

Shipbreaking in the Developing World: Problems and Prospects

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The global shipping industry relies upon the developing world to dispose of retired deep-sea vessels through the process of shipbreaking. In doing so the industry avoids the burdens of complying with developed world standards for the management of hazardous waste. Occupational and environmental health (OEH) risks associated with dismantling of beached ships, primarily in India and Bangladesh, are significant. Worldwide concerns about these risks, which arose in the late 1990s, and activism by domestic organizations appear to be gathering momentum for global and domestic OEH reforms. This article addresses recent developments in characterizing these risks and in proposals to control them. *Key words:* ship recycling, ship scrapping; shipbreaking; asbestos; Alang, Bangladesh; Mumbai, India; Basel Convention; Greenpeace; International Labor Organization; International Maritime Organization; International Metalworkers Federation.

INT J OCCUP ENVIRON HEALTH 2007;13:359-368

The global shipping industry heavily depends on ship scrapping—"shipbreaking"—enterprises in the developing world to dispose of deep-sea vessels. These enterprises pay the final owners for the opportunity to salvage, for domestic markets, industrial products. For a developing country with relatively little industrial capacity to meet domestic demand for industrial products, deep-sea ships are almost entirely salvaged for materials ranging from steel to engines to toilets.

This arrangement does not merely provide a ready global market for ship owners at the time of final disposition. It also shifts significant occupational environmental health (OEH) risks from the developed world, where dismantling capital infrastructure, government regulation, and social expectations for safety are relatively mature, to largely rural areas of developing countries, where infrastructure, regulation and expectations are relatively weak.

In other words, the economics of the deep-sea vessel recycling model in place for sellers, ship breakers, distributors, and final consumers assumes the absence of OEH standards of the kind imposed within the developed world. The current economic model is quite vibrant, shifting rapidly according to changing market forces. However, a widespread reform effort has been trying, for close to ten years and with increasing momentum, to make participating businesses more legally liable and pertinent regulators more empowered and motivated to enforce developed world standards.

This reform effort is difficult to chart out in its entirety. It ranges from calls to shut down entirely developing world shipbreaking to proposals for incremental improvements in regulation within the existing economic model. Also, the campaign for reforms is taking place in multiple venues, in loosely coordinated ways, in the international, national and sub-national regional arenas. Moreover, managing OEH risks of ship recycling might appear at first glance to be easily localized (at the shipbreaking site), but in reality is spread out across a long continuum of the life cycle of ships, from their original design through their dismantling, perhaps 30 years later, and disbursement into tens of thousands of reused materials, involving hundreds of formal and informal business enterprises.

Further, it is difficult for a developing-world nation to increase significantly its OEH standards for a particular, migrant-staffed industry, ship recycling, while the OEH profile for the rest of its society remains troubled. For instance, the fragile workers' compensation systems of developing countries cannot be expected to work well for shipbreaking workers and not for others.

Nonetheless, it is possible that in the next few years a number of forces will push the economic model towards notably greater compliance with developed-world-type OEH standards. Already, worker safety appears to have improved in Alang, India. Momentum is building among international standard-setting bodies to do something serious, primarily about pre-disposal environmental safety measures. Also, the European Union has, in response to major oil spills on its Atlantic shores, introduced a requirement that double-hulled ships replace single-hull oil tankers. This

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Alang Maritime sign at roadside.

single regulatory change is expected greatly to increase ship disposal volumes in the next few years, and puts on the front burner the question of how safely the EU-mandated disposals will take place.

In this article, the authors provide an overview of the recycling business, as it has emerged, focusing on shipbreaking as practiced in Alang, India's, leading shipbreaking site and the leading global site for many years. Alang today has about 12,000 workers directly engaged in dismantling ships. Chittagong, the site of yards in Bangladesh, today has about 20,000 such workers.¹ In both sites, thousands more work in supportive functions, such as cooking and retail, and thousands more in facilities that turn the products from the ships into materials that flow into the domestic economy. The authors address some of the key issues relating to occupational risk. They review some prominent reform efforts, and assess where these efforts may lead to in the next few years.

