

# Overview of Russian Nuclear Submarine Dismantlement

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# International Context

- Overall, over 500 nuclear-powered vessels constructed (by 1995)
- All face similar dismantlement problems (nuclear wastes, spent fuel, reactor shutdown, and storage; plus weapons)
- U.S. (40%) and Russia (51%) together produced 91% of nuclear vessels--thus, they have bulk of dismantlement work



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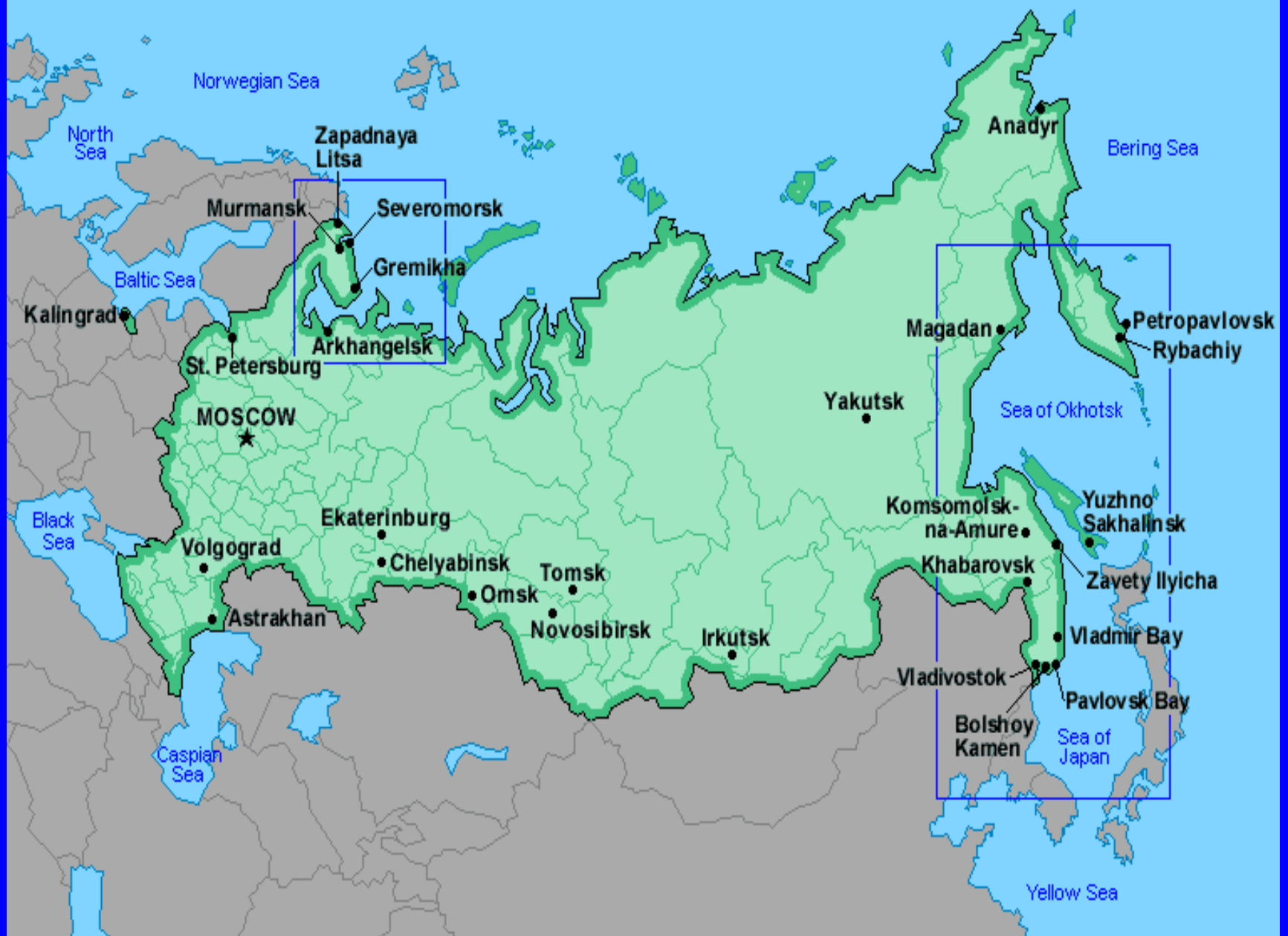
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# Russian Nuclear Submarines

- Submarines constitute 94% of world nuclear vessels (consisting of attack subs., cruise missile subs., and ballistic missile subs.)
- Russia produced by far the most (52% of all nuclear submarines), total: 244
- Over 170 are now decommissioned, but 110-115 still have operating nuclear reactors on board

