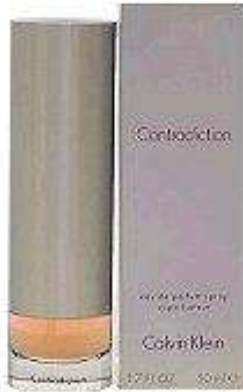


**Dangerous Goods
&
Cargo Security
(Singapore Perspective)**

**Aloysius Lim
Singapore
4 December 2006
Seoul, Korea**

Is Perfume Dangerous?



Contradiction



Pleasures



Hypnotic Poison



Escape



Envy



Cheap & Chic



Miracle



Opium



Extravagance



Obsession



Addict



Deep Night³



Wednesday, 14 May 2003: THE STRAITS TIMES

Wife uses perfume, man scents danger

TAMPA (Florida) - A Florida woman has been arrested on a charge of aggravated battery after her husband, who is extremely chemical sensitive, claimed she tried to kill him by dousing herself with perfume.

Lynda Taylor, 36, was arrested last Thursday at her home in Stuart, 160 km north of Miami, after her husband David, 46, went to the police about her chemical assault.

"When he told us what was going on, frankly, we didn't treat it seriously," said a sergeant from the local Sheriff's Department. Only when Mr Taylor showed investigators a physician's letter stating that he suffered from extreme chemical sensitivity did officers act on his complaint.

He had been exposed to toxins as a labourer at a building later found to contain poisonous chemicals and toxic mould.

His wife is accused of not just wearing perfume, but also burning incense and using air fresheners and antiseptic sprays. In the complaint, he wrote: "She went around the house spraying Lysol and even sprayed some in my face... All day long, she kept closing the windows." - AFP



14 October 2003

Flammable trousers

The Moscow apartment of a man who poured a litre of gasoline into his washing machine was severely damaged when the machine exploded when switched on.

He was trying to remove stains from a pair of trousers, but succeeded in wrecking two walls and giving other residents of the block a fright. The October 14 incident brought the Moscow fire brigade to the scene and following the incident they decided to give the resident a lesson in handling flammable materials.

Hot Foot

5th November 2004



A calcium carbide spill held an unexpected hazard for an attending fireman.

Near Paradise Valley, Durban, South Africa, a truck carrying 'carbide' crashed, spilling its cargo across the road and on to the kerb.

[According to one incident report: "Carbide, which looks like rocks, is a binary compound of carbon with a metal." There is no arguing with that, though it is not very helpful. Subsequent events suggest that it was probably calcium carbide.]

Subsequently a fire-fighter's feet were badly burnt when his boots caught fire while he was overseeing the clean-up operation and rain fell, producing acetylene gas.

A police spokesman said the man had walked on the "rocks" and a little while later had felt heat around both his feet: "When he looked down, his boots were on fire. The flames were put out and he was taken to hospital."

**How Do You Define
Hazardous Substances
or
Dangerous Goods ?**

Death / Injury to Human Beings



Property Damage



Environment Damage



Environment Damage

THE STRAITS TIMES, MONDAY, APRIL 7, 1997

Boy, oh boy, see what ship chemical has done to slugs



LEE CHEE CHEW

PATTANI (Thailand) — A toxic chemical used to keep ships clean is having a bizarre effect on certain species of shellfish — it causes them to change sex.

Scientists studying sea snails in the Gulf of Thailand and the Straits of Malacca have discovered that where there is heavy shipping traffic, including some sites off the Eastern Seaboard, every single female found displayed male sexual organs, typically a penis and sperm duct, according to a report in *The Nation* newspaper.

The shellfish have sprouted the male organs as a result of contamination by a chemical called tributyltin (TBT), which creates hormonal imbalances in certain snail-like species known as gastropods, said Mr Cornelius Swennen, a Dutch marine ecologist who works out of Prince of Songkhla University (PSU) in Pattani.

Gastropods include commonly-eaten species such as

oysters and mussels.

Every single female sea snails found displayed male sexual organs, typically a penis and sperm duct. Chemical used in anti-fouling paint creates hormonal imbalances.

...not known, he added. But a paper written by him and his colleagues in the scientific journal *Wallaceana* stated that "its use on ships must be severely reduced in the interest of public health and that of the marine environment".

In theory, humans who eat TBT-contaminated seafood could also be subject to hormonal imbalances. But nobody had ever seen such effects in people and "a human would have to eat an awful lot of contaminated seafood to be affected", he said.

Mr Swennen said he was concerned about the marine "tomboy" non — known as imposex — and prevented selected species. The chemical on ship hulls all the shellfish including crab

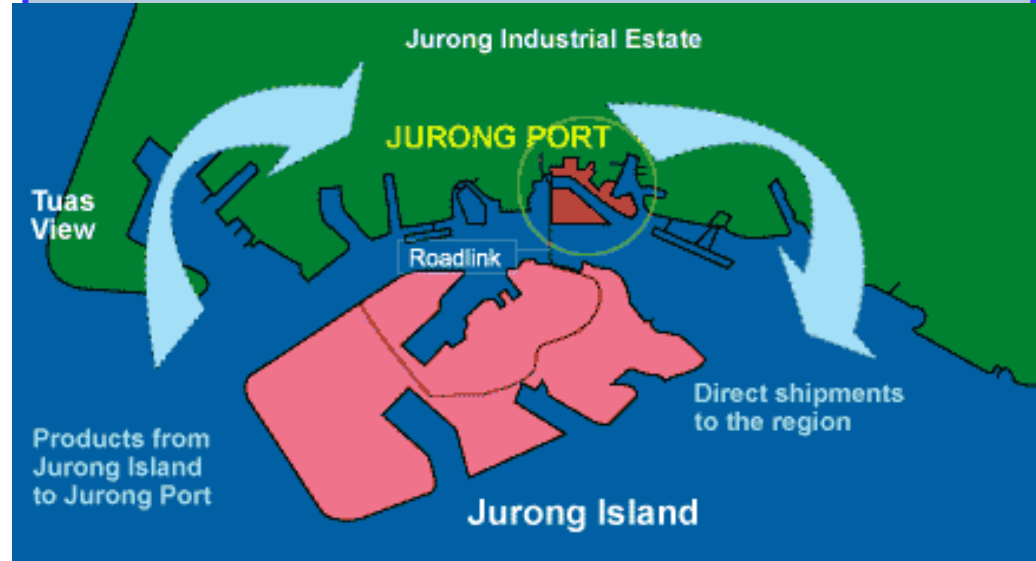
TBT have been well-documented in Europe, North America and Japan since the late 60s, when the anti-fouling agent was first used.

