NUREG-0503

U. S. NUCLEAR REGULATORY COMMISSION
BUDGET ESTIMATES
FISCAL YEAR 1980

APPROPRIATION: SALARIES AND EXPENSES

BUDGET ESTIMATE FOR

U. S. NUCLEAR REGULATORY COMMISSION

FISCAL YEAR 1980

INDEX

U. S. NUCLEAR REGULATORY COMMISSION
FY 1980 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 1980 provide for obligations of $373,300,000 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 on pages 9 through 12.

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 license fee program and indemnification fees to Miscellaneous Receipts of the Treasury. FY 1980 revenues from this source are estimated at $20,300,000 as compared with $22,300,000 in FY 1979.

The following table summarizes the total obligations for NRC's Direct and Reimbursable Programs for FY 1978, FY 1979 and FY 1980. 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 1978	Estimate FY 1979	Estimate FY 1980
Nuclear Reactor Regulation	$ 42,580	$ 47,514	$ 57,040
Standards Development	11,979	14,377	14,270
Inspection and Enforcement	32,805	38,926	41,200
Nuclear Material Safety and Safeguards	23,662	26,279	29,605
Nuclear Regulatory Research	140,823	160,300	185,570
Program Technical Support	12,117	14,022	14,925
Program Direction and Administration	23,733	29,988	30,690
Total Obligations - Direct Program	$287,699	$331,406	$373,300
Reimbursable Program	554	750	900
Total Obligations	$288,253	$332,156	$374,200
Unobligated balance, start of year	-2,465	-4,805	0
Unobligated balance, end of year	4,805	0	0
Orders received from other Federal agencies	-570	-750	-900
Budget Authority	$290,023	$326,601 1/	$373,300

1/ Includes $4,300,000 for the proposed FY 1979 pay raise supplemental.

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

Financing of Obligations

The financing of the estimated total obligations of $373,300,000 proposed in the budget estimate for FY 1980 is summarized in the following table:

SUMMARY OF FINANCING

	Actual FY 1978	Estimate FY 1979	Estimate FY 1980
Sources of Funds Available for Obligations:			
Unobligated balance, beginning of year	$ 2,465	$ 4,805	$ 0
Appropriated to NRC	290,023	326,601 1/	373,300
Orders received from Federal sources	570	750	900
Total Funds Available for Obligations	$293,058	$332,156	$374,200
Less: Unobligated balance, end of year	-4,805	0	0
Total Obligations	$288,253	$332,156	$374,200

1/ Includes $4,300,000 for the proposed FY 1979 pay raise supplemental.

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

Outlays for Salaries and Expenses

Outlays for 1980 are estimated at $345,285,000. 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 1978	Estimate FY 1979	Estimate FY 1980
Unexpended balance, beginning of year:			
Obligated	$107,538	$124,344	$150,435
Unobligated	2,465	4,805	0
Appropriation to NRC	290,023	326,601 1/	373,300
Total Funds Available for Outlays	400,026	455,750	523,735
Unexpended balance, end of year:			
Obligated	-124,344	-150,435	-178,450
Unobligated	-4,805	0	0
Total Outlays	$270,877	$305,315	$345,285

1/ Includes $4,300,000 for the proposed FY 1979 pay raise supplemental.

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

SUMMARY OF BUDGET

OBLIGATIONS BY FUNCTION

	Actual FY 1978	Estimate FY 1979		Estimate FY 1980
Direct Program				
Personnel Compensation	$ 77,172	$ 86,880		$ 92,140
Personnel Benefits	7,360	8,280		8,720
Program Support	164,652	187,430		220,970
Administrative Support	25,787	33,076		34,100
Travel	5,378	6,720		7,320
Equipment	7,350	9,020		10,050
Total Obligations - Direct Program	$287,699	$331,406	1/	$373,300
Reimbursable Program	554	750		900
TOTAL OBLIGATIONS	$288,253	$332,156		$374,200

1/ Includes $4,300,000 for the proposed FY 1979 pay raise supplemental.

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 $12,500); reimbursement of the General Services Administration for security guard services; hire of passenger motor vehicles and aircraft; $373,300,000, 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 1980 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

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 therefor 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. 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 1980 Budget Highlights - Major emphasis in FY 1980 will be directed toward issuing power plant license applications on a timely basis; decreasing the backlog of operating reactor licensing amendments; resolving generic safety issues; developing an integrated framework of regulations, standards and guides for licensing nuclear waste repositories; conducting light water reactor safety research; assisting states in performing their emergency preparedness and regulatory roles; and, reviewing import and export licenses toward the enhancement of international nuclear safety and safeguards.

Although the rate of growth in the nuclear industry has slowed, we estimate that there will be some 84 nuclear power plants licensed to operate by the end of FY 1980, compared to the 70 plants currently licensed. In addition to the 70 plants now on line, 124 plants have been issued construction permits or are under construction permit review. As more plants come on line, feedback from expanded operating experience increases the number of licensing actions that are required for operating reactors. In addition, due to a variety of factors, such as the increased number of contested hearings, the resources required to complete action on applications for a construction permit (CP) and operating license (OL) have increased sharply in recent years.

The NRC has been using risk assessment techniques to augment engineering judgments in determining priorities for the resolution of safety issues. Highest priority has been allocated to those issues where resolution would have the greatest impact on the overall level of safety. As a result of this effort, emphasis will be focused on and largely limited to tasks of major safety significance during FY 1980.

Our request for budget authority amounts to $373 million with outlays estimated at $345 million. The funding increases over FY 1979 are attributable primarily to the generally higher cost of doing business and to the first full year of funding for operation of the Loss-Of-Fluid-Test (LOFT) facility. In FY 1979 the operating cost of LOFT was shared by NRC and DOE. The cost of operating this facility in FY 1980 will be solely the responsibility of the NRC. The first LOFT test with a nuclear core in operation was accomplished on December 9, 1978.

The NRC has entered into an agreement with Japan and the Federal Republic of Germany (FRG) to perform large-scale tests to measure three-dimensional flow effects in the core of a pressurized water reactor during a loss-of-coolant accident. This program will make use of planned facilities in Japan and the FRG and advanced computer codes and instrumentation developed in the U. S. In FY 1980, fabrication of the two-phase flow instrumentation for the core, vessel and loops for the test in Japan and the upper plenum test in the FRG will be completed.

In waste management, NRC has published for public comment a proposal for licensing procedures for high-level waste disposal facilities. The proposal is composed of a two-step licensing process, much like that for power reactors, in which most issues would be resolved prior to initiating construction, with a second review being conducted prior to actually placing waste in the facility. Major efforts in 1980 will be devoted toward establishing the necessary framework for licensing a bedded salt repository. This involves closely monitoring the Department of Energy's research and development activities while at the same time maintaining regulatory independence. In FY 1980 NRC plans to issue proposed regulations relating to high-level waste classification, form and packaging, as well as on repository siting and design issues.

NRC's participation in the development of State nuclear regulatory programs continues to expand. NRC provides training and technical assistance to the states and conducts in-depth reviews of local programs to ensure they are adequate to protect public health and safety. The emergency preparedness program which is conducted by the Office of State Programs is providing an increased level of technical support to State and local governments in emergency response procedures and the development of local operational capabilities to deal with radiological emergencies. This increased support is being supplied in response to a continuously growing interest by the states in this area.

NRC's regulatory responsibilities have been increased as a result of the provisions of the March 1978 Nuclear Non-Proliferation Act. In addition to more intensive reviews of export cases from a non-proliferation standpoint, the act requires NRC to asssume additional export licensing responsibilities which have been transferred from other U.S. Government agencies. Additionally the Act requires an increase in consultation responsibilities between NRC and other U.S. agencies regarding nuclear export matters. The total number of export licenses issued by NRC is projected to increase from 445 in FY 1978 to 755 in FY 1982.

NRC has also responded to the increased attention being given to the potential health, safety, and environmental effects of U.S. nuclear exports. NRC has expanded its programs of safety and regulatory cooperation directed toward providing advice and assistance to the safety authorities of countries initiating nuclear power programs.

The highlights addressed above are described in more detail in subsequent pages. The NRC is pursuing measures to improve the regulatory process in a number of dimensions, as well as increasing the internal effectiveness and overall efficiency of NRC programs and resource management. In this context there follows a brief description of each of NRC's major programs:

Nuclear Reactor Regulation - The assurance of adequate safety, environmental protection, and safeguards in the issuance of construction permits (CP), operating licenses (OL), and making changes to operating licenses of nuclear power plants continue to be the primary responsibilities of this program. A major objective in 1980 will be to decrease the backlog of operating reactor licensing actions and generic safety issues.

In addition to the regulatory effort associated with operating reactors, special analyses will be accomplished to assure that operating reactors which were issued operating licenses prior to 1969 continue to operate safely. Minimizing licensing time through employment of standard review plans, resolution of generic technical problems, and standardized plant designs will continue as a primary objective in 1980.

Standards Development - New engineering standards will include work in the areas of qualification of equipment inservice inspections and testing, management and disposal

of radioactive waste, decommissioning, transportation of radioactive materials in urban areas, and consumer and industrial products containing radioactive materials. Site and health standards work will include the facilitation of early site reviews, completion of an effective rule for the licensing of high level waste management facilities (10 CFR 60), issuance of guidance for maintaining radiation worker exposures as low as reasonably achievable, a comprehensive review of the data base on biological effects of low-level radiation exposure, and safeguards standards for physical protection and material control. There will be a continuing increase of effort being applied to maintenance of existing standards to reflect the current state of the technology, operating experience, changes in licensing requirements, and research results. Efforts will continue to support expediting the regulatory process, to more thoroughly evaluate the value and impact of standards, to assure safety and eliminate unnecessary requirements, and to seek greater and more timely public involvement in the standards development process. 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 development of regulatory standards for nuclear power plant safety.

Inspection and Enforcement - In FY 1980, NRC will increase the number of power plant safety inspections in consonance with the projected growth in the number of operating reactors and reactors under construction. The inspection and enforcement program constitutes the principal field effort of the NRC. In addition, NRC will continue implementing the Revised Inspection Program. This program includes the resident inspection program which assigns an NRC inspector to each operating reactor site, selected reactor sites under construction, and to selected fuel cycle facilities. Full implementation of this program is expected in FY 1981. The vendor and contractor program, which is an important and integral part of the reactor construction inspection program, will continue at the FY 1979 level. Safety inspections of radioisotope materials licensees and fuel cycle facilities will increase in FY 1980 commensurate with the projected growth in the numbers of licensees and facilities. Although the overall safeguards program will remain essentially the same in FY 1980, more comprehensive safeguards regulations developed for reactors, fuel cycle facilities and materials shipments will be implemented.

Nuclear Material Safety and Safeguards - The regulatory issue at the NRC of paramount concern to the industry is radioactive waste management, specifically, the disposal of high-level waste and spent fuel. In FY 1980, NMSS will continue to focus management attention on this important area of our responsibility to establish a process and associated regulatory base for licensing High-Level Waste disposal facilities within the framework of the National Nuclear Waste Management Program.

Other items of interest in the FY 1980 NMSS program include: increased activity in fuel cycle facility licensing, a new initiative for review of DOE remedial actions related to inactive mill tailings sites, increased activity in security and accountability evaluation relating to nuclear exports as required by the Nuclear Non-Proliferation Act of 1978, and a major effort in improving material control and accounting regulations.

Nuclear Regulatory Research - The objective of the research program is the developement of analytical methods that can be used to assess margins of safety for nuclear power reactors, both as regards the adequacy of engineering designs to prevent accidents as well as to predict the course of events that could occur in accidents. Emergency core cooling system experiments for Light Water Reactors will require increased funding in FY 1980 to maintain the program which includes the first full year of LOFT nuclear testing. In addition, many of the experiments initiated in prior years will yield

NUCLEAR REGULATORY COMMISSION - continued

meaningful data which must be reduced and analyzed. Site safety research to define with greater precision the potential hazards to nuclear facilities of natural phenomena such as earthquakes and tornados, and waste management efforts will receive increased attention. Environmental, fuel cycle, and safeguards research will be continued to assure information for evaluating nuclear facility license applications. The advanced converter safety assessment program will be phased down during FY 1979 and no research effort is planned for FY 1980.

Program Technical Support - The organizations in this program (ACRS, Boards and Panels, Executive Legal Director, and International and State Programs), directly support the overall missions of the Commission. In addition to the activities associated with the licensing applications for new reactors, in FY 1980, increased efforts will be applied to operating license amendments, waste management matters, legal support for an expanded enforcement program, enrichment facility applications, training of State employees in emergency preparedness, developing and approving more State radiological emergency response plans, reviews of import/ export licenses, consummating international reactor safety and regulatory information exchange agreements, and strengthening physical security and safeguards worldwide.

Program Direction and Administration - The offices under this category indirectly support the missions of the Commission and provide financial, administrative and logistic support. Last year a document retrieval system was initiated and in FY 1980 the system is scheduled to become operational. The system is designed to provide an automated remote-access system that will enable multiple users to simultaneously search, locate, and examine documents centrally stored in microfiche form, thereby providing efficiencies in time utilization. We have also recently consolidated four organizational units into the Office of Management and Program Analysis to provide for greater organizational efficiency.

Personnel Overview - The NRC is requesting an increase in permanent personnel of 108 over the FY 1979 level for a new ceiling of 2,896. About 80% of this increase is associated with review of operating reactors and development of licensing amendments; more detailed and extensive reviews of applications for construction permits, operating licenses, and standard designs; and the resolution of generic safety issues. The remainder of the increase is to provide for continuation of the revised inspection program (inspectors located at the sites) which was implemented last year, additional effort in waste management, increased workload in import/export licensing matters, legal support at hearings and for court litigation proceedings and for providing additional assistance to State reguatory programs.

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

NUCLEAR REGULATORY COMMISSION - continued

Nuclear Reactor Regulation $57,040

Summary of Nuclear Reactor Regulation Estimates by Function

	Actual FY 1978	Estimate FY 1979 1/	Estimate FY 1980
Personnel Compensation	$19,421	$21,430	$24,235
Personal Benefits	1,851	2,040	2,300
Program Support	14,417	15,540	21,151
Administrative Support	5,931	7,454	8,185
Travel	960	1,050	1,169
Equipment	-	-	-
Total Obligations	$42,580	$47,514	$57,040
Personnel	605	631	716

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 1978		Estimate FY 1979		Estimate FY 1980	
	Dollars	People	Dollars	People	Dollars	People
Operating Reactors	$2,822	132	$3,342	166	$5,000	193
Systematic Evaluation of Operating Reactors	467	16	1,088	32	1,200	32
Safeguards	825	16	800	18	970	16
Casework	4,854	203	4,962	222	7,281	240
Technical Projects	4,182	152	4,318	126	5,985	167
Advanced Reactors	1,267	14	1,030	10	815	10
Standards Assistance	-	25	-	15	-	11
Training and Correspondence	-	30	-	23	-	28
Management Direction	-	17	-	19	-	19
Totals	$14,417	605	$15,540	631	$21,151	716

1/ Includes $1,060,000 for FY 1979 pay raise supplemental.

NUCLEAR REACTOR REGULATION - continued

The Office of Nuclear Reactor Regulation (NRR) performs the safety, safeguards, environmental and antitrust reviews of nuclear reactors prior to licensing. This office is charged with the responsibility for reviewing applications for construction permits (CPs), operating licenses (OLs), 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. Upgraded physical security, safeguards contingency, and emergency planning will be accomplished.
- 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 a 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. Seventeen issues addressed by twenty-two generic tasks in the NRC program have been identified 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. NRR is requesting an increase of 85 additional positions over its FY 1979 authorized strength of 631 positions. The majority of the personnel increases will be allocated to Operating Reactors (+27), Casework (+18) and Technical Projects (+41). The reasons for the increases will be to decrease the backlog of operating reactor amendment/licensing actions; additional staff to review the increased number of OL applications anticipated to be under review, and additional manpower for Technical Projects to address the generic issues. The increase in resources in FY 1980 will permit progress towards attaining objectives listed above while at the same time assuring that those nuclear power plants now operating and those due to come into operation will produce electricity safely, with acceptable environmental impact, and in accordance with antitrust regulations.

The following is a summary of the tasks necessary to accomplish the stated objectives:

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

NUCLEAR REACTOR REGULATION - continued

Operating Reactors..... FY 1978 = $2,822 (132) FY 1979 = $3,342 (166) FY 1980 = $5,000 (193)

NRR gives 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 include:

- 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. Evaluate other operating plants to determine the applicability of these problems as they arise and to assure that this concern will not result in unacceptable reductions of safety margins. If the safety margins are significantly reduced, take the necessary actions in a timely manner to reestablish those margins.

- 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.

- Continue to assure that operating experience is fed back into the licensing process.

- By FY 1980, NRR plans to develop and implement a program (1) to revise the current licensing approach for amendment/actions and thereby reduce the need for many license amendments and (2) revise the evaluation process to make the review of the amendment/actions more efficient. 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. (This effort is discussed further in the "Licensing Improvement" subtask in the "Casework" program and resources for this effort are included in that section.)

- By implementing the revised program for amendment/actions it is expected that the number of incoming FY 1980 actions will be reduced from the projected level of about 1300 to approximately 1000, and the average manpower to process an action will be reduced from 0.15 to 0.12 professonal man-years per action.

- Major actions in this task that we expect to complete in FY 1980 include core reloads, stretch power evaluations, implementation of 10 CFR 50.55a (inservice inspection) requirements, and spent fuel pool modifications. Also included are the implementation of the resolution of the following generic Category A issues A-2 (asymmetric blowdown loads on the reactor vessel), A-21 (main steam line break inside containment), A-35 (adequacy of offsite power systems), and A-39 (safety relief valve loads and temperature limits for BWR containments).

NUCLEAR REACTOR REGULATION - continued

- The existing amendment/actions that await final action will be completed by a combination of staff effort, contracting for technical support from contractor personnel for technical assistance and elimination of some administrative actions. About 800 licensing actions will be completed inhouse in FY 1979 and 950 in FY 1980. In addition, approximately 200 backlog actions will be resolved in FY 1979 and 335 actions in FY 1980 by contractual support from the national laboratories. Also, about 200 nonradiological (administrative) actions will be completed by the NRR staff by the end of FY 1979.

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 technical safety concerns at operating plants as they arise.
- Develop and implement a technical position on each problem and event and follow up by considering the applicability of the concern to all operating reactors. Modify the positions established to assure that plants of different designs take proper consideration of the concern and are being responsive to Regulatory requirements.
- Factor lessons learned from unexpected events back into the licensing process. Long term resolution of unanticipated problems will be handled as part of the normal NRR management process since further detailed assessment of the technical concern will be handled as part of the Technical Projects activity (see Technical Projects for further explanation).

	FY 1978	FY 1979	FY 1980
Systematic Evaluation of Operating Reactors	$467 (16)	$1,088 (32)	$1,200 (32)

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 has 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 SEP 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.

NUCLEAR REACTOR REGULATION - continued

- Phase II, the actual evaluation of the eleven oldest facilities, has commenced and is scheduled for completion by January 31, 1981.

- 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 review.

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 estabish 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.

- 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.

Safeguards.....

FY 1978	FY 1979	FY 1980
$825	$800	$970
(16)	(18)	(16)

The NRR reactor safeguards program is concerned with the physical security of nuclear reactors (power and nonpower). NRR is responsible for program development, licensing reviews and program evaluation of safeguards within the protected area at nuclear reactors.

As part of this program, all plants under licensing reviews must be evaluated against the requirements of 10 CFR 73.55 (Physical Protection of Nuclear Power Plants). NRR must also assure that overall Commission policy in the safeguards area is considered in the regulation of nuclear reactors. In FY 1980, NRR will implement safeguards requirements for nonpower reactors, codify criteria on guard training, and evaluate a proposed clearance program for onsite personnel. Also, NRR will continue to investigate existing and advanced methods for making nuclear reactors less vulnerable to sabotage. Effective interfaces with other NRC offices (NMSS, SD and RES) will be maintained in order to insure a coordinated and effective reactor safeguards program.

