

# **CHAPTER 31**

## **TRANSNATIONAL MOVEMENT OF HAZARDOUS WASTE IN DEVELOPING COUNTRIES**

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# Transnational Movement of Waste in Developing Countries

## Introduction

The World Health Organisation (WHO) defines waste as follows:

*“Something which the owner no longer wants at a given place and time and which has no current perceived market value.”*

- Suess et. al., 1983.

Because waste is by definition of little or no perceived value to the entity generating it, there is little financial incentive to handle it in a careful and secure manner and, on the whole, there is an inbuilt temptation to relinquish responsibility for it at the earliest opportunity. There are several problems associated with poor disposal techniques and fly tipping and litter are examples of what can happen when waste is disposed of without proper care and without a suitable framework of regulation and enforcement. Movement of hazardous wastes across national boundaries and, certainly, from the developed countries to the developing countries is on the increase.

The international community, the African countries and regional initiatives aimed at the regulation and control of illegal movement of hazardous wastes have been attempted.

Sound management of hazardous waste activities, including transnational movement, is essential for any civilised society. Ideally, it should be viewed as a complete unit with integrated control at all levels of the problem. Such management is even more critical in developing countries where legislation to control the menaces from careless disposal are lacking.

## Transportation and Storage of Hazardous Wastes

The public has become increasingly aware of environmental and health damage that can result from accidents involving the transportation of hazardous wastes. At the same time many officials are aware that they do not fully understand the complexity of the risks to public safety posed by transportation of hazardous materials. Moreover, there is a pervasive feeling that existing programmes aimed at minimising transport risks do not take into account special local circumstances and are increasingly asking for international help in establishing regulatory, enforcement and emergency response programs that meet their specific needs.

For example, the federal regulatory system governing the transportation of hazardous materials in the US was developed over the twentieth century with substantial industry involvement. The existing regulations promulgated by the US Department of Transportation (DOT), Environmental Protection Agency (EPA), and other federal agencies are extensive. They cover all aspects of the transportation of hazardous wastes: *classification of the wastes, engineering specifications for containers, communication requirements such as container and vehicle labelling, handling and operating requirements for each mode of transport, safety requirements for shippers and carriers, worker safety, and environmental protection.* This type of arrangement is seriously lacking in most developing countries, certainly on the African continent.

## **The Consolidation of Regulations Governing the Transportation of Hazardous Wastes**

Because the US is presently the largest producer of hazardous wastes in the world (see Table 27.1), we will use the existing regulations in the US to try and illustrate the dangers of hazardous wastes movement. Furthermore, although hazardous wastes are transported across boundaries in developing countries, very little is documented about such movement as on many occasions, this is done illegally by business people who seek to exploit stringent environmental regulations in developed countries to dump such wastes in developing countries.

**Table 31.1:** Volume of Hazardous Wastes Generated (million tonnes per year) 1988

<b>Country</b>	<b>Volume of Waste (million tonnes per year)</b>
United States	275
OECD Europe	30
Eastern Europe	25
Rest of the World	20

Persistent administrative and organisational difficulties in the early 1970s led the DOT to seek the passage of legislation to consolidate regulatory authority over hazardous materials. Little was done until 1973, when a cargo jet carrying several tons of hazardous materials crashed. The inquiry into the accident showed that there was a *general lack of compliance with existing requirements because of the complexity of the rules, fragmentation of federal surveillance and enforcement authorities, and lack of industry familiarity with the regulations at working level.*

In 1975, the Hazardous Materials Transportation Act (HMTA) of the US was passed. The intent of the law was to improve regulatory and of transportation broad authority to set regulations applicable to all aspects of the transportation of hazardous materials. Such an arrangement needs to be formalised for most developing countries if they are expected to cope with this increasing menace.

Countries need to *list the classification* for hazardous materials that should be subject to international transportation regulation. These regulations should focus on materials likely to cause immediate injury to carrier personnel and the public if they are unexpectedly released during transport. Such regulations should further *define the label, packaging, and carrier requirements* for specific hazardous chemicals. *This should be based on serious threats to human health but not necessarily to the environment.*

It is estimated that 264 million metric tons of hazardous materials are generated each year in the United States. Of these, 96 percent are disposed of on site. Most of the waste shipped off site for disposal or treatment is transported by truck over distances less than 100 miles. In 1981, the EPA estimated that over 14 000 generators produced hazardous wastes, and that there were 12 367 transporters of such materials. In 1984, legislation was passed that extended the scope of existing regulations to include small quantity generators of hazardous wastes. Because most small quantity generators ship their waste to offsite facilities, the number of shipments regulated has increased.

