

Energy and the Marine Environment

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One energy-environment issue that has not been mentioned is the ocean transport and dumping of oil, and the movement of nuclear waste, which are becoming a serious problem.

Recent APEC forecasts (Table 1) suggest that within 10–15 years there will be four or five major competitors for existing Asian oil supplies in regional markets traditionally dominated by Japan. Some of this oil will find its way into the ocean, through tanker accidents and land runoff.

Table 1. Oil demand in Northeast Asia, 2000–2010 (thousand barrels/day)

Year	China	Japan	South Korea	Taiwan
2000	4,388.6	5,458.2	2,163.2	864.8
2001	4,526.2	5,497.2	2,149.5	885.0
2005	5,322.8	5,551.8	2,385.7	957.1
2010	6,495.2	5,627.1	2,675.1	1,013.7

Source: FACTS, Inc.

The three main types of commercial damage from oil pollution are fish mortality, tainting of fish, and decreased tourism. Tainting of commercial fish may cause more economic damage than outright death, because it affects many more fish, and tainted fish may be unmarketable or greatly reduced in value.

Eastbound tankers proceeding along the Malacca-Singapore Straits–South China Sea route are for the most part loaded with crude petroleum from the Persian Gulf area bound for Northeast Asia, with some originating in Malaysian coastal ports or Indonesian ports on the northeast coast of Sumatra.⁶ South- and west-bound traffic either carries refined products or ballast. The physical restrictions imposed by the less than 23m channel depths in the Straits, and the safety limitation of a 3.5m under-keel clearance added by the three coastal states effectively preclude the use of this route by fully laden tankers of more than

6. Mark J. Valencia and James Barney Marsh, “Access to Straits and Sea Lanes in Southeast Asian Seas: Legal, Economic and Strategic Considerations,” *Journal of Maritime Law and Commerce* 16 (4): 513–51, October 1985.

200,000 dead-weight tonnage (dwt), which commonly have hulls extending to 19 m or more. The alternate route for these very large crude carriers (VLCCs) is through the deep (150 m) and wide (20 km minimum) waters of the Lombok and Makassar Straits and the Celebes Sea, south of Mindanao.

The greatest source of tanker-related oil pollution is the discharge of tank washings. Between 0.35% and 0.50% of a tanker's cargo settles at the bottom of the tanks during long sea voyages, and unscrupulous operators discharge this residue into the sea. On a single voyage of a 200,000-tonne tanker, approximately 1,000 tonnes may be discharged into the sea with tank washings. In Southeast Asia, this phenomenon results in major concentrations of ballast discharge at each end of the Malacca Strait, in the western Java Sea, west of Madura, off Balikpapan, and off Brunei and Sabah. Plumes of tank washings are also generated along the two major tanker routes.

Asia was introduced to high-technology marine accidents through the 1973 grounding of the *Showa Maru* in the Malacca Strait and the subsequent wide-spread pollution of the area. There have been several spectacular accidents there in recent years, including the collision of two supertankers. These accidents often have far-reaching impact on coastal populations and on the environment and thus produce political backlash. Indeed, Malaysia and Indonesia are now considering how best to enhance their security against such threats.

In Northeast Asia, oil-tanker traffic is very heavy, mainly to Japan, South Korea, and Taiwan. About 4 billion barrels of crude oil a day—these three countries import 23% of the global total. With the thaw in political relations, new oil shipping routes running from the Bo Hai to Japan, South Korea, and southern China have been opened. And Sakhalin crude may soon start moving by sea to Japan.

Although routine discharges are a problem, a key concern is the possibility of a catastrophic spill. In Northeast Asia, accidents resulting in spilled oil are becoming increasingly common. The first major oil-pollution incident in the East Sea was the 6,400 tonnes spilled from the wrecked tanker *Juliana* in November 1971. Many organisms were killed outright and fisheries products were unmarketable for three months; clean-up was very difficult and the costs were significant.⁷ The region's extreme sensitivity and vulnerability was demonstrated by a South Korean spill in winter 1987. A tanker carrying 2,000 tonnes of refined oil, diesel fuel, and bunker-C oil was wrecked 64 km off Incheon Harbour and

7. Baruch Boxer, "Marine Science and Society in China," *Oceanus* 27 (1): 47–53, spring 1984.

spilled 80 tonnes. A strong tidal current with the prevailing north-westerly wind spread the oil over 40 km of coastline, contaminating numerous mariculture sites and damaging more than \$10m-worth of seaweed, shellfish, and shrimp. In June 1995, the *Sea Prince* ran aground off southern South Korea, spilling over 800 tonnes of bunker-C oil. In January 1997, the Russian tanker *Nakhodka* broke in two in the East Sea, spilling much of its 19,000 tonnes of fuel oil which then blanketed the south-western coast of Honshu causing severe environmental damage, preliminarily estimated at 7 billion yen.⁸ In September 2001, a Chinese oil tanker laden with 8,800 tons of diesel sank off Gulangya near Xiamen City after colliding with the Greek container ship *Edinburgh*.⁹