# Proliferation Problems

- Nuclear weapons and missile technology
- Fresh and spent submarine fuel (HEU and Pu content)--smuggling threat
- Terrorist threat (reactors, spent fuel)
- Environmental threats of decommissioned (but not dismantled) boats
- Border regions and “rogue” states



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# Russian Dismantlement Facilities

- Nerpa Shipyard (Murmansk)
- Zvezdochka Shipyard (Severodvinsk)
- Zvezda Shipyard (Bolshoi Kamen)
- Sevmash in Severodvinsk will be involved in *Typhoon* dismantlement
- Current dismantlement rate only 3-6 total per year

Photo Credit: Bellona Foundation, Norway



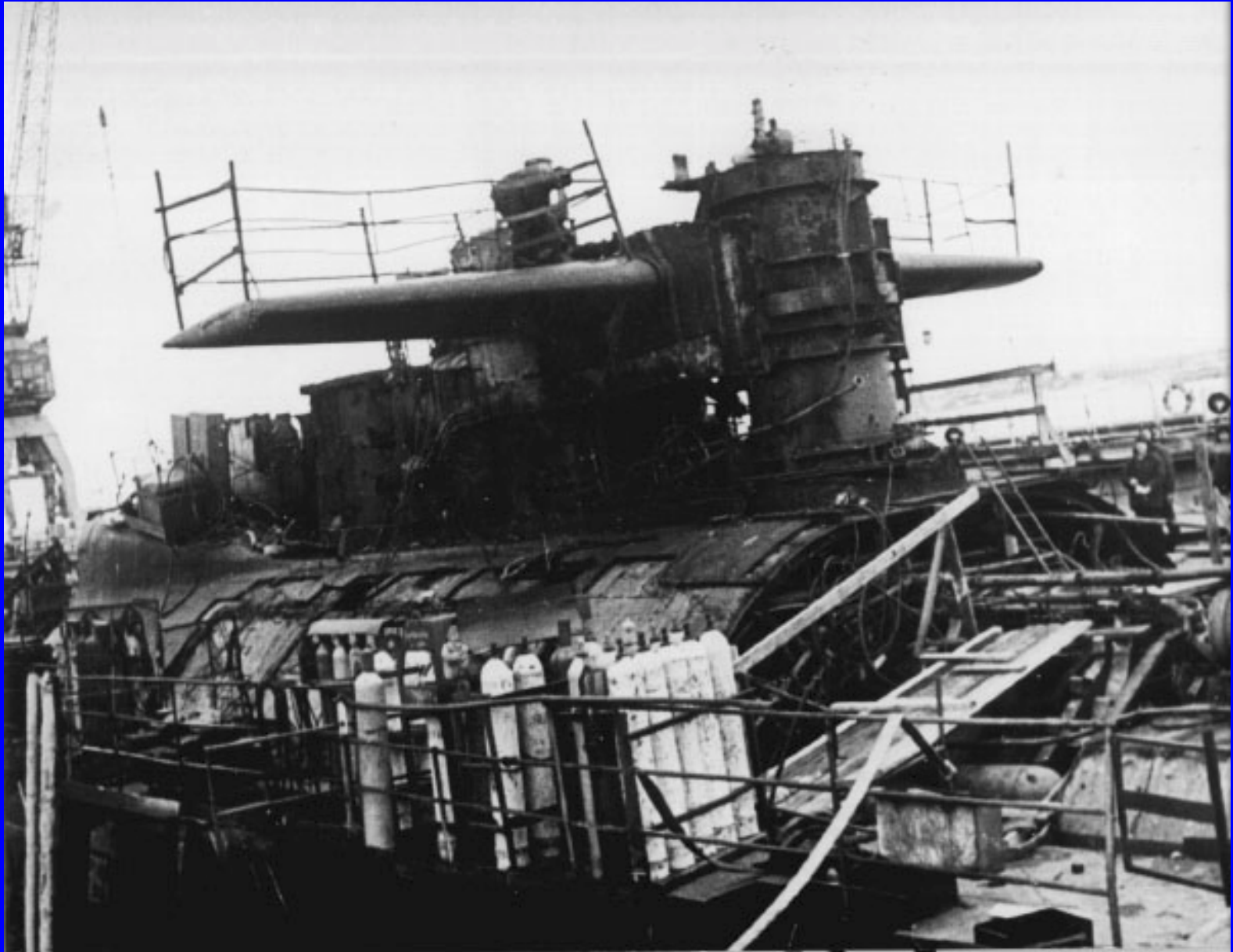
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# Dismantlement Process

- Unload missiles and warheads
- Shut down reactors and remove spent fuel
- Shut down all other systems
- Cut up and recycle all usable metals and materials
- Long-term storage of reactor compartments
- Cost: U.S. (approx. \$25 million per sub.)