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

NUCLEAR REACTOR REGULATION - continued

Casework..... FY 1978 = $4,854 (203) FY 1979 = $4,962 (222) FY 1980 = $7,281 (240)

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 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 included in this unit to improve the licensing process by implementing, on a trial basis, new procedures aimed at increasing the efficiency and effectiveness of the staff in processing licensing actions. In addition, efforts are included in this unit to perform additional internal audits of the staff's reviews 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:

- CPs - Continue to recommend appropriate actions regarding CPs 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 the new cases tendered in FY 1980. 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 (SERs) six months after docketing an application. New CP applications received in FY 1980 will have a target review schedule of 24 months from docketing to decision date (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 CPs.

- OLs - 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 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.

NUCLEAR REACTOR REGULATION - continued

- 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).

The following table of accomplishments provides the number of licenses, permits or approvals that have been completed in FY 1978, are scheduled for completion in FY 1979, and are projected for completion in FY 1980.

	Licensing Actions* Completed in FY1978		Licensing Actions* Scheduled for Completion in FY1979		Licensing Actions* Projected for Completion in FY1980	
CP's	7	(15)	11	(20)	3	(5)
OL's	5	(5)	6	(6)	14	(14)
Standard Plant Designs	1	-	3	-	5	-
Early Site Reviews	1	-	1	-	2	-
LWA's	3	(6)	3	(5)	0	-

Technical Projects..... FY 1978 = $4,182 (152) FY 1979 = $4,318 (126) FY 1980 = $5,885 (167)

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

*Figures in ( ) represent the number of units.

NUCLEAR REACTOR REGULATION - continued

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, principally NMSS, with the exception of the Office of Standards Development, 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 generic technical tasks to develop technical positions on generic issues that relate to the safety, safeguards 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 in January 1978, NUREG-0410, "NRC Program for the Resolution of Generic Issues Related to Nuclear Power Plants"). Seventeen issues addressed by twenty-two generic tasks in the NRC program have been identified as "Unresolved Safety Issues" by the Commission and their progress is discussed in the 1979 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. Also included under the heading "Generic Issues" is effort expended to revise NRR's Standard Review Plan, effort for computer code development and maintenance, and effort for the performance of audit calculations of vendor analyses.

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 a timely manner.

*The NRR program is described in a report to Congress (NUREG-0410, January 1, 1978) required by Section 210 of the Energy Reorganization Act of 1974 as amended by PL-95-209. Progress reports, also required by the statute, will be provided to the Congress annually.

NUCLEAR REACTOR REGULATION - continued

- Non-NRR Support - To provide direct technical assistance to outside organizations (pimarily 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.

Substantial reprogramming of NRR manpower resources from technical projects to meet the demands of other higher priority tasks (operating reactors and casework) was necessary in FY 1978 and is planned again for FY 1979. The results of the reprogramming from the Technical Projects task has and will continue to cause delays in the resolution of the generic issues during FY 1978 and FY 1979. The manpower requested for FY 1980 for Technical Projects is sufficient to achieve resolution of those unresolved safety issues previously scheduled for completion by FY 1980. The accomplishments described below are based on these reprogrammed resource levels for Technical Projects.

- Topical Report Reviews - In FY 1980, the NRR staff expects to complete reviews of approximately 75 topical reports. If the historical level for new topical reviews continues in FY 1980, the backlog of topical reports will increase above the current 200.

- 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. Summaries were transmitted to the other NRC offices for information, coordination, and comment. A system was established for forwarding program briefs to provide guidance for the preparation of work statements by DOE contractors. Technical direction of contracts has been maintained at a level that is marginally acceptable for assuring that the work is responsive to NRR needs.

- Non-NRR Support - NRR has provided some technical assistance to other 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.

- Research Coordination - Twenty research requests were transmitted to RES in FY 1977 and twenty-four were transmitted in FY 1978. 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.

- Generic Issues - the NRR generic issues program was initiated in FY 1977. Task Action Plans were developed

NUCLEAR REACTOR REGULATION - continued

and approved for 40 generic tasks. Four of these tasks were completed in FY 1978. Available manpower in FY 1979 and FY 1980 will be concentrated on resolving the "Unresolved Safety Issues" discussed in the 1979 NRC Annual Report. The "Unresolved Safety Issues" are addressed by twenty-two generic tasks in the NRC program. These twenty-two include three of the four completed tasks referred to above. Therefore nineteen tasks will receive priority attention. Sixteen of these tasks are already underway. Three will be initiated in FY 1979. Five of these tasks are expected to be completed in FY 1979, nine in FY 1980, two in FY 1981 and three have not yet been scheduled.

- Major revisions to the Standard Review Plan will be completed in FY 1980.

Advanced Reactors.....

FY 1978	FY 1979	FY 1980
$1,267	$1,030	$815
(14)	(10)	(10)

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 of 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.
- Monitor the ascent to full power 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 (NASAP).

The accomplishments in the Advanced Reactor area are:

- Completed two years of monitoring the safety of operation of Fort St. Vrain.
- Completed a considerable portion of several preliminary design reviews and licensability assessments of design concepts developed for DOE (FY 1979).
- Completed the operating stage review of the FFTF and issued a Safety Evaluation Report.

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

NUCLEAR REACTOR REGULATION - continued

Standards Assistance..... FY 1978 = $0 (25) FY 1979 = $0 (15) FY 1980 = $0 (11)

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 CPs and OLs. 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 1978 = $0 (30) FY 1979 = $0 (23) FY 1980 = $0 (28)

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.

Correspondence - Resources are required to respond to Freedom of Information Act 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 Governmenta' 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.

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 CY 1978, NRR sent more than 220 individuals to technical courses, and about 40 individuals to management, supervisory, administrative and clerical courses.

Additionally, 97 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 CY 1978, NRR responded to 100 FOIA requests requiring 340 professional, technical and clerical staff hours.

Management Direction.....

FY 1978 = $0	FY 1979 = $0	FY 1980 = $0
(17)	(19)	(19)

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:

- Assure that operating reactors continue to operate in a safe and environmentally prudent 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.

(Dollars in Thousands, except whole dollars in ... ...tive material)

NUCLEAR REACTOR REGULATION - continued

- 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.

Standards Development

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

NUCLEAR REGULATORY COMMISSION - continued

Standards Development..... $14,270

Summary of Standards Development Estimates by Function

	Actual FY 1978	Estimate FY 1979 2/	Estimate FY 1980
Personnel Compensation.....	$4,668	$ 5,080	$ 5,350
Personnel Benefits.....	438	480	510
Program Support.....	5,387	6,800	6,425
Administrative Support.....	1,289	1,807	1,705
Travel.....	197	210	280
Equipment.....	0	0	0
Total Obligations.....	$11,979	$14,377	$14,270
Personnel.....	142	157	157

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 1978		Estimate FY 1979		Estimate FY 1980	
	Dollars	People	Dollars	People	Dollars	People
Power Facility Standards.....	$1,598	59	1,193	64	1,040	62
Fuel Facility and Materials Standards.....	998	28	1,132	31	1,330	32
Operation and Utilization Standards.....	1,492	26	1,970	29	955	32
Safeguards Standards.....	1,299	14	2,505	16	3,100	14
International Standards.....	0	4	0	5	0	5
Management Direction and Support.....	0	11	0	12	0	12
Total Program Support.....	$5,387	142 1/	$6,800	157	$6,425	157

1/ Does not include three full-time permanent positions actually filled by five part-time employees in an experimental part-time employment program with SD that was authorized by OMB. These positions are included in the FY 1979 and FY 1980 columns.

2/ Includes $250,000 for FY 1979 pay raise supplemental.

STANDARDS DEVELOPMENT - continued

1. Introduction

The primary function of the Office of Standards Development (SD) is to develop the 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. These comments 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 to facilitate management review of the proposed regulatory 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.

Aggressive efforts to obtain increased public comments have greatly improved the product of the regulatory standards program. Public meetings have been an important part of this effort. An environmental statement on transportation of radioactive material in urban environs and needed changes to regulation concerning use of radiographic devices are examples of subjects discussed at these meetings. In FY 1979 NRC initiated two significant procedures to allow for increased public participation in the development of standards. The principal benefits of these new procedures will begin to emerge in FY 1980. First, to assure that affected licensees are aware of proposed and effective amendments to NRC regulations, all proposed and effective regulations of a substantive nature are mailed to affected licensees and other known interested persons and organizations such as standards writing groups, trade associations and public interest groups. This action is expected to result in a broader spectrum of public comments on proposed regulations, and better assurance of licensee awareness of and compliance with effective regulations. The second initiative requires the solicitation of public comments (by Federal Register notice and direct mailing) on draft regulatory guides at an earlier stage in their development than has been the previous practice. It also requires the NRC Regulatory Requirements Review Committee (RRRC), a group of high level NRC officials that reviews all substantive changes in regulatory requirements for reactors, to consider the public comments when they initially review the draft guide. Previously public comments were solicited after the RRRC

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

STANDARDS DEVELOPMENT - continued

1. Introduction (continued)

completed its first review of a guide. Comments are also requested on the associated draft value-impact analysis.

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. The majority of the NRC staff involved in this program comes from outside SD. This involvement is providing direct benefits to NRC since about half of NRC's regulatory guides refer to or endorse national (consensus) standards.

NRC participates in national standards development activities 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.

2. Power Facility Standards.....

FY 1978	FY 1979	FY 1980
$1,598	$1,193	$ 1,040
(59)[1/]	(64)	(62)

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 operation of nuclear power plants.

[1/] Does not include one full-time permanent position actually filled by two part-time employees in an experimental part-time employment program within SD that was authorized by OMB. This position is included in the FY 1979 and FY 1980 columns.

STANDARDS DEVELOPMENT - continued

2. Power Facility Standards (continued)

The overall objective is to codify and maintain the primary criteria and detailed engineering and site 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.

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, SD responds to petitions for rule making filed by the public on matters relating to the siting and safety of nuclear plants.

Major recent accomplishments in the power facilities area have been the development of standards on: seismic design, systems design and analysis, missile protection, ventilation systems, quality assurance, qualification of electrical equipment, protection system and emergency power (AC and DC) system design and testing, the reporting of design and construction deficiencies, emergency core cooling systems, containment design and construction, and accident analysis. Through 1979, more than 130 regulatory guides will have been issued for use in licensing nuclear power plants. An increasingly significant portion of the effort in NRC's Office of Standards Development 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 existing standards to make them clearer, and to make changes that will reduce the regulatory burden on the public where this can be done without sacrifice to safety. For example, a revision of Part 21 of NRC's regulations dealing with, "Reporting of Defects and Noncompliance" was recently issued. This revision clarifies that subtier suppliers of "off the shelf" commercial items are not included in the scope of the regulations. A recent change to Part 50, "Licensing of Production and Utilization Facilities," of NRC's regulations relaxed previous requirements for maintaining an inert atmosphere inside the containments of many nuclear power plants. Inerting had been considered necessary to prevent explosions of combustible gases generated during certain postulated accidents. More recent calculations confirmed the position that safety can be assured with a less restrictive regulation.

Policy reviews of important individual siting issues, such as alternative site evaluation, accident evaluation, emergency planning, geological and seismological criteria, have been completed. A definitive regulatory program for radiation safety for workers at reactor facilities has been developed. A plan of action to achieve compatibility with new EPA regulations on uranium fuel cycle effluents is largely completed for power facilities. A number of important and complex petitions for rule making in the site and health standards area have been answered.

During FY 1980, planned accomplishments include the issuance of new or updated standards on the 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

STANDARDS DEVELOPMENT - continued

2. Power Facility Standards (continued)

assurance (QA) including QA personnel qualification, handling of records and guidance on QA for specific aspects of nuclear power plant construction; reporting requirements for specific design and construction deficiencies; protection from natural and man-made hazards such as earthquakes, fires, and explosions; radwaste processes; decontamination and decommissioning of nuclear power plants; anticipated transients without scram (ATWS); emergency core cooling systems (ECCS); and accident analysis and shielding. More than half of this effort will be devoted to maintenance of existing standards to reflect the current state of the technology and to remove requirements shown to be unnecessary by experience, research, or other studies.

Work will be continued on Task Action Plans transferred from the Office of Nuclear Reactor Regulation (NRR) in FY 1978. These are directed toward solutions of generic problems associated with flaw detection, and missile effects. Completion is scheduled for FY 1981.

Additional accomplishments in FY 1980 will be the development of standards to facilite early site reviews including issuance of plant performance characteristics and comparison of alternate systems for NEPA reviews, accident evaluation procedures, evaluation of site selection procedures, and emergency preparedness planning. Site safety standards accomplishments will be in the areas of geology/seismology, geotechnics and meteorology to codify licensing experiences, and to maintain hydrology standards. In the radiation protection area, this will include implementation of the EPA radiation standards; updating of Table S-3, "The Summary of Environmental Consideration for the Uranium Fuel Cycle," of 10 CFR Part 51; and updating the regulations that limit radiation exposures to workers. It will also include coordination with EPA and other Federal agencies on implementation of the Clean Air Act and the Toxic Substances Control Act.

The decrease in the technical support funds is the result of a reduction in the contracts associated with the regional siting study.

3. Fuel Facility and Materials Standards..... FY 1978 = $ 998 (28) FY 1979 = $1,132 (31) FY 1980 $1,330 (32)

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

The primary objective is to promulgate and maintain the primary criteria and detailed standards against which the siting, design and construction of fuel cycle facilities, the transportation of radioactive materials, and the use

STANDARDS DEVELOPMENT - continued

3. Fuel Facility and Materials Standards (continued)

of products containing such materials are measured. A second aim is to develop standards that minimize the regulatory burden on the public, consistent with the needs for safety and environmental protection. A third objective is to establish and implement forward looking policy objectives that facilitate public understanding of the regulatory decision making process and focus resources on key safety, protection and environmental protection considerations, and enable industry and NRC staff decisions to be made in a timely manner.

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 for decommissioning activities at all types of nuclear facilities. NRC transportation regulations need 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. These will be implemented by NRC in the standards being developed for the licensing of geologic repositories.

In the health standards area, a major accomplishment has been the mapping out of a definitive standards development program for assuring worker safety in licensed fuel facilities. As in the case of environmental radiation standards, this program is being closely coordinated with radiation guidance being developed by the Environmental Protection Agency. Some of the standards in this program relate to fuel cycle and material standards, but most relate to operation and utilization standards, and are discussed in Section 4 below. A series of guides has been completed to facilitate the licensing review of materials license applications. Regulatory guides have been issued covering license applications on the medical, industrial and academic areas involving the use of all types of licensed materials. Several regulations and guides on environmental and radiation protection standards have been issued. A proposed rule for the licensing of high level waste management facilities and a supporting draft environmental statement will be issued.

In FY 1980, new or updated standards will be issued dealing with quality assurance, licensing guidance and packaging for transportation of radioactive materials; licensing for manufacturing medical products and qualification of paramedical personnel administering or using radioisotopes; use of radioactive materials in industrial products; decommissioning of fuel cycle facilities; and management of radioactive wastes.

Other planned accomplishments for FY 1980 include the formalization and promulgation of the Commission's fuel cycle facility siting policy and practice paper being developed during FY 1978-79. This will cover all aspects of siting pertinent to both environmental protection and health and safety for all fuel cycle facilities except waste disposal facilities. Other planned accomplishments include guidance on decommissioning, nonradiological and radiological environmental impact, radiation protection; coordination with EPA to implement the Clean Air Act; and completion of an effective rule for the licensing of high level waste management facilities (10 CFR 60) and the supporting final environmental impact statements.

STANDARDS DEVELOPMENT - continued

3. Fuel Facility and Materials Standards (continued)

The increase in manpower and technical support funds is being used to facilitate the high-level waste management program.

4. Operation and Utilization Standards..... FY 1978 - $1,492 (26) FY 1979 - $1,970 (29) FY 1980 - $ 955 (32)

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

Recent accomplishments in this area include:

a. For reactor facilities: issuance of about 25 regulations and regulatory guides in the areas of inservice inspection, loose parts detection, and preoperational and initial startup testing.

b. For fuel cycle facilities: issuance of regulatory guides for waste management, extended spent fuel storage operations, prevention of criticality; issuance of reports establishing the technical bases for a generic rule and an Environmental Impact Statement (EIS) on decommissioning of nuclear reactors and fuel cycle facilities; and 2 regulatory guides on reactor decommissioning operations.

c. For materials transportation and utilization: responses to petitions for rulemaking; issuance of several regulations and regulatory guides on consumer products, on byproduct material in nuclear medicine uses, and on uses of nuclear materials in well-logging operations; and completion of environmental impact statements on transportation of radioactive material by air and other modes and through urban areas.

As part of the definitive standards development program for assuring worker safety in licensed facilities mentioned in the preceding section, guides have been issued on respirator use, health physics surveys at medical institutions and manufacturing plants, and occupational exposure control at medical institutions. Recent proposed amendments to the regulations would require performance testing for personnel dosimeters, limitation of radiation doses to transient workers, improved

STANDARDS DEVELOPMENT - continued

4. Operation and Utilization Standards (continued)

safety measures in industrial radiography, and programs to implement the as-low-as-reasonably achievable (ALARA) concept. An epidemiologic feasibility/planning study on low-level radiation effects will be initiated.

In FY 1980, planned accomplishments include (1) for nuclear power plants, development of new and updated standards dealing with inservice inspection and surveillance; initial startup and periodic testing programs; and reporting requirements; (2) guidance on decommissioning operating reactors and fuel cycle facilities; (3) for transportation, guidance on emergency response to transportation accidents; reduction of exposures in normal transport; and review of labeling requirements; (4) for radioactive products, guidance on medical applications; standards for industrial uses; and laboratory testing and instrumentation measurements; (5) a policy concerning the protection of individuals who supply information to NRC.

SD also plans the development and maintenance of ALARA guidance for occupational exposures and other worker and environmental radiation protection standards for licensed nuclear facilities and activities. The maintenance of effluent and environmental monitoring standards will continue. Guidance to license applicants and licensees is planned in the areas of: training, radiation personnel qualifications, occupational ALARA at medical institutions, bioassays, radiation surveys, instrument calibration, dosimeters with audible alarms, protection against neutron radiation, occupational ALARA risks, and the use of respirators. New regulations are planned in the areas of occupational dose limits, survey instrument calibration, and performance testing of personnel dosimeters.

A comprehensive review of the data base on biological effects of low-level radiation exposure including reexamination and evaluation of epidemiology studies performed by others will be made. In addition, an epidemiology feasibility/planning study on low-level radiation effects will be completed and, based on the results of this study, planning for a large scale epidemiologic study of low-level radiation effects may be initiated. 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.

The increase in manpower is for the major effort on low-level radiation exposure and a small increase in the decommissioning effort. The decrease in program support for FY 1980 is essentially attributable to the completion in FY 1980 of the epidemiology feasibility planning study and completion of some technical assistance contracts for Environmental Standards.

STANDARDS DEVELOPMENT - continued

5. Safeguards Standards..... FY 1978 - $1,299 (14) FY 1979 - $2,505 (16) FY 1980 - $3,100 (14)

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.

During FY 1978 and FY 1979 regulations were published or are planned to be published to materially improve physical protection systems at both fuel cycle facilities and nuclear power plants. Rulemaking actions are also planned to promulgate performance oriented material control and accounting regulation to upgrade this aspect of the safeguards program. Publication of final rules in this area is expected early in FY 1980. Safeguard regulations are being supplemented and implemented by a series of more than 50 existing regulatory guides and technical reports. Additional regulatory guides and technical reports will be produced or existing ones revised to upgrade their technical content to reflect the current state-of-the-art and to implement rulemaking actions.

