews of licensee personnel to confirm that prescribed procedures are routinely followed; periodic verifications of licensee and system performance by means of direct NRC observations; and examinations of licensee review and audit committee actions, changes to the quality assurance program and personnel/organization changes.

Efforts to improve both licensee performance and regulatory effectiveness through the reactor operations enforcement program consist of a clearly delineated series of deterrents that escalate according to the severity of the noncompliance(s) found and the past history of licensee performance. Enforcement actions are taken both to correct situations and to encourage future compliance with NRC regulations and license provisions.

The reactor operations evaluation program consists of reviews of licensee performance, licensee event reports, inspection and enforcement experience, and data relating to the licensee's compliance with NRC rules and regulations to improve both licensee performance and regulatory effectiveness.

Activities include developing and administering inspection programs and policies; conducting inspections; investigating incidents, accidents, allegations and unusual circumstances; enforcing NRC orders, rules, regulations and license provisions; recommending changes in licenses and standards; evaluating licensee performance nationally; and notifying licensees of generic problems. This Program includes all field resources applied to reactor operational safety inspections/investigations -- inspectors, branch and section chiefs, direct clerical support personnel and technical equipment funds. It also includes headquarters personnel in the Reactor Operations Inspection Division and Program Support funds dedicated to this program.

The workload of nuclear reactor units inspected is displayed below:

Phase	FY 1979 ^{1/}	FY 1980 ^{2/}	FY 1981 ^{2/}
Pre-operation Test Units	12	15.50	15.75
Startup Units	4	6.25	9.25
Operating Units	71	80.50	90.75
Non-power reactor Units	86	84.00	84.00

^{1/}Workload for FY 1979 reflects plant status as of the end of the fiscal year.

^{2/}Workload for these fiscal years is determined on a quarterly basis to

Vendors & Contractors

NRC rules and regulations require licensees to construct nuclear power plants in such a manner that when they become operational they will pose no threat to the public and the environment. The resources reflected in

incorporate any phase changes that are projected within each year. For example, a reactor unit projected to be in the pre-operation test phase in the first quarter is counted as .25 units against that phase with the remaining .75 counted against reactor units with an OL. This method of workload identification makes manpower planning more precise.

A critical element of IE's Revised Inspection Program is and will continue to be to increase direct observation of licensee plant operations at each nuclear reactor unit. The majority of this increased effort will be accomplished through the assignment of additional resident inspectors who will provide added inspection coverage in seven main areas:

- (1) Engineered Safety Feature Observation and Independent Assessment
- (2) Surveillance Test Observation
- (3) Technical Specification and Operating Parameter Check
- (4) Maintenance Overview
- (5) Jumper and Bypass Control
- (6) Operating Procedure Adherence
- (7) Startup and Pre-operational Testing

By conducting these types of inspection activities, it is believed that the assurance of safety equipment operability will be significantly improved.

FY 1979 resident assignments and the plan for FY 1980 and FY 1981 are as follows:

	FY 1979	FY 1980	FY 1981
Operations residents assigned by EOY -	28	135	149

In addition to the region based and resident inspections described above, Program Support funding in FY 1980 is being directed toward a determination of the direct verification roles of the resident inspector and a revision of the reactor operations inspection program with more emphasis on direct observation. These projects will be completed in FY 1980 and the results incorporated into the inspection modules in FY 1981. Also, in FY 1981, an evaluation of accident response procedures for nuclear power plant operation will be completed and a checklist for identification of accident response procedural deficiencies for use by IE inspectors will be issued.

FY 1979 = \$0	FY 1980 = \$180	FY 1981 = \$0
(26)	(29)	(32)

this Program are required to adequately inspect certain licensee vendors and contractors to assure that they maintain adequate controls to produce nuclear products and services of sufficient quality to assure public health and safety.

(Dollars in Thousands, except whole dollars in narrative material)

INSPECTION AND ENFORCEMENT (Continued)

This aspect of NRC's inspection program is known as the Licensee Contractor and Vendor Inspection Program (LCVIP). This program was established in FY 1974 because a significant number of problems at licensee facilities were traced to faulty work by contractors and vendors utilized by the licensee in facility design, construction and testing. Inspectors review documented procedures, interview personnel, and examine both designs and hardware to determine if adequate quality control procedures have been prepared and are being followed. Licensees remain responsible for product acceptance.

The LCVIP consists of conducting both routine inspections (scheduled) and reactive (unscheduled) inspections/investigations. The routine component consists of a series of preplanned audit type inspections to assure that licensees have the required controls in place to assure quality products and services. The reactive component consists of both inspections and investigations conducted in response to events and conditions that generally emanate either from licensee reported events, allegations of licensee noncompliance, or generic problems. NRC presently conducts a minimal program of inspection of vendors architect engineers and nuclear steam system suppliers. Approximately 250 inspections are conducted annually by NRC inspectors. Emphasis is placed on allocating inspection resources in response to feedback on licensee problems with added emphasis placed on the inspections of architect engineers and nuclear steam system suppliers.

In FY 1977, NRC initiated a two-year trial program with the American Society of Mechanical Engineers (ASME) to test the use of third-party inspection systems as a means of supplementing the LCVIP. Adoption of the third-party inspection systems would expand and strengthen NRC inspection of mechanical component manufacturers with only limited additional NRC resources. The ASME trial program was not concluded in FY 1979 as initially anticipated but will be continued until program acceptance is deemed appropriate. Anticipating ultimate success, this program will be established on a routine basis and serve as a model for exploring the possible use of other third-party inspection systems.

Fuel Facilities & Materials Safety Program

NRC rules and regulations require licensees to operate their facilities and use nuclear materials in a safe manner. The programs and resources reflected in this Program are required to adequately inspect, enforce, and evaluate the use of nuclear materials at fuel cycle facilities, materials licensees, and nuclear reactors, thereby assuring the public that licensees are fulfilling this aspect of their responsibilities.

The Fuel Facilities and Materials Safety inspection program consists of conducting two types of inspections; (1) safety inspections at fuel facilities and materials licensees and (2) reactor health physics

Activities include developing and administering inspection programs and policies; conducting inspections; investigating incidents, accidents, allegations and unusual circumstances; enforcing NRC orders, rules, regulations and license provisions; recommending changes in licenses and standards; evaluating licensee performance nationally; and notifying licensees of generic problems. This Program includes all field resources directly applied to the inspection of licensee contractor and vendor activities that are not conducted at the construction site -- inspectors, branch and section chiefs and direct clerical support personnel. It also includes a small portion of the Reactor Construction Inspection Division responsible for policy and program development, implementation and evaluation of the LCVIP.

The workload of NRC licensee vendors and contractors inspected is displayed below:

	FY 1979	FY 1980	FY 1981
Nuclear Steam Suppliers and			
Architect Engineers	15	15	15
Fuel Suppliers	5	5	5
Component Suppliers	135	150	175

The NRC relies heavily on the LCVIP program to attest to the quality of safety related components manufactured offsite. Approximately 50% of the safety related equipment problems that are reported can be attributed to vendor activities. Utility licensees have not proven effective in dealing with many generic problems primarily because they do not have the broad perspective needed to recognize and deal with these issues. Recent events indicate that many component failures are oriented toward early design and not fabrication. Consequently, three additional positions are needed in FY 1981 to increase the scope and depth of the inspection program at Architect Engineers and Nuclear Steam System Suppliers and to conduct inspections focusing on increased technical reviews during the design and specification development stage.

FY 1979 = \$1,367
(152)

FY 1980 = \$1,590
(153)

FY 1981 = \$2,165
(184)

inspections which examine licensee's radiation/environmental protection, environmental monitoring, and radwaste processing and control programs. The routine component consists of a series of pre-planned audit type inspections designed to assure that licensees have the required controls in place to prevent adverse situations from occurring. The reactive component consists of both inspections and investigations conducted in response to events and conditions that generally emanate either from licensee-reported events, noncompliance findings, allegations of licensee noncompliance, unsafe operations, and generic problems.

(Dollars in Thousands, except whole dollars in narrative material)

INSPECTION AND ENFORCEMENT (Continued)

Fuel facilities inspected are: uranium mills; uranium hexafluoride facilities; fuel processing and fabrication (uranium and plutonium) facilities; spent fuel reprocessing facilities; short-term fuel storage facilities; and facilities for storage and disposal of high level radioactive wastes. The inspection program for fuel facilities presently requires, in frequency of inspection, four inspections per year of reprocessing, plutonium processing and fuel fabrication plants; three inspections per year of uranium processing and fuel fabrication plants; and one inspection each year of uranium hexafluoride conversion plants, uranium mills, reactor fuel storage sites, R&D facilities, and decommissioned facilities.

Materials licensees are those authorized by the NRC to possess and use byproduct, source and special nuclear materials in radiography, medical, academic, and industrial applications as well as to operate low-level nuclear waste disposal facilities. Inspection frequency and depth for these licensees are based on risk potential. The highest risk category, priority 1 (about 25 licensees), is inspected twice per year; priority 2 (about 350 licensees) is inspected once per year; priority 3 (about 200 licensees), is inspected every two years; priority 4 (about 3500 licensees), every three years; priority 5 (about 100 licensees), every five years; priority 6 (about 1200 licensees), every 10 years. The remaining licensees (about 3500) in the lowest frequency grouping priority 7 are not routinely inspected but 5% are inspected on a sample basis each year.

Nuclear reactors inspected are power reactors in pre-operational testing, startup testing, and in commercial power operation, as well as non-power test and research reactors. Annual reactor health physics inspections are conducted to assure that licensees have adequate radiation protection, emergency planning, radioactive waste management, and environmental monitoring programs. All power reactor facilities receive the same level of routine inspection, whereas the effort for non-power and research reactors varies by type, based on risk potential.

The enforcement program consists of a clearly defined, evenly applied series of deterrents that escalate according to the severity of inspection findings and the past history of licensee performance. Enforcement actions are taken both to correct situations that require immediate action and to assure future compliance with NRC requirements. The ability of the NRC to take these actions to enforce its rules and regulations is an incentive for licensees to perform in a safe manner.

The evaluation program consists of reviews of licensee performance, inspection and enforcement experience, and data relating to the licensee's compliance with NRC rules and regulations, to improve both licensee performance and regulatory effectiveness.

Activities include developing and administering inspection programs and policies; conducting inspections; investigating incidents, accidents,

allegations and unusual circumstances; enforcing NRC orders, rules, regulations and license provisions; recommending changes in licenses and standards; evaluating licensee performance nationally; and notifying licensees of generic problems. This Program includes all field resources applied to fuel facilities and materials safety inspections/investigations -- inspectors, branch and section chiefs, direct clerical support personnel, and technical equipment funds. It also includes headquarters personnel in the Fuel Facilities and Materials Safety Inspection Division and Program Support funds dedicated to this program.

The workload of fuel facilities, materials licensees and reactors inspected is displayed below:

Facilities	FY 1979	FY 1980	FY 1981
Fuel Reprocessing	3	2	2
Plutonium Processing	6	6	6
Uranium Processing	18	17	17
UF-6 Processing	2	2	2
Uranium Mills	18	35	47
R&D Facilities	5	7	7
Fuel Storage Facilities	2	2	2
Decommissioned Facilities	1	2	2

Materials Licensees

Manufacturing & Distribution	23	23	24
Medical	3,002	2,998	3,081
Academic	808	808	831
Industrial	1,817	1,821	1,872
Radiography	367	367	377
Waste Disposal	11	11	11
Other	2,847	2,922	3,004

Reactors^{1/,2/}

Pre-op Test Units	12	15.50	15.75
Startup Units	4	6.25	9.25
Operating Units	71	80.50	90.75
Non-Power Units	86	84.00	84.00

^{1/}Workload for FY 1979 reflects plant status as of the end of the fiscal year.

^{2/}Workload for FY 1980 and FY 1981 is determined on a quarterly basis to incorporate any phase changes that are projected within each year. For example, a reactor unit projected to be in the pre-operation test phase in the first quarter is counted as .25 units against that phase with the remaining .75 counted against reactor units with an OI. This method of workload identification makes manpower planning more precise.

An additional thirty-one (31) positions are needed in FY 1981. Eight (8) positions will be used to support caseload growth and six (6) for anticipated increases in work from Three Mile Island Lessons Learned and increased reactive inspections/investigations. Six (6) more positions will be used to conduct a mail/telephone program with low inspection priority materials licensees to increase the frequency of NRC contact with these low risk licensees. Six (6) additional positions will be used to inspect all new materials licensees within six months of license issuance. Five (5) more positions will be used to expand IE Headquarters expertise in emergency planning, radiation protection, radwaste processing, and environmental protection.

Program Support funds will be used in the following areas:

Safeguards Program

NRC rules and regulations require licensees to control and account for certain types of special nuclear materials; to protect nuclear materials, reactor facilities and fuel facilities against theft, sabotage, or unauthorized entry; and to ensure that special nuclear material and irradiated fuel are transported safely. The resources reflected in this Program are required to adequately inspect, enforce, and evaluate the safeguarding of nuclear facilities and materials thereby assuring the public that licensees are fulfilling this aspect of their responsibilities.

The Safeguards inspection program consists of conducting two types of inspections: (1) material accountability inspections designed to assure that the licensees are adequately controlling and accounting for special nuclear material; and (2) physical security inspections designed to assure that licensees are adequately protecting facilities and shipments and their contents against theft, diversion and sabotage. Both types of inspections can be routine (scheduled) or reactive (unscheduled). The routine component consists of a series of pre-planned audit type inspections designed to assure that licensees have the required controls in place to permit adverse situations from occurring. The reactive component consists of both inspections and investigations conducted in response to events and conditions that generally emanate either from licensee-reported events, noncompliance findings, allegations of licensee noncompliance or unsafe operations and generic problems.

Facilities inspected include: power reactors in the pre-operational test phase, power reactors with operating licenses, non-power reactors (test and research), spent fuel storage facilities, certain materials licensees,

- Continue the support of aerial radiological surveys of reactor and fuel facility sites.
- Increase the support of State contracts and the on and offsite radiation measurement program.
- Continue the support of the Measurement Assurance Program.
- Continue to maintain and calibrate region based environmental monitoring vans.
- Increase the use of contractor laboratories to support expanded independent measurements of licensee activities.

Technical equipment funds will be used to maintain and upgrade region based equipment.

FY 1979 = \$925	FY 1980 = \$1,000	FY 1981 = \$1,166
(90)	(90)	(93)

licensees who transport special nuclear material both within and outside the United States and licensees who transport irradiated reactor fuel.

The enforcement program consists of a clearly defined, evenly applied series of deterrents that escalate according to the severity of inspection findings and the past history of licensee performance. Enforcement actions are taken both to correct situations that require immediate action and to assure future compliance with NRC requirements. The ability of the NRC to take these actions to enforce its rules and regulations is an incentive for licensees to perform in a manner both safe and consistent with public interest, thereby assuring public safety.

The evaluation program consists of reviews of licensee performance, inspection and enforcement experience, and data relating to the licensee's compliance with NRC rules and regulations to improve both licensee performance and regulatory effectiveness.

Activities include developing and administering inspection programs and policies; conducting inspections; investigating incidents, accidents, allegations and unusual circumstances, enforcing NRC orders, rules regulations and license provisions; recommending changes in licenses and standards; evaluating licensee safeguards performance nationally; and notifying licensees of generic problems. This Program includes all field resources applied to safeguards inspections/investigations -- inspectors, branch and section chiefs, direct clerical support personnel, and technical equipment funds. It also includes headquarters personnel in the Safeguards Inspection Division and program support funds dedicated to this program.

(Dollars in Thousands, except whole dollars in narrative material)

INSPECTION AND ENFORCEMENT (Continued)

The workload of the Safeguards Inspection program is displayed below.

	FY 1979 ^{1/}	FY 1980 ^{2/}	FY 1981 ^{2/}
Pre-Operational Test Reactors	12	15.50	15.75
Reactors with Operating Licenses	75	86.75	100.00
Non-power Reactors	71	70	70
High Enriched Uranium Fuel Facilities	14	14	14
Low Enriched Uranium Fuel Facilities	5	5	5
Materials and Spent Fuel Storage Facilities	14	17	17
Shipments	70	240	241

^{1/}Workload for FY 1979 reflects plant status as of the end of the fiscal year.

^{2/}Workload for these fiscal years is determined on a quarterly basis to incorporate any phase changes that are projected within each year. For example, a reactor unit projected to be in the pre-operation test phase in the first quarter is counted as .25 units against the phase with the remaining .75 counted against reactor units with an OL. This method of workload identification makes manpower planning more precise.

