Implementation of GHS in Singapore

Submitted by: Singapore
Implementation of Globally Harmonized System (GHS) in Singapore

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OSH Specialist Department

Scope

• GHS & Chemical Safety Management
• Singapore GHS Building Blocks
• Competent Authorities & Stakeholders
• Legislative requirements
• Strategies & Roadmap
• Journey & Milestones
GHS in a Nutshell

Harmonisation of
1. Classification
2. Labeling
3. Safety Data Sheet

Hazard Communication System
• Between chemical suppliers & users
• Along the supply chain

Key Information
• Hazards
• Precautions

Hazard Communication in an integral part of Chemical Safety Management

• Policy and strategy
• Selection and procurement
• Register of hazardous chemicals
• Hazard communication
  Labeling & Safety Data Sheet
• Risk assessments & safe work procedure
• Storage
• Transportation
• Waste disposal
• Personal protection equipment
• Hygiene and Medical Surveillance
• Training
• Emergency planning
Main Competent Authorities

• **MOM** (Ministry of Manpower)  
safety & health aspects of hazardous chemicals at work

• **NEA** (National Environment Agency)  
regulates prescribed hazardous substances of environmental concerns

• **SCDF** (Singapore Civil Defence Force)  
regulates petroleum & flammable substances

• **SPF** (Singapore Police Force)  
regulates explosives

• **MPA** (Maritime & Port Authority)  
controls dangerous goods in ports

Key Stakeholders

• Chemical Manufacturers
• Chemical Suppliers
• Singapore Chemical Industrial Council
• Trade Associations
• Chemical users
• Service providers
• Others
## GHS Classification adopted by Singapore

### Physical Hazard Class

<table>
<thead>
<tr>
<th>Physical Hazard Category</th>
<th>Physical Hazard Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explosive</td>
<td>Unstable Explosives</td>
</tr>
<tr>
<td>Flammable gases</td>
<td>Cat 1, 2</td>
</tr>
<tr>
<td>Flammable aerosols</td>
<td>Cat 1, 2</td>
</tr>
<tr>
<td>Oxidizing gases</td>
<td>Cat 1</td>
</tr>
<tr>
<td>Gases under pressure</td>
<td>Compressed Gas</td>
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<tr>
<td></td>
<td>Liquidified Gas</td>
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<tr>
<td></td>
<td>Refrigerated Liquid</td>
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<tr>
<td></td>
<td>Gas</td>
</tr>
<tr>
<td>Flammable liquids</td>
<td>Cat 1, 2, 3</td>
</tr>
<tr>
<td>Flammable solids</td>
<td>Cat 1, 2</td>
</tr>
<tr>
<td>Self-reactive substances and mixtures</td>
<td>Type A, B, C &amp; D, E &amp; F, G</td>
</tr>
<tr>
<td>Pyrophoric liquids</td>
<td>Cat 1</td>
</tr>
<tr>
<td>Pyrophoric solids</td>
<td>Cat 1</td>
</tr>
<tr>
<td>Self-heating substances and mixtures</td>
<td>Cat 1, 2</td>
</tr>
<tr>
<td>Substances and mixtures which, in contact with water, emit flammable gases</td>
<td>Cat 1, 2, 3</td>
</tr>
<tr>
<td>Oxidizing liquids</td>
<td>Cat 1, 2, 3</td>
</tr>
<tr>
<td>Oxidizing solids</td>
<td>Cat 1, 2, 3</td>
</tr>
<tr>
<td>Organic peroxides</td>
<td>Type A, B, C &amp; D, E &amp; F, G</td>
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<tr>
<td>Corrosive to metals</td>
<td>Cat 1</td>
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</tbody>
</table>

### Health Hazard Class

<table>
<thead>
<tr>
<th>Health Hazard Category</th>
<th>Health Hazard Class</th>
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</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>Cat 1, 2, 3, 4</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Cat 1A, 1B, 1C</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Cat 1A, 2A, 2B</td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
<td>Respiratory Cat 1</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Cat 1A, 1B, 2</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Cat 1A, 1B, 2</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Cat 1A, 1B, 2</td>
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<tr>
<td>Specific target organ toxicity - single exposure</td>
<td>Cat 1, 2, 3</td>
</tr>
<tr>
<td>Specific target organ toxicity - repeated exposure</td>
<td>Cat 1, 2</td>
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<tr>
<td>Aspiration hazard</td>
<td>Cat 1, 2 – not adopted</td>
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</tbody>
</table>
GHS Classification adopted by Singapore