The history of deep-sea vessel recycling over the past 25 years can be divided into phases of evolving approaches to addressing risks associated with shipbreaking. In the early 1980s, shipbreaking shifted its geographic center of operations from the west, to countries such as Korea, and then to India and Bangladesh, effectively allowing sellers and ship breakers to avoid financial exposure for OEH risks. This phase persisted relatively undisturbed through the late 1990s.

The second phase saw a significant rise in concern about these risks among unions, public interest organizations, researchers, regulators, and the media. A visit by Greenpeace to Alang in 1998 marked the start of this new phase. The International Labor Organization followed up shortly thereafter. Nongovernmental organizations besides Greenpeace, including some in India and Bangladesh, began to advocate for better occupational and environmental protections. During

this phase, which has run up through the present, there have been many attempts to understand these risks, promulgate standards for sellers and ship breakers, and agitate for action.

A Story of a Ship's Recycling

By following imaginatively the course of a single vessel through recycling one can learn about the many actors and their relationships with OEH risks. In April 2007, the ship "Opportunity" was reported to have been sold for disposal.² Weighing 12,765 light displacement tons (LDT, a good measure of the scrap weight of a ship), it sold for the equivalent of \$408 per ton. The ship was to be dismantled in India. Virtually all shipbreaking in India is concentrated in Alang and a neighboring site, Sosiya, located in Gujarat State, northwest of Mumbai.

The "Opportunity" was one of 28 ships reportedly sold for disposal during the months of March, April, and May 2007. Their destinations were India (14 ships); Bangladesh (8 ships); Pakistan (4 ships); China (1 ship); and Turkey (1 ship). In historical context, this is a very low number of ships sold for disposal in a three-month period. Freight rates have been very high since 2004, inducing owners to keep their older ships in use. Shipbreaking prior to 2004 had been at an annual rate of about 7 to 10 million LDT; since then it has been much lower; but sooner or later, ships have to be disposed of.

Consistent with shipping industry practices, the "Opportunity" was almost certainly designed and constructed without much thought given to improving the efficiency and safety in its dismantling. Any renovations made during its lifetime (ships are retired on average after 25 years) would have been done also without regard to dismantling implications. The ship would have arrived off the beach at Alang under its own steam. Between the times of the "Opportunity"'s last commercial voyage and its arrival off Alang, it may have passed among several brokers and would eventually have been bought by a shipbreaking company. Indians living outside of Gujarat state typically own shipbreaking companies.

The Gujarat Maritime Board (GMB) regulates shipbreaking activity and is responsible for the infrastructure dedicated to the industry in the Alang area. In the late 1970s, the government of Gujarat started to explore ways to participate in the global business of dismantling large ships. Governmental agencies and businesses selected Alang to create inexpensive shipbreaking facilities. Alang was attractive because it has a wide, non-muddy beach and 10-meter tides. In the first year of operations, 1982, five ships were handled. The Gujarat government, which owns the beach, has leased out over 100 plots averaging 30 meters wide. The GMB, like other Gujarat governmental agencies, is partly financed from taxes and fees arising from shipbreaking. The state government has a substantial economic



Shipbreak in Mumbai. Men wielding sledgehammers break up heavy marine engines for salvage. Heavy marine diesel engines are repaired, broken, or cannibalized.

stake in the sustainability of the shipbreaking industry. In mid-2007 roughly 40 plots were being used at Alang.

An officer of the GMB would have boarded the ship at anchor. The GMB officer would have ascertained that, according to safety rules introduced in 2003, the “Opportunity” had eliminated excess gas to eliminate the danger of explosion. Hazardous waste still on board such a ship can be sent to a landfill site,³ but potentially explosive materials can still remain inside the hull.⁴ One document almost certainly not on board is a comprehensive checklist of hazards and design peculiarities of interest to the shipbreaking workers. The GMB official will eventually give permission that the ship be beached. The “Opportunity” would have been driven onto the plot leased by the ship breaker who purchased the ship, bow first at high tide.⁵

Over the course of several months workers would have disassembled the ship—about 250 working at any time on the plot on which the ship rested. Cranes would have been used to move very heavy pieces, but workers would have continued, as in the past, to perform much of the moving of parts. From time to time the ship’s hull, as it was being dismantled, would be drawn further ashore at very high tides.