Program Support funding will be principally directed toward independent measurement of licensee special nuclear material measurements by the New Brunswick Laboratory. Additional Program Support funding is needed to continue the effort begun in FY 1980 to upgrade inspection strategies and methodology.

Technical equipment funds will be used to provide spare and replacement parts for the regional laboratories and for new portable equipment. Three (3) additional positions are requested in FY 1981 for the preparation of an inspection program and appropriate facility attachments associated with the joint US/IAEA agreement.

Specialized Technical Training Program..... FY 1979 = \$346 (17) FY 1980 = \$790 (25) FY 1981 = \$1,268 (25)

Newly hired and existing inspector personnel, as well as other NRC personnel, must be sufficiently knowledgeable of the facilities, processes, and activities within their technical purview. Most personnel, hired to be future inspectors, do not possess all the technical and regulatory qualifications required to properly perform their duties and existing personnel must be kept abreast of current industry state-of-the-art. Therefore, training must be provided to assure that necessary levels of knowledge are developed and maintained. This Program contains the resources required to administer and conduct specialized training - e.g., instructor and support personnel plus program support funds for developing and conducting courses under contract.

Specialized technical training provides IE personnel with performance

skills training in the classroom by NRC instructors; technology and codes courses developed and taught by contractors specifically for NRC personnel, technical training by NRC instructors at Tennessee Valley Authority simulator facilities which enable NRC personnel to obtain "hands on" experience; programmed self-study training and "off-the-shelf" type courses related to various aspects of the development and implementation of the NRC inspection and enforcement program.

Program Support funding is for the development and conduct of selected specialized technical courses. The FY 1981 increase of \$478,000 is used to provide technology and code courses for new NRC resident inspectors recruited in FY 1980 against the expanded program. No additional positions are needed in FY 1981.

Management Direction & Support..... FY 1979 = \$657 (97) FY 1980 = \$945 (97) FY 1981 = \$887 (103)

The resources reflected in this Program provide support to IE's other functions. Management direction and support is provided in NRC headquarters by the Office of the Director, the Executive Officer for Management and Analysis, and the Executive Officer for Operations Support. In the regions, management direction and support is provided by the offices of the Regional Directors and the regional administrative staffs. Program Support funds included in this Program are for information system

studies, management studies, incident response capability analysis, and effectiveness measurement studies.

The regional administrative support personnel included in this Program are for secretarial support for regional office management personnel, clerical support for personnel assigned to regional offices from other NRC offices, receptionists in each region, and management information coordination.

(Dollars in Thousands, except whole dollars in narrative material)

INSPECTION AND ENFORCEMENT (Continued)

The Administrative Support funds for regional offices are for: rent and utilities; telephone and non-telephone communications; purchase lease, and maintenance of office equipment; general office equipment; general office supplies and materials; space alterations; and health services.

The Director of I&E is responsible for overall program management. The two headquarters Executive Officers provide necessary technical and administrative services. They:

- Develop policy for and assist in investigations, incident response, event reporting and enforcement actions.
- Provide technical liaison with NRC's Office of Research and with other agencies (e.g., EPA, DOT)
- Respond to Freedom of Information Act (FOIA) requests
- Maintain and distribute the IE Inspection Manual
- Provide centralized headquarters administrative support (e.g., file room, mail distribution, word processing)

- Plan, budget, evaluate and control resource utilization
- Administer contracts
- Operate an office-wide management information system
- Operate the NRC Operations Center for incident response
- Conduct studies on alternative policies and programs

The Offices of the Regional Directors are responsible for executing the inspection and enforcement programs and for managing assigned resources. The Regional Directors also serve as the NRC's senior official in their respective geographical areas.

In FY 1981, six (6) additional positions are needed to staff the NRC Operations Center on a permanent, 24 hour/day, 7 day/week basis. Program Support funding is primarily directed toward the conduct of studies of alternative policies and programs and toward the support of ongoing management information systems. Technical equipment funds (\$3,000,000) are needed to implement the results of a FY 1980 System Engineering/Architecture Study on modifications needed to improve the NRC Operations Center response capability during emergencies.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY COMMISSION - continued

Nuclear Material Safety and Safeguards.....\$43,680

Summary of Nuclear Material Safety and Safeguards Estimates by Function

	Actual FY 1979	Estimate FY 1980 1/	Estimate FY 1981
Personnel Compensation.....	\$ 8,282	\$10,006	\$11,430
Personnel Benefits.....	730	944	1,097
Program Support.....	15,787	14,865	21,745
Administrative Support.....	4,081	5,482	8,778
Travel.....	352	494	630
Equipment.....	0	0	0
TOTAL OBLIGATIONS	\$29,232	\$31,791	\$43,680
Personnel.....	(263)	(313)	(335)

The Nuclear Material Safety and Safeguards personnel requirements and program support funding requirements (primarily contractual support with DOE laboratories and private contractors), have been allocated to major programmatic functions as shown below. The narrative that follows provides justification in support of these requirements.

	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
Fuel Cycle and Material Safety.....	\$ 2,890	90	\$ 2,199	106	\$ 4,250	108
Safeguards.....	3,080	90	1,800	98	2,510	96
Waste Management.....	9,817	67	10,706	90	14,885	112
Management Direction and Support.....	0	16	160	19	100	19
Total.....	\$15,787	263	\$14,965	313	\$21,745	335

1/ Includes \$479,000 for the FY 1980 pay raise supplemental and \$2,610,000 FY 1980 program supplemental.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

The Energy Reorganization Act of 1974 as amended, established the Office of Nuclear Material Safety and Safeguards (NMSS). The Act charges the Director of NMSS to perform two principal functions: a) license and regulate all facilities and materials associated with the processing, transport and handling of nuclear materials, including provisions for maintenance of safeguards against threats, thefts, and sabotage; and b) review safety and safeguards of all such facilities and materials, including: monitoring, testing and upgrading internal accounting systems for nuclear materials;

developing contingency plans for dealing with threats, thefts, and sabotage; and recommending research.

To carry out these responsibilities and other statutory requirements, NMSS has established and manages three major programs: Fuel Cycle and Material Safety, Safeguards, and Waste Management. These programs are managed and supported by the Management Direction and Support Program. Each major program consists of program elements.

Summary of Fuel Cycle and Material Safety Program

Program Elements	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
Fuel Cycle Licensing.....	\$ 2,164	39	\$ 1,754	45	\$ 3,595	44
Transportation Certification.....	509	12	195	15	305	18
Radioisotopes Licensing.....	217	39	250	46	350	46
Total	\$ 2,890	90	\$ 2,199	106	\$ 4,250	108
Fuel Cycle Licensing.....	FY 1979 = \$2,164 (39)		FY 1980 = \$1,754 (45)		FY 1981 = \$3,595 (44)	

The goals are to license fuel cycle plants and improve the effectiveness and efficiency of the licensing process. This includes: performing safety and environmental reviews on new, existing, and formerly licensed facilities and former AEC contractor sites to ensure the health and safety of the public; revising guidance used in fuel cycle facility licensing actions and implementing requirements resulting from new rules and standards; formulating and coordinating standards and confirmatory research requirements for resolving fuel cycle problems; and developing radiological contingency plans for coping with accidents and incidents.

The major objectives are to: 1) perform safety and environmental evaluations required for licensing decisions for fuel cycle plants and facilities; 2) perform studies in support of rulemaking proceedings and other required Commission activities, to resolve generic and specific fuel cycle problems; 3) survey former licensee sites, unlicensed burial grounds and burial grounds at selected licensed plants that may have potentially undesirable health, safety, or environmental impacts, and evaluate proposed remedial actions and related environmental assessments; 4) review DOE proposed remedial actions for former AEC industrial contractor sites and evaluate the proposed plans; 5) develop, with other NRC organizations, regulations for new environmental radioactivity limits and personnel exposure requirements, and implement the new limits and requirements through the licensing process, as a continuing program; 6) refine the technological base to

support and improve the efficiency and effectiveness of the licensing process; and 7) develop radiological contingency plans for coping with accidents and incidents at licensed fuel cycle plants, and coordinate these plans within NRC with other affected Federal, State, and local agencies, and with licensees.

The significant accomplishments for FY 1979 were to: 1) complete 24 major and 95 minor fuel cycle licensing actions within established review times, progress will be made toward resolution of long-term casework projects to be completed beyond FY 1980, and complete two of the natural phenomena reviews for Advanced Fuel Processing Plants, initiated in FY 1977; 2) contribute to the NRC Report to Congress on Alternative Fuel Cycles and provide limited reviews of broad nuclear fuel cycle environmental studies and statements; 3) complete the review of docket files of former licensees who possessed source or special nuclear materials, and begin the review of docket files of former byproduct licensees; 4) begin the review of proposed remedial actions for one former AEC site (Cannonsburg, PA); 5) complete Division participation on revised rule implementing most of EPA's environmental radiation protection standards for nuclear power operations; 6) formulate and coordinate requirements for confirmatory research and standards in support of fuel cycle licensing, review value-impact analyses and respond to information requests; and 7) initiate the development of radiological contingency plans.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

The significant accomplishments planned during FY 1980 are to: 1) complete 23 major and 95 minor licensing actions for uranium fuel cycle plants and facilities and complete the remainder of the natural phenomena reviews for Advanced Fuel Processing Plants, initiated in FY 1977; 2) publish a radon rule and a draft update of the Environmental Survey of the Uranium Fuel Cycle, continue to contribute to the NRC Report to Congress on Alternative Fuel Cycles, and continue limited reviews of former nuclear fuel cycle environmental studies; 3) continue the review of former byproduct licensees and begin radiological surveys of sites which may contain radioactive contamination; 4) begin the review of proposed actions for additional sites identified in the DOE Remedial Action; 5) participate in an NRC Task Force to develop implementing regulations for the Clean Air Act; 6) continue to formulate and coordinate requirements for confirmatory research and standards, review value-in analyses, and respond to information requests; and 7) continue the development of radiological contingency plans.

Transportation Certification.....

The goal is to perform safety reviews for package designs and operations for shipment of radioactive materials in quantities exceeding certain limits, as specified in 10 CFR Part 71; to review package licensing procedures and the standards which packages must meet; to develop, maintain, and improve package analysis methods to assure quality and timely reviews; and to develop radiological contingency plans.

The major objectives are to: 1) conduct safety reviews of major package (e.g., spent fuel cask, plutonium package, high-level waste, etc.) designs within one year and of other designs within four months, reduce the forecast backlog of applications, and maintain a registry of package users; 2) provide technical expertise on a continuing basis for structural, thermal, criticality, and shielding analysis for licensing requests; review licensee quality assurance programs; maintain and improve standardized analysis methods on a continuing basis; and evaluate the safety effectiveness of regulations, procedures and methods of analysis with regard to severe accidents in the various transportation modes; and 3) develop radiological contingency plans for coping with transportation accidents and incidents.

The significant accomplishments for FY 1979 were to: 1) complete 64 safety reviews; 2) maintain and improve heat transfer, shielding, and criticality codes; and 3) initiate the development of radiological contingency plans.

The significant accomplishments planned during FY 1981 are to: 1) complete 24 major and 95 minor licensing actions for uranium fuel cycle plants and facilities; 2) complete the Uranium Fuel Cycle Survey and S-3 Table update of 10 CFR 51 to be used in reactor licensing, and continue reviews of broad nuclear fuel cycle studies and statements; 3) complete the review of former byproduct licensees; 4) survey former licensee sites and burial grounds and evaluate proposed remedial actions; 5) review of five DOE proposed remedial actions; 6) develop new environmental radioactivity limits and personnel exposure requirements and implement them through the licensing process; 7) continue to formulate and coordinate standards and regulatory research requirements for fuel cycle licensing, assess research results and implement them into the licensing process, begin review of Parts 40 and 70 of 10 CFR, review value-impact analyses, and respond to information requests; and 8) continue the development of radiological contingency plans.

The increase in program support is mainly to support safety studies of the NFS high-level waste systems at West Valley, New York

FY 1979 = \$509
(12)

FY 1980 = \$195
(15)

FY 1981 = \$305
(18)

The significant accomplishments planned for FY 1980 are to: 1) complete 50 safety reviews; 2) continue to maintain and improve heat transfer, shielding, and criticality codes; 3) continue the development of radiological contingency plans.

The significant accomplishments planned for FY 1981 are to: 1) complete 56 reviews of the estimated 84 cases awaiting action, and reduce the caseload backlog; 2) maintain criticality, shielding, and heat transfer programs and data base on a continuing basis; provide technical input and develop policy decisions for the Office of Nuclear Regulatory Research to conduct the Modal Study; evaluate the results of the Modal Study; and develop appropriate action plans for possible rulemaking; and 3) continue the development of radiological contingency plans.

The increase in manpower is for increased work on package certification and for support of the Modal Study. The increase in funding is for the ongoing program to develop and maintain standardized methods of analysis.

(Dollars in thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

Radioisotopes Licensing.....	FY 1979 = \$217 (39)	FY 1980 = \$250 (46)	FY 1981 = \$350 (46)
------------------------------	-------------------------	-------------------------	-------------------------

The goal is to assure protection of public health and safety by preventing excessive radiation exposure through a system of licensing for the possession, use, transfer, and disposal of radioactive material (byproduct, source, and special nuclear material).

The major objectives are to: 1) perform safety evaluations required for materials licensing so that licensing decisions will be completed on all cases within an average time of 30 to 45 days, and evaluate 200 sealed sources and devices per year on a continuing basis; 2) provide technical assistance and training as requested by Agreement States; 3) review and update existing radioisotope licensing guides, regulations, and standards on a continuing basis and develop new ones relative to current safety needs; 4) conduct generic studies to improve the licensing process; 5) conduct post-licensing evaluations on a continuing basis (approximately 70 per year) to confirm the validity of licensing actions; 6) conduct the existing licensing regionalization program in NRC Region II; 7) complete and maintain a licensing information program to supplement the license application guides with instructional materials, quarterly bulletins, and regional seminars; 8) develop and maintain standard license review plans; and 9) develop radiological contingency plans for coping with accidents and incidents at major materials licensees.

The significant accomplishments for FY 1979 were to: 1) process 5,150 licensing applications with an average turnaround time of 35-50 days for license amendments and new applications, and 120 days for a license renewal, and evaluate 100 sealed sources and devices; 2) continue to furnish technical assistance to Agreement States; 3) develop and publish three new licensing guides and seven amendments to regulations; 4) initiate studies to reexamine how operations at radiopharmaceutical facilities can be carried out to maintain occupational exposures and effluent releases at as low as reasonably achievable (ALARA) level, improve the evaluation of sealed sources and devices, and develop NRC policy on consumer products; 5) conduct approximately 47 post-licensing evaluations to confirm the validity of licensing actions; 6) continue the evaluation of the pilot licensing regionalization program; and 7) initiate the development of radiological contingency plans.

The significant accomplishments planned during FY 1980 are to: 1) process 5,600 licensing applications, reduce the turnaround time to 30 to 45 days, and evaluate 200 sealed sources and devices; 2) continue to provide assistance and training to Agreement States; 3) continue review and revision of current licensing guides and develop the most urgently needed new guides; 4) complete studies to reexamine the application of ALARA for occupational exposures and effluent releases at radiopharmaceutical manufacturers and to improve methods for evaluating and licensing sealed sources and devices, and continue the study to develop NRC policy on consumer products containing radioactive material; 5) conduct approximately 70 post-licensing evaluations; 6) complete evaluation of the pilot regionalization program; 7) initiate an information program for licensees concerning licensing requirements and the licensing process; and 8) continue the development of radiological contingency plans.

The significant accomplishments planned for FY 1981 are to: 1) review all new, renewal, and amendment applications and issue licenses within 30 to 45 days, and evaluate 200 sealed sources and devices; 2) continue to provide assistance and training to Agreement States; 3) develop new licensing guides; 4) initiate a study of general licenses and the development of techniques for radioisotopes accountability, and complete the study to develop NRC policy for exempt consumer products; 5) conduct approximately 70 post-licensing evaluations; 6) conduct the licensing regionalization program in NRC Region I; 7) complete development of a licensing information program; 8) develop standard license review plans; and 9) continue the development of radiological contingency plans.

