



RESPONSIBLE CARE[®]

DISTRIBUTION CODE

CODE OF MANAGEMENT PRACTICES

Developed by
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Distribution Code of Management Practices

Introduction

The Chemical Industries Council of Malaysia (CICM) and its members desire to be a responsible industry have committed themselves to Responsible Care which brings with it specific moral obligations regarding the responsible management of the total life cycle of their products; from the very beginning in the laboratory, to the very end at ultimate disposal or destruction.

The six (6) Codes of Practice apply to member company operations in Malaysia and member companies are also expected to work with customers, transporters, distributors and other parties in the application of these codes to their operations.

The six Codes span the complete life cycle of the products and have been developed focussing on the following areas:-

- ***Community Awareness and Emergency Response***
- ***Distribution***
- ***Pollution Prevention***
- ***Process Safety***
- ***Employee Health and Safety***
- ***Product Stewardship***

These codes do not dictate how a company should operate but instead they are performance indicators that encourage commitment, innovation and continual improvement. They focus on improving performance in all stages of the chemical manufacturing process and life cycle and hence Responsible Care is a journey and not an event.

CICM has given priority to the development of the Distribution Code of Management Practice because of the greatest potential exposure of the public to chemicals when they are being transported and distributed from the ports and from the chemical manufacturers to the various customers. The large number of road accidents and the congestion on Malaysian roads also makes the Distribution Code of prime benefit to the society as a whole.

Scope

The Distribution Code of Management Practices applies to all modes of transportation. The Code also applies to distribution activities (storage, handling, transfer and repackaging) while chemicals are in transit between companies and their supplies and customers. The implementation of a number of practices of the Code will vary according to the characteristics of the chemical being distributed, the mode of transportation and the type of distribution activity involved.

Objective

The purpose of this Distribution Code of Management is to reduce the risk of harm posed by the distribution of chemicals to the general public, carrier, distributor, contractor, the chemical industry employees; and the environment.

Benefit

The Code will promote improvements in:

- The safety performance of carriers and other providers of distribution services;
- Employee preparedness and awareness in preventing distribution emergencies;
- The public's preparedness in responding to chemical distribution emergencies;
- The public's understanding of, and confidence in industry

Distribution Code

The Guiding Principles

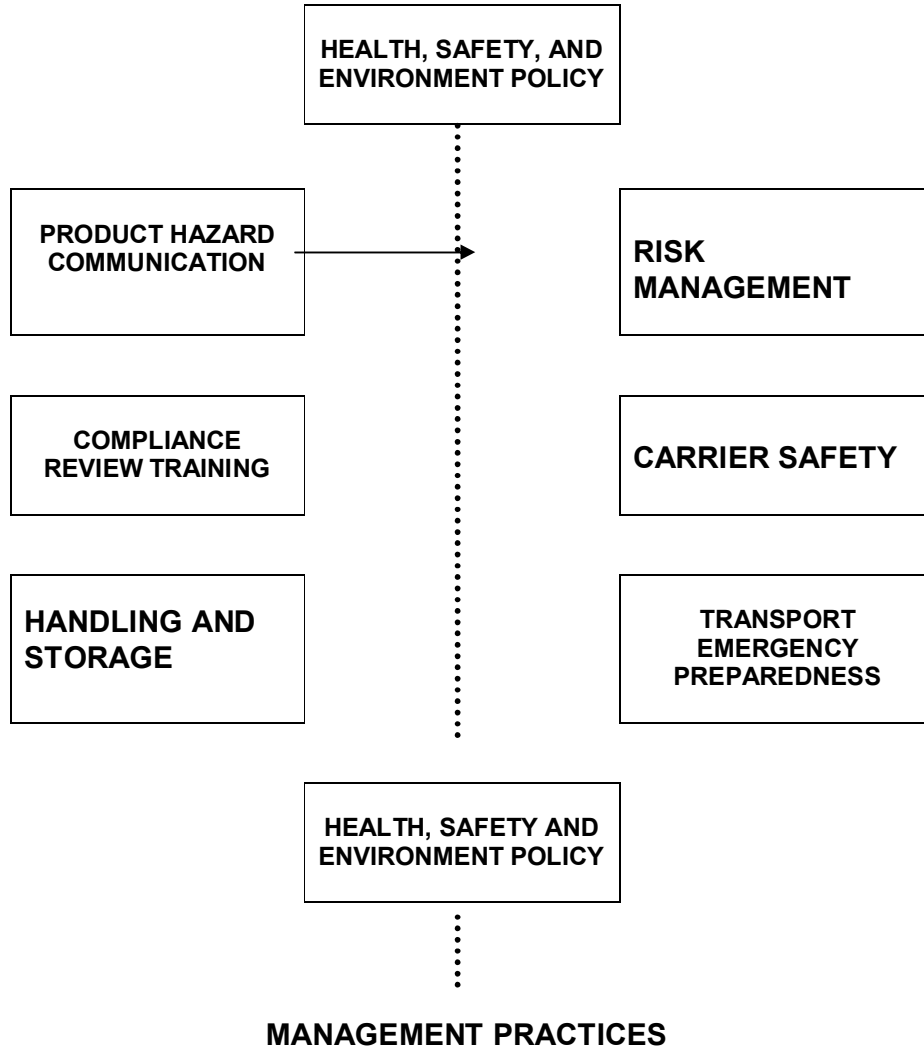
The guiding principles of this code as they reflect those of the "Statement of Policy on Responsible Care" are:

- Distribute chemicals, chemical products and services in a manner which protects people and the environment from hazards;
- Provide information about the hazards and associated risks of chemicals, chemical products and services distributed to customers, enabling them to use and dispose of these chemicals and chemical products in a responsible manner;
- Provide information about the hazards and associated risks of distribution activities to employees, other people on site, distributors and resellers, and to those in the community who have an interest;
- Make Responsible Care an early and integral part of the planning process leading to the introduction of new chemical, chemical products or services, before actual distribution is allowed to begin;
- Apply this code to existing, modified and new chemicals, chemical products, and services, equipment and facilities;
- Know the laws and regulations concerning distribution of chemicals, chemical products, services and information, and meet or exceed them in letter and in spirit;
- Be sensitive and responsive to community concerns about the chemical distribution activities;
- Require, with due diligence, that chemical distribution companies, and other resellers of members' chemical, chemical products and services meet the minimum standards of this code of practice as it applies to those of their operations which impinge on member companies; require, with due diligence, similar performance on their part with respect to their distributors and other resellers;
- Require, with due diligence, that suppliers of chemicals, chemical products and services to member companies meet the minimum standards of this code of practice as it applies to those of their operations within Malaysia which impinge on member companies;
- Work actively, alone or through selected organizations, and, if possible, in consultation with other affected stake holders, to assist government in developing public policies, legislation and regulations governing distribution activities

Distribution Code

Programme Elements

Each member company of CICM shall have an ongoing chemical distribution safety, health and protection of the environment programme that includes senior management commitment through policy, communications and resources to improvements in chemical distribution safety. This programme should include the elements in the figure below:-



Distribution Code
Management Practices and Implementation Guidelines

Management Practices	Implementation Guidelines
1. Health, Safety and Environment	
1.1 Establish Policies and Standards	1.1.1 Written policies, procedures & standards pertaining to Distribution activities should be communicated to those handling the material
	1.1.2 Employee performance to Health, Safety & Environment (HSE) standards must be understood and accepted at all levels of the organisation.
1.2 Accountabilities and Responsibilities	1.2.1 Responsibilities for generation of Health, Safety & Environment (HSE) policies & procedures are clearly defined
	1.2.2 HSE activities and results to be achieved should be included in the Officers' measures of performance and evaluations
	1.2.3 Policies, standards and procedures are reviewed and updated periodically
1.3 Compliance with Regulatory Requirement	1.3.1 Policies, procedures and standards should meet or exceed all applicable laws and regulations.
	1.3.2 Member companies should have copies of all applicable laws and regulations readily available on site
	1.3.3 A system should be in place to monitor laws and regulations and to ensure compliance.

Management Practices

Implementation Guidelines

2. *Product Hazard Communication*

- | | |
|---|--|
| 2.1 Classify products in accordance to Government/international codes of practices | 2.1.1 Product safety communications (eg. MSDS) are made available to everyone in the distribution chain including all road, rail and marine carriers. |
| 2.2 Provide material safety data sheet (MSDS) | 2.2.1 Known product hazards, together with relevant (HSE) protection information should be communicated to potentially affected persons in timely manner.