As parts were removed from the ship they would have been transported to stores and sheds owned by

independent contractors, who prepare such parts for distribution into the Indian economy. A typical use of steel from Alang is rebars, used in cement construction. In a 12-month period between 2003 and 2004, Alang shipped 2.19 million tons of steel into the economy, 4.7% of all steel domestically produced in that period for the Indian market; in late 1990s, the share was much higher.⁴ The cost of Alang steel is estimated to be half of that of regular furnace-produced steel.⁶ One study asserts that entire engines have been converted into 5-megawatt power plants for 15% of the cost of a new plant.⁷

Shipbreaking is conducted in Bangladesh in a similar economic and political context, except that recycling is significantly more important for the domestic economy. Eighty percent or more of domestic consumption of steel is derived from shipbreaking. Some 200,000 workers were estimated in 2005 to be engaged directly or indirectly in shipbreaking.⁸

SUSTAINED DEMAND FOR DEVELOPING WORLD SITES

Between 1982 and 2003 close to 3,800 ships were broken at Alang alone, representing over 27 million LDT.⁷ Between 1996 and 2004, Alang handled at least



Press shipbreaking inside principal Kumbharwada marine scrap yards. Heavy scrap is lifted by crane.

250 ships every year. It led in tonnage of scrap from its inception in 1983 through about 2003, when Bangladesh assumed the leadership. Alang's absolute volume of activity has dropped by well over half from 2003, due in part to the diminished supply of ships into the scrap market because of higher freight costs, and in part to the willingness of Bangladesh shipbreaking companies to bid up the price for end-of-life ships.

To put Alang's history into global context, about 5,600 deep-sea ships were scrapped worldwide between 1994 and 2006, for an average of about 430 a year. Within these years, the high point of work was in 1999, when 6.4 million LDT were scrapped. The low point was in 2005, when about 1.5 million LDT were scrapped.⁹ As noted above, the volume of ship disposal is strongly influenced by fluctuations in freight rates, which cannot be reliably predicted, and the price of steel.

If one forecasts future disposal on the basis of the aging of the world's deep-sea shipping fleet only, and ignores the EU's mandated retirement of single-hulled tankers, disposal through 2015 may range between 5.5 million LTD and 7.6 million LTD per year, or roughly 500 to 700 ships a year. The EU's mandate could add another 10 million LTD, or 800 ships, into the disposal stream before a deadline at the end of 2010.

The annual capacity of shipyards that are dedicated to dismantling and capable of meeting developed-world OEH (i.e., "green") standards stands at roughly 2 million LTD. About a quarter of this capacity is in China, half in Turkey, and the balance in the EU or the United States. More capacity at high OEH standards can be added by shifting construction yards to dismantling work. But the burden of complying with OEH standards, and the fluctuation in the supply of end-of-life ships, make it extremely difficult to apply a sustainable business model. This is especially the case in yards located in the developed world, where daily labor rates are in the order of \$250 instead of \$5. It is therefore highly likely that dependence upon Indian and Bangladeshi sites will continue into the future.

SAFETY AND HEALTH: WORKERS' PERSPECTIVE¹⁰

Alang shipbreaking workers typically come from marginal rural landowner households in relatively poor Indian states. They generally have no alternative employment opportunities within the village apart from the low-wage agricultural work, paying on the order of 35 to 50 rupees a day (as of mid-2007, the exchange rate approximated 40 rupees to the dollar). The shipbreak-



Shipbreaking in Mumbai. Worker with blowtorch, termed the "gas cutter." Workers prepare to walk metal girder further up the beach for cutting.

ing yards in Alang, upwards of a three days' train ride away, and paying today considerably more, emerged in the 1980s as a destination. Workers are paid about 200 rupees daily—\$5. These workers are not eligible by law for overtime, leave benefits, and minimum wages. Their employers do not provide health benefits.¹¹

Workers who migrate are typically relatively well-educated (5 to 8 years' schooling) and literate, married, and between 25 and 40 years old. Very few bring their families. Workers typically return home for several months, often in the hot summer months when planting and weddings take place in the villages.

Most workers live at no cost in encampments—10-by-8-foot plots in which three or four people live, on ground controlled by the GMB. They have access to fresh water brought in, but there are few community toilets. In the monsoon period the ground can be covered with excrement.

