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THE PRESIDENT HAS SEEN

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FY 1977 Defense Budget
Overall Summary

Background: The 1977 Budget provides a real increase of \$7.4 billion in total obligational authority in defense spending to buy new weapons systems, improve readiness of existing forces, and increase selected combat forces. At the same time, the Budget proposes actions to increase the efficiency of the Defense Department by reducing programs that do not affect combat capability, including adjustments to civilian personnel and compensation levels. Many of these proposals will require new legislation.

Actions Proposed in Budget: The 1977 Budget continues the effort, begun in 1976, to reverse a seven-year decline in defense purchasing power. The new upward trend is planned to continue into 1981.

Defense Total Obligational Authority
(\$ Billions)

	<u>1968</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1979</u>	<u>1981</u>
Constant 1977 Dollars	150.2	100.7	105.3	112.7	115.9	121.9
Current Dollars	75.6	87.9	98.3	112.7	130.0	149.7

Program Increases

The Budget proposes to strengthen U.S. forces to offset steadily expanding Soviet military capabilities. This will be accomplished in two ways:

- Selected increases are provided in combat forces within constant military personnel levels, by shifting people from support to combat functions.

- Increases are provided to improve force modernization and readiness through the procurement of new systems and through better maintenance of existing equipment.

Efficiencies

In order to limit the increases in Defense spending to those absolutely essential for our national security, the Department of Defense is also sharing in the general restraint upon which the President's overall spending proposals are based. Particular emphasis has been placed on reducing personnel costs.



The average pay of military and civilian personnel has more than doubled since 1968, as shown in the following table: ✓

Index of Average Annual Cost Per Person (1968 = 100)

	<u>1968</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
Military	100	198	206	214
Civilian	100	181	194	207

Faced with increasing pay costs, every effort has been made in recent years to reduce personnel levels. Military strengths have declined by about 40% between 1968 and 1976 while civilians, during the same period, declined by 25%. Further reductions in civilian personnel are proposed in 1977 as a result of consolidations in the Defense base structure and headquarters and support activities.

Defense Manpower (in Thousands)

	<u>1964</u>	<u>1968</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1977</u>
Military	2,685	3,547	2,127	2,087	2,102	2,101
Civilian	1,035	1,287	989	962	967	942



In addition to personnel adjustments, a number of initiatives are proposed to reduce defense costs without adversely affecting force readiness or capability. These include adjustments to military benefits, operating efficiencies, and an austere level of military construction.

Funding

The total Defense budget increases from \$98.3 billion in 1976 to \$112.7 billion in 1977. After adjusting for inflation, the increase expressed in constant 1977 dollars is over \$7 billion. In the following table these changes are shown by appropriation.

Department of Defense
(Total obligational authority in billions of dollars)

pay constant dollars?

	<u>1976</u> <u>Approved</u> <u>Program</u>	<u>1976 Program</u> <u>at 1977</u> <u>Prices</u>	<u>1977</u> <u>Budget</u> <u>Request</u>
Military personnel	25.6	27.3	26.5
Retired pay	7.3	8.0	8.4
Operation & maintenance	28.9	31.1	32.4
Procurement	21.4	22.9	29.3
RDT&E	9.5	10.2	11.0
Military construction	2.4	2.6	2.3
Family housing	1.3	1.4	1.2
Civil defense	.1	.1	.1
Revolving & management funds	.1	.1	.4
Military Assistance	1.5	1.6	1.2
Total	98.3	105.3	112.7



? → * Constant dollars

1977 Defense Budget
Program Increases

Background: The 1977 Defense budget is being increased in real terms based upon a careful assessment of the international situation and the contingencies we must be prepared to meet. In conjunction with our allies, we must be able to:

- . Maintain a worldwide military balance and thus reduce the threat of war.
- . Deter any attack against the United States, or its allies.
- . Protect the sea lanes that are vital to our national security and economic strength.

If we are to be effective in reducing international tensions through negotiations, our forces must remain second to none.

Actions Proposed in Budget:

- . Protect combat force strength and readiness.
 - Provide increases of \$7.2 billion in constant 1977 dollars to develop and procure new and more capable combat equipment.
 - Continue the force expansion initiated last year to achieve 16 Army combat divisions.
 - Provide improved force readiness by increases in maintenance, overhaul and repair activities. The operation and maintenance appropriations, which finance the immediate readiness of our forces, increase by over \$1 billion in constant 1977 dollars.
- . Strengthen the capability of our strategic forces.



Strategic program funding has been as follows in recent years:

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
TOA (constant 1977 \$ billions)	8.5	8.2	7.8	9.4

The program for 1977 will provide for:

- Start of production of the B-1 bomber. If cost and performance goals are achieved, full-scale production will be initiated in FY 1977.
- Increases for procurement of Trident. This advanced sea-based strategic missile system is longer range and less vulnerable than the current Polaris-Poseidon system.

- Development of a variety of strategic force improvements which can be deployed if necessary in light of Soviet actions. These include: a new intercontinental ballistic missile, long-range cruise missiles for aircraft, submarine, or surface ship deployment, and increases in the yield and accuracy of ballistic missile warheads.

Modernize general purpose forces.

General purpose forces funding has been as follows in recent years:

	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>
TOA (constant 1977 \$ billions)	34.1	31.9	35.7	40.2

The 1977 program will provide for:

- Increased production of equipment for the Army and Marine Corps, primarily tanks and attack helicopters as shown below:

	<u>1975</u>	<u>1976</u>	<u>1977</u>
M-60 Tanks (incl. Marines)	573	814	927
Attack Helicopters	6	52	105

This equipment will be used to arm the new combat units in the Army, and to build up our stockpile of weapons in Europe.

- An improved tactical air force capability through continued procurement of the Navy F-14 and the Air Force F-15 fighters, and the Air Force A-10 aircraft for close support of ground forces. New air combat fighters are under development for both the Air Force and Navy with initial production of the Air Force F-16 scheduled in 1977. The following aircraft production is provided for:

	<u>1975</u>	<u>1976</u>	<u>1977</u>
F-14	50	36	36
F-15	72	108	108
A-10	22	53	100
F-16	-	-	16

- Increases in the size and capability of naval forces. Of the 16 new ships, 15 will be procured for the general purpose forces in 1977 including three nuclear attack submarines, eight guided missile frigates, and a new destroyer which will carry an advanced missile system to protect the fleet from hostile aircraft and missiles. In addition, several support ships will be procured.



FY 1977 Defense Budget
New Items in FY 1977

Background: Supporting programs such as construction, operating, and personnel costs have been reduced to make room within budget constraints for high priority new systems.

Actions Proposed in Budget: Funding is proposed to begin buying the B-1 Strategic Bomber and the new Trident strategic missile. The F-16 fighter aircraft, the UTTAS utility helicopter, the new Carrier on Board Delivery (COB) aircraft and the CH-53E Super Stallion Helicopter are among the principal new General Purpose Force items. The Non-Nuclear LANCE and the new shoulder-fired STINGER weapon system are also programmed in FY 1977 for initial procurement.

The Navy's shipbuilding program includes the lead ship Aegis class destroyer, one Destroyer Tender, one Fleet Oiler and one Submarine Tender. Ongoing programs include three more nuclear attack submarines and one Trident submarine.

The construction program includes \$437 million for the Aeropropulsion Systems Test Facility, a new wind tunnel for testing aircraft engines. This will provide by 1985 a capability for testing new generations of high performance turbine engines in environments similar to those experienced in actual flight. Current wind tunnels permit us to test engines only in isolation from surrounding aircraft structures and thus do not provide direct information on how the aircraft and engine interact. The new facility will avoid costly flight testing and the need for post-flight engine and structural modifications. It will be used for new commercial as well as military engine development.

1977 Defense Budget
DOD Restraints in Support of Reduced Federal Spending

Background: While Defense spending must be fully adequate to assure the national security of the United States, every effort has been made to minimize defense expenditures without affecting combat capability. Defense programs, in addition to those of civilian agencies, have been critically examined with the goals of constraining Federal spending in 1977 and achieving a balanced budget in the future.

Actions Proposed in Budget: To provide necessary program increases within a constrained budget total, the efficiency of the defense establishment must be increased by reducing costs in areas that do not contribute directly to combat capability. The budget proposes actions that will result in program savings of about \$2.8 billion in 1977. In addition to moderating the pace of research and development, the following specific actions are included in the budget.

- Adjustments in military compensation: Proposed actions to adjust fringe benefits and to correct inequities in the current military compensation system will save over \$200 million in 1977 and \$400 million in 1978. (Details are discussed in a separate paper on Proposed Adjustments in Military Compensation). In addition, there are savings of about \$.8 billion in 1977 from adjustments in pay increases for Government employees.

- Civilian Personnel Reductions: Civilian manpower will be reduced by 25,000 spaces below the September 1976 level of 967,000, continuing the downward trend in civilian personnel levels from a high of 1.3 million in 1968. This will be accomplished by transfer and consolidation of functions that permit base realignments and by reductions in headquarters staffing. Estimated savings are \$100 million in 1977 and \$400 million in 1978.

- Travel: The Department of Defense spends over \$2 billion a year for travel costs. This includes temporary travel to meetings and conferences, movements of military personnel to overseas assignments without their families, and the cost of moving military personnel and their families. This last category, called Permanent Change of Station travel, is being reduced by a number of policy changes which will reduce the number of moves required by: (1) permitting dependents to remain at a home base while the military member is away on an unaccompanied short tour of duty overseas; (2) assuring achievement of the full time period of overseas tours; and (3) treating assignments to Hawaii as regular domestic tours rather than as overseas duty.

Other types of travel will be reduced by limiting the number of participants and frequency of travel on official visits. Program savings from all of these actions are estimated at \$244 million in 1977.

- Military Construction and Family Housing: Construction programs for 1977 have been limited to those considered essential for mission performance. As shown by the following table, the funds requested in 1977 are below the amounts appropriated in 1976:

	(\$ billions)		
	<u>1975</u>	<u>1976</u>	<u>1977</u>
Military Construction	1.8	2.4	2.3
Family Housing	1.2	1.3	1.2

The 1977 budget will reduce construction of family housing units and government leases of quarters for military personnel, reflecting a policy of increasing reliance on the use of available housing in the local community:

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Units of Family Housing			
approved for construction	6,800	2,778	1,054
Leases Approved	25,000	24,741	22,418

- Petroleum Consumption: Efficiencies are proposed in training and proficiency flying programs, including expanded use of simulators and smaller aircraft for a greater portion of flight training. Estimated savings in 1977 are about \$200 million. In addition, fuel consumption will be reduced from 190 million barrels in 1975 to 187 million barrels in 1977.

- Enlistment Bonuses: Favorable 1975 recruiting experience permits lower levels in future enlistment bonuses.

The following table shows proposed funding for this program:

	(\$ millions)		
	<u>FY 1975</u>	<u>FY 1976</u>	<u>FY 1977</u>
	59	73	29

During 1975, all of the military services exceeded their recruiting objectives. The percentage of recruits who are high school graduates increased from 66% in 1974 to 72% in 1975 while higher mental group categories increased from 90% in 1974 to 94% in 1975. This favorable recruiting trend has continued into 1976. Personnel shortfalls in several occupational skills have been significantly eased, permitting further reductions in the use of new enlistment bonuses.

1977 Defense Budget
Proposed Adjustments in Military Compensation

Background: Defense payroll costs are continuing to increase both in direct salary and in related personnel support and benefit costs. In these circumstances, it is essential to ensure that further increases in personnel costs are held to the minimum needed to assure a strong defense.