Mr Swennen teamed up with PSU lecturer Nukul Ruttanadakul and Dr Suraphol Ardseungnern of Mahidol University to check imposex levels in the inner Gulf of Thailand and around Pattani.

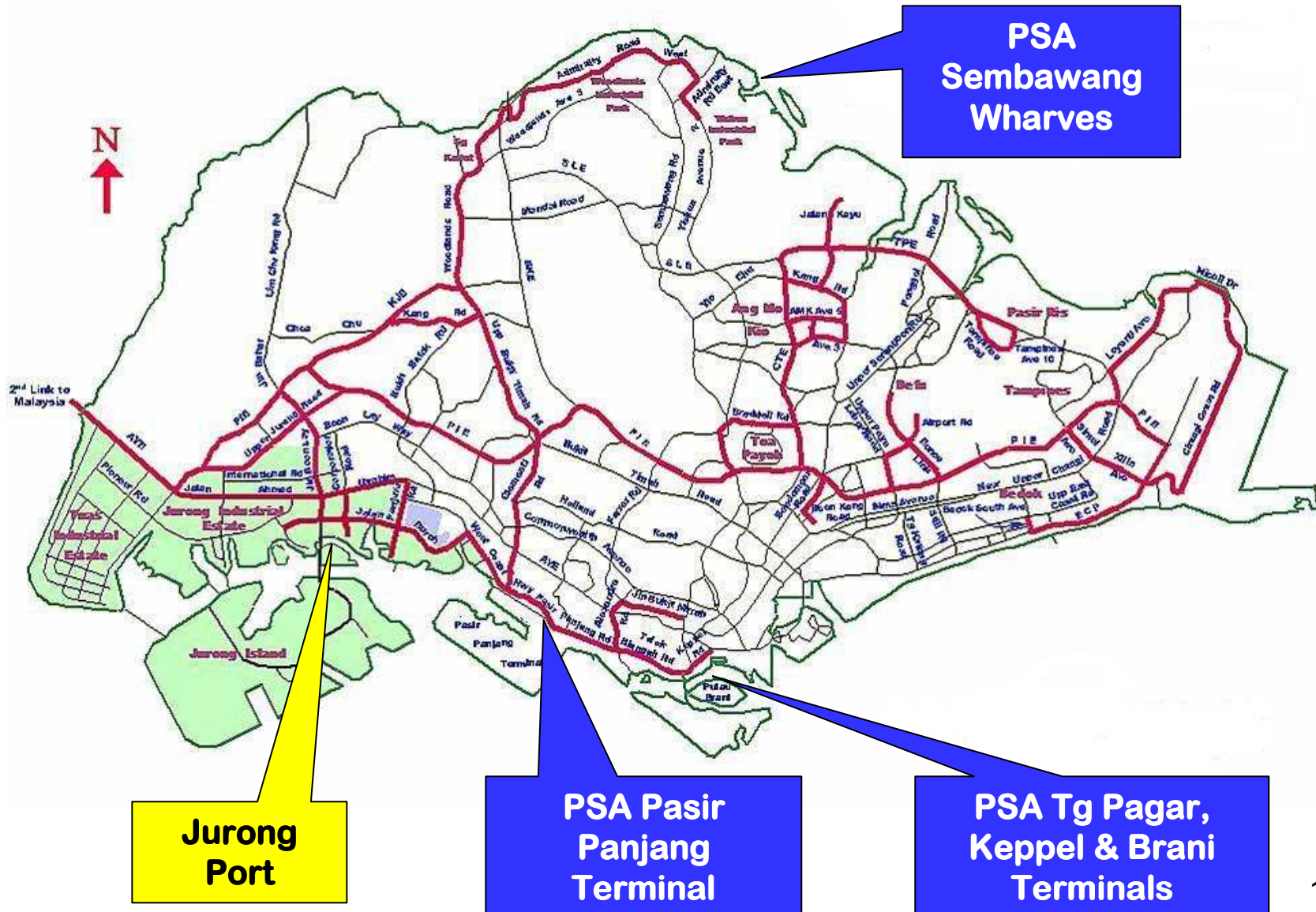
They found that the greatest contamination areas in Thai waters were off Chon Buri, where imposex incidences reached 100 per cent at some sites.

Strategic Location of Singapore

Facilities	Current	Projected
Container berths	43	45
Quay length (m)	12,500	13,000
Area (ha)	423	445
Max draft (m)	16	16
Quay cranes	139	147
Designed capacity ('000 TEUs)	24,000	25,400



Location of Ports in Singapore



Unique situation to Singapore due to its proximity to populated areas



PSA re-group 9 IMO classes into 3 groups for operational convenience

PSA Group I – vessel cannot berth alongside

PSA Group II – direct loading & discharging

PSA Group III – can be stored in port areas



MPA DG Re-Classification

- Maritime and Port Authority of Singapore (formed in Feb 1996) adopted PSA's grouping system.
- Shipping community requested MPA to do away with the grouping system and to control dangerous goods in port based on IMO classes.
- MPA carried out study on the re-classification and consulted other government agencies and terminal operators





Changes in MPA Re-Classification of DG

- Consolidated all MPA Group I and a small number of Group II dangerous goods into a new schedule i.e. *The First Schedule*



- Dangerous goods in this schedule are grouped according to the IMO Classes and UN Numbers

- For explosives and explosive articles, the quantities are recommended by the Explosive Safety Technical Sub-committee.



- For other dangerous goods, the quantities are determined by the quantitative risk assessment and accepted by NEA, MPA and SCDF.



Changes in MPA Re-Classification of DG

- Vessel carrying First Schedule dangerous goods prohibited alongside wharf.



