CHEMICAL EMERGENCIES

THE JAMAICAN EXPERIENCE

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INTRODUCTION

Although problems may be common to both developed and developing countries it is important to note that whereas developed countries have the necessary expertise and legal requirements in place for dealing with the manufacture storage transportation and use of harmful substances, there is dire lack of similar controls in developing countries. Some common chemicals include various solvents and pesticides.

In view of the fragile nature of the economies of most developing countries, serious consideration must be given to the impact of chemical emergencies in such situations. Further economic decline would in most cases be catastrophic.

THE JAMAICAN EXPERIENCE

Jamaica like most developing countries has been progressing steadily along the path of industrialization. Currently there are approximately 2000 factories in operation; over 70 of these are engaged in the manufacturing of various chemical products and employing some 2700 workers. A large number of other factories use harmful chemicals in one form or the other, hence the exposure to such substances could involve a large percentage of industrial workers. In the rubber industry for instance there are some 500 workers employed and using solvents which could in time cause bladder cancer which take some time to surface, hence an entire working population could be affected.
Fortunately, in Jamaica we have not had many cases of large scale chemical emergencies or disasters in comparison with what has occurred elsewhere.

Before dealing with the proposed case studies I wish to give an overview of the capability of the various government agencies and to mention in passing a number of incidents which may prove interesting though not serious enough to be classified as disaster.

LEGAL AND OTHER RESPONSIBILITIES OF GOVERNMENT AGENCIES

1. The Industrial Safety Division - Ministry of Labour - has responsibility for administration of the Factories Act and Regulations. The Division supervises factory and other industrial operations to ensure adequate standards of Safety Health and Welfare of workers.

2. The Environmental Control Division of the Ministry of Health, concentrates mainly on environmental matters in industrial establishments. The work done encompasses the Public Health and other related Acts. However there does not exist any Legislation dealing exclusively with the subject.

3. The Mines and Quarries Division of the Ministry of Mining and Energy administers the Mining Act and Regulations with responsibility for Safety Health and Welfare in Mining and Quarrying operations bauxite processing works and includes licence for mining and quarrying and blasting operations.
4. The Natural Resources Conservation Department of the Ministry of Science Technology and Environment, administers the Beach Control and Watershed Protection Acts. There is general responsibility for environmental matters and advising other agencies on pollution matters.

5. The Harbours Department administers the Harbours Act and Regulations and exercises supervision of all traffic in and out of the harbours as well as all marine installations, i.e. navigational aids and pipelines etc.

6. The Jamaica Defense Force Coast Guard has responsibility for certain matters particularly oil spills incidents. The J.D.F.C.G. has direct responsibility for on scene command of clean-up operation.

7. The Jamaica Bureau of Standards was established under the Standards Act of 1968 and is engaged in setting of standards for the manufacturing distributive and consumer sectors and includes chemical engineering raw materials, food, etc. Within the Bureau is the Industrial Safety Committee which was set up for a rationalizing of the situation as it relates of the various agencies, legal matters and making recommendations for the making of codes of practice and other rules.

professions and is concerned with all aspects of the manufacture formulation, mixing and application of chemicals with emphasis on regular monitoring to ensure safe and effective use.

9. Historically, the various Government Departments have in the main operated in virtual isolation, there being only taken collaboration on occupational safety, health and related issues, the need for greater collaboration has in recent years been stressed particularly through the efforts of the office of Disaster Preparedness and Emergency Relief co-ordination. This organization came into being in the aftermath of massive flooding in western Jamaica in 1979. The establishment of the office was recommended by the joint review committee involving the United Nations Disaster. Relief Office (U.N.D.R.O.), the U.S. Office of Foreign Disaster Assistance (O.F.D.A.) and the League of Red Cross Societies (C.R.C.S.).

O.D.P.E.R.C. is engaged primarily in

a. Public information and training
b. Planning and research
c. Coordinating activities of other agencies
d. Disaster preparedness in general

During a disaster event the Jamaican Prime Minister directs emergency operations through to Director (ODPERC) who may if necessary activate the National Emergency Operations Center which functions on a 24 hour basis. Regional Centers may also be established.
In performing a coordinating role the ODP provide communications resources and back up for key agencies and conducts simulations and drills for testing contingency plans.

CASE STUDY 1

FOOD POISONING - AGRICULTURAL CHEMICAL

Agricultural workers are exposed daily to a variety of pesticides but there has fortunately been only isolated cases of illhealth and death resulting from normal use. Although accidental poisoning occur and even misuse for human pests, such as the most disturbing incident in recent years involving food poisoning.

Samples of the contaminated flour were analyzed by the Government Chemist who found that the poisoning was due to the presence of the organo-phosphate-parathion.

A commission of enquiry with sole commissioner E.G. Green (now Parliamentary Ombudsman) found among other things that the Health Authority has failed in their task of containing the epidemic within the shortest possible time. Reported cases spread over the period of January 2 - January 24 when the decision was finally taken to withdraw the item from the market. The investigation also revealed that contamination occurred before the flour was unloaded at the docks. It must therefore be concluded that food for human consumption was carelessly stowed with the poisonous substance.
The foremost recommendations were:

a. Exporting countries should certify shipments of food as to safety and other precautions taken and should include identity of the manufacturer, transporter and should provide also for suitable markings to be placed on containers.

b. Improved packaging to include where possible impermeable material on the outside of sacks.

c. There should be established in Jamaica a body (within the Bureau of Standards) of highly competent persons to inspect foodstuff in ports, warehouses and retail outlets.

d. That all vessels carrying food items be inspected before and during unloading.

e. Specific duties should be imposed on importers, wholesalers and retailers to comply with such provisions as may from time to time be laid down by a competent authority.