2.2.2 Provide training to ensure that the correct handling procedures are clearly understood. |

Management Practices

Implementation Guidelines

3. Risk Management

- | | |
|--|--|
| 3.1 Evaluate Distribution Risk | 3.1.1 Risk Assessment to include hazards of chemicals distribution, likelihood of accidents/incidents and resulting releases. Lastly impact of these releases on the public and the environment. |
| 3.2 Implement Risk Reduction Measures | 3.2.1 Developing and implementing risk reduction measures
~ Container selection & design
~ Mode of transport
~ Route Selection
~ Operating procedures and practices
~ Emergency response
~ |
| 3.3 Investigate/Report Accidents | 3.3.1 Accidents investigated and reports distributed and discussed. |
| 3.4. Implement Preventive Measures | 3.4.1 Implement preventive measures with follow-up actions. |

Management Practices

Implementation Guidelines

4. Compliance Review/Training

4.1 Monitor Regulations/Standards

4.1.1 Monitor compliance to Regulations/Standards and train employees for compliance.

4.2 Train employees on regulation/standards

4.2.1 Provide specific training on emergencies, handling of chemicals and personnel protective equipment use.

4.3 Provide guidance/information to carriers, contractors, etc.

4.3.1 Audit for compliance

Management Practices

Implementation Guidelines

5. *Carrier Safety*

5.1 **Motor Carrier Selection/Qualification**

5.1.1 Carrier is mechanically safe and roadworthy and complies with current legislation.

5.2 **Sea, Air, Rail and Pipeline Carrier Qualification**

5.2.1 Compliance with relevant regulations and Codes of Practice

5.2.2 Training of operator and emergency response plan

5.3 **Motor Driver Hiring Practices**

5.3.1 Establish criteria for driver selection

5.3.2 Develop training programme for drivers

5.3.3 Driver management and hours of work

5.3.4 Drug and alcohol policy

5.4 **Vehicle Maintenance/Inspection**

5.4.1 Preventive vehicle maintenance, both pre-trip and post-trip inspection.

5.5 **Tank Cleaning and Waste Disposal**

5.5.1 Tank cleaning facilities and treatment waste disposal.

Management Practices

Implementation Guidelines

6. Handling and Storage

- | | |
|---|--|
| 6.1 Establish procedures for product shipping Container selection and use | 6.1.1 Documented procedures for selection and use of containers compatible with chemicals shipped. |
| | 6.1.2 Request test certificates and inspection report that container is free of leak and visible defects. |
| 6.2 Establish procedures for loading chemicals, reduce emissions, protect employees, assure safe transit | 6.2.1 Documented procedures for loading chemicals that will reduce emission, protect personnel and is secure during transit. |
| 6.3 Establish procedures for unloading chemicals, reduce emissions, protect personnel, assure safe unloading/storage | 6.3.1 Documented procedures for unloading chemicals, reduce emission, protect personnel, transfer to compatible tanks, etc |
| 6.4 Develop criteria for cleaning of tank cars, trucks, marine vessels etc., and disposal of used containers and packages | 6.4.1 Define criteria for cleaning; return of tanks, refilling, safe disposal or residue. |
| 6.5 Provide guidance/information to customers/distributors on proper unloading/storage | 6.5.1 Provide guidance, information to customer; distributor on unloading and storage of chemicals. Material safety data sheets (MSDS) provided. |
| 6.6 Select distributors and facilities that emphasize safety and regulatory compliance | 6.6.1 Process for selection of distributors, facilities for storage and handling that emphasize safety and regulatory requirements. |
| 6.7 Feedback to distributors/facility operators on safety performance | 6.7.1 Feedback to distributors, facility operators on their safety performance and suggest improvements. |

Management Practices

Implementation Guidelines

7. Transport Emergency Preparedness

- | | | |
|---|-------|---|
| 7.1 Develop procedures for responding to distribution incidents/accidents | 7.1.1 | Written transportation emergency response plans with contact persons including government authorities. |
| | 7.1.2 | Establish response group training with reliable response equipment. |
| 7.2 Provide information on company's chemicals in distribution to emergency response authorities | 7.2.1 | Readily available chemical information to response to authorities and provide technical advice to responders. |
| 7.3 Provide emergency support to authorities | 7.3.1 | Provide emergency support to authorities including technical assistance and follow-up plan. |
| 7.4 Dialogue with emergency response authorities on distribution and handling of company products and hazards | 7.4.1 | Develop incident/accident reporting procedure and assess the status of emergency preparedness. |
| | 7.4.2 | Follow-up on all incidents/accidents report given to relevant employees. Remedial action taken. |

Health, Safety and Environment Policy

The carrier company must have Health, Safety and Environment policy and Health, Safety and Environment Management System in place.

Health, Safety and Environment Policy

The health, safety and environment (HSE) policy simply states the priority that HSE has within the company and shows the commitment of the company to HSE.

This policy must contain the following key elements:-

- It is the policy of the Company to conduct all their activities in such a way so as to take account of the safety and health of the employees' and the public; and to give proper regard to maintaining a conducive environment.
- The HSE objectives have equal status with the primary business objectives of the company.
- The top management is responsible and line management is accountable for implementing the HSE policy.
- The starting point of the HSE policy is full compliance with the prevailing legislative requirements. This must be demonstrated by visible management commitment through education, training and employee involvement and contribution.

Safety

Company works on the principle that all injuries can be prevented and develop activities and programmes to create consciousness and discipline amongst its employees and contractors.

Health

Company prevents all occupational diseases and promotes health of their employees through visible medical and health surveillance.

Environment

Company sets targets to progressively reduce emissions, effluent and discharges of waste materials with the ultimate aim of eliminating them.

- Company provides products and services with information and practical advice so as not to cause injury or pollute the environment.
- Company develops activities that makes efficient use of materials which promotes protection of environment.

This HSE policy must be updated regularly and communicated to all employees and displayed prominently as a constant reminder.

Health, Safety and Environment (HSE) Management System

The Managing Director is responsible for the application of the HSE policy to the company or area of business. This will entail the setting of appropriate targets to meet the HSE objectives. Within this system, the HSE responsibilities of each of the following levels of staff must be clearly laid down:-

- ***Managing Director***
- ***Managers***
- ***Engineers***
- ***Supervisors***
- ***Contractors***
- ***HSE Committee Representatives***

All of the above are to be advised that they should never allow operational pressure to take priority over any speedy action which may be necessary to avoid harm to people; the workplace or the environment.

Whilst management commitment is essential for the successful implementation of the HSE policy, it should be recognised that line supervisors and contractors foreman "make" it happen and they should be made aware of this; be given appropriate authority and made accountable for the policy implementation relevance to their work.

There must be HSE performance monitoring section with set indicators. The aim of this activity is the improvement of performance rather than simply detection of failure.

Performance in HSE matters must be equivalent to or exceed the legal requirements against these standards.

Corrective action must be implemented and a manager must be nominated as the custodian of the corrective action plan for the HSE management system.

List of Applicable Legislation

Check for compliance with most recent Regulatory Requirements. The following are some of the Statutory Requirements with regard to Transportation of hazardous goods.

- **The Road Transport Act 1987 and Regulations**
- **Environmental Quality Act 1974 and Regulations**
- **Factories and Machinery Act 1967 and Regulations**
- **Petroleum (Safety Measures) Act 1984 and Codes**
- **Occupational Safety and Health Act 1994 and Regulations**
- **Public Health Ordinance 1960/2**
- **Employment Act 1953**
- **Atomic Energy Licencing Act 1984**
- **Fire Services Act 1990**
- **Pesticides Act 1914**
- **Poisons Act 1952**
- **Customs Act 1967**
- **Express Way Act. (*pending*)**
- **Towing Act. (*pending*)**

The above is not a complete list and member's are required to develop their own library of statutes affecting the transportation of hazardous products.