Planned safeguards standards development accomplishments in FY 1980 are to provide generic standards for: definition of protection and response requirements for alternative fuel cycle facilities; security system designs and operation to implement the strengthened physical protection requirements published in FY 1978 and FY 1979; reactor design and layout criteria to enhance physical protection; definition of requirements for material control and accounting systems; performance, design, and operating criteria and methods for material control and accounting systems; a measurement quality assurance program; and maintenance of consistent, comprehensible and technically current safeguards standards. In addition, to assist in license reviews and licensee inspections, generic standards will be developed for analysis and measurement of levels of assurance provided by integrated safeguards systems as well as by the respective physical protection, material control and material accounting systems.

The increase in technical support dollars is to accelerate technical assistance studies associated with efforts to meet schedules for material control and accounting upgrading established in FY 1978-1979 by the material control and accounting task force. The decrease in manpower is due to the completion of major efforts in physical protec- upgrading.

6. International Standards..... FY 1978 - $ 0 (4) FY 1979 - $ 0 (5) FY 1980 - $ 0 (5)

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, and 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

STANDARDS DEVELOPMENT - continued

6. International Standards (continued)

resource needs. NRC manpower for this activity is small from a budget standpoint, but it does include a significant involvement by key NRC staff.

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. NRC has also 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 smoke detectors.

The resources requested for FY 1980 are needed to continue to ensure the 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.

	FY 1978	FY 1979	FY 1980
7. Management Direction and Support	$ 0 (11)[1/]	$ 0 (12)	$ 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.

[1/] Does not include two full-time permanent positions actually filled by three part-time employees in an experimental part-time employment program within SD that was authorized by OMB. These positions are included in the FY 1979 and FY 1980 columns.

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

NUCLEAR REGULATORY COMMISSION (Continued)

Inspection and Enforcement	$41,200

Summary of Inspection and Enforcement Estimates by Function

	Actual FY 1978	Estimate FY 1979 1/	Estimate FY 1980
Personnel Compensation	$18,080	$20,750	$21,400
Personnel Benefits	1,717	1,970	2,030
Program Support	3,781	4,365	5,285
Administrative Support	6,447	8,451	8,525
Travel	2,395	3,090	3,210
Equipment	385	300	750
Total Obligations	$32,805	$38,926	$41,200
Personnel	694	715	724

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 1978		Estimate FY 1979		Estimate FY 1980	
	Dollars	People	Dollars	People	Dollars	People
Reactor Construction Program	$ 200	145	$ 146	148	$ 540	151
Reactor Operations Program	165	182	483	197	515	205
Vendor and Contractor Program	0	25	75	29	180	29
Fuel Facilities and Materials Safety Program	1,171	133	1,391	136	1,575	138
Safeguards Program	914	89	994	90	1,280	90
Specialized Technical Training Program	300	16	350	18	450	14
Management Direction and Support	1,031	104	926	97	745	97
Total	$3,781	694	$4,365	715	$5,285	724

1/ Includes $1,030,000 for FY 1979 pay raise supplemental.

* The Office of Inspection and Enforcement has redefined the content of its Congressional Budget Program Elements to more closely coincide with the IE program/organization structure. The FY 1978-1980 manpower and program support resources shown in this Budget for each Program Element are those that match the new structure. This redefinition has no impact on total IE programs or resources, although the resources distribution is somewhat different than presented to Congress in the FY 1979 Budget Submission.

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

INSPECTION AND ENFORCEMENT (Continued)

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

Activities performed by the Office include: (a) inspecting licensees and their contractors to ascertain compliance with Commission regulations, rules, orders and license provisions and to determine if these licensees are taking appropriate actions to safeguard nuclear materials and facilities and to protect both the environment and the health and safety of the public; (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 requirements for particular licensed activities and, where necessary, recommending corrective regulatory action; (g) evaluating information concerning incidents and accidents to assure adequacy of the overall response to the incident or accident and to provide prompt ongoing 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

The inspection, investigation, enforcement, evaluation and information activities are concerned primarily 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 - fuel fabrication facilities, processing or reprocessing plants, and processors, distributors, or users of byproduct, source and/or special nuclear materials; and (3) vendors - nuclear steam system suppliers, nuclear facility architect/engineers and other major nuclear system components suppliers.

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

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

INSPECTION AND ENFORCEMENT (Continued)

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.

Verifying licensee and system performance by means of independent NRC observations, tests or measurements.

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

Enforcement

The enforcement program is aimed at achieving public safety by assuring operation within requirements, correcting situations of noncompliance or poor practice and deterring further noncompliance with requirements. 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 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 correct situations that may require immediate action and to insure compliance with NRC rules, regulations, orders, and license provisions. These actions encourage licensee performance in the public interest, thereby assuring public safety.

Revised Inspection Program

During FY 1977, the Commission approved a modified approach for inspecting nuclear reactors and major fuel plants. This Revised Inspection Program includes a resident inspection program which will locate NRC inspectors full-time at selected nuclear power plant sites under construction, at reactors in start-up, preoperational testing and in operation, and at selected fuel cycle facilities. The revised program also places increased emphasis on independent verification of licensee performance by direct observation and measurement. It further includes a modest centralized performance appraisal effort that will give national perspective to licensee performance and the NRC inspection program.

IE will evaluate the performance of licensees and will seek to identify the qualities that determine performance. In this way, NRC will be able to better allocate its inspection work force and to make available to industry the qualities or factors that lead to better performance. Finally, the revised program includes an element focusing on improved career management for inspectors. These coordinated efforts are designed to make noticeable improvements in the effectiveness of the inspection program by improving inspection quality and licensee performance. Some manpower efficiencies are expected from this program and are factored into the request for FY 1980 resources.

To allow program implementation, 61 positions and $2,650,000 were approved by supplemental appropriation in August 1978. Twenty-two resident inspectors were assigned at the end of FY 1978. In FY 1979, IE plans to assign 27 additional residents. Full implementation - having an inspector at all operating reactor sites, at selected reactor construction

INSPECTION AND ENFORCEMENT (Continued)

sites and at six fuel cycle facilities - will be achieved in FY 1981. Under this program, more than one inspector will be assigned to sites with multiple reactors in different phases of construction and operation and at sites with more than two reactors in a single phase. Throughout the implementation period, NRC will maintain a balanced program that will gradually increase the number of resident inspectors and concurrently reduce the region based inspection effort. A sufficient number of region based inspectors will be maintained to provide the necessary level of specialized technical support.

Management Initiatives

A broad, comprehensive and integrated series of studies of Inspection and Enforcement programs were initiated in FY 1977 and FY 1978. These studies consist of the following topics: inspection and enforcement mission and strategy; vendor inspection; resident inspection; independent measurements; incentive systems for licensees; techniques of other regulatory, safety and professional organizations; licensee performance evaluation; statistical sampling; and integrated resource management. Many of these studies are now completed or are nearing completion. Other studies will conclude later in FY 1979 and in FY 1980.

The Office of Inspection and Enforcement has made progress and will continue efforts to improve resource utilization. The Office has increased inspectors as a percentage of the total Inspection and Enforcement staff. In addition, strong management emphasis has been applied to increase the percentage of an inspector's time that is spent onsite conducting inspections. The efficiencies associated with inspecting multi-unit reactor sites have also been factored into the FY 1980 resource request.

While workloads continue to increase in all inspection program areas, a minimal increase of nine positions is requested in FY 1980. The efficiencies of the Revised Inspection Program permit the redirection of some existing positions to other inspection program areas, thereby reducing the magnitude of the increase that would be needed otherwise.

Specific program descriptions and objectives and the FY 1980 effort required to achieve these objectives are described below for each of the seven program elements.

Reactor Construction Program..... FY 1978 = $200 (145) FY 1979 = $146 (148) FY 1980 = $540 (151)

The Office of Inspection and Enforcement conducts an inspection program for nuclear power reactors to assure that they are constructed for operations in a manner that will adequately protect both the health and safety of the public and the environment. The major objectives of this program are to:

Perform construction oriented inspections of reactors during construction as well as operating reactors undergoing major modification, repair, or in-service inspection to ascertain compliance with NRC requirements, to identify and assure correction of deficient conditions and to obtain information to support recommendations for issuance or denial of licenses.

INSPECTION AND ENFORCEMENT (Continued)

Conduct timely investigations, as appropriate, of licensee noncompliance or allegations/indications of inadequate public protection.

To improve program effectiveness, the NRC will enhance its ability to evaluate licensee performance by establishing greater NRC presence onsite at licensee facilities, increasing the direct observation of key licensee activities by NRC inspectors, improving NRC review, analysis and follow-up of reported events and occurrences and by improving information flow from the field inspection staff to IE Headquarters and other NRC offices.

During FY 1978, 115 nuclear power reactor facilities in various stages of construction were inspected. Approximately 1,100 inspections, requiring 44,200 manhours of onsite inspection were completed. In FY 1979 a number of facilities will have progressed into more advanced stages of construction and will require heightened inspection effort; i.e., approximately 1,325 inspections and 51,000 inspector hours onsite. This increased inspection effort will be facilitated by reducing overhead to increase the percentage of employees who serve as inspectors; by increasing the region based inspector's time spent onsite to approximately 30 percent and by further increasing the number of resident inspectors.

Further implementation of the Revised Inspection Program will occur in FY 1980. Additional sites with significant construction activity will be assigned full-time onsite inspectors. Region based inspectors will continue to perform the full inspection program at sites without resident inspectors and will provide specialized technical support to those sites with resident inspectors. Approximately 1,370 inspections involving 55,300 hours of onsite inspection will be conducted during FY 1980. Also during FY 1980, formalized efforts to improve evaluation of inspection program performance, to analyze licensee performance from a national perspective, and to insure that inspection uniformity and inspector objectivity will receive continuing management emphasis. Collectively termed "performance appraisal," these efforts began in FY 1978 and will be in routine operation by the end of FY 1979.

Three additional positions are requested in FY 1980 due to project workload increases. Vacancies will be selectively filled to maintain the percentage of total Inspection and Enforcement staff who are inspectors.

Program support funding for this program is directed toward technical assistance consulting to resolve special technical problems, contractual support to perform specialized independent measurements at facilities under construction and improving program effectiveness and efficiency. The increase in funding from FY 1979 to FY 1980 is primarily associated with analyzing the performance appraisal program focusing on inspection program uniformity and inspector objectivity.

Reactor Operations Program..... FY 1978 = $165 (182) FY 1979 = $483 (197) FY 1980 = $515 (205)

The Office of Inspection and Enforcement conducts an inspection program to assure that nuclear reactors are operated in a safe, responsible manner consistent with regulatory requirements. This program is applied to both commercial power and nonpower reactors. The major objectives of this program are to:

INSPECTION AND ENFORCEMENT (Continued)

Perform inspections of reactor operations, startup testing and preoperational testing programs at licensee facilities to ascertain compliance with NRC requirements and to identify conditions that must be corrected to assure protection of both the environment and the health and safety of the public;

Conduct timely investigations, as appropriate, of licensee noncompliance or allegations/indications of inadequate public protection;

To improve program effectiveness, the NRC will enhance its ability to evaluate licensee performance by establishing greater NRC presence onsite at licensee facilities, increasing the direct observation of key licensee activities by NRC inspectors, increasing direct verification/independent measurements by NRC personnel, improving NRC review, analysis and followup of licensee reported events and occurrences, and by improving information flow from the field inspection staff to IE headquarters and other NRC offices.

During FY 1978, 70 power reactors and 85 major nonpower reactors were inspected. In FY 1979, the number of power reactors will increase to 76 while the major nonpower reactors will increase by one to 86. In 1980, the number of power reactors will increase to 84, while non-power reactors will remain constant. During FY 1978 approximately 1,650 inspections were completed which involved nearly 67,000 manhours of onsite inspection.

In FY 1979, effort will have grown to approximately 1,775 inspections and 78,000 inspector hours onsite. This increased inspection effort will be facilitated by reducing overhead to increase the percentage of inspectors in the workforce; increasing the regional based inspector's time spent onsite to approximately 30 percent; and by further increasing the number of resident inspectors.

Further implementation of the Revised Inspection Program will occur in FY 1980. Additional sites with reactors in startup testing or commercial operation will be assigned full-time onsite inspectors. Regional office based inspectors will continue to perform the full inspection program at sites without resident inspectors and will provide specialized technical support to those sites with resident inspectors. Approximately 1,950 inspections involving 80,700 hours of onsite inspection effort will be conducted during FY 1980.

Eight additional positions are required in FY 1980 to accommodate projected increases in workload. Vacancies will be selectively filled to maintain the percentage of total Inspection and Enforcement staff who are inspectors.

Program Support funding for this program is directed toward radiological surveys at selected licensee sites, technical assistance consulting to resolve special technical problems, contractual support to perform specialized independent measurements at licensed facilities, and improving program effectiveness and efficiency.

Vendor and Contractor Program..... FY 1978 = $0 (25) FY 1979 = $75 (29) FY 1980 = $180 (29)

The Office of Inspection and Enforcement conducts an inspection program to improve nuclear power plant safety by assuring, through NRC surveillance, that vendor organizations (architect engineers, nuclear steam system suppliers and component manufacturers) have established quality assurance programs capable of providing quality products or services that meet safety requirements. NRC relies on these inspections as an input to the determination that

INSPECTION AND ENFORCEMENT (Continued)

plants have been constructed in a manner that will assure safe operation once an operating license is issued. Major objectives for FY 1980 are to:

Perform inspections to evaluate the effectiveness of licensee contractor and vendor quality assurance programs and thereby assure regulatory requirements are being satisfied and that acceptable quality is obtained;

Conduct inspections of:

Nuclear steam system suppliers and architect engineers;

All major suppliers of Class I mechanical components (pumps, valves, etc.);

Other component or service suppliers commensurate with the safety significance of the product.

Monitor the implementation of the American Society of Mechanical Engineer's (ASME) inspection system to supplement the NRC inspection program and to provide a mechanism for reducing the duplicative inspection of vendors required by NRC rules;

Feedback operating experience data to both the headquarters staff and manufacturers to improve the quality of design, fabrication and testing of new components;

Assure that vendors comply with the provisions of Title 10, Code of Federal Regulations (CFR) Part 21, Reporting of Defects and Noncompliance.

Of the approximately 800 vendors who provide services or products to the nuclear industry, the organizations presently being inspected on a periodic basis include 12 nuclear steam system suppliers and architect engineering firms and approximately 130 component manufacturers. The component manufacturers include the major suppliers of pumps, valves, pressure vessels, piping, nuclear fuel, control rods, control rod drives, valve operators, and electrical and instrumentation components. The frequency of prescribed inspection varies and is determined by the safety significance of the product, the volume produced by a specific supplier and the performance history of the supplier and his products.

FY 1978 manpower was allocated to inspect selected architect engineers and nuclear steam system suppliers on the average of twice per year. Firms are selected for inspection if they have an active nuclear project underway. The current program also provides coverage of about 20 percent of the mechanical component manufacturers at an average frequency of once per year. Supplementing the program with the ASME inspection system will provide significantly greater coverage of these manufacturers with no increase in NRC resources in the forseeable future. Only a small percentage (less than 10 percent) of non-mechanical component vendors are inspected. These include manufacturers of electrical and instrumentation components, control rods and rod drives, nuclear fuel and other components not covered by the ASME code.

During FY 1978, the number of companies included in the program grew from 145 to 165 with approximately 265 inspections requiring 11,300 on-site hours. In FY 1979, about the same level of inspection will be applied with an added requirement to assure that vendors comply with the provisions of a new regulatory requirement (10 CFR Part 21 - Reporting of Defects and Noncompliance) and to investigate such reports.

No additional positions are requested in FY 1980. Given available resources, the NRC will continue to conduct a limited program of inspection which focuses on a selected portion of the vendor population. Allocation of

INSPECTION AND ENFORCEMENT (Continued)

inspection resources will be based on feedback of problems identified in the field, either through inspection or licensee reports. A larger portion of the inspection effort will be devoted to reactive inspections with a corresponding decrease in routine inspections. Additional program support funds will be applied to testing reactor components that must be capable of functioning under extreme environmental conditions.

Fuel Facilities and Materials Safety Program..... FY 1978 = $1171 (133) FY 1979 = $1391 (136) FY 1980 = $1575 (138)

The Office of Inspection and Enforcement conducts a fuel facilities and materials safety inspection program. This program element covers licensed fuel facilities, materials licensees, and health physics related activities at nuclear reactors. The inspection, investigation, enforcement and evaluation activities are designed to assure that production oriented fuel facilities are built, tested and readied for operation in accordance with NRC requirements. It provides a basis for assuring that fuel facilities (uranium mills, uranium hexafluoride plants, reprocessing plants, and storage facilities) are operated in a safe, responsible manner and in accordance with the NRC requirements established to protect the health and safety of the public and environment. It assures that four health physics related activities (radiation protection, emergency planning, radioactive waste management, and environmental monitoring) at nuclear reactor facilities are conducted safely and in accordance with requirements established for protection of public health and safety and the environment. It also assures that materials licensees (licenses for byproduct; source; and special nuclear materials in radiography, medical programs, academic and industrial uses; waste disposal; and other applications) are using the materials in a safe, responsible manner and in accordance with applicable regulatory requirements. Program objectives include:

Performing effective and efficient inspections of license applicants and licensees;

Conducting timely and appropriate investigations of noncompliance or other indications of inadequate public and environmental protection.

To improve program effectiveness, the NRC will enhance its ability to evaluate licensee performance by increasing inspector observation and direct measurement of key licensee activities, increasing NRC evaluation and follow-up of licensee reported events and by improving information flow from the field inspection staff to the Office's program direction staff and NRC's research and licensing organizations.

The routine inspection frequency for reactor facilities is once per year in each of the four health physics related activities. The frequency for fuel facilities ranges from one to four inspections per year; multiple inspections are performed at facilities which conduct activities that have potential for adverse situations regarding radiological and criticality safety. The inspection frequency for materials licensees varies from twice per year for some licensees, to once every several years for others depending upon the use, quantity, and type of material licensed.

In FY 1978 about 400 inspections of health physics related activities at nuclear reactor facilities and 2,650 inspections of fuel facilities and materials licensees were completed. The required number of routine inspections for materials licensees was not entirely achieved in FY 1978 and there was a backlog at the end of the year of about 150 inspections.

INSPECTION AND ENFORCEMENT (Continued)

Workloads for FY 1979 will be somewhat greater than FY 1978 with overdue materials license inspections remaining about the same. Reactor facility inspections are expected to increase from 400 to about 450, while the inspections of fuel facilities and materials licensees will increase to about 2750.

In FY 1980 there will be a modest increase in the fuel facility and materials licensee workload plus a small increase in reactor health physics inspections. Fuel facilities and materials inspection are projected at approximately 2900 with reactor inspections totaling 460. Two additional positions are requested to accomplish this increase in workload.

Program support for this program is heavily oriented to environmental protection. Contracts include: aerial radiological surveys of major licensee sites to determine the level of environmental protection being provided; the analysis of water and soil samples taken from various locations in this environment; and special studies and laboratory analyses related to events which affect the environment's radiological quality. Funds are also provided for independent study and analysis of nonenvironmental radiological events. The increase for FY 1980 will further emphasize aerial radiological surveys, extending the program to cover fuel facilities, some waste disposal sites, and other users of large quantities of radioactive materials.

Safeguards Program..... FY 1978 = $914 (89) FY 1979 = $994 (90) FY 1980 = $1,280 (90)

The Office of Inspection and Enforcement inspects power and nonpower reactors, fuel facilities and special nuclear material shipments to determine and assure that these licensed facilities and activities are operated in accordance with the strict requirements established to safeguard nuclear materials and facilities and to protect the common defense and security. The goal is to increase confidence that an acceptably low probability exists for both the loss of special nuclear material through theft or diversion and for public risk of radiological contamination due to acts of sabotage upon licensed facilities and operations. Program objectives include:

Performing effective and efficient inspections of applicable licensees and materials shipments;

Conducting timely and appropriate investigations of noncompliance or other indications of inadequate safeguarding protection.