The increase in funding is to initiate and maintain a licensing information program to supplement the license application guides and to initiate a study to evaluate and certify sealed sources and devices.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

Summary of Safeguards Program

PROGRAM ELEMENTS	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
Material Control and Accounting.....	1,133	44	1,035	38	735	44
Physical Security.....	1,947	46	765	60	1,775	52
Total.....	3,080	90	1,800	98	2,510	96
Material Control and Accounting.....	FY 1979 = \$1,133 (44)		FY 1980 = \$1,035 (38)		FY 1981 = \$735 (44)	

The goal is to assure the protection of the public health and safety and promote the common defense and security through the development, implementation, and maintenance of effective MC&A programs at licensed fuel cycle facilities and support international safeguards and nonproliferation objectives through participation with other U.S. agencies in programs to strengthen international safeguards.

The major objectives are to: 1) perform timely licensing casework reviews. This includes the review and approval of licensee MC&A plan submittals, revisions to existing plans and the institution of remedial licensing actions based on the results of inspection and evaluation activities; 2) perform MC&A reviews of export/import license applications, timely implementation and maintenance of the provisions of the US/IAEA Safeguards Agreement and development and implementation of programs to strengthen IAEA safeguards, support international safeguards and contribute to the achievement of U.S. nonproliferation objectives; 3) perform reviews, adequacy assessments, and analysis of accounting data for existing MC&A programs at licensed facilities to form the basis of remedial licensing actions and the refinement of regulatory requirements which improve the licensing process; 4) formulate NMSS safeguards research requirements, plan and manage research projects, insure user-utility of results, direct contract activities, maintain NRC integrated safeguards program plan, and perform interagency planning in order to anticipate MC&A requirements, and 5) develop improved regulations, value impact statements, and associated guidance documents.

The significant accomplishments for FY 1979 were to: 1) complete the review of 15 measurement control plans; 6 other major MC&A plan changes, 75 minor plan revisions and major licensing actions were completed at 3 facilities; 2) review approximately 200 export/import applications. Provided analysis which prompted a Commission decision requiring substantive MC&A export licensing reviews. Plan and initiate implementation of US/IAEA Safeguards Agreement. Contribute to the development of U.S. action plan for strengthening international safeguards. Initiate analysis of IAEA technical objectives and provide consultation to IAEA and foreign countries in support of nonproliferation goals; 3) evaluate MC&A programs at 11 facilities. Develop procedures for tracking foreign origin material and facility reporting of IAEA data. Formulate the development of an integrated

safeguards information system; 4) provide user planning and management of the MC&A research program. Generate approximately 4 new MC&A regulatory research requirements. Develop methodology to assist field assessors. Perform 1 user suitability test. Direct 25 agencywide MC&A research and technical assistance project reviews. Publish the integrated safeguards program plan. Review approximately 48 NASAP and 180 INFCE documents for SG adequacy; and 5) complete a major generic regulatory issue paper on MC&A upgrade for SSNM and complete material control guidance in the Part 73 Upgrade Rule Guidance Compendium.

The significant accomplishments planned for FY 1980 are to: 1) review 8 major and 80 minor MC&A plan changes; conduct 15 reviews of licensee procedures for calculating measurement uncertainties; 2) review 200 export/import applications. Implement the US/IAEA Safeguards Agreement. Provide expert safeguards consultation to IAEA and foreign countries in support of U.S. nonproliferation goals; 3) evaluate MC&A programs at 3 fuel cycle facilities. Improve inventory difference simulation models. Develop a method synthesizing MC&A assessment data. Carry out the system design work for an integrated safeguards information system; 4) generate approximately 4 new MC&A regulatory research requirements. Perform 3 facility application analyses. Direct 25 agencywide MC&A research and technical assistance project reviews; update the integrated safeguards program plan. Provide Biannual Safeguards NRC, NASAP report to the President; 5) complete a minor generic regulatory issue paper on MC&A requirements for low-enriched uranium. Complete two minor regulatory issue papers. Complete a proposed MC&A upgrade rule with a draft value/impact analysis and implementation guidance documents.

The significant accomplishments planned for FY 1981 are to: 1) review approximately 10 major amendment cases, 80 minor amendment cases, and 20 remedial licensing amendments and correction of generic and site-specific deficiencies; 2) extend the implementation of the US/IAEA Safeguards Agreement to assist in preparation of facility attachments in all eligible reactor and nonreactor licensed facilities and to implement requirements in 10 CFR Part 75 through licensing cases for about 90 facilities and modification for about 15 facilities. Assess, evaluate and formulate policy alternatives for 220 MC&A reviews for export/import licensing cases. 3) conduct MC&A assessments at two facilities. Analyze MC&A inventory difference and other accounting data at three facilities. Improve NMSS information system for

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

domestic and international safeguards; 4) formulate approximately 6 NMSS MC&A research requirements and plan and manage an MC&A research program of approximately \$1.1 M. Conduct 25 project reviews of NRC Safeguards Research and Technical Assistance Programs. Meet changing safeguards needs caused by changing technology. Ensure dissemination of MC&A technology for NRC

Physical Security.....

The goal is to assure the protection of the public health and safety and promote the national security through the development, implementation and maintenance of effective physical security programs at power and non-power reactors, licensed fuel facilities and during the shipments of SNM. Support nonproliferation objectives and physical protection of nuclear material by other countries through participation with other U.S. agencies in programs to strengthen international safeguards.

The major objectives are to: 1) develop and monitor programs to protect licensed SNM from loss or diversion and reactors from radiological sabotage. Perform licensing reviews that include approval of physical security plans, contingency plans, guard training plans and remedial licensing actions; 2) conduct physical protection reviews of export license applications and in-country evaluations of foreign physical protection programs to assure the adequacy of the protection of exported material and facilities; 3) interface with licensees, transportation agents, and local law enforcement agencies and negotiate supporting interagency agreements in order to provide a threat assessment basis for NRC safeguards and incident response activities for response against threats and attempted theft or sabotage; 4) perform adequacy assessments of existing safeguards at licensed facilities and transportation activities; 5) formulate, plan and manage safeguards research requirements to provide agencywide coordination of all contractual physical security projects and determine the need for new policy initiatives; coordinate with other government agencies for physical protection technology changes; and 6) review generic regulatory issues and develop new and revised regulations with associated guidance documents and corresponding value impact statements.

The significant accomplishments for FY 1979 were to: 1) review and approve: 17 transportation and fuel cycle facility plans, 47 minor amendments, 2 licensability reviews of DOE facilities; 39 contingency and guard training plans, review transportation security arrangements for 20 Category I export shipments; 2) review and approve 181 export applications, conduct three foreign in-country evaluations; 3) complete a generic adversary characteristics study based on over 650 data sources. Continue to maintain a data base of threat information. Complete NRC Headquarters contingency plan effort and complete an interagency agreement with the FBI; 4) complete 8 comprehensive evaluation reports on safeguards at SSNM facilities and evaluate the vulnerability of 15 SSNM vault designs; 5) provide user planning and

and licensees; and 5) complete MC&A upgrade rule with value impact analyses. Complete four minor generic issue papers on MC&A. Complete two minor MC&A regulatory amendments with value impact analysis and implementation guidance.

The increase of six positions in FY 1981 is to extend the IAEA agreement to additional facilities.

FY 1979 = \$1,947
(46)

FY 1980 = \$765
(60)

FY 1981 = \$1,775
(52)

management of the physical security research program involving approximately \$1.3 M. Perform 6 user suitability tests. Direct agencywide activities for approximately 25 physical security research and technical assistance projects. Publish the integrated safeguards program plan; and 6) complete the upgrade rule for SSNM, the rule for protecting Category II/III materials, major guidance documents for each rule, 6 minor generic regulatory issue papers, and testimony concerning spent fuel shipments.

The significant accomplishments planned for FY 1980 are to: 1) review and approve: 32 transportation and fuel cycle facility plans, 46 remedial amendments, 2 contingency plan review, transportation security arrangements for 76 domestic and export shipments of Category I and II material. Review 35 spent fuel plans to include monitoring of 300 shipments. Complete for reactor facilities: six 10 CFR 73.55 reviews for power reactors, complete 50 remedial licensing actions, 20 vital area analyses, complete review of 35 contingency plans and 18 guard training plans, and complete reviews of 16 nonpower reactor security plans; 2) review and approve 195 export applications and conduct four in-country foreign evaluations; 3) complete an insider threat study. Continue contingency planning related to transport of nuclear materials; 4) complete vulnerability assessments of actual SSNM shipments. Conduct unscheduled safeguards evaluations at three nuclear facilities; 5) perform 7 facility application analyses. Direct agencywide Safeguards Technical Assistance and Research (STAR) activities for approximately 25 physical security research and technical assistance projects. Update the integrated safeguards program plan; and 6) complete a rule for protecting Transient Shipments and related value/impact analyses and guidance documents. Complete a major regulatory issue paper on Spent Fuel Shipments. Complete 12 minor generic issue papers and 5 minor regulatory amendments.

The significant accomplishments planned for FY 1981 are to: 1) complete 46 major license amendments, 105 minor license amendments, and 35 amendments resulting from vulnerability assessments for protection plans for Category II/III materials, Contingency Plans and Guard Training Plans. Review 200 nuclear material shipments. Complete six 10 CFR 73.55 operating reactor reviews and three reactor contingency plan reviews. Complete 60 security plan

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

license amendments and the analysis of 8 vital components and systems. Implement the upgrade rule for 22 nonpower facilities, 8 Contingency Plans and 8 Guard Training Plans, and implement the Category II/III Rule at 26 facilities. Remedial licensing actions, identification of generic issues and participation in nonproliferation activities will continue; 2) complete four foreign visits and 12 country analyses reports, and 220 physical protection reviews of export/import applications; 3) assess the implications of 300 safeguards events and maintain the threat data base. Accomplish contingency planning with an estimated 180 local law enforcement agencies distributed along 3000 road miles relative to in-transit protection over five nuclear shipment routes; 4) based upon the requirements in 10 CFR Part 73 conduct vulnerability assessments of four nuclear fuel facilities and three spent fuel/high level waste shipments resulting in approximately 35 remedial licensing actions; 5) formulate approximately six NMSS physical security

research requirements and plan and manage an approximate \$1.3 M annual research program to assure the relevance of overall NRC physical security research and technical assistance program through agencywide reviews, update the integrated safeguards program plan, meet changing safeguards needs caused by a changing technology; and 6) draft a final regulation for physical protection of spent fuel shipments, complete one minor generic regulatory issue paper, complete four minor regulatory amendments, value/impact analyses, and implementation guidance packages, complete two self-test guidance packages for physical protection subsystems. Take over development of generic issue papers, guidance and new regulations for power and nonpower reactors.

The increase of \$1,010,000 is primarily for additional technical assistance required to review reactor safeguards.

Summary of Waste Management Program

Program Element	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
High Level Waste Management.....	\$ 6,636	27	\$ 7,275	42	\$10,640	50
Low Level Waste Management.....	1,203	17	2,425	25	1,975	27
Uranium Recovery Licensing.....	1,978	23	1,006	23	2,270	35
Total.....	\$ 9,817	67	\$10,706	90	\$14,885	112
High-Level Waste Management.....	FY 1979 = \$6,636 (27)		FY 1980 = 7,275 (42)		FY 1981 = \$10,640 (50)	

The goals are to provide assurance to the public that all Department of Energy (DOE) repositories accepting high-level waste material are properly designed, constructed, operated and terminated so as to have no adverse effect on health and safety and the environment. DOE has been given sole authority to dispose of high-level waste, consequently, NRC must develop a capability to independently assess DOE proposals in all critical areas. NRC must also provide guidance and direction to the DOE R&D Program.

The major objectives are to: 1) develop critical technical and scientific information required for and publish generic regulations; 2) develop regulatory guidance (technical directives, review plans, format and content guides) a minimum of two years before receiving a DOE license application; 3) develop a capability to perform reviews of DOE applications for the construction and operation of high-level radioactive waste disposal facilities; 4) conduct site characterization reviews and safety and environmental licensing reviews; and 5) evaluate the content and possible NRC use of results from DOE R&D efforts, provide guidance for DOE preapplication efforts, and evaluate overall DOE program content and progress.

The significant accomplishments for FY 1979 were: 1) issued for public comment a proposed policy statement on the procedures for licensing geologic high-level waste repositories, which has been developed into the procedural portion of the high-level waste regulation; 2) developed guidance on the format and content of reports submitted prior to site characterization, and as part of a license application; 3) continued the development of models for assessing radionuclide transport in bedded salt; 4) reviewed DOE site characterization programs, and schedules; directed the NRC review of the DOE's draft GEIS on the management of commercially generated high-level waste and on the draft EIS for WIPP; 5) initiated an in-depth review of DOE's entire high-level waste management program.

The significant accomplishments planned for FY 1980 are to: 1) publish for public comment the proposed procedural and technical portions of the high-level waste disposal regulation (10 CFR 60) with supporting EIS; 2) issue draft guidance on the format and content of site characterization, environmental, and safety analysis reports, publish technical directives on site selection and characterization for bedded and domed salt; 3) complete development of models for assessing radionuclide transport in bedded salt; 46

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

4) develop plans for conducting site characterization reviews, and construction authorization reviews; begin onsite review of DOE site characterization activities at bedded and domed salt candidate sites; and 5) assess the extent to which DOE's high-level waste program is directed at developing the information necessary to comply with the proposed 10 CFR 60 and provide the results to DOE.

The significant accomplishments planned for FY 1981 are to: 1) complete resolution of comments on the procedural portion of 10 CFR 60 and publish as final; complete resolution of comments on the technical portion of 10 CFR 60; 2) publish the format and content guides as final regulatory

Low-Level Waste Management

The goal is to assure that low-level waste disposal facilities are constructed, operated, and terminated in a manner which will protect the public health and safety and the environment.

The major objectives are to: 1) perform thorough, yet expeditious, safety and environmental assessments required for low-level waste disposal operations licensed by the NRC, and provide assistance to Agreement States to help them discharge their regulatory responsibilities; 2) publish final regulations governing low-level waste disposal by shallow land burial (FY 1982) and by alternative methods (FY 1984); 3) upgrade the technical basis, including regulatory guides, and prepare standardized review procedures for licensing shallow land burial sites (FY 1982) and alternative low-level waste disposal methods (FY 1984); and 4) provide assistance to other NRC offices in developing regulations and solving problems associated with the decontamination and decommissioning of nuclear facilities.

The significant accomplishments for FY 1979 were: 1) completed licensing action on six applications for license amendments, and provided technical assistance to the Agreement States of Washington and Kansas; 2) published reports on alternative LLW disposal methods and classification system for low-level waste; 3) completed development of a model for making low-level waste projections; and 4) provided technical assistance for disposing of Three Mile Island (TMI) decontamination wastes.

Uranium Recovery Licensing.....

The goal is to assure that uranium recovery facilities are constructed, operated, and terminated in a manner that protects the public health and safety and the environment.

The single major objective of this decision unit is to make licensing and regulatory decisions to assure that the preceding goal is achieved.

guides, publish technical directives on waste form and repository design for bedded and domed salt; 3) complete the development of models for assessing radionuclide transport in domed salt and basalt; 4) expand review of DOE site characterization activities to include the onsite review of candidate basalt and granite sites; and 5) continue the critical review and overall surveillance of DOE's high-level waste R&D program and continue to provide feedback to DOE.

The increase in resources in FY 1981 is to continue development of regulations and regulatory guidance for geologic disposal of high-level waste.

FY 1979 = \$1,203
(17)

FY 1980 = \$2,425
(25)

FY 1981 = \$1,975
(27)

The significant accomplishments planned for FY 1980 are to: 1) complete the safety reviews for renewal of the Richland, WA and Barnwell, SC licenses, and complete the environmental assessment for the Sheffield, IL decommissioning, and continue technical assistance to Agreement States; 2) issue a draft regulation as an advanced notice of proposed rulemaking for low-level waste disposal; 3) prepare proposed guides for the preparation of license applications and environmental reports for low-level waste disposal by shallow land burial; and 4) continue to provide technical assistance for disposing of TMI decontamination wastes.

The significant accomplishments planned for FY 1981 are to: 1) complete 50% of licensing review of an application for a new commercial LLW disposal site, and continue to provide technical assistance to Agreement States; 2) continue work on final low-level waste disposal regulation (10 CFR 61) and associated EIS; 3) continue work on regulatory guides and standardized review procedures for shallow land burial; and 4) provide technical assistance for developing decommissioning and decontamination regulations for fuel cycle facilities, continue to assess special low-level waste disposal problems associated with the TMI cleanup, and evaluate onsite disposal activities of facilities being decommissioned.

The increase in personnel in FY 1981 is to permit more timely development of regulations and licensing review procedures especially for alternative methods of low-level waste disposal.