Historically, military personnel have received a significant proportion of their total compensation in fringe benefits rather than in salary. These benefits were a partial offset for a low basic salary. However, Federal employees, including military personnel, are now compensated at rates comparable to non-Federal workers. In recent years, military compensation adjustments have increased regular military compensation (which includes basic pay, allowances for quarters and food which are not taxable, and tax advantage) to levels comparable with civilian compensation. ~~This comparability has now been achieved and certain fringe benefits are no longer required to offset low salaries.~~

In addition to proposals affecting special military personnel benefits that are no longer required, the 1977 Budget also proposes revisions to certain pay practices relating to the guard and reserve, to retired pay, and to pay of cadets in military academies. These revisions will reduce costs and correct inequities in the present pay system.

Actions Proposed in Budget:

- Seek legislation to phase out the subsidy of direct labor in commissaries over a three year period. At present \$300 million in annual direct labor costs to operate military commissaries is fully subsidized by the Federal Government. At the same time, direct labor costs in military exchanges are paid by the customer. The proposed legislation would eliminate this taxpayer support to the commissaries and would bring the commissaries under the same policy as the exchanges. Commissary prices are expected to rise by three percent in each of the next three years as this subsidy is phased out. Savings of \$94 million would occur in 1977.

There is no attempt in this proposal to close commissaries. In fact, commissaries will still enjoy savings of 10-12 percent due to free rent, no State or local taxes, no advertising or insurance costs and no profits. In addition, overseas commissaries will receive a subsidy of \$88 million in transportation costs to assure that military personnel overseas can continue to buy food which is comparable in price and quality to that available in the United States.

intended to be
with such comparability



- Begin to convert the Defense housing system to a fair market rental system. Today, military personnel receive housing directly by occupying government quarters or they are paid a cash housing allowance when quarters are not furnished. A recent appraisal of family housing indicates a wide range of disparity between the value of government housing and the rental allowance paid by the occupants. As a first step in remedying this situation and bringing housing allowances in line with their value, one-quarter of the next pay raise will be applied directly to the quarters allowance of all military personnel. Estimated 1977 savings will be \$44 million.

- Support legislation which has been submitted to Congress but not yet enacted to restructure the current military retirement system, to correct existing inequities, and eventually to slow the dramatic rise in annuity costs.

Five major changes in the nondisability retirement system are proposed.

- . Increased retirement benefits for extended periods of service.
- . Some reductions in retirement benefits for those who retire with less than 30 years of service.
- . Use of a one-year salary base for computing retirement income instead of the pay base on the final day of service.
- . Integration of military and social security retirement benefits at age 65 as is the case with most private retirement plans.
- . Severance payments for voluntary separations after ten years of service and for involuntary separations after five years of service.

Savings from the new system would begin in the 1980's and are expected cumulatively to exceed \$10 billion by the year 2000.

- Introduce legislation to eliminate dual compensation for Federal employees who serve in the Guard and Reserve. An estimated 150,000 Federal employees serve in the National Guard or the Reserves. When these employees take military leave to participate in their annual Reserve training program, they receive their full Federal salary plus an average \$400 in military pay. Private employers generally follow the practice of granting military leave and providing pay, but only to the extent necessary to assure no loss of pay to the Reservist. The proposed legislation would adopt this practice for Federal employees and would result in annual savings of \$45 million.

- Propose legislation to adjust the compensation of cadets and midshipmen. Cadets and midshipmen at the nation's military academies receive a high quality education, free room and board, and a salary equivalent to 50 percent of the basic pay of a second lieutenant. These "salary" funds are held by the academy which deducts expenses for books, uniforms, laundry and dry cleaning, etc., and provides the cadets with pocket money. The proposal would substitute a reduced monthly allowance of \$125 rather than the current \$333, while continuing to provide education, room and board, and non-personal expenses. This would bring direct compensation to cadets more in line with that provided to ROTC students. The new system would be phased in beginning with the classes entering the academies in 1976. Savings would be \$2 million in FY 1977 and would reach \$24 million after full implementation in four years.

- Introduce legislation to eliminate dual compensation for Federal employees who serve in the Guard and Reserve. An estimated 150,000 Federal employees serve in the National Guard or the Reserves. When these employees take military leave to participate in their annual Reserve training program, they receive their full Federal salary plus an average \$400 in military pay. Private employers generally follow the practice of granting military leave and providing pay, but only to the extent necessary to assure no loss of pay to the Reservist. The proposed legislation would adopt this practice for Federal employees and would save \$47 million in 1977.

1977 Defense Budget
Strategic Improvements

Background: Strategic nuclear forces are the foundation of overall deterrence. Our policies, plans and programs must not permit any fundamental weaknesses that might undermine that deterrent. We must therefore maintain a broad-based program to sustain deterrence and enhance strategic stability. These programs are essential to assure that:

- There is no real or perceived advantage from a Soviet "first strike" nuclear attack on the U.S., and conversely, U.S. forces do not appear to have the capability for a disarming first strike on Soviet forces;
- There is no real or perceived advantage in overall strength and capabilities favoring the Soviet Union;
- A clear capability exists to increase deployments and accelerate force improvements if it should become necessary to counter possible Soviet actions that would upset the military balance and strategic stability;
- U.S. strategic forces conform to the provisions of all strategic arms agreements, and to the extent consistent with other U.S. security objectives, U.S. plans avoid provoking additional deployments by existing nuclear powers as well as any nuclear testing or deployments by other countries.

While our current strategic forces are highly effective and survivable today, Soviet deployment of strategic missiles and their development efforts in other strategic areas could lead to a significant reduction in the future deterrent value of our forces without continued force improvements. Thus, if we are to maintain a strong deterrent posture, we must maintain a well diversified mix of modern strategic offensive forces consisting of the triad of land-based ballistic missiles, sea-based systems and manned bombers and their supporting command, control and communications systems.

Actions Proposed in Budget: The Administration is requesting \$9.4 billion to cover the direct cost of our strategic forces in 1977. The increase of \$2.1 billion over the 1976 request is due primarily to phasing into production of the B-1 bomber and increases in the Trident missile and submarine program. In addition, the 1977 program continues:

- Ballistic missile accuracy and yield improvements;

- Development of cruise missiles for launch from a variety of platforms;
- Development of a large intercontinental ballistic missile that may eventually replace currently deployed land-based missiles.
- Improved command, control, surveillance and warning systems;
- Research and development on anti-ballistic missile technology.

1977 Defense Budget
Army Combat Power and Readiness

Background: Last year the Army initiated a program to expand its combat forces from 13 to 16 divisions within current manpower levels. The 16 divisions are now in being but the new divisions are still in the early stages of organization. During 1977 additional personnel and new equipment will be added to these divisions to bring them up to full strength.

Actions proposed in Budget: Two combat brigades, totaling over 6,000 soldiers, will be activated in FY 1977 to complete the 16 division program. Units of the Reserve and National Guard will also continue to receive priority in training and equipment.

The Army procurement budget in 1977 is 40 percent higher than 1976 to provide equipment for the new forces and to restore stock levels of combat equipment in Europe which were depleted as a result of the Middle-East conflict. The following table indicates the quantities of Army tanks and armored personnel carriers (APC's) which will be purchased:

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Army tanks	439	662	886
APC's	111	845	1,200

1977 Defense Budget
Shipbuilding Costs

Background: Shipbuilding budgets have been increasing sharply (up 26% in FY 1976 and 60% in FY 1977) to reach a level of \$6.3 billion in FY 1977.

Actions Proposed in Budget: Of \$6.3 billion requested in FY 1977, \$1.6 billion is for cost increases on FY 1975 and prior programs. Sixteen new ships are funded in FY 1977, the same number as in FY 1976.

During the coming year DOD will, as a matter of priority, review future shipbuilding requirements in terms of fleet size, composition and effect on projected DOD resources.

A summary of the planned shipbuilding program for 1975-77 follows:

	<u>1975</u>	<u>1976</u>	<u>1977</u>
<u>Quantity by Ship Type</u>			
Trident Ballistic Missile Submarine	2	1	1
Nuclear Attack Submarines	3	2	3
Nuclear Guided Missile Cruiser	1		
Guided Missile Destroyer			1
Destroyer	7		
Guided Missile Ocean Escort	3	6	8
Patrol Hydrofoil	4	1	
Repair Ships	1	1	2
Fleet Oiler	1	2	1
Fleet Tugs		3	
	-----	-----	-----
Total Ships	22	16	16
<u>Funding of New Ships (in billions)</u>			
Cost of Above Ships	\$2.7	\$2.3	\$4.5
Misc. programs	.3	.2	.2
Inflation and Cost Increases (1975 and prior)	.1	1.4	1.6
	-----	-----	-----
Total Program Cost	\$3.1	\$3.9	\$6.3

*This paper
out of
rule?*

1977 Defense Budget
Projections of Future Defense Program

Background: Long range spending projections are required by the Executive Branch and Congress for fiscal planning, and by agencies to evaluate proposed programs.

Actions Proposed in Budget: The 1977 Budget projects Military and Military Assistance programs rising - in constant 1977 dollars - to \$121.9 billion by 1981. This increase includes an allowance for annual real growth in defense purchases in 1978 and beyond for modernization of current forces. Defense purchases provide for basic military programs exclusive of military and civilian pay, military retired pay and funding to cover shortages in prior-year shipbuilding programs. Real growth in purchases is needed to cover the additional costs associated with technological improvements and increased numbers of modern U.S. weapon and support systems. The efficiency reductions proposed in the 1977 Budget are also reflected in the 1978 through 1981 projections. Civilian and military pay levels will again be made comparable to the private sector after 1977.

The projection should be understood as a benchmark against which requirements can be measured, neither as a ceiling on Defense nor a commitment to finance programs regardless of their merit and importance.

Actual Defense recommendations for 1978 through 1981 will be determined from a review of individual proposals.

Long Range Projections
Total Obligational Authority
(\$ in billions)

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
Current \$	112.7	120.6	130.0	139.8	149.7
Constant 1977 \$	112.7	113.2	115.9	118.9	121.9



1977 Defense Budget
Twenty-Six Air Force Tactical Wings

Background: The Air Force in the past year reorganized its tactical air forces from 22 into 26 active wings within the current total number of active aircraft.

Actions Proposed in Budget: The Air Force will simultaneously modernize the total force through the introduction of new production aircraft including F-15 long-range fighter aircraft, the lower-cost F-16 air combat aircraft and the A-10 aircraft for close support of ground troops. A summary of the 1975-77 procurement plan for these aircraft is shown below:

	<u>1975</u>	<u>1976</u>	<u>1977</u>
F-15	72	108	108
F-16	-	-	16
A-10	<u>22</u>	<u>53</u>	<u>100</u>
	94	161	224

Concurrent with modernization of the active fighter force, we are pursuing modernization of reserve forces. By 1980, the 10-wing reserve fighter attack force will consist of F-4's, A-7's, and A-10's which will effectively complement the active force in the event of a mobilization.

1977 Budget
Selective Service

The Administration proposes to eliminate the requirement that young men 18 years of age and older register for the draft in peacetime. Elimination of the annual registration will mean that young men born in 1959 or later years will not have to register for the draft.

Prior to arriving at the decision to end annual registration, a review was made of likely Department of Defense manpower requirements in the event of a sudden major conflict. That review resulted in the determination that annual registration could be eliminated without risk to the nation's security.

In World War II the Selective Service grew from a small planning activity in the War Department. Without pre-registration, the first inductees were delivered to training centers within 50 days of mobilization.

The Selective Service will retain responsibilities for Reserve training and mobilization planning. Ending annual registration will save over \$20 million in 1977 and each year thereafter. The resulting system will cost \$6 million annually and will employ about 100 people compared to the 1,939 employed in December of 1975.

FOREIGN AID

Foreign aid programs, including both military assistance and foreign economic and financial assistance will total \$5.8 billion in budget authority for 1977. Budget authority declines by \$762 million from the 1976 budget request now pending before the Congress. This reduction results largely from: the tight 1977 budget policy; underlying trends in military assistance; and, the timing of international agreements on multilateral development assistance.