Within these objectives, the NRC will enhance its ability to evaluate licensee performance by establishing greater NRC presence onsite, increasing inspector observation and direct measurement of key licensee activities, increasing NRC evaluation and followup of licensee reported events and by improving information flow from the field inspection staff to the Office's program direction staff and NRC's research and licensing organizations.

During FY 1978, NRC's inspection staff completed 500 preventive inspections for applicable fuel facilities, special nuclear materials (SNM) shipments and the growing number of reactors with an operating license. This involved 25,000 hours of onsite inspection time. In addition, significant reactive effort was applied to two fuel facilities with unusual material accountablity problems. This reactive effort amounted to more than four times the scheduled inspection time for these sites. In FY 1978, the safeguards inspection program was augmented by assigning full-time

INSPECTION AND ENFORCEMENT (Continued)

safeguards inspectors onsite at two of the 11 critical fuel facilities with two more residents projected for assignment during FY 1979. These inspectors will increase the opportunity for observing key licensee safeguards activities and independently testing safeguards systems. Also in FY 1979, some of the less specialized aspects of reactor safeguards will be transferred to the onsite reactor resident inspectors. This will permit a small reduction in dedicated safeguards inspection effort for sites with an onsite inspector. The region based staff will supplement the onsite resident inspectors at both fuel facilities and reactor sites with technical specialists and will perform the complete inspection program at other sites.

In FY 1980 safeguards inspections will be conducted at eight additional operating reactors and new safeguards regulatory requirements will be implemented. These new requirements include: strengthened reactor safeguards requirements; upgraded fuel facility and shipment safeguards; additional requirements for guard qualifications and training; administrative security systems; upgraded nonpower reactor safeguards; and promulgation of a safeguards contingency planning rule. Efficiencies derived from the Revised Inspection Program and other management improvements will be sufficient to offset the need for additional resources in FY 1980.

Program support funding is required for independent laboratory analysis of licensee inventory, which is a major component of the material accountability approach to safeguards. Funds are also required for independent study and analysis of safeguards events and for management studies to improve program effectiveness and efficiency.

Specialized Technical Training Program..... FY 1978 = $300 (16) FY 1979 = $350 (18) FY 1980 = $450 (14)

Specialized technical training consists of a combination of technical courses taught by a staff of in-house professional instructors, courses taught under contract and programmed self study courses. Inspector training provides a means to assure that new employees are trained in an effective and timely manner to assure earliest performance as fully qualified inspectors. Current employees are kept abreast of new technological developments, new NRC and government regulations, and new office requirements and policies. Such training is considered a prime component of each professional's career development.

Inspector training consists of a rigorous, carefully planned and balanced program emphasizing classroom training specifically designed to meet NRC needs, supplemented by realistic training sessions in leased power reactor simulator facilities, programmed self-instruction, and on-the-job training.

In FY 1978 725 man-weeks of training were provided by the in-house training staff. Program support funds provided 1,002 student-weeks of classroom training and necessary leasing of simulator time. In FY 1979, nearly 715 student-weeks of training will be provided in-house. Program support funds will support another 2,039 student-weeks of classroom training and simulator time leasing.

Fewer positions are required in FY 1980 as the peak training requirement associated with the Revised Inspection Program will be nearly completed by the end of FY 1979. Assigned instructors will continue the carefully planned curriculum for new employees directed towards onsite and performance

INSPECTION AND ENFORCEMENT (Continued)

appraisal inspection assignments. Program support funds will increase to provide additional experience at reactor simulators and customized courses in reactor system design and operation, and in welding, concrete, and electrical instrumentation technology.

Management Direction & Support..... FY 1978 = $1,031 (104) FY 1979 = $926 (97) FY 1980 = $745 (97)

This program element includes the functions that indirectly support the programmatic activities of the Office of Inspection and Enforcement. 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 field, direction and support is provided by the offices of the Regional Director and the regional administrative staffs.

The Office of the Director is responsible for overall program management. The two headquarters Executive Officers provide supporting technical and administrative services. They:

Conduct studies on alternative policies and programs;

Develop and control investigation, incident response, event reporting and enforcement policy;

Plan, budget, evaluate and control resource utilization and administer contracts;

Develop and operate office-wide management information systems;

Operate the NRC incident response center;

Provide Technical Liaison with NRC's Office of Nuclear Regulatory Research and with other federal and state agencies (e.g., EPA, DOT);

Respond to Freedom of Information Act requests;

Maintain and distribute the IE Inspection Manual;

Provide centralized headquarters administrative support (e.g., files, mail distribution and word processing).

The Offices of the Regional Directors are responsible for executing the inspection and enforcement programs and for managing assigned resources and facilities. Region Directors also serve as the NRC's senior official in their respective geographical area. Regional administrative staffs provide:

Secretarial support for regional office management;

Clerical support for non-IE personnel assigned to regional offices;

Management information coordination and financial management services.

Program Support funds for FY 1980 will be used primarily to conduct several management studies and to evaluate various aspects of IE's incident response activities.

Nuclear Materials
Safety and Safeguards

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

NUCLEAR REGULATORY COMMISSION - continued

Nuclear Material Safety and Safeguards $29,605

Summary of Nuclear Material Safety and Safeguards Estimates by Function

	Actual FY 1978	Estimate FY 1979 1/	Estimate FY 1980
Personnel Compensation	$ 7,666	$ 8,550	$ 8,990
Personnel Benefits	728	810	850
Program Support	12,277	12,995	15,779
Administrative Support	2,579	3,414	3,410
Travel	407	510	576
Equipment	5	0	0
TOTAL OBLIGATIONS	$23,662	$26,279	$29,605
Personnel	272	294	297

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 1978		Estimate FY 1979		Estimate FY 1980	
	Dollars	People	Dollars	People	Dollars	People
Fuel Cycle and Material Safety	$ 3,669	108	$ 4,040	117	$ 4,114	118
Safeguards	1,589	95	2,340	104	2,530	89
Waste Management	7,019	35	6,615	34	8,975	55
Program Evaluation and Policy Management	0	34	0	39	160	35
Total	$12,277	272	$12,995	294	$15,779	297

1/ Includes $420,000 for FY 1979 pay raise 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 of 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 by the Policy Management program and supported by the Technical Program Analysis and Evaluation program. Each major program consists of program elements.

Summary of Fuel Cycle and Material Safety Program

Program Elements	Actual FY 1978 Dollars	Actual FY 1978 People	Estimate FY 1979 Dollars	Estimate FY 1979 People	Estimate FY 1980 Dollars	Estimate FY 1980 People
Uranium Fuel Cycle	$ 1,415	24	$ 1,715	26	$ 1,890	32
Spent Fuel Storage and Processing	1,345	18	1,190	16	900	17
Transportation	408	13	210	14	275	13
Radioisotopes Licensing	160	32	300	40	314	40
Operations and Technology	341	21	625	21	735	16
Total	$ 3,669	108	$ 4,040	117	$ 4,114	118
Uranium Fuel Cycle	FY 1978 = $1415	(24)	FY 1979 = $1,715	(26)	FY 1980 = $1,890	(32)

The goal is to perform safety and environmental evaluations as the basis for licensing decisions on license applications for new and existing uranium fuel cycle plants, provide technical assistance to Agreement State licensing programs, perform environmental and licensing evaluations on previously licensed sites decommissioned prior to 1965, and effectively implement requirements from new rules and standards pertaining to uranium fuel cycle operations.

The major objectives are to: 1) license uranium milling, UF_6 production, and uranium fuel fabrication plants; 2) provide technical assistance to Agreement States with respect to licensing of uranium mills; 3) evaluate by 1985 former licensee sites that may have residual radioactive contamination above current limits; 4) implement by 1983 new EPA radiation standards and new requirements that result from the Generic Environmental Impact Statement (GEIS) on Uranium Milling; and 5) review DOE

proposed remedial actions to be applied to inactive mill tailing sites and industrial contractor sites starting in FY 1980.

The following items were the significant accomplishments during FY 1978: 1) completed 22 major facility licensing actions including five renewals; 2) completed four reviews for Agreement States; 3) examined several thousand retired licensee dockets and identified those sites which may have radiation levels above current limits; and 4) initiated review of existing licensees to determine whether licensing actions are required to meet EPA limits.

The significant accomplishments planned for FY 1979 are to: 1) complete 34 major (over 100 reviewer man-hours) and 75 minor (less than 100 reviewer man-hours) uranium fuel cycle licensing actions within established review times; 2) complete four safety or environmental reviews for Agreement States to ensure their licensing actions have a sound technical basis; 3) initiate a survey of potentially contaminated former licensee sites (identified in FY 1978) and an evaluation of proposed remedial actions and related environmental assessments; and 4) begin implementing, through the licensing process, new EPA environmental radioactivity limits.

The significant accomplishments planned during FY 1980 are to: 1) complete 40 major and 75 minor licensing actions related to uranium fuel cycle plants and licensees; 2) provide technical assistance to Agreement States to analyze the impact of uranium mill tailings for six uranium milling projects (14 requests for such reviews are expected in FY 1980); 3) continue the program to investigate and, if necessary, survey former licensee sites that may have residual radiation contamination above current requirements and evaluate proposed remedial actions and related environmental assessments; 4) continue the review of existing licensed fuel cycle activities to determine if licensing actions are required to meet new EPA environmental radioactivity limits and initiate implementation of new requirements resulting from the GEIS on Uranium Milling; and 5) initiate the review of one of five expected DOE proposed remedial actions to be applied to inactive mill tailing sites and former AEC industrial contractor sites (the "Uranium Mill Tailings Radiation Control Act of 1978" requires that NRC take action on 22 sites requiring remedial action including issuing licenses.)

The increase in resources in FY 1980 are for the increased licensing casework and the review of DOE remedial actions.

Spent Fuel Storage and Processing.....FY 1978 = $1,345 (18) FY 1979 = $1,190 (16) FY 1980 = $900 (17)

The goal is to conduct licensing reviews and perform environmental evaluations to support licensing decisions for interim spent fuel storage facilities, conduct licensing reviews and perform technical and environmental evaluations to support licensing decisions relative to proposed facilities for solidification of liquid high-level waste (HLW) and interim storage of solidified HLW, and conduct licensing reviews and perform technical and environmental evaluations to support licensing decisions on amendments and renewals relative to previously licensed advanced fuel R&D and pilot plants while reducing NRC dependence on contractual assistance in regard to licensing decisions in order to enhance NRC's role as an independent regulatory agency.

The major objectives are to: 1) review and license commercial away-from-reactor spent fuel storage facilities including

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

modifications and decommissioning plans, review and approve a second standard design for spent fuel storage, and initiate reevaluation of the domestic and foreign spent fuel storage situation for generic problems which can affect NRC policies; 2) conduct licensing evaluation and rulemaking regarding disposition of liquid HLW from the Nuclear Fuel Services (NFS) West Valley reprocessing plant; 3) continue licensing control of seven existing advanced fuel research and development and pilot plant facilities, including decommissioning plans and financial surety arrangements, and process three major amendments per year; 4) maintain licensing control of the NFS West Valley reprocessing plant, implement decontamination and dismantling requirements for the reprocessing plant and associated facilities, and review and approve the plan for eventual disposition of the plant; and 5) participate in the NRC Task Force on development of regulations for implementation of EPA's Environmental Radiation Protection Standards for Nuclear Power Operations.

The following items were the significant accomplishments during FY 1978: 1) approved the Stone and Webster standard design for a 1000 metric ton spent fuel storage pool, issued the Draft Generic Environmental Impact Statement on the Handling and Storage of Spent Light Water Power Reactor Fuel, and incorporated decommissioning plans and ALARA programs into existing licenses renewed; 2) began obtaining data on the NFS West Valley HLW storage tank to assist in consideration of alternatives for HLW dispositions; 3) completed 60% of the special natural phenomena resistance review program for existing plutonium facilities and incorporated decommissioning plans and ALARA programs into existing licenses renewed; 4) pursued the plan for dealing with the complex NFS case and completed many details; and 5) continued to participate in development of NRC regulations for implementing 40 CFR 190 for fuel cycle facilities.

The significant accomplishments planned for FY 1979 are to: 1) continue on the GE-Morris Operation application to increase spent fuel storage capacity, review the transfer of spent fuel from Duke's Oconee plant to the McGuire plant, issue the Final Generic Environmental Impact Statement on the Handling and Storage of Spent Light Water Power Reactor Fuel, and incorporate decommissioning plans and ALARA programs into renewed licenses; 2) obtain additional data on the West Valley HLW storage tank to assist in consideration of alternatives for HLW disposition; 3) complete the special natural phenomena resistance review program for existing plutonium facilities and incorporate decommission plans and ALARA programs into renewed licenses; 4) complete an updated revised safety evaluation covering the NFS facility including additional information on resistance to natural phenomena and condition of the waste tanks; and 5) continue to participate in development of NRC regulations for implementing 40 CFR 190 for fuel cycle facilities.

The significant accomplishments planned during FY 1980 are to: 1) continue licensing reviews for two commercial spent fuel storage facilities; 2) continue licensing evaluation and rulemaking regarding disposition of HLW from NFS West Valley, and monitor a DOE task force effort on the site and HLW; 3) complete reviews and issue license amendments for major modifications to three advanced fuel R&D and pilot facilities and maintain licensing control of seven facilities; 4) maintain licensing control of the NFS West Valley reprocessing plant, begin to implement decontamination and dismantling requirements for the plant and associated facilities, and review the plans for eventual disposition of the plant; and 5) continue participation in the NRC Task Force on development of regulations for implementation of EPA's Environmental Radiation Protection Standards for Nuclear Operations.

The increase in staff is required for the increased activity and priority for rulemaking regarding disposition of HLW from the NFS West Valley reprocessing plant.

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

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

	FY 1978	FY 1979	FY 1980
Transportation	$408 (13)	$210 (14)	$275 (13)

The goal is to perform safety reviews for package designs used 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; and to develop and maintain package analysis methods to assure quality and timely reviews.

The major objectives are to: 1) conduct safety reviews of major package (e.g., spent fuel cask, plutonium package, etc.) designs within one year, reduce the forecast backlog of applications, and maintain a registry of package users, amending existing package approvals as necessary; 2) conduct safety reviews of minor package (e.g., radiography and teletherapy sources, low-level waste, etc.) designs within four months, reduce the forecast backlog of applications, keep the NRC review process out of the critical path of applicants' requirements, and maintain a registry of package users, amending existing package approvals as necessary; and 3) develop standardized methods of analysis.

The following items were the significant accomplishments during FY 1978: 1) completed four major package licensing actions and certified a plutonium package for air transport; 2) completed about 75 minor package licensing actions; and 3) continued to modify and improve the thermal, criticality, and shielding analysis computer programs.

The significant accomplishments planned for FY 1979 are to: 1) complete the review of two new spent fuel cask major designs and two major amendments; 2) complete the review of 40 DOE and licensee minor package designs and eight renewals; and 3) continue development of standardized methods for thermal, criticality, and shielding analysis of package designs.

The significant accomplishments planned during FY 1980 are to: 1) complete the review of three new or modified spent fuel cask, plutonium package, or high-level waste cask major designs and three major amendments, 2) complete the review of 25 DOE and licensee minor package designs and 50 renewals; and 3) complete the major development, and provide for the maintenance and improvement of standardized methods of thermal, criticality, and shielding analysis for evaluating package designs.

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

Radioisotopes Licensing.....FY 1978 = $160 (32) FY 1979 = $300 (40) FY 1980 = $314 (40)

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). This program element must be responsive to the large number of license applications (600-700 per month), and the licensing process must be timely to avoid delaying needed services (e.g., medical) or causing economic losses to applicants.

The major objectives are to: 1) perform safety evaluations required for materials licensing so that by the end of FY 1980 licensing decisions will be completed on all cases within an average time of 30-45 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 guides relative to current safety needs; 4) conduct generic studies as follows: a) reexamine existing NRC policy on consumer products by the end of FY 1980, and b) categorize and improve methods for evaluating and licensing sealed sources and devices by the end of FY 1980; 5) complete the pilot regionalization program; 6) conduct post-licensing evaluations on a continuing basis (approximately 70 per year) to confirm the validity of licensing actions starting in FY 1979; and 7) implement and maintain an information program concerning licensing requirements and the licensing process.

The following items were the significant accomplishments in FY 1978: 1) made 8,300 licensing decisions, evaluated 200 sealed sources and devices, and initiated a licensing flow study; 2) conducted a training course for state personnel and continued to provide routine assistance to Agreement States; 3) developed 9 amendments to regulations necessary for protection of public health and safety and published for public comment a commission policy on the regulation of the medical use of radioisotopes; 4) initiated a study of the NRC policy relative to consumer products containing radioactive material; and 5) initiated the regionalization pilot program.

The significant accomplishments planned for FY 1979 are to: 1) process 7,050 licensing actions with an average turnaround time of 45-60 days for new application and license amendments and 150 days for a licensing renewal, complete the licensing flow study, and evaluate 200 sealed sources and devices; 2) continue to furnish technical assistance to Agreement States; 3) develop and publish four new licensing guides either in final form or for public comment; 4) reexamine the radiopharmaceutical manufacturers to assess their ALARA status; 5) expand the pilot program to include two additional states; and 6) conduct approximately 70 post-licensing evaluations to confirm the validity of licensing actions.

The significant accomplishments planned during FY 1980 are to: 1) review 7,250 new, renewal and amendment applications and issue licenses within 30-45 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 only the most urgently needed new guides; 4) (a) develop and implement NRC policy relative to consumer products containing radioactive material and (b) categorize and improve methods for evaluation and licensing of sealed source actions; 5) complete regionalization pilot program in FY 1980; and 6) conduct approximately 70 post-licensing evaluations; and 7) partially implement and maintain an information program for licensees concerning licensing requirements and the licensing process.

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

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

	FY 1978	FY 1979	FY 1980
Operations and Technology	$341 (21)	$625 (21)	$735 (16)

The goal is to develop, evaluate, and improve the technical base and regulatory procedures for the Fuel Cycle and Material Safety program to assure public health and safety and protection of environmental values.

The major objectives are to: 1) perform broad generic environmental impact statements and fuel cycle surveys (e.g., update the environmental survey of the uranium fuel cycle and Summary of Environmental Considerations for Uranium Fuel Cycle, Table S-3 of 10 CFR Part 51), and assess the DOE recommended alternative thermal reactor fuel cycle; 2) resolve specific fuel cycle problems through detailed studies (e.g., estimate of fuel cycle materials and services costs, standardization of assessment methodologies and models, etc.); 3) refine the technological base through use of confirmatory research and standards efforts so licensing decisions can be made with confidence and public credibility maintained; and 4) improve the efficiency and effectiveness of the licensing process by reviewing specific fuel cycle regulations and procedures, evaluating their cost effectiveness, restructuring them if warranted and, if required, conducting appropriate rulemaking hearings.

The following items were the significant accomplishments during FY 1978: 1) initiated the update of the environmental survey of the uranium fuel cycle and Table S-3, and closed out GESMO proceedings; 2) provided fuel cycle cost information and hearing support for reactor licensing, developed improved estimates for radon releases from mines and mills, initiated research to measure radon releases from underground and open pit mines, and provided participation of restricted scope in NASAP/INFCE working groups; 3) implemented formal procedures for identifying research needs, processed 20 research requests, and reviewed proposed and ongoing research programs; and 4) completed a study on license renewal terms, and initiated a study of Price-Anderson indemnification applicability to radioisotopes.

The significant accomplishments planned for FY 1979 are to: 1) continue the update of the environmental survey of the uranium fuel cycle and Table S-3; 2) complete a study concerning extension of NRC licensing or regulatory authority over Federal waste disposal and storage activities not presently subject to NRC authority as required by the FY 1979 NRC Authorization Bill, continue to a) provide fuel cycle cost information and hearing support for reactor licensing, b) develop improved estimates of radon releases from mines and mills, and c) provide participation of restricted scope in NASAP/INFCE working groups; 3) assure that the Fuel Cycle and Material Safety program needs for confirmatory research and standards are being met through coordination of activities with other NRC offices, formulation and implementation of confirmatory research programs and standards development, and assessment of confirmatory research results; and 4) complete th study of Price-Anderson indemnification applicability to radioisotopes.