- Permission for berthing will be subject to the types and quantities of dangerous goods in the new Schedule carried onboard a vessel.

- Dangerous goods not listed in the new schedule will be allowed to be carried onboard the vessels without any quantity restrictions.



- In view of the fire and explosion risk, all flammable gases are subject to weight limitations except those packed in the mall receptacles.



MARITIME AND PORT AUTHORITY OF SINGAPORE (DANGEROUS GOODS, PETROLEUM & EXPLOSIVES) REGULATIONS 2000

FIRST SCHEDULE — *continued*

<u>Substance/Article</u>	<u>Category/ IMO Class</u>	<u>UN No.</u>	<u>MPA Group</u>
ACETAL	3.1	1088	I*
ACETAL	3.2	1088	II
ACETALDEHYDE	3.1	1089	I
ACETALDEHYDE AMMONIA	9	1841	III
ACETALDEHYDE DIETHYL ACETAL	3.1	1088	I*
ACETALDEHYDE DIETHYL ACETAL	3.2	1088	II
ACETALDOL	6.1	2839	III
ACETIC ACID SOLUTION, MORE THAN 25% BUT NOT MORE THAN 80% ACID, BY MASS	8	2790	III
ACETIC ACID SOLUTION, MORE THAN 80% ACID, BY MASS	8	2789	III
ACETIC ACID, GLACIAL	8	2789	III
ACETIC ALDEHYDE	3.1	1089	I
ACETIC ANHYDRIDE	8	1715	III
ACETIC OXIDE	8	1715	III
ACETOIN	3.3	2621	III
ACETONE	3.1	1090	II
ACETONE CYANOHYDRIN, STABILIZED	6.1	1541	II
ACETONE HEXAFLUORIDE	2.3	2420	II
ACETONE OILS	3.2	1091	II





MARITIME AND PORT AUTHORITY OF SINGAPORE (DANGEROUS GOODS, PETROLEUM & EXPLOSIVES) REGULATIONS 2005

FIRST SCHEDULE

Regulation 2 (1)

DANGEROUS GOODS

<i>S/No.</i>	<i>Substance/Article</i>	<i>IMO Class</i>	<i>UN No.</i>
1	SAMPLES, EXPLOSIVE other than initiating explosive	1	0190
2	DIAZODINITROPHENOL, WETTED with not less than 40% water or mixture of alcohol and water, by mass	1.1A	0074
3	GUANYL NITROSAMINO GUANYLIDENE HYDRAZINE, WETTED with not less than 30% water, by mass	1.1A	0113
4	GUANYL NITROSAMINO GUANYL TETRAZENE, WETTED with not less than 30% water or mixture of alcohol and water, by mass	1.1A	0114
5	TETRAZENE, WETTED with not less than 30% water or mixture of alcohol and water, by mass	1.1A	0114
6	LEAD AZIDE, WETTED with not less than 20% water or mixture of alcohol and water, by mass	1.1A	0129
7	LEAD STYPHNATE, WETTED with not less than 20% water or mixture of alcohol and water, by mass	1.1A	0130
8	LEAD TRINITRORESORCINATE, WETTED with not less than 20% water or mixture of alcohol and water, by mass	1.1A	0130
9	MERCURY FULMINATE, WETTED with not less than 20% water or mixture of alcohol and water, by mass	1.1A	0135
10	BARIUM AZIDE dry or containing less than 50% water, by mass	1.1A	0224





Benefits

- Much simpler, port users need only to refer to about 700 items in the new Schedule, compared to more than 4,000 items previously.



- Prevent confusion and facilitate compliance with dangerous goods requirements by overseas shippers and shipping agents.

- Gives terminal operators more flexibility in dangerous goods handling and storage in accordance with their facilities and capabilities, so long as the requirements of the relevant landward regulatory authorities are complied with.



- Singapore will be inline with practices in other major ports.

PSA Classification System



PSA Groupings	Definitions
1D & 2	For direct delivery/loading only Stuffing/unstuffing at F05 to be allowed only under special application from Chemcare
1S & 2S	For storage at designated DG yards; allowed for stuffing/unstuffing at F5
1C & 2C	For special monitoring in designated yards under approved application by Chemcare Stuffing/unstuffing at F05 allowed only under special application from Chemcare
1N	For special monitoring of Ammonium Nitrate containers in designated yards under approved application by Chemcare

PSA Classification System



PSA Groupings	Definitions
2A	Denotes Arms and Explosives cargo; for storage at designated DG yard
2B	For storage at designated DG yards Stuffing/unstuffing at F05 allowed only under special application from Chemcare
2F	For storage of containers under fumigation in designated DG yards
3	For storage at terminal with proper segregation

Chemcare

- Terminals
- Services
 - Container Services
 - Shipper Services
 - Security
- Transshipment
- Portnet.com
- Documentation
- Tenders

Container Services

CHEMCARE

PSA Chemcare helps to provide value-added services and facilitate the movement of dangerous goods through PSA terminals to our customers. Customers can also consult us for any advice on questions that they may have regarding the local regulations on dangerous goods

Services provided include:

- Fumigation: Fumigation services are provided for containers with commodities requiring such a service.
- DG Reworking: We rework damaged or leaking containers which are unsafe and not fit for shipment.
- DG Labelling: We provide labelling of DG containers with missing or incorrect labels- IMO and local authorities require all DG containers to be labelled with hazard labels.
- Pre-shipment inspection: We provide pre-shipment checks of the stacking and packing of DG cargo within a container prior to loading onto vessel. This enables the identification and prevention of potential hazards during shipment due to sub-standard packaging.
- Storage and Monitoring of special DG: We take special care of highly hazardous DG shipments in order to meet high safety standards.
- DG Training: We provide customized training on local and international DG regulations and requirements. Click [here](#) for course outline and more information.

DG Grouping Enquiry Portal

Advanced DG enquiry function in PORTNET® allows search by UN range and download DG Chemical information to an Excel file.