Despite the reduction in 1977, budget authority will be almost one-fourth higher than Congress provided in 1975. Much of this increase is due to the provision of large-scale aid to help achieve a durable peace settlement in the Middle East. The increase also results, however, from the failure of Congress to appropriate the full amount requested in 1975; the appropriation request for 1976 is still pending.

Key 1977 Budget Decisions

- Limit military assistance by reducing or terminating a number of grant military aid programs.
- Continue the high level of economic aid to Middle East countries at about the 1976 level.
- Support new multilateral development assistance initiatives as an outgrowth of the UN Seventh Special Session.
- Reduce the initial Administration legislative request for bilateral development aid, thereby permitting only slight growth over 1976.
- Maintain U.S. food aid at about two-thirds of the world-wide target of 10 million tons of food.

The highlights and explanation of these categories of foreign assistance are explained below.



Foreign Aid
(In millions of dollars)

	<u>Budget Authority</u>		
	<u>1975</u>	<u>1976</u>	<u>1977</u>
Military assistance*	1,379	1,230	785
Economic and financial aid:			
Security related aid	1,195	1,923	1,836
Multilateral development	758	1,505	1,205
Bilateral development	791	1,030	1,127
Food for peace	778	1,090	1,169
Other	181	195	123
Proprietary receipts**	<u>-104</u>	<u>-412</u>	<u>-446</u>
Total foreign aid	4,979	6,562	5,800

	<u>Outlays</u>		
	<u>1975</u>	<u>1976</u>	<u>1977</u>
Military assistance*	1,879	1,037	739
Economic and financial aid:			
Security related aid	892	1,247	1,431
Multilateral development	685	1,183	1,109
Bilateral development	960	1,118	1,054
Food for peace	936	1,209	996
Other	192	195	146
Proprietary receipts**	<u>-104</u>	<u>-412</u>	<u>-446</u>
Total foreign aid	5,440	6,578	5,029

* Net of offsetting receipts

** Repayments of Economic Assistance Loans

MILITARY ASSISTANCE

Military assistance, which is included in the National Defense function, is an integral part of the U.S. foreign aid program. The basic philosophy underlying the current budget request is to hold military assistance to the minimum level necessary to enable friendly countries to meet their self-defense needs and to facilitate the achievement of U.S. foreign policy objectives.

The geographic focus of the military assistance program has shifted rapidly from Southeast Asia to the Middle East and the primary form of assistance has changed from Military Assistance program grants to credits under the Foreign Military Sales program. Almost half of the 1977 program is intended for the Middle East and fully two-thirds of the value of the program is in the form of credits which will be repaid eventually by recipient governments. The largest recipient of military assistance credits will be Israel.

The \$495 million reduction in budget authority from 1976 reflects the continued downward trend in grants, increases in collections from prior year loans and increased reliance on credit guarantees rather than direct loans. Credit guarantees, which insure loans made by the Federal Financing Bank, require only a 10% guarantee reserve charge against budget authority and do not result in budget outlays.

FOREIGN ECONOMIC AND FINANCIAL ASSISTANCE

There are four major components of economic and financial assistance:

- security related economic aid;
- multilateral development assistance;
- bilateral development assistance; and
- food for peace.

1. Security related programs. Security supporting assistance, \$1.8 billion in budget authority, is proposed for 1977 and is the largest single component of economic aid. This program provides grants and loans to countries of particular importance to U.S. security interests. The funds help meet the recipients' budget and balance-of-payments needs.

More than 90 percent of the 1977 supporting assistance will be provided to Israel, Egypt, Jordan, and Syria in order to support economic progress and facilitate movement toward an overall political settlement in the region. This assistance is being maintained approximately at 1976 levels, with the reduction of \$87 million from the 1976 supporting assistance request level to be taken in the smaller programs to countries outside the Middle East.

The Middle East Special Requirements Fund will be reduced from \$50 million requested in 1976 to \$35 million in 1977, primarily because the initial costs of setting up the U.S. Sinai Support Mission, which will monitor military movements in the Sinai passes, will have occurred in 1976. The Special Requirements Fund will still be available to meet unforeseen contingencies.

2. Multilateral development assistance. Slightly more than half of the \$1.2 billion in 1977 budget authority proposed under this heading for 1977 is to carry out U.S. commitments to provide loan funds for the International Development Lending Institutions--the World Bank Group and the Inter-American, Asian, and African Development Banks. A smaller portion, \$178 million, will provide voluntary contributions to United Nations organizations and the Organization of American States mainly to finance technical assistance and humanitarian relief activities. In addition, budget authority is requested for new initiatives stemming from U.S. proposals at the UN Seventh Special Session.

	(Budget Authority in \$ millions)		
	<u>1975</u>	<u>1976</u>	<u>1977</u>
International Development Lending Institutions	619	1,076	985
International Organizations (UNDP, OAS)	139	230	178
International Finance Corporation (IFC)	--	--	42
International Fund for Agricultural Development	<u>--</u>	<u>200</u>	<u>--</u>
Total	758	1,505	1,205

In recent years, the United States has significantly increased its support for the multilateral development banks, although congressional action has cut back Administration budget requests. The United States has found it advantageous to channel a growing portion of development aid through these multilateral institutions because they encourage other donors to match U.S. contributions and because of the institutions' technical expertise.

In addition to payments on existing pledges, the budget provides up to \$42 million for the first payment on an increase in the capital of the International Finance Corporation, which supports private sector involvement in the development programs of the poorer countries. Also, up to \$200 million is included in the 1976 budget for a contribution to the new International Fund for Agricultural Development. The Fund will be established upon completion of international negotiations now underway. Contributions from the industrialized countries and the OPEC countries will be used to finance agriculture-sector growth in developing countries.

Both of these latter programs were part of a package of initiatives proposed by Secretary Kissinger in a speech to the Seventh UN Special Session. The speech also included proposals, which have subsequently been accepted, for a special trust fund managed by the International Monetary Fund (IMF) and an increase in IMF lending to countries experiencing sudden export shortfalls. The IMF proposals will have no budgetary impact.

3. Bilateral development assistance. \$1.1 billion in budget authority is requested for the Agency for International Development (AID) to finance concessional development loans, technical assistance and humanitarian relief grants, and operating costs. Bilateral development assistance is currently focused on the problems of agricultural production, population growth, and education.

The budget authority request for AID programs in 1977 is \$97 million above the 1976 request now pending before Congress, but it is \$105 million below the amount initially sought for 1977 by the Administration in authorizing legislation proposed last year. In terms of the program level, the reduction from the originally planned level for 1977 is primarily in development loans, which will be held at about the 1976 level, while grant programs will be permitted to increase by 17 percent. Loan programs have been reduced in part because some of the economically stronger developing countries are less in need of highly concessional AID lending. Moreover, increases in multilateral lending, supported

by the United States, should be able to fill much of the gap caused by a decrease in the bilateral program. Grant technical assistance programs will provide critical assistance in overcoming particular development bottlenecks, especially in the poorest countries such as those of Sahelian Africa.

AID Program Level
(in \$ millions)

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Development loans	453	531	518
Development grants	314	403	472
Operating expenses	162	175	176
Disaster and other	<u>211</u>	<u>30</u>	<u>33</u>
Total, Program	1,140	1,139	1,199

The bilateral assistance category also includes the insurance, guarantee and loan activities of the Overseas Private Investment Corporation, and the grants of the Inter-American Foundation to private organizations in Latin America. No additional budget authority is needed for these agencies in 1977.

4. Food for peace. Neither budget authority nor outlays adequately measure trends in the Food for Peace program under Public Law 480. Outlays, which measure the costs of actual shipments, have been affected by the wide fluctuations in food prices starting in 1973, and the PL-480 program can exceed budget authority in any given year because legislation permits extensive use of Commodity Credit Corporation funds.

In terms of the amount of food stuffs actually provided, the 1977 budget anticipates shipments of approximately 6.2 million tons. This is about the same size as the 1976 program but costs are estimated to be lower because of changes in the commodity mix and possible price reductions. This level represents a substantial U.S. commitment toward the world food aid target of 10 million tons set at the World Food Conference in Rome in November 1974.

PL-480 Commodity Shipments
(in millions of metric tons)

	<u>1975</u>	<u>1976</u>	<u>1977</u>
Title I credits	3.5	5.1	4.9
Title II grants	<u>1.2</u>	<u>1.3</u>	<u>1.3</u>
Total	4.8	6.4	6.2

The PL-480 program in 1976 and 1977 is more than 25 percent above the 1974 program which was held to 4.8 million tons because of world food shortages and the depletion of the formerly large U.S. grain stocks which initially gave rise to the PL-480 program. Because of the need to rebuild U.S. stocks and meet a variety of commercial demands for food, and because of the relatively improved agricultural situation in some food aid recipient countries, the program has been held below the 9 million ton shipment level of the late 1960s and early 1970s. Title I shipments, which are financed on concessional credit terms will decrease slightly in 1977. Title II people-to-people grant donations will remain at the 1.3 million ton level mandated by law.

EXPORT-IMPORT BANK OF THE UNITED STATES

The Export-Import Bank supports exports by providing direct loans, discount loans, and guarantees and insurance. Eximbank's direct loan program is designed primarily to finance the purchase of major capital goods requiring repayment terms of five years or longer. Under the discount loan program, Eximbank stands ready to finance medium-term (five years or less) export credits through loans made to commercial banks. Eximbank's guarantee and insurance programs are aimed at increasing private capital participation by insuring banks and exporters against commercial and political risks involved in export transactions.

Key Budget Decisions

- Revise the 1976 direct loan ceiling to \$3.0 billion based on lower estimates of likely loan authorizations and increase it to \$4.0 billion in 1977.
- Reduce the discount loan program to \$1.0 billion in 1977, pending probable termination of the program next year.
- Hold guarantees and insurance ceiling at the \$8.8 billion level of 1976.

Export-Import Bank Authorizations* (\$ in millions)

	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976 Budget Amend.</u>	<u>1977 Request</u>
Direct loans	2,296	2,414	3,981	1,701	3,050	4,075
Discount loans	989	1,640	924	1,112	1,400	1,000
Guarantees and insurance	<u>3,945</u>	<u>4,460</u>	<u>4,194</u>	<u>4,502</u>	<u>8,850</u>	<u>8,850</u>
TOTAL	<u>7,230</u>	<u>8,514</u>	<u>9,099</u>	<u>8,315</u>	<u>13,300</u>	<u>13,925</u>
Net Outlays	184	548	1,228	1,504	1,358	1,306

* Eximbank's program activity subject to annual limitation, calculated on a net basis, is shown in the attachment.

Discussion

Background--Budget decisions concerning the Export-Import Bank were based on an analysis of Government export credit support from two perspectives: (1) the U.S. credit market and (2) the international economic environment.

As with other credit programs, the budget decision was based partly on the need to avoid pre-empting the private credit market. Accordingly, the budget request reflects estimates of the need for export credit financing to overcome various imperfections in financial markets (for example, the lack of long-term credits for exports, or excessive risk premiums) while trying to avoid simply substituting Federal programs for private lending.

Some substitution for private credit is unavoidable, however, because Eximbank must provide direct credits at interest rates below those available in the private market in order to counteract the credit subsidies offered by foreign governments to support their exports. The extent of foreign subsidies appears to be increasing as governments include export financing in fiscal plans designed to promote economic recovery. Negotiations are now underway on an agreement to limit the self-defeating escalation of subsidized export credits. The 1977 budget decisions are intended to signal U.S. willingness to enter into such an agreement while allowing Eximbank adequate leeway to meet foreign competition until an agreement is reached.

