Since World War II, there has been an average of one major naval accident every two weeks. With some 15,000 nuclear weapons and 550 nuclear reactors at sea, the radioactive damage from these accidents is mounting.

On April 7, 1989, a fire raged out of control aboard a Soviet *Mike* class submarine, forcing it to surface 150 miles southwest of Bear Island in the Norwegian Sea. Unable to put out the fire, the boat sank to the ocean floor, some 1800 meters below. Twenty-seven crew members survived. Forty-two did not.

On board when it sank were two nuclear torpedoes and two nuclear reactors. Although the Soviet Union later said the reactors had been "shut down" before the submarine was scuttled, the impact with the ocean floor and the pressure of the deep water may have done considerable damage to the reactors' containment structures and the nuclear warheads.

The reactors alone contained 10-20 million curies of radioactive material. Much of this material consists of longer-lived radionuclides that will remain highly toxic for thousands of years—certainly outlasting the battered containment structure.

This tragic accident occurred in a major fishing ground for cod, herring, and shrimp. Strong ocean currents in the Norwegian Sea could also bring any radioactive releases from the ocean floor to adjacent fishing areas.

Dramatic as it was, this accident is only one of almost 1300 major naval accidents recorded since 1945, according to a study published in June 1989 by Greenpeace and the Institute for Policy Studies. The study documents naval collisions, fires, groundings and explosions killing a total of almost 3000 people. Some 365 of these accidents have involved submarines.

From these accidents—a quarter of which had never been made public—48 nuclear warheads and 9 nuclear reactors have been left on the ocean floor.

When these accidents occur at sea, they threaten the marine environment. When they happen in crowded ports, they can threaten an entire city. Studies of the potential impact of a nuclear accident on different port cities, based on US government figures, show casualties ranging from 2,000 in San Francisco to 11,000 in Sydney to 30,000 in New York City (see sidebar page 11).

The *USS Belknap* before and after a fire in November 1975 off the Italian coast. The ship's

US and Soviet Naval Nuclear Accidents: Abridged Chronology

April 10 1963: *The* USS Thresher's *nuclear reactor shuts down while the submarine is on sea trials off the New England coast. The sub plunges to the sea floor, imploding and killing all 129 hands. The reactor's remains lie on the ocean bottom. The US Navy will neither confirm nor deny the presence of nuclear weapons aboard the submarine.*

December 5 1965: *An A-4E aircraft loaded with a B43 nuclear weapon rolls off the* USS Ticonderoga *while the ship is en route from Vietnam to Japan. The plane, pilot, and weapon sink to 2700 fathoms and are never recovered. The Pentagon later claims the accident took place "more than 500 miles from land," but Navy documents released by Greenpeace and IPS reveal the ship was about 70 miles east of Japan.*

1967: *A core meltdown and major radiation leak aboard the Soviet ice-breaker* Lenin *is believed to kill up to 30 people, and renders the ship too radioactive to use for over three years.*

May 27 1968: *The nuclear-propelled submarine* USS Scorpion *sinks about 400 miles southwest of the Azores, killing all 99 men on board. Pentagon information suggests the submarine was carrying nuclear weapons at the time of the disaster, although the US Navy neither confirms nor denies their presence.*

April 12 1970: *A Soviet nuclear-powered* November *class submarine sinks approximately 300 miles northwest of Spain. The accident is thought to be related to a problem in the nuclear propulsion system.*

May 25 1975: *A story in the New York Times details a secret US Navy intelligence operation named "Holystone," in*

A full evaluation of the environmental damage already done by nuclear accidents at sea is difficult to undertake, since little information is usually released by the navies. Naval secrecy, normally invoked to protect defense information, has been repeatedly used to cover up accidents, blunders, and possible environmental damage.

For example, on April 21, 1973, the nuclear-powered attack submarine *USS Guardfish* lost its primary coolant—the liquid that prevents its nuclear reactors from overheating and melting down—while submerged about 370 miles south southwest of Puget Sound, Washington. The submarine surfaced and managed to repair the damage, but not before four crew members were sent to a naval hospital for radioactive monitoring. To cover up the accident, the deck log and command history of the ship were falsified.

This undisclosed accident, revealed by Greenpeace, contradicts the US Navy's assertion that it has never had a nuclear propulsion accident.

"It is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment"
—article 35, 1977 Protocol to the 1949 Geneva Conventions

The London Dumping Convention has declared a moratorium on the ocean dumping of radioactive waste. But the Convention has no jurisdiction over naval matters. Thus the nuclear navies, through both their routine operations and frequent mishaps, continue to discharge perilous quantities of low, medium, and high level radioactive materials in the seas.

Accidents will always happen. As long as naval vessels carry nuclear weapons and nuclear reactors, they will further contaminate the seas. Only by eliminating both nuclear weapons and nuclear propulsion can the oceans be protected.

nuclear weapons, stored in the forward missile magazine (circle), barely escaped damage.

which nuclear-armed and nuclear-powered US submarines were sent into Soviet territorial waters. Several accidents resulted from these missions, including the damaging of a US submarine that surfaced under a Soviet ship.
November 22 1975: *The* USS Belknap *and the* USS John F. Kennedy *collide at night about 70 miles east of Sicily, setting off fires on the Belknap that burn the ship to the water line. An early Navy "Broken Arrow" bulletin warns of "a high probability that nuclear weapons on the* USS Belknap *were involved in fire and explosions," although later reports assure that "no radiation hazard exists." The US Navy never acknowledges that the ship carries nuclear weapons.*
June 1983: *A Soviet* Charlie *class nuclear-powered submarine sinks east of Petropavlovsk in the Pacific. US intelligence reports most or all of the 90 person crew lost. The submarine is raised by Soviet vessels in August 1983.*
October 6 1986: *A Soviet* Yankee I *class nuclear-powered submarine sinks in the Atlantic 600 miles east of Bermuda, after an explosion in the liquid propellent of one of the nuclear missiles. Two nuclear reactors and 32 nuclear weapons go down with the sub in 18,000 feet of water.*
April 7 1989: *A fire breaks out aboard a Soviet* Mike *class nuclear submarine, in the Norwegian Sea about 150 miles south-southwest of Bear Island. Several hours later, the submarine sinks in 6000 feet of water. After several days, the Soviet government confirms that the submarine sank with two nuclear missiles on board, although little other information about the radioactive dangers is provided.*