

# The USS Seawolf Sodium-Cooled Reactor Submarine



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President**

**American Nuclear Society**

**Washington DC ANS Local Section  
May 17, 2012**





**Hyman Rickover**



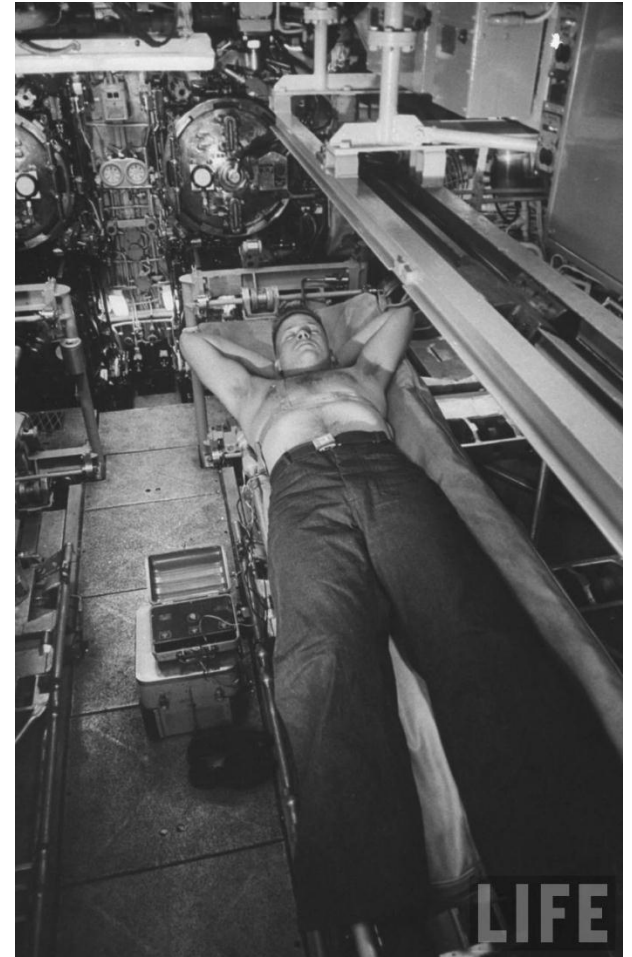
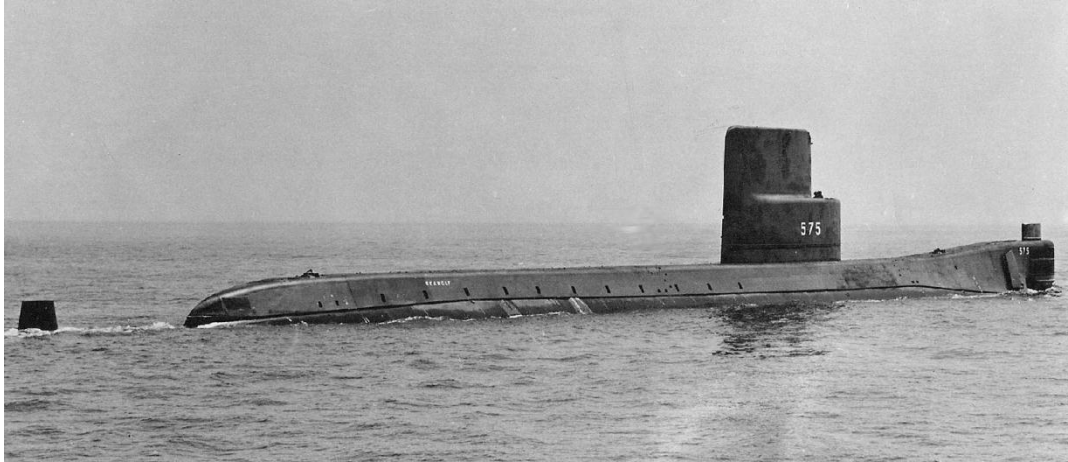
**Alvin Weinberg**