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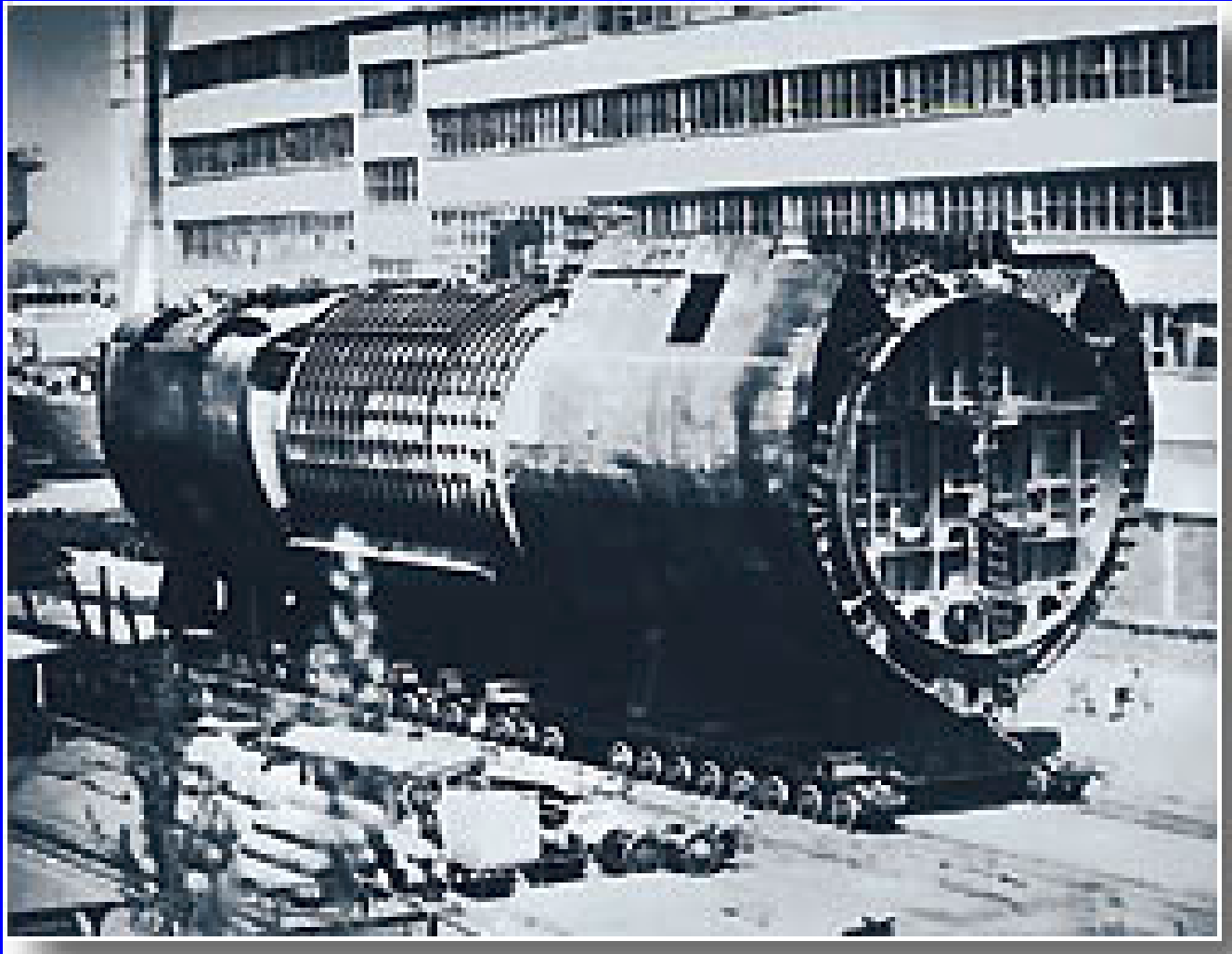
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# Roots of the Russian Submarine Problem

- No pre-planning for dismantlement until after 1991 (dumping legacy)(can't stop a train on a dime)
- Timing of the Russian financial crisis
- Russian military crisis and accelerated decommissioning
- Bottlenecks: liquid waste filtration, spent fuel storage, and dismantlement rates