For further information, please contact

Hu Wing Ko
Manager (ChemCare)
Email: chemcare@psa.com.sg

- Corporate Information
- Technology
- Community Relations
- Newsroom
- Careers

Chemical Name

Chemical Search

Zoom: 100%  Print 19-11-2006 12:24:49 SG

UN No.	<input type="text"/>
IMO Class	All 
Chemical Name	Nitric acid

Retrieve

Reset

The information contained and provided in the DG Chemical Database is subject to change at any time. We do not warrant the accuracy, completeness or currency of the information provided or accept any liability for any loss or damage arising from any reliance thereon.

Additional Information:

Circular on Dangerous Goods, Petroleum and Explosives Regulations 2005 (Maritime and Port Authority of Singapore website)

http://www.mpa.gov.sg/circulars_and_notices/portmarine_circulars/pc05-02.htm

http://www.mpa.gov.sg/circulars_and_notices/portmarine_circulars/pc05-13.htm

Environmental Management & Pollution Control (National Environment Agency website)

http://app.nea.gov.sg/cms/htdocs/category_sub.asp?cid=73

<http://www.nea.gov.sg/> (home page)

Fire Safety (Petroleum And Flammable Materials) Regulations (Singapore Civil Defence Force website)

http://www.scdf.gov.sg/html/newsr/2005/newsr_150205_FS.html

<http://www.scdf.gov.sg/> (home page)

Note: An internet connection is required to access these websites.

Users on Extranet/ Dial-up link will not be able to access these URL directly from PORTNET®

Internet

100%

Chemical Name

Chemical Search Results

Zoom: 100% [Print](#) 19-11-2006 12:26:28 SG

IMO Class	UN No.	PSA Grp	Wt Restr	Chemical Name
8	1826	2	N	NITRATING ACID MIXTURE, SPENT WITH MORE THAN 50% NITRIC ACID
8	1826	2	N	NITRATING ACID MIXTURE, SPENT WITH NOT MORE THAN 50% NITRIC ACID
8	2031	2S	N	NITRIC ACID, OTHER THAN RED FUMING WITH MORE THAN 70% NITRIC ACID
8	2031	2S	N	NITRIC ACID, OTHER THAN RED FUMING WITH NOT MORE THAN 70% NITRIC ACID
8	2032	2	N	NITRIC ACID, RED FUMING

<<Back

Legend for PSA Group

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- 3 - Group III DG recommended for storage.

Chemical Name

Chemical Information

Zoom: 90% Print 19-11-2008 12:27:16

UN No.	1828		
IMO Class	8		
Substance Name	NITRATING ACID MIXTURE, SPENT WITH MORE THAN 50% NITRIC ACID		
Description			
PSA Group	2	Marine Pollutant	Subsidiary Risk 5.1
Weight Restricted	N	Label Required	Y
Special Details	APPLICATION FOR SPECIAL MONITORING OF DIRECT DANGEROUS GOODS CAN BE OBTAINED FROM CHEMCARE.		

<<Back

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Legend for Marine Pollutant

- P - Marine pollutant
- PP - Severe marine pollutant
- * - Can be a marine pollutant or a severe marine pollutant

IMO Class

Chemical Search

UN No.	<input type="text"/>
IMO Class	2.1 FLAMMABLE GASES
Chemical Name	<input type="text"/>

Retrieve Reset

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Additional Information:

Circular on Dangerous Goods, Petroleum and Explosives Regulations 2005 (Maritime and Port Authority of Singapore website)
http://www.mpa.gov.sg/circulars_and_notices/portmarine_circulars/po05-02.htm
http://www.mpa.gov.sg/circulars_and_notices/portmarine_circulars/po05-13.htm

Environmental Management & Pollution Control (National Environment Agency website)
http://app.nea.gov.sg/cms/htdocs/category_sub.asp?cid=73
<http://www.nea.gov.sg/> (home page)

Fire Safety (Petroleum And Flammable Materials) Regulations (Singapore Civil Defence Force website)
http://www.scdf.gov.sg/html/newsr/2005/news_r_150205_FS.html
<http://www.scdf.gov.sg/> (home page)

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IMO Class

Chemical Search Results

Zoom: 90% Print 19-11-2008 12:29:19 S

MO Class	UN No.	PSA Grp	Wt Restr	Chemical Name
2.1	2035	2S	Y	1,1,1-TRIFLUOROETHANE
2.1	1030	2S	Y	1,1-DIFLUOROETHANE
2.1	1959	2S	Y	1,1-DIFLUOROETHYLENE (REFRIGERANT GAS R 1132A)
2.1	2452	2S	Y	1-BUTYNE, INHIBITED
2.1	2517	2S	Y	1-CHLORO-1,1-DIFLUOROETHANE
2.1	2044	2S	Y	2,2-DIMETHYLPROPANE
2.1	1001	2S	Y	ACETYLENE, DISSOLVED
2.1	3374	2S	Y	ACETYLENE, SOLVENT FREE
2.1	1950	2S	N	AEROSOLS
2.1	2200	1S	Y	ALLENE, INHIBITED
2.1	2419	2S	Y	BROMOTRIFLUOROETHYLENE
2.1	2452	2S	Y	BUT-1-YNE, INHIBITED
2.1	1010	2S	Y	BUTADIENES, STABILIZED OR BUTADIENES AND HYDROCARBON MIXTURE, STABILIZED WITH MORE THAN 40% BUTADIENES
2.1	1011	1S	Y	BUTANE
2.1	1012	2S	Y	BUTYLENE
2.1	1954	1D	Y	COMPRESSED GAS, FLAMMABLE, N.O.S.
2.1	2601	1S	Y	CYCLOBUTANE
2.1	1027	2S	Y	CYCLOPROPANE
2.1	1957	2S	Y	DEUTERIUM, COMPRESSED
2.1	3150	2	N	DEVICES, SMALL, HYDROCARBON GAS POWERED
2.1	2517	2S	Y	DIFLUOROCHLOROETHANE
2.1	3252	2	Y	DIFLUOROMETHANE
2.1	1033	2S	Y	DIMETHYL ETHER
2.1	1032	2	Y	DIMETHYLAMINE, ANHYDROUS
2.1	1035	1S	Y	ETHANE
2.1	1981	1S	Y	ETHANE, REFRIGERATED LIQUID
2.1	2452	2S	Y	ETHYL ACETYLENE, INHIBITED