The significant accomplishments planned during FY 1980 are to: 1) complete the uranium fuel cycle survey and Table S-3 update to be used in reactor licensing and begin limited assessment of the DOE recommended alternative thermal reactor fuel cycle; 2) continue to perform estimations of fuel cycle materials and services costs and render testimony as needed in support of reactor cost/benefit analyses and licensing, continue a program to standardize and maintain assessment methodologies and models for environmental statements and surveys, and continue review of broad nuclear fuel cycle environmental studies and statements as requested by other NRC offices; 3) continue to formulate and implement standards and confirmatory research programs for fuel cycle licensing; and 4) continue review of regulations (Part 40) and procedures for the front end of the fuel cycle (milling and UF_6 production), continue to review Value-Impact analyses of Division staff papers, and respond to information requests from other offices, government agencies, and Congress.

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

The increase in funding is related to resolving specific fuel cycle problems by calculating cost information and development of standarized models.

Summary of Safeguards Program

PROGRAM ELEMENTS	Actual FY 1978 Dollars	Actual FY 1978 People	Estimate FY 1979 Dollars	Estimate FY 1979 People	Estimate FY 1980 Dollars	Estimate FY 1980 People
Contingency Planning and Threat Assessment	$ 0	16	$ 0	17	$ 200	13
Information, Analysis, and Evaluation	185	18	689	20	1,005	12
International Safeguards	299	10	210	10	365	11
Safeguards Licensing	117	24	0	26	0	27
Safeguards Technology	497	8	771	10	430	8
Safeguards Regulatory Improvements	491	19	670	21	530	18
Total	$ 1,589	95	$ 2,340	104	$ 2,530	89

Contingency Planning and Threat Assessment.....FY 1978 = $0 (16) FY 1979 = $0 (17) FY 1980 = $200 (13)

The goal is to develop and maintain systems of safeguards contingency plans which will improve protection from threats, theft, and sabotage relating to special nuclear materials, high-level radioactive wastes and nuclear facilities. In support of this goal, the major objectives are to: 1) develop NRC headquarters level safeguards contingency plan and implementation capabilities during 1982; 2) assure the development and maintenance of individual safeguards contingency plans and required implementation capabilities for each nuclear fuel cycle licensee and transportation activity during 1980; 3) develop, negotiate, and implement on an ad hoc basis by 1985, an estimated 14 interagency agreements required to assure adequate interagency liaison and support of safeguards contingency plans and threat assessment (specific resources are not identified in FY 1980 for this ad hoc activity); and 4) refine, operate, and maintain a safeguards threat assessment system which determines the capabilities, characteristics, and trends of any current or developing threat, correlates information, and quickly identifies indicators that may require implementation of extra safeguards measures.

The following items were the significant accomplishments during FY 1978: 1) completed a straw-man headquarters level safeguards contingency plan; 2) published the effective rule (10 CFR Part 73) and associated regulatory guides for nuclear fuel cycle licensees to develop and implement safeguards contingency plans; 3) prepared a draft interagency agreement with the FBI to document procedures for exchanging threat information and obtaining support during a safeguards contingency; and 4) defined the output requirements and conceptual design for automation of the safeguards threat assessment system, and operated and refined the manual threat assessment system.

The significant accomplishments planned during FY 1979 are to: 1) continue the development and maintenance of a headquarters level safeguards contingency plan and participation in NRC incident response training; 2) assess the adequacy of safeguards contingency plans submitted by nuclear fuel-cycle licensees in response to 10 CFR Part 73 (Physical Protection of Plants and Materials), and continue coordinated response planning with local

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

law enforcement agencies (LLEA) in support of licensee level safeguards contingency planning; 3) complete negotiations on the FBI Interagency Agreement, prepare draft interagency agreements with the Department of Energy, the Bureau of Alcohol, Tobacco and Firearms, and the Federal Aviation Administration to document arrangements for exchanging threat information and obtaining support during a safeguards contingency; and 4) continue operation and refinement of the manual threat assessment system, complete and disseminate an operating assumption concerning adversary characteristics, continue participation in and support of Information Assessment Team activities, and undertake a study of potential insider threat characteristics.

The significant accomplishments planned during FY 1980 are to: 1) refine and maintain the basic headquarters level contingency plan and continue support and participation in NRC incident response training including preparation and maintenance of NMSS implementing procedures; 2) continue work with licensees and associated LLEAs to implement safeguards contingency plans and to enhance and maintain operational readiness and reconnoiter newly identified road routes and update previously reconnoitered routes in connection with specific domestic shipments of special nuclear material; 3) continue interagency liaison and agreements on an as needed basis contingent upon resource availability; and 4) perform threat characterization activities, and threat studies, maintain chronologies of safeguards-related events, and determine trends and patterns in support of safeguards rule making, design, and information requests; and maintain and refine the threat information data base with bi-weekly updates.

The $200,000 in FY 1980 are to fund the joint threat credibility assessment activities with DOE and FBI. This activity is a follow-on to efforts previously funded by the Office of Nuclear Regulatory Research during the developmental phase.

Information, Analysis, and Evaluation.....FY 1978 = $185 (18) FY 1979 = $689 (20) FY 1980 = $1,005 (12)

The goal is to develop and maintain a systematic review process to determine the adequacy of safeguards of all nuclear facilities and materials licensed under the Atomic Energy Act of 1954, as amended, associated with the processing, transport, and handling of nuclear materials. In support of this goal, the major objectives are to: 1) maintain a comprehensive data base for nuclear materials accounting and develop an integrated safeguards information system (ISIS) which will include data to evaluate the adequacy of safeguards; 2) complete development of methods to test the adequacy of safeguards at nuclear fuel cycle facilities and during transport; and 3) periodically assess and monitor the effectiveness of particular safeguards systems for all strategically important special nuclear material fuel cycle facilities and transportation modes.

The following items were the significant accomplishments during FY 1978: 1) continued to operate and refine the Nuclear Materials Management and Safeguards System (NMMSS) pending development of the ISIS; 2) continued to refine the methodology for evaluating safeguards effectiveness at nuclear fuel cycle facilities and during transport; and 3) evaluated the vulnerability of safeguards at selected nuclear fuel cycle facilities and for selected transportation routes.

The significant accomplishments planned during FY 1979 are to: 1) continue to operate NMMSS and evaluate alternative ISIS implementation plans; 2) develop two mathematical models to assist in evaluating the adequacy of material accounting safeguards and physical security safeguards; and 3) evaluate the

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

effectiveness of the safeguards systems for selected nuclear fuel facilities and selected transportation routes.

The significant accomplishments planned during FY 1980 are to: 1) continue to operate the NMMSS, and contract for the detailed design and implementation of the ISIS; 2) adapt and test site-specific material control and accounting models for three operating facilities and a physical protection model for one facility; and 3) continue the review of operating facility safeguards information for early warning of potential problems, support a joint NRC/DOE engineering test program for safeguards, and provide a capability for unscheduled special purpose evaluations of safeguards at three nuclear facilities.

The increase in funding in FY 1980 is for the detailed design and implementation of ISIS.

International Safeguards.....FY 1978 = $299 (10) FY 1979 = $210 (10) FY 1980 = $365 (11)

The goal is to strengthen international nuclear safeguards and physical protection measures by participating with other U.S. agencies in bilateral and multilateral activities, and fulfill NRC technical responsibilities for export/import licensing through the evaluation of international material control and accounting and physical security measures. In support of this goal, the major objectives are to: 1) implement the U.S./International Atomic Energy Agency (IAEA) Safeguards Agreement provisions (subject to Congressional approval); 2) conduct timely safeguards technical reviews of export/import license applications in compliance with the Nuclear Non-Proliferation Act of 1978; 3) fully support U.S. efforts for strengthening international safeguards by participating in various interagency programs, committees, and symposia; and 4) maintain a comprehensive data base and information system to track foreign origin nuclear material.

The following items were the significant accomplishments during FY 1978: 1) assisted in finalizing specific technical requirements in the Subsidiary Arrangements and Facility Attachments to the IAEA Agreement, published rule changes requiring application of international physical protection standards to forms and amounts of nuclear materials not covered by current NRC regulations, and upgraded the Nuclear Materials Management and Safeguards System to satisfy IAEA reporting requirements; 2) conducted timely safeguards 376 reviews of exports/imports license applications; 3) provided technical assistance to the U.S. representatives to the IAEA/Standing Advisory Group on Safeguards Implementation (SAGSI) and participated in interagency efforts to strengthen IAEA safeguards; and 4) develop an automated system for tracking foreign origin nuclear material.

The significant accomplishments planned in FY 1979 are to: 1) take regulatory actions to apply IAEA Safeguards to selected U.S. nuclear facilities, and satisfy IAEA data reporting requirements; 2) perform 328 timely Safeguards technical reviews and recommend actions on export and import license applications; 3) provide technical assistance to the U.S. representatives to the IAEA/SAGSI and participate in interagency efforts to strengthen IAEA safeguards; and 4) implement automated systems for tracking foreign origin nuclear material.

The significant accomplishments planned during FY 1980 are to: 1) continue coordination of the NRC effort to implement the U.S./IAEA Safeguards Agreement in eligible licensed facilities, and review facility design information and assist in the preparation of facility attachments in approximately 100 facilities; 2) conduct an expanded physical security and material control and accounting review of 200 export/import license applications, and conduct visits to perform physical security program evaluations; 3) support U.S. efforts for strengthening international

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

safeguards and physical security; and 4) continue implementation of the procedures for tracking foreign origin material.

The additional resources requested in FY 1980 are for implementing the IAEA Agreement and performing an expanded physical review of export/import applications in compliance with the Category II and III Rule currently under promulgation.

Safeguards Licensing.....FY 1978 = $117 (24) FY 1979 = $0 (26) FY 1980 = $0 (27)

The goal is to assure the protection of the public health and safety and promotion of the national security through the Safeguards licensing of certain nuclear activities in the private sector. In support of this goal, the major objectives are to: 1) complete the timely review of new license applications and requests for major and minor modifications to existing safeguards plans, and prepare required environmental impact statements; 2) complete, by the end of 1980, the review of licensee physical protection plans submitted in compliance with the Physical Protection Upgrade Rule; and 3) impose license conditions and identify the need for rule changes to correct weaknesses noted as a result of feedback from the Information, Analysis, and Evaluation Program Element and licensing reviews of inspection reports.

The following items were the significant accomplishments during FY 1978: 1) performed timely review of 5 major (over 100 reviewer man hours) and 158 minor (less than 100 reviewer man hours) modifications to existing safeguards plans, prepared required environmental impact statements and completed the major portion of the Material Measurement Control Plans (10 CFR 70.57) submitted by licensees; 2) work on major objective 2 is expected to begin in FY 1979; and 3) imposed license conditions and identified the need for rule changes to correct weaknesses in licensee safeguards.

The significant accomplishments planned during FY 1979 are to: 1) perform the timely review of 54 major and 130 minor modifications to existing safeguards plans, and prepare required environmental impact statements; 2) complete initial review and evaluation of licensee Phase One Physical Protection Plans submitted in compliance with the Physical Protection Upgrade Rule; and 3) impose license conditions and identify the need for rule changes to correct weaknesses in licensee safeguards.

The significant accomplishments planned during FY 1980 are to: 1) complete review of 47 major and 170 minor amendments to existing safeguards plans; 2) substantially complete the reviews of licensee Phase One Physical Protection Plans for fixed sites and complete reviews of the Transportation Plans submitted by licensees in compliance with the Physical Protection Upgrade Rule; and 3) impose license conditions required as a result of feedback from site assessments, contingency planning, and inspection report reviews.

The additional staff is required to accommodate the forecast increase in minor cases.

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

Safeguards Technology.....FY 1978 = $497 (8) FY 1979 = $771 (10) FY 1980 = $430 (8)

The goal is to provide the basis for responsive and cost effective safeguards for an evolving nuclear industry. In support of this goal, the major objectives are to: 1) formulate NMSS safeguards research requirements and monitor and provide inputs to the NRC safeguards research programs; 2) via the Safeguards Technical Assistance and Research (STAR) Coordinating Group, provide agency-wide review of research and technical assistance projects to confirm their need, avoid duplication and overlap, and assess priorities; (3) ensure applicability and transfer of advanced safeguards technology in a form suitable for use by NRC and licensees; 4) ensure the timely availability of needed safeguards for an evolving nuclear industry; 5) develop and update the NRC Integrated Safeguards Program Plan; and 6) provide safeguards technology coordination with other agencies.

The following were significant accomplishments during FY 1978: 1) four major research requirements were formulated and transmitted to RES; 2) through the STAR Coordinating Group, provided agency-wide review of NRC safeguards research and technical assistance projects to confirm need, avoid duplication and overlap, and assess priorities; 3) investigated the utility of advanced safeguards technology in the areas of communications, transportation, process monitoring techniques and evaluative methodologies, including initiation of user suitability tests of several models for evaluating safeguards effectiveness; 4) performed studies and analyses on safeguards needs in the areas of (i) alternative fuel cycles, (ii) initial geologic repositories for high-level waste, and (iii) byproduct materials and small quantities of SNM; 5) published Phase I and initiated Phase II of the NRC Integrated Safeguards Program Plan; and 6) provided coordination with the safeguards technology programs of other agencies.

The significant accomplishments planned for this program element in FY 1979 are to: 1) formulate, coordinate, and transmit additional research requirements to RES, including a coordinated program plan responsive to the NMSS evaluative methods research requirement on insider crime data; 2) the STAR Coordinating Group will continue to provide agency-wide review of all safeguards contractual projects; 3) continue investigation of the utility of advanced safeguards technology in the areas of communications, transportation, process monitoring techniques and evaluative methodologies--user suitability of the TRW, SAFE, and MAIT methodologies will be completed; 4) continue studies and analyses on safeguards needs in the areas of (i) initial geologic repositories for high level waste and (ii) byproduct materials and small quantities of SNM; 5) update the NRC Integrated Safeguards Program Plan; and 6) continue coordination of NRC safeguards technology programs of other agencies.

The significant accomplishments planned during FY 1980 are to: 1) continue to formulate, coordinate and transmit safeguards research requirements to provide the basis for responsive and cost-effective safeguards; 2) the STAR Coordinating Group will continue agency-wide review of research and technical assistance projects; 3) continue investigation of the utility of advanced safeguards technology in the areas of (i) communications--improved communications procedures will be drafted and a user-oriented communications performance model will be developed, (ii) process monitoring technology -- evaluate the alternative concepts for timely detection of theft or diversion of nuclear material from fuel cycle facilities, and (iii) evaluative methodologies--feedback will be provided to RES based on results of user suitability tests and operational use of models tested in prior years; 4) examine the safeguards implications of alternative waste facilities associated with fuel cycles identified by NASAP and INFCE and, where indicated on the basis of the results of the first two phases of the safeguards analysis of byproduct materials and small quantities of SNM, candidate safeguards systems will be defined and their impact assessed; 5) update the Integrated

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

Safeguards Program Plan; and 6) continuing coordination with safeguards technology programs in other agencies will be provided.

Safeguards Regulatory Improvements.....FY 1978 = $491 (19) FY 1979 = $670 (21) FY 1980 = $530 (18)

The goal is to establish safeguards regulations which effectively promote the national security and protect the public health and safety against nuclear theft from, and sabotage of, NRC licensed facilities and associated transport. In support of this goal, the major objectives are to: 1) implement the Safeguards Physical Protection Upgrade Rule and review upgraded safeguards operating experience through FY 1982 to determine what changes should be made in existing regulations; 2) publish a draft Material Control and Accounting (MC&A) Upgrade Rule in FY 1980 and a final rule in FY 1981 3) upgrade and improve regulatory guidance on a continuing basis starting in FY 1980; 4) combine physical protection (10 CFR 73) and MC&A (10 CFR 70) safeguards requirements into an Integrated Safeguards Regulation by 1983; 5) implement by FY 1980 a regulatory planning system which analyzes trends, characteristics, and regulatory impacts of evolving safeguards technology; and 6) perform value/impact analysis on proposed safeguards regulations.

The following were the significant accomplishments during FY 1978: 1) revised and published the proposed Physical Protection Upgrade Rule for public comment, developed part of the draft regulatory guidance for implementation of the Upgrade Rule and published for public comment requirements for the protection of materials of moderate and low strategic significance, 2) developed initial approaches for a proposed MC&A Upgrade Rule; 3) effort on major objective 3 starts in FY 1980; 4) activity on major objective 3 begins in FY 1979; 5) activity on major objective 5 begins in FY 1979; and 6) conducted value-impact assessments of protection of transient shipments that temporarily use U.S. facilities while enroute from one foreign country to another.

The significant accomplishments planned for this program element during FY 1979 are to: 1) publish the Physical Protection Upgrade Rule in effective form and complete supporting regulatory guidance; 2) develop a MC&A Upgrade Rule, and begin developing regulatory guides to be used with the rule; 3) effort on major objective 3 starts in FY 1980; 4) develop initial alternative approaches for the proposed Integrated Safeguards Rule; 5) prepare a long term plan to MC&A upgrades requiring new technology; and 6) conduct value-impact assessments of the MC&A Upgrade Rule.

The significant accomplishments planned during FY 1980 are to: 1) initiate review of operating experience at six fuel cycle facilities under upgrade rule as well as of licensees with nuclear material of low and moderate strategic significance; 2) publish the MC&A Upgrade Rule and necessary regulatory guidance in draft form; 3) complete upgrading of Physical Protection Guidance; 4) develop alternative approaches for combining physical protection and MC&A safeguards requirements into an integrated regulation; 5) complete the advanced planning system and make initial assessments for incorporating major evolving safeguards technology into the regulations; and 6) complete the MC&A Upgrade Rule value/impact assessment.

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

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

Summary of Waste Management Program

Program Element	Actual FY 1978 Dollars	Actual FY 1978 People	Estimate FY 1979 Dollars	Estimate FY 1979 People	Estimate FY 1980 Dollars	Estimate FY 1980 People
High Level and Transuranic Waste Management	$ 6,125	19	$ 4,315	18	$ 6,250	30
Low Level Waste Management	894	16	2,300	16	2,725	25
Total	$ 7,019	35	$ 6,615	34	$ 8,975	55
High Level and Transuranic Waste Management	FY 1978 = $6,125 (19)		FY 1979 = $4,315 (18)		FY 1980 = $6,250 (30)	

The goal is to develop a comprehensive High Level and Transuranic Waste Management program for NRC including an integrated framework of regulations, standards, and guides for management of all nuclear wastes under NRC regulatory jurisdiction; and perform safety and environmental analyses, perform licensing reviews, and make licensing decisions.

The major objectives are to: 1) develop and issue regulations for geologic disposal of high-level wastes (HLW), transuranic wastes (TRU), and spent fuel by early FY 1980 and issue an amendment to the general regulation on waste classification by the end of FY 1980; 2) develop a licensing capability (including an analytic model) and review procedures for assessing the impact (on public health and safety and the environment) of proposed geologic disposal facilities located within the continental U.S. for solid wastes, and issue guides for content/format of DOE environmental reports and safety analysis reports to support an application for licensing of facilities for disposal of HLW and TRU in bedded salt by the end of FY 1982; and 3) complete the operating license review for a pilot commercial waste repository (PCWR) by the end of FY 1985 and for the first commercial repository by the end of FY 1989.

The following items were the significant accomplishments during FY 1978: 1) preliminary drafts of both the administrative and technical portions of 10 CFR 60 were prepared and circulated internally for review and comment; 2) preliminary drafts of both the environmental report and preliminary safety analysis report guides for content and format were prepared and circulated for internal review (the environmental report guide was sent to DOE and other interested parties for comment in November 1978); and 3) the third major objective (i.e., operating license review) will not begin until FY 1979.