Material Safety Data Sheets

Mandatory Headings in Safety Data Sheets

- 1.** Identification of the substance or preparation
- 2.** Company undertaking identification
- 3.** Composition/information on ingredients
- 4.** Hazards identification
- 5.** First aid measures
- 6.** Fire-fighting measures
- 7.** Accidental release measures (spillages)
- 8.** Handling and storage (in normal use)
- 9.** Exposure control/personal protection (in normal use)
- 10.** Physical and chemical properties
- 11.** Stability and reactivity
- 12.** Toxicological information
- 13.** Ecological information
- 14.** Disposal consideration
- 15.** Transport information (Regulations and multinational codes)
- 16.** Regulatory information (Supply classification, eg. Labeling, national laws)
- 17.** Other information
 - Uses and restriction on use
 - Training advice
 - Further information and references
 - Sources of key data
 - Date of issue
 - Issue number
 - Original/Revision

Risk Assessment Guide

Introduction

The Responsible Care Distribution Code of Management Practices calls for each member company to have an ongoing chemical distribution risk management program to evaluate chemical distribution risks (risk assessment) and develop and implement risk reduction measures (risk reduction) that are appropriate for the level of risk. Risk assessment should include analysis of the:

- É ***Hazards of the chemical/incidents distributed;***
- É ***Likelihood of accidents/incidents and resulting releases; and***
- É ***Impact of these releases on the public and the environment.***

There are generally two types of risk management: **qualitative and quantitative**: Qualitative risk management is the basis for this implementation guide as it is the practicable method based on knowledge and experience of experts.

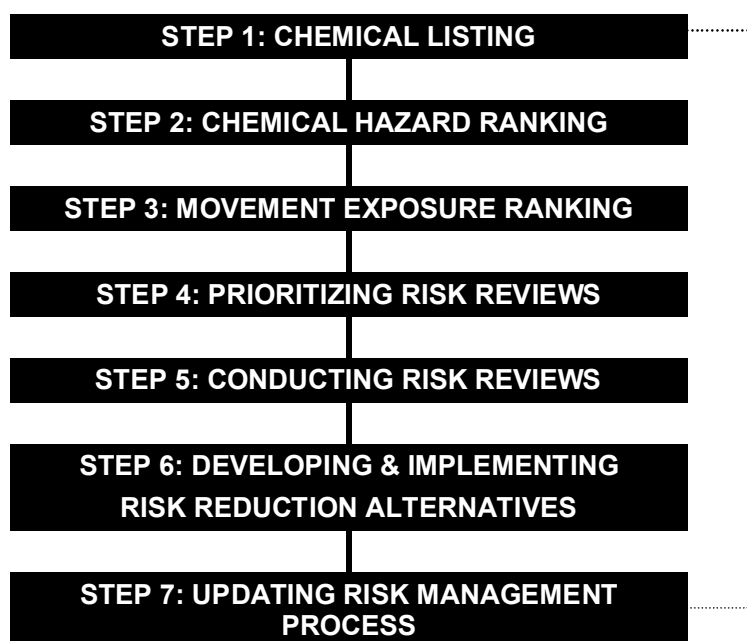
For distribution, qualitative risk management generally uses the experience and judgement of knowledgeable people to:

- É ***Analyze the causes and effects of accidents and resultant releases; and***
- É ***Determine appropriate ways to reduce their likelihood, magnitude, and/or consequence.***

When applying the process, the transporter would generally want to determine which chemicals receive the initial focus by prioritizing in a logical manner.

What follows are suggested steps for this process. The examples are given simply represent possible components of qualitative risk management.

Steps for Qualitative Distribution Risk Management



Step 1

Chemical Listing

To begin the risk management process, compile a list of transported chemicals for risk evaluation. Chemicals to be considered may include products, raw materials, intermediates and wastes. At a minimum, the list should include Department of Environment and Department Occupational Safety and Health regulated chemicals.

Step 2

Chemical Hazard Ranking

Once the list completed, a hazard ranking process can be used to identify and rank those chemicals that may have the potential, due to the inherent nature, to adversely affect people and the environment.

The approach to chemical hazard ranking can be used as fundamental as using existing classification systems such as those established by the Department of Environment or the United Nations (UN Recommendations on the Transport of Dangerous Goods, Orange Book Section 1.44). Each company can develop their own ranking based upon multiple factors such as:

É <i>Flammability</i>	É <i>Vapor Pressure</i>
É <i>Explosivity</i>	É <i>Reactivity</i>
É <i>Toxicity</i>	É <i>Corrosivity</i>

The purpose of this process is to facilitate a relative ranking. One example is indicated below:

Hazard Ranking

HIGH
MEDIUM
LOW

Each company is encouraged to use a system appropriate for hazard ranking of the materials it distributes.

Step 3

Movement Exposure Ranking

The next step is to measure and rank the exposure potential of a product movement to the public and the environment. Factors that may be considered, singly or in combination in the ranking include:

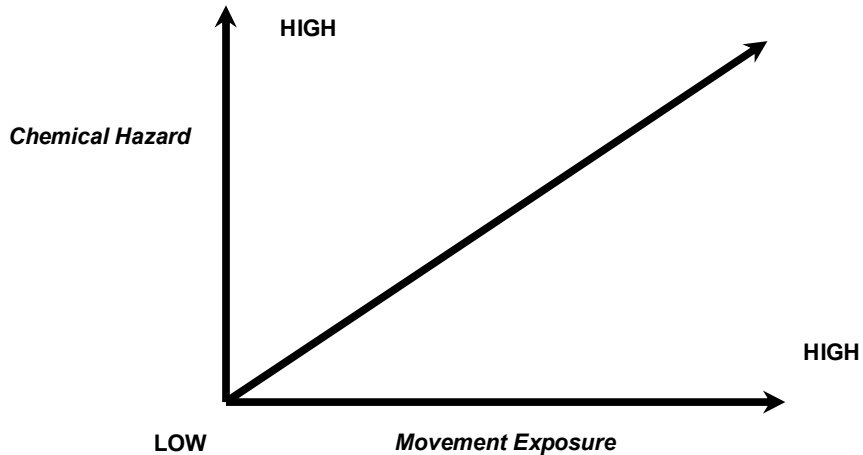
É <i>Annual Volume</i>	É <i>Population Densities</i>
É <i>Number of Trips</i>	É <i>Environmental Considerations</i>
É <i>Trip Distance</i>	

The list may not be all inclusive and members may also consider other factors that have impact movement risk such as traffic congestion and condition of road.

Step 4

Prioritizing Risk Reviews

Once the chemical hazard ranking from Step 2 and the movement exposure ranking from Step 3 are complete, they can be used to prioritize risk reviews. The following diagram illustrates a two axes system designed to consider the two rankings.



Risk review priorities can be determined based on hazard and exposure as illustrated above.

Another practical way of prioritizing risk reviews would be to divide the two axes into categories:

<i>Chemical Hazard</i>			
HIGH	3	2	1
MEDIUM	4	3	2
LOW	5	4	3
	LOW	MEDIUM	HIGH
<i>Movement Exposure</i>			

Note: Numbers in the grids suggest the priorities of review with 1 representing the highest and 5 the lowest. Some high hazard chemicals which are shipped with low movement exposure may warrant high priority consideration.

In setting priorities for risk reviews, the frequency of future reviews should also be considered with the higher priority categories receiving reviews more often. Companies are encouraged to use these guidelines to develop and implement a program of risk reviews that are performed on a regular basis. (See Step 7)

Step 5

Conducting Risk Reviews

Although this step applies and works well for one may not be applicable or effective for another. However, all members will likely perform some sort of risk review containing basic elements common to all. The goal is to anticipate and help prevent incidents that may cause loss of containment of a chemical during transportation.

The preceding steps dealt with prioritizing the risk reviews. The risk reviews themselves involve a more detailed consideration of the hazard and exposure assessment coupled with the assessment of both accident and release likelihood.

The review process will normally focus on current activities and practices. Various what if+scenarios of accident occurrences and probabilities may be helpful in assessment and acceptability of current practices and procedures.