IMO Class

http://pn2.portnet.com/DGWebPublic/com/pn2/dg/web/dgchemicalpublic/enquireChemicalDetail.do?subStrXCriteria=&imoCl

chemcare singapore

PORTNET - DG Chemical Information

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Chemical Information

UN No.	1950		
IMO Class	2.1		
Substance Name	AEROSOLS		
Description			
PSA Group	2S	Marine Pollutant	Subsidiary Risk 2.1
Weight Restricted	N	Label Required	Y

<<Back

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UN Number

Chemical Search

UN No.	<input type="text" value="2780"/>
M O Clas s	<input type="text" value="All"/>
Chemical Name	<input type="text"/>

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Environmental Management & Pollution Control (National Environment Agency website)
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<http://www.nea.gov.sg/> (home page)

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UN Number

Browser address bar: <http://pn2.portnet.com/DGWebPublic/com/pn2/dg/web/dgchemicalpublic/searchChemicalList.do>

Search bar: chemcare singapore

Page title: PORTNET - DG Chemical Search Results

Navigation: Home, RSS, Print, Page, Tools

Utility: Yahoo! Search, Answers, Mail, My Yahoo!

Chemical Search Results

Zoom: 100% [Print](#) 19-11-2006 12:37:41 SG

IMO Class	UN No.	PSA Grp	Wt Restr	Chemical Name
3	2780	2	N	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC

[<<Back](#)

Legend for PSA Group

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- 3 - Group III DG recommended for storage.

UN Number

Chemical Information

UN No.	2780		
IMO Class	3		
Substance Name	SUBSTITUTED NITROPHENOL PESTICIDE, LIQUID, FLAMMABLE, TOXIC		
Description			
PSA Group	2	Marine Pollutant *	Subsidiary Risk 6.1
Weight Restricted	N	Label Required	Y
Special Details	APPLICATION FOR SPECIAL MONITORING OF DIRECT DANGEROUS GOODS CAN BE OBTAINED FROM CHEMCARE.		

<<Back

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**Maritime And Port Authority Of
Singapore
Act (Chapter 170a)
Maritime And Port Authority Of
Singapore (Dangerous Goods,
Petroleum And Explosives)
Regulations 2005**

Article 38 Compliance...

- 1) No person shall within the port**
 - a) Handle, import, export, load, discharge, transport or otherwise deal with dangerous goods; or**
 - b) Cause or permit dangerous goods to be handled, imported, exported, loaded, discharged, transported or otherwise dealt with, except in accordance with these Regulations, the IMDG Code and any other written law.**

Article 38 Compliance

- 2) In the event of any conflict between these Regulations and the IMDG Code, these Regulations shall prevail**
- 3) If a vessel is carrying on board any goods of a dangerous nature to which the IMDG Code does not apply, the owner, agent or master of the vessel shall**
 - a) Inform the Port Master that the goods are not expressly referred to in the IMDG Code; and**
 - b) Comply with all the directions of the Port Master relating to the goods**

Article 40 Notice of Arrival...

(1) The owner, agent or master of a vessel arriving in the port and carrying dangerous cargoes shall

(a) not less than 24 hours before the arrival of the vessel, give notice of its arrival to the Port Master;

(b) furnish a list of the dangerous goods on the vessel to the Port Master stipulating the technical names, the quantity and the class of the goods according to the IMDG Code; and

(c) provide such information relating to the dangerous cargoes on the vessel, whether in bulk or packaged form, as may be required by the Port Master from time to time.

Article 40 Notice of Arrival

- (2) Notwithstanding paragraph (1), the Port Master may require such shorter notice as he may determine.**
- (3) In the case of a vessel that is to be berthed at a wharf, the notice shall also be given to the terminal manager.**
- (4) Where it is impracticable to give notice 24 hours before the arrival of the vessel in the port as required under paragraph (1), notice of the arrival of the vessel in the port shall be given immediately upon its arrival.**

Article 47 Prohibited alongside Wharf

- (1) No person shall cause or permit a vessel carrying First Schedule dangerous goods to be berthed alongside any wharf unless he has obtained the permission of the Port Master and the terminal manager.**

- (2) The Port Master and the terminal manager may each, in granting his permission, impose such conditions as he thinks fit..**

- ❑ **Article 39 Power of entry and search**
- ❑ **Article 41 Master to carry special list, manifest or detailed stowage plan**
- ❑ **Article 42 Packing, labelling and marking of dangerous goods**
- ❑ **Article 43 Notice and permission required for discharging of dangerous goods**
- ❑ **Article 44 Loading of dangerous cargoes and goods**
- ❑ **Article 46 Restrictions on night movements of vessels carrying First Schedule dangerous goods**
- ❑ **Article 53 Restrictions on loading or discharging of First Schedule dangerous goods at night**
- ❑ **Article 72 Additional requirements on arms and explosives**

Procedures for Dangerous Goods Declaration

- ❑ **Load/Discharge/Transit of Dangerous Goods at PSA Terminals:**
 - **Applications/Declarations must be submitted electronically via PORTNET.**

- ❑ **Load/Discharge/Transit Dangerous Goods at Jurong Port's Conventional Wharves and Container Terminal:**
 - **Applications/Declarations must be submitted electronically via JP-Online**

Procedures for Dangerous Goods Declaration

- ❑ **Load/Discharge/Transit of Dangerous Goods at Anchorage and Terminals other than PSA Terminal and Jurong Port:**
- **Declarations must be submitted electronically via Marinet, or**

A hard copy of the Advance Notification of Dangerous Goods (PM4) must be faxed to MPA's Hazardous Cargo Section via

Fax : 63252430.

Advance Notification of Dangerous Goods (PM4)

This form may take you 10 minutes to fill in.