# Current Funding Problems

- \$2.2 billion is needed per year (including fuel cycle activities, waste storage, transportation (Minatom figures))
- Only \$500 million received from Russian government
- U.S. and other foreign assistance programs providing \$50-60 million in 1999



# Serious Problems in Current Russian Dismantlement Work

- No Russian plan for complete cycle
- Not enough storage facilities for spent fuel or liquid waste
- Absence of plan for reactor compartments
- Transportation problems
- Lack of salaries, power, and resources at Russian shipyards
- Poor coordination of foreign aid efforts



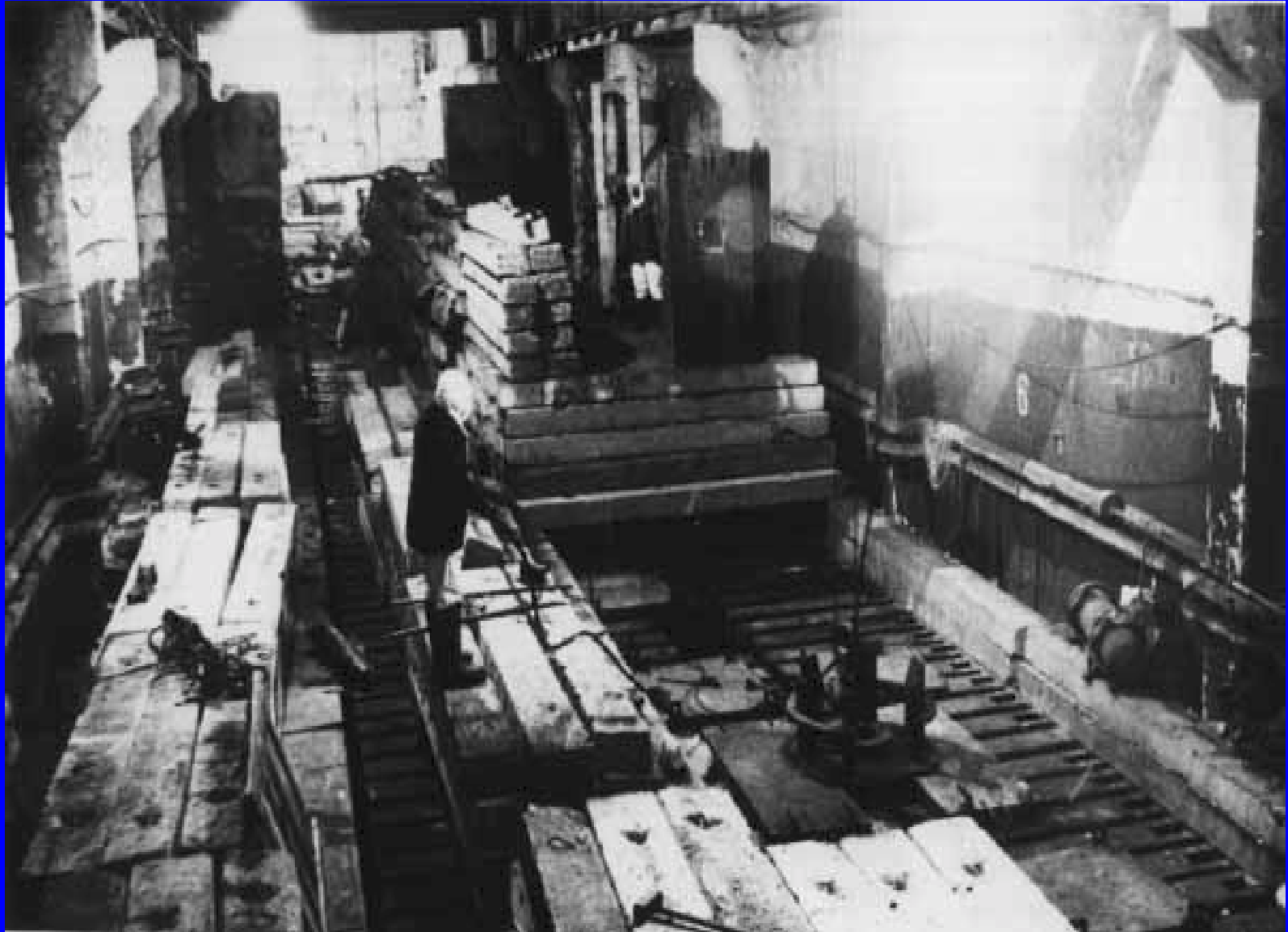
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# Foreign Assistance (Mainly U.S.)