<table>
<thead>
<tr>
<th>Aquatic Environment Hazard Class</th>
<th>Hazard Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>Cat 1</td>
</tr>
<tr>
<td></td>
<td>Cat 2</td>
</tr>
<tr>
<td></td>
<td>Cat 3</td>
</tr>
<tr>
<td>Chronic toxicity</td>
<td>Cat 1</td>
</tr>
<tr>
<td></td>
<td>Cat 2</td>
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<td></td>
<td>Cat 3</td>
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<tr>
<td></td>
<td>Cat 4</td>
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Our GHS Journey

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>2002</td>
<td>Endorsement by APEC</td>
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<tr>
<td>2005</td>
<td>Formation of GHS Task Force</td>
</tr>
<tr>
<td>2006</td>
<td>Alignment of Law</td>
</tr>
<tr>
<td>2007</td>
<td>GHS Capability Building</td>
</tr>
<tr>
<td>2008</td>
<td>Launch of SS 586 GHS</td>
</tr>
<tr>
<td>2009</td>
<td>GHS Leaflets</td>
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<tr>
<td></td>
<td>GHS Virtual Expert Group</td>
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<tr>
<td></td>
<td>GHS Road map</td>
</tr>
<tr>
<td></td>
<td>GHS Guidebook</td>
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</tbody>
</table>
Building Blocks not adopted by Singapore:

- Flammable Liquid - Cat 4 except Diesel
- Aquatic Env. Acute Cat. 2 +3
- Aquatic Env. Chronic Cat. 3 + 4
- Acute toxicity Cat. 5
- Skin irritation Cat. 3
- Aspiration hazard Cat. 2

National GHS Task Force

1. Ministry of Trade and Industry
2. Singapore Chemistry Industry Council
3. Ministry of Manpower
4. National Environment Agency
5. Economic Development Board
6. Standards Productivity and Innovation Board
7. Maritime and Port Authority
8. Singapore Civil Defence Force
9. Singapore Police Force
10. Agri-Food & Veterinary Authority of Singapore
11. Health Science Authority
12. Ministry of Health
GHS - Strategies

Strategic Outcome
Implementation of GHS for effective hazard communication through labeling and SDS

1. Promoting GHS
2. Building capability
3. Engaging Stakeholders
4. Regulatory framework
5. Developing partnership

Strategy 1
Promoting GHS

- Launching of SS 586 Hazard Communication
- WSH Bulletin
- GHS leaflets
- Seminars & Dialogues
- SCIC Newsletter
- SISO Newsletter
Strategy 2
Building Capability

- GHS Awareness Training
- GHS Classification Course
- GHS Chemical Users Course
- GHS Guidebook
- Incorporating GHS into relevant training courses e.g. MHS course

Strategy 3
Engaging Stakeholders

- Licensees of hazardous substances
- Licensees of flammable substances
- GHS Awareness Seminars
  - chemical manufacturers & suppliers
  - users of chemicals
  - others
Strategy 4
Regulatory Framework

• WSH Act
• WSH (General Provisions) Regulations
• Fire Safety Act
• Environmental Protection & Management Act
• SS 586 Hazard Communication

Strategy 5
Develop Strong Partnership

• Competent authorities
• Trade unions
• Employer organisations
• Chemical associations
• Professional institutions
• Virtual GHS Expert Group
### Implementation Phases

<table>
<thead>
<tr>
<th>Phase</th>
<th>Target Group</th>
<th>GHS focus</th>
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</thead>
<tbody>
<tr>
<td>Phase 1A</td>
<td>Chemical manufacturers / suppliers</td>
<td>Single chemicals GHS SDS &amp; Label</td>
</tr>
<tr>
<td>2008 to 2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 2A</td>
<td>Users of chemicals</td>
<td>Single chemicals GHS Label</td>
</tr>
<tr>
<td>2008 to 2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 1B</td>
<td>Chemical manufacturers / suppliers</td>
<td>Mixtures GHS SDS &amp; Label</td>
</tr>
<tr>
<td>2008 to 2012</td>
<td></td>
<td></td>
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<tr>
<td>Phase 2B</td>
<td>Users of chemicals</td>
<td>Mixtures GHS Label</td>
</tr>
<tr>
<td>2008 to 2013</td>
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### Alignment of Law with GHS

**Workplace Safety and Health Act 2006**

**Section 16 (Duties of manufacturers / Suppliers of Hazardous Substances)**

Provide information about the safe use of hazardous substances

(i) the precautions to be taken;

(ii) the health hazards associated with the substance;

(iii) the information relating to any tests or examinations of the substances
Meaning of Hazardous Substances is in line with GHS classification