FY 1979 = \$1,978
(23)

FY 1980 = \$1,006
(23)

FY 1981 = \$2,270
(35)

Specific activities are to: 1) issue license amendments to bring operating mills into compliance with new EPA radiation standards and regulations resulting from the GEIS on Uranium Milling; 2) perform environmental and safety reviews of applications for proposed facility modifications; 3) issue license amendments supporting new requirements resulting from review of facility operating data and NRC inspection reports; 4) perform safety

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

and environmental reviews of license renewal applications; 5) evaluate DOE remedial action plans, as mandated by PL 95-604; 6) perform safety and environmental reviews of applications for new uranium recovery operations; and 7) provide technical assistance to Agreement States.

The significant accomplishments for FY 1979 were: 1) initiated action to establish the basis for determining whether operating mills are in compliance with the new EPA radiation standards; 2) completed regulatory action on five applications for proposed facility modifications; 3) continued to review facility operating data and NRC inspection reports to identify any required license amendments; 4) completed regulatory action on one uranium mill license renewal application; 5) prepared to review DOE remedial action plans; 6) issued licenses for twelve new uranium recovery facilities; and 7) provided technical assistance to Agreement States in completing six project reviews.

The significant accomplishments planned for FY 1980 are to: 1) complete the final GEIS on Uranium Milling and complete four license amendments implementing new requirements; 2) complete regulatory action on ten applications for proposed facility modifications; 3) complete ten license amendments resulting from review of facility operating data and NRC

inspection reports; 4) complete regulatory action on four uranium mill license renewal applications and four R&D facility license renewal applications; 5) complete the review of proposed remedial action plans for one DOE facility; 6) issue licenses for five new uranium recovery facilities; and 7) provide technical assistance to Agreement States in completing ten project reviews.

The significant accomplishments planned for FY 1981 are to: 1) complete nine license amendments implementing new EPA radiation standards and regulations resulting from the GEIS on Uranium Milling; 2) complete regulatory action on 16 applications for proposed facility modifications; 3) complete ten license amendments resulting from review of facility operating data and NRC inspection reports; 4) complete regulatory action on three uranium recovery license renewal applications; 5) complete the review of proposed remedial action plans for six DOE facilities; 6) issue licenses for 14 new uranium recovery facilities; and 7) provide technical assistance to Agreement States in completing 13 project reviews.

The increase in resources in FY 1981 is to permit the licensing staff to reduce the casework backlog for uranium recovery activities.

Management Direction and Support.....

FY 1979 = 0
(16)

FY 1980 = \$160
(19)

FY 1981 = \$100
(19)

The goal is to ensure effective and efficient management of NMSS programs. The director provides overall management direction and policy guidance on major program goals and objectives. The Program Support staff assists the NMSS Director by evaluating and assessing the effectiveness with which allocated resources are managed in NMSS programs. In addition, the Program Support staff provides resource management, contractual, administrative, and other direct support to the Division program staff, as well as coordination with the EDO staff.

The major objectives are to: 1) provide overall management direction and policy guidance as necessary to achieve NMSS program goals and objectives; 2) conduct special independent technical and management evaluations of program resource utilization to ensure that programs are planned and executed in an efficient manner; 3) manage the NMSS Program Planning and Status Assessment System (PPSAS) which provides NMSS program resource planning, status assessment and reporting, and financial control information, enabling program managers to monitor decision unit accomplishments; 4) support NMSS programs by the placement of technical assistance projects with private contractors, Department of Energy (DOE) laboratories, and other government agencies; and 5) provide administrative and personnel services required to operate NMSS programs.

The following items were the significant accomplishments of FY 1979: 1) NMSS realigned the organizational structure of the Division of Safeguards to allow more effective use of available resources, recognize shifting priorities, and more clearly delineate functional responsibilities and established the Division of Waste Management to provide increased management emphasis on this important area of NMSS responsibilities; 2) the NMSS Director was provided, at his request, with independent technical and management assessments of selected technical programs, proposals, and other issues, which included the proposed annual budget submission, proposed mid-year financial reprogramming, executive program analysis reports, Congressional budget testimony, and responses to Congressional inquiries; 3) the PPSAS manpower reporting subsystem for noncase activities became operational; 4) approximately 80 procurement actions were executed with private contractors, and the same number with DOE laboratories; and 5) necessary administrative and personnel services which include responding to FOIA requests, controlling suspense items, controlling classified documents, evaluating resumes, and processing personnel action requests were provided to the NMSS Director and Divisions.

The significant accomplishments planned in FY 1980 are as follow:
1) policy guidance and management direction will continue to be provided to

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

resolve issues and restructure programs, as necessary, to accomplish the major objectives of NMSS Decision Units within allocated resources; 2) the NMSS Director will continue to be provided, at his request, with independent technical and management assessments of selected technical programs, proposals, and other issues; 3) the PPSAS manpower reporting system is scheduled to be fully operational, with the integration of the budget subsystem, the casework subsystem, and the implementation of the reporting subsystem; 4) approximately 80 procurement actions will be executed with private contractors and the same number with DOE laboratories; and 5) necessary administrative and personnel services will continue to be provided to the NMSS Director and Divisions.

The significant planned accomplishments planned for FY 1981 are as follow: 1) policy guidance and management direction will continue to be provided to resolve issues and structure programs, as necessary, to accomplish the major objectives of NMSS programs within allocated resources; 2) independent technical and management assessments of selected technical programs, proposals, and other issues will continue to be provided; 3) the NMSS PPSAS will continue to be managed, and appropriate management information reports will be provided to NMSS program managers and the EDO staff; 4) approximately 80 procurement actions will be accomplished with private contractors and 75 with DOE laboratories; and 5) necessary administrative and personnel services will be provided to the NMSS Director and Divisions, to support the efficient operation of the Office.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY COMMISSION - Continued

Nuclear Regulatory Research.....\$228,228

Summary of Nuclear Regulatory Research Estimates by Function

	Actual FY 1979	Estimate ⁽¹⁾ FY 1980	Estimate FY 1981
Nuclear Regulatory Research:			
Personnel Compensation.....	\$ 5,593	\$ 6,272	\$ 6,900
Personnel Benefits.....	493	593	662
Program Support.....	140,465	186,821	207,100
Administrative Support.....	1,891	2,159	2,686
Travel.....	330	480	580
Equipment.....	8,612	7,737	10,300
TOTAL OBLIGATIONS.....	\$157,384	\$204,062	\$228,228
Personnel.....	(154)	(164)	(178)

The Nuclear Regulatory Research personnel and program support funding requirements have been allocated to major programmatic functions as shown below. The narrative that follows provides justification in support of these requirements:

	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
Reactor Safety Research.....	\$117,847	78	\$157,721	83	\$159,300	82
Environmental Effects and Fuel Cycle Safety.....	7,999	12	7,000	12	12,200	14
Waste Management.....	4,450	8	8,600	11	13,600	15
Safeguards Research.....	4,997	10	4,000	8	4,900	8
Risk Assessment.....	4,372	21	8,500	25	12,600	30
Improved Reactor Safety.....	800	1	1,000	1	4,500	3
Management Direction and Program Support.....	0	24	0	24	0	24
TOTAL PROGRAM SUPPORT.....	\$140,465	154	\$186,821	164	\$207,100	178

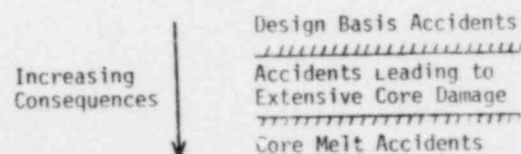
⁽¹⁾ Includes \$302,000 for the FY 1980 pay raise supplemental and \$24,035,000 FY 1980 program supplemental.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY COMMISSION - Continued

The Office of Nuclear Regulatory Research has the responsibility and authority under the Energy Reorganization Act of 1974 to perform research in support of the nuclear regulatory process. A major part of this responsibility is to develop an independently verified source of safety, health, environmental and safeguards information to be used together with the information furnished by the applicant or licensee in support of his proposal, as a basis for licensing and regulatory activities. Thus, a basic objective of the RES program is to provide objectively verified safety data and analytical methods which meet the needs of licensing and regulatory activities and the need for public confidence.

The FY 1981 request provides resources to continue the research program on understanding reactor accidents from small loss-of-coolant accidents, reactor transients and human error. In general terms, the TMI accident can be thought of as emphasizing the need for additional safety research information and understanding as indicated in the figure below:



Design basis accidents (DBAs) have been studied extensively in NRC's licensing process. A prime example of a DBA is a large loss-of-coolant accident (LOCA). These analyses and supporting research are performed to ensure that plant safety equipment (emergency core cooling systems, etc.) have adequately defined safety margins to prevent significant fuel damage in the event of a DBA. While NRC has known for some time that more attention is required for small LOCA and transient events, the TMI accident clearly calls for much more action than has so far been taken to examine these areas.

The area which lies in between the design basis accident and the Core Melt Accident has received less emphasis in both our research program and the

licensing process. Such accidents, similar to TMI, can occur as a result of partial failure and intermittent operation of various systems and may lead to extensive core damage, without fuel melting. It is clear that the TMI accident was not a unique sequence; one can postulate other similar accidents starting from a variety of operational transients or other causes that could ultimately lead to extensive fuel damage. For this reason, we believe the work requested below needs urgent attention.

Soon after the TMI accident, RES moved to reorient its research program to increase emphasis on small loss-of-coolant accidents (LOCA) and anomalous transient events, enhanced operator capability, plant response under accident conditions and post mortem examination and plant recovery.

This FY 1981 request will enable NRC to continue vitally needed programs begun in FY 1980 to address safety issues raised by the TMI accident, and assumes the FY 1980 supplemental request recently submitted to Congress and included in the FY 1980 column of the budget request is approved. In particular, better computer codes will be developed (1) to enhance our understanding of small LOCAs and transients, (2) to allow multitudinous plant studies to be made of these types of events and the many variations that can occur in them, and then (3) to predict, with greater precision than now possible, the behavior of nuclear power plants in response to such events. Studies will be made of simulator requirements to enhance the capability for training plant operators. Analyses will be made of the instrumentation needed by operators to understand and react properly to the full spectrum of potential reactor accidents, and studies will be conducted of the control room display and diagnostic equipment needed to assist the plant operators in effecting proper responses and insuring that limiting conditions of operation are met. Risk assessment tasks to construct event trees (probability models) are needed to define accident sequences covering severe core damage, which the codes must calculate, and to guide the research tasks needed to assess the potential impacts of human errors on the course of these types of accidents.

Also, the need exists to understand better the reaction and response of plants to the type of accident that occurred at TMI. Research programs have been started in FY 1980 to obtain a better understanding of primary coolant chemistry after severe fuel damage; hydrogen evolution and behavior in the primary coolant system and in the containment; behavior of important components under long-term, severe accident environments; equipment qualification and testing requirements; and structural analysis of important plant components and safety features under accident conditions. These programs will be continued and expanded under the proposed FY 1981 budget.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY RESEARCH - Continued

I. Reactor Safety Research

	Actual FY 1979		Estimate FY 1980		Estimate FY 1981	
	Dollars	People	Dollars	People	Dollars	People
A. Light Water Reactor (LWR) Safety Research.....	\$94,045	46	\$131,845	51	\$137,400	53
B. Seismic, Engineering and Site Safety.....	8,402	19	10,476	19	16,900	23
C. Advanced Reactor Safety Research Program.....	15,400	13	15,400	13	5,000	6
Total Reactor Safety Research Program.....	\$117,847	78	\$157,721	83	\$159,300	82
A. Light Water Reactor Safety Research						
(1) Systems Engineering.....	32,187	17	41,345	19	38,000	19
(2) LOFT.....	23,300	7	42,300	8	43,000	8
(3) Code Development.....	9,330	7	12,000	8	14,200	8
(4) Fuel Behavior.....	20,828	8	27,600	9	27,900	9
(5) Primary Systems Integrity.....	8,400	7	8,600	7	14,300	9
Total Light Water Reactor Safety Research.....	94,045	46	131,845	51	137,400	53
(1) Systems Engineering.....	FY 1979 = \$32,187		FY 1980 = \$41,345		FY 1981 = \$38,000	

The Systems Engineering research program has been modified to emphasize improved understanding of accidents less severe (but more likely) than design basis accidents and to increase research on reactor operational safety. Systems Engineering objectives are (1) to provide an experimental data base from separate effects and integral-system testing for use in developing and assessing analytical models and codes and in assessing regulatory practices and requirements, and (2) to provide operational safety research results for use in assessing and improving reactor operational programs.

The Systems Engineering research programs fall into four categories: (1) Integral systems tests (such as the Semiscale facility and the Two Loop Test Apparatus) which will simulate reactor system performance during anomalous transients, small-break loss-of-coolant accidents, or during natural circulation conditions after an accident, (2) Separate-effects tests which investigate different components or regions of the reactor system (e.g., simulated fuel bundles, pumps, etc.) under controlled transients for purpose of investigating behavior under accident conditions, (3) Very small scale (i.e., "bench-type") experiments designed to investigate fundamental two phase flow phenomena for model development, and (4) Operational safety research to test relief/safety valves, fire protection systems, and qualification-testing methods for safety-related equipment that must withstand reactor accident conditions, studies on human factors, and development of methods to improve NRC capabilities for inspection and emergency response. These research programs and facilities are described below.

Semiscale is a test facility designed to simulate PWR transient behavior under loss-of-coolant accident (LOCA) conditions. The facility is a scale model of the LOFT system and utilizes electrical heater rods to simulate nuclear fuel rods. The Semiscale facility has been reconfigured to simulate upper head injection of emergency core coolant, and TMI-accident-support experiments were conducted in FY 1979. Within a few days after the TMI accident started, Semiscale tested ways to remove gas from the primary coolant loop and provided the results to the TMI recovery team. Subsequent TMI transient simulation tests at Semiscale confirmed that pressurizer "full" level readings did not preclude core uncovering. In FY 1980, small-break testing and upper-head-injection testing will be concluded. The Semiscale facility will then be upgraded in FYs 1980 and 1981 for better transient simulation of a pressurized water reactor plant. Upgrading will simulate a two-loop plant with two pumps in each loop, sealed steam generators, and active secondary loops. This will provide realistic experimental simulation of reactor transients over a wide range of accident conditions and operator responses.

The PWR blowdown heat transfer (BDHT) program, a separate research program at the Oak Ridge National Laboratory, has been reoriented to emphasize small-break conditions. This program is concluding its experiments on large loss-of-coolant accidents, and in FY 1980 will conduct bundle uncover tests. These experiments will provide data for evaluating possible consequences of slow loss of PWR coolant over a range of conditions.

NUCLEAR REGULATORY RESEARCH - Continued

Separate effects and systems effects experiments on the reflood phase of a PWR loss-of-coolant accident are conducted under the FLECHT-SEASET project. This project is jointly funded by NRC, Westinghouse and the Electric Power Research Institute (EPRI). The project has obtained separate effects data on reflood heat transfer in a simulated core and in a full height U-tube steam generator during a large break loss-of-coolant accident (LOCA). In FY 1981, FLECHT SEASET will study modes of post-accident core cooling following a small-break LOCA, including natural circulation, and will study reflood heat transfer with flow blockage.

A BWR research program, jointly funded with GE and EPRI, has obtained data on BWR blowdown heat transfer. In addition, a BWR integral system loop, the Two Loop Test Apparatus (TLTA), will conduct small break tests to assess analysis methods in FY 1980. Plans are underway to upgrade the TLTA facility to improve small break and transient simulation.

Another separate effects program is the international cooperative 2D/3D research program which NRC is jointly funding with Japan and the Federal Republic of Germany. This cooperative program will obtain experimental information on ECCS behavior during the refill and reflood phases of a LOCA in full-scale PWR geometry. These experimental results will be used to confirm the physical models in the multidimensional system code, TRAC. Germany (FRG) is planning to construct a nonnuclear full-scale PWR upper plenum test facility (UPTF) mockup to study the behavior of water and steam in the upper plenum and in the downcomer during reflood. The Japanese Atomic Energy Research Institute (JAERI) completed the construction and initiated testing in a large (2,000 rod) electrically heated cylindrical-core test facility (CCTF) to study the refill and reflood phase during a PWR LOCA and is fabricating an electrically heated slab-core test facility (SCTF) to study the multidimensional flow behavior of steam and water within the core, upper plenum, and downcomer during reflood. The NRC is providing the analyses, integration, and evaluation of the JAERI experimental efforts through the advanced analysis code (TRAC), and is in addition fabricating instrumentation for installation on loan to these facilities to provide for measuring steam and water flow patterns and behavior. The experimental data and analysis will be used to evaluate computer codes and to assess margins of safety. The JAERI CCTF Core I commenced testing in mid FY 1979, the SCTF Core I is scheduled to begin testing in FY 1981, and FRG is projecting a start-of-testing in the UPTF in FY 1983. NRC contractors have already delivered a large complement of two phase flow, liquid level and momentum flux measurement instrumentation to Japan which has been installed and is in use in the vessel and loops of CCTF Core I. The

design of instrumentation for the SCTF Core I has been initiated and fabrication is to be completed in FY 1981. The TRAC code will be used to perform post-test analyses of the CCTF test results and design calculations for the SCTF and UPTF facilities.