1976 Direct loan re-estimate--The pending 1976 budget request was amended downward from \$4.0 billion to \$3.0 billion in order to provide outlay estimates that are consistent with current estimates of program activity. Authorizations will fall below initial estimates largely because of the continuing economic recession in many countries. This amendment is not expected to affect Eximbank's actual 1976 lending level.

Discount loans--The 1977 budget level for the discount loan program is designed to significantly tighten the program pending probable termination of the program the following year.

The primary objective of the program is to encourage the provision of export credits at fixed rates. The program also provides export incentives to small and medium-size exporters and banks and counters the effects of similar programs offered by European and Japanese export credit agencies. The 1977 budget decision was

based on the judgment that the objective of assuring fixed-rate credits is not of sufficient importance to warrant the continuation of a sizeable Federal credit program.

Guarantees and insurance--The decision to continue guarantees and insurance at the \$8.8 billion level is based on an estimate of 1977 program usage. The funding level will allow substantial growth since 1976 authorizations will probably fall short of the ceiling due to the effects of the recession. These programs do not result in budget outlays, except in the unusual instance of loan defaults.

Attachment

Export-Import Bank
Limitation on Program Activity

The Eximbank's annual limitation on program activity is based on:

1. Direct and discount loan authorizations net of cancellations.
2. Guarantees and insurance authorizations at 25 percent of face value, less cancellations, repayments, and expirations.
3. Interest payments and non-administrative expenses.

Congress also enacts a sub-limitation on equipment and services loans within the overall program limitation. The Bank has normally fallen well below its limitation in terms of actual activity.

Program Activity Subject to Limitation
(\$ in millions)

	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u> <u>Budget</u> <u>Amend.</u>	<u>1977</u> <u>Request</u>
Direct loans	2,223	2,336	3,872	2,592	3,000	4,000
Equipment and services	(2,139)	(2,261)	(3,790)	(2,508)	(3,000)	(3,875)
Discount loans	839	1,436	807	920	1,260	900
Guarantees and insurance	459	333	261	220	823	718
Interest and non- administrative expenses	<u>186</u>	<u>215</u>	<u>325</u>	<u>453</u>	<u>537</u>	<u>716</u>
TOTAL, actual or estimated	<u>3,707</u>	<u>4,320</u>	<u>5,265</u>	<u>4,185</u>	<u>5,620</u>	<u>6,334</u>
LIMITATION set by Congress	7,324	7,324	7,650	6,403	5,620	6,334

FY 1977 Budget

National Aeronautics and Space Administration

Program Activities	FY 1976		FY 1977		Percent Change 1976-1977
	Outlays (\$ millions)	Percent of Total	Outlays (\$ millions)	Percent of Total	
Manned Space Flight (i.e. Space Shuttle)	1,734	49%	1,865	51%	+ 8%
Space Science, Appli- cations and Technology (e.g., Viking Mars lander, Landsat earth resources satellite)	1,118	32%	1,125	31%	+ 1%
Aeronautical Research and Technology	330	9%	339	9%	+ 3%
Supporting Activities (e.g. operation of tracking network)	335	10%	347	9%	+ 4%
Total NASA	3,517	100%	3,676	100%	+ 5%

Major Budget and Program Highlights (FY 1977)

- The 1977 budget strategy for NASA is to:
 - seek to maintain a "balanced" program (i.e., unmanned satellite projects as well as continuing space shuttle development) across all space activities.
 - hold to the space shuttle development schedule. Through 1976 about \$3 billion will have been invested in the program. A major slippage in the schedule could add an estimated \$350-500 million to the out-year costs of completing the program. (The current development cost estimate for the shuttle at completion is \$6.6 billion in FY 1977 dollars.)
 - the 1977 Budget also seeks to maintain a constrained total dollar level for space programs. While there are many projects that are technically feasible in space, the cost of exploiting what is feasible must be balanced against other national priorities.
- Almost all of the \$159 million NASA increase in 1977 (over 1976), is related to the orderly buildup of activity in the space shuttle development program.

- Space Shuttle development will be moving forward toward "roll-out" of the complete first space shuttle orbiter in September 1976:
 - the shuttle is planned to begin a series of approach and landing tests in the atmosphere during 1977.
 - initial manned space flight is scheduled for mid-1979.
- Two new satellite projects will be initiated in FY 1977:
 - Solar Maximum Mission (total project cost of \$83 million) to make important scientific measurements of the Sun during the next peak of solar flare activity expected to occur in 1978-1980, the only time in the next decade that this opportunity will be available.
 - Magnetic Field Satellite (total cost of \$20 million) to be launched in 1980 which will make precise measurements of the earth's magnetic field--expected to contribute to energy-related mineral exploration activities as well as providing scientific information about the earth's crust and internal structure.
- In keeping with the President's energy objectives, the NASA aeronautical R&D program (totalling \$339 million in 1977) will give priority attention to technology for the achievement of more energy-efficient future air transports--overall technology goal is to reduce fuel consumption of new airplanes by about half by 1985.
 - NASA will be working to obtain cost-sharing and heavy involvement of the private sector in the development and demonstration of advanced aircraft technologies (particularly in the area of composite materials).
- Construction will begin on a new wind tunnel at Langely Research Center, Virginia (total cost of \$65 million), expected to have wide application as an R&D tool for development of future military and civilian aircraft.
 - The wind tunnel will have advanced capabilities to provide measurements of certain air-flow characteristics of aircraft operating near the speed to sound which were previously not obtainable.

Major Deferrals and Reductions in 1977

- Program reductions and deferrals will be made in several areas of the NASA budget in order to achieve the President's objective of constraining the total Federal budget. These reductions are not expected to impair NASA's overall ability to carry forward a productive program in aeronautics and space technology.
 - Defer procurement of a 3rd (production version) space shuttle orbiter and selected development efforts--FY 1977 saving is \$90 million.
 - Defer initiation of Space Telescope flight project--FY 1977 saving is \$4 million. (Total project cost is \$350-400M.)
 - Reduce general support for NASA's research and development activities in aeronautics and space (e.g., research at NASA laboratories and universities)--FY 1977 saving is \$28 million.
 - Defer modifications to a wind tunnel and other proposed construction projects--FY 1977 savings is \$9 million.
 - Reduce NASA civil service employment levels (500 positions) and related support contractor manpower at NASA installations as the result of an assessment undertaken by NASA to increase efficiency and productivity at the NASA centers--FY 1977 saving is \$15 million.

1977 Budget

Federal Research and Development

	Obligations (\$Millions)		% Change 1976-1977
	1976	1977	
<u>Conduct of R&D</u>			
Defense	9,879	11,198	+ 13
NASA	3,473	3,573	+ 3
ERDA	2,812	3,573	+ 17
HEW	2,369	2,570	+ 8
NSF	628	726	+ 17
Agriculture	483	507	+ 5
Other	<u>1,694</u>	<u>1,609</u>	- 5
Total, Conduct of R&D	21,338	23,465	+ 10
<u>R&D facilities</u>	<u>909</u>	<u>1,215</u>	+ 34
Total, all R&D	22,247	24,680	+ 11

Included in total funds for the conduct of R&D are Federal support for both -

Basic research (in Government labs, universities, and industry)	2,380	2,640	+ 11
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Grants and contracts to universities for both basic and applied (e.g., medical) research	2,460	2,614	+ 9
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Overall Strategy for R&D

- The Government invests in R&D largely to develop new products or processes. It is not a separately budgeted activity of the Federal Government and should not be viewed as an "end-in-itself." Rather it is a means whereby agency or national goals can be achieved more effectively or more efficiently.

° R&D on new weapons systems can improve the Nation's defense.

° R&D on the space shuttle can improve our ability to work in outer space.



- R&D on the liquefaction of coal can improve our ability to use coal rather than rely on imported oil.
- R&D on new varieties of wheat can increase agricultural production to meet domestic needs and sales to foreign countries.
- Federal R&D covers a wide variety of activities. In varying degrees agency R&D programs include:
 - Basic research (to develop fundamental new knowledge);
 - Applied research (to apply new knowledge to specific applications);
 - Development (to do the engineering for new devices or systems);
 - Demonstration (to build experimental new devices or systems to see how well they work and what they cost to build and operate at full scale).
- Private industry, foundations, universities, and others also invest in R&D. The private sector accounts for nearly half of the national investment in R&D. The Federal Government seeks to encourage -- through its R&D programs, as well as through its tax policies -- continued and expanded private investment in R&D so that overall national goals may be better met through science and technology.
- The Federal Government focuses its R&D investment in three broad areas to meet:
 - Direct Federal needs, where the Government has full responsibility, such as in space and national defense.
 - General economic and human welfare needs, where the Federal Government assumes major responsibility because there are not sufficient incentives for the private sector to invest enough to meet national needs, such as in basic research, medicine, environment, and agriculture.
 - Specific national needs, where Government shares responsibility and uses Federal funds to accelerate and augment the efforts of private sector because of the overriding national interest, and there is a need to provide the Nation with technological options for the future, such as in energy.

- Constraints must be exercised and priorities set for R&D, not only because of overall budget limitations, but also to:
 - ° Avoid overtaking private sector responsibilities to produce, market and utilize technical advances, such as technologies to conserve energy in industrial manufacturing where there is a strong incentive for private industry to do the job.
 - ° Encourage cost-sharing with private sector for technologies ready for commercial demonstration, such as oil-shale development.
 - ° Avoid investing in technology currently seen to have future questionable benefits, such as:
 - A large space station
 - Expensive high-speed trackless trains operating on cushions of air

Budget and Program Highlights (FY 1977)

- In defense
 - ° Overall obligations increase by 13% over 1976 with significant increases in basic research, in ballistic missile warhead improvements, and in providing options for a new inter-continental ballistic missile system.
 - ° Funding will decrease in the Trident long-range submarine and missile system because these systems are entering procurement.
- In space
 - ° Continue development and testing of the space shuttle
 - ° Defer procurement of a third space shuttle in recognition of budget constraints
- In other civilian agencies
 - ° In the Energy Research and Development Administration: Increase research and development to assure the availability of safe and reliable nuclear power; continue development of fusion technology and the nuclear breeder demonstration program; expand research to make better and more environmentally acceptable use of fossil fuel through gasifying or liquefying coal; assist industry in advanced energy conservation technology and technologies involving solar and geothermal energy.

- In the Department of Health, Education and Welfare: Augment research on immunology, aging, and environmental health.
- In the National Science Foundation: Increase efforts in basic research including emphasis on physics, engineering, chemistry, and materials.
- In the Department of Agriculture: Expand research on the basic biological processes underlying agriculture production, and development of additional sources of usable vegetable protein.
- In other agencies: Obligations decline in total for the conduct of R&D in those other agencies with less than \$.5 billion each in R&D. This reflects the impact of a few agencies, such as the Environmental Protection Agency and the Department of Commerce, where some R&D efforts have been completed or postponed, or where there were usually high obligations in 1976.
- In facilities: Increase obligations by 34% to provide the necessary plant and equipment for scientists and engineers to conduct their research and development. Key increases are:
 - An aircraft test complex for the Department of Defense
 - A wind tunnel for the National Aeronautics and Space Administration
 - A variety of development and demonstration projects for the Energy Research and Development Administration, primarily in fossil, fusion, and fission energy technologies.
- In universities and colleges: Increase grants and contracts for basic and applied research in health, energy, and science in general - by 9%.
- In overall support of basic research:
 - In the National Science Foundation: Increase basic research funding by 19% to strengthen its key role in support of such research.
 - In other agencies: Strengthen basic research in support of their mission.

- ° Provide an overall Federal increase of 11% for basic research.
- ° In addition, strengthen the competitiveness of U.S. research in high energy physics by starting, in 1977, a new machine (a "colliding beam" facility) to develop and test new theories on the ultimate nature of matter.

