Managing Hazardous Chemical Using Online Database program

A presentation to AIHce 2007
Pennsylvania Convention Centre
Philadelphia
2nd to 7th June 2007

Azizin Zainudin
Rina C Ronaldin

PETRONAS, Malaysia
Population: 26 million
Independence Date: 31st August 1957 (50th Anniversary)
Capital City: Kuala Lumpur
Language: Malay (English widely used)
Presentation Outline

- Introduction to PETRONAS
- PETRONAS Chemical Online Database (Datakimia)
- Online MSDS / Labeling
- Online Chemical Inventory
- Issues & Challenges
- In Conclusions
- Incorporated on August 17th, 1974
- 107 wholly-owned subsidiaries, 28 partly-owned outfits and 52 associated companies
- In the 2006 Fortune Global 500 - rank No: 120 in the world and No:1 in South East Asia / Australia
- 33 countries (Sudan, Pakistan, Thailand, Egypt, Vietnam, Indonesia, South Africa, etc.)
- Aspiration to become a leading oil and gas multinational of choice
Wide spectrum of petroleum activities, including:

- upstream exploration
- downstream oil refining
- oil, petrochemical and natural gas manufacturing, marketing and distribution
- shipping
- automotive engineering
With the nature of PETRONAS’s operations, exposure to hazardous chemicals is unavoidable.

PETRONAS takes every necessary precautions to control the risks.

Malaysia has introduced many chemical regulations; CIMAH, CPL, USECHH.
Status of MSDS, Labeling & Chemical Register in PETRONAS (Pre Chemical Online Database)

Findings

- Unavailable of Full MSDS in the workplace
- Inappropriate / No chemical Labeling of chemicals in the workplace
- Incomplete chemical register in the workplace
- No standard approach in managing of chemicals in the workplace

Group Intervention Program

- Groupwide online chemical database program
PETRONAS Online Chemical Database

Approach

- Online chemical database:
  - Establishment of Chemical database software accessible to all plants.
  - An Intranet web based application, can be assessed by all staff
  - All products and supplied chemicals to be included into database
  - Complete dual-language MSDS and labels
  - The responsibility of chemical management lies with each area owner

- Meeting GHS (Global Harmonisation System) implementation

- The online chemical database is known as PETRONAS Datakimia
PETRONAS Datakimia

• ChemWatch software as the support system.
• Comprehensive database of chemicals.
• The system meets various requirements of national & international agencies.
• Quarterly Updates. Ensure compliance with changing regulations and up-to-date advice on any new findings related to chemical products.
• Multi-language capability - over 20 European and Asian languages
Online MSDS / Labeling

MSDS
MSDS Database
MSDS Search by:
  Name, Trade name, CAS number, UN / Part / NIOSH number, DG classification
MSDS can be viewed in many languages
Common Group MSDS format
Online MSDS for PETRONAS products

Labeling
Common Labeling Templates
PETRONAS Chemical Online Database
Assess through Intranet Website...
CHEMICAL DATABASE & MANAGEMENT SYSTEM

Database  Password
Documentation  Bulletin Board
Printer Setup  Personalise
Backup  Frequently Asked Questions

Turbo Tools  Exit

Tuesday, 06 February, 2007

Help
Page Screen: search result for “vcm”

The ‘search’ button used to find chemicals.

To get to the MSDS, click on the chemical.

Search results will display all chemicals which have the word ‘vcm’ in it.

This indicates the year and version of the application.

Click ‘manifest’ to access the online chemical inventory database.

To get the label, click the ‘label’ icon.
**VCM in MSDS menu**

**vcm (VINYL CHLORIDE)**

- Extremely flammable.
- May form explosive peroxides.
- Causes burns.
- Risk of serious damage to eyes.
- Risk of explosion if heated under confinement.
- May cause CANCER.
- Inhalation and/or skin contact may produce health damage*.
- Cumulative effects may result following exposure*.

- Vapours potentially cause drowsiness and dizziness*.
- Keep locked up.
- Keep container in a well ventilated place.
* (limited evidence).
9 more phrases ...