Model development activities (supported by small scale tests) will continue during FY 1980 to provide basic data for developing models and correlations needed by advanced safety codes. Validity of these models is then assessed by comparisons with data from the larger scale separate effects and integral tests. In FY 1981 this work will include testing models for liquid/gas separation and thermal stratification within containment subcompartments following an accident and also will include basic research on steam/water interactions.

A major lesson from the TMI accident is the importance of operational safety. Operational safety research will continue to evaluate the effectiveness of both fire prevention measures being utilized in nuclear power plants and qualification testing methods utilized for nuclear power plant safety-related equipment. Results to date from these tests, have generally confirmed the acceptability of current practices and have led to the modification of the technical reviews of such related electrical equipment. Large-scale replication fire testing will be started in FY 1980 and continued in FY 1981. In FY 1981 operational safety research will also include testing pressurizer safety/relief valves and other safety-related components, providing research support for the Office of Inspection and Enforcement (IE) and helping IE develop a rapid communication link between operating reactors and the NRC response center, developing noise analysis techniques to monitor reactor behavior, and providing research support to develop human-factor guidelines for reactor operation and maintenance.

In addition to the above activities, technical support will continue to make NRC codes and research information available to the public through the National Energy Software Center and the Nuclear Safety Information Center, and will continue to develop instruments to monitor such things as post-accident reactor water level and leakage through relief/safety valves.

The shift of NRC's Systems Engineering research to emphasize small breaks and anomalous transients has been accompanied by a similar shift in emphasis of reactor safety research in other countries. NRC has coordinated plans in this area with other countries (particularly Japan and the Federal Republic of Germany) so that this research in the U.S. and other countries is complementary.

(2) Loss-of-Fluid Test..... FY 1979 = \$23,300 FY 1980 = \$42,300 FY 1981 = \$43,000

The Loss-of-Fluid Test (LOFT) facility is a nuclear reactor designed to investigate the behavior of a nuclear plant and its engineered safety features under accident conditions. The test results are used to evaluate

the adequacy of analytical techniques for assessing performance of engineered safety systems; to evaluate the actual performance of integral reactor systems including safety systems under off-normal and accident

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY RESEARCH - Continued

conditions; to identify any unanticipated behavior not presently accounted for in evaluating the performance of safety systems; and to evaluate the information available to the operator, and its display, during off-normal and accident conditions.

The nuclear LOCA testing began in early FY 1979, approximately 12 weeks in advance of the schedule committed in October 1976. The first and second nuclear loss-of-coolant experiments in the power ascension series with full sized double-ended cold-leg breaks and with cold leg ECC injection were done in FY 1979. In light of the TMI-2 accident, plans for small break tests, off-normal transient tests and natural circulation tests were advanced, the first zero-power small break test was performed in FY 1979 and the first full-power test was performed in early FY 1980. For FY 1980, a total of five small break tests and one operational transient test are

being planned and these should provide information on natural circulation and plant recovery from anomalous conditions. In FY 1981, test planning includes three operational transients, a large LOCA at 100% of the power density in a commercial PWR and assuming a loss of offsite power, one small-break test, and one intermediate break test. This program will provide important information concerning the safe operation of today's commercial plants, and the plants expected to come on line in the future.

The LOFT is also serving as a test bed for improved instrumentation to monitor the status of a plant during recovery from an accident and for computer-assisted graphics to display this information clearly for the operators. This will be helpful in testing the feasibility and effectiveness of proposed improvements in reactor control rooms.

(3) Code Development and Applications..... FY 1979 = \$9,330 FY 1980 = \$12,000 FY 1981 = \$14,200

The development of computer codes for analysis of nuclear power plant behavior under accident conditions is of central importance to the safety research program. The objective of code development is to provide a family of widely applicable computer codes for the analysis of the safety of the various light water reactor systems and components currently in operation and in the design phases (CP and OL reviews). Experimental results from the research program provide information used in code development and the data for assessment of code accuracy. This research includes developing the codes, assessing the accuracy of these codes by comparison to experiments, and applying the codes to specific safety issues.

The major effort in code development has shifted from improvement of existing codes (primarily RELAP) to development of advanced codes (primarily TRAC). The RELAP code has been improved periodically over several years and is in wide use, both in the United States and abroad. The first version of the advanced systems analysis code (TRAC) has been completed and released for general use. In FY 1980, improved versions of TRAC to analyze a broader range of possible abnormal reactor conditions and accidents are being completed. In FY 1981, a fast-running version of TRAC will be completed for PWRs and initiated for BWRs. Codes will be extended to analyze conditions leading to severely damaged cores.

Also in FY 1981, a study will be performed to evaluate the feasibility of developing an engineering simulator that realistically models PWR and BWR

plant behavior for small-break LOCA and transients that may require operator actions. Development of this advanced simulator, if undertaken, would take several years.

The advanced code for PWR containment analysis (BEACON) has been completed, and its accuracy is being tested through comparisons with experiments. Final assessment, starting in FY 1981, will include comparisons with data from the containment intercompartment flow tests (described under Systems Engineering). This code is to be used by the NRC staff to evaluate the effects of various accidents on the integrity of reactor containment buildings.

As advanced codes are completed, effort will increase to assess the codes by comparison with experiments and to apply the codes. Application of these codes to evaluation of plant response transients and small breaks will be made in a systematic manner in conjunction with the development (under Risk Assessment) of event and fault trees that include multiple equipment failures and specified operator actions.

A plant data bank to store and rapidly retrieve design data from each operating reactor power plant is being studied in FY 1980. In FY 1981, it will be developed and applied to a few plants on a trial basis. Such a data bank will, in the event of an accident, allow NRC to promptly analyze the accident and calculate results of alternative recovery actions. This capability will be greatly enhanced through an engineering simulator.

(4) Fuel Behavior..... FY 1979 = \$20,828 FY 1980 = \$27,600 FY 1981 = \$27,900

Fuel Behavior research provides experimental data for independent assessment of reactor fuel behavior during accidents. The approach used is to develop analytical models through basic experiments on fuel rods conducted out-of-reactor, to assess these models with in-reactor tests, and to better

quantify fission product release and transport from fuel under accident conditions. The research includes fuel/clad model development experiments, fuel irradiation tests including the Power Burst Facility (PBF) experimental program, fuel-behavior code development and testing, and molten fuel behavior

NUCLEAR REGULATORY RESEARCH - Continued

and fission product release and transport. Increased priority is placed on research on the behavior of severely degraded fuel because of the TMI accident.

In the area of fuel/clad model development experiments, electrically heated single and multirod bundle tests have provided information on the magnitude of cladding strain associated with burst due to depressurization accidents as a function of temperature, pressure, and heating rate. Experiments on the mechanical properties of zirconium cladding containing oxygen provided information used in the revision of licensing LOCA audit curves and, in addition, will provide the basis for consideration of a new embrittlement criterion for a future revision of 10CFR50 Appendix K. In FY 1981, the large bundle (8 x 8) experiments in the Multi-Rod Burst Test Program will be completed. The out-of-pile experiments on stress rupture properties of irradiated Zircaloy will be completed. Production of flammable gas on contact of metal coatings and organic coating systems by steam will be underway and studies of radiation effects will start. Data on factors which affect fuel temperatures during accidents will be obtained from three experimental assemblies in the Halden (Norway) reactor. Preparations will be made for the obtaining of fuel samples from the TMI-2 reactor to mesh with the site schedule for access to the reactor vessel. Investigations will continue on the possibility of generating explosive hydrogen/oxygen mixtures in containment during accidents.

Codes for detailed analysis of fuel behavior during steady state (FRAPCON) and during transients (FRAP-T) have been developed and are in wide use in the U.S. and abroad. Ongoing upgrading of these codes gives the licensing staff a more complete and accurate prediction of possible fuel assembly temperatures during accident situations. In FY 1981, these fuel-analysis codes will be brought to a maintenance level, although upgrading will continue by incorporating improved models and more efficient running methods. Linkage to systems codes will continue. Assessment of FRAP-T6 and FRAPCON-2, by comparisons with data, will be completed in FY 1981.

Irradiation experiments are conducted to measure fuel response under realistic accident conditions and to assess the accuracy of fuel codes. The Power Burst Facility (PBF), located at the Idaho National Engineering Laboratory, is the principal facility for this research.

A loss-of-coolant test was performed in PBF using pressurized fuel rods in which unexpected ballooning of the fuel cladding occurred. These test

(5) Primary System Integrity..... FY 1979 = \$8,400 FY 1980 = \$8,600 FY 1981 = \$14,300

The objective of primary system integrity research is to provide information to help assure the integrity of the reactor vessel, other primary system components, and piping systems. The scope includes vessel, steam generator, and piping integrity, irradiation embrittlement, corrosion, and flaw detection and evaluation.

results may cause some revisions in methods of calculating fuel pin distortion in such accidents. Also PBF tests were conducted on prototype LOFT fuel rods to assure that their design would withstand LOFT test conditions.

Another PBF experiment provided data to help resolve the uncertainty in measured cladding temperatures caused by placing thermocouples on the LOFT cladding. Other PBF research has shown that the fuel pin cladding embrittlement which follows film boiling during an accident does not necessarily weaken the structure beyond its ability to retain fission products (current licensing practice assumes fission product release if film boiling occurs). Reactivity initiated accident (RIA) tests in PBF have identified additional failure mechanisms to be factored into proposed revisions of RIA licensing criteria. During FY 1980, PBF testing will continue in the areas of simulated overpower accidents, simulated loss-of-coolant accidents, and possible fuel rod failure due to fuel pellet-cladding mechanical interaction during reactor transients. In FY 1981, PBF will perform two operational-transient experiments, two reactivity initiated accident experiments, and one severe-fuel damage scoping test.

To complement the PBF testing of three-foot-long fuel rods (during the blowdown phase only), full-length (twelve-foot-long) fuel rods will be tested (during the heatup-phase only) in the NRU reactor in Canada in FY 1981. Also in FY 1981, experiment planning and design will be performed for the ESSOR program. This program will test six-foot long rod bundles during a complete LOCA sequence (blowdown, heatup, and reflood). Membership in the Halden Reactor Group will continue.

As a result of the TMI accident, higher priority is now placed on fuel-melt behavior and fission-product transport. By the end of FY 1980, 270 experiments on vapor explosion triggering phenomena will be completed. Also, in the 48 larger scale tests to determine the thermal to mechanical energy conversion efficiency, the largest observed efficiency was 1.5%. This is about a factor of 20 less than the maximum theoretical efficiency. In FY 1981, small-scale steam-explosion tests will be completed in the fully instrumented test facility, and large-scale steam-explosion efficiency tests will begin. Modeling of containment fission-product transport for the TRAF-MELT code and fission-product source-terms will be performed. Determination of fission product release on two PBF tests will be performed. Means of making real-time estimates of core damage from fission product measurements in the coolant will be investigated, in addition to studies on remote sampling of coolant chemistry during accidents.

The results of large vessel tests have demonstrated the design conservatism in reactor pressure vessels, and thus have helped validate the American Society of Mechanical Engineers (ASME) Code for reactor pressure vessels. In addition, results of fracture mechanics research in FY 1980 have greatly

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY RESEARCH - Continued

clarified the conditions for the extent and limitation of crack extension under nonpressurized thermal shock accident conditions. In FY 1980, this research provided the first significant data on the fracture toughness of irradiated thick steel weld metal exhibiting minimum acceptable fracture toughness in its unirradiated state as defined by present federal regulations. Data to be developed in FY 1981 will complete this evaluation and help establish correlations between small test specimens and reactor vessel material conditions. This work will help to determine the need for redefining federal regulations to assure a continuing safe level of reactor pressure vessel material toughness, and determine the possible need for in-service annealing of pressure vessels. Data collection in FY 1980 on the rate of crack growth in vessel and piping steels has progressed such that a draft revision of the ASME Code Section XI curves for evaluation of crack growth in operating plants is expected in FY 1981. The TMI accident revealed accident conditions for which the pressure vessel can undergo thermal shock at high pressures, and it is therefore necessary to investigate vessel integrity under pressurized thermal shock conditions. Design and construction of a facility for such pressurized thermal shock will begin in FY 1981. Studies which have continued through FY 1980 will result, in FY 1981, in an analytical code for the prediction of jet loads and forces from broken pipes and the consequences of the resulting pipe impact loads. New methods developed to evaluate vessel and piping materials in the elastic-plastic range will be validated in FY 1981 by testing large diameter piping removed from operating power plants.

Based upon the receipt of a retired steam generator in FY 1980, studies in FY 1981 will be concentrated on validating nondestructive examination methods for detection and characterization of steam generator tube cracks and dents. Construction of the facility for conducting the extended research program on the patterns of degradation and corrosion will continue. Based on the completion in FY 1980 of a comprehensive survey, studies will be initiated in FY 1981 to establish a licensing basis for evaluating and mitigating

B. Seismic, Engineering, and Site Safety.....

The Seismic, Engineering and Site Safety (formerly Site Technology and Engineering) program provides safety information for nuclear power plant sites, structures, components and equipment subjected to normal operating, extreme environmental and accident events such as earthquakes, tornadoes and floods. The program also assists in the development and confirmation of regulations, standards and guides which define the safety design basis for nuclear facilities to withstand these phenomena. These objectives are achieved through advanced analysis, experiments, field tests and observations. In addition, the Seismic, Engineering and Site Safety program seeks to evaluate concepts which mitigate the effects of extreme environmental and accidents events. Novel nuclear facility siting designs, such as underground facilities or floating power plants, fall within the interests of this program.

against the environmental effects causing corrosion and stress corrosion cracking in BWR and PWR piping.

Research is being conducted on a series of nondestructive examination (NDE) methods for pressure vessel, piping and steam generator tubes in order to define the current limits of in-service inspection techniques and to improve the capability for both detection and evaluation of flaws. Based on development of the SAFT-UI ultrasonic test method in previous years, the method will be transferred to industrial practice in FY 1981 to field usable equipment for vastly improved characterization of flaws periodically found especially in large diameter piping. Other ultrasonic test work is aimed at defining the test parameters and improved methods for performing more accurate in-service examinations. In FY 1981, the initial tests will be complete from many inspection teams examining a series of standard flawed specimens. Without the corroborating evidence of such multiple-team tests, the newer methods and ranges of test parameters to be used cannot be proposed and enforced. Studies on improved eddy current NDE equipment for steam generator tube inspection resulted in field trials in FY 1980 in an operating reactor steam generator for detection of crevice cracking. This program is expected to be complete in FY 1981 with further field data establishing the improvement in detection and characterization of a wide range of flaws, dents and degradation in steam generator tubing. In addition to the periodic NDE methods noted above, continuous monitoring for cracking is also pursued. The acoustic emission method detects the location and growth of cracks during operation. In FY 1981, tests will be underway in operating reactor environments to validate the criteria, proposed in FY 1980, for the potential severity of a growing flaw, established through lab tests and in prototype component tests. The other continuous method under study employs internal friction to detect the incipient formation of a crack. Following successful laboratory proof of incipient crack detection in previous years, work in FY 1981 will be focused on providing the ability to monitor in an operating reactor environment and on proving the capability of the method to predict stress corrosion crack initiation in BWR stainless steel lines.

FY 1979 = \$8,402
(19)

FY 1980 = \$10,476
(19)

FY 1981 = \$16,900
(23)

The Seismic, Engineering and Site Safety program is using the principles and methods of probabilistic risk assessment in its research. The most noteworthy example of this is the Seismic Safety Margins Research Program (SSMRP). This is a multidiscipline effort involving seismology, structural engineering and mechanical engineering. The objective of the SSMRP is to develop mathematical models that can more realistically define elements that effect the probabilities of radioactive release due to large earthquakes. These models will be used to gain engineering insights which can be applied to develop improved design methods and criteria. Application of probabilistic techniques, along with conventional methods, will be used to study the effects of loads from the combination of simultaneous large earthquakes and system transients such as large and small loss-of-coolant accidents (LOCA).