The transportation of hazardous wastes should be governed by establishing certain standards for transporters of hazardous materials and to co-ordinate regulatory activities with responsible government departments in each country. This should cover among other things the following:

- Identification, listing, and labelling;
- Record keeping;
- Generators, transporters, and owners and operators of treatment and disposal facilities;
- Permit requirements for all facilities involved in the production and transportation of hazardous materials; and
- Tracking of the movement of hazardous wastes.

Countries should administer and enforce their own hazardous waste programs if their regulations are consistent with and at least as stringent as internationally accepted and acceded to programmes and regulations.

## Definition of Generators (Shippers) and Transporters (Carriers)

A **shipper of hazardous wastes** is considered to be an entity that performs any of the functions listed in 49 Code of Federal Regulations, Parts 172 and 173 such as labelling or packaging.

In the US, the EPA calls an entity fitting the DOT description of a shipper a waste “**generator**” defined as *any person, by site, whose act first causes a hazardous waste to become subject to regulation*. For example, any person who removes hazardous sludge and residues in vehicles or vessels that have carried products or raw materials or who hires another party to remove and dispose of sludge and residues, or who takes a vehicle or vessel to a central facility for cleaning, fall under the category of waste generator. The EPA regards *all parties involved in the transportation of hazardous waste as generators and believes they can be held jointly and severely liable if regulations are violated*. An international protocol could be arrived at which would regulate this internationally.

Under DOT regulations, a **carrier** *is also considered a generator if the carrier imports hazardous wastes into the United States, mixes hazardous wastes with different DOT descriptions, or is responsible for discharge or spill of hazardous wastes or commercial chemical products occurring during transport*. In the latter cases, the transport generator is responsible for cleanup of the discharge or spill of hazardous wastes or commercial chemical products occurring during transport. In the latter cases, the transporter-generator is responsible for cleanup of the discharge or spill as well as any resulting pollution, such as the contaminated soil or water. *This scenario is critically lacking in most developing countries and may be responsible for many of the incidences that have been reported regarding dumping of hazardous wastes from developed countries*.

If a generator or transporter accumulates hazardous wastes for more than 90 days, an RCRA storage facility permit must be obtained. However, if a transport vehicle, vessel, tank, or container is used for neutralising corrosive wastes, a facility permit is not required. Transfer facilities that store manifested shipments of hazardous wastes for 10 days or less are not required to obtain a permit. There are incidences where large volumes of hazardous wastes are stored for years in developing countries and very little precautions are taken to ensure that they are safely stored or looked after. The potential for accidents is great and should not be underestimated.

# Regulations Governing Generators of Hazardous Wastes

Generators of hazardous wastes should be responsible for complying with all legislation regulating the transportation of hazardous materials as well as regulations promulgated internationally specifically covering hazardous wastes. These regulations cover three major areas: *preparation for transport*, including identification, notification, and packaging; *compliance with manifest requirements*; and *record keeping and reporting*. Details exist of how each hazardous waste type should be handled to comply with such requirements (Wentz, 1989).

Most pre-transport requirements apply to all hazardous materials. They include identifying and classifying wastes determining whether the wastes are prohibited from certain modes of transport or whether special shipping requirements must be met; and complying with all packaging, marking, labelling, and placarding requirements. Looking at DOT regulations as they pertain to hazardous wastes and the relevant EPA requirements sees an indication of how this works.

## EPA Identification and Notification

Generators of waste must first determine whether their wastes are hazardous according to EPA criteria. A waste is considered hazardous if it satisfies all of the following conditions:

- It is a *solid waste* as defined by the EPA;
- It is listed as a hazardous waste by the EPA or is a mixture that contains a listed waste or exhibits one of the four EPA characteristics of a hazardous waste - *ignitability, reactivity, corrosivity, or toxicity characteristic*;
- It is *not explicitly excluded from regulation*.