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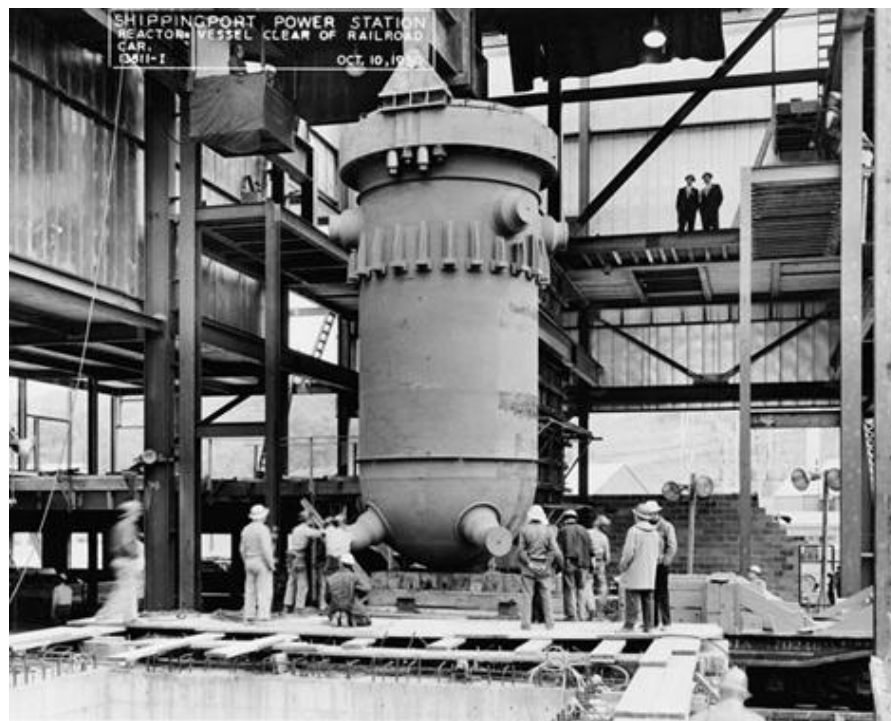




**NUCLEAR NAVY** — Uncle Sam's first atomic submarines are shown at opposite moorings. The world's first sub operating on nuclear energy is the USS Nautilus at right and the second atomic craft is the USS Seawolf in the foreground, both using equipment built at Phillipsburg. More A-powered subs will join them soon as fore-runners of what eventually will be a nuclear navy.

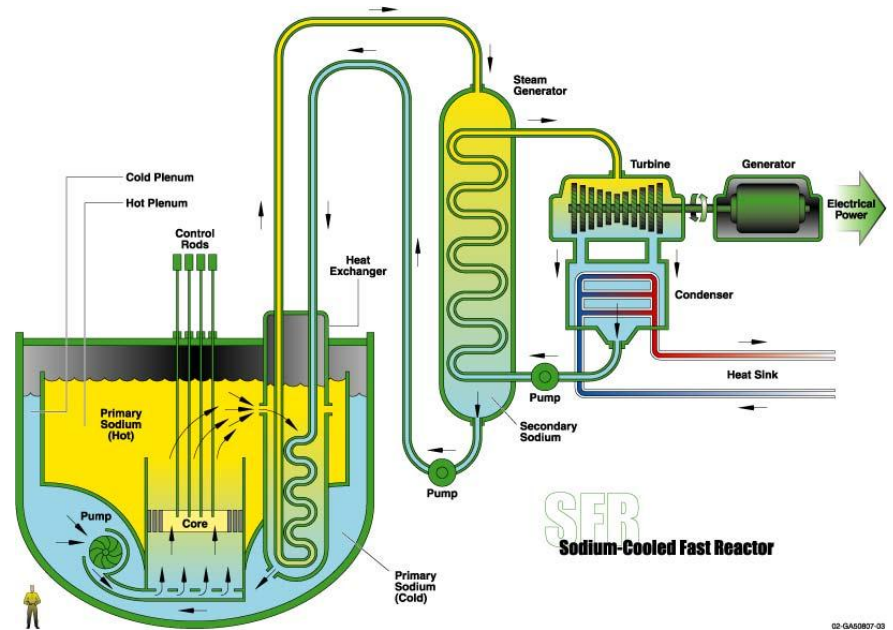
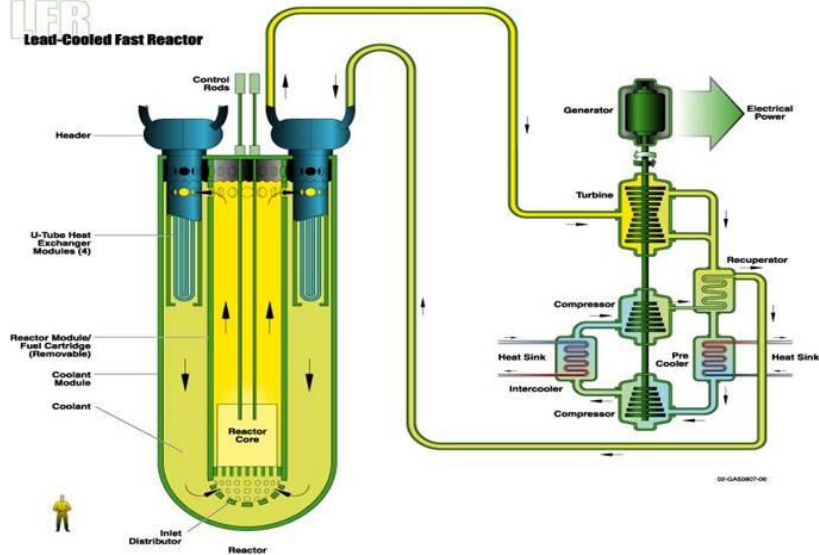
—Navy photo