As if oil tankers were not a sufficient threat, Asia now has to be prepared for the possibility of an accident involving a vessel carrying nuclear spent fuel.¹⁰ Since 1992, Japan has shipped plutonium from France to refuel its nuclear power plants. The shipments follow a route around the Cape of Good Hope, across the Indian Ocean and on to Japan. In 1992, South Africa said it would bar Japanese ships carrying plutonium from sailing within 320 km of its coast. Emil Salim, then Indonesia's Minister of State for Population and Environment, said that, in the interests of safety, Indonesia advised Japan to avoid congested straits and shipping lanes off Southeast Asia, even though they might offer a quicker route. In January 1997, Malaysia expressed its serious concern with an ongoing shipment and requested the vessel, the *Pacific Teal*, to observe strict safety precautions while in its waters.

Transporting highly radioactive material by sea is of considerable environmental and health concern to countries along the shipping route. One tonne of plutonium—the amount of each shipment—is enough to make about 100 nuclear bombs. Environmental groups and other critics of Japan's plan claim that such shipments could be a target for hijacking. Staffed by a Japanese crew without military training or heavy arms, the vessel could be susceptible to a terrorist group equipped with a speedboat and anti-ship missiles. Environmental activists showed how easy it is by illegally boarding one carrier as it passed through the Panama Canal. Environmental critics also worry that containers of

8. "Oil-hit Prefectures State Their Case for Compensation," *Japan Times*, 18 February 1997.

9. "Oil slick off Chinese coast to be cleared by end of month," *BBC Monitoring Asia Pacific–Political*, 26 September 2001.

10. See Mark J. Valencia, "Japanese Plutonium Raises a Nuclear Scare at Sea," *International Herald Tribune*, 14 July 1992, p. 4. "KL Bars Nuke Waste Ship from its Waters," *The Straits Times Interactive*, 16 January 1997.

plutonium-oxide powder are not guaranteed to withstand temperatures of more than 800° C, a temperature sometimes exceeded by fires at sea. Moreover, should the cargo ship sink, the pressure of water in the depths of the ocean might crush the casks and release the plutonium.

There is also concern that the Japanese shipments may encourage worldwide commercial traffic in one of the most toxic substances on earth. For example, South Korea and Taiwan may also want to begin shipping spent nuclear fuel from their reactors for reprocessing into plutonium and have it returned by sea.

Transport and disposal of nuclear waste is another problem. Last year Taiwan explored the possibility of shipping nuclear waste to North Korea.

And several years ago it was revealed that the Soviet and Russian Navy dumped 18 decommissioned nuclear reactors and 13,150 containers of radioactive waste from 1978 to 1993, most of it in the East Sea. This news jolted nuclear-sensitive Japan and South Korea, and even drew negative comment from North Korea. More recently, a Russian naval vessel dumped nearly 1,000 tonnes of low-level waste in the Sea of Japan shortly after Russian President Boris Yeltsin's October 1996 visit to Japan.

Then Japanese Foreign Minister Tsutomu Hata warned his then counterpart Andrei Kozyrev that if Russia proceeded with its plans to dump another 900 tonnes of similar waste, "the foundation of a new Japan-Russia relationship will crumble." But, ironically, Japanese Science and Technology Agency Director-General Satsuki Eda admitted that the Tokyo Electric Power Company dumps ten times more radioactive waste each year into the East Sea.

Although most scientists agree that the dumped waste provides no immediate threat to the environment or to humans, the longer-term effects are unknown, particularly after the containers corrode. And consumers may well avoid marine products taken from the East Sea to be on the safe side.

What are the likely consequences of this increasing environmental insecurity? Amid growing environmental consciousness, governments may increasingly interpret their jurisdiction over the environment out to 200 nautical miles from shore as a responsibility to protect living marine resources and human health from activities that could cause serious pollution. The eventual result may be "creeping" jurisdiction barring environmentally risky vessels like substandard tankers and nuclear-spent-fuel or waste carriers from particularly congested or

shallow straits and sea-lanes. The main effect would be higher insurance costs and the diversion of such vessels to longer routes.¹¹

Needed now is a regional agreement on acceptable and unacceptable uses of the ocean environment. The January 2002 International Maritime Organization meeting in Tokyo was a step in this direction. But more progress is urgently needed.

11. Mark J. Valencia, "ZOPFAN, Strategic Sea Lanes and Navigation Rights: Stormy Seas Ahead?" *Far Eastern Economic Review*, 7 March 1985, pp. 38–39.