Fiscal Year 1977 Budget
National Science Foundation

	FY 1976		FY 1977		Percent Change 1976-1977
	Budget Authority (\$ Millions)	Percent of Total	Budget Authority (\$ Millions)	Percent of Total	
Basic research (e.g., biology, math, chemistry geology, astronomy)	\$523	71%	\$625	77%	+ 20%
Applied research (e.g., Earthquake resistant structures)	\$110	15%	\$ 90	11%	- 18%
Science education (e.g., fellowships, curriculum improvement)	\$ 65	9%	\$ 65	8%	--
Other (e.g., international) science programs, admin- istrative expenses)	\$34	5%	\$ 32	4%	- 6%
Total NSF	\$732	100%	\$812	100%	+ 11%

Basic Research: The primary responsibility of NSF

- ° The major responsibility of the National Science Foundation (NSF) is support of basic research.
 - Basic research may be defined as the intensive study of natural laws and phenomena or human behavior for the purpose of learning or increasing knowledge.
 - Basic research is generally free from practical needs to meet immediate objectives, but it is regarded as the foundation for future applications of science to improve our national defense, our economy, and our human welfare.



- ° The NSF uses its funds to complement the funding of other agencies (which support basic research to serve their specific mission needs). Thus, NSF aids in assuring
 - that enough basic research is conducted in this country to meet the Nation's need for new fundamental knowledge to support future advancements in technology.
 - that Federal support is "balanced" across the many disciplines of basic science, and
 - that highly innovative ideas, which other agencies cannot support in relation to their missions needs, are pursued.
- ° The importance of this responsibility to NSF is indicated by the budget where 77% of the NSF funding is for basic research in 1977.
 - NSF finances 20% of the Federal effort in basic research. Responsibility for the other 80% is divided among several Federal agencies, which fund basic research oriented toward their mission.

These include chiefly the

- Department of Defense
 - National Aeronautics and Space Administration
 - Energy Research and Development Administration
 - Department of Health, Education, and Welfare (particularly the National Institutes of Health).
- ° The Federal effort in support of basic research is predominant in the Nation because the benefits of basic research generally accrue to all of society.
 - Federal efforts account for about 70% of the national activity in basic research. Other support for basic research comes from non-profit organizations, private industry, and some States.
 - Industry as a whole does not make a major investment in basic research because the results of such research cannot generally be patented and therefore industry cannot readily "profit" from basic research.
 - ° Individual judgments will certainly vary about the worth of particular basic research projects. Nevertheless, some examples should help understand the type and range of activities supported by NSF in fulfilling its responsibility for strengthening basic research.

- Discoveries of fundamental particles that make up the nucleus of atoms and molecules (discoveries like this one, in the past, have led to the major advances in chemistry and electronics that we have seen in recent years);
- Studies of changes in the Earth's magnetic and volcanic forces (to develop ways to predict the timing and location of earthquakes);
- Development of advanced techniques for modeling and analyzing the national economy (which may provide the basis for improved future management of national growth);
- Identification of the functioning of chemical and biological catalysts (which are essential for improved chemical industrial processes);
- Investigation of the novel properties of metals at extremely low temperatures (which is providing the basis for major technological advances in computing, measurement and other electronic systems).

Other significant responsibilities of NSF

- ° The Foundation supports a limited amount of applied research which is focused on important national problems not addressed by other Federal agencies. This is chiefly through the RANN program (Research Applied to National Needs) which was, for example, the program that initially supported Government efforts in solar and geothermal R&D (now transferred to ERDA).
- ° NSF as part of its responsibilities also supports the U.S. Antarctic Program for scientific research using the logistic support of the Departments of Defense and Transportation. This program which supports important overall U.S. interest in the Antarctic will total \$45 million in FY 1977.
- ° Science education programs of NSF provide for both the training of scientists and engineers and the development of new approaches for teaching science.

Budget and Program Highlights (FY 1977)

- Overall budget authority for NSF will increase by 11%, from \$732 million to \$812 million, because of the need to strengthen Federal support of basic research in the national interest.
- Budget authority for basic research will increase by 20%, from \$532 million to \$625 million.
 - Nearly, all fields of basic research will share these increases including programs in biology, chemistry, physics, engineering, math, and astronomy.
 - These increases are balanced with increases for basic research provided in the 1977 budget in other agencies, particularly the Department of Defense, the Energy Research and Development Administration, the Department of Agriculture, and the Department of Health, Education and Welfare.
 - Along with increases in NSF support, total Federal support will grow from \$2.38 billion in 1976 to \$2.64 billion in 1977, an increase of 11%.
- Increases for basic research in NSF and other Federal agencies will help reverse a decline that has taken place in the last several years in terms of real spending on basic research. Because inflation has been at a higher rate since 1967 than the Federal increases in funds for basic research, the level of scientific work supported by the Federal Government has decreased.
- The program of Research Applied to National Needs (RANN) will be reduced reflecting a shift of responsibilities in applied energy research (particularly for solar and geothermal power) from NSF to the Energy Research and Development Administration.
- The science education program does not grow because evaluations are being conducted on the need for and effectiveness of some of these programs.

Program Operations

- All NSF research projects are carried out through grants and contracts. The large majority of the awards are made with scientists and engineers at colleges and universities. Over \$500 million in the 1977 NSF budget will be awarded to these institutions. Grants and contracts are also awarded to private firms, non-profit organizations, and State and local governments.
- Awards are made on the basis of merit, through competition, and after intensive review of the research topic, project design and potential usefulness of the research results.

FY 1977 Budget
Outdoor Recreation and Wildlife Programs
 Department of the Interior

Budget Summary:

<u>Program Activities</u>	<u>1976</u>		<u>1977</u>		<u>% Change 76-77</u>
	<u>Outlays \$ in M</u>	<u>% of Total</u>	<u>Outlays \$ in M</u>	<u>% of Total</u>	
1. Land and Water Conservation Fund	300	34	329	34	+10
2. Bureau of Outdoor Recreation	6	--	6	--	--
3. National Park Service	368	41	390	41	+6
4. Fish and Wildlife Service	<u>225</u>	<u>25</u>	<u>233</u>	<u>25</u>	<u>+4</u>
Total	899	100	959	100	+7

Budget Policy Highlights:

- The Land and Water Conservation Fund is fully funded at \$300 M.
- An increase of \$21 M is provided for the operation of the National Park System.
- An increase of 400 park rangers and other park employees, effective immediately, is provided to augment National Park operations for the Bicentennial.
- A new national wetlands inventory will be initiated.

Specific Budget Decisions:1. Land and Water Conservation Fund.Program:

- Fund provides grants to States for acquisition of recreation lands and development of recreational facilities. About 1.5 million acres of land have been bought to date and \$720 M used for development of facilities.
- Fund also provides for acquisition of recreation and conservation lands by the National Park Service, Forest Service, Fish and Wildlife Service, and Bureau of Land Management.

Budget:

- The Fund will be "fully funded , requesting appropriation of \$300 M providing -
 - \$176 M for grants to States to support some 2,500 recreation projects.
 - \$118 M for Federal land acquisition with priority given to congressionally authorized areas such as Big Cypress and Big Thicket National Preserves.
 - \$6 M for administrative costs.

2. Bureau of Outdoor Recreation.Program and Budget:

- The Bureau administers the Land and Water Conservation Fund, assesses national outdoor recreation demand and supply, reviews recreation policy, and conducts studies of potential recreation areas.

3. National Park Service.Program:

- 29.3 million acres are managed in the National Park System to protect natural, scenic, and historic resources and to provide visitor services.

Budget:

- The Park Service total of \$390 M includes an increase over 1976 of \$21 M for the operation of the National Park System. Funds for routine maintenance of park facilities, as an element of park operations, will increase substantially in 1977.
- 400 more rangers and other permanent NPS employees are provided in 1976 for Bicentennial work and will be retained in 1977.

Budget restrictions:

- National Park Service construction levels will drop from \$110 M in 1976 to \$41 M in 1977, mostly because of the completion in 1976 of a large number of Bicentennial facilities. The 1977 program will include

construction of sewage treatment facilities, some initial development of new park areas, and some construction and rehabilitation of facilities at older park areas.

- As a part of the reduced road construction program, a rescission is proposed of \$58.5 M of contract authority provided by the Federal Aid Highway Act of 1973 for road construction. This is authority that will not be used in 1976 and will lapse.
- Historic preservation activities (largely grants to States for planning and historic preservation projects) will be reduced from \$25 M to \$15 M by providing \$10 M more to finance higher priority activities within the National Park Service.

4. Fish and Wildlife Service.

Program:

- The Service manages 33.6 million acres of wildlife refuges to conserve migratory waterfowl, endangered species and other wildlife.
- It operates hatcheries for the propagation of fish.
- The Service also conducts research and provides biological services to other agencies.
- Grants are provided States for fish and wildlife restoration, financed mostly from excise taxes on sporting equipment.

Budget:

- \$233 M are provided for the Fish and Wildlife Service, an increase of \$7.6 M over 1976.
- The increased funding is for wildlife habitat preservation, for grants to States, and for starting a survey of wetlands which are important wildlife habitat.

Reductions:

- Construction will be reduced some because of the higher than usual level in 1976.

- \$12 M is estimated to be available from the sale of "duck stamps" for the purchase of migratory waterfowl habitat - the same level as in 1976. An additional \$7.5 M were provided through direct appropriations in 1976 for habitat acquisition. No direct appropriations are requested in 1977 because the Administration supports the concept that wildlife land acquisition should be fully supported by current sales of stamps. The Administration supports proposed legislation to provide the Secretary with authority to raise the price of stamps above the \$5 level set several years ago to provide additional funds for habitat acquisition.
- No funds are requested in 1977 for Endangered Species grants to States (\$2 M appropriated in 1976) since some \$90 M of other State grant funds are estimated to be available for this purpose.

FY 1977 Budget

Water Resources Development Program

Program Activities	(Outlays in Millions)				
	FY 1976		FY 1977		Percent Change
	\$	Percent of Total	\$	Percent of Total	
Corps of Engineers	2118	70	2151	68	+2
Bureau of Reclamation	648	21	751	24	+16
Soil Conservation Service	199	7	187	6	-6
Tennessee Valley Authority	73	2	67	2	-8
Total, Water Resources Programs	3038	100%	3156	100%	+4

Program Summary

- The Corps of Engineers constructs, operates and maintains dams, canals, levees, and other structures for flood control, navigation, hydropower, and related purposes under a wide variety of cost-sharing arrangements. The Corps also has spent substantial funds in recent years to conduct flood emergency work in the Lower Mississippi Valley and elsewhere in the Nation.
- The Bureau of Reclamation constructs dams, canals, and related facilities in the 17 Western states, Alaska and Hawaii primarily for irrigation, but with substantial hydropower, municipal and industrial water supply, and related purposes.
- The Soil Conservation Service conducts a cost-sharing grant program to help finance the construction of small dams, canals, and similar facilities for flood control, drainage, and related purposes. The water program is limited largely to rural areas in upstream small watersheds. Outlays in 1977 show a slight reduction from 1976 primarily because of non-recurring emergency work in 1976.
- The TVA constructs dams, navigation locks, and related facilities in the 7 state Tennessee Valley area for power, flood control and other purposes. TVA's water program is phasing out as most of the potential hydropower dams have been built, and the water programs shown above are now only a small part of the agency's total program.