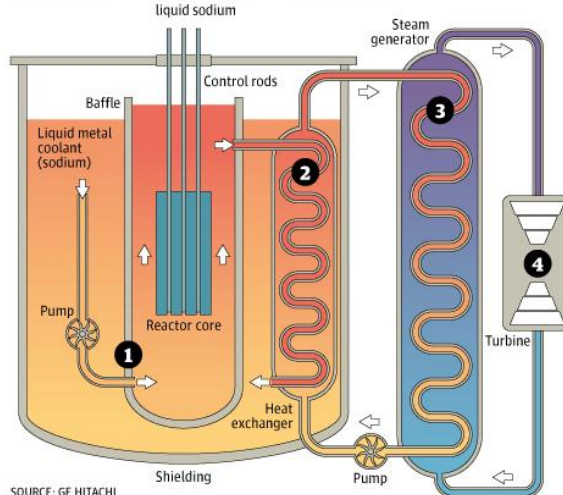


## LFBR Lead-Cooled Fast Reactor

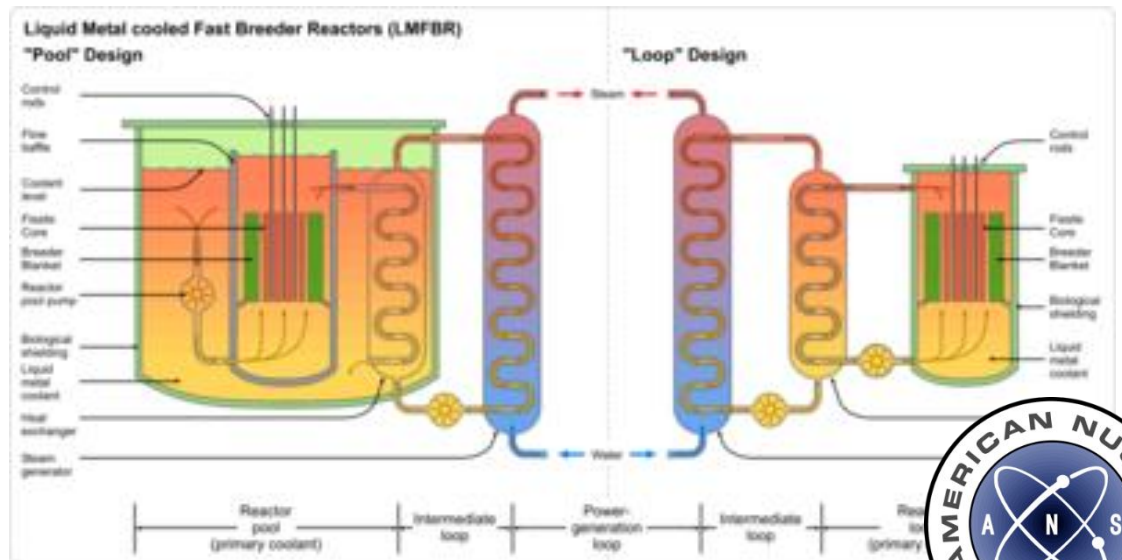


## Inside a fast reactor

- 1 Liquid sodium pumped through baffle to be heated by reactor core
- 2 Heated sodium passes through a heat exchanger, containing more liquid sodium
- 3 Liquid sodium from heat exchanger heats water in a steam generator
- 4 Steam drives a turbine to generate electricity



SOURCE: GE HITACHI  
Diagram showing how a fast reactor would work.