THE MARITIME AND PORT AUTHORITY OF SINGAPORE (DANGEROUS GOODS, PETROLEUM AND EXPLOSIVES) REGULATIONS, 2005				<small>Note: This form must be completed neatly</small>		<small>Sheet.....of.....</small>				
M P A Singapore				ADVANCE NOTICE OF ARRIVAL/LOADING AND APPLICATION TO DISCHARGE/LOAD/TRANSIT						
Name of Vessel		Voy No:	Type:	ETA	Last Port :	Licensed DG/Explosive Lighter Nos.(if applicable)				
				BTR						
<small>NOTE: Please arrange in the order of discharging/loading/transiting</small>										
S.No.	Quantity, Type of Packaging & Correct Technical Name of Substances(Trade Names Shall Not Be Used)	Net Wt. (Kg)	Container No.	Stowage Onboard Cell Location	IMO Class	UN No.	FP (°C)	Discharge/Load/Transit		Port Chemist Remarks
								Location	Date/Time	
DECLARATION UNDER SECTION 10 OF THE MPA ACT (CHAPTER 170A) We hereby declare that the information is correct and undertake to fulfill and comply with all the regulations in respect of the Carriage of Dangerous Goods, including those remaining on board, as specified in the MPA (Dangerous Goods, Petroleum and Explosives - Regulations 2005)								Remarks		
Name of Person Signing : Designation : *Name & Address of Owner/Agent : Tel No : Date : Fax No : *Delete as appropriate				Signature of Owner/Agent/Master (With firm's/company's stamp)				for Port Master PM4-0485A4		
<p style="text-align: center;">GENERAL CONDITIONS</p> 1. Agents are to ensure that they correctly declare the quantity, type of packaging, technical name, IMO class, UNNO, and flash point. 2. For discharging DG, applications must be submitted at least 24 hours (working days) before vessel's arrival in port. 3. For loading DG, applications must be submitted at least 24 hours (working days) before date of cargo being loaded. 4. To avoid delays in processing the application, agents are urged to provide correct and complete information.										

3 Strategies

❑ Avoidance

- ✓ Minimise bulk transportation
- ✓ Select routes
- ✓ Judicious siting of hazardous installations

❑ Prevention

- ✓ Compliance with relevant codes
- ✓ Proper engineering & design
- ✓ Operational & maintenance procedures

❑ Mitigation

- ✓ Emergency response planning

Toxic chemicals need tight controls

Singapore prevails small toxic

By MA

MORE Singapore chemicals which environment. Hazards such as used by ries, chemicals, ties. Ch to dest ing wat ful in the. Che caused of the worst leak at in the 198 3,000 of thou manent. Sing risk of cause of and lim plies.

The Ministry of the Environment said there have been no major disasters here because of the strict regulations in place to prevent accidents and minimise their impact.

But minor accidents have happened. Last month, glutaraldehyde, a chemical used to tan leather, leaked onto the road after an accident near the Science Park.

Police and fire fighters were on the scene in nine minutes to clear up the spill and set up a safety zone within a 100 m radius to minimise the risk of contact with humans.

Mr Foong Chee Leong, head of the ministry's Pollu-

LAWS: To handle worst scenario

MINISTRY of Environment regulations for the use and handling of hazardous substances are based on "worse-case" scenarios. The regulations cover:

◆ **Location:** All companies which use toxic chemicals are located in industrial zones, or on Jurong Island.

◆ **Building design:** Plans must be submitted before building starts to ensure appropriate storage and safety.

◆ **Licensing controls:** Any company or individual that imports, sells, supplies, buys, transports or uses hazardous substances must hold a licence or permit.

◆ **Transport regulations:** Vehicles carrying toxic chemicals must use designated routes which avoid populated housing estates and water catchment areas. Trucks must be labelled and drivers fully-trained.

◆ **Safety-audit scheme:** Sixty-one companies using large amounts of hazardous substances undergo regular audits.



locating) or in sasters.

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Land Regulations...

- ❖ The Environmental Pollution Control Act (EPCA) & The Environmental Pollution Control (Hazardous Substances) Regulations
 - Pollution Control Department (PCD), National Environment Agency
 - ✓ *Toxic & environmental hazardous chemicals*



Land Regulations...

❖ The Fire Safety Act

- Fire Safety & Shelter Department (FSSD), Singapore Civil Defence Force (SCDF)