The significant accomplishments planned for FY 1979 are to: 1) promulgate a general administrative regulation on the management of HLW 10 CFR Part 60 along with the negative declarations, promulgate the technical criteria for the management of HLW as an appendix to 10 CFR Part 60, and publish the draft of the supporting EIS; 2) complete the development of an analytic model for predicting long-term migration of radioactive materials from deep geologic repositories in bedded salt and issue the draft standard format and content guides and draft licensing procedures for assessing proposed facilities for disposal of high-level and transuranic wastes in bedded salt; and 3) complete 15% of the repository development authorization review for PCWR. (The PCWR review may not develop because the NRC may not be required or permitted to license the facility.)

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

The significant accomplishments planned for FY 1980 are to: 1) issue a general regulation for disposal of HLW, TRU, and spent fuel; issue an amendment to the general regulation on waste classification; publish a Branch Technical Position on radiological performance objectives; and start to develop standards for layered basalt; 2) start methodology development for analyzing repositories in layered basalt; and 3) issue the Final Environmental Statement and the Safety Evaluation Report for PCWR and initiate review of first commercial waste repository and preliminary site review work.

The increase in resources in FY 1980 are to continue the development of regulatory base and expand it to include geological media other than salt.

	FY 1978	FY 1979	FY 1980
Low Level Waste	$894 (16)	$2,300 (16)	$2,725 (25)

The goal is to develop a comprehensive Low Level Waste Management program for NRC including an integrated framework of regulations, standards, and guides for management of all low level nuclear wastes under NRC regulatory jurisdiction; and perform safety and environmental analyses, perform licensing reviews, and make licensing decisions on a timely basis.

The major objectives are to: 1) develop and issue proposed general regulations governing shallow land burial by the end of FY 1980 and alternative disposal methods for low-level wastes (LLW) by the end of FY 1983; 2) develop a licensing capability, review procedures and publish regulatory guides to assess the impact (on public health and safety and the environment) of shallow land burial by the end of FY 1980, and alternative LLW disposal methods by the end of FY 1983; 3) participate in the agency-wide program to develop and issue proposed general regulations applying to decommissioning by the first quarter of FY 1981 and regulatory guides by the end of FY 1983; 4) complete review of one existing commercial shallow land burial site in FY 1980, reassess existing sites in FY 1981-1983 and provide technical assistance to Agreement States as required, and initiate licensing actions (safety and environmental review) on three new shallow land burial sites (or alternative disposal methods) by the end of FY 1983; and 5) complete rulemaking actions derived from the final GEIS on Uranium Milling in FY 1980.

The following items were the significant accomplishments during FY 1978: 1) published a report on the development of a classification system for waste disposal; 2) initiated development of a model for projections of waste disposal needs; 3) initiated a study of decommissioning of a shallow land burial ground; 4) prepared the Sheffield Environmental Impact Statement; and 5) published the draft GEIS on Uranium Milling.

The significant accomplishments planned for FY 1979 are to: 1) publish reports on the chemical toxicity of low level waste, volume reduction technology and organizational roles in low level waste management; 2) complete development of a model for making projections of waste disposal needs and publish a report on the model; 3) complete study of shallow land burial ground decommissioning with SD; 4) publish the final EIS for the Sheffield LLW site and commence hearings; and 5) complete the final GEIS on Uranium Milling and start rulemaking.

The significant accomplishments planned for FY 1980 are to: 1) publish a proposed regulation with supporting EIS on administrative requirements for LLW disposal, with appendix on technical requirements for shallow land burial, and complete 20% of the development of appendix on technical requirements for alternative disposal methods; 2) publish regulatory guides for comment and develop licensing capability and review procedures for shallow land burial sites; and complete 20% of the

development of regulatory guides, review procedures and licensing capability for alternative disposal methods; 3) under the lead of OSD, complete 80% of proposed regulations for decommissioning of fuel cycle facilities and initiate development of regulatory guides; 4) complete review of Sheffield and six minor license amendments for existing shallow land burial sites; and 5) complete the rulemaking actions derived from the final GEIS on Uranium Milling.

The increase in resources in FY 1980 will expand the regulatory base to allow for alternatives to shallow land burial.

Summary of Program Evaluation and Policy Management Program

PROGRAMS	Actual FY 1978 Dollars	Actual FY 1978 People	Estimate FY 1979 Dollars	Estimate FY 1979 People	Estimate FY 1980 Dollars	Estimate FY 1980 People
Technical Programs Analysis and Evaluation	$ 0	15	$ 0	15	$ 50	13
Policy Management	0	19	0	24	110	22
Total	$ 0	34	$ 0	39	$ 160	35

Technical Programs Analysis and Evaluation.....FY 1978 = $0 (15) FY 1979 = $0 (15) FY 1980 = $50 (13)

The goal is to provide the Office Director with timely and substantive assessments of financial, schedule, and performance status of NMSS programs and resources; provide to the Director timely alternatives for reallocation of current resources; and formulate alternatives to improve the efficiency and effectiveness of planning, organizing, directing and controlling NMSS technical programs.

The major program element objectives are to: 1) develop and manage an office-wide system to improve the quality of technical and resource planning, technical assistance execution, and status reports; 2) conduct special technical and management evaluations as requested by the Office Director, and provide independent technical and management assessments of selected technical programs, proposals, and other issues; 3) manage the NMSS Financial Control System (FCS); 4) develop, implement, and manage the NMSS Program Planning and Status Assessment System (PPSAS); 5) execute delegated responsibilities regarding placement of technical assistance projects with the Department of Energy; 6) execute delegated responsibilities for placement of technical assistance projects with private contractors; 7) manage the NMSS personnel services program; and 8) manage the NMSS administrative services program.

The following items were the significant accomplishments during FY 1978: 1) prepared office instructions for NMSS Program Managers and implemented procedures for detailed intraoffice pre-procurement planning; 2) provided the Office Director with independent technical and management assessments of NMSS performance; 3) achieved full operation of the NMSS computerized Financial Control System; 4) initiated the idea of a Program Planning and Status Assessment System (PPSAS) which will integrate program planning and assessment activities through an automated system for tracking resources to program objectives; 5) assisted in developing NRC Manual Chapter 1102 which delineates standardized procedures for requesting and authorizing

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

technical assistance from DOE, and evaluated and administered 84 requests for DOE work; 6) evaluated and administered 70 requests for technical assistance from private contractors; 7) evaluated approximately 300 requests for personnel actions and 3,000 resumes and made recommendations to NMSS managers for filling vacancies within NMSS; and 8) established a computerized suspense control system and advised the Office Director and Division Directors regarding NMSS administrative support requirements and capabilities.

The significant accomplishments planned for FY 1979 are to: 1) publish criteria for selection, training and certification of Program Managers; 2) provide independent technical and management assessments to the Office Director; 3) expand the computerized Financial Control System to track period of performance and costs (forecast vs actual) for an estimated 150 active technical assistance efforts; 4) achieve an initial operational capability for PPSAS; 5) evaluate and administer approximately 70 requests for DOE; 6) evaluate and administer approximately 80 requests for technical assistance from private contractors; 7) provide personnel management assistance to the NMSS Office and Division Directors; and 8) manage the computerized NMSS suspense control system and provide administrative support to the Office and Division Directors.

The significant accomplishments planned during FY 1980 are to: 1) develop detailed guidance and procedures for technical program managers; 2) conduct technical and management evaluations required by the Office Director; 3) manage the NMSS Financial Control System; 4) complete development of the PPSAS; 5) evaluate and administer an estimated 70 requests for technical assistance from DOE; 6) evaluate and administer an estimated 80 requests for technical assistance from private contractors; 7) provide personnel management assistance to the NMSS Office and Division Directors; and 8) manage the computerized NMSS suspense control system and provide administrative support to the Office and Division Directors.

Policy Management..... FY 1978 = 0 (19) FY 1979 = 0 (24) FY 1980 = $110 (22)

The goal is to establish, and revise as necessary, policies and procedures for effective management of NMSS programs for Waste Management, Fuel Cycle and Material Safety, Safeguards, and Technical Programs Analysis and Evaluation; establish Office goals consistent with the charter in the Energy Reorganization Act of 1974 and subsequent Congressional and Commission direction; and develop and continually improve systems and procedures for ensuring the efficient utilization of resources toward accomplishment of NMSS major objectives and operational activities.

The major objectives are to: 1) provide policy guidance and management direction to coordinate the efforts of the NMSS programs; 2) provide effective overall management direction for the day-to-day operational activities on a timely basis; and 3) conduct policy initiatives to improve organizational efficiency and management effectiveness based on trends identified through the Technical Programs Analysis and Evaluation (TPA&E) program to include an assessment of NMSS licensing methods of one licensing program each year, the development of management skills of currently assigned managers, a reduction in NMSS dependence upon contractual support for radiological assessments, and a reduction in NMSS dependence upon DOE laboratories to less than 50 percent of the total NMSS program by the end of FY 1984.

The following items were the significant accomplishments during FY 1978: 1) directed TPA&E to initiate the development of an automated program planning and status assessment system, and obtained additional resources for the Waste Management and

NUCLEAR MATERIAL SAFETY AND SAFEGUARDS - continued

Fuel Cycle programs; 2) directed the implementation of an automated suspense item control system; directed the administration of the planning, budgeting, contracting, and other fiscal activities of the Office programs; and established programs to solicit and respond to employee suggestions and to hold periodic meetings between the NMSS Director and employees; and 3) completed an independent management and technical study of the Radioisotopes Licensing program element, realigned its organization and management, and revised management practices to improve efficiency of operation and responsiveness to applicants; and conducted a successful management seminar for managers and supervisors to increase their understanding of management concepts and techniques.

The significant accomplishments planned for FY 1979 are to: 1) provide policy guidance and management direction to coordinate the efforts of the NMSS programs and to organize a new Waste Management Division; 2) direct the administration of the planning, budgeting, contracting, and other fiscal activities of the Office programs; and 3) initiate an independent study of a second NMSS licensing activity, institute a series of procurement policy seminars to enhance the management capabilities of individual NMSS project managers, begin the reduction of NMSS dependence on contractual support for Fuel Cycle casework, and reduce technical assistance efforts conducted by DOE laboratories by at least five percent compared to FY 1978.

The significant accomplishments planned during FY 1980 are to: 1) continue to provide policy guidance and management direction to coordinate the efforts of NMSS programs in formulating and successfully accomplishing their individual major objectives, 2) continue to provide effective and timely management direction for the day-to-day operational activities, and 3) conduct policy initiatives in the areas of assessing NMSS licensing methods, reducing NMSS dependence upon contractural support for radiological assessments related to Fuel Cycle casework, and reducing NMSS dependence on DOE laboratories to less than 70 percent of the total NMSS program.

The $110,000 will be used for technical assistance for assessing NMSS licensing methods.

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

NUCLEAR REGULATORY COMMISSION

Nuclear Regulatory Research ..... $ 185,570

Summary of Nuclear Regulatory Research Estimates by Function

	Actual FY 1978	Estimate FY 1979 1/	Estimate FY 1980
Nuclear Regulatory Research:			
Personnel Compensation	$ 4,398	$ 5,130	$ 5,255
Personnel Benefits	418	490	500
Program Support	127,179	143,480	168,000
Administrative Support	1,547	2,080	2,045
Travel	349	400	470
Equipment	6,932	8,720	9,300
TOTAL OBLIGATIONS	$140,823	$160,300	$185,570
Personnel	152	159	159

The Nuclear Regulatory Research personnel and program support funding requirements (primarily contractual support with DOE laboratori s 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 1978		Estimate FY 1979		Estimate FY 1980	
	Dollars	People	Dollars	People	Dollars	People
Reactor Safety Research	$105,840	76	$120,180	81	$142,000	81
Environmental and Fuel Cycle	7,892	13	8,150	12	7,600	12
Waste Management	4,344	6	4,450	8	6,700	10
Safeguards Research	5,702	11	5,500	11	5,000	7
Risk Assessment	3,401	22	4,400	22	5,700	24
Improved Reactor Safety	0	0	800	1	1,000	1
Management Direction and Program Support	0	24	0	24	0	24
TOTAL PROGRAM SUPPORT	$127,179	152	$143,480	159	$168,000	159

1/ Includes $250,000 for FY 1979 pay raise supplemental.

NUCLEAR REGULATORY RESEARCH - Continued

The Office of Nuclear Regulatory Research has the authority and responsibility under the Energy Reorganization Act of 1974 to perform research in support of the nuclear regulatory process. The NRC must maintain a regulatory program which ensures public health and safety and public confidence. A significant part of the basis for this confidence must be 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 needs for public confidence. The principal direct users of the results of the RES program are the various major offices of NRC, the ACRS, the hearing boards, and the nuclear community. There are other important requestors for research, most notably the public. The general scientific community, the public at large, and Congress have shown interest in nuclear safety and must be heard in important decisions regarding the nuclear power alternative. For this reason, the NRC confirmatory research program must also be responsive to inputs from these sources.

Reactor Safety Research..... FY 1978 =$[illegible],840 FY 1979 =$120,180 FY 1980 =$142,000

The objective of the Reactor Safety Research program is development of analytical methods that can be used to assess safety of nuclear power reactors. The overall program includes the following major efforts:

- develop understanding and basic data on phenomena involved in potential reactor accidents
- integrate data and models into complete analytical descriptions of these accidents
- provide integrated experiments that are designed to test the adequacy and completeness of the analytical descriptions in their predictions of accident sequences and consequences
- provide an experimental and analytical basis for criteria and procedures for assessing the safety of system integrity.

The assured safety of nuclear power reactors is of highest importance to the national goal of providing electrical energy in the coming years. The objective of the RSR program is the development of analytical methods that can be used to assess the margin of safety of nuclear power reactors, both as regards the adequacy of engineering designs to prevent accidents as well as to predict the course of events that would occur in accidents.

The analytical methods of safety analysis must be established on a sound engineering base and must be suitably tested. The conditions that might start postulated reactor accidents and the conditions that occur afterwards are outside ordinary engineering experience, and very little data exist in this area. Research programs to provide this information are therefore needed. The analytical methods used to describe such accidents are also outside ordinary engineering methodology and therefore must be developed.

Methods of safety assessment exist now, and these are applied in the course of licensing proceedings. Where data are missing or inadequate, the assessment methods use assumptions generally believed to be conservative. Where the models are simplified or have not been tested adequately, the same principles of conservatism are used. Since the degree of conservatism that

exists in actual designs has a significant degree of uncertainty, it must be determined with greater precision so that confidence in the methods can be increased, and safety margins may, if necessary, be appropriately modified.

Summary of Reactor Safety Research Program Components:

		Actual FY 1978	Estimate FY 1979	Estimate FY 1980
a.	Light Water Reactor (LWR) Safety Research	$ 84,031	$ 95,580	$118,300
b.	Site Technology and Engineering	6,080	8,400	10,000
c.	Advanced Reactor Safety Research Program	15,729	16,200	13,700
	Total Reactor Safety Research Program	$105,840	$120,180	$142,000

a. Light Water Reactor Safety Research

(1)	Systems Engineering	$ 28,216	$ 33,722	$ 34,800
(2)	LOFT	14,660	23,300	42,900
(3)	Code Development	9,146	9,330	8,900
(4)	Fuel Behavior	24,869	20,828	23,100
(5)	Primary Systems Integrity	7,140	8,400	8,600
	Total Light Water Reactor Safety Research	$ 84,031	$ 95,580	$118,300

(1) Systems Engineering ..... FY 1978 = $28,216 FY 1979 = $33,722 FY 1980 = $34,800

The major objectives of the Systems Engineering research programs are to provide an experimental data base from which the performance of engineering safety features for light water reactor (LWR's) can be judged, and from which analytical predictive models and codes which permit assessment or margins of safety in current licensing calculations can be developed and tested.

The Systems Engineering research programs fall into four categories: (1) Integral systems tests (such as the Semiscale facility) which provide a simulated reactor system to evaluate emergency core cooling (ECC) performance, (2) Separate effects test facilities which investigate different components or regions of the reactor system (e.g., simulated fuel bundles, pumps,

NUCLEAR REGULATORY RESEARCH - Continued

etc.) under controlled transients for purposes of investigating behavior under postulated accident conditions, (3) Very small scale (i.e., "bench-type") experiments designed to investigate fundemental two phase flow phenomena for model development, and (4) Operational safety-related to the design of fire protection systems and the development qualification tests for the performance safety-related equipment under reactor accident conditions. 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. Semiscale integral tests have evaluated emergency core cooling (ECC) systems performance, studied steam-generator tube rupture behavior and investigated the scaling philosophy employed to derive the LOFT design from a power reactor design. FY 1979 planned activities will evaluate the upper head injection (UHI) ECC concept and other tests of importance for evaluating ECC performance and capabilities of the analytical tools to predict the performance. In FY 1980, the Semiscale program will include tests on other representative ECC systems. The program will investigate the sensitivity of peak clad temperature to various break sizes in the primary coolant system and will evaluate alternate ECC designs which have the potential to improve reactor safety.

Blowdown heat transfer (BDHT) data, under simulated LOCA transient conditions, is being obtained for BWR and PWR fuel geometrics. The PWR BDHT program at the Oak Ridge National Laboratory (ORNL) is scheduled to complete testing during FY 1980.

A BWR test program, jointly funded with GE and EPRI, is scheduled to continue throughout FY 1980. The joint effort will study the effectiveness of BWR ECC top spray utilizing a facility of larger dimensions to determine whether upflowing steam tends to "levitate" the downflowing BWR ECC water in the BWR upper plenum. Full radius, 30° sector tests at GE's Lynn, Massachusetts facility are planned for FY 1980 and FY 1981.

Small scale tests of ECC bypass and refill are scheduled for completion in FY 1980. Major efforts will consist of tests using special instrumentation installed in FY 1979 and completion of analyses of small scale tests results.

PWR reflood efforts will include continuation during FY 1980 of the jointy funded program with EPRI and Westinghouse. This program studies PWR ECC heat transfer during reflood as influenced by such factors as fuel clad dimensions, grid type, flow blockage shape, and system component geometry.

The principal separate-effects program to investigate the refill/reflood phase of a postulated loss-of-coolant accident (LOCA) will be conducted in the 2D/3D international program currently in the final stage of negotiation with Japan and the Federal Republic of Germany (FRG). This program will provide important information at full scale, will serve as a means for testing the TRAC code and is consistent with NRC emphasis on cooperation and exchange of information with foreign safety research programs. The 2D/3D program will investigate two- and three-dimensional effects of emergency core coolant (ECC) flow through a reactor under simulated refill/reflood conditions. The FRG is planning to construct a non-nuclear full-scale upper plenum test facility (UPTF) to study the de-entrainment of water droplets in the upper plenum and the behavior of emergency core coolant in the downcomer. The Japanese Atomic Energy Research Institute (JAERI) is constructing a large electrically heated cylindrical-core test facility (CCTF) and an electrically heated slab-core test facility (SCTF) to study the flow of steam and water within the core, upper plenum, and downcomer. The NRC is providing the use of an advanced analysis code (TRAC) to analyze, integrate, and evaluate these experimental efforts, and is providing, on loan,advanced instrumentation which will be

installed in these facilities to permit determination of steam and water flow patterns and behavior. These data will then be used to evaluate computer codes and to assess margins of safety. The JAERI CCTF-I is scheduled to commence testing in FY 1979, the SCTF-I in FY 1981, with FRG projecting a start-of-testing in the UPTF in FY 1982. In 1980 NRC contractors will: complete fabrication of instrumentation for the core, vessel and loops for the SCTF in Japan and start fabrication of instrumentation for the UPTF in Germany; start fabrication of film and impedance probes for Core No. 2 of the CCTF in Japan; perform TRAC pre-test and post-test analysis of the CCTF Core No. 1 tests and perform TRAC design calculations for the UPTF.