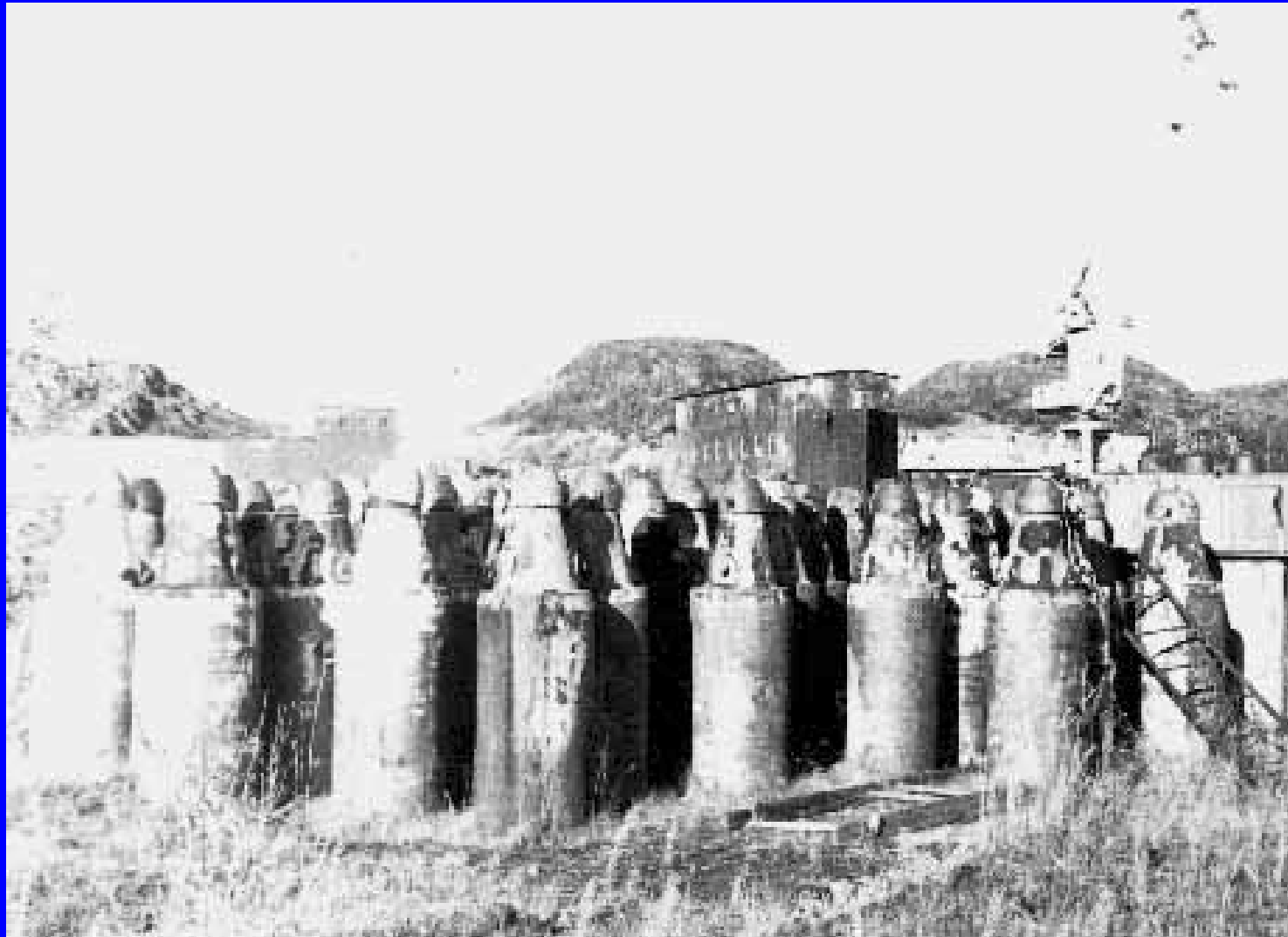
- U.S. Cooperative Threat Reduction Program
- START I and dismantlement equipment only (1991-96)
- Direct contracts with shipyards (1997-present); but for 30 SSBNs only
- Other assistance: Norway, EU/TACIS, Arctic Council, and Japan

# Recent Developments

- U.S. consideration of SSN dismantlement; spent fuel problem
- Greater interest by United Kingdom, Japan
- New Minatom responsibilities since 1998

# Conclusion

- Problem cannot be solved overnight
- New integrated system must be created
- Long-term storage for reactor cores and spent fuel needed
- SSBN dismantlement is being funded by U.S.
- SSN dismantlement is a bigger task, but plans are in the works



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