- ✓ *Flammable petroleum products*

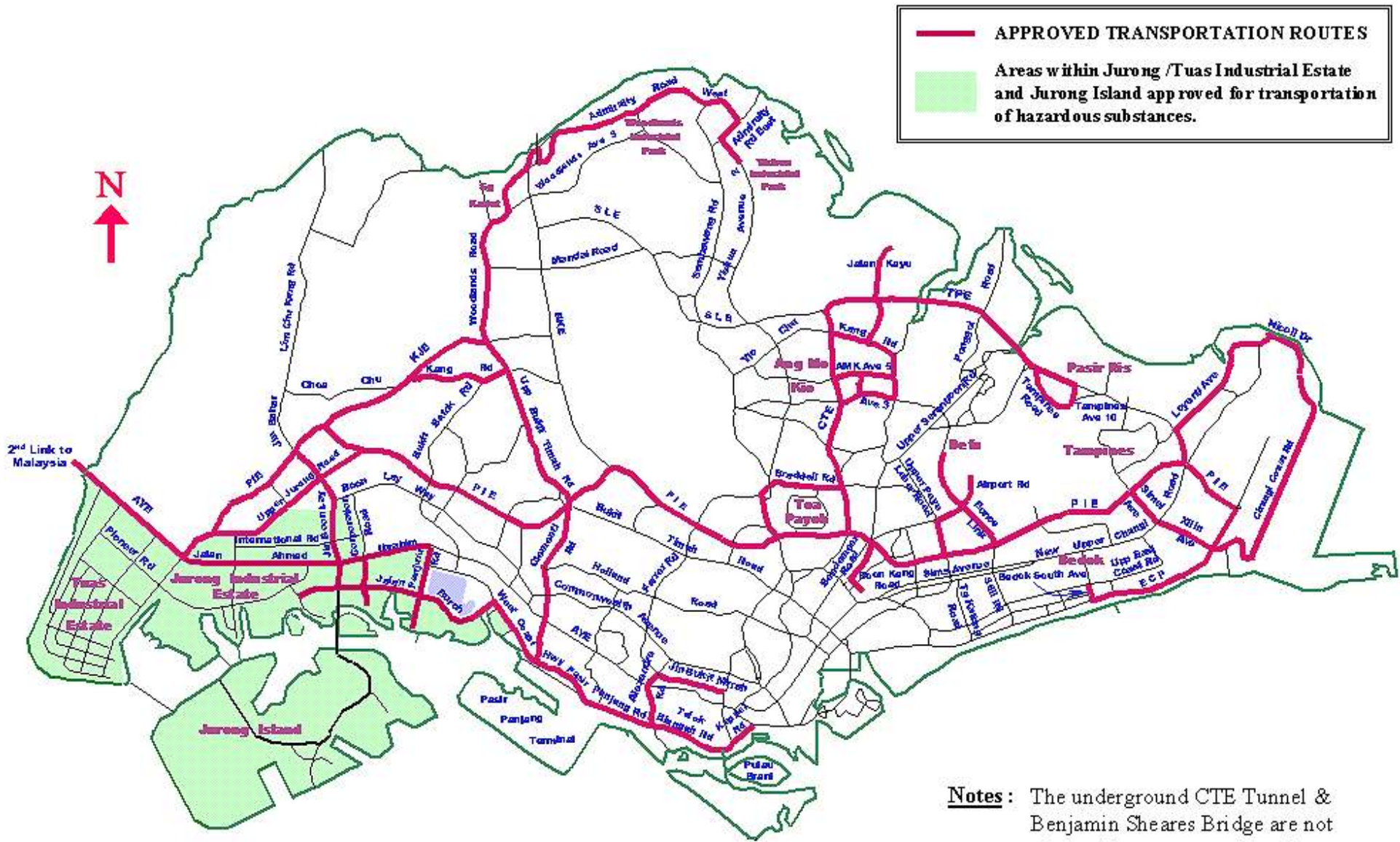


Land Regulations...

- Centre for Radiation Protection
- Health Sciences Authority
- ✓ *Radioactive substances*



Transportation Routes



— APPROVED TRANSPORTATION ROUTES

Areas within Jurong /Tuas Industrial Estate and Jurong Island approved for transportation of hazardous substances.

Notes: The underground CTE Tunnel & Benjamin Sheares Bridge are not allowed for transportation of Hazardous Substances

Hollywood Movie ?

Great Balls of Fire in Tuas blaze (23 May 1997)

FIREBALLS shot 80 metres into the air as 200-litre drums of chemical solvents exploded in a fire.

Thick smoke from the fire was visible 5km away as 200 firemen and police officers took four hours to bring the blaze under control.

Two factory workers injured with burns, more than 500 people had to be evacuated from six buildings within a 500-m radius



Court gives harshest possible punishment to company which failed to protect workers against toxic fumes.

Between 25 to 30 Sept 2002, eight workers fell ill after inhaling toxic fumes and three died thereafter.

PENALTY

\$200,000 Fine for failing to ensure its worker safety against the inhalation of toxic fumes.

\$20,000 fine for failing to warn its workers of the risks they were exposed to.

\$5,000 fine for not informing Manpower Ministry that its workers had died because of the accident.



HAZMAT : The Best of the Best

The elite group of some 200 SCDF officers are trained to handle toxic spills and fires involving chemicals

“A chemical fire burns more easily and is difficult to extinguish. The chemicals causing the fire are themselves toxic, and would often cause toxic by-products.”

- Head of Hazmat Branch



“Toys” of HAZMAT



Platform On Demand System (PODS)

- ❑ Carry an anemometer to measure & record wind speed and direction, so firefighters can monitor how wind conditions will affect the spread of toxic fumes
- ❑ Had a laptop computer to give firefighters information on the chemicals
- ❑ Carry equipment to contain chemical spills
- ❑ Can be converted into a Mass Decontamination Pod, which is like a portable shower unit. When people affected by a chemical fire or spill are evacuated, they can be washed down in this unit with water & detergent.

This little robot can help to contain hazardous chemical leaks where it would be too dangerous for civil defence officers to get close.

Emergency Exercises





Hospital Car Porch Turns Into A Decontamination Station

- Within 5 mins, rows of shower heads appear from the ceiling and screens descend around the sides to cordon the area off
- 7 patients can be wheeled in simultaneously and the chemicals washed off
- 42 victims per hour can be cleaned





Security & Terrorism

Security Challenges to the Port of Singapore

Maritime Crossroad between East and West

- 50,000 ships pass through Straits of Malacca and Singapore
- 1/2 of world's oil and 1/3 of world's trade

Busy Hub Port

- World's busiest port – 130,318 vessels, total 1.15 billion GT
- Focal point for 200 shipping lines
- Linking >600 ports in 120 countries

Container Transshipment

- World's busiest container port
- Record 23.19 million TEUs (2005)

Need for Maritime Security

Oil / Chemical / Gas Carriers

- ❑ 3rd largest oil refining centre in the world
- ❑ More than 17,000 tanker calls

Regional Ferries & Cruise Ships

- ❑ Daily ferry services to Batam, Bintan & Karimun
- ❑ About 50,000 calls

Bunker Services

- ❑ Busiest bunkering port, supplying to 23.6 million tonnes

Marine Services

- ❑ 1200 harbour craft operating daily providing tugs and pilotage services, bunkering, supplies, launches, etc

Post 9/11 : Securing Port Waters

- ❑ **Monitoring movements of sensitive vessels**
- ❑ **Prohibited areas around sensitive installations**
- ❑ **Designated routes for certain types of vessels**
- ❑ **Designated landing points to facilitate ship's crew members through customs and immigration**
- ❑ **Licensing Regime for Regional Ferry Operators**

Accompany Sea Security Teams (ASSeT) – 180 Squadron

Vessels entering or leaving the port may be boarded by ASSeTs



Purpose is to protect the port and vessels from security threats within Singapore Port Waters

- ❑ **Implemented by Maritime and Port Authority of Singapore (MPA), Police Coast Guard (PCG) and Republic Singapore Navy (RSN).**
- ❑ **Enable the security agencies to identify and track the movements of all powered harbour and pleasure craft inside Singapore port waters.**
- ❑ **All MPA-licensed powered harbour and pleasure craft shall carry the HARTS transponder with effect from 1 Jan 2007.**
- ❑ **Real time data from the transponder such as vessel identity, position, speed, course and other information are transmitted to a shore-based system via the wireless communication link.**

HARTS (Harbour Craft Transponder System)

Vehicle-crippling device to foil lorry-bombers

By **BEN NADARAJAN**

AS PART of an effort to prevent terrorists wreaking havoc with lorries carrying petrol or chemicals, a tracking system is to be installed on all such vehicles in Singapore, together with a device to stop them in their tracks if they leave designated routes.