# LMR Liquid-Metal Reactor

SFR

Sodium Fast Reactor

LFR

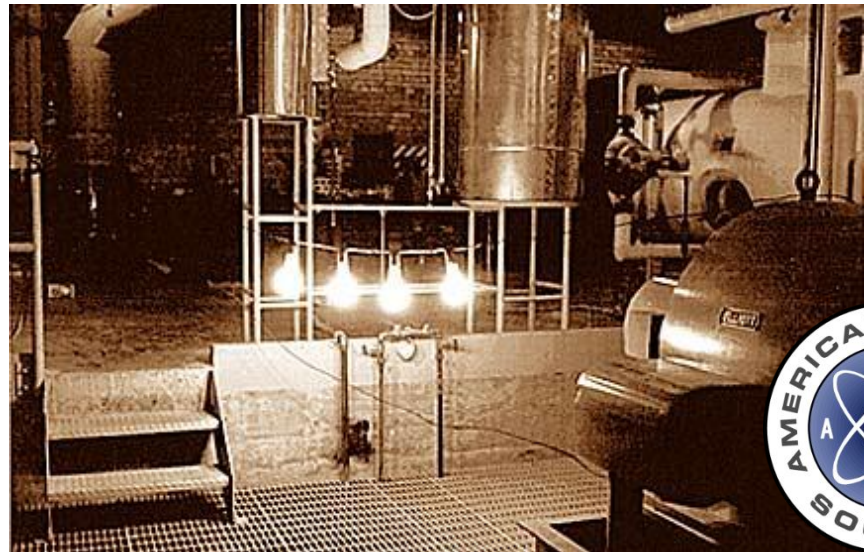
Lead Fast Reactor

LBFR

Lead-Bismuth Fast Reactor

FTR

ALMR at CRBR









**Knolls Atomic Power Laboratory**



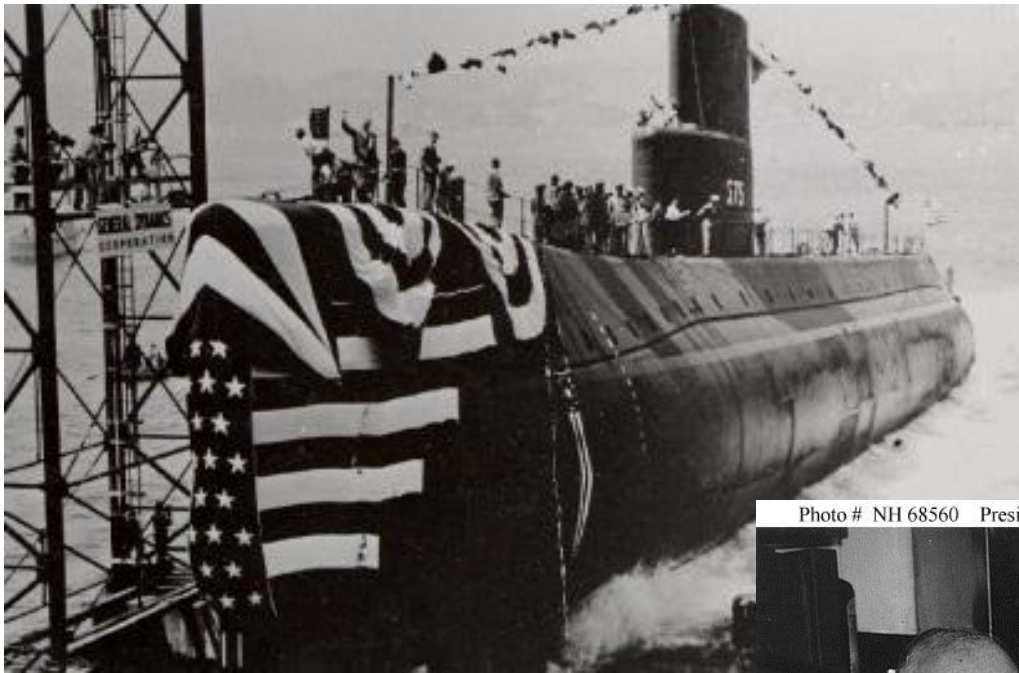


Photo # NH 68560 President Eisenhower dines with crewmen on board USS Seawolf, September 1957