Questions asked during risk reviews could include:

- É ***What are we doing now?***
- É ***What could go wrong?***
- É ***What could we do to reduce the risk?***

Risk reviews generally include the following types of activities:

■ **Hazard Assessment**

This activity helps to determine the degree and nature of the hazards of a chemical relative to those of other chemicals. It is measured relative to releases occurring as a result of distribution accidents. Examples of issues to focus on are:

- É ***Acute inhalation hazard to humans***
- É ***Flammability***
- É ***Explosivity***
- É ***Vapor cloud potential***
- É ***Reactivity***
- É ***Environmental damage potential (soil and water)***
- É ***Any unique hazards***
- É ***Regulations applicable to the chemical***
- É ***Distribution container volume***
- É ***Container contents pressure***
- É ***Container contents temperature***

■ **Exposure Assessment**

This activity helps to determine the degree of exposure to accidents and resultant releases for a chemical movement. Examples of issues to focus on are:

- É ***Annual volume distributed***
- É ***Trip length***
- É ***Number of trips***
- É ***Average population density along the route***
- É ***Size of metropolitan areas along the route***
- É ***Nature and number of potential risks along the route (e.g. bridges, tunnels, crossroads, etc.)***

■ Accident Likelihood Assessment

This activity helps to determine the likelihood of accidents occurring with the distribution mode and carrier used for this movement, relative to other modes and carriers. Examples of issues to focus on are:

- É *Relative accident rate for mode used*
- É *Relative accident rate for carrier used*
- É *Effect of any route-specific accident rate*
- É *Effect of procedures or controls employed*
- É *Effect of special training completed*
- É *Effect of special equipment used. E.g., bearing heat detectors*
- É *Age and condition of equipment and facilities*

■ Release Likelihood Assessment

This activity helps to determine the likelihood of an accident causing a release from the container used for this movement, relative to other container choices. Examples of issues to focus on are:

- É *Types of releases/spill scenarios*
- É *Impact resistance of container*
- É *Susceptibility of container fittings to damage*
- É *Special protective features, e.g., head shields*
- É *Container preparation*
- É *Container age and maintenance*
- É *Accident/incident history*

Step 6

Developing Seven (7) Implementing Risk Reduction Alternatives

Once the risk review is complete, the next logical step is to consider how to reduce the risks, where deemed necessary. Several possible risks reduction alternatives are detailed below.

■ Container Selection and Design

Container comes in a wide variety of sizes, types, configurations and construction materials. Minimum requirements for regulated chemicals are specified by government agencies. To help reduce risk in distribution, items to consider selection or modification include, but may not be limited to:

- É Construction materials, their strength and product compatibility
- É Pressure vs. non-pressure design required due to product vapor pressure, or for improved containment (vessel wall thickness)
- É Type of loading/unloading fittings, location on the container (top vs. bottom), excess flow check valves and physical protection from incidents and vandalism
- É Owned vs. leased vs. carrier-supplied containers, and frequency of testing, inspection and maintenance
- É Pressure relief valves vs. rupture disc vents, their operating settings and test frequency of relief valves
- É Containers that are insulated vs. non-insulated vs. thermally protected
- É Size selection which relates to the amount of material allowable by mode and magnitude of release

- É Ease or difficulty of proper securement before shipment to preclude spillage during normal distribution handling and in an overturned position.
- É Special features such as a double-walled containment, multiple compartments and protective shields.

■ **Mode Selection**

Risk reduction alternatives may be developed by considering the various modes, combination of modes, and options within modes used to transport chemicals. The modes of transport include:

- É **Highway**
- É **Rail**
- É **Marine**
- É **Air**
- É **Pipeline**

A number of options exist within each of these modes including:

- É **Common vs. contract vs. private**
- É **Truckload vs. less than truckload**
- É **Bulk vs. packaged**
- É **Pushed barges vs. towed barges**

A number of options exist within each of these modes including:

- É **Number of trips**
- É **Incident History**
- É **Maintenance**
- É **In-transit storage and handling**
- É **Time in transit**

■ **Carrier Selection**

One way of reducing the risk of accidents and releases is to select carriers based on safety performance record, safety programs, and quality of their equipment, facilities and personnel. In risk management, further effort and resources should be directed at reviewing carriers used for transporting the higher risk chemicals. For more detail on carrier selection, refer to the implementation aids on the subject.

■ **Route Selection**

Some factors to be considered in selecting a route to minimize risk include:

- É **Accident frequencies**
- É **Physical condition/terrain of route**
- É **Population density**
- É **Environmentally sensitive areas**
- É **Length of route**

■ Operating Procedures and Practices

Changes in operating procedures and practices can influence risk and may be a part of risk reduction alternatives. Some administrative areas that may be considered are:

- É *Frequency and depth of carrier evaluation*
- É *Loading and securement*
- É *Inspection: (1) pre-loading; (2) post-loading; (3) in-transit*
- É *Special in-route procedures such as speed limitations*
- É *Unloading procedures*
- É *Maintenance schedules and frequency*
- É *Screening of personnel involved*
- É *Specific policies that affect distribution, e.g. operating during daylight hours only*

■ Emergency Response

Emergency response and public preparedness are considered an integral component of risk management because they can help reduce the consequences resulting from an incident.

■ Training

The greater the training and knowledge of personnel involved in chemical distribution, the more responsible their job performance may be. Detailed training in loading, unloading and inspection procedures are important to reducing the possibility that an incident might occur during the distribution process. Training in safe handling and intrinsic dangers and properties associated with various types of chemicals should also be considered. Finally, thorough training in emergency response procedures is necessary to quickly and effectively minimize any incident-related harm to the general public, our workers and the environment. Training may cover:

- É *Pre and post-loading inspection and in-transit inspection*
- É *Securement*
- É *Loading and unloading*
- É *Hazards associated with the chemical*
- É *Emergency response*
- É *Vehicle operations*
- É *Shipping documentation*
- É *Risk assessment and mitigation*

■ Chemical and Physical Properties

In some instances, options may be available to alter the physical properties or state of the chemicals transported. These options could reduce the volatility, explosivity, reactivity or toxicity of the products. Some examples are:

- É *Further processing*
- É *Mixing or diluting*
- É *Lowering temperature*
- É *Adding inhibitors*

Step 7

Updating Risk Management Process

Effective distribution risk management should be considered a continuing process of risk reduction. Since many of the factors involved in the overall risk management are dynamic and changing, this process should be repeated at regular intervals. In addition, as more pertinent information becomes available, it should be used to improve this process. It is suggested that higher risk movements receive more frequent reviews.

UN Classification of Hazardous Chemicals

There are 9 CLASSES OF 'dangerous goods'.

Characteristics of each class:

Class 1 - EXPLOSIVES

Subdivision of Class 1

1.1	Substance with a mass explosion hazard	Ammonium Picrate, TNT
1.2	Substances with a projection hazard	Shotgun cartridges, bombs, grenades.
1.3	Substances with fire hazard + minor blast hazard	Distress signals, display fireworks
1.4	Substances with no significant hazard, but may ignite during transport	Explosive release devices, toy fireworks
1.5	Very insensitive substrates with mass explosion hazard	
1.6	Extremely insensitive articles which do not have a mass hazard	

Class 2 - GASES

Subdivision of Class 2

2.1	<i>Flammable gas</i> . ignite on contact	Acetylene, Hydrogen
2.2	<i>Non flammable / non toxic gas</i>	Oxygen, Nitrogen
2.3	<i>Toxic gas</i> . Liable to cause death or serious injury to human health if inhaled	Ammonia, Chlorine

Class 3 – FLAMMABLE LIQUIDS

This class of product is subdivided into 3 packing groups based on flash point and boiling point:

Definition of Flash Point

Flash Point is the temperature at which a liquid or volatile solid gives off a vapour sufficient to form an ignitable mixture with the air near the surface of the liquid or with the test vessel.

The UN defines packing groups (PG) which are required for various dangerous products depending on the degree of hazard. The greater the hazard the more stringent the test is that the package has to pass e.g. Drop test.

<i>Packing Group</i>	<i>Drop Test Height</i>	<i>Flash Point</i>	<i>Boiling Point</i>	<i>Example</i>
I	1.8m	-	< 35°C	PENTANE (Fp <-18°C Bp 27°C)
II	1.2m	< 23°C	> 35°C	PROPANOL (Fp 15°C Bp 97°C)
III	0.8m	> 23°C < 23°C	> 35°C	ISOBUTANOL (Fp 28°C Bp 97°C)

Class 4 – FLAMMABLE SOLIDS

Subdivision of Class 4

4.1	Flammable Solids	Nitrocellulose, Phosphorus
4.2	Substance liable to spontaneous combustion	Activated or spent catalysts
4.3	Substances which in contact with water emit flammable gases.	(Sodium, Calcium Carbide)

Class 5 – OXIDISING SUBSTANCES

Subdivision of Class 5

5.1	<i>Oxidising</i> . other than organic peroxides	Calcium Hypochlorite, Amonium Nitrate, Hydrogen Peroxide
5.2	<i>Organic Peroxides</i>	Benzoyl Peroxide, Cumene Peroxide

Class 6 – POISONOUS (TOXIC) AND INFECTIOUS SUBSTANCES

Subdivision of Class 6

6.1	<i>POISONOUS</i> - liable to cause death if inhaled, swallowed or by skin absorption	Cyanides, Lead Compounds
	<i>TOXIC</i> . harmful to human health	Low toxicity Pesticides
6.2	<i>INFECTIOUS</i>	Medical waste, vaccines

The following table shows the relationship between the Toxicity and Packing Groups.