The Global Positioning System (GPS) tracking device will be attached on top of all vehicles entering the country with hazardous material (Hazmat).

If the lorries run beyond approved transportation hours or diverge from their approved routes, or if the devices are tampered with, the authorities will receive an alarm. Singapore Civil Defence Officers can then

cripple the vehicles remotely.

The tracking system was unveiled by SCDF Commissioner James Tan at last month's Workplan Seminar.

It can keep track of up to 10,000 vehicles simultaneously.

An average of 100 Hazmat vehicles enter Singapore from Malaysia daily.

Every year, 40,000 tonnes of chemicals are moved between Singapore and Malaysia via the Second Link at Tuas.

There are about 60 approved routes for Hazmat vehicles, said Captain Lim Kian Boon of the SCDF Hazmat Team's operations department.

The routes are designed to keep Hazmat-laden vehicles away from highly populated

areas, tunnels, water bodies and sensitive buildings.

The new tracking system, which will be in operation by the end of the year, will also allow the SCDF to set up virtual out-of-bound zones around potential targets. If any Hazmat vehicle breaches the perimeter, the alarm will be triggered.

Capt Lim said it is unlikely that a Hazmat vehicle would accidentally stray off its designated route, as drivers are required to know the routes before receiving permits to drive such vehicles in Singapore.

The worry, however, is that such carriers may be hijacked by terrorists and turned into explosive fuel-bombs.

That is why the SCDF is planning at the same time to install a jamming device, to

cripple the vehicles if they stray from permitted paths.

The lorries will be fitted with devices that could cut off fuel to the engine or lock the brakes when activated.

The gadgets will initially be made compulsory on lorries operated by local companies that transport hazardous material and will later be extended to Malaysian vehicles as well.

In the United States, California recently drafted laws making "stopping devices" mandatory on all Hazmat trucks by next year.

Earlier this year, the Fire Safety Bill here was amended to allow security checks on drivers before they are given licences to drive Hazmat vehicles.

Commissioner Tan said:



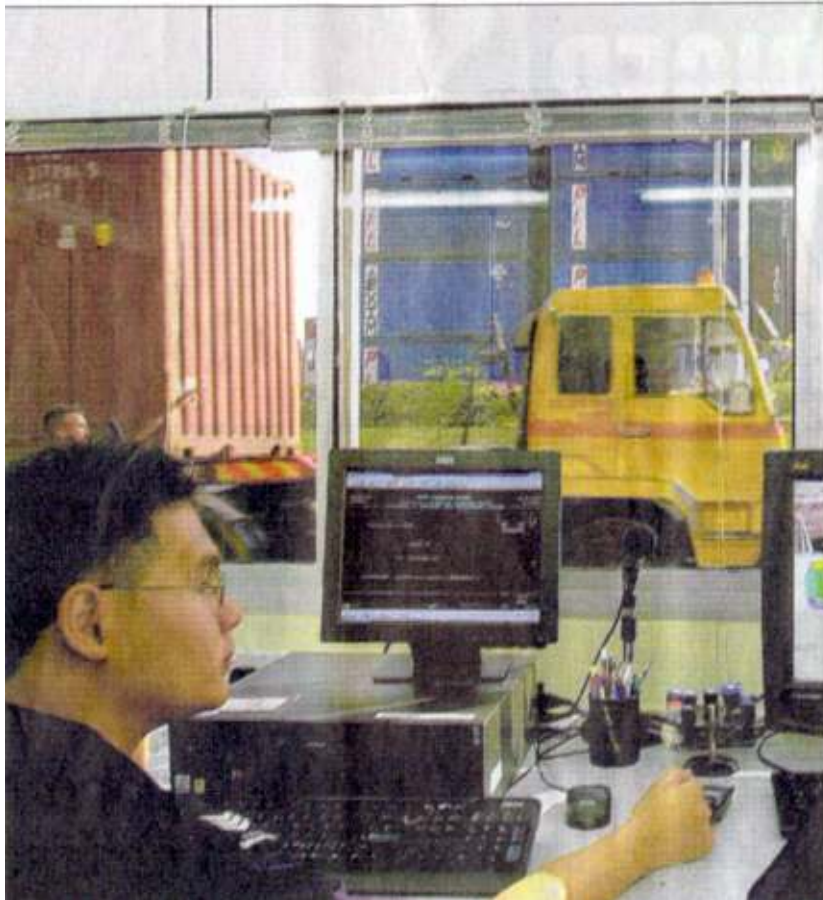
TERENCE TAN

The tracking device installed on top of the vehicle.

"We recognise that vehicles carrying hazardous materials or petrol can be used by terrorists as weapons to cause mass destruction. These new measures will greatly lessen the chances of that happening here."

- Hazmat Transport Vehicle Tracking System can track 10,000 vehicles simultaneously.
- Vehicles carrying petrol or chemicals will be fitted with Global Positioning System (GPS) tracking device
- If vehicles run beyond the approved transportation hours or diverge from their approved routes, the authorities will receive an alarm
- Singapore Civil Defence Officers can cripple the vehicles remotely or send Mobile Enforcement Team on motorcycles

Vehicle and Cargo Inspection System



- \$1.8 million gamma-ray scanner
- Takes about 1 minute to scan a 12m container
- Installed at port to inspect containers



Will Daddy come home?



Think of Yours And Others Loved Ones





Thank You

Aloysius Lim

Aloysius_Lim@ite.edu.sg