Water Policy Highlights

- Water projects represent investments in physical facilities for development of communities; for economic development of regions; and for assistance to specific sectors of industry.
- Rate of progress on most of these projects is controllable -- it can be speeded up or slowed down, within reasonable limits, according to the availability of investment funds in each year.
- The upper limit of controllability is determined by physical limits on the amount of construction activity that can be conducted on all sites simultaneously, and the lower limit by the amount of funds necessary to meet construction contracts previously entered into.
- Starting many new projects and contracts in one year will raise the lower limit of funds required in following year.
- Care must be taken to balance the program with (1) investment funds available this year and (2) expected availability of investment funds in future years.
- The 1977 construction appropriations of \$2.0 B for direct (Corps, BuRec, TVA) construction will provide one year's funding for about 260 projects underway, for which \$18 B must be appropriated in future years to complete construction.

Specific budget decisions are:

- No ongoing contracts will be cancelled for budgetary reasons and no projects will be terminated for policy reasons.
- Planned schedules for starting generation of electricity at hydropower projects underway will be met.
- New construction starts added by Congress to the 1976 budget request are financed with follow-on funds in 1977.

- The construction of the Bacon Siphon of the Bureau of Reclamation's Columbia Basin project is budgeted in 1977 contingent on agreement being reached on a satisfactory repayment contract.
- Budget level in 1977 will be constrained to contribute to Administration budget objectives.
 - o Rates of progress on some ongoing projects will be slowed down.
 - o No new construction projects are proposed to be started in fiscal year 1977.
 - o Construction schedules for Corps and Reclamation will be adjusted to reflect completion dates based on future funding projections in the 1977 budget.
- Amounts budgeted for specific projects appear on Pages 301-310 (Corps), 435-446 (BuRec), 162 (SCS), 796-799 (TVA).

Rescissions and Deferrals

- \$2.5 M for 1976 and \$1.1 M for 1976T was added by Congress to the 1976 Public Works bill for the relocation of Route 209 in Pennsylvania as part of the Tocks Island Lake project. These funds are proposed for rescission because the Governors of the affected states have withdrawn support and the reservoir project has been recommended for deauthorization. Therefore, the relocation is unnecessary.
- \$700 K in unbudgeted 1976 funds for design of 3 hopper dredges will be deferred until the private dredging industry has had an opportunity to demonstrate whether it can meet the need for additional hopper dredges. The dredging industry presently has several hopper dredges in various stages of design or construction.

PRESIDENT'S
NATIONAL ENERGY PROGRAM

FY 1977 Budget

Program Activities ^{1/}	(outlays in millions of dollars)				
	FY 1976		FY 1977		Percent change
	\$	%	\$	%	
° Domestic energy resource development, conservation and petroleum storage (e.g., FEA, Energy Independence Authority, TVA & power administrations, uranium enrichment)	5,516	69.4%	7,259	70.0%	+31.6%
° Energy research, development and demonstration (e.g., ERDA, Interior, NRC)	2,194	27.6%	2,858	27.6%	+30.3%
° Regulation (FEA, FPC, MESA, NRC)	234	3.0%	244	2.4%	+4.3%
Total outlays	7,944	100.0%	10361	100.0%	+30.4%
Less: Receipts (TVA, NPR, uranium enrichment)	-3,385		- 4355		+28.7%
Net outlays	4,559		6,006		+31.7%

Approach

Growing dependence on foreign oil makes the United States vulnerable to foreign petroleum price increases and threats of embargo by foreign suppliers. Oil is fundamental to the workings of our economic system and it is therefore essential to assure an adequate continuous supply. The Nation's energy situation illustrates the magnitude of the problem.

- ° Domestic crude oil production peaked in 1970 and since then has declined by more than one million barrels per day. Production is now at a nine-year low.
- ° Oil imports are about 37% of U.S. oil consumption and are expected to rise to more than 50% of consumption or 12 million barrels per day by 1985 if no new actions are taken.

^{1/} Includes on-budget and off-budget (EIA, REA) program activities.

- ° Because of our increasing import dependence, our payments to foreign producers for imported oil have increased from less than \$3 billion in 1970 to about \$25 billion in 1974.
- ° Domestic natural gas production peaked in 1973, declined by 6% in 1974 and dropped another 8.5% during the first half of 1975, leading to curtailments of service in many parts of the country.

The Nation has undeveloped reserves of coal, oil, gas and uranium. There are also many opportunities to conserve energy. A solution to the dependence problem can be achieved with a longer term effort directed toward increasing domestic energy supplies and achieving greater conservation. The President's national energy program is a comprehensive approach designed to achieve a capability for energy independence by 1985. The program includes both short-term and longer term initiatives but places basic reliance on the private sector to carry out expanded domestic energy supply production and conservation, and by developing a strategic storage petroleum system that will be capable of easing the impact of any embargo.

The 1977 budget outlay estimates reflect the President's strong emphasis on domestic energy production, conservation and petroleum storage programs and massive R&D efforts to develop new energy technologies.

Domestic Energy Resource Development, Conservation and Storage

Development and conservation of energy resources are essential to achieving greater independence from foreign petroleum suppliers. These programs encourage the development of oil, gas, coal and uranium reserves, energy production, strategic petroleum storage, and more energy efficient processes. Highlights contained in the FY 77 budget include:

- ° Energy Resource Development, Production, Conservation
 - Energy Independence Authority - Proposed establishment of an Energy Independence Authority with \$100 billion in equity and funding authority to provide assistance (mainly loans and loan guarantees) to the private sector to encourage the development of energy projects using conventional technology (e.g., fossil and nuclear power plants) and emerging technologies (coal to gas plants, oil shale to oil). The Authority will also work to shorten the time required for energy projects to obtain clearances and permits from Federal regulatory agencies. (Refer to description of EIA, Tab B.)

- Natural Gas Deregulation - Proposed deregulation of well-head price of new domestic natural gas in order to encourage greater production and minimize shortages.
- Federal Leasing - An expanded Federal leasing program carried out by Interior for nine Outer Continental Shelf (OCS) oil and gas lease sales and to increase on-shore leasing to encourage increased future production of oil and gas.
- Uranium Enrichment - Uranium enrichment is one of the processes required to convert uranium ore into usable fuel for nuclear power plants. At the present time, this activity is carried out in three Government-owned production facilities originally built for defense purposes.
 - In order to relieve the taxpayer of the financial burden of funding the construction of additional uranium enrichment facilities and to assure the availability of fuel for nuclear power plants, the President has proposed legislation required to foster the creation of a private competitive uranium enrichment industry in the U.S.
 - To produce a large enough stockpile to meet potential future needs, the FY 1977 budget will provide a substantial increase for (a) the production of enriched uranium and (b) the continuation of the previously approved expansion of the capacity of the current ERDA plants. However, the Administration believes that future expansion of enrichment capacity should be financed by the private sector with necessary Government cooperation and temporary assurance under the proposed Nuclear Fuel Assurance Act.
- TVA - Outlays of \$2 billion to support electric power development for TVA, the water resource agencies, and the power administrations.
- Rural Electrification - Continued support by Agriculture for rural electrification financial assistance. \$2 billion in authority for new loans and loan guarantees is requested for electric power development.
- Energy Conservation - Conservation proposals to: provide \$55 million in financial assistance to low-income homeowners for insulation, establish thermal efficiency standards for new residential and commercial buildings,

encourage appliance manufacturers to improve energy efficiency and to label appliances, and encourage auto manufacturers to increase fuel economy. The Energy Policy & Conservation Act makes the appliance labeling and auto fuel economy standards mandatory.

- Energy/Environment - Amendments to the Clean Air Act to provide a needed balance between environmental and energy goals.
 - Energy Tax Expenditures - Tax expenditures to encourage energy resource development and production. A \$1 billion incentive will encourage the exploration and development of new oil and gas resources by allowing these costs to be treated as current expenses rather than being depreciated over a number of years. A \$1.6 billion incentive will encourage oil and gas production by allowing percentage depletion rather than actual cost depletion. A proposed package of tax aids will provide \$800 million to help utility generating facilities which use alternatives to oil and gas as fuels.
- o Strategic Petroleum Storage

This program is designed to provide for the storage of a large quantity of petroleum in salt domes, tanks, mines, in reserve to be used to minimize the adverse affects caused by embargos by foreign oil suppliers. The stored petroleum along with standby plans for mandatory conservation of energy use and allocation will provide a means for dealing with the adverse affects of embargos providing protection to the U.S. against such actions. The 1977 budget provides for \$100 million in new funding authority for FEA to plan for and begin development of a strategic storage program. While the storage program will take time to construct and fill, an important step is being taken in 1977 to proceed with development. This program will be financed mainly by revenues from the sale of oil produced at the Naval Petroleum Reserves. Legislation establishing this special fund is now pending before the Congress.

The Energy Policy and Conservation Act mandates a faster rate of development of the storage program than provided for in the President's budget. A budget amendment will be necessary in 1977 to meet this accelerated schedule.



Energy Research, Development and Demonstration

The Energy Research and Development Administration, proposed by the Administration, was established in January 1975 to be the major Federal agency for the conduct of energy research and development. In FY 1977 ERDA will provide 83% of the total Federal funding for energy R&D. It also provides a central Federal agency for the planning and coordination of Federally sponsored energy research and development.

The following table summarizes the energy research, development, and demonstration program for ERDA and other Federal agencies:

<u>Program Activities</u>	(outlays in millions of dollars)				<u>Percent Change</u>
	<u>FY 1976</u>		<u>FY 1977</u>		
	<u>\$</u>	<u>%</u>	<u>\$</u>	<u>%</u>	
ERDA, total.....	<u>1412</u>	<u>64</u>	<u>1975</u>	<u>69</u>	<u>+ 40</u>
Non-Nuclear, total....	(519)	(24)	(710)	(25)	(+ 37)
Fossil.....	333	15	442	15	+ 33
Solar.....	86	4	116	4	+ 35
Geothermal.....	32	2	46	2	+ 44
Conservation.....	56	2	91	3	+ 63
Environmental Control	12	1	15	1	+ 25
Nuclear, total.....	(893)	(40)	(1265)	(44)	(+ 42)
Fusion.....	224	10	304	11	+ 36
Fission.....	521	23	709	24	+ 36
Fuel Cycle/Safeguards	59	3	144	5	+144
Enrichment R&D.....	89	4	108	4	+ 21
EPA (Environmental Control).....	<u>87</u>	<u>4</u>	<u>75</u>	<u>3</u>	<u>- 14</u>
NRC (Safety Research)	<u>94</u>	<u>4</u>	<u>116</u>	<u>4</u>	<u>+ 23</u>
DOI (Mining).....	<u>52</u>	<u>2</u>	<u>64</u>	<u>2</u>	<u>+ 23</u>
Other.....	<u>14</u>	<u>1</u>	<u>9</u>	<u>--</u>	<u>- 36</u>
<u>Total Direct Energy R&D</u>	<u>1659</u>	<u>75</u>	<u>2239</u>	<u>78</u>	<u>+ 35</u>

<u>Program Activities</u>	(outlays in millions of dollars)				<u>Percent Change</u>
	<u>FY 1976</u>		<u>FY 1977</u>		
	<u>\$</u>	<u>%</u>	<u>\$</u>	<u>%</u>	
<u>Supporting R&D</u>					
ERDA.....	<u>373</u>	<u>17</u>	<u>403</u>	<u>14</u>	<u>+ 8</u>
EPA.....	<u>40</u>	<u>2</u>	<u>47</u>	<u>2</u>	<u>+18</u>
NSF.....	<u>93</u>	<u>4</u>	<u>139</u>	<u>5</u>	<u>+50</u>
<u>Total Supporting R&D..</u>	<u>506</u>	<u>23</u>	<u>589</u>	<u>21</u>	<u>+16</u>
<u>Energy Related:</u>					
DOI (Mine health/ safety).....	<u>29</u>	<u>2</u>	<u>30</u>	<u>1</u>	<u>+ 3</u>
<u>GRAND TOTAL*.....</u>	<u>2194</u>	<u>100</u>	<u>2858</u>	<u>100</u>	<u>+30</u>

*In addition, the FY 1977 Budget identifies funds to accelerate the commercialization and demonstration of energy technologies through loan guarantees: Geothermal Resources Development Fund, FY 1977 outlays of \$4.4 million; and Synthetic Fuels Commercial Demonstration Fund, FY 1976 outlays of \$3.0 million.