(Dollars in thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY RESEARCH - Continued

The structural and mechanical engineering programs have been reoriented as a result of Three Mile Island and the five plant shutdown resulting from potential seismic design deficiencies. The studies should be continued and accelerated to provide information to the user offices in a timely manner. Of particular importance are programs that provide damage assessment and requalification of structures and components subjected to accident conditions, evaluate effects of explosion inside the containment structure, assess the qualification standards for pumps and valves, and verify computer codes used to predict the behavior of structures and components under normal and accident conditions.

During FY 1981, the structural engineering program will continue to support the SSMRP in the areas of soil-structure interaction and structural response. Programs that support the licensing review of operating plants to determine their capacity to withstand additional and new loads not required during initial design, as well as assessing methods to define seismic input, and develop technical positions relating to water hammer effects will be continued or initiated during FY 1981.

The mechanical engineering program will continue investigations in the area of systems behavior in support of the SSMRP, component and equipment failure, nonlinear modeling and scaling of components, and mechanical

component response. Investigations of the behavior of mechanical and hydraulic snubbers under accident and environmental conditions will continue. A program to assess the adequacy and validity of the ASME Boiler and Pressure Vessel Code, as it applies to nuclear power plant components, will be started in FY 1981.

During FY 1981, current effort on regional seismological and meteorological investigations will be continued, including expansion of the seismic monitoring network near the Indian Point, New York, reactor site. Estimation of potential earthquake hazards at different reactor sites, development of methods for interpreting earth stress measurements, reevaluation of reactor site seismic instrumentation requirements, evaluation of real-time meteorological modeling and site network requirements, analysis of ultimate heat sink performance tests, and completion of regional lightning hazard assessment for U.S. are the projected accomplishments for the year in Site Safety Research.

The increase in FY 1981 provides for structural and mechanical engineering programs, including initiation of experimental verification in efforts such as the SSMRP, computer codes and snubber qualification. Also, other seismic activities are evolving from initial scoping to detailed analytical and experimental efforts which are necessary to cope with the issues related to the seismic safety of nuclear plants.

C. Advanced Reactor Safety Research

(1) Fast Breeder Reactors.....	
(2) Advanced Converter Reactors.....	
Total Advanced Reactor Safety Research.....	

Actual FY 1979	Estimate FY 1980	Estimate FY 1981
\$12,500	\$13,700	\$5,000
2,900	1,700	0
\$15,400 (13)	\$15,400 (13)	\$5,000 (6)

The objective of this program is to provide the NRC with an independent capability for safety assessment and for the development of licensing standards for advanced reactors. Two types of reactors have been the focus of this program - Fast Breeder Reactors (FBR) and Advanced Converter Reactors (High Temperature Gas-Cooled Reactors). These research programs will be terminated in FY 1981.

This is in concert with Administration policy on Advanced Reactor development and is consistent with the DOE plan for FY 1981.

II. Environmental Effects and Fuel Cycle Safety.....

This research program provides technical methods and data to predict and assess the impacts and effects upon the public and the environment of nuclear power plant operations and to assess the safety and environmental impacts of other licensed nuclear facilities.

Ongoing activities that involve projected expenditures in FY 1981 will be slowed down and no new commitments will be made starting in third quarter FY 1980 (April 1980) to allow orderly termination in FY 1981. At the indicated level of \$5.0 million, it will not be possible to mothball facilities or to finish current safety calculations. The primary effort in FY 1981 will be to close down facilities and to document the current status of test programs.

FY 1979 = \$7,999 (12)	FY 1980 = \$7,000 (12)	FY 1981 = \$12,200 (14)
---------------------------	---------------------------	----------------------------

There are two general categories of research activity under Environmental and Fuel Cycle research.

NUCLEAR REGULATORY RESEARCH - Continued

1. Environmental Effects research is responsive to the needs identified by the licensing process for assessing and limiting the impact of licensed nuclear activities upon the environment.
2. Systems Performance research focuses on the performance of effluent control, occupational protection and safety systems other than reactor safety systems.

Environmental Effects Research

In FY 1981 environmental effects research will assess impacts of nuclear power plants on oceans, rivers, lakes and ponds and associated fisheries. Computer codes for simulating entrainment and impingement phenomena and resulting fish mortality will be tested using independently observed field measurements. A mathematical model of radionuclide transport in water and sediments based on movement of radionuclides from the West Valley, New York site to Lake Erie will be tested by field measurement data at all states of flow of Cattaraugus Creek. Research efforts will be increased in FY 1981 in the areas of assessing of the feasibility of a real time environmental monitoring data acquisition system for normal and emergency conditions, determination of entrainment effects on Zoo and phyto-Plankton. Tests of methods used to establish bioaccumulation of P-32 in fish will be evaluated.

A model for forecasting baseload and peakload needs for electrical power on state and utility service bases will be developed and verified, and research will be initiated to evaluate the effect of power plant construction and operation on the local economy. Land use and value, population growth, need for public services, taxes and living costs will be among the factors studied. Development of a capability for predicting the need for electrical generating capacity on a regional basis will be continued with the participation of the New England states. Reflecting TMI concerns, additional research will be initiated in FY 1981 on assessing emergency preparedness capability at the Federal, State, and local level.

Research related to occupational radiation exposure and radiation health effects will be continued with no new initiatives. Methods for assessing occupational exposures to radiation and alternative means of reducing work exposure will be further analyzed in support of the as low as reasonably achievable exposure control concept. Radiobiological research will be done to determine the radiation dose patterns resulting from inhalation and ingestion of particulate fuel materials. Independently developed and verified information on the biological half-life of uranium in yellowcake will be available to support bioassay requirements for uranium mill workers. Measurements of radionuclides in tissue relating the internal deposition of thorium to measurements made by whole body counting and thoron breath analyses will be continued. Codes for calculating radiation dose to critical organs of the human body from internal depositions of radionuclides will be developed to improve assessments of radiation effects required for safety and environmental impact analyses. Increased research effort in FY 1981 over FY 1980 in occupational exposure and radiation health

effects mainly reflect increased emphasis on advanced research in acute morbidity and mortality studies and in early effects of inhaled radionuclides, plus increased emphasis on internal dosimetry of nuclear power plant workers and neutron dosimetry evaluation.

Systems Performance Research

In 1981, ongoing research will provide measured data and validated analytical models for evaluating radioactive aerosol production and release for a range of fuel cycle facility accidents. Work will continue on the development and testing of codes and data to assess the response of shipping packages to the structural, thermal and radiation environments and to assess the adequacy of shielding and criticality controls as required by NRC's current regulations. Improvement of current codes being used routinely in NRC licensing actions can shorten the time required for licensing reviews and improve their technical bases. A modal transportation study, initiated in FY 1980, is being accelerated in 1981 with the objective of developing an improved technical base for NRC's transportation regulations, thereby further enhancing the safety of radioactive materials transport. During FY 1981, package acceptance standards will be established for extremely severe transportation accident environments. Based upon the results, alternative regulatory methods to limit potential exposures of the public will be developed.

The measurements of radionuclide concentrations and releases being taken in operating nuclear power plants will continue and the report on results obtained from the first four plants will be published.

Studies will also continue to evaluate degradation of iodine trapping ability of charcoal filters under simulated accident conditions and exposure to atmospheric pollutants during normal plant operations. Work will be initiated to reflect increased emphasis on the evaluation of advanced effluent treatment concepts which could significantly reduce normal plant radionuclide releases and waste volumes.

Reactor decommissioning projects initiated in FY 1979 will be expanded to reflect current needs to establish decommissioning source terms based on assessment of samples from reactor stations. The quantities and distribution of long-lived activation products and radionuclide contamination as well as the effectiveness of decontamination methods for reducing waste volumes and occupational exposures in operating plants will be determined.

Additional research will be initiated to determine radionuclide inventories and distribution in fuel cycle facilities to assist the development of source terms for guidance of NRC policy for fuel cycle facility decommissioning.

Assessment of effects of decontamination on reactor effluent control systems will continue. A study will be initiated on the effects of decontamination and decommissioning on the ability to solidify wastes. Research will also be initiated to evaluate the reduction in occupational exposure that could be effected by using decontamination processes during the plant lifetime, particularly during maintenance operations.

NUCLEAR REGULATORY RESEARCH - Continued

III. Waste Management

Waste management research is providing tested analytical and predictive methods and confirmed data to support or improve engineering and scientific assumptions and judgments used as bases for regulatory standards, impact assessments, licensing decisions and monitoring methods for processing and handling wastes, and for siting, designing, constructing, operating and terminating waste management facilities. This includes methods and data for evaluating radiation protection and safety systems; for predicting and assessing environmental impacts from the processing, packaging, transport, handling and isolation of wastes; and for assuring that deleterious impacts are kept as low as reasonably achievable. The program is expanding and accelerating in order to develop technical information to support and improve regulation of high-level waste processing and isolation, low-level waste facilities and uranium mill tailings in response to major DOE and industrial demands for licensing and regulation of waste management facilities.

High Level Wastes

The high-level waste program provides technical bases for regulating the processing and isolation of wastes that contain high levels of radioactivity and for providing timely guidance to the DOE regarding information that will be needed to meet licensing requirements. The program will improve understanding of the mechanisms important to the durability and stability of the waste and provide methods for predicting the degradation of processed and packaged wastes. This includes increased testing of matrices and initiation of container testing for wastes and new projects to determine the combined effects of multiple processes that can decompose solidified wastes and their containers. Additional tests will be initiated to confirm the effectiveness of overpack materials, and engineered multi-barrier systems which are designed to assure retention of any radionuclides for at least 1000 years. The main natural mechanisms which can affect the long term migration of radionuclides released from decomposing stored waste are geochemical and hydrological processes. To develop an understanding of these processes, studies of the interactions between high level wastes and various host rocks will be expanded, and methods will be developed for predicting the long term migration and fate of these radionuclides. Systems analyses will include an intensified and accelerated development and refinement of models for predicting radionuclide migration pathways, transport rates and consequences. Repository engineering safety studies to be carried out will include tests of the reliability of bore-hole and fractured rock sealing techniques for repository requirements;

FY 1979 = \$4,450
(8)FY 1980 = \$8,600
(11)FY 1981 = \$13,600
(15)

experiments to evaluate remote techniques for determining the morphology of unexposed geologic structures; assessments of geophysical responses to thermal and other stresses from stored wastes; evaluation of the safety aspects of retrieving wastes or spent fuel from repository storage, and assessments of the structural response and safety of repositories with respect to accidents and natural geologic and climatic phenomena. The entire program of High Level Waste research will be broadened to develop and verify methods for predicting, monitoring and assessing occupational safety, public exposure to radiation and environmental impacts.

Low Level Waste

A major increased effort of this program will be to expedite the development of the technical bases for site selection criteria needed for additional shallow land burial facilities, for evaluating and ensuring improvement of the operation of facilities in current use, and for decommissioning terminated facilities. This includes intensive laboratory testing and field experiments at existing shallow land burial sites to determine the effectiveness and reliability of methods used to site and construct the existing facilities, and to support regulatory requirements for the engineering design and operation of burial facilities and for monitoring the effectiveness and safety of these facilities. A study of the characteristics of radioactive wastes from medical and research institutions will be completed. Research will be initiated to define the characteristics of volume reduced wastes for shallow land burial and to assess other disposal methods such as medium depth burial.

Tailings

Field sampling and analyses of radioactive gaseous emissions from mill tailings will be completed. Models for predicting atmospheric resuspension and transport of particulates and the seepage into groundwater of radionuclides and other toxicants from mill tailings will be developed and tested. Research will be initiated to (a) support criteria for regulating the stabilization and decommissioning of tailings, (b) measure the rated of natural compaction of tailing piles, (c) test the effectiveness of erosion control methods, (d) assess methods, costs and benefits of disposing of tailings in mines, and (e) evaluate methods for reducing the volume or radioactive content of tailing wastes. This program will provide technical information needed to support scheduled licensing actions and provide guidance to mill operators for stabilizing mill tailings, and for minimizing the emanation of radon from inactive tailings piles.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY RESEARCH - Continued

IV. Safeguards Research.....

Safeguards research continues to stress the development of systematic methods for uniform, equitable and repeatable evaluations of the effectiveness of safeguards systems, and to provide confirmed data and tested methods to improve the technical judgments and assumptions used in license review, field evaluation and inspection, and the development of new regulations and regulatory strategy. This research covers physical protection and material control and accounting at fixed facilities and the protection of special nuclear material and spent fuel in transit.

In FY 1981, research in physical protection will stress transfer of three evaluation codes to NRC for user application. These will include the completion of vital area identification using fault tree methodology at all operating power reactors, and the preliminary application of two other methods, SAFE (Safeguards Automated Facility Evaluation) and SNAP (Safeguards Network Analyses Procedure), to evaluate safeguards at licensed fuel cycle facilities and power reactors. All three of these methods will be employed by the NRC staff to assist in licensing reviews. The contractor will support the initial efforts involved in this transfer and will incorporate the results and lessons learned from limited test applications during FY 1980 to increase the efficiency and effectiveness of the codes.

Methods previously developed for evaluating fixed site material control and accounting (MC&A) procedures will be fully incorporated into the coordinated research and applications program following publication of the MC&A requirements as an effective rule. The codes developed in the research program will be extensively used in FY 1980 to support the development of these new rules.

V. Risk Assessment.....

Risk assessment research entails the development of new or improved methods to predict the sequence of events in nuclear accidents, estimate their likelihood, and evaluate their consequences. The current scope of this research embraces light water reactor plants and radioactive waste repositories. The principal focus of the reactor risk assessment research program lies in the development and initial application of safety analysis techniques that can address accidents that go beyond design basis events, particularly those entailing multiple failures, human errors, and/or common-cause failures and that lead to core damage or meltdown.

Considerable growth in the risk assessment research program is required in FY 1980 and FY 1981 to accommodate the recommendations of the President's Commission on the Accident at Three Mile Island (Kemeny Commission), the Risk Assessment Review Group (Lewis Committee NUREG/CR-0400) and the Advisory Committee on Reactor Safeguards (ACRS).

FY 1979 = \$4,997
(10)

FY 1980 = \$4,000
(8)

FY 1981 = \$4,900
(8)

Work will continue on the development of an improved national system for nuclear material inventory tracking and control. Data will be collected and analyzed to determine the significant factors which contribute to in-process holdup.

The research project to develop improved techniques and inspection procedures for field evaluations and inspection will be completed during FY 1981, and the 24 delivered modules will serve as the basis for strategy and implementation of the regional inspection program. These inspection modules are being developed by a two year cooperative program involving the contractor, the Office of Inspection and Enforcement and the regional inspection force, and will be transferred directly to operational use. Some elements of the modules will be made available to licensees for use in self test and evaluation of contingency response and guard training.

The two year program of research to identify source terms for potential radioactive material releases resulting from explosive attack and deformation of spent fuel shipping casks will be about two-thirds completed during 1981. Interim results will be published to assist in reconsideration of the current interim rule and to support environmental impact assessments. Research on optimum defensive tactics during safeguards incidents will stress field experimentation on the instrumented Miles test range (Sandia - Albuquerque) to provide data and methods for adversary neutralization and to validate safeguards encounter models. Research to develop concepts and methods for previously developed evaluation of safeguards for AFR (Away from Reactor) and long-term spent fuel storage will be initiated.

FY 1979 = \$4,372
(21)

FY 1980 = \$8,500
(25)

FY 1981 = \$12,600
(30)

Each of these groups has recommended expanded development and application of these nuclear safety analysis techniques.

Major efforts underway in the risk assessment program are:

- An Integrated Reliability Evaluation Program (IREP) has been initiated to apply existing risk assessment techniques to each of the operating commercial light water reactor plants in the U.S. The objectives are to identify particularly high-risk accident sequences at individual plants to develop a cadre of experienced practitioners of these safety analysis techniques.
- Improved collection and analysis of statistical data on component failure rates and human error rates applicable to reactor operators and maintenance personnel.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY RESEARCH - Continued

- Development of improved methods to classify, model, and predict human errors by reactor operators.
- Development of improved methods to predict the risk posed by in-plant fires, in-plant and external floods, and transportation accidents in the vicinity of nuclear power plants.
- Development of improved methods to predict the risk posed by high-level radioactive waste repositories.
- Continue research to improve core melt consequence prediction models, particularly atmospheric dispersion, liquid pathways, and biological effects of released radioactive materials.