There are six workdays in the week. By 5:30 in the morning the men are up. They work from 7 AM until noon with a 15-minute break. There is a one-hour lunch period. Work runs again from 1 PM until about 7 PM with one 15-minute break.

Since about 2003, notably after the rise of international and domestic awareness of the OEH conditions in Alang, every worker in these yards has been required

to enroll in a three-day safety and risk-management training course, conducted under the aegis of GMB and paid for either by the worker or by his employer. The course is officially mandatory but many workers appear not to have taken it.

Interviewed workers perceive the three-day training program as useful. An example of useful training tips is removing the small broken metal scraps from sheets before applying a blowtorch, removing a cause of fire. Workers are no longer permitted to work alone. Helmets are now being distributed; interviewed workers allege they are inadequate to protect against a heavy blow. The employers, or "*seths*," are now paying for protective glasses. And the employers provide work uniforms to 70% to 80% of the workers, in contrast to 20% before 2003.

With the collaboration of the Gujarat State AIDS Control Society (GSACS), the Gujarat government has deployed mobile first-aid vans, to both address work injuries and promote safe health behavior among the workers. Workers and project staff of GSACS interviewed by the authors reported that workers found the vans to be a benefit.

The two most dangerous tasks are moving metal sheets, due to the threat of crushing, and engine dismantling, due to the threat of explosions.



Shipbreaking in Mumbai. Part-broken ships and superstructure debris. Gang of workers chanting and lifting massive metal girder.

For handling sheets of metal, men would in the old way stand inside and outside the sheet while it was standing in place. The men on the outside were at risk of being crushed when the sheet was being pushed out. Now men stay clear of the outside space. Also, tractors are used more for moving sheets for long distances. But men still carry sheets for short distances. A team of 16 workers, called loaders, might be needed to carry a sheet that is 4 by 8 feet. Cranes can be used to lift sheets, with hooks placed in holes that the workers have cut into the sheets.

They use a chain block to lift engines. They hammer open the outer casing. They used to throw water onto the casing to eliminate the danger of sparks and explosion; now they use a stream of water coming from a pressure pump.

One worker whom the authors interviewed had sustained a serious injury. He had migrated from Uttar Pradesh in the late 1980s to Alang, then offering 35 rupees a day. After starting, as many do, as a *jodi*—an all-purpose worker, he progressed to one of the most skilled positions, “gas cutter,” using a hand-held torch to cut steel. Over time, he pulled in the ships and dismantled engines. In around 2000, he was applying a spanner to open up an engine when hot oil sludge struck him, burning the left side of his neck and chest. He was hospitalized for three months in the nearest city, then for a month in a medical facility in Alang.

Alang workers directly engaged in shipbreaking are considered to be employees of the shipbreaking company. Therefore, this worker’s injury-related costs were covered by the nation’s Workmen’s Compensation Act of 1923.

The Indian affiliate of the International Metalworkers Federation (IMF), which surveyed Alang and Mumbai sites in 2004, confirms that shipbreaking workers who are recognized as employees of shipbreaking companies are covered by the nation’s Workmen’s Compensation Act.

The workers’ compensation act provides for compensation of 50% of wages after the first three days of disability. The act does not cover diseases, and does not require compensation for medical expenses. However, in practice, where the employer recognizes the validity of the worker’s condition as work-related it bears some or all of medical treatment expenses. It may attempt to negotiate with the worker not to file a claim, may negotiate a lump-sum settlement, or may simply refuse to recognize the condition.¹² The IMF asserts that if a third party, such as an attorney, does not represent an injured worker the employer may attempt to ignore the Act.

This worker’s employer—*seth*—paid for this injured worker’s medical care, which came to 100,000 rupees. The *seth* paid the worker several months’ wages, and then encouraged him to sue the *seth*’s workers’ com-



Unemployed ship breakers and their families dig pits in search of scrap metal.

pensation insurer. He eventually received an award of 60,000 rupees, 3,000 of which he paid to his lawyer.