Model development activities (supported by small scale tests) will continue during FY 1980 to provide basic data for developing models or 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.

Under Operational Safety, tests will continue to emphasize evaluating the effectiveness of both fire prevention measures being utilized in nuclear power plants and qualification testing standards utilized for nuclear power plant safety-related equipment. In FY 1980 larger scale tests of fire protection systems will be conducted, and qualification testing evaluation of full size safety-related equipment will be conducted.

In addition to the above activities, a continued level of technical effort will be applied to maintain a data bank for thermal hydraulic experimental data, to assist in the technical surveillance of NRC/industry jointly funded programs, and to make NRC developed codes and research information available to the public through the National Energy Software Center and the Nuclear Safety Information Center.

(2) Loss-of-Fluid Test.....FY 1978 = $14,660 FY 1979 = $23,300 FY 1980 = $42,900

The Loss-of-Fluid Test (LOFT) facility provides a unique nuclear test facility to investigate the behavior of engineered safety features under a number of postulated accident conditions. The test results are being used to evaluate the adequacy of analytical techniques for assessing performance of engineered safety systems; evaluate the actual performance and safety margins of safety systems; and identify any unanticipated behavior not presently accounted for in evaluating the performance of safety systems.

The non-nuclear LOCA test series on LOFT was completed in FY 1978. The first nuclear loss-of-coolant experiment, at about 2/3 the power density of commercial PWR's, was completed in December 1978, and the second nuclear test at the full power density of commercial PWRs will be completed in FY 1979. In FY 1980, the third and fourth nuclear loss-of-coolant experiments in the five-test power ascension series will be conducted with double ended cold-leg breaks and with cold-leg ECC injection. Work will continue on fabrication and testing of experiment instrumentation, instrumented nuclear fuel and other experimental support such as non-destructive examination of plant components and methods for the structural analysis of plant components. FY 1980 will be the first complete year that NRC assumes from DOE the full costs for operation of the LOFT facility. Therefore, the LOFT budget for FY 1980 includes an additional $9.9M of operating costs that have been previously funded by DOE and must now be provided by NRC. Also an increase of $9.7 million is included for replacement instrumented fuel, plant component examination and to provide facility support and spare parts, the latter two categories were previously DOE's responsibility and must now be borne by NRC.

NUCLEAR REGULATORY RESEARCH - Continued

(3) Code Development and Applications.....FY 1978 = $9,146 FY 1979 = $9,330 FY 1980 = $8,900

Code development 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 safety analysis of reactor systems and components. Experimental results from the research program provides the data for code development and assessment of code accuracy. Code development research includes developing the codes, assessing the accuracy of these codes by comparison to experiments, and applying the codes to specific safety issues. Two types of codes are developed: best estimate models and more conservative evaluation models. Evaluaton models are used in the licensing process to conservatively analyze postulated accidents to ensure that consequences will be within prescribed safety limits. Best estimate models are used in the research program to make realistic predictions of reactor accident behavior, to guide the design of experiments and to analyze experimental results. Also best-estimate models will be used to quantify safety margins and to identify important safety parameters through sensitivity studies.

The RELAP series of systems codes has been under development over several years, with periodic releases to the public of the completed code versions. The RELAP-4 code is in wide use, both in the United States and abroad. This series will be terminated with the release of RELAP-4/MOD 7, currently planned for FY 1980. The basic version of an advanced code (TRAC) for analysis of accidents has been completed and released for general use. In FY 1980, new versions of TRAC to analyze a broader range of possible abnormal reactor conditions and accidents will be completed. Thorough testing of the TRAC code for accuracy and more application studies and sensitivity studies using TRAC are planned for FY 1980.

An advanced code for PWR containment analysis (BEACON-2A) is being completed in FY 1979. In FY 1980 the accuracy of this code will be tested through comparisons with experiments.

(4) Fuel Behavior.....FY 1978 = $24,869 FY 1979 = $20,828 FY 1980 = $23,100

Fuel Behavior research provides experimental data to provide NRC with the capability for independent assessment of reactor fuel behavior during accidents. Specific objectives are 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 work includes fuel/clad model development experiments, fuel irradiation tests, fuel-behavior code development and testing, molten fuel behavior and fission product release and transport, and the Power Burst Facility (PBF) experimental program.

The fuel accident modeling codes FRAP and FRAPCON have been developed to describe fuel behavior during reactor accidents.

In FY 1980 the efficiency of the codes will be improved and some of the models will be improved to incorporate new data from the experimental program. Data on fuel and cladding behavior will be incorporated in the materials properties compilations to improve the predictibility and reduce uncertainty in the fuel codes used in licensing evaluations. In FY 1980, work will continue on improving understanding of fission gas release from high burnup fuel and on cladding ballooning during loss-of-coolant accident conditions.

Irradiation experiments are conducted both 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. In FY 1980 six experiments are planned in PBF. Three tests will be conducted to determine the conservatism of licensing criteria to limit fuel rod damage during simulated overpower accidents. Two tests will subject fuel rods to LOCA conditions and the final experiment will study possible fuel rod failure due to fuel pellet - cladding mechanical interaction during postulated reactor transients.

To complement the PBF testing of three-foot-long fuel rods, an agreement has been made with the Atomic Energy of Canada, Limited, to test full-length (twelve-foot-long) fuel rods in the NRU reactor. The first experiment is planned for FY 1980. The NRC also participates in the international OECD Halden Reactor Project in Norway to obtain additional fuel safety information.

Also included with the Fuel Behavior program are studies of fission product release and transport following fuel failure and the behavior of fuel following a meltdown. The experimental studies of molten fuel/concrete interactions, vapor explosion triggering, and fission product release during fuel melting have been completed. In FY 1980 the models in the TRAP code to analyze fission product transport will be mostly completed, vapor explosion propagation will be studied at intermediate scale and molten core-concrete interaction results will be summarized in a state of the art report.

(5) Primary System Integrity.....FY 1978 = $7,140 FY 1979 = $8,400 FY 1980 = $8,600

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

The results of large vessel tests have demonstrated the design conservatism 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 1979 have demonstrated integrity of weld repair techniques and have identified conditions under which thermal shock will not propagate cracks.

In FY 1980 this research will obtain data to update the ASME Code curves for evaluating the growth of cracks found in operating plants, will define the toughness necessary to arrest cracks in irradiated steel to assure integrity of vessels under thermal shock accidents and will determine fracture toughness of irradiated vessel steel to assure compliance of operating reactors with Federal regulations for material toughness. Analysis of thermal shock and steam line break tests will validate the methodology for determining reactor vessel integrity under these accidents. Also in FY 1980, this program will begin testing criteria for determining break locations in piping systems and for assessing damage caused by pipe whip to permit licensing decisions on plant design and to preclude severe consequences of pipe system failures.

Research in post-irradiation annealing has shown the potential for improving the mechanical properties of irradiated reactor vessels for continued safe service. Research in FY 1980 will establish time, temperature and recovery criteria for possible licensing actions on applications for annealing pressure vessels. Interpretation and application of irradiation effects data, especially vessel surveillance results, requires accurate

NUCLEAR REGULATORY RESEARCH - Continued

neutron dosimetry methods. In FY 1980, experimental irradiations will be complete to start the checking calculations against measurements of both neutron dosimetry and radiation embrittlement from a realistic pressure vessel environment.

Studies through FY 1979 of steam generator tubes having man-made flaws have provided the technical basis for criteria for requiring plugging of degraded steam generator tubes. Research in FY 1980 is planned for checking the degree of integrity of tubes having dents, cracks, and corrosion by using tubes from a decommissioned steam generator. Further studies are planned on the decommissioned generator to determine the true degraded conditions following years of service.

Research on in-service inspection techniques is required to define the current capabilities for detection and evaluation of flaws by non-destructive examination methods for both pressure vessels and piping. In FY 1979, ultrasonic in-service inspection equipment will be used to show the capability for flaw evaluation within ASME Code Section XI requirements for flaw shape, depth and location, on flaws detected in the field. In FY 1980, this test work will be expanded to develop a large data base for reliability of flaw detection in vessels, nozzles and piping using both current and advanced NDE techniques. These data will help to provide a basis for setting limits on the size of flaws that can remain undetected, and establish error bounds on the size and shape of detected flaws. Other research will obtain acoustic emission data from operating reactor environments for setting of criteria for the potential severity of a growing flaw in an operating reactor component; field evaluation tests will be performed to establish the capability of improved eddy current techniques for in-service inspection of tubing in steam generators having severe tube denting.

Site Technology and Engineering.....FY 1978 = $6,080 FY 1979 = $8,400 FY 1980 = $10,000

The 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, laboratory experiments and field tests and observations. Aircraft collisions, accidental explosions and the threat of damage from missiles generated by turbine failures are representative of other accidents which, in certain cases, warrant consideration in the licensing safety evaluation. In addition, the site technology and engineering program seeks to evaluate concepts which mitigate the effects of extreme environmental and accident events, as for example, systems which isolate nuclear power plants from the vibratory motions of earthquakes. Novel nuclear facility siting designs, such as underground facilities or floating power plants, fall within the interests of this program.

The site technology and engineering 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 multidisciplined effort involving seismology, structural engineering and mechanical engineering. The objective of the SSMRP is to develop mathematical models that can more realistically define these elements that affect 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 structural loads from the combination of simultaneous large earthquake and large loss-of-coolant.

During FY 1980, current effort on seismological and meteorological investigations will be continued and expanded. Estimation of potential earthquakes hazards in different regions of the U.S., development of methods for recognition of recent movements on faults, a best estimate tornado hazard model for all regions of the U.S., and determination of tornado static and dynamic loads are the projected accomplishments for the year. The structural engineering program will continue to support the Seismic Safety Margins Research Program and will develop programs responsive to licensing needs in the areas of buckling of steel containments, assessment of structural margins to failure and seismic testing of structures. The latter effort will have a major impact on the seismic portion of the Systematic Evaluation Program of older operating reactors. The mechanical engineering program will continue investigations in the areas of component and equipment facility nonlinear modeling and scaling of components and equipment, and mechanical component response and systems behavior in support of the SSMRP. Investigations of the behavior of mechanical and hydraulic snubbers under accident and environmental conditions will be continued.

c. Advanced Reactor Safety Research

	Actual FY 1978	Estimate FY 1979	Estimate FY 1980
(1) Fast Breeder Reactors	$13,544	$12,500	$13,700
(2) Advanced Converter Reactors	2,185	3,700	0
Total Advanced Reactor Safety Research	$15,729	$16,200	$13,700

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. It will keep the minimum expertise in place to provide the capability to respond to national initiatives with a program of advanced reactor safety research to meet agency responsibilities. Two types of reactor have been the focus of this program - Fast Breeder Reactors (FBR) and Advanced Converter Reactors (High Temperature Gas-Cooled Reactors); the gas-cooled reactor safety research will be terminated in FY 1980.

(1) Fast Breeder Reactors.....FY 1978 = $13,544 FY 1979 = $12,500 FY 1980 = $13,700

The program is divided into four areas: analysis, aerosol release and transport, material interactions and structural integrity.

Analysis

The program in the analysis area is designed to provide a balanced inventory of computer codes to assess the safety of

NUCLEAR REGULATORY RESEARCH - Continued

advanced reactor systems and the consequences of accidents. The SIMMER code is designed to analyze core disruptive accidents (CDA); the Super System Code (SSC) is designed to analyze the response of the plant to transients;COMMIX is designed to analyze the detailed thermal-hydraulic performance of plant components and CONTAIN is designed to assess the performance of containment systems.

During FY 1980 the SIMMER code treatment of thermophysical properties and neutronics will be improved and tested against experimental data to improve the quality of predictions and to extend the scope of its predictive capability. The SSC code which currently treats loop type plants will be extended to allow the analysis of pool type plants. The capability of COMMIX will be extended to treat a full range of two-phase flow problems. The CONTAIN code will be published and tested against available experimental data.

Aerosol Releases and Transport

This area is directed towards measuring the amount of radioactive material that could be available for release from the containment building as a consequence of a core disruptive accident. It will provide needed data and validated analytical methods (HAARM-3 code) for predicting the behavior of the aerosol in the containment building. Two types of tests are used: one to assess the transport of the radioactive aerosol and the other to assess how much is involved.

During FY 1980 a series of fuel and sodium oxide aerosol tests will be conducted in the Nuclear Safety Pilot Plant to help test the HAARM-3 code. Other tests in which fuel is vaporized under sodium will be conducted in the Fuel Aerosol Simulant Test vessel to measure the amount of aerosol available for release to the containment building under accident conditions.

Materials Interactions

This area provides data for evaluating the consequences of the thermal, chemical, and mechanical interactions of hot core materials under postulated core disruptive accident conditions, and supports the development of models of the governing phenomena for use in accident analysis codes.

The FY 1980 program of in-core experiments will be conducted under near prototypic conditions of those significant phenomena observed in tests in earlier years. They include experiments on prompt-burst energetics (damage potential) with larger bundles of fuel pins and experiments on the disruption of irradiated fuel rods under accident conditions. The core-debris behavior experiments are a continuation of unique in-core experiments which showed higher than expected coolability of particulate core debris in sodium pools under post-accident conditions. The new experiments will better define these less restricted coolability limits and will include experiments on the coolability and containability of molten core materials.

Structural Integrity

This area provides data for the development of models to calculate the effect of molten fuel and sodium on the plant structure below the reactor vessel in core melt accidents. Also included is the development of data to assess the integrity of metal components of a reactor plant that operates at high temperatures over a 30 to 40 year lifetime.

The FY 1980 containment integrity program includes tests of hot sodium on steel-lined concrete cells including intentionally defected cell liners, tests of molten core materials on concrete, fire brick, and other materials, and the development of analytical models. The FY 1980 program for evaluating long-term reactor system integrity at high temperature consists of tests on creep-fatigue interaction, non-linear analysis of system

NUCLEAR REGULATORY RESEARCH - Continued

components, identification of in-service inspection needs over the plant lifetime, and evaluation of NDE (non-destructive examination) methods for measuring material damage.

(2) Advanced Converter Reactors.....FY 1978 = $2,185 FY 1979 = $3,700 FY 1980 = 0

This research program, including research activities in support of the Ft. St. Vrain Reactor, will be terminated in FY 1980. This is in concert with administrative policy to not pursue a national HTGR development program and is consistent with the DOE plan for FY 1980.

Environmental and Fuel Cycle.....FY 1978 = $7,892 FY 1979 = $8,150 FY 1980 = $7,600

The research program of the NRC provides the required technical data for predicting and assessing effects on the environment and on man from nuclear power plant operation and for assessing the safety and environmental impacts of nuclear fuel cycle facility operation.

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

1. Environmental Effects research is directed to meeting the needs identified by the licensing process for assessing the impacts of power plant and fuel cycle operation.

2. Systems Performance research involves studies of the performance of effluent control systems used in uranium milling, fuel fabrication, fuel processing and the transport of nuclear materials, and reactor operations.

Nuclear Power Plant Environmental Effects

Environmental Effects research in FY 1980 includes a large number (46) of projects covering the physical transport of radioactive chemical and thermal releases in terms of their impacts on people and aquatic environments. The physical transport of normal reactor effluents and accidental releases of radionuclides to aquatic systems will be studied to provide verified data and an improved matematical model for the assessments of environmental impacts which are carried out as part of each licensing action. Hydrological and radiochemical field measurements will be made to provide verified data on the transport of radionuclides on sediments in rivers and will continue to provide a basis for testing the models used for environmental impact assessments.

Data from effluent samples will be collected to identify the chlorine compounds discharged to rivers, estuaries and marine waters, and bioassays will be made to determine the toxicity of the byproducts of the chlorine used to reduce biofouling in cooling system piping will be completed in FY 1980 in direct support of nuclear power plant licensing. Research to assess and model the ecological impact of cooling water intake structures on important species of fishes, zooplankton and phytoplankton in the Hudson River will be continued for use in environmental impact statements and for public hearing testimony relative to impacts on striped bass and white perch.

In plant measurement of PWR effluent source terms will be continued to validate assumptions and engineering judgments used in safety analyses. Work will be continued to verify radiation dosimetry models and improve codes used for calculating

dose commitments and predicting health effects for radiation exposure in all licensing actions.

Case studies assessing the socioeconomic effects of nuclear power plant siting construction and operation on the resident people, communities and institutions will be completed for cost benefit analyses needed in the licensing process associated with plant construction. Research on decommissioning NRC licenses facilities will be continued during FY 1980 to provide a basis for regulatory standards on decommissioning nuclear plant systems at the end of their useful life.

Systems Performance Research

Systems Performance research includes work to confirm the performance of systems and equipment designed to limit the release of radioactivity to the environment. This research deals with activities associated with reactor fuel fabrication, processing, spent fuel storage, facility decommissioning, transportation and the commercial uses of radioisotopes and routine reactor operations. Data from field measurements made in these programs are used as a principal source of technical support for the development of regulatory guides and standards and in licensing assessments of the impacts of routine and accident effluents on man and the environment.

The proposed FY 1980 funding provides for the completion of experimental programs to provide improved criticality models for licensing spent fuel storage and transportation systems and data on the performance of ventilation safety systems under accident conditions. Measurements of radioactive effluents from operating nuclear power plants will be completed and will provide confirmation of Appendix I assumptions used by the licensing staff. The experimental program to develop data on accident effluents will be continued. Programs will be initiated to provide validated data on the extent of contamination in nuclear facilities to support "as low as reasonably achievable" decisions relative to nuclear facility decommissioning. Residual levels of radioactivity in reactors and fuel cycle facilities will be measured and the impacts of decontamination operations on effluent control and waste treatment systems will be determined.

In the area of transportation safety, experimental programs designed to characterize the releases from failed shipping systems will be continued, focusing on packages for low specific activity materials. Studies and analyses required to support cost benefit and ALARA decisions on alternative transportation regulations will be initiated and efforts to improve computer codes for licensing assessments of the structural response of shipping containers to accident conditions will be continued.

Waste Management.....FY 1978 = $4,344 FY 1979 = $4,450 FY 1980 = $6,700

The waste management research program is directed at producing the technical information and confirmed methodologies required to provide the bases for decisions and actions to regulate the storage and disposal of radioactive wastes. It provides an independent NRC appraisal of DOE waste management plans including assessments of alternatives, costs and benefits. The program will develop the necessary information for the licensing of waste control facilities including high-level waste repositories and shallow-land burial and uranium mill tailings sites. The information base consists of data and models for predicting long-term behavior of radionuclides stored in or contiguous to the biosphere or in deep geologic media. The research also encompasses analyses and assessments of alternative methods for treatment, packaging transport and isolation of nuclear wastes.

NUCLEAR REGULATORY RESEARCH - Continued

High-Level Waste

The primary objective of the high-level waste program for FY 1980 is to provide adequate data for establishing standards and licensing requirements for deep geologic repositories, for giving timely guidance to DOE concerning these standards and for assuring that the Commission will be able to make necessary licensing decisions on a timely basis. Specifically, improved data and methods for evaluating waste force durability, package integrity and waste release rates under environmental conditions are needed. Geochemical interactions between wastes and implacement media must be understood to determine effective integrity and useful life time of repositories. Long-term physical transport modeling must be undertaken to predict the long-term fate of wastes and to establish consequences of the potential breaching of a repository.

Low-Level Waste

The low-level waste program involves studies to assess performance at existing shallow-land burial sites for the purpose of determining the adequacy of siting and monitoring criteria and standards. Research will be done to improve methods for predicting environmental impacts of waste burial, to assess the safety of operational methods, and to evaluate alternatives to shallow-land burial for low-level waste management. Field and laboratory measurements are needed to confirm the adequacy of monitoring methods, the appropriateness of engineering practices and the extent that radionuclides have been transported from existing sites such as West Valley, New York and Maxey Flats, Kentucky. Models must be tested and improved to predict the transport of radioactive wastes by surface waters and groundwaters, and the transport of sediments from adjacent streams at the sites.