## ELECTROMAGNETIC PUMPS FOR PRIMARY COOLANT SYSTEM

U.S.S. Seawolf  
SSN 575

**GENERAL ELECTRIC**  
SCHENECTADY, N. Y.

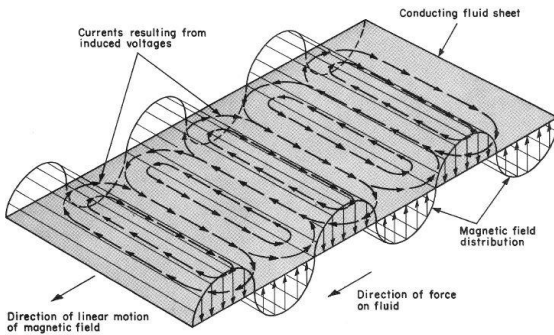


Fig. 12. Schematic diagram of the principles of operation of a linear induction electromagnetic pump

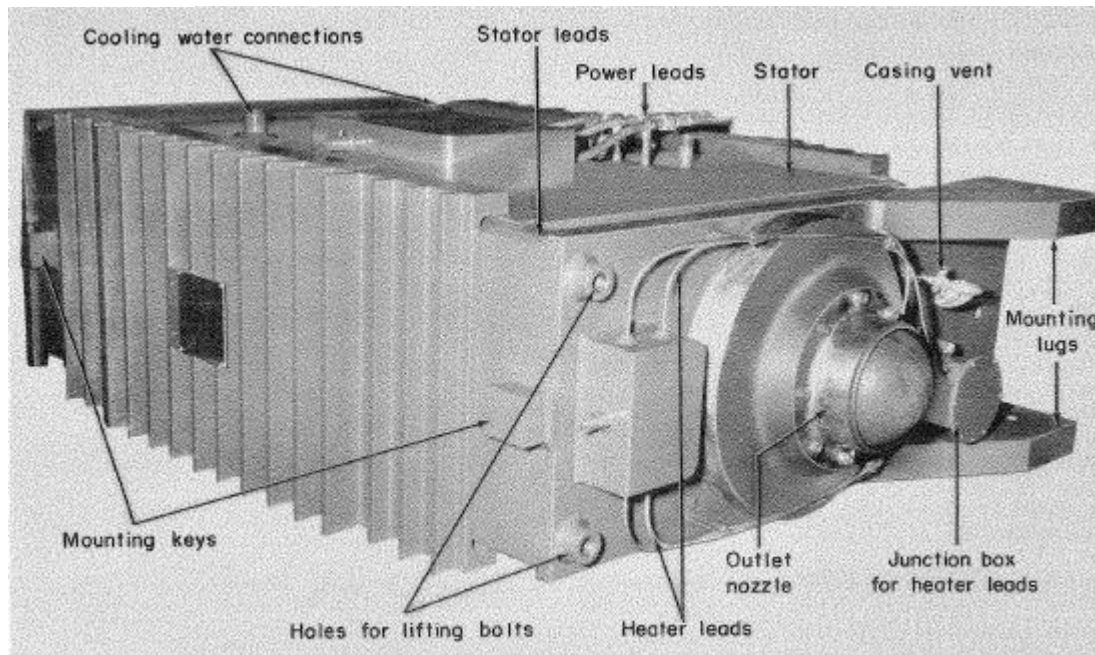
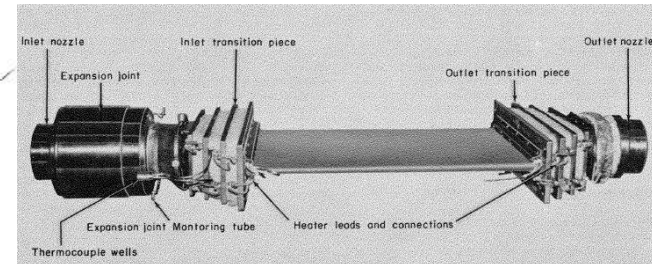
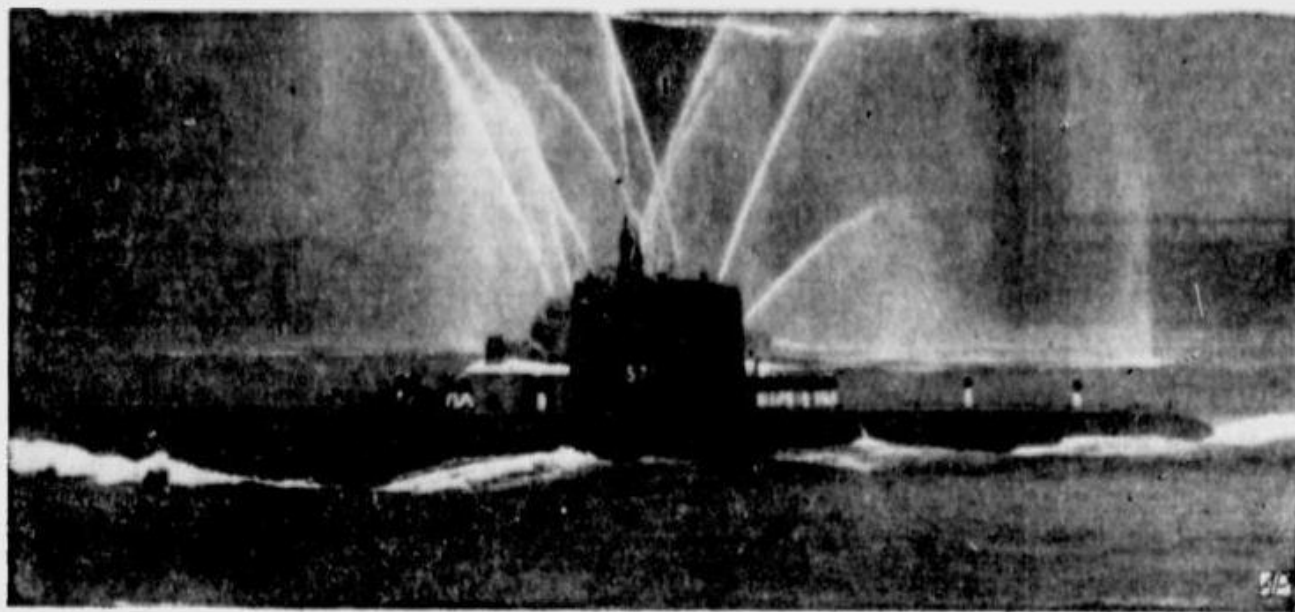


Fig. 5. Pump assembly, view from outlet end





WELCOME HOME — Band-carrying boat, horns, sirens and fire house spouting accompanied atomic sub-

marine Seawolf into New London, Conn. harbor Monday. Sub had been submerged 60 full days for new record.

### 'SEAWOLF' GETS ROUSING WELCOME

# A-Sub Surfaces After 60 Days Underwater

NEW LONDON, Conn (AP) — The atomic submarine Seawolf surfaced Monday after a record two months beneath the sea and came home in glory. edge of the deep Atlantic, about 40 miles from this, her home port. Then she moved in on the surface and tied up alongside her pier.

The Nautilus, America's first atomic submarine, was among the first to congratulate the Seawolf on her record of remaining submerged 60 full days.

The Seawolf broke water on the

Military, state and other high officials awaited her arrival. But the crew of the Seawolf had eyes only for wives, many of whom lifted children on high for a first glimpse of their fathers in two months.

Among those on hand to greet

Capt. Richard B. Laning and his Seawolf crew after their historic trip was Rear Adm. H. G. Rickover, "father of the atomic submarine."

At a news conference, Laning estimated the time which an atomic sub can remain under the surface at half again or once again as long as the 60-day-mark set by the Seawolf.



