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**SAFETY OF JAPANESE PLUTONIUM SHIPMENTS
IS NOT ASSURED, EXPERTS' REPORT REVEALS**

The shipping casks that are to be used for ocean voyages of highly toxic plutonium from Europe to Japan later this year are not certified to withstand fire, collision, and deep-immersion conditions that have occurred in serious accidents and attacks at sea, according to a new analysis by maritime safety experts.

"Marine accidents involve significant forces and outcomes that appear to exceed the limits of the standards to which the casks are designed," according to the report that was released today in Tokyo, London, and Washington by the Nuclear Control Institute and Greenpeace International. The report noted that the casks are only certified to meet safety standards established by the International Atomic Energy Agency (IAEA)---standards that fall below conditions experienced in actual severe accidents and attacks at sea.

The two organizations requested the report by an independent firm of maritime safety experts after learning that the U.S. government is not reviewing the safety specifications of the casks to be used by Japan to ship many tons of the extremely toxic plutonium from France and England. The shipments, due to start this summer or fall, will contain about one metric ton of plutonium each. Research has shown that a speck of plutonium the size of a pollen grain, if inhaled, can cause cancer.

An accident could affect people in Europe or Japan and, depending on the route to Japan, in South America, Africa, and the Pacific region, as well. Under the terms of arrangement with the United States, Japan must prepare a contingency plan that includes arrangements made in advance with nations en route for emergency port calls in the event of trouble at sea. Possible routes include around South America or Africa, or through the Panama Canal.

The U.S. government has responsibility as the supplier of nuclear fuel from which the plutonium is separated. Because separated plutonium is used to make nuclear weapons, the United States is reviewing a top secret security plan

now being developed by Japan and France for the first shipment to protect against hijackings by terrorists or rogue states. Each shipment will contain enough plutonium for at least 125 bombs.

However, a U.S. government official told representatives of the Nuclear Control Institute and Greenpeace International that the United States is not examining the safety of the shipments beyond accepting Japan's assertion that the shipping casks meet safety standards established by IAEA.

Yet, according to the experts' report, "The duration and intensity of shipboard fires, the enormity of the energy levels associated with ship collisions, and the extent of hydrostatic pressure of the ocean depths, to say nothing of the consequences of acts of terrorism, would appear to create exposure environments beyond the limits of the casks designed in accordance with IAEA standards."

The report was prepared by ECO Engineering Inc. of Annapolis, Maryland. The firm has been operated since 1973 by former U.S. government maritime transport experts and specializes in assessments and risk analyses of hazardous cargoes, including radioactive wastes, for government and commercial clients in the United States and other countries.

The report provides a review of information prepared by the U.S. government and by non-government organizations which pertain to implementation of a plan for ocean transport of Japanese plutonium recovered from nuclear fuel originally supplied by the United States. The fuel was used in Japanese reactors to produce electricity and then shipped by sea to French and British reprocessing plants. Reprocessing separates the used fuel into uranium, plutonium, and highly radioactive wastes. The separated plutonium is to be shipped back to Japan for reuse in power reactors under a revised U.S.-Japan agreement for nuclear cooperation, signed in 1987. The European reprocessors will return the nuclear wastes later to Japan.

The plan to ship the plutonium has run into many problems because of the difficulty in protecting this toxic and explosive nuclear material. The original plan to ship the plutonium by air was abandoned in 1987 after Japan failed to develop a crash-proof shipping cask. The ECO Engineering report was commissioned by NCI and Greenpeace to assess whether there is adequate information to support a Japanese claim that the sea shipment casks are safe.

According to the report, "Based upon the documentation furnished, there is no substantive evidence to support any claim relative to the integrity of a cask exposed to the consequences of a maximum credible marine accident." The

report noted a lack of information on how the nuclear transport ship and one armed Japanese escort vessel would be operated in congested waters near populated areas or in making emergency port calls after an accident or attack at sea.