Toxicity – LD₅₀ (mg/kg)

<i>Packing Group</i>	<i>Oral mg/kg</i>	<i>Dermal mg/kg</i>	<i>Inhalation of Dusts & Mists mg/1</i>
I	< 5	< 40	< 0.5
II	> 5 - 50	> 40 . 200	> 0.5 . 2
III	> 50 . 200	> 200 . 1000	> 2.0 . 10
IIII	> 50 . 500		

For the inhalation toxicity of vapours . the criteria are different to those for dusts and mists and take account of vapour pressure.

Class 7 – RADIOACTIVE SUBSTANCES

A substance or a combination of substances which emit radiation, e.g. Uranium, Radioisotopes.

Class 8 – CORROSIVES

Substances which being solids or liquids may harm living tissue or damage equipment, e.g. Hydrochloric Acid, Caustic Soda, Dobanic Acid.

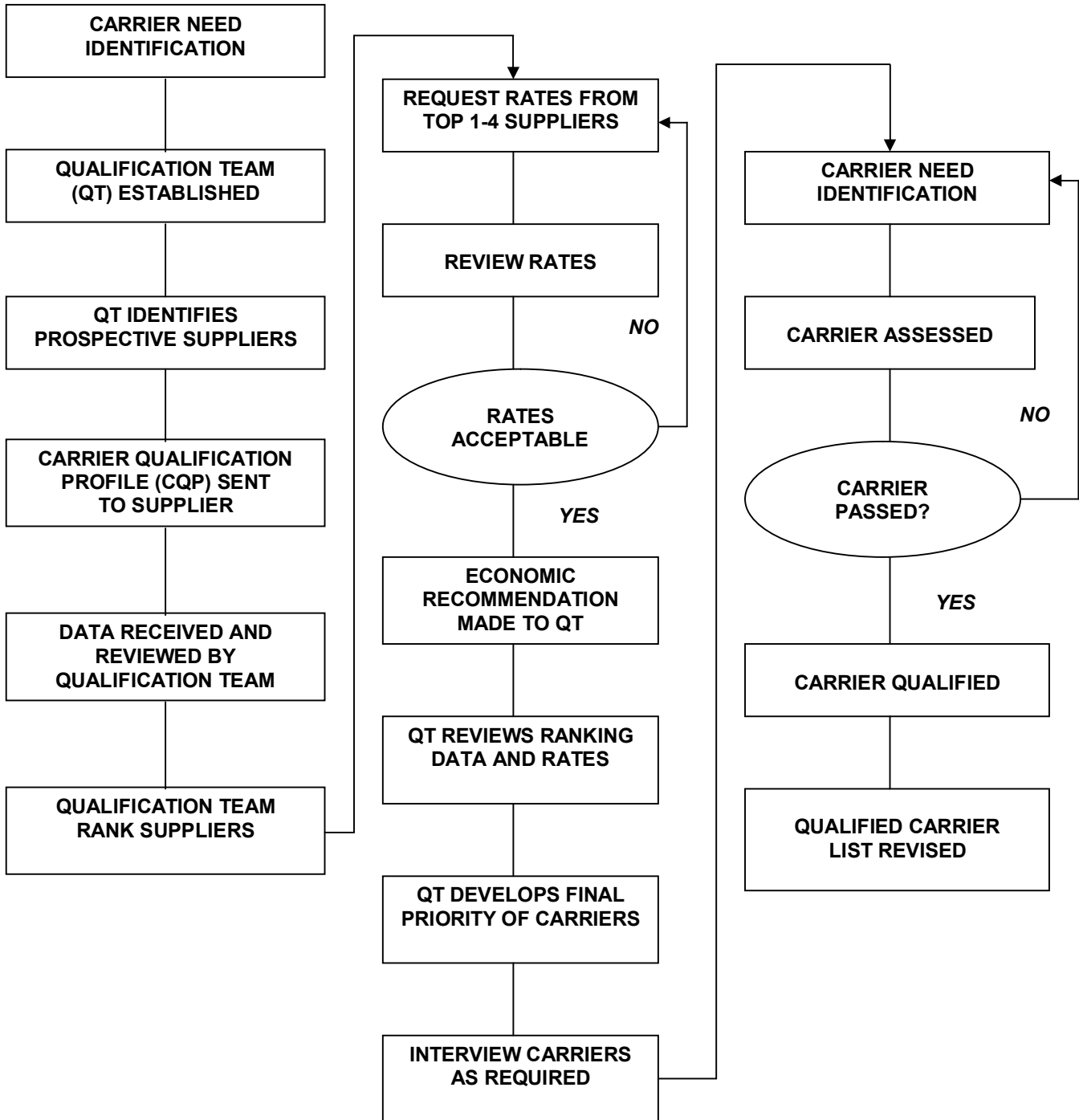
The following table gives the relationship between the Corrosity and Packing Groups.

<i>Packing Group</i>	<i>Time Scale in Which Visible Necrosis to the Skin Occurs</i>
I	< 3 mins
II	3 . 60 mins
III	1 . 40 hours or corrosive metal

Class 9 – MISCELLANEOUS DANGEROUS PRODUCTS

Substances which present relatively low hazards e.g. EPS (a solid which contains/emits a flammable vapour . pentane), Aerosols.

Motor Carrier Qualification Process Flow Chart



Motor Carrier Qualification Process

Accident and release-free chemical transportation is critical to the entire chemical industry. The key to this is to utilise only those carriers who share the Chemical Industry's Safety and Environmental commitments and whose good words are backed by:

- ***An effective safety organisation, including adequate staffing to do the job properly.***
- ***Effective management control and record-keeping systems.***
- ***Safety performance.***

Qualification Standards

1. Safety Compliance

The carriers management has a written that states the belief that all accidents and injuries can be prevented and provides the resources, organisation and process necessary for investigation analysis and development of action steps needed for prevention and continuous improvement of safety performance.

Carrier provides overall operations and services in conformance with all applicable laws and regulations and provides evidence of on-going compliance including a process for self assessment of regulatory compliance.

2. Authority

Carrier must have appropriate operating authority to meet customer's shipment requirements e.g. permits authorizing Carriers to provide such contract services.

3. Insurance

Carrier must meet or exceed the minimum levels of financial responsibility as prescribed by Road Transport Department (RTD).

Carrier must meet or exceed the minimum requirement of RM _____ cargo insurance as prescribed by _____ (customer).

4. Equipment

Carrier must provide equipment which is safe, mechanically fit and up-to-date based on all regulatory requirements. This equipment is subject to a preventive maintenance program, effective inspections and follow-up to repair and correct reported discrepancies.

5. Carrier Drivers

Carrier's management uses high standards in the selection of drivers and provide regular training and retraining to ensure that all drivers are able to perform their responsibilities in a safe, professional manner and comply with applicable regulations. The driver population must be composed of 100% company drivers or a combination of company drivers and owner/operators on a long term lease totaling 100%.

6. Quality Process

Carrier must have a demonstrated commitment to a quality improvement process which includes a statement of quality, on-going quality training for all employees, use of statistical process control techniques to measure safety, delivery, pickup, claims and equipment performance.

7. Carrier Responsiveness

Carrier must provide a 24 hour contact in the event that they have to be contacted during non-business hours.

8. Financial Stability

Carrier must be in sound financial position.

Driver Hiring Practices

1 Carrier has established criteria for selection of drivers based on the following:

- É ***Driving experience***
- É ***Minimum/maximum age limits***
- É ***Physical (medical) conditions***
- É ***Hazardous material training & experience***
- É ***Possession of the required licenses***
- É ***Language skills***
- É ***Driving history***

2 Carrier maintains individual files for drivers to verify qualifications vs above criteria

3 Carrier has established method of testing driver's qualification and validation of work history. Method includes but not limited to reference to police and previous employer. Results are noted in driver's life.

4 Driver's qualifications are tested through written tests for knowledge, a road test for driving skills and a medical examination.

Carrier Safety

The three basic steps that can help achieve the desired improvement in safety performance are:

- ***Carrier Qualification***

Overall safety performance may be improved by selecting carriers that have superior safety records and/or demonstrated through policies, programs and operating practices that they have a management commitment to safety.