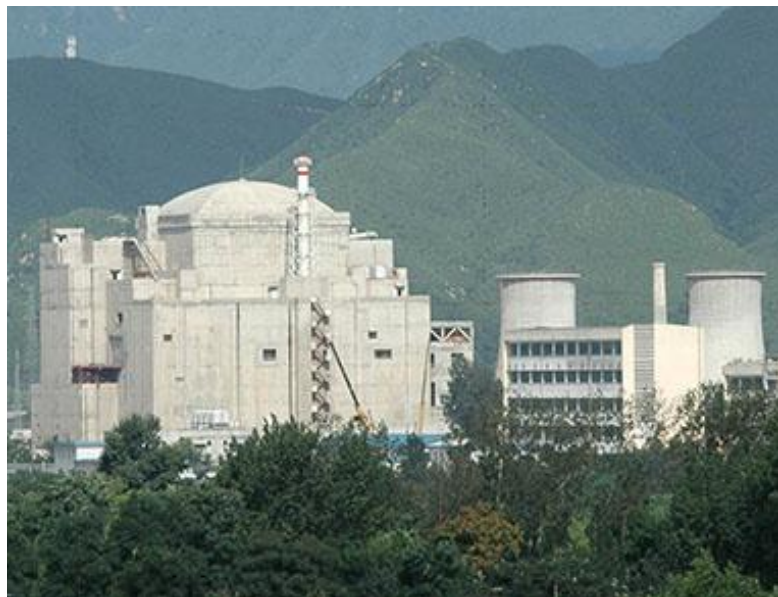




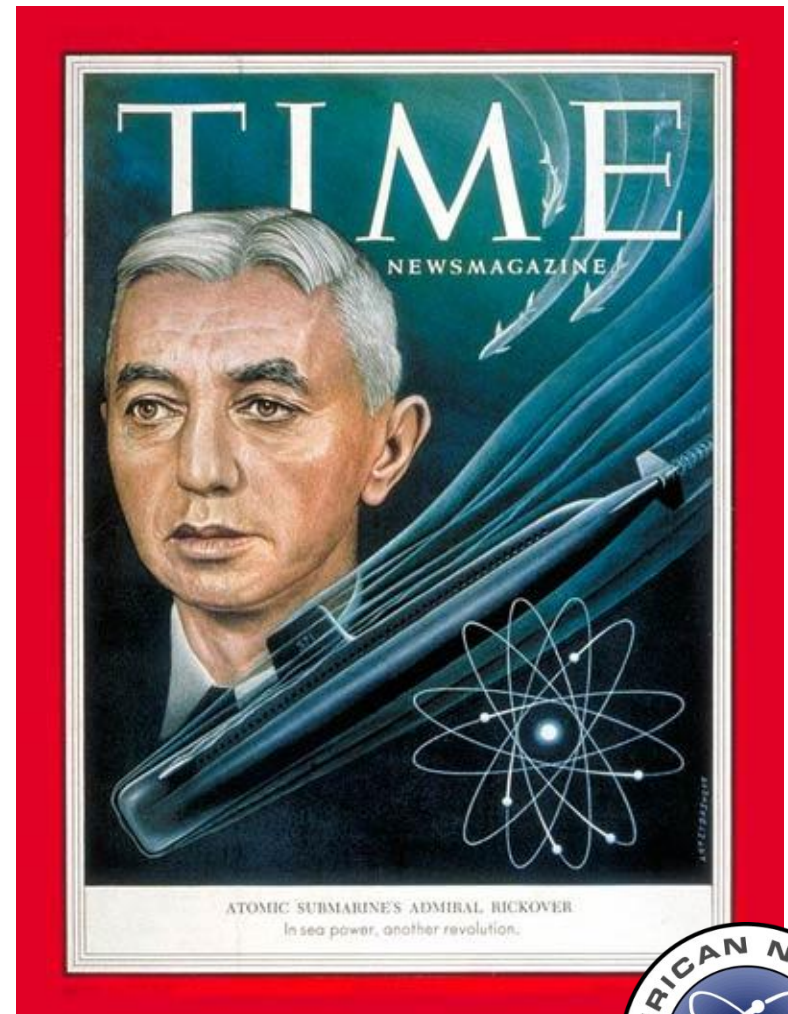
**Soviet Alfa Class  
Pb-Bi Cooled Reactor Submarine**











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