

*Security -
Fissionable
Weapons
Production
Costs*

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*Semi-Annual Report
to the President
U.S.C.*

Summary of Semiannual Status Report to the President
as of December 31, 1953 - *filed in date order*

"The Atomic Energy Program"

Part I - Raw Materials

Commission feels increasingly confident that its annual procurement goal of of U₃O₈ can be reached by 1960.

Expected total receipts in 1955 will be more than double the calendar year 1953 receipts of of U₃O₈. In 1953, United States production was 32 percent of the total, Canadian production was 10 percent, and overseas sources provided 58 percent.

Outlook for U.S. production has improved because of ore discoveries in the West. Compared with of U₃O₈ produced in 1953, United States production is expected to reach in 1955 and in 1958.

Canadian production is expected to grow from in 1953 to in 1957.

Overseas sources: Congo shipments are expected to continue at of U₃O₈ per year. Deliveries from South Africa, which were in 1953, are now expected to reach about annually. Australia will contribute up to and Portugal .

Part II - Fissionable Materials

New capacity for thermonuclear materials, such as tritium, lithium 6, deuterium gas, and boron 10, is required to meet recently established weapon requirements. (by JCS)

Plutonium production (separation) for 1953 was 18 percent greater than the quantity specified in the President's directive. The production rate in the July-December period was 46 percent higher than the average rate for calendar year 1952. Additional reactor

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Carl Wilson 5/23/84
REVIEWED BY *Diaz 8/17/85*

*1953-1953
production
times
calendar*

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BY AUTHORITY OF
BY *Carroll* - DATE *indicated*

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capacity is now becoming available. The first Savannah River reactor started up December 28, the second on February 20; all five are to be in operation by next February. Two jumbo-size reactors at Hanford will be started up within the next year.

Uranium 235 production was 27 percent more than the quantity indicated in the President's directive. The average rate of production in the July-December period was about double the average rate for calendar year 1952. The diffusion plants still under construction at Oak Ridge, Paducah, and Portsmouth are all to be in full operation by July 1956.

(Sharply increased tritium production now planned will be at the expense of both plutonium and uranium 235 production otherwise available for fission weapons.)

Part III - Weapons

The immediate objective of the weapons program is to achieve emergency capability to deliver thermonuclear weapons. A longer range objective is improved thermonuclear designs.

At operation CASTLE, seven thermonuclear shots are being fired,

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Weapon production schedules for the next 2 or 3 years emphasize fabrication of thermonuclear weapons.

Fission weapon development continues on atomic warhead installations for various guided missiles, and two types have begun to enter stockpile. Work on other improved-type fission weapons has been extended to two artillery-fired projectiles, one for the Navy and one for the Army.

The number of nuclear assemblies in stockpile showed a net growth of [REDACTED] in 1953.

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Part IV - Reactor Development

Proposed legislation to encourage industrial participation in nuclear power development was redrafted and submitted to the Bureau of the Budget in November, 1953. (More recently, a draft bill was transmitted to the Joint Committee on Atomic Energy at the time the President's message of February 17, 1954, was submitted to the Congress.)

Additional study agreements with industry groups were approved, bringing to eight (and more recently to twelve) the number of groups of industrial and utility concerns engaged in surveys of reactor technology.

Pressurized Water Reactor. Following cancellation of the large-snip reactor project, pursuant to the Council's decision of last May, the Commission determined that an early demonstration of a nuclear power plant for civilian electric power should be undertaken. The resulting Pressurized Water Reactor project, known as the PWR, is being developed by Westinghouse, which will also fabricate the reactor. Present plans are to complete its construction in 1957, at a site still to be selected.

The Commission is studying proposals from industry under which the steam turbine and electric generator facilities might be financed and operated by private enterprise.

Development of other power reactor designs, such as the fast-breeder, homogeneous, and sodium-graphite types, is proceeding more cautiously and with minimum capital costs.

Submarine reactors. The STR prototype at Idaho has operated well. The SIR prototype at West Milton, N. Y., is to be completed in September, 1954. The NAUTILUS was launched January 21, 1954. The SEAWOLF is to be completed in 1955. Development work has been authorized for a Submarine Advanced Reactor (SAR).

Aircraft reactor emphasis is now largely concentrated on power plant development. Efforts are being restricted to two types of systems: a direct-cycle, air-cooled reactor and a circulating-fuel reactor.

Part V - Unit Costs and Expenditures

Since fiscal year 1951, the unit cost of plutonium has been lowered 42 percent and the unit cost of uranium 235 has been lowered 45 percent. These reductions have been accomplished despite

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the fact that the average unit cost of uranium concentrates has more than doubled in the same period.

Expenditure Summary

	<u>FY 1953 Actual</u>	<u>FY 1954 Estimated</u>	<u>FY 1955 Estimated</u>
		(In Millions)	
Total AEC Expenditures			
Reported February 1, 1954	\$1,790.9	\$2,200.0	\$2,425.0
Revised Estimates	1,790.9	2,125.0	2,575.0

Progress Reports and Statistics Branch March 3, 1954

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