"Thus," according to the report, "there is a risk of the release of plutonium in heavily trafficked waterways and ports where ship collisions are most likely to occur and where population centers tend to be located---both of which would increase the involuntary risk to the public."

The report acknowledged "the necessity for some restrictions in information due to security concerns," but found that "there is so little substantive disclosure that risk must be accepted on the basis of good faith and little factual data. Considerably more information on safety specifications and accident prevention is required."

The report also challenged the adequacy of information that is available on the plutonium transports. Regarding a claim by the United Kingdom Atomic Energy Authority that the loss of a plutonium ship would occur on the order of once in a half-million years and that a severe fire would occur once in a million years, the report said: "There is no data to support the claimed incredibility of the occurrence of such events. In fact, historical occurrence of the type of accident events necessary to place the casks in jeopardy do occur ... and nothing in the furnished documentation gives any definitive basis as to why the historical frequency will be mitigated by the intended manner of transport."

Specifically, the report noted, while the IAEA standard is for a cask to survive a fire of 1,472 degrees Fahrenheit (800 degrees Centigrade) for a half hour, "shipboard fires routinely exceed 2,000 degrees Fahrenheit, or nearly 1,100 degrees Centigrade, have an average duration of nearly one day, but often extend over a period of days and sometimes weeks." The study cited a number of specific accidents in which such fires have been encountered.

In addition, although the IAEA standard requires that a cask survive immersion to a depth of 200 meters for a half hour, one U.S. government study reported that plutonium sea shipment casks will begin to fail at 200 meters and collapse totally at 3,600 meters. The report noted that depths beyond 200 meters will be encountered along 75 to 90 percent of the plutonium ship's route.

"It also appears credible that the nuclear transport vessel could sink in sufficiently deep water to externally pressurize the cask to the point of collapse with subsequent release of the plutonium into the ocean," the study found.

The report also suggested that the casks could not withstand the enormous forces of a credible collision at sea. It pointed out that the relatively small size of the plutonium transport vessel causes "additional concern for its survivability following an accident." It noted that the vessel will be exposed to "some of the more unforgiving areas (in terms of weather, wind and wave environments) of the oceans without any port calls between Europe and Japan" and that the large amount of fuel oil needed for the non-stop, 17,000 mile voyage also raises "added concern for fires should that fuel be ignited for any reason, including a ship collision or terrorist strike."

Regarding the terrorist threat, the report quoted from a U.S. Pentagon study that warned that "...even if the most careful precautions are observed, no one could guarantee the safety of the cargo from a security incident, such as an attack on the vessel by small, fast craft, especially if armed with modern anti-ship missiles." The report cited the intense heat caused by the single EXOCET missile that hit and destroyed the HMS Sheffield during the British-Argentine Falklands war.

"Even if the nuclear transport ship survived such an act of sabotage or terrorism (i.e., did not sink), it is difficult to imagine without further evidence that the casks could successfully survive the resulting shock, fire and secondary effects of damage---circumstances that again could result in the release of plutonium."

In releasing the report, Paul Leventhal, president of the Nuclear Control Institute, said: "On the basis of what we know, the plutonium sea-shipment casks are no better able to withstand a severe accident than the air shipment casks. It is irresponsible to ship tons of plutonium on the high seas unless people in Europe and Japan and in ports where emergency calls might have to be made along the way are assured that no plutonium will be released in any credible accident or attack."

Damon Moglen, of the Greenpeace International reprocessing campaign, said: "Plans to ship plutonium, especially in casks of unknown design and durability, are totally unjustified. The governments of Japan, the United States, Britain and France must immediately cancel all transport plans and release documentation as to the safety of the casks proposed for plutonium shipments."

Nuclear Control Institute and Greenpeace International, in addition to several other environmental and arms control groups, have requested that the House Foreign Affairs Committee and the Senate Foreign Relations Committee hold hearings on the safety hazards and proliferation risks posed by the plutonium shipments. The State Department recently held initial briefings for House and Senate staff members.