Once it has been established that a waste is hazardous, generators are required to obtain an EPA identification number by submitting an EPA Form 8700 -12 to the agency. Generators are also responsible for seeing that any entities that will eventually handle the waste (e g: transporters or owner-operators of treatment, storage, or disposal facilities) have EPA identification numbers. This is to ensure that all activities related to this industry are done in a professional manner, and accountability exists.

In addition, the EPA requires generators to mark all containers of hazardous wastes with a capacity of 110 gallons or less with a statement indicating that federal law prohibits improper disposal of such wastes.

Generators of hazardous wastes that produce less than 100 kg of hazardous

waste per month are conditionally exempt from full EPA regulation, such as certain record keeping requirements.

## **DOT Identification and Classification**

In the DOT system of classification, hazardous wastes are any material so classified by EPA under 40 CAR 262. It is important to classify hazardous waste correctly according to this system, because regulations covering hazard communication and packaging of hazardous material and waste correspond to the class of the hazard.

First, it must be determined whether a hazardous waste is listed in the DOT Hazardous Materials Table in 49 Code of Federal Regulations. 172.101. If it is not, the EPA characteristics or EPA lists of the waste must be identified. The proper shipping name for a hazardous waste includes the word waste preceding the 49 CAR 172.101 material name (eg: waste toluene or waste sodium hydroxide).

All generators and carriers of hazardous waste including small quantity generators, must comply with appropriate DOT regulations covering marking, labelling, and placarding. These “hazard communications” furnish essential information about the cargo that can be used by the emergency response personnel should an accident occur.

The DOT requires shippers (generators) to mark all the packages with a capacity of 110 gallons or less with a proper shipping name, including a United Nations or North American (UN/NA) identification number (see Wentz, 1989). This is done so the contents of a package can be identified if it is separated from its shipping papers. Requirements for intermodal portable tanks, highway cargo tanks, and rail tank cars specify that the UN/NA number be displayed on a placard or an orange rectangular panel. There is a number for all hazardous waste in the “Hazardous waste n.o.s.” (Not otherwise specified) category - NA 3082 (liquids) and NA 3077 (solids).

Labels are symbolic representations of the hazards associated with a material. Labels are required for most packages containing hazardous materials and must be printed on or affixed to a spot near the marked shipping name. Like labels, placards are symbolic representations of the hazards of a given cargo. They are placed on the ends and sides of motor vehicles, railcars, and freight containers. Placards are particularly important in case of accident because they are highly visible.

## Packaging

The DOT regulations that pertain to the packaging of all hazardous materials are discussed below. Because of their usefulness in trans-boundary movement of hazardous wastes, they should be used where possible in third world countries. Two special rules that apply to hazardous wastes are:

- ❑ An open-end drum, rather than a closed-head drum, may be used for wastes containing solids or semi solids; and
- ❑ Hazardous wastes may be shipped in used packaging that has not been reconditioned but is in good condition.

## Manifest Requirements

The manifest system was established by RCRA to ensure that hazardous wastes designated for delivery to offsite treatment, storage and disposal (TSD) facilities actually reach their destination. Hazardous waste management in the United States covers hazardous wastes from cradle to grave. A **manifest** is a *form that contains information about the specific hazardous waste and accompanies a shipment from generation point to ultimate destination*. Like DOT shipping papers, manifests provide information about the nature of the shipment than can be used by emergency response personnel when accidents or incidents occur. The only significant difference between a manifest and a DOT shipping paper is that a manifest lists the EPA identification numbers of the generator, transporter, and designated facility. The DOT regulations specify that an EPA manifest may be used in place of a DOT shipping paper.

Generators are responsible for originating and signing manifest forms. They must also obtain the signature of the transporter, retain one copy of the form for their records, and give the remaining copies to the transporter.

## Record Keeping and Recording

Generators are required by the EPA to keep a copy of each signed manifest for 3 years whether or not a signed copy is returned to the generator by the designated TSD facility. Records of all test results, waste analyses, and so on as well as copies of all reports submitted to the EPA must also be kept for at least 3 years.