- Continue to apply the core melt consequence prediction models in research to improve emergency planning and to improve nuclear plant site selection and evaluation criteria.
- Continue research to develop a quantitative criterion of acceptable risk.
- Continue research to resolve selected generic safety issues and identify improvements to the "single failure" criterion.
- Continue the development of waste repository risk assessment models.

VI. IMPROVED REACTOR SAFETY.....

Implementation of NRC's "Plan for Research to Improve the Safety of Light-Water Nuclear Power Plants" (NUREG-0438, April 1978) was begun in FY 1979 and continued in FY 1980. The research examines a spectrum of suggestions for improving reactor safety, develops functional requirements and conceptual designs, and assesses the value/impact of developing, licensing and implementing these concepts. The objectives are to determine the feasibility of achieving particular safety improvements, to evaluate the safety significance of proposed concepts and to propose regulatory requirements where implementation is determined to be desirable, without preparing detailed designs. To date three concepts have been emphasized: (1) vented, filtered containment systems; (2) add-on decay heat removal systems; and (3) improved in-plant accident response.

The objective of vented containment systems is to reduce the probability of large airborne releases of radioactivity in the event of a core melt or other severe accident. In FY 1980 preliminary design requirements, conceptual designs for several containment types, and computer models to analyze the performance of the system are being developed. In FY 1981 the systems will be analyzed in detail, the design requirements will be refined, and a Research Information Letter (RIL) assessing the values and impacts of incorporating vented filtered containment into nuclear power plant designs will be prepared. Needs for additional information, including experimental data, to reduce the uncertainty in the assessment will be identified.

The objective of add-on decay heat removal systems is to reduce the probability of severe core damage through increased reliability of shutdown heat removal. In FY 1980 preliminary design requirements and conceptual designs for a PWR and a BWR are being developed by NRC and the development and analysis of down heat removal system attributable to the add-on system will be determined, the design requirements will be refined, and a RIL assessing the values and impacts of the add-on system will be prepared for use in developing regulatory position. Other

FY 1979 = \$800	FY 1980 = \$1,000	FY 1981 = \$4,500
(1)	(1)	(3)
alternatives for achieving the same or greater increases in reliability of shutdown heat removal will also be explored.		

The objective of research on improved in-plant accident response is to enhance the capability of reactor operators in preventing, recognizing and controlling accidents. In FY 1980 studies are being performed to provide the operator with the necessary and sufficient information to indicate unambiguously the physical status of the plant and its engineered safety features. Preliminary functional requirements for computerized disturbance analysis and surveillance systems are being developed. In FY 1981 these studies will produce guidance for improving the quality of the operator/machine interface. There will also be a significant expansion into other aspects of operator capability. Among them are studies to evaluate the technical adequacy of approaches (e.g., noise diagnostics, logic modeling, pattern recognition) to disturbance analysis; to assess the performance of prototype systems; to determine the feasibility of new concepts for instrumentation and their applicability to commercial facilities; to improve the ways that plant data are collected, stored and presented to the operator; to develop requirements that plant simulators must meet in order to serve as more effective training tools; and to gather data on operator performance under simulated and actual plant conditions. Some of these studies will utilize the improved information displays and diagnostic system being installed on LOFT in FY 1980.

In addition to the concepts emphasized to date, studies will be performed in FY 1981 which identify the risk reduction potential and feasibility of other concepts such as innovative approaches to the protection against sabotage, molten core retention devices, improved monitoring and control systems, and others. Also the methodology to assess quantitatively the values and impacts of proposed safety improvements will be developed and applied to guide the implementation of concepts and to set priorities for further research.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY RESEARCH - Continued

VII. Management Direction and Program Support (Personnel).....

FY 1979 = (24)

FY 1980 = (24)

FY 1981 = (26)

The personnel requirements for this area consists of the Director's Office, administration support staff and the resource control and contract execution staff. This staff provides the Director of RES with technical assistance and support to direct and evaluate complex technical research projects; and plans, coordinates, directs, and executes the business matters of the Office, including contractual agreements, budget formulation, fiscal management, personnel administration, travel assistance, and research coordination.

By the nature of its function, this area is interrelated with all other NRC offices and organizations, related groups external to NRC, and the

other programmatic functions within RES. These relationships involve both providing information to and receiving information from these other offices, organizations, and groups. The workload within this area is directly related to the workload within the other RES organizational elements, by the demand for RES action by other NRC offices and organizations and by the interaction with those groups external to NRC. The requested increase in FY 1981 will provide stronger administrative assistance required by the expanding competitive contractor selection process and the implementation and execution of the agency-wide management performance system.

Equipment.....

FY 1979 = \$8,612

FY 1980 = \$7,737

FY 1981 = \$10,300

Equipment requirements are needed for the varied research and development programs described above under Program Support. A major portion of the equipment is required in order to productively utilize major research facilities such as LOFT, PBF, Semiscale, and thermal-hydraulic heat transfer experiments. Equipment will also be required to support: environment, fuel cycle, and waste management programs.

calibration certification facility, and in the new fault-diagnostic unit being installed to study operator/reactor interaction and information display.

Equipment is requested in Systems Engineering research to modify test facilities to allow more accurate simulation of reactor small-break LOCAs and operational transients. In addition, equipment is needed for operational safety tests of fire protection and safety equipment qualification and also for containment intercompartment flow tests. New equipment is needed to replace aging equipment used in the continuing LOFT program and facility support activities. Further, as the LOFT project is expanded to its full scope, new equipment needs are being identified. In particular, equipment is needed in the new fuel inspection and examination facility (the hot shop and hot cells), the new steady state flow

In Fuel Behavior research, equipment is needed to upgrade the Power Burst Facility for testing at conditions beyond design basis accidents in order to better define the threshold of conditions leading to severe fuel damage. Also, equipment is needed for research on large-scale steam-explosion testing, fission-product release at high temperatures, and hydrogen generation and behavior in containment. Equipment for Primary System Integrity is requested for the examination of a steam generator removed from service. Also, equipment is needed for research on inspection techniques and on environmental effects on piping and pressure vessel materials. Waste management equipment will also be procured. This will include sampling and measuring devices, analytical and test instruments for high-level waste activities.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY COMMISSION - continued

Program Technical Support \$18,861

Summary of Program Technical Support Estimates by Function

	Actual FY 1979	Estimate FY 1980 1/	Estimate FY 1981
Personnel Compensation	\$ 7,622	\$ 8,464	\$ 9,800
Personnel Benefits	672	803	941
Program Support	1,312	3,595	2,798
Administrative Support	2,888	3,590	4,187
Travel	637	920	1,135
Total Program Costs	\$13,131	\$17,372	\$18,861
Personnel	(250)2/	(267)2/	(294)2/

This budget activity includes salaries and other costs for the staff offices that provide direct program technical support. These are the Advisory Committee on Reactor Safeguards, the Atomic Safety and Licensing Board Panel, the Atomic Safety and Licensing Appeal Panel, the Office of the Executive Legal Director, the Office of State Programs, the Office of International Programs, and the newly created Office for Analysis and Evaluation of Operational Data.

- a. The Advisory Committee on Reactor Safeguards (ACRS) established in 1957 by Statute, reviews and reports on safety studies and facility license applications referred to it; advises the Commission on potential hazards of proposed or existing reactor facilities and the adequacy of proposed safety standards; and performs such other duties as the Commission may request. The ACRS reviews each application for a construction permit or an operating license for power and test reactors and spent fuel reprocessing plants, any application for an amendment to an operating license referred to it by the Commission and any matter related to nuclear facilities specifically requested by the Department of Energy. The Committee's report on applications for facility licenses becomes a part of the record of the application and is made available to the public, except for privileged or security material. Section 29 of the Atomic Energy Act of 1954 also requires that the ACRS advise the Commission with respect to the safety of operating reactors. The President, in his response to the Kemeny Commission Report, supported the concept of an expanded ACRS safety review role. The requested increase of 2 technical positions

over the FY 1980 level of 40 represents an initial response to this goal and will be used to provide increased analytical capability for the ACRS office to do independent analysis of reactor safety matters.

- b. Atomic Safety Licensing Board Panel (ASLBP) conducts statutory adjudicatory hearings through its hearing boards which issue decisions with respect to granting, suspending, revoking, or amending licenses or authorizations under the provisions of applicable laws or regulations. These decisions cover both the construction and operation of nuclear power plants, and antitrust issues relating to the operation of such plants. Three-person boards, appointed from members of the Panel, conduct the hearings which deal with environmental issues as well as matters of health and safety, national defense, financial qualifications and economic considerations. Boards are also appointed to resolve issues that may arise as a result of interventions by members of the public or any other party. Accordingly, the Panel has authority to rule on Petitions for Intervention and to conduct rulemaking hearings as designated by the Commission. The Boards are required to initiate most of the hearings in the vicinity of the plant site. The FY 1980 staff totals 37 and remains unchanged in FY 1981.
- c. From the Atomic Safety and Licensing Appeal Panel (ASLAP) are drawn three-member tribunals which review decisions of administrative law judges and atomic safety and licensing boards, and perform other appellate functions in (a) proceedings on applications for licensing of production and

1/ Includes \$403,000 for the FY 1980 pay raise supplemental and \$1,425,000 for the FY 1980 program supplemental.

2/ Includes 8 personnel in FY 1981 converted to full time permanent with corresponding comparability adjustments in FY 1979 & FY 1980.

PROGRAM TECHNICAL SUPPORT - continued

utilization facilities (under 10 CFR Part 50), and (b) such other licensing proceedings as the Commission may specify. In addition, these Appeal Boards perform such other regulatory functions as may be delegated to them by the Commission.

Members of an Appeal Board for a particular proceeding are assigned from the Atomic Safety and Licensing Appeal Panel, the members of which are designated by the Commission. The Panel is organizationally separate from the Atomic Safety and Licensing Board Panel. The Appeal Panel's activities and the assignment of Panel members to serve in particular proceedings are responsibilities of the permanent Chairman and, in his absence, of the permanent Vice Chairman. The FY 1980 Appeal Panel staff totals 15 and remains unchanged in FY 1981.

- d. The Office of the Executive Legal Director (ELD) is responsible for providing advice and services to the Executive Director for Operations and the NRC programmatic and support offices which report to that official. ELD responsibilities include providing legal representation for the NRC staff in administrative proceedings involving the licensing of nuclear facilities and materials, enforcement actions and rulemaking. In addition, ELD is responsible for providing legal advice and services with respect to such matters as health and safety, environmental impact and antitrust aspects of licensing and regulation; research programs; general agency administration, including contracts, patents, personnel, security and labor relations; safeguards and waste management programs; and the export/import licensing program.

The diverse responsibilities of ELD are performed by five divisions: Hearing Division, Antitrust Division, Regulation Division, Rulemaking and Enforcement Division and the Operations and Administration Division. In FY 1981, the ELD staffing level reflects a net increase of eight positions over the FY 1980 staffing level of 98. Two of these positions will be assigned to the Regulations Division to deal with growth in high and low level waste management and international export and safeguards matters. Two positions will be assigned to Rulemaking and Enforcement to accommodate a projected increase in enforcement and civil penalty matters, petitions for actions against licensees and rulemaking matters. Three positions will go to Operations and Administration to accommodate workload increase in personnel, labor and EEO matters and related hearing activity. One position will be assigned to the Program Support Branch to cover new support activities.

- e. The Office of State Programs (OSP) was established in 1976 to develop and direct a program of cooperation and liaison with States, local governments and interstate organizations; administer the State Agreements Program under section 274 of the Atomic Energy Act of 1954, as amended; provide guidance, training and assistance to State and local governments in radiation control and radiological emergency response planning and operations; coordinate the development of an NRC national emergency action plan; and cooperate with other NRC offices and U. S. Government agencies having State and interstate responsibilities.

The functions of the office fall into three program areas: (1) State Program Development. Assist the Commission in formulating policies involving NRC/State cooperation and liaison; conduct national conferences, workshops and administrative and contractual programs for coordinating and integrating Federal and State regulatory responsibilities involving the streamlining of the licensing process, the transport of radioactive materials, safeguarding public health and safety, the decommissioning of nuclear facilities, the storage and disposal of radioactive waste materials and the identification and resolution of technical problems involving uranium mills and mill tailings; maintain liaison with and provide guidance and support to State, interstate regional and quasi-governmental organizations, NRC offices and other U. S. Government agencies on nuclear regulatory matters; and monitor nuclear-related State legislation.

(2) State Agreements. Administer the State Agreements program in which 26 States are exercising regulatory responsibility for certain classes of radioactive materials; conduct annual reviews of State radiation control programs, provide annual training for State radiation control personnel, and render technical assistance to the Agreement States to ensure adequacy and compatibility with NRC standards; negotiate with and assist in qualifying other States to enter into agreements with NRC and administer the Uranium Mill Tailings Radiation Control Act of 1978.

(3) Emergency Preparedness. Carry out NRC's lead agency responsibilities in providing leadership and management for the Federal Interagency Radiological Emergency Response Planning and Preparedness Assistance Program for State and Local Governments; publish technical guidance in many areas of radiological emergency response planning, including instrumentation guidance, accident scenarios to test emergency plans, protective action guides, radioprotective

PROGRAM TECHNICAL SUPPORT - continued

prophylaxis, and radioactive materials transportation emergency planning; train State and local government personnel, including emergency medical services personnel, to establish an adequate radiological emergency response posture in support of fixed nuclear facilities and the transportation of radioactive materials.

The FY 1981 request reflects an increase of 11 positions over the FY 80 level of 28. Three of these positions will be utilized to assist in the expanding Agreement State program and in the administration of the Uranium Mill Tailings Radiation Control Act of 1978; two positions will provide State liaison officers for two additional NRC regional offices, bring the total to four; the remaining six positions will be applied to the emergency preparedness function to assist in the review and approval of State emergency response plans. It should be noted that discussions are currently underway between NRC and FEMA on the possible transfer of some NRC resources to FEMA in order to consolidate the emergency preparedness function in one federal agency.

- f. The Office of International Programs (OIP) is responsible for negotiation and implementation of regulatory and safety information exchange agreements with other countries, licensing the import and export of nuclear materials and nuclear facilities, NRC nonproliferation and international safeguards policy planning, analysis and coordination, and providing direct program support for all NRC international activities.

Major objectives of OIP are to improve public health and safety by assuring timely U. S. access to operating data and safety research information from foreign nuclear activities, especially that which concerns foreign nuclear facilities of U. S. design or bears on current regulatory decisions in the U. S.; to provide to other countries on a reciprocal basis the benefit of NRC nuclear safety experience, including, in particular, information pertaining to the design and operation of exported U. S. reactors; to comprehensively and carefully review export and import license applications for nuclear materials and equipment to ensure that such exports and imports will not adversely affect U. S. national security; and to develop and implement NRC policy in support of U. S. goals concerning nonproliferation, the strengthening of international safeguards and other controls against misuse of exported U. S. nuclear materials and equipment.

OIP, with technical support from and in coordination with NMSS, will develop NRC's contributions to U. S. government international safeguards and physical security policy on measures to detect,

deter, and prevent diversion and theft of nuclear material exported from the United States. OIP is also responsible for NRC's interagency liaison on the implementation of the US/IAEA Safeguards Agreement, which was submitted to the Senate for consideration in February 1978.

The FY 1981 staff request reflects an increase of four positions above the FY 1980 level of 31. This increase is largely due to the expanded export licensing responsibilities which the NRC was required to assume with passage of the Nuclear Nonproliferation Act. This Act required NRC to assume a greatly expanded licensing function for a wide variety of exported nuclear components some of which were previously licensed under authority of the Department of Commerce and the Department of Energy and to consult formally on exports licensed by other U. S. Government agencies. In further support of NRC's export licensing responsibilities, OIP is expanding efforts in the areas of international safeguards and physical security, and in health and safety cooperation with developing countries which import U. S. nuclear materials and equipment. OIP is also taking additional steps to help ensure that data on foreign abnormal reactor operating occurrences are available to be factored into NRC's domestic safety program.

- g. Office for Analysis and Evaluation of Operation Data (AEOD). Largely in response to TMI and the GAO and Kemeny Commission recommendations, NRC has created a new Office for Analysis and Evaluation of Operational Data (AEOD) and is expanding its operating data analysis function for all licensees. The function of this new office will be to gather, collate, analyze, and disseminate information received from all licensed facilities with particular emphasis on operating reactors and to assess the safety implications such data has for regulatory policies and procedures. Both the amount of data received and the complexity of the analyses and evaluations are increasing significantly. The FY 1980 revised base (including supplemental) of 18 positions for this office is increasing by 2 positions in FY 1981 to accommodate the expanding workload.