This worker and co-workers interviewed asserted that this story was an isolated case of a cooperative *seth*. For instance, interviewed workers cited a shipbreaking company that announced that the estates of three workers killed in March 2007 by an explosion had each received 75,000 rupees (about \$1,900) in death compensation under the workers' compensation act. They alleged that each family had actually received only 25,000 rupees.

The national government administers the Employees' State Insurance Act, which is perceived to be more beneficial to workers than is the Workmen's Compensation Act. This is contributory plan where employer, employees, and the national government contribute. Workers covered by this Act can claim compensation under this Act only. It is not considered applicable at this time to shipbreaking workers.

An employment relationship may last only for the duration of one ship's dismantlement, until the worker takes on a new assignment with another employer. Rapid turnover complicates the introduction of health and welfare insurance that is employer-based. Along workers contribute to a "prudential" system of savings,

which is funded by employee deductions (10% of wages) and matching employer contributions. Lack of education and understanding of the mechanism by workers reportedly often results in accumulated balances not following the worker to his new employment. Proposals to create a central database to record contributions and balances have not been implemented.

OCCUPATIONAL RISKS

As typical of studies of shipbreaking, an important 2004 report by the International Labor Organization contains no incidence data.¹³ However, it does list what the authors believe are frequent causes of accidents. These include fire and explosion, falling objects, trapping or compression, snapping of cables, falls from heights, and lack of personal protective equipment, housekeeping standards, and safety signs.¹³

Traumatic injury and death risk data for shipbreaking workers are of very uneven quality. There are no reliable time series of incidents, injuries, and illnesses for Indian yard workers, for example. As an official in an Indian union affiliated with the International Metalworkers Federation explained,



A digger. They receive only 5–6 Rupees per kilo, just enough to buy a little food.

There is not any machinery appointed by any authority for recording the number of accidents happening in the shipbreaking yards. There is not any provision forcing the employers to report immediately the accidents to any responsible authorities and therefore no official data available. We have collected the facts and figures of the accidents based on sources those were available to us in the course of conducting [surveys]. These include nearby hospitals, injured shipbreaking workers, medical camps and personnel visits.¹⁴

Moreover, within the literature on Alang there are no references to any studies of Alang workers for disease risk until one study in 2006, addressed below.

It is difficult to estimate confidently the fatality rate of workers directly engaged on plots in Alang to work on the ships or in moving objects around within the plots themselves. In the period 2002 to 2003, roughly 15,000 to 25,000 workers in total were directly engaged on board or in the yards. Using the United States' OSHA standard measure of 2,000 work hours per year, a work year of 180 at 11 hours a day results in a mid-point estimate of about 20,000 full-time-equivalent workers. Interviewed workers and researchers in the Alang area estimate that at that time the Alang yards sustained roughly 40 traumatic work fatalities per year. These figures yield annual fatality rates of roughly 200 fatalities per 100,000 workers, or 2 fatalities per 1,000 workers. The most dangerous work in the United States, such as logging and fishing, rarely exceeds 100 deaths per 100,000 workers.

This crude estimate does not take into account any disease-related deaths that could have arisen from exposures to toxic agents, such as those summarized below. The ILO study cites numerous hazardous substances that can give rise to diseases. They include asbestos fibers (a ship built in the 1960s and 1970s can contain many tons of asbestos), heavy and toxic materials such as lead, mercury, cadmium, zinc, and copper,

PCB (polychlorinated biphenyl) in paint, PVC (polyvinyl chloride), and welding fumes.¹³

ACCIDENT AND DISEASE RISK IN BANGLADESH¹⁴

Young Power in Social Action (YPSA) is the leading non-governmental organization in Bangladesh advocating for OEH protections for shipbreaking workers. This organization summarizes from a survey conducted in 2003 that

88% of the workers suffered from some form of accidental injury from foot injury, to larger accidents. 87% suffered from muscle pain, 72% have problems with eyesight, 52% have breathing difficulty, and gastric problems occur in 81% of labour. Whereas, 56% of them suffered from skin diseases and 28% have other infections.¹⁵

In 2005 YPSA conducted a survey to document socioeconomic conditions. It reported that

major . . . problems of labour . . . are—very risky job / threats of accident/ fear to work on the top of the ships, wages are not paid accurately and timely, lack of pure drinking water, hands and legs are always burned, feel pain in body and chest, too much working pressure but fewer wages, necessary tools and elements (like dresses, gloves, helmet, shoes and welding glass) are not provided, lack of healthy toilet, no security of life, legs are often cut and injured and Have to work in hot and rainy days because the undeclared rule is “no work no money.”¹⁵

JUDICIAL ACTIVISM IN INDIA

In 2006 the approach of an ocean liner towards Alang prompted an outcry among activist groups, a review by the Indian Supreme Court, and the commissioning of a study of the OEH issues at Alang.