Biennial reports must be submitted to the EPA by all generators who ship their wastes offsite. The report describes all shipments initiated by the generator during a given time period. In addition, if a generator does not receive a signed copy of a manifest from the designated TSD facility within 45 days of

the date the waste was accepted by the initial transporter, an exception record must be filed with the EPA. Exception reports help the EPA determine whether a waste has been properly disposed of. This kind of arrangement in the movement of hazardous wastes would ensure that trans-national movement of hazardous wastes adhered to accepted principles of managing such wastes.

## **Regulations Governing Transportation of Hazardous Wastes**

Both the EPA and DOT also regulate transporters of hazardous wastes. The relations applicable to transporters include notification requirements, manifest requirements, rules governing record keeping, and cleanup regulations. Some states have developed their own permit and registration programs for transporters of hazardous wastes. This system of regulating transporters of hazardous wastes would also be useful if applied in trans-boundary movement of hazardous wastes.

### ***Notification to Transport***

All transporters of hazardous wastes are required to obtain an EPA identification number and to follow DOT regulations governing hazard communication. The DOT regulations prohibit all transporters from accepting hazardous materials that have not been properly identified, packaged, marked and labelled. Special requirements for leaking containers have been established by the DOT for each mode of Transport.

Generators are responsible for following DOT and EPA pre transport requirements. If a generator has not affixed the appropriate placard to a shipment, it must supply the transporter with the necessary placard and the transporter must affix it. Generators are responsible for placarding railcars, highway Varga tanks, internodal tanks, and certain freight containers.

### ***Manifest Requirements***

The EPA regulations prohibit transporters from accepting hazardous waste shipments from a generator without a manifest. Transporters that accept manifested hazardous wastes are required to sign manifest, return a signed copy of the manifest to the generator, and ensure that the manifest accompanies the waste to its destination. When the shipment is delivered to the next transporter or designated facility, the initiating transporter must obtain a signature from the accepting transporter or the operator of the facility. A transporter is responsible for a hazardous waste shipment until the manifest is signed by a receiving

facility. If a hazardous waste shipment cannot be delivered to the designated facility the transporter must ask the generator for further instructions. Special requirements for bulk shipments by water and rail have been established.

## ***Record Keeping***

Transporters must keep a copy of each signed manifest or shipping papers used in place of manifests for bulk shipments for 3 years. This applies for shipments of hazardous wastes outside the United States, and would apply within developing countries as well.

## ***Discharge and Clean-Up***

A **discharge of hazardous waste** is defined as “*the accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous wastes into or on any land of water*”. The EPA regulations require all transporters to take immediate action in the event of a discharge. Such action may include notifying local authorities or initiating interim measures such as diking an area to contain the wastes. The DOT immediate notification requirements for incidents involving hazardous materials are applicable to discharges of hazardous wastes. Notice is given by calling the National Response Centre, which is operated by the US Coast Guard. Both the EPA and DOT include provisions in their regulations authorising federal, state, or local government officials to permit the immediate removal of hazardous wastes by transporters who do not have EPA identification numbers and are without a manifest. The EPA has also exempted all persons involved in treatment or containment activities taken during an immediate response to the discharge of hazardous wastes on materials from requirements governing facility permits. After the emergency, all normal regulations for formal disposition of the wastes must be followed. The EPA has established a procedure for rapidly issuing identification numbers to emergency response personnel and to shippers or carriers who need to transport hazardous wastes following an unanticipated release. A provisional identification number may be obtained by telephoning the appropriate EPA regional office.

The EPA regulations require that transporters clean up all discharges that occur during transport and take any actions required by government officials for mitigating the effect of the discharge on human health or the environment. The DOT regulations do not contain a comparable provision for other hazardous materials.

Finally, DOT requirements for written incident of accident reports must be met. For discharges of hazardous wastes, transporters are required to attach a copy

of the manifest to the DOT reporting form and provide an estimate of the quantity of wastes removed from the scene. The name and address of the facility to which the wastes were taken, and the manner of disposition of any wastes that were not transported elsewhere.

## **Conclusions and Recommendations for Managing Trans-National Movement of Hazardous Wastes in Developing Countries**

An increasing amount of hazardous waste is affecting human health and the environment, but *many developing countries do not have the expertise to manage the hazardous waste problem.* Governments often lack information about how much and what types of pollution are released, and what risk they pose to people and the environment.

*All national environment protection plans should include targets for hazardous waste reduction.* Programmes are needed to identify wastes and their potential effects, and to minimise them and treat them safely. They should be based on the “polluter pays” principle.