CASE STUDY 2

OIL SPILL INCIDENTS

The wider caribbean region may be regarded as being among the largest producers of oil. The Gulf of Mexico and off the coasts of Venezuela, Trinidad and Tobago are, at about 50 percent capacity, producing some 3 million barrels per day. It is estimated that seven percent of production could spill to the marine environment. There is threat also from tanker traffic which transports another 4-5 million barrels daily.
Although Jamaica is yet to experience a spill of the magnitude of the Ixtoc spill of 1979, we have had our fair share of problems. In the period 1978-79 eight spills were recorded involving some 200,000 gallons of oil. The most significant involved the MV Erodena which ran aground off the South Coast of Jamaica, causing a spill of 150,000 gallons.

Of concern also was the incident of the disabled Ogden Williamette having 36,000 tons of crude aboard. She drifted dangerously close to our south east coast for about three days before being taken in tow.

Accidental spills are by no means the only problem. There are numerous instances of bilges being pumped in our coastal waters and the unauthorized use of dispersants.

Response to oil spills involves the calling out of the National Response Team which is comprise of the ODP, NRCD, JDPCG, PA, AG, PAJ and relevant agencies dealing with Health, Public Utilities, Agriculture, Works, Local Government, Fire Department. The team operates the Draft Marine Pollution Contingency Plan. This plan was drafted as a result of recommendations made by an IMO representative who assisted in assessing the impact of the Erodena spill. Clean-up operations have been done manually and with the assistance of machinery. However our capacity to deal with spills was recently enhanced with a gift of equipment from the Canadian Government. Included in the package were skimmers, booms and dispersant gears. Additional equipment must however be provided and strategically placed around the island.
as transportation over relatively long distances could mean losing the advantage of affecting an early containment of a spill.

CASE STUDY 3

THE WHERRY WHARF INCIDENT

This involved the leakage of chemical into the public water supply system. The relevant operation at the wharf was the pressure treatment of lumber with a solution of chronic acid, arsenic pentoxide and copper oxide. These are stored in large tanks which could contain over 25,000 gallons of the material at any one time.

Investigations revealed that extreme low pressure condition resulted from a water lock of which allowed a backflow of chemical through a number of defective check valves. In addition it was found that the installation was patently, defective as both the water and chemical lines entered the tanks at the base.

A formal inquiry from the relevant Government Agencies in their duties found that the Plant was built and put in operation without prior approval. Adequate monitoring of the installation was also lacking.

The detection of the chemical in the water was facilitated by the greenish colour. Down town Kingston is heavily populated and includes also several offices, shops and a major public general hospital.

In closing it must be stressed that chemicals will be in use for a number of years to come. Therefore safety in their use must be
based on available information and the inputs of the various disciplines such as medicine, chemistry and experimental toxicology, developing countries need to take seriously the responsibility for legislative and other controls and when necessary appropriate penalties should be imposed on offenders.

In the case studies mentioned no legal action was taken hence the offending organizations got off lightly indeed. Wheery wharf was simply required to rectify faults in the piping system and it was then in business as usual.

In the case of the flour poisoning not even the recommendations of the inquiry seemed to have been implemented.

The spillers of oil were simply required to meet the cost of the clean-up.

Government agencies are in the main ill-equipped to deal with emergencies. The need for adequate training of personnel and the provision of instrumentation must be urgently addressed.

Unfortunately the issues at hand do not seem to occupy the minds of the Political Directorate until an emergency arises. It is therefore the duties of technical authorities to ensure by whatever means, that the highest priorities be accorded to safety and health as well as to environmental matters, since this is the only way that our work could be worthwhile and not exercise in futility.
OUTLINE MAP OF JAMAICA

Key = □ Areas where outbreaks occurred
NATIONAL WARNING AND ALERTING SYSTEM

SOURCE

METEOROLOGY OFFICE
Weather Information, Warnings

NATIONAL WATER COMMITTEE
Flood From Dam Failure

COAST GUARD
Marine Emergencies

FIRE AUTHORITY
Hazardous Fires

MINISTRY OF HEALTH
Major Human Health Problems

MINISTRY OF AGRICULTURE
Veterinary Health Problems

POLICE
Transportation and Traffic Accidents

JAMAICA RAILWAY CORP.
Rail Accidents

INDUSTRY—PRIVATE SECTOR
Spills and Industrial Accidents

MEANS
Telephone
Teletype
Radio
Personal Contact

USERS

MINISTRIES & GOVERNMENT DEPARTMENTS

MEDIA

ODP REGIONAL COORDINATORS

PARISH DISASTER COMMITTEES

LOCAL COMMUNITIES

HOSPITALS & HEALTH INSTITUTIONS

VOLUNTEER RELIEF ORGANISATIONS

OTHER
### Factories Engaged in the Manufacture of Chemicals and Chemical Products

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<thead>
<tr>
<th>Types (I.S.I.C. Method)</th>
<th>Numbers</th>
<th>Employment</th>
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<tbody>
<tr>
<td>311 Basic Industrial Chemicals Including Fertilizers</td>
<td>17</td>
<td>847</td>
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<tr>
<td>312 Vegetable and Animal Oils and Fats</td>
<td>15</td>
<td>172</td>
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<tr>
<td>313 Manufacture of Paints Varnishes and Lacquers</td>
<td>6</td>
<td>403</td>
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<tr>
<td>319 Manufacture Miscellaneous Chemical Products</td>
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<td>321 Petroleum Refineries</td>
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<tr>
<td>328 Manufacture of Miscellaneous Products of Petroleum and Coal</td>
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<td>112</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>76</strong></td>
<td><strong>2726</strong></td>
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