The owners of the passenger ship “Norway,” originally called “France” at its christening in 1960, had been seeking ways to scrap the ship, retired from use after a disastrous fire in 2003. In May 2005 it sailed from Bremerhaven, Germany, to Malaysia, where it was renamed “Blue Lady.” The owners then sent it to Chittagong, Bangladesh, for scrapping, where it arrived in February 2006.

An increasingly aggressive coalition of environmental activists had been tracking the ship for several years even while it languished in Europe. The Bangladesh Environmental Law Association threatened legal action, which apparently was the reason for ship's departure from Chittagong in May, heading for Alang.

Fresh from a victory in early 2006, preventing the French decommissioned aircraft carrier “Clemenceau” from being broken up at Alang, the coalition set its sights on inducing the Indian Supreme Court to pre-

vent the “Blue Lady” from being beached. The coalition failed—the “Blue Lady” was beached in Alang in August 2006. But it wrung out of the struggle a consolation prize in the form of a blue-ribbon assessment of the adequacy of the Alang yards to control the OEH risks of shipbreaking. It was commissioned by the Supreme Court to report on any deficiencies and suggest remedial measures. The committee submitted its final report on August 30, 2006.¹⁶

This thin final report is divided into two sections. (It cited no substantive prior study of worker OEH incidence.) One was an analysis of x-rays and pulmonary function tests that had been conducted on some Alang workers over the course of the prior two years. The method of subject selection and the levels of exposures to asbestos and other entities were not known to the analysts in 2006. All subjects had worked at Alang for not more than ten years. The analysts were from the Indian National Institute of Occupational Health. They reported:

The x-ray examination by [the analysts] showed linear shadows on chest x-rays of 15 (16%) of 94 workers occupationally exposed to asbestos. These are consistent with asbestosis but could be caused by other lung conditions. All cases of radiological abnormalities reported by NIOH belonged to ILO category I (early asbestosis) and were not associated with pulmonary function abnormalities.¹⁶

The other section of the report was a summary of recommendations for remedial action. Forty-eight actions were recommended, of which 19 were “immediate,” 15 were “short term,” eight were “medium term,” one was “long term,” and one was multiple in time horizon.

The “immediate” recommendations addressed remedies to practices prior to deconstruction; that is, while ships were yet to be authorized for beaching, or after beaching but before breaking. An example is “all hazardous materials are marked by the recycler [i.e., shipbreaking company] and verified after beaching and prior to breaking.” Other “immediate” remedies pertained to environmental monitoring of air, seawater, and ground water.

Changes to occupational safety and health practices were generally given “short term” horizons. An example was “specifications to be laid down for PPEs [personal protection equipment].” A “medium term” recommendation under workers’ welfare issues was “to provide on rental basis workers housing facilities with provision for drinking water, sanitation, electricity and shopping.”

ADVOCATING ON BEHALF OF SHIPBREAKING WORKERS

Since the late 1990s journalists and activists globally and in India and Bangladesh have brought to the attention of the public and regulatory bodies the OEH issues of

shipbreaking workers and environmental hazards to the local ecology. Often the two focal points—worker protection and environmental protection—are joined in single campaigns. Greenpeace, the International Metalworkers Federation, the International Transport Workers Federation, FIDH (The International Federation for Human Rights), and the Basal Action Network have been particularly active. Most have affiliates or chapters in India located in New Delhi. Recently these organizations created a Global Platform on Shipbreaking in order to coordinate campaigns.

Other domestic activist and research organizations addressing shipbreaking OEH include the Delhi office of Friedrich Ebert Stiftung (FES), a major German foundation, Young Power in Social Action of Chittagong, Bangladesh, and the Bhavnagar University. The latter two are located near their respective countries’ shipbreaking yards.