*The priority should be to change industrial processes,* and this includes setting targets for reducing the amount of hazardous waste produced per unit of manufacture. Governments should work with industry on campaigns to minimise hazardous wastes and on the reduction of other emissions. Industries have a critical role to play, and should promote cleaner production methods on a wide scale and ensure that their hazardous waste standards are not weaker in one country than in another. In this way, unnecessary trans-national movement of hazardous wastes will be minimised.

In an effort to curb this menace which if not checked will continue to cause suffering to millions of people in third world countries, it is suggested that certain steps and actions by governments and the international community be taken:

- Governments should immediately identify contaminated waste-disposal sites and populations at high risk, and take the necessary remedial measures, including cleaning up the sites.
- Governments should require and assist in the innovation by industry of cleaner production methods and of preventive and recycling technologies.
- Governments should encourage the phasing out of the processes that produce high risks because of hazardous waste.

- ❑ Governments should conduct environmental audits of existing industries to improve hazardous waste management.
- ❑ Governments should hold promulgate regulations that hold waste “generators” responsible for the environmentally sound disposal of the hazardous wastes they generate.
- ❑ Governments should establish public information programs and ensure that training programs are provided for industry and government workers on hazardous-waste issues, especially waste minimisation.
- ❑ Governments should promote the establishment of treatment centres for hazardous wastes, either at a national or regional level. Industry should treat, recycle, re-use and dispose of wastes at or close to the site where they are.
- ❑ Developed countries should promote the transfer of environmentally sound technologies and know-how on clean technologies and low-waste production methods to developing countries.

In an effort by the international community to address the movement of hazardous waste, the General Assembly of the United Nations made this pronouncement:

*“In Section 1 of Resolution 44/2226 of 22 December 1989, the General Assembly requested each regional commission, within existing resources, to contribute to the prevention of the illegal traffic in toxic and dangerous products and its environmental and health implications. The Assembly also requested the regional commissions to interact among themselves and co-operate with the United Nations Environment Programme (UNEP), with a view to maintaining efficient and co-ordinated monitoring and assessment of the illegal traffic in toxic and dangerous products and wastes.”*

It should also be recognised that part of the international movement of hazardous waste involves illegal shipments, often to developing countries. Governments should ban the export of hazardous wastes to countries that are not equipped to deal with those wastes in an environmentally sound way. They should see that hazardous waste shipments destined for recovery are handled by environmentally and economically sound recycling systems. Countries should create an alert system to detect illegal traffic in hazardous wastes.

Furthermore, it is important that the root cause of this problem is addressed. A good starting point would be to require that National Environmental Protection Plans include targets for hazardous waste reduction. This would ensure that there is nominal hazardous wastes produced and hence to deal with.

## **Overall Objectives of Most Countries in the Management of Hazardous Wastes**

Within the framework of integrated life-cycle management, the overall objective should be to prevent, to the extent possible and minimise, the generation of hazardous wastes, as well as to manage those wastes in such a way that they do not cause harm to health and the environment.

**Overall targets and Recommendations** may be stated as follows:

- ❑ Minimising the generation of hazardous wastes as part of an overall integrated cleaner production approach; reducing trans-boundary movements of hazardous wastes; consistent with the environmentally sound and efficient management of those wastes, and ensuring that environmentally sound and efficient management of those assets and hazardous waste management options are pursued to the maximum extent possible. The transboundary movements that take place should be on environmental and economic grounds and based upon agreements between the States concerned;
- ❑ Ratification of the Basel Convention on the Control of Trans boundary Movements of Hazardous Wastes and their disposal and the expeditious elaboration of related protocols, such as the protocol on liability and compensation, mechanisms and guidelines to facilitate the implementation of the Basel Convention;
- ❑ Ratification and full implementation by the countries concerned of the Bamako Convention on the Ban on the Import into Africa and the Control of Transboundary movement of Hazardous Wastes within Africa and the expeditious elaboration of a protocol on liability and compensation:
- ❑ Elimination of the export of hazardous wastes to countries that, individually or through international agreements, prohibits the import of such wastes, such as, the contracting parties to the Bamako Convention, the Fourth Lome Convention or other relevant conventions, where such prohibition is provided for.

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