- ***Safety Performance Monitoring***

Data may be collected from the carrier, or provided by the carrier, to assist in evaluating its ongoing commitment to safety and to reinforce the importance of safety programs and safety results.

- ***Performance Improvement***

Providing feedback to carriers on safety performance deficiencies, reviewing performance improvement measures and setting performance improvement goals may contribute to long-term continued safety improvement.

The depth of application of each of these steps will vary each mode of transportation and the degree of hazard of each chemical product. The information provided in this implementation Aid is designed to provide concepts and lists of possible elements that may assist each company in designing a specific program to fit its business and meet the goals of the code.

Motor Carrier Selection/Qualification

Although any motor, rail, air, ocean, inland waterway or pipeline provider of chemical transportation service can be considered a carrier but in this aid only motor and rail transportation will be considered.

Whatever your programme, you may regard the following elements as important for implementation of this code.

1. ***A process for qualifying common carriers***

- Check for compliance with most recent Regulatory Requirements regarding all aspects of distribution of chemicals.
- The carrier company must have Safety and Health Management System in place.

2. ***Safety Policy Organisation***

The policy simply states the priority that safety has within the company and shows the commitment of the entire company to safety. By displaying the policy, the company sets the formal basis for safety performance monitoring and for holding the carriers accountable for their safe operations.

A formal Safety Organisation is needed for specific accountability, specific individuals and functions must be charged with primary safety accountability; this responsibility must be formally communicated throughout the organisation and safety must be a key part of performance evaluation.

3. *Driver Hiring Practices*

Driver hiring practice by the transport company will help to secure only qualified drivers.

The criteria shall include such factors as experience, minimum age, physical and medical examination, language skills, possession of the required licences, and driving history.

4. *Driver Training*

Company must have a driver training programme to improve driving skills and dangerous goods expertise.

Training programme to cover such topics as defensive driving; dangerous goods handling; loading and unloading procedures, vehicle inspection; explanation of relevant regulations; accident investigation; what to do when an accident or spill occurs; route selection to avoid densely populated areas, etc. Training must range from formal classroom teaching to periodic discussion sessions focussed on safety related topics.

5. *Driver Management and Hours of Work*

Driver management consists of formal safety requirements such as:

- (i) speed limit policy; (ii) seat belt policy; (iii) passenger restrictions;
- (iv) alcohol prohibition etc.

Carrier must adhere strictly to statutory requirements pertaining to hours of work per day and rest periods.

Carriers must have effective record keeping and analysis to measure driving hours of service time. The normal work of a driver consists of driving time and time required to load and unload. A driver must be present during loading and unloading of bulk chemicals in order to move vehicle in case of emergency.

6. *Vehicle/Tank Specifications*

Every vehicle has modern, operable electrical lighting with overload protection (fuses, circuit breakers), including headlights, tail lights, turn indicators, stop lights, identification lights and side marker lights. Appropriate type of fire extinguisher for use of chemicals and electrical fires.

Retread tyres not used on front (steering) wheels operable brakes on all wheels.

Vehicles must be equipped with stopped-vehicle warning devices e.g. operable flashing lights or large emergency reflectors such as reflective triangles. Note: Flares not allowed on trucks containing flammable or explosive materials. Fuel, brake and electrical lines are protected from chafing, abrasion and engine.

There must also be a first-aid kit; filled eye-wash bottle, safety goggles and chemical resistant gloves. Hazardous chemical, identification symbol (HAZCHEM) must be displayed together with contact telephone number on carrier. Rear underrun bumpers and sideguards for heavy vehicles. All heavy vehicles must be fitted with hazard warning lights (Beacon Light). All heavy vehicles should carry at least 5 traffic cones to be used during emergency or

breakdown. Reflective plate of minimum size 285 mm x 285 mm must be provided at the rear of the vehicle to increase reflectivity.

Drivers must always wear long pants, shirt and shoes.

7. For Bulk Cargo, the following specifications must be met:-

Each tank compartment is equipped with at least one pressure safety relief device (valve) designed to relieve excessive overpressure in a controlled fashion and to limit the potential for rupture of the container due to overpressure. (A combination of fusible and frangible devices may be used in addition to safety relief valves if the valves alone are not sufficient to restrict pressure building to safe limits.)

Safety relief valves close automatically when the pressure buildup is reduced and are designed to prevent loss of liquid in case of vehicle overturn.

Each tank compartment is equipped with vacuum relief valve(s) of adequate size to protect against tank collapse as materials cool or are unloaded.

Each tank compartment has a gauging device which accurately indicates the liquid level in each compartment. (Gauge **glasses** are not permitted; a dip tube and gauging table is a common acceptable device.)

All openings for filling, access or inspection have positive closure (tight against leakage of vapor and/or liquid) and roll-over protection to prevent leakage of lading in the event of overturning vehicle. Safety relief valves have similar rollover protection.

Each tank compartments is made of a material suitable for the material contained; all compartment linings, hoses and fittings are suitable for the product carried.

All discharge outlets are equipped with caps to prevent leakage of lading, and have an external, manually operated valve which is leak tight; this valve has the capability of being repaired and maintained.

In addition to the external product discharge valve, all discharge lines have **internally** shutoff valves which are spring loaded to be normally closed.

The discharge lines and internal valves are designed so that, in the event an external valve is shared off in a accident, the internal valve remains intact. The internal valves are equipped for remote operation in emergencies where the driver cannot reach the primary control area. As a secondary protection in the event of fire, the valves allow closure by automatic heat-actuated means (e.g., fusible links or plugs).

Cargo tanks have rear bumpers to protect tank and piping from rear end collisions.

Hoses, piping and fittings for tanks loaded or unloaded by pressure have a bursting pressure of at least 4 times the pressure to which it will be subjected.

8. Vehicle/Tank Inspections

Vehicles and tanks are inspected regularly to ensure safe operations and equipment is not operated when in a condition likely to cause an accident, breakdown or leak. Four kinds of inspections are involved: Routine pre-trip inspections; post-trip inspections; in-transit inspections of hazardous materials shipments; and periodic, scheduled tank inspections.

Both pre-trip and post-trip inspections consist of a visual examination and/or operational test of such items as the following: brakes; steering mechanism; towbars or fifth wheel assemblies

and locking devices; lights and reflectors; horn windshield wipers; mirrors; coupling devices; emergency equipment; tank valves and discharge line caps; wheels, rims and tires.

NOTE: Tires are considered safe when they have no significant damage and a minimum tread groove pattern depth of at least 3.2 millimeters (4/32 inches) on the front (steering) wheels and 1.6 millimeters (2/32 inches) on the remaining tractor and trailer tires.

A written checklist is suggested for these inspections, and if deficiencies are found, the vehicle is not operated until they are corrected. Maintenance records are maintained by tractor and by trailer to show when necessary repairs are made.

In-transit inspections of hazardous material shipments consist of stopping the vehicle at a safe location at least once after every two hours of travel and conducting a visual walk-around inspection, looking for any problems such as flat or hot tires, leaks, dragging rigging, etc. On-road problems are corrected at the nearest safe location before continuing on the trip; drivers are trained in these inspection requirements.

Scheduled tank inspections and tests are conducted according to the following fixed schedules to ensure that the structural integrity of the tank and its appurtenances is maintained:

External Visual Inspections take place annually to check for corrosion, leakage, structural defects, weld defects, functionality and any external damage. The inspection covers tank shell, heads, piping, valves, gaskets, pressure and vacuum relief devices, manhole covers and tightening devices, and structural attachments to the trailer itself. Carriers have written instructions defining pass/fail limits for the items inspected and records are maintained of inspection dates and inspection/test results. Tanks which have not been inspected on time or which have failed such an inspection are not offered for use to UCC until they pass inspection with no deficiencies.

In addition to annual scheduled external inspections, similar inspections take place and are recorded whenever a tank is involved in an accident. Such inspections may be used to ~~re-~~start the annual clock.

Internal Visual Inspections are conducted every 5 years or after a tank has been in an accident.

Formal records and pass/fail criteria are maintained in the same fashion as for external inspections. The internal visual inspection checks the tank shell and heads for corroded and abraded areas, dents, distortions, weld defects and any other potential safety-related conditions. Corroded or abraded areas are thickness tested to confirm they have not deteriorated beyond safe limits.

Pressure tests are conducted every 5 years or after an accident where dome or tank deformation takes place to ensure tanks are leakproof at 1.5 times the design pressure or 20.7 kPa (3 psig), whichever is greater. Pressure tests are conducted as follows:

Each compartment of a multi-compartment tank is tested separately, with the adjacent cargo tanks empty and at atmospheric pressure.