(Dollars in Thousands, except whole dollars in narrative material)

NUCLEAR REGULATORY COMMISSION - continued

Program Direction and Administration..... \$38,057

SUMMARY OF PROGRAM DIRECTION AND ADMINISTRATION ESTIMATE BY FUNCTION

	Actual FY 1979	Estimate FY 1980 1/	Estimate FY 1981
Personnel Compensation	\$17,864	\$20,198	\$21,660
Personnel Benefits	1,576	1,913	2,079
Program Support	1,422	2,603	2,537
Administrative Support	7,236	9,345	10,916
Travel	385	915	865
Total Program Costs	\$28,483	\$34,974	\$38,057
Personnel	(708) 2/	(740) 2/	(753) 2/

Program Direction and Administration offices provide overall policy direction, resource management, administration and logistic support, and includes the staff offices of the Commissioners and the Executive Director for Operations as shown below:

<u>The Commission:</u>	<u>EDO:</u>
Commission	EDO
Secretary	Equal Employment Opportunity
General Counsel	Controller
Policy Evaluation	Management and Program Analysis
Inspector and Auditor	Administration
Congressional Affairs	
Public Affairs	

a. The Office of the Commissioners (OCM) is the governing body which must exercise the overall NRC responsibilities of the Energy Reorganization Act of 1974 and the Atomic Energy Acts of 1946 and 1954, as amended. This body provides fundamental policy guidance and administration and management direction necessary to assure that the civilian use of nuclear energy is developed in a manner consistent with the public health and safety, environmental quality, national security and antitrust laws. No staff increases are requested above the FY 1980 level of 31 people, however, OCM is requesting a \$500,000 increase in program support to initiate a pilot intervenor funding program in FY 1981.

b. The Office of the Secretary (SECY) develops policies and

procedures for complete secretariat services for the conduct of Commission business and implementation of Commission decisions; advises and assists the Commission and staff on the planning, scheduling and conduct of Commission business; prepares for and records Commission meetings in accordance with requirements of the Sunshine Act; provides senior-level management and administrative guidance on preparation and submission of Commission staff papers to include monitoring the status of all items requiring action; maintains a forecast of matters for future Commission consideration; processes and controls institutional correspondence; maintains the Commission's official records; controls the handling and service of documents issued and received in all adjudicatory matters and public proceedings; coordinates protocol activities at the Commission level; maintains liaison with and support for the Atomic Safety and Licensing Board Panel, Atomic Safety and Licensing Appeal Panel and the Advisory Committee on Reactor Safeguards; performs services of the Federal Advisory Committee Management Officer; operates a reproduction facility; administers the NRC Historical Program; operates the classified document control system for the Commissioners; provides personnel, administrative and logistical support services to the Commission and other NRC offices located in Washington, D. C.; and supervises and administers the NRC Public Document Room, which is organized to maintain and provide to the public regulatory information, reference services and access to docket material pertaining to NRC regulatory and adjudicatory activities.

1/ Includes \$977,000 for the FY 1980 pay raise supplemental and \$525,000 for the FY 1980 program supplemental.

2/ Includes 136 personnel in FY 1981 converted to full-time permanent with corresponding comparability adjustment in FY 1979 and FY 1980.

PROGRAM DIRECTION AND ADMINISTRATION - continued

The FY 1981 staffing level for the Office of the Secretary shows no increase above the FY 1980 level of 42 positions.

- c. Office of the General Counsel (OGC) is the chief legal advisor to the Commission. The General Counsel provides legal opinion, advice, and consultation to the Commission in connection with the quasi-judicial responsibilities of the Commission and in the development of substantive policy matters. It represents the Commission in matters relating to litigation and, in cooperation with the Department of Justice, represents the Commission in court proceedings affecting the the NRC program in the Federal District Courts. It represents the Commission, unassisted by the Department of Justice, in Courts of Appeal proceedings to review Commission orders. The office also provides legal advice with respect to legislative matters of concern to NRC, including drafting of legislation, preparation and review of testimony, and preparation and transmission of statements of views requested on proposed legislation.

In response to a significant increase in workload related to suits for regulatory actions from the public, expanded legislative review, resolution of numerous unresolved legal issues, and a variety of other legal matters, OGC is requesting one position increase over the FY 1980 staffing level of 26.

- d. Office of Policy Evaluation (OPE) advises the Commission on a broad range of substantive policy matters to enhance the information base on which Commission decisions are made. The office provides the Commission with an independent evaluation of program policy objectives; reviews staff papers, provides independent technical evaluation of issues presented to the Commission, including cases under adjudication, and contributes technical and policy advice for projects being conducted and managed by other NRC offices for outside agencies. The FY 1981 staffing level remains unchanged from the FY 1980 level of 18.

- e. Office of Inspector and Auditor (OIA) functions as the Agency Inspector General and is responsible for developing policies and standards that govern the financial and management audit program, including planning and directing the long-range comprehensive audit program, as well as conducting day-to-day internal audit activities; conducting investigations and inspections, as necessary, to ascertain and verify the facts with regard to the integrity of all operations, employees, organizations, programs and activities; referring suspected or alleged criminal violations to the Department of Justice; administering the Commission's "Open Door" policy; serving as point of contact with the General Accounting Office (GAO) and maintaining liaison

with GAO, the Department of Justice and other audit and law enforcement agencies.

The objective of OIA is to provide the Commission with an independent review and appraisal of programs and operations to assure that responsibilities are discharged with effectiveness and efficiency, and to provide a capability to verify facts to assure continued maintenance of the highest standards of integrity of all NRC organizations, programs and activities.

OIA is involved in a wide variety of activities leading to the issuance of audit reports and memoranda related to NRC operations and activities. Typically these activities involve coordination with the General Accounting Office, interviews with NRC and industry officials, visits to utilities (reactor licensees), steam supply system vendors, architect engineers, reactor sites, and fuel fabrication facilities. In addition, the office is responsible for conducting a significant number of investigations and referring items, when appropriate, to the Department of Justice. In all of OIA's activities, a continuous effort is made to eliminate waste, fraud, and error. The FY 1981 staff reflects no increase above the FY 1980 level of 28 positions.

- f. The Office of Congressional Affairs (OCA) assists and advises the Commission and senior staff on Congressional matters, coordinates interagency Congressional relations activities and is the principal liaison for the Commission with Congressional committees and members of Congress.

The primary objective of the office is to assure that the Congress is kept fully and currently informed of NRC activities as required by Section 202 of the Atomic Energy Act of 1954, as amended. The office seeks to assure that individual members of Congress are kept currently and adequately informed of significant NRC licensing activities that impact on their respective states and districts. Additionally, the office provides the Commission and senior NRC staff with relevant and current information as to major legislative activities likely to effect NRC.

The FY 1981 staffing level remains unchanged from the FY 1980 level of 9 people.

- g. Office of Public Affairs (OPA) activities can be broken down into three broad categories. These categories are: (1) issuance of public announcements both from headquarters and

PROGRAM DIRECTION AND ADMINISTRATION - continued

the regional offices; (2) responding to telephone inquiries from the news media and the public; and (3) responding to letters from the media and the public, including the bulk of the NRC referrals from the White House. In addition, OPA arranges press conferences in the Washington area and in the vicinity of nuclear facilities, and coordinates requests for Commission speakers before civic groups and other organizations interested in the role of the NRC. The office also assists the licensing boards, the appeal boards and the ACRS at the hearings and meetings in which a high degree of public and press interest is evidenced.

In light of the unparalleled growth in office workload as a result of increased public concern over nuclear power, OPA is requesting a one position increase over the FY 1980 staffing level of 18 positions.

- h. The Executive Director for Operations (EDO) is responsible for supervision and coordination of policy development and operational activities of both line and staff offices and for implementation of the Commission's policy directives pertaining to these offices. The office consists of the EDO and his immediate staff and the Administrative and Correspondence Branch which is responsible for the EDO correspondence system including the assignment, review, and coordination of all correspondence. The FY 1980 staffing level of 13 remains unchanged in FY 1981.
- i. The Office of Equal Employment Opportunity (EEO) is responsible for defining the procedures and practices necessary to attain and maintain equal employment opportunity within the NRC. The office develops and prepares the agency's Affirmative Action Plan, advises and assists on recruitment plans and provides investigation of discrimination complaints when necessary.

Major objectives of the office are to emphasize a program that will increase employment of minorities and women in the agency; provide interaction with community groups concerned with equal opportunities for minorities and women; promote continued growth of the Upward Mobility Programs; provide training in Equal Employment Opportunity awareness for NRC managers and supervisors; and assure a climate for improved employee morale by promoting and maintaining EEO counseling activities and supporting advisory committees made up of special emphasis groups.

The FY 1981 staffing level of six reflects an increase of two positions over FY 1980. This increase is necessitated by growth in EEO workload internally and by increased efforts with respect to compliance activities pertaining to Title VI recipients and others

subject to NRC regulation.

- j. The Office of the Controller (CON) provides the budgetary and fiscal management organization for the NRC, including the development and maintenance of a financial control system and a system of accounting designed to conform to the standards prescribed by the Comptroller General. It provides resource planning and evaluations to assess the relationship between program workload and resource allocation, develops manpower standards, evaluates overhead ratios, and provides work measurement analyses.

In FY 1979 and FY 1980 the computerized multi-year Zero Base Budgeting system was modified to enable greater flexibility for generating ZBB data. Productivity increases continue to accommodate the increasing workload within the Division of Accounting, although some backlogs are still anticipated. Nonetheless, the FY 1981 staffing level of 68 remains unchanged.

- k. The Office of Management and Program Analysis (MPA) provides management data and analyses for a variety of users within the NRC and is the office responsible for developing and maintaining most of the agency's key management information systems. Organizationally, MPA is divided into two divisions: (1) the Division of Information, Analysis and Planning which consists of the Internal Information Systems Branch; the Analysis and Planning Branch; and the Special Projects Branch and (2) the Division of Technical Support which is made up of the Automated Systems Branch; the Licensee Operations Evaluation Branch; and the Applied Statistics Branch. MPA provides analyses and management information for the EDO and other offices through studies and evaluations on a wide variety of subjects of interest to NRC management.

Much of the analytical effort within MPA involves program and management issues, and long and short-range planning studies. Additionally, MPA is a central source for statistical analysis. The office also produces Congressionally mandated reports such as: the NRC Annual Report including the Report on Domestic Safeguards and Abnormal Occurrence Reports. The FY 1980 staffing level of 76 remains unchanged in FY 1981.

- l. The Office of Administration (ADM) is responsible for personnel administration; security and classification; document control; agency-wide training; facilities and materials license fees; contracting and procurement; transportation services; telecommunications; administration

(Dollars in Thousands, except whole dollars in narrative material)

PROGRAM DIRECTION AND ADMINISTRATION - continued

of Freedom of Information requests; centralized automatic data processing; printing and reproduction; records management; Privacy Act requests; and a variety of other housekeeping functions as well as support for 152 local public document rooms.

The substantive work of ADM is performed by the Management Development and Training Staff, the License Fee Management Branch and seven divisions: Organization and Personnel, Security, Facilities and Operations Support, Technical Information and Document Control, Automatic Data Processing, Rules and Records, and Contracts.

Nine additional positions above the FY 1980 staffing level of 407 positions are requested for FY 1981. In a recent report, the General Accounting Office criticized the agency for over-reliance upon sole source contracting. The GAO concluded that NRC's historical level of 65% sole source contracts could and should be improved. It is estimated that an average competitive procurement consumes four times the amount of time a contract specialist would need to complete a non-competitive action. Six positions are requested for the Division of Contracts to enable the Commission to increase the percentage of competitive procurements. This additional staffing will also permit more effective contract administration and reduction in the number of completed contracts requiring close-out. Two Personnel Management Specialist positions are requested to provide accelerated staffing and placement services as well as concentrated implementation of the Civil Service Reform Act. Also, one permanent position is requested to handle (i.e., receive, account for, process, disseminate and otherwise safeguard) the continuously growing volume of agency intelligence-related security documents.

U. S. NUCLEAR REGULATORY COMMISSION

FY 1981 Budget Estimates

(Dollars in Thousands, except whole dollars in narrative material)

ALL PROGRAMS - NRC DIRECT EMPLOYMENT

Year-end strengths and average employment for permanent full-time employees and total personnel compensation and benefits by programs are shown in the tables below.

The bases for the increases in year-end strengths are described in the respective narrative justification.

EMPLOYMENT AND PERSONNEL COMPENSATION AND BENEFITS

Program	Actual FY 1979				Estimate FY 1980				Estimate FY 1981		
	End Strength	Av. Full Time	Obligations		End Strength	Av. Full Time	Obligations		End Strength	Av. Full Time	Obligations
Nuclear Reactor Regulation	605	605	22,432	.	722 3/	663	26,649	.	722	722	29,844
Standards Development	134 2/	136	5,065	.	160	145	6,267	.	161	160	6,653
Inspection and Enforcement	727	710	22,559	.	874	800	27,017	.	947	910	32,484
Nuclear Material Safety and Safeguards	263	268	9,012	.	313	288	10,950	.	335	324	12,527
Nuclear Regulatory Research	154	153	6,086	.	154	159	6,865	.	176	171	7,562
Program Technical Support	250	243	8,294	.	267	258	9,267	.	294	280	10,741
Program Direction and Administration	708	636	19,440	.	740	724	22,111	.	753	746	23,739
TOTAL NUCLEAR REGULATORY COMMISSION	2,841 4/	2,751	92,865	.	3,240 4/	3,037	109,126 1/	.	3,390 4/	3,313	123,550

1/ Includes \$4,810,000 for the proposed FY 1980 pay raise supplemental and \$49,200,000 for the proposed program supplement.

2/ Includes equivalent 4 full-time personnel accomplished by 6 part-time personnel.

3/ Includes 4 personnel temporarily assigned to the U.S. Army Corps of Engineers.

4/ Includes 146 personnel in FY 1981 converted to full-time permanent with corresponding comparability adjustments in FY 1979 and FY 1980.

U. S. NUCLEAR REGULATORY COMMISSION

FY 1981 Budget Estimates

(Dollars in Thousands, except whole dollars in narrative material)

NRC DIRECT TRAVEL

	Actual FY 1979	Estimate FY 1980	Estimate FY 1981
Nuclear Reactor Regulation	\$ 1,053	\$ 1,305	\$ 1,230
Standards Development	173	250	240
Inspection and Enforcement	3,193	3,455	4,520
Nuclear Material Safety and Safeguards	352	494	630
Nuclear Regulatory Research	330	480	580
Program Technical Support	637	920	1,135
Program Direction and Administration	385	915	865
Total	\$ 6,123	\$ 7,819	\$ 9,200

The NRC estimate for travel covers the cost of official travel for Government employees while discharging assigned duties away from their official duty stations. The travel costs reflect the travel of NRC permanent full-time employees, NRC intermittent employees such as members of advisory groups, members of boards and panels, individual consultants, and NRC trainees.

A majority of the travel is required in connection with inspection responsibilities of licensee facilities by IE personnel working out of five regional offices; by NRR and NMSS licensing offices in

examination and oversight of all commercial reactor and fuel cycle facilities; coordination with DOE offices and contractors and travel associated with the health, safety and compliance function of the Advisory Committee on Reactor Safeguards and the Atomic Safety and Licensing Board Panel.

A significant portion of the planned travel is required to maintain technical and administrative supervision of Commission programs, and to provide for attendance of NRC personnel at necessary domestic and foreign meetings.

U. S. NUCLEAR REGULATORY COMMISSION

FY 1981 Budget Estimates

(Dollars in Thousands, except whole dollars in narrative material)

LEGISLATIVE PROGRAM PROJECTIONS

	<u>Actual</u> <u>FY 1979</u>	<u>Estimate</u> <u>FY 1980</u>	<u>Estimate</u> <u>FY 1981</u>	<u>Estimate</u> <u>FY 1982</u>	<u>Estimate</u> <u>FY 1983</u>	<u>Estimate</u> <u>FY 1984</u>	<u>Estimate</u> <u>FY 1985</u>
NRC Total							
Budget Authority	\$ 326	\$ 417 <u>1/</u>	\$ 468	\$ 481	\$ 477	\$ 480	\$ 480
Budget Outlays	309	351 <u>1/</u>	433	445	441	444	444

1/ Budget Authority includes \$4,810,000 for the proposed pay raise supplemental. Budget Outlays associated with this supplemental total \$4,680,000. Also, related to the program supplement, includes \$49,200,000 Budget Authority and \$6,000,000 Budget Outlays.