- Overall Energy R&D Budget Strategy

- Accelerate energy research and development programs directed at achieving greater long-term energy independence.
 - Expand efforts to assure the safety, reliability, and availability of commercial nuclear power plants by increasing R&D on the long-term storage of radioactive wastes, fuel reprocessing, and safeguards against theft of nuclear materials.
 - Place greatest funding on technologies with the highest potential payoff in terms of recoverable resources (i.e., nuclear and fossil).
 - Continue to expand the investigation of other technologies where they can make significant contributions to meeting the long-term energy requirements of the U.S. (i.e., solar, geothermal, and conservation R&D).

- Encourage cost-sharing with private industry (e.g., coal liquefaction demonstrations) and avoid undertaking shorter term R&D more appropriately the responsibility of the private sector (e.g., in areas of conservation technology).
- Support the commercial demonstration of synthetic fuel production from coal, oil shale, and other domestic resources by providing loan guarantees during FY 1976 (upon enactment of the Energy Independence Authority legislation in FY 1977, transfer these projects to EIA).
- Non-nuclear Energy R&D
 - Balance between nuclear and non-nuclear energy R&D - the table of direct ERDA spending indicates more effort on nuclear than non-nuclear energy R&D. However, direct ERDA spending is not a true measure of the total national effort on non-nuclear energy R&D and greatly understates the effort being made to develop and commercialize non-nuclear energy technologies.
 - Although specific data is not available, private industry is known to be spending much more on non-nuclear energy R&D than on nuclear energy R&D (which has higher technical and regulatory uncertainties).
 - The Administration plans to support legislation which is expected to provide about \$6 billion of loan guarantees in FY 1976-78 to enable industry to construct facilities for producing synthetic fuels.
 - About \$50 million per year will also be provided for loan guarantees for geothermal production projects.
 - Fossil energy development - Accelerate the development and demonstration of technology to (a) enable plentiful domestic coal resources to be substituted for increasingly scarce supplies of oil and natural gas; (b) increase the efficiency of the use of fossil fuels through advanced power conversion systems; and (c) increase the recovery of oil and natural gas from fields in the U.S.

- Solar energy development - Increase the development and demonstration of solar energy applications, including 226 units to demonstrate solar heating and cooling in residential and commercial buildings and acceleration of technology for the conversion of solar energy to electricity.
- Geothermal energy development - Expand R&D required for the utilization of U.S. geothermal resources including improving the capability for defining the extent and availability of such resources, developing advanced engineering techniques and building pilot plants. Provide \$50 million in FY 1977 for loan guarantees to enable industry to proceed with geothermal production projects which would otherwise not be undertaken because of current technical and economic uncertainties.
- Conservation R&D - Provide an expanded program to improve technology and encourage conservation of energy in buildings, industry, and transportation.

• Nuclear Energy R&D

- Fusion - Continue research to determine the scientific feasibility of obtaining virtually unlimited power for the long-term (beyond the year 2000) from the controlled thermonuclear fusion reaction. In FY 1977 continue construction of the \$215 million Tokamak Fusion Test Reactor at Princeton, N.J., which will represent a major milestone for the development program.
- Fission - Increase funding for the Liquid Metal Fast Breeder Reactor (LMFBR) which is a proven technological concept for greatly extending supplies of uranium fuel for nuclear power plants. The increase is primarily for the continued construction of the \$1.95 billion LMFBR demonstration project.
- Fuel Cycle and Safeguards - Improve the use of current commercial nuclear reactors (refer to description of Nuc Power, Tab):
 - Commercial waste management - Greatly accelerate the conduct of R&D to provide the technology for the terminal storage of radioactive wastes from commercial power plants by demonstrating this technology at several sites.

- Nuclear fuel reprocessing - Assist industry by conducting R&D on the technology for reprocessing and reusing spent nuclear fuel discharged from commercial nuclear power plants.
- Safeguards - Demonstrate techniques for safeguarding nuclear materials against theft.
- Uranium enrichment R&D - Develop and demonstrate improved techniques for uranium enrichment which offer the promise of more efficient production and cheaper electricity for consumers.
- Other Direct Energy R&D
 - Significantly increase outlays for the Nuclear Regulatory Commission's safety research program and the Department of the Interior's mining R&D program.
 - Reduce outlays for the Environmental Protection Administration's development of environmental control technology because of the completion of portions of major contracts and the increasing responsibility of other agencies in this area.
- Supporting Energy R&D
 - Continue the FY 1976 level of effort on programs to (a) determine the biomedical and environmental effects of nuclear and non-nuclear energy sources to assure development of safe energy technologies and (b) solve fundamental scientific and engineering problems that constrain the development of energy technologies.
- Synthetic Fuels
 - Support legislation to provide \$2 billion in loan guarantees for industry (\$500 million of Budget Authority) during 1976 for the commercial demonstration of synthetic fuel production from coal, oil shale, and other domestic resources. A total of \$6 billion in loan guarantees is expected to be necessary over the 1976-78 period in order to reach the 1985 objective of 350,000 barrels per day of synthetic fuel production capacity (refer to description of Syn Fuels, Tab).

Regulation

Regulatory programs include:

- price controls on petroleum products
- interstate gas price and transmission controls
- coal mine safety
- nuclear power plant safety and materials safeguards.

Program highlights for 1977 include:

- Petroleum Regulation - FEA's budget for 1977 shows a sharp drop from the 1976 level because it assumes the expiration of petroleum price controls and allocation authorities on December 15, 1975.

The 1977 budget therefore provides for only a standby allocation force, and for completion of a comprehensive program to audit petroleum producers, refiners, wholesalers and retailers to make sure that they complied with the regulations before expiration. The Energy Policy and Conservation Act has extended petroleum price and allocation controls. This Act will provide for the gradual phasing out of controls on domestic oil. FEA will therefore continue its regulatory program during 1977, and will take steps to simplify and streamline controls on domestic oil. A budget amendment will be necessary for 1977.

- Nuclear Regulation - Funding for the Nuclear Regulatory Commission will increase 23% because of the important role which NRC plays in ensuring that nuclear power continues to be a safe and environmentally acceptable means of generating electricity. The United States needs additional nuclear power plants in order to achieve more energy independence from foreign suppliers and to provide consumers with cheaper electricity than alternative sources can provide. The additional resources for NRC will help enable the U.S. to achieve the benefits of nuclear power by assuring adequate attention to the problems of safety, environmental effects, and safeguarding nuclear materials against theft.
- Nuclear Licensing - A legislative proposal to streamline the NRC procedures for licensing nuclear power plants to reduce the amount of time required to process applications while maintaining safety and environmental standards.

TAB B
EIA

FY 1977 Budget
Energy Independence Authority
(Proposed Legislation)

Need for Initiative to Develop Domestic Energy Resources

It is essential that the Nation move promptly to develop domestic energy resources to assure that needed supplies are available in the long run to avoid a growing dependence on foreign energy supplies. The Nation's energy situation continues to deteriorate:

- Domestic crude oil production peaked in 1970 and since then has declined by more than one million barrels per day. Production is now at a nine-year low.
- Oil imports are about 37% of the U.S. oil consumption and are expected to rise to more than 50% of consumption or 12 million barrels per day by 1985 if no new actions are taken.
- Because of our increasing import dependence, our payments to foreign producers for imported oil has increased from less than \$3 billion in 1970 to about \$25 billion in 1974.
- Domestic natural gas production peaked in 1973, declined by 6% in 1974 and dropped another 8.5% during the first half of 1975, leading to curtailments of service in many parts of the country.

The Nation has undeveloped reserves of coal, oil, gas and uranium. There are also many opportunities to conserve energy through the use of more energy efficient processes. However, many domestic energy projects are not proceeding to construction because of difficulties being encountered by the private sector in obtaining:

- . the necessary funds for large scale projects,
- . needed regulatory permits in an expedited manner.

Presidential Proposal for Energy Independence Authority

To encourage needed domestic energy development and conservation, the President has proposed the establishment of a government corporation, the Energy Independence Authority (EIA) with \$100 billion in financial resources to help achieve greater energy independence. The EIA will:

- . have financial resources totaling \$100 billion consisting of \$25 billion in capital stock owned by the government and authority to borrow up to \$75 billion,
- . supplement and encourage private sector capital investment by providing loans, loan guarantees and other financial assistance for domestic energy projects across a broad spectrum of energy supply, conservation and energy related environmental projects,
- . expedite the regulatory process at the Federal level on projects deemed "critical" to assure domestic supplies.

A. Scope of EIA Investments

Specific types of projects which EIA could provide financial and regulatory assistance would be limited to commercialization of:

- Emerging energy technologies such as synthetic fuels, not yet in widespread domestic commercial operation.
- Technologies essential to production of nuclear power.
- Conventional or emerging technologies for production and transmission of electric power generated by sources other than oil and gas.
- Conventional energy technologies for the production or transportation of energy that are of such size or scope that they would not otherwise be financed by the private sector.

The projects that could be supported by EIA cover the full spectrum of energy, excluding research. These would include such areas as synthetic fuel commercialization (e.g., coal gasification, liquefaction, and production of oil from shale); other emerging technologies (e.g., solar energy or geothermal energy); and conventional technologies (e.g., coal, nuclear, and geothermal power plants). EIA could support projects that increase efficiency of energy use, as well as those of unusual size such as energy parks or major new pipelines for transportation of oil and gas.

B. Financial Structure

EIA will have authorized capital stock of \$25 billion and the authority to issue and to have outstanding at any one time notes, debentures, bonds, or other obligations of \$75 billion.

The corporation's issuance of its securities, as well as loan guarantees or other similar obligations, will be subject to approval by the Secretary of the Treasury as to the timing, method, source, interest rate, and other terms and conditions. At the discretion of the Secretary of the Treasury, EIA's obligations may be purchased directly or channeled through the Federal Financing Bank.

Financial commitments by EIA will not be for the purpose of acquiring a permanent controlling or operating interest in commercial production, transportation, or distribution of energy. Federal ownership or operation could occur only temporarily, in the event of default, or in providing financial assistance involving construction, testing, demonstration of a facility provided to a business on a "turnkey" basis, or in providing lease-purchase and sale-leasebacks. No permanent ownership, control, and operation of energy production facilities by the EIA will be authorized.

EIA financing will provide for the maximum participation of private financial institutions in projects. To the extent practicable, financial assistance will be in the form of loans and loan guarantees. Such assistance will be provided in ways that will not give recipients undue advantage over competing firms. Minimum interest rate requirements and other terms to be required by EIA before financing is executed.

EIA in the President's 1977 Budget

Because the EIA is to be self-liquidating and will have its investments repaid, its outlays will not be included in the budget of the United States. However, the Authority's losses or gains from its operations are included in the budget. In 1977--its first year of operation--it is estimated that the corporation's net losses will be about \$42 million.

The off-budget activities of the Authority in 1977 include an initial \$8 billion appropriation request for purchase of EIA capital stock and a one-time request for congressional authorization of \$75 billion in borrowing authority. During its first year of operation, it is anticipated that EIA will use up to \$10 billion of its financial authority. Off-budget outlays of the corporation in 1977 are estimated at \$650 million.