All re-closing pressure relief valves are removed and their openings plugged. The valves themselves are tested separately to ensure they open at the required set pressure and reseal to a leak-tight condition at the appropriate pressure.

Tanks are tested either hydrostatically or pneumatically and hold the test pressure without leakage for 10 minutes.

Test schedules and results are maintained and tanks which leak, fail to retain pressure, show distortion, excessive expansion or other evidence of weakness are not returned to service until repaired.

9. Vehicle and Tank Maintenance

All maintenance work on tanks, tractors and trailers, is recorded in files which identify the specific piece of equipment and its inspection/maintenance history.

Tank maintenance is performed according to results of the scheduled periodic tank inspections, or as necessary if a tank is involved in an accident. Tractor and trailer maintenance is performed as required to repair problems detected during the various inspections and after accidents.

A system of routine preventive maintenance also exists ensures equipment is kept in safe operating condition at all times. This system requires scheduled maintenance of the systems described previously, as well as additional items which may affect operations, e.g., lubrication systems, frame and frame assemblies, suspension systems, axles and steering systems. It also requires maintenance of outlet valves in such condition that they will pass pre-loading vacuum and pressure testing requirements.

Incidents: History, Investigation Policies & Insurance

It is important to be able to analyze the cause of accidents and spills (incidents) in order to try to prevent them in the future. Similarly, incident trend data is important to help measure the effectiveness of safety programs. Lastly, carriers need adequate financial resources to be able to withstand the consequences of incident if they do occur.

Whenever accidents and/or spills occur, they are analyzed and casualty is determined.

An incident file is maintained wherein details of all incidents are recorded . e.g., date, cause, cost of repairs, whether people were injured or killed, etc. If material was spilled, the material name, amount spilled and value of lost material is also recorded.

All incidents are discussed with involved personnel; details and actions taken are recorded in their files.

Third party liability insurance is always in force in a large enough amount to cover the upper limits of financial risk normal incidents and cleanup costs.

Emergency Response

Designated personnel are available 24 hours/day to receive notice of emergencies. Response procedures are planned in advance and are communicated to drivers. The procedures cover the following issues:

- Product and hazard identification in event of spill . including immediate hazards to health, risks of fire or explosion, immediate precautions to be taken, and immediate methods for handling fires and spills in the absence of fire
- Immediate notification (:call-in+) procedures to public safety authorities, to carrier headquarters, and to your company
- Other formal reporting procedures as may be required by local regulations
- Use of protective equipment carried onboard the vehicle
- The actual physical response to the emergency

If specialized contractors are used for cleanup or emergency response, they are selected based on their competency. The contractors preferences and basis for selection are maintained on file, available for review.

Tank Cleaning: Heal & Waste Disposal

CICM's safety and environmental concern extends beyond transportation itself to ancillary activities such as tank cleaning and waste disposal.

While many motor carriers handle their own tank cleaning, the disposal of waste (the undiluted remains (heel) of the material transported as opposed to waste-water which is diluted with water) often is handled by outside contractors. If a job is sub-contracted, the motor carrier must ensure that all subcontractors also meet the requirements.

Tank cleaning facilities have safe operating practices and do not release harmful wastes to the environment.

Examples of safe operating practices:

- Programs exist which instruct tank cleaners and waste disposal personnel in the hazards of the materials they handle, in the use of protective equipment
- Spark-free tools are used and a flame-free operating environment is maintained

The waste-water and waste disposal requirements attempt to avoid ground water and surface contamination as well as to protect employees and the public from exposure to hazards of the materials.

Carrier Safety Assessment

Safety Assessments consist of periodic surveys conducted at a carrier's site (terminal and/or headquarters) where a carrier's safety performance is formally assessed against local government regulation accident records, delays, damaged equipment and cargo, poor morale, customer complaints and high operating costs. This will identify the possible shortcomings of your present transport operation. To help you systematically evaluate the major areas of concern, you should develop a checklist highlighting those items.

Carrier Company's Site Management & Safety Procedures

This last section covers carrier's site management and terminal operations:

- Carrier's terminals are neat and well-maintained
- Safety policies exist and are communicated to terminal personnel regarding such issues as vehicle operations, on-site speed limits, where smoking is permitted, spill cleanups, etc.
- Operable on-site fire fighting facilities exist of adequate nature to prevent the spread of a normal truck fire involving the contents of a leaking tank of flammable material
- Employees have access to and are required to wear, as circumstances dictate, protective safety equipment such as boots, gloves and goggles
- Paved parking and storage facilities are favoured, with appropriate diking and drainage diversion facilities to allow containment of on-site spills. At a minimum, formal spill containment and reclamation plans exist, along with the operable equipment and training to implement such plans.

Rail Carrier Qualification

Rail carrier, as opposed to motor carrier options, are more limited. No standard inter-industry survey form or program is currently available. It is necessary to consider designing a survey form specific to your company and your chemicals.

In Peninsular Malaysia, the rail service is operated by the Malaysian Railways which is a privatised Government Company whilst in Sabah and Sarawak each State has its own railways operated as a Statutory Body.

You may consider the following survey elements as important in developing a rail carrier safety survey program:

⊇ Operating Practices

- Defined interchange points along routes of movement where train inspections are performed;
- Train and yard operating procedures to accommodate wide variation in daily ambient temperatures or severe weather conditions;
- Coupling speed standards;
- Procedure for monitoring coupling speeds;
- Inspections of tank mounting;
- Train speeds and operating procedures for monitoring/control on mainline and branch lines;
- Testing of safety devices on pressure tanks mounted on bogeys
- Availability of special protective clothing and safety equipment provided for workers who handle hazardous materials;
- Loading and unload procedure of hazardous chemicals;
- Carrier emergency response practises;
- Process for reviewing planned route of movement with shippers of high hazard materials; and
- Substance abuse policy and enforcement procedures
- Labelling of tanks

⊘ Employee Training

- Type and frequency of training in railroad operating rules and procedures
- Crew training in railcar securement procedures and inspection for proper securement;
- Special training on the characteristics and proper handling of hazardous materials for crews involved in transporting them;

- Crew training in the proper use of protective clothing and other safety equipment;
- Emphasis on accident and product release prevention in railroad policies and procedures; and
- Crew training in emergency response procedures.

⊂ **Emergency Response and Incident Communications**

- Availability and location of emergency response equipment;
- Availability and location of hazardous materials emergency response teams (either outside professionals or carrier-operated);
- Procedures for notifying other organizations eg. Police, hospitals, fire dept, etc.
- Carrier's designated emergency response contact(s) for the shipper; and
- Defined responsibility within carrier management for notifying local authorities.

⊂ **Maintenance Capabilities (running gear and safety appliances)**

- Pressure tank preventive maintenance and servicing procedure
- Special maintenance procedures and capabilities for cars carrying hazardous materials; and
- Auditing procedures (maintenance service audits, compliance and procedures, follow-up action or recommendations, audit team qualifications, etc.)

Marine Carrier Safety Qualifications Guide

The focus of marine carrier safety is usually directed at equipment maintenance, operator training and management practices and procedures so as to reduce the possibility of product releases, safe loading and unloading activities and provide effective mitigation and corrective actions in the event of emergencies.

Marine carriers are usually checked regularly for seaworthiness and safety by ship Classification Societies and are also surveyed regularly by qualified surveyors according to Merchant Shipping Ordinance 1952.