1. Corrosive substances
2. Flammable substances
3. Explosives
4. Oxidising substances
5. Pyrophoric substances
6. Gases under pressure
7. Organic peroxides
8. Self heating substances
9. Self-reactive substances
10. Substances which in contact with water, emit flammable gases
11. Toxic substances
12. Mutagens
13. Carcinogens
14. Teratogens
15. Sensitizers
16. Irritants
17. Substances hazardous to aquatic environment

WSH (General Provisions) Regulations

Regulation 42 (Warning labels)

Factory occupier shall ensure that every container of hazardous substance is affixed with one or more labels that

(a) are easily understood by all persons at work
(b) warn of the hazards involved with the hazardous substance; &
(c) specify the precautionary measures to be taken when dealing with the hazardous substance
Regulation 43 (Safety Data Sheet)

(1) Where any hazardous substance is used, handled or stored in a factory, the occupier shall:

(a) obtain a SDS of the substance;

(b) assess the information in the SDS & take precautionary measures to ensure the safe use of the substance;

(c) make available the SDS to all persons at work who are liable to be exposed to the substance.

Regulation 43 (Safety Data Sheet)

(2) Where any hazardous substance is sold to any person for use in a factory, the seller or any agent of the seller who caused or procured the sale shall provide the buyer with a SDS for the substance, giving accurate & adequate information on the substance.
**SDS information items are in line with GHS SDS**

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<table>
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<tbody>
<tr>
<td>1</td>
<td>Identity</td>
</tr>
<tr>
<td>2</td>
<td>Safety and health hazard</td>
</tr>
<tr>
<td>3</td>
<td>Composition &amp; ingredient</td>
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<tr>
<td>4</td>
<td>First – aid measures</td>
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<tr>
<td>5</td>
<td>Fire – fighting measures</td>
</tr>
<tr>
<td>6</td>
<td>Accidental release measures</td>
</tr>
<tr>
<td>7</td>
<td>Precautions for handling and storage</td>
</tr>
<tr>
<td>8</td>
<td>Exposure control &amp; personal protection</td>
</tr>
<tr>
<td>9</td>
<td>Physical &amp; chemical properties</td>
</tr>
<tr>
<td>10</td>
<td>Stability and reactivity</td>
</tr>
<tr>
<td>11</td>
<td>Toxicological information</td>
</tr>
<tr>
<td>12</td>
<td>Ecological information</td>
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<tr>
<td>13</td>
<td>Disposal considerations</td>
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<tr>
<td>14</td>
<td>Transport information</td>
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<tr>
<td>15</td>
<td>Regulatory information</td>
</tr>
<tr>
<td>16</td>
<td>Other relevant information</td>
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</tbody>
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**Other Legislative Requirements**

- Competent person to take charge of hazardous substances
- Proper storage, usage, handling & disposal
- Workers shall be warned of the hazards & precautions
- Warning notices indicating the nature of danger
- Measures to control exposure & to protect workers vs toxic dust, fumes & other contaminants
- Regular monitoring of workplace where toxic substances are used, handled or given off.
- Measures to ensure workers are not exposed to toxic substances exceeding the PEL
- Risk assessment before commencement of work
- Periodic medical examinations for exposure to certain chemicals
Environmental Protection and Management Act
EPM (Hazardous Substances) Regulations

Requirements on Hazardous Substance

• A licence is required to import, sell or export any hazardous substance.

• A permit is required to purchase, store or use any hazardous substance controlled under the Regulations.

• A licence is required to transport any hazardous substance in quantities exceeding those specified in Regulations before applying for transport approval.

• Containers, tankers and vehicles must be properly labelled and carry appropriate hazard warning panels.

Fire Safety Act
Fire Safety (Petroleum & Flammable Materials) Regulations

• A licence is required to import, transport & store petroleum & flammable materials above the exemption quantity.

• Petroleum (flash point below 61°C), diesel & 237 flammable chemicals & their mixtures are subjected to licensing control.

• Vehicle transporting, container containing & premises storing regulated petroleum & flammable materials must be labelled in accordance with SS 586 for hazard communication

• SS 586 requires individual container (e.g. drum, package) for transportation & storage of hazardous chemicals be labeled in accordance with GHS; vehicle transporting & premises storing hazardous chemicals be provided with Emergency Information Panel.
Experience & Lesson Learnt

- Cooperation among competent authorities
- An appropriate body to champion or drive GHS
- Engaging stakeholders, in particular chemical manufacturers & suppliers
- Building capability, particularly on GHS classification for SME
- A GHS implementation plan with deliverables, target & timeline
- Legislation back-up