In 2002–2003, FES undertook to organize workers in Alang around safety and health issues. Shipbreaking companies resisted and, according to the research director of the FES Delhi office, the Gujarat government “was there as a mere spectator.”¹⁷ The FES pulled back. The authors could not determine whether the FES’s initiative had any causal relationship to the improvement in work-safety practices that interviewed workers recalled began at that time.

In 2007 the IMF was successful in registering a shipbreaking workers union under the Trade Union Act 1926. This is the first trade union to be given legal recognition for shipbreaking workers.

The single most informative publication regarding OEH risks to shipbreaking workers and remedies remains the ILO report published in 2004.¹³ This publication is not a research report (it contains, for example, no research bibliography); rather, it is an extensive statement of OEH guidelines. In its preface, it says that “the guidelines are not legally binding, nor are they intended to be national laws, regulations or accepted standards.” They are intended to provide guidance to those engaged in framing formal laws and regulations.

However, the authors took note of the following “international instruments”: the International Maritime Organization, which is in process of formulating a binding convention on recycling of ships, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989), the Convention of the Prevention of Marine Pollution by Dumping of Wastes and Other Matters (attached to the Basel Convention in 1995), and the International Chamber of Shipping Industry Code of Practice on Ship Recycling. Some major shipping powers in the world, such as the United States, are not signatories to these conventions; however, the European Union is.

Activist organizations, global and domestic, have used courts in countries that have ratified the conventions to argue that movement of ships from these coun-

tries to shipbreaking sites without addressing the presence of hazards on board is a violation of law. For example, they cited the conventions in their partly successful efforts to prevent ships from being sent from Europe to shipbreaking sites elsewhere.

In May 2007 the Commission of the European Communities issued the "Green Paper on better ship dismantling."¹⁸ There is a call to action by the European Union, where 36% of world shipping tonnage is owned, and where 100 warships under EU flags await decommissioning in the next ten years. The paper states baldly that the ". . . requirements of the Basel Convention, which are legally binding on all its parties, are rarely complied with in the case of end-of-life ships."¹⁹

PROSPECTS FOR IMPROVING OEH PRACTICES

After close to ten years of activist campaigning, international attention, and domestic initiatives, momentum appears to be building for more concerted efforts to control OEH risks of shipbreaking workers in the developing world. The European Union, which oversees the movement of a large minority of deep-sea vessels, is the locus for developed-country attention. There is little perceptible effort in the United States except for the Seattle-based and globally focused Basel Action Network.²⁰ Activists have been engaged in countering efforts by the U.S. Federal Maritime Administration (MARAD) to send ships to the developing world for disposal. On balance, developed-world governments and international organizations are clearly more concerned about the OEH issues than they were in the early years of this decade.

The best prospects for improvement are probably in the area of preparing end-of-life ships for dismantling prior to their arrival at shipbreaking sites. The shipping industry is dead opposed to any requirement that ships be entirely decontaminated prior to arrival, for instance by removal of asbestos. However, standards for proper labeling and disclosure of on-board risks appear to prompt less opposition. The International Maritime Organization promulgates standards, which its member countries ratify. Activist groups have roundly criticized the IMO for what they view as foot dragging on the issue of end-of-life related risks. The IMO has issued draft guidelines and it expects to issue a final version in 2009; it may take years for countries to ratify it.²¹

With regard to worker welfare and domestic protections such as workers' compensation systems, domestic activist campaigns aimed at the courts and national and regional regulators may bear more fruit. Better enforcement of laws on the books, such as workers' compensation laws and labor laws in general, is probably the most likely path towards improvements in the near future.

Given that the shipbreaking industry provides revenue to the Gujarat state exchequer and that at present

there are 14 different types of government departments having their respective offices in Alang, the state has given clear indication that it recognizes the economic importance of the shipbreaking industry. What now remains to be achieved is a more coordinated government attempt to bring shipbreaking in Alang to a higher level of activity, with occupational safety, environmental protections, and worker social security embedded in a business-growth strategy.²²

The authors are grateful for the assistance of Joyce Lehman and Narendra Singh in the preparation of this article.

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