TAB C
Synfuels

1977 Budget

ERDA SYNTHETIC FUELS COMMERCIAL DEMONSTRATION PROGRAM
(\$ millions)

	<u>1976*</u>		<u>1977</u>	
	<u>Budget Authority</u>	<u>Outlays</u>	<u>Budget Authority</u>	<u>Outlays</u>
Loan Guarantee Fund	500	--	--	--
Administrative Expenses	<u>3</u>	<u>3</u>	<u>--</u>	<u>--</u>
Total	503	3	--	--

*The loan guarantee fund will cover \$2 billion in guarantees to initiate the program in 1976. The guarantee program will be transferred to the Energy Independence Authority upon its enactment in 1977.

Need for the Program

- U.S. dependence on foreign sources of oil and gas continues to grow with domestic production having fallen in the last several years.
- Even using advanced oil and gas recovery techniques, extensive production from the Outer Continental Shelf and Alaska, improved energy conservation, expansion of nuclear power facilities, and greater direct burning of coal, oil imports will continue to rise substantially if synthetic fuel production capacity is not available by the middle 1990's. Synthetic gas and liquid fuels can be obtained from the processing of coal, oil shale, biological waste, and other domestic resources not now being fully utilized.
- Initiating a synthetic fuels industry capable of providing about 5 million barrels/day of production capacity (i.e., about 100 major plants) by 1995 will require early resolution of a number of uncertainties related to regulation, environment, financing, labor and transportation. The lead time to initiate such an industry requires the construction and operation, over the next 5 to 10 years, of a variety of synthetic fuel plants to obtain the needed data and information.

The President's Proposal

- In his 1975 State-of-the-Union message, the President proposed the first important step toward the development of a synthetic fuels industry--a Federally sponsored Synthetic Fuels Commercial Demonstration Program. An extensive interagency study concluded that the synthetic fuels program should proceed in two phases, the first of which would involve the construction and operation of about 12-15 commercial-size plants and would result in total synthetic oil and gas production equivalent to 350,000 barrels per day of oil. The second phase might begin in 1978 or 1979 and raise production to 1 million barrels per day, but this depends on the results of R&D efforts, additional information on environmental impacts, and the private sector's response to the first phase.
- Although a \$6 billion program of loan guarantees to implement aspects of the President's proposal was passed by the Senate during the last session, it failed to pass the House of Representatives.

Support for the Program in the 1977 Budget

- The President is again supporting immediate creation, in 1976, of a synthetic fuels commercial demonstration program in the Energy Research and Development Administration. This program will be carried forward in ERDA until such time as the Energy Independence Authority is enacted and the program can be incorporated under that Authority.
 - As a first step in implementing this program a supplemental 1976 request will provide for \$503 million in budget authority to cover \$2 billion in loan guarantees for the remainder of 1976.
 - Additional budget authority to cover the full \$6 billion loan guarantee program for Synthetic Fuels, which the Administration supported in 1975, is included in the 1977 Budget under the Energy Independence Authority.



TAB D
Nuclear Power

FY 1977 Budget (ERDA)
R&D to Improve Commercial Use of Nuclear Power

Summary Table

<u>Research and Development Programs</u>	<u>(Outlays \$ Millions)</u>		<u>% Change</u>
	<u>1976</u>	<u>1977</u>	<u>1976-1977</u>
Nuclear power plant safety*	60	89	49%
Safeguarding nuclear materials	15	27	80%
Nuclear fuel reuse	13	30	131%
Management of commercial wastes	<u>12</u>	<u>63</u>	<u>425%</u>
Total	100	209	109%

* Most of these funds are included in the budget of the Nuclear Regulatory Commission (NRC).

Need for the Program

- The U.S. needs more nuclear power
 - o Although domestic coal supplies are extensive and accessible, their use is severely limited by environmental constraints. Widespread use of coal without relaxing environmental standards will require new clean conversion technologies (e.g., gasification or liquefaction of coal) or those permitting direct use of coal (e.g., sulphur removal from exhaust gases.)
 - o Recovery of potentially significant solar and geothermal resources is currently limited by technological and economic uncertainties. Their economical use will require development of new or improved technologies.
 - o The U.S.'s most plentiful domestic resources are coal and nuclear. Neither one alone could be sufficiently developed to meet all our energy needs over the next few decades due to limitations on required transportation and other supporting facilities and equipment manufacturing capacity. Both coal and nuclear must be exploited to achieve energy independence from foreign suppliers.
 - o Furthermore, compared to coal-fired power plants, the price for electricity generated by nuclear power plants is significantly cheaper for the consumer in most parts of the country.

- But nuclear plants and their associated service facilities also have problems that must be addressed
 - ° Nuclear plants must be carefully designed, constructed, and operated so that none of the radioactive materials contained deep inside the plant can ever be released to the environment.
 - °° An independent Government agency (the Nuclear Regulatory Commission) regulates the safety of nuclear power plants at every stage.
 - °° A recent report by a group of safety experts has concluded that nuclear power plants are very safe (the chance of any member of the public being killed in a nuclear plant related accident is one in 5 billion which is slightly less likely than the chance of being struck by a meteor and over 2000 times less likely than being struck by lightning).
 - ° The nuclear materials that serve as fuel for the power plant must be protected against theft.
 - °° For most stages of a nuclear fuel's production and use cycle, the nuclear materials are in forms which would make it extremely difficult, if not impossible, for anyone to succeed in fabricating even a crude bomb.
 - ° Nuclear fuel discharged from power plants must be reused or recycled and radioactive waste material must be safely managed and disposed of.
 - °° In the process of operating and generating electric power, most of the uranium fuel in nuclear power plants becomes converted to either radioactive wastes or a material known as plutonium which can also be used as fuel for nuclear power plants.
 - °° In order for the U.S. to be able to take advantage of the benefits of nuclear power, industry and the Government must develop the technology to ensure (a) the safe long-term disposal of radioactive wastes and (b) the safe, environmentally-sound and economic reuse ("recycle") of fuel recovered from power plants.
 - °° After being used in the nuclear power plant for about one year, the spent fuel is removed and stored in large water basins. As presently planned, the spent fuel will be sent to a special facility (known as a "chemical reprocessing" plant) where it will be separated into three main components:

- Uranium which has not been consumed and which can be reused as fuel.
- Plutonium which can also be used as fuel.
- Radioactive wastes which must be converted into a solid form and sent to a long-term storage facility.

°° As presently planned, the recovered uranium and plutonium will be fabricated into fuel for use in power plants. This will result in a major (45%) increase in the nuclear fuel supplies of the U.S. and hold down the price of electricity for consumers.

Presidents Proposal and the FY 1977 Budget

Nuclear Power Plant Safety

- The Nuclear Regulatory Commission will expand its safety research program to assure the safety of commercial nuclear power plants even beyond the extremely safe levels achieved to date. This will be done by proceeding with all major safety experiments now underway, such as the loss of fluid (coolant) tests (LOFT).

Safeguarding Nuclear Materials

- The large increase requested for FY 1977 will be used to design and test overall systems and to improve methods of accounting for nuclear materials in order to improve current methods of protecting the public health and safety from possible misuse of nuclear materials such as plutonium or possible sabotage of nuclear facilities.

Waste Management

- Radioactive wastes will be converted into a solid form and stored in rock formations deep underground. In the FY 1977 budget, ERDA will greatly accelerate its waste management efforts by (a) conducting drilling at various locations to determine their suitability as storage sites and (b) intensifying research and development on a more stable material form for the wastes, on containers for the long-term storage of the wastes, and on the preparation of an overall assessment of the environmental impacts of disposing of these wastes.

Reuse of Nuclear Fuel

- Because of the potential economic benefits of recovery of uranium and plutonium, industry has started to build the required facilities. However, all of the Government's rules for operating these facilities and safeguarding the plutonium against theft has not yet been established. In addition, these facilities are very expensive to build and require the development of difficult

technology. Thus, industry now faces major regulatory, cost, and technical problems. In order to realize the national benefits to U.S. fuel supplies and electric power costs, in the FY 1977 budget the Government will increase its efforts toward solving key technical problems. In addition, the Government will ask industry to identify the specific assistance which may be required in order to complete these facilities.

FY 1977 Budget

Outer Continental Shelf Oil and Gas Leasing Program

Background

The major undiscovered petroleum deposits in the United States are believed to be on the Outer Continental Shelf (OCS).

The OCS is the sea-bottom from the seaward boundary of each State - usually three miles from shore - down to where the rocks of the continent merge with the rocks of the deep seabed.

OCS mineral resources are owned by the Federal Government and have been leased by sealed competitive bid to oil companies for exploration and development since 1954.

Since that time:

- more than 10 million acres have been leased;
- more than 17,000 oil and gas wells have been drilled;
- during the 1953-1972 period 43 major OCS accidents occurred, 20 of which spilled oil. However, since 1968 the accident frequency has declined because of more stringent regulation, and improved drilling technology. The Government is committed to doing all that can feasibly be done to reduce the environmental risks of OCS operation in order to avoid the greater environmental risks and other undesirable features of importing foreign oil by tankers.

Current Plans

In 1974, the President decided to accelerate development of the OCS as part of our effort to reduce U.S. dependence on foreign oil supplies.

The planning schedule for leasing in fiscal years 1976 through 1977 includes:

- 14 lease sales
- sales in "frontier" areas off Alaska and the Atlantic coast which have great petroleum promise but have never been explored by drilling.

- Environmental baseline and monitoring studies, geologic hazard studies, and all other environmental procedures necessary to assure that the environment is protected. These procedures include an Environmental Impact Statement with associated public participation for each planned sale.

None of these sales will be offered until all environmental procedures have been completed and the Secretary of the Interior has decided whether they can be leased, explored and developed with environmental safety.

Estimating Receipts

The Federal Government sells the rights to explore and produce OCS oil by a competitive bidding process, receiving a "bonus" which is the subject of the bid and paid in advance of exploration, plus a fixed royalty on each barrel of oil produced. These receipts go to the Treasury and the estimated amount is included in the budget.

OCS budget receipts are estimated in the following way:

- The Geological Survey estimates the potential reserves for each sale based on acreages to be offered and rough estimates of the volume of petroleum-favorable rocks likely to be under that size acreage in the sale region.
- Economists in the Department of the Interior analyze the likely costs of producing those reserves given water depths, distances to shore, and other factors.
- Market prices of the petroleum and the prices which bidders are likely to offer, given costs and market prices, are estimated.
- An analysis is done of the probabilities that scheduled sales will not be held in the fiscal year because of litigation, decisions to delay, or decisions not to lease specific areas.

Receipt estimation is very difficult and uncertain because:

- In areas not drilled before, no experience of the geology or of potential bids is available.

- Company bids are based upon detailed evaluations of the geology and economics of individual tracts. While the Government has all of the company data at the time of the sale and uses it to accept or reject bids, budget estimates must be made as much as 20 months before the sale when detailed tract-by-tract geologic and economic data are not available. In fact, specific tracts to be leased have not yet been selected at that time.
- Some sales are quite controversial and become delayed by litigation.
- Some sales turn out to involve difficult environmental questions and are delayed by the Government to resolve those questions or to allow further comments by State governments or other interested parties.
- The Government may decide to not offer a scheduled sale at all for environmental reasons.
- The value placed on a given tract by the oil companies may vary widely - with the winning bid on some tracts as much as 4 or 5 times as high as the second highest bid.

The following shows how recent budget estimates of OCS receipts have compared with actual receipts:

<u>Fiscal Year</u>	<u>Original Budget Estimate (\$ M)</u>	<u>Actual Receipts (\$ M)</u>
1970	950	187
1971	970	1,051
1972	190	279
1973	3,080	3,956
1974	2,100	6,340
1975	5,000	2,428

In fiscal years 1976 through 1977, we estimate that OCS receipts will be:

	(\$ M)
FY 1976	3,000
Transition quarter	500
FY 1977	6,000

Unfortunately, estimates for those periods are subject to more than usual uncertainty because the majority of the scheduled sales are first sales in so-called "frontier" areas which have never been drilled before.