Mill Tailings

The research on mill tailings management is assessing the radiological source terms associated with uranium milling operations as input to the generic environmental impact statement (GEIS). Data characteristics of resuspended particulates from mill tailings and conditions which cause particulate redistribution are needed. Radon measurements made under different types of management schemes and under various environmental conditions are important for assessing long-term impacts. Experiments are needed to resolve questions about impacts on groundwater from tailings and in-situ mining practices. The data from these studies are needed permit evaluation of alternative means of containing and stabilizing existing and future mill tailings.

The requested funding increase of $2,250,000 will permit an extension of ongoing waste form studies to materials other than glass/ceramics and allow the initiation of deep geologic mining engineering studies which are not yet underway. New research will be initiated to confirm the role of geochemical processes in retarding migration and affecting the fate of radonuclides in geologic media. The shallow land burial research will be extended to include all of the existing sites. The mill tailings program will begin ground water contamination modeling and validation.

Safeguards Research.....FY 1978 = $5,702 FY 1979 = $5,500 FY 1980 = $5,000

The goals of the safeguards research program are to provide systematic and quantitative bases for licenses safeguards regulation and to develop methods for objective and consistent evaluation of safeguards effectiveness. Their goals will be achieved by:

NUCLEAR REGULATORY RESEARCH - Continued

1. Developing methods for evaluating the effectiveness of safeguards subsystems (Physical Protection, Material Control and Accounting, and Transportation) and integrating these methods into an overall assessment of total safeguards system effectiveness.

2. Providing comprehensive and validated data bases to support the use of performance evaluation methods in performing the functions of license review, performance evaluation, and compliance inspection.

3. Providing information and analysis to support the selection and development of new safeguards regulatory policies and performance criteria.

The program initiated in FY 1977 to examine methods and data which can assist in characterizing, assessing, or responding to communicated threats will continue at a reduced level of effort. The emphasis will shift toward maintaining the NRC/DOE /FBI operational capability to assess communicated threats at a state-of-the-art level. This capability is jointly supported by NRC and DOE.

Research to develop performance inspection methods for physical protection will continue. Research products during FY 1980 will include an improved equipment catalog and evaluation guide which will include all physical protection equipment currently installed or proposed for installation at reactor sites, a training program for I&E field inspectors, documented standards and test equipment specifications for I&E field inspection use, and a fully developed manual for field inspection and assessment procedures. These products will be routinely transferred to the user early in their development to insure that final documentation as NRC directives and guidance is realistic and response to the needs of the I&E regional inspectors. The primary emphasis of this program will be directed at power reactor inspection and evaluation.

Research initiated in FY 1979 to provide the basis for NRC guidance on fixed site protective tactics will be continued. Results of this research will be published as NUREG documents to provide information and guidance to assist licensees in development of plans and programs for training, contingency planning, and security.

Risk Assessment.....FY 1978 = $3,401 FY 1979 = $4,400 FY 1980 = $5,700

Risks assessment research is directed toward developing improved methods and data for use in performing improved quantitative risk assessments of various aspects of the nuclear fuel cycle, and in supporting, through selective application, the decision making process regarding licensing or regulatory issues for all phases of the nuclear fuel cycle. Considerable growth in the program is required in FY 1980 since the increased understanding of quantitative risk assessment techniques derived from the Risk Assessment Review Group (Lewis) Report (NUREG/CR-0400) require expanded efforts in improvement of these techniques and in their application to improve the licensing process.

Research on effectiveness evaluation of fixed sites will continue to stress the development and demonstration of methods suitable for licensing and field application. Results of the extensive FY 1979 program of user applicability testing at fuel cycle facilities will be the basis for determining which programs deserve continued or accelerated development. If preliminary applications of the SAFE evaluation method to an operating reactor during FY 1979 have merit, the SAFE evaluation method will be extended to other operating reactors.

Research to assess the value of specific alternative reactor design and damage control features for increasing inherent

NUCLEAR REGULATORY RESEARCH - Continued

protection of nuclear power plants against sabotage will be completed during FY 1980. Concurrently, the impact of these features on plant cost, operability, and safety will be evaluated. During FY 1980 an analogous study of design features will have potential for increasing safeguards effectiveness at fuel cycle facilities, as well as those associated with possible alternate fuel cycles, will be initiated.

Research on methods for evaluation of safeguards for material in highway transit will be developed to support the needs identified in field evaluation test. This field test will utilize the previously developed methodologies for communication reliability and encouter outcome in a real-time field application.

Major efforts are underway to improve the results of quantitative analytical efforts. These activities include work to improve the accuracy of the input data. Significant improvements of the input data will provide the following features: (1) A major expansion of component failure rates for components and types used in nuclear power plants; (2) A determination from historic failure data of the actual failure rate uncertainties and the statistical distribution of the error spreads; (3) A firmer, statistical data base for quantifying human error rates and explicitly identifying their contributions to system or sub-system unavailability. Effort will also be devoted to the development of and improvements to the methodology to predict and analyze risks from accident initiating events such as floods, fires and earthquakes. Work will continue on programs to extend the application of the quantitative risk assessment techniques risk to the standardized plant designs; which in turn, will provide for increased understanding and application of these techniques by licensing personnel. Work in support of the licensing review process will be continued; these efforts include such activities as the determination of risk-based intervals for testing, planned maintenance and allowable down-time for engineered safety systems; risks to nuclear power plants from nearby transportation accidents involving hazardous non-radiological materials; and supportive risk assessments relating to licensing issues. Improvements to the consequences model will be continued in the areas of dispersion modeling and biological efforts. Activities initiated in FY 1979 to perform risk benefit analyses of various facets of the licensing process will be continued.

Work previously started to develop may perform quantitative risk assessment of the fuel cycle external to the reactor will be continued. Program efforts in this area will be enlarged to include the methodology development necessary to assess the risks related to various spent fuel isolation alternatives, and to the storage or isolation of high and low level radioactive waste products.

Improved Reactor Safety.....FY 1978 = 0 FY 1979 = $800 FY 1980 = $1,000

A plan for research to improve the safety of light-water nuclear power plants was submitted to Congress in FY 1978. The plan will be partially implemented in FY 1979 using funds reallocated within NRC. The research will examine a spectrum of suggestions for improving reactor safety, will develop functional requirements and, when necessary, conceptual designs, and will assess as quantitatively and objectively as possible 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. Specific concepts to be reviewed in FY 1979 and FY 1980 include vented containment, alternate decay heat removal systems methods to reduce human error, and the development of value/impact methods. The vented containment program will examine designs to control the release of radioactivity from containment during a core melt accident.

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

NUCLEAR REGULATORY RESEARCH - Continued

The alternate decay heat removal program will examine designs to reduce the probability of core melt through increased reliability of shutdown decay heat removal systems. The human error program will review available information on human-machine interfaces during accidents and identify the most effective ways to proceed with developing techniques for improving human behavior during accidents. More quantitative methods for assessing the values (e.g., risk reduction potential) and impacts (e.g., cost of implementation) of proposed concepts will be developed to assist in planning future research and to guide decisions regarding the implementation of proposed concepts. NRC is coordinating with DOE in this area to eliminate unnecessary duplication of effort.

Management Direction and Program Suppoort (Personnel).....FY 1978 = (24) FY 1979 = (24) FY 1980 = (24)

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 decison units 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.

Personnel.....FY 1978 = (152) FY 1979 = (159) FY 1980 = (159)

Personnel requirements are needed to execute, direct and support the contracted research program discussed above. While no increse in total personnel is requested, changes in program emphasis require some increases and decisions in specific personnel levels for certain programmatic functions.

Additional personnel with geochemical and hydrogeological expertise will be required to provide technical direction of the new and expanded waste management research on environmental transport and movement of wastes in geologic media. Personnel are also required to expand efforts to improve risk assessment techniques and their application to improve the licensing process. These additional personnel will be offset by deceased personnel requirements related to Safeguards research in view of reduced level of effort in this area.

Equipment.....FY 1978 = $6,932 FY 1979 = $8,720 FY 1980 = $9,300

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: Advanced

NUCLEAR REGULATORY RESEARCH - Continued

Reactor assessment, safeguards, environment, and fuel cycle programs.

Equipment for Systems Engineering is primarily for two purposes: Equipment is needed to modify the Semiscale facility from an upper head injection test configuration to a normal cold-leg injections mocked with pump and steam generator in the primary loop. Equipment is needed for the 2D/3D flow distribution program to fabricate and test advanced, two-phase-flow instrumentation.

Interagency agreement between NRC and DOE regarding the LOFT facility requires NRC funding support for all operational activities following plant turnover from DOE to NRC. The LOFT equipment requirements includes data acquisition and visual display equipment for both the LOFT facility and various instrumentation calibration and test facilities, spent fuel rod gamma scanner and fission gas data processors, fuel fabrication equipment, charging pumps, calibration standards, advanced two-phase flow transducers and equipment for flow visualization. In addition, outmoded equipment (in some cases over ten years old) must be replaced, and process instruments, radiation monitoring devices, control equipment and minor components will also be required as a result of test operations.

The requested funding for PBF equipment will provide for replacement of programming and monitoring system to improve sequence control in experiments, signal conditioning interface equipment to tie experiment sensors to the data system, an expanded memory for the data acquisition system, and a new data processing software package to reduce data processing costs Also, equipment will be provided to support the test train for underwater inspection and assembly, test instruments installed on test trains, give a time-dependance measurement of fission product release, store data obtained from Halden experiments, allow microscopic examination of fuel microstructures remotely, and adapt the pulsed eddy current apparatus for longer fuel rods.

The advanced reactor safety program will require instruments for seven-pin in-pile experiments on prompt burst energetics; measurements systems for tests on molten fuel intereactions with containment materials; equipment for controlling tests of sodium (Na) spills on vault liners and sodium void measurement systems.

Fuel cycle and waste management equipment will also be procured. This will include sampling and measuring devices, analytical and test instruments for environmental activities.

Program Technical Support

NUCLEAR REGULATORY COMMISSION - continued

Program Technical Support.....$ 14,925

Summary of Program Technical Support Estimates by Function

	Actual FY 1978	Estimate FY 1979 1/	Estimate FY 1980
Personnel Compensation	$ 7,427	$ 8,130	$ 8,305
Personnel Benefits	722	790	760
Program Support	825	1,350	1,930
Administrative Support	2,452	2,872	2,980
Travel	663	880	950
Equipment	28	0	0
Total Program Costs	$ 12,117	$ 14,022	$ 14,925
Personnel	237	239	246

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, and the Office of International Programs.

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 increased number of operating reactors has resulted in an increase in operating data and generic items which require Committee review action. In addition, the NRC, since its establishment in 1975, has requested a number of special studies and reports from the Committee and this trend is expected to continue.

1/ Includes $410,000 for FY 1979 pay raise supplemental.

PROGRAM TECHNICAL SUPPORT - continued

Public Law 95-209, NRC's FY 1978 Authorization Act, added to the Committee's functions the requirement for Committee directed studies of the U. S. Reactor Safety Research program and an annual report to Congress on the results of these studies. In FY 1980 it is anticipated that the ACRS Fellowship Program initiated in late FY 1978 will be fully staffed and involved in the study of a wide variety of generic and safety issues. Despite a continuing expansion in both the variety and complexity of these issues, the FY 1980 ACRS staff totals 37 and reflects no increase above the current level.

b. Atomic Safety and 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. Despite an increase in administrative workload associated with an expanded amount of information being made available to the ASLBP, the FY 1979 staff totals 37 and remains unchanged in FY 1980.

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 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. This 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 1979 Appeal Panel staff totals 15 and remains unchanged in FY 1980.

d. The Office of the Executive Legal Director (ELD) is responsible for providing legal 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.

PROGRAM TECHNICAL SUPPORT - continued

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 1980, the ELD staffing level of 97 reflects a net increase of two positions over FY 1979. One of these positions will be assigned to the Regulation Division to assure improved capability to deal with the anticipated increases in export/import licensing matters and waste management program matters. The other position will be assigned to the Rulemaking and Enforcement Division to assure adequate legal support for an expanding enforcement program.

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 25 States are exercising regulatory responsibility for certain classes of radioactive materials (currently involving 11,000 licenses); conduct annual reviews of State radiation control programs, provide annual training for some 200 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.

(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 prophylaxis, and radioactive materials transportation emergency planning; train approximately 400 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 for transportation

PROGRAM TECHNICAL SUPPORT - continued

of radioactive materials. During FY 1980, OSP will review, assist in developing and concur in 12 - 14 State radiological emergency response plans and observe and evaluate an additional seven emergency response exercises. Additionally, OSP is developing and maintaining a plan to set up facilities, resources and procedures to permit NRC to function in any national emergency.

The FY 1980 staff totals 28 and reflects an increase of one position over the FY 1979 level to enable OSP to deal with the backlog in the review of State emergency response plans so that these States may proceed with the development of reliable and effective regulatory programs.

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 on 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 1980 staff totals 32 and reflects an increase of four positions above the FY 1979 level. 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 addition, OIP is expanding efforts in the areas of improving international safeguards and physical security and enhancing the health and safety programs of developing countries which import U. S. nuclear materials and equipment.

Program Direction and
Administration

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

NUCLEAR REGULATORY COMMISSION - continued

Program Direction and Administration.....$ 30,690

Summary of Program Direction and Administration Estimate by Function

	Actual FY 1978	Estimate FY 1979 1/	Estimate FY 1980
Personnel Compensation	$ 15,512	$ 17,810	$ 18,605
Personnel Benefits	1,486	1,700	1,770
Program Support	786	2,900	2,400
Administrative Support	5,542	6,998	7,250
Travel	407	580	665
Equipment	0	0	0
Total Program Costs	$ 23,733	$ 29,988	$ 30,690
Personnel	564	593	597

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

The Commission:

Commission
Secretary
General Counsel
Policy Evaluation
Inspector and Auditor
Congressional Affairs
Public Affairs

EDO:

EDO
Equal Employment Opportunity
Controller
Management and Program Analysis
Administration

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 1979 level of 31 people.

1/ Includes $880,000 for FY 1979 pay raise supplemental.

PROGRAM DIRECTION AND ADMINISTRATION - continued

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.

Despite a significant increase in workload, the FY 1980 staffing level for the Office of the Secretary shows no increase above the FY 1979 level of 37.

c. Office of the General Counsel (OGC) is the chief legal advisor to the Commission. The General Counsel provides legal opinion, advice, and consultations 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 NRC program. 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 projected increase in court litigation proceedings and an expanded effort in providing legal analyses on major policy issues, OGC is requesting a one position increase in FY 1980 bringing the staffing total to 24 positions.

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 1980 staffing level remains unchanged from the FY 1979 level of 18.

PROGRAM DIRECTION AND ADMINISTRATION - continued

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 1980 staff totals 28 and reflects no increase above the FY 1979 level.

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 relevent and current information as to major legislative activities likely to effect NRC.

The FY 1980 staffing level remains unchanged from the FY 1979 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 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

PROGRAM DIRECTION AND ADMINISTRATION - continued

interested in the role of the NRC. The office also assists the licensing boards, the appeal boards and the ACRS at hearings and meetings in which a high degree of public and press interest is evidenced.

The FY 1979 staffing level of 15 remains unchanged in FY 1980.

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 Administrative and Correspondence Branch, responsible for the EDO correspondence system which includes the assignment, review, and coordination of all correspondence, is the only remaining auxiliary organizational unit within the Office of the Executive Director for Operations. Two other branches which previously had been incorporated into the EDO office (Special Projects Branch and Applied Statistics Group) have been transferred to the Office of Management and Program Analysis. The FY 1979 revised staffing level of 13 remains unchanged in FY 1980.

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 1980 staffing level of four reflects an increase of one position over FY 1979. This increase is based on expanded emphasis in insuring that EEO policies are strictly adhered to in all NRC hiring practices and other personnel policies and procedures.

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 1978 a new computerized multi-year Zero Base Budgeting procedure was established and implemented to satisfy requirements mandated by the Office of Management and Budget. Productivity increases continue to accommodate the increasing workload within the Division of Accounting, although some backlogs are anticipated in processing license fees. Nonetheless, the FY 1980 staffing level remains unchanged at 65 positions.

k. The Office of Management and Program Analysis (MPA) is the newest staff office in NRC, consolidating four previously separate organizational units. Two of these units are a consolidation of the Office of Management Information and Program Control and the Office of Planning and Analysis. The remaining units were in the Office of the Executive Director for Operations (EDO) (Special

PROGRAM DIRECTION AND ADMINISTRATION - continued

Projects Branch and Applied Statistics Group). Under the new structure, 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 is designed to provide analysis and management information for the EDO and other offices through studies and evaluations on a wide variety of subjects of interest to NRC management.

To a significant degree, 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: (1) the NRC Annual Report; (2) the Report on Domestic Safeguards; and (3) Abnormal Occurrence Report. The FY 1980 staff totals 74 positions.

1. 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 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 145 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.

   Four additional positions are requested for FY 1980. Two positions are requested for the Division of Contracts to accommodate a projected 20 percent increase in contract actions, including increased competitive actions and increased efforts in the administration and close-out of contracts. Two positions are requested for the Division of Facilities and Operations Support for telephone operators. In addition to regular duties, NRC telephone operators serve as the agency's initial point of contact on National Emergency (DEFCORD) and Incident Response activities on a 24 hour/day, 7 day/week basis, and as the agency's non-duty hours secure communications coordinator.

Special Supporting Tables

U. S. NUCLEAR REGULATORY COMMISSION

FY 1980 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 justifications.

EMPLOYMENT AND PERSONNEL COMPENSATION AND BENEFITS

Program	Actual FY 1978			Estimate FY 1979			Estimate FY 1980		
	End Strength	Av. Full Time	Obligations	End Strength	Av. Full Time	Obligations	End Strength	Av. Full Time	Obligations
Nuclear Reactor Regulation	605	610	21,272	631	618	23,470	716	695	26,535
Standards Development	142	145	5,106	157	149	5,560	157	157	5,860
Inspection and Enforcement	694	642	19,797	715	705	22,720	724	722	23,430
Nuclear Material Safety and Safeguards	272	266	8,394	294	283	9,360	297	296	9,840
Nuclear Regulatory Research	152	139	4,816	159	156	5,620	159	159	5,755
Program Technical Support	237	229	8,149	239	238	8,920	246	244	9,065
Program Direction and Administration	564	552	16,998	593	578	19,510	597	596	20,375
TOTAL NUCLEAR REGULATORY COMMISSION	2,666	2,583	84,532	2,788	2,727	95,160 1/	2,896	2,869	100,860

1/ Includes $4,300,000 for the proposed FY 1979 pay raise supplemental.

U. S. NUCLEAR REGULATORY COMMISSION

FY 1980 Budget Estimates

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

NRC DIRECT TRAVEL

	Actual FY 1978	Estimate FY 1979	Estimate FY 1980
Nuclear Reactor Regulation	$ 960	$ 1,050	$ 1,169
Standards Development	197	210	280
Inspection and Enforcement	2,395	3,090	3,210
Nuclear Material Safety and Safeguards	407	510	570
Nuclear Regulatory Research	349	400	470
Program Technical Support	663	880	950
Program Direction and Administration	407	580	665
Total	$ 5,378	$ 6,720	$ 7,320

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 and 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 oversite 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 1980 Budget Estimates

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

LEGISLATIVE PROGRAM PROJECTIONS

	Actual FY 1978	Estimate FY 1979	Estimate FY 1980	Estimate FY 1981	Estimate FY 1982	Estimate FY 1983	Estimate FY 1984
NRC Total Budget Authority	$ 290	$ 327 1/	$ 373	$ 377	$ 383	$ 383	$ 383
Budget Outlays	271	305 1/	345	349	355	355	355

1/ Budget Authority includes $4,300,000 for the proposed pay raise supplemental. Budget Outlays associated with this supplemental total $4,215,000.