However the important elements for consideration when reviewing marine carriers may include the following:-

Safety PERFORMANCE Review

- Overall safety philosophy, safety goals and objectives
- Compliance with applicable national and international Regulations
- Incident/accident investigation and recommended safety procedure changes;
- Log of occupational lost-time injuries
- Employee hiring pollicy
- Documentation of marine leaks/spill; vessel and dock damage;
- Contingency Plan for hazardous substance spill/release
- Insurance and financial resources for covering emergencies

Operating Practices

- Frequency of equipment inspections.
- Operating procedures to accommodate bad weather
- Audits of operating procedure,
- Availability of special protective and safety equipment for handling hazardous substances;
- Cargo handling practices and emergency response procedures for hazardous substances
- Carrier substance abuse policy and enforcement
- Employee exposure monitoring for hazardous materials
- Emergency release notification and reporting procedures and
- Auditing ownership and responsibility

Maintenance Procedure

- Preventive and predictive marine equipment maintenance programme
- Carrier's equipment and maintenance files;
- Resources available to perform repairs under normal operating conditions;
- Repair procedures in compliance with regulatory requirements
- Equipment maintenance auditing programme

Employee Training

- Type of training and frequency pertaining to marine safety, operating rules and procedures,
- Documentation of all training records;
- Special training for crews involved in transportation of hazardous substances;
- Special training for crew in use of special personnel protective clothing and other safety equipment
- Carrier accident and product release prevention procedures;
- Crew and employee training in emergency response procedure, including first aid etc;
- Carrier qualification procedure for sub-contractors;
- Hazard Communication programme;
- Refresher training
- Training requirement with local and international regulations;
- Training drills at regular intervals

Emergency Response and Incident Communications

- Procedures for notifying relevant local authorities and other organizations in case of emergency
- Information and operational guidelines on emergency procedures for hazardous materials;
- Location, quantity and capability of emergency response equipment;
- Availability and location of emergency response teams and/or outside professional emergency response teams; and
- Carriers designated emergency response contacts;

Pipeline Carrier Qualification Guide

Pipeline carrier is usually a loading, storage or unloading facility at the manufacturers installing site or at a port or wharf. There are Regulations and Codes of Practice for the design of pipeline construction which are used for transportation of chemicals. Such Regulations control the anchorage; size; safe working pressure, expansion/contraction, emergency shut-down and safe operation of such pipeline system. What is important in pipeline carrier qualification is the on-site inspection and emergency response capability in case of a mishap.

The following elements for pipeline operator qualification may be considered:-

- Regulatory compliance including safety and incident recording
- Documentation of employee training programme;
- Emergency response capability and incident communications plan of the operator
- Procedures and practices in use by the pipeline operator to ensure system integrity
- Materials Safety Data Sheet (MSDS) or other product hazard information which accurately depicts the nature of the product to be handled
- Clear understanding of what danger in-transit pipeline storage can occur
- The criteria for and manner of the construction of the pipeline
- Review of the safety equipment available in case of emergency response
- The in-transit storage facility procedures and capabilities for the proper handling or disposal of product interface material which occurs from transportation in both system and;
- Management programmes, training, inspection, security, waste management other environmental considerations

Handling and Storage

Chemical handling and storage covers a wide range of activities. There is an unloading and loading step at each transfer point along the distribution chain, associated storage and in many cases a transfer to another container that entails a separate loading/unloading step in the process. Customers are the ultimate receivers of the chemicals and must be included in the information chain to provide for proper handling and storing at their facilities.

For bulk shipments of chemicals, and other types of returnable and reusable containers, there is an associated product residue remaining in the container. Sufficient information about the product, or criteria for cleaning the containers should be developed and passed on to the appropriate handlers to assist them in the proper cleaning of the equipment and the proper disposal of cleaning residues.

A wide range of storage and handling services by third parties. The Code calls for a process to qualify these service providers such as transporters and warehouse operators.

Container Selection

Documented procedures for the selection and use of containers that are appropriate for the chemical being shipped, in compliance with testing and certification requirements, and free of leaks and visible defects.

Modern regulatory responsibilities are placing a greater burden on the shipper to certify that containers are in compliance with regulations. Part of that procedure defines a range of suitable containers that are appropriate. In addition, your particular chemical product may be incompatible with some materials of construction. A documented procedure that defines how you go about the selection, testing and certification is the best way to achieve regulatory compliance.

For the purpose of this Code, the term container is used very broadly. It ranges from small bottles and bags to ocean-going tankers or barges.

Many containers, especially bulk, are suitable for a documented leak and defect detection procedure prior to use. Performance-oriented leak detection can best be performed after container filling.

Loading and Unloading

Documented procedures for loading chemicals at company facilities that will reduce emissions to the environment, protect personnel and provide securement of lading during transit.

Documented procedures for unloading chemicals at company facilities that will reduce emissions to the environment, protect personnel and provide for safe unloading into proper storage facilities.

Loading and unloading procedures bears a strong similarity but are usually carried out at different locations within a facility. Emissions to the environment from loading and unloading should be given special consideration when developing procedures.

There are two distinct differences between loading and unloading operations.

- Loading procedures should include provisions for loading, blocking and bracing of the lading, and for the securement of all fittings on all types of containers; and
- Unloading procedures should contain provisions that lead to the transfer of chemicals into safe and compatible tanks and facilities.

Cleaning and Disposal Criteria

Defined criteria for the cleaning and return of tank cars, tank trucks, marine vessels and returnable/refillable bulk and sem-bulk containers, and for the proper disposal of cleaning residues.

Defining criteria for the cleaning and return of all forms of returnable and reusable containers can assist the cleaner/disposer in developing procedures that will protect its personnel that will protect its personnel, the environment and the public from present or future exposure.

Information and Guidance to Customers

A program for providing guidance and information to customers, distributors and other receivers on proper procedures for unloading and storing the company's chemicals.

Each chemical product must be accompanied by a material data sheet for information of user. Information you develop while documenting your own procedures and which you determine is important for the safe unloading and storage of your products should be passed on as guidance to your products. Not only are safety considerations important, but some closely related products quality issue are also important to maintaining a lasting business relationship between you and your customers.

Qualification and Performance Improvement of Others

A process for selecting distributors and other facilities that store or handle the company's chemical in transit that emphasizes safety fitness and regulatory compliance, and includes regular reviews of their performance and compliance.

Feedback to distributors and operators of other facilities on their safety performance and suggestions for improvement.

There is a wide range of third parties that provide distribution services for your company (distributors, toll processors, contract packers, public warehouses and terminalling and transferring operations to name but a few). Because the distinction between these third parties and your customers may be narrow, it is important to determine which should be subject to a qualification process. The qualification process principles should be similar to the qualification principles, and lead to rational and conscious decisions on whom you wish to provide these services in a safe and effective manner.

Transport and Emergency Preparedness

Basic requirements:

Each member company shall have written transportation emergency plans and/or procedures to deal with accidents/incidents and mechanical breakdowns

(Note: This program element is not intended to encompass the requirements concerning community awareness and emergency response plans, which will be covered in other codes, yet to be published).

Drivers should be instructed in the proper procedures to be followed if they were involved in an accident, incident and/or mechanical breakdowns. Each vehicle or driver should have a formal accident report questionnaire to record necessary information accurately and in a timely manner. Drivers should know how to secure the scene while waiting for help to arrive. Drivers should also know what to do and whom to contact in the event of a transportation emergency. Contact numbers should be kept evergreen.

Emergency plans and procedures should include/address the following:

- Develop with carriers written transportation emergency response plans
- Formal and periodic training of employees involved in emergency involved in emergency response activities.
- Provide information about the company's products in distribution, to Emergency response authority.
- Provide technical advice to emergency responders.
- Provide emergency support to carriers and emergency response authorities during incidents
- Manage reporting, investigation and follow-up of all accidents/incidents.

Acknowledgements

The Chemical Industries Council (CICM) wishes to express its appreciation and gratitude to the CICM responsible Care Programme (RCP) Committee and the CICM Distribution Code Working Group whose guidance, cooperation and assistance made possible the compilation of this handbook.

CICM would also like to record its gratitude to IR Harminder Singh whose expertise and devotion had been very helpful in the completion of the Distribution Code.

Special thanks to the following persons and organisations for their valuable contributions:

Mr Stephen Kinder
Chairman, CICM RCP Committee

Tiram Kimia Sdn Bhd

Mr S. Jayaram
*Chairman CICM Distribution
Code Working Group*

Union Carbide Chemicals (M) Sdn Bhd

IR Harminder Singh
CICM Technical Adviser

Professional Inspection Engineering Sdn Bhd

Mr Raymond Yap Ching Chwan

Exxon Chemical (M) Sdn Bhd

Mr Qua Kiat Seng

Unilever (Holding) Malaysia Sdn Bhd

Dr Rahim Hamzah

**University of Malaya (Department of Social &
Preventive Medicine)**

IR Runny Poh

The Institution of Engineers, Malaya

Mr T.K Chan

Malaya Acid Works Sdn Bhd

Mr Tham Weng Keong

Ancom Berhad

Mr Lee Ten Chai

Petronas Dagangan Berhad

En Mastimar Yusoff Hilmi

Projek Lebuhraya Utara – Selatan Berhad

En Zakaria Shafie

Projek Lebuhraya Utara – Selatan Berhad

En Mohd Radzi Osman

Kontena Nasional Sdn Bhd