**Physical Properties**
**Synonyms**
**Acute Health**
**Toxicity**
**Engineer Controls**
**Handling**
**Storage / Transport**
**Disposal**
**Appearance**
**Use**
**Chronic Health**
**Exposure Standards**
**Personal Protection**
**Instability Conditions**
**Spills**
**Fire Report**
**Environ.**
Online Chemical Inventory

- An initiative to enhance Petronas Datakimia with the objective to develop specific online chemical register in every OPU

- Characterise the chemical hazards through
  - Chemical incompatibility
  - Dangerous goods area
  - Risk assessment
  - Hazard identification and prioritisation

- Assist in full compliance to Malaysia USECHH 2000
  - Inventory may act as an online Chemical Register
Online Chemical Inventory

Scope

- Chemicals to be included in the inventory
  - All chemicals incl. non-hazardous chemicals

References

- OPU Chemical Health Risk Assessment Report
- OPU Chemical Register/Inventory/MSDS

PETRONAS domestic OPUs
Online Chemical Inventory

Approach

- Implementation at every Operating Units (OPUs) in Malaysia
- Establish OPUs team members
- OPU Folder set-up in online database under ‘manifest’ function
- Identify chemical storage areas for the plant
  - Creation of area, location, storage areas
- Initiate review of chemicals and check availability in the online chemical database
  - input into specific area in the folder for available chemicals document in online database
  - Non available chemicals will be added once document updated in the online database
- Additional info on quantity of chemicals being stored and chemical suppliers
Online Chemical Inventory

Process Flow

Create OPU folder

Review MSDS

Consolidate for further action

Yes?

Input into folder

Not available?

Maintain & Update folder

Continuous improvement

Industrial Hygienist (facilitator)
OPU Lab focal person
OPU Operations focal person
OPU HSE focal person

OPU HSE focal person

Appointed staff with access to online Datakimia
(OPU HSE /Lab/ Operations Focal person)

e.g. Chemical change? New store? New chemical?
The 'search' button used to find chemicals

Click 'manifest' to access the online chemical inventory database

Search results will display all chemicals which have the word 'vcm' in it

To get the label, click the 'label' icon

To get to the MSDS, click on the chemical

This indicates the year and version of the application

2007

Integrated Chemical Management Solutions
The layout of the folders can be changed back to “FLAT”

Various assessment reports can be produced
Online Chemical Inventory

Conflict report

Incompatibility Report - best practice guide

The following advice applies for other than minor quantities.

Area: VCMSB
Section: Laboratory
Location: Lab chemicals store

Store Isolation checks found: Materials requiring segregation. Materials requiring fire separation.

Prohibited material combinations:

- Fire separation DGC 2.1 vs 3
- DGC 2.1
  - vinyl chloride
  - acetone
  - allyl chloride
  - benzene
  - carbon disulfide
  - chlorobenzene
  - amyl alcohol
  - cis-acetylene dichloride
  - ethanol
  - ethylene dichloride
  - isopropanol
  - methanol

- DGC 3
  - acetaldehyde
### Poster report

**Online Chemical Inventory**

**MANIFEST**

#### Posters

<table>
<thead>
<tr>
<th>MATERIALS</th>
<th>TOXIC</th>
<th>FLAMM</th>
<th>REACT</th>
<th>BODY</th>
<th>CHRONIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hach PhosVer 3 Phosphate</td>
<td>Min</td>
<td>Min</td>
<td>Low</td>
<td>High</td>
<td>Min</td>
</tr>
<tr>
<td>Reagent Powder Pillows</td>
<td>Min</td>
<td>Min</td>
<td>Min</td>
<td>High</td>
<td>Min</td>
</tr>
<tr>
<td>Hach Acid Reagent Powder Pillows</td>
<td>Min</td>
<td>Min</td>
<td>Min</td>
<td>High</td>
<td>Min</td>
</tr>
<tr>
<td>Hach FerroVer Iron Reagent</td>
<td>Mod</td>
<td>Min</td>
<td>Min</td>
<td>High</td>
<td>Mod</td>
</tr>
<tr>
<td>Hach Buffer Solution</td>
<td>Mod</td>
<td>Low</td>
<td>Min</td>
<td>High</td>
<td>Mod</td>
</tr>
<tr>
<td>Hardness 1 pH 10.1 +/- 0.1</td>
<td>Low</td>
<td>Min</td>
<td>Min</td>
<td>Min</td>
<td>Min</td>
</tr>
<tr>
<td>Hach Phenol 2 Reagent Powder</td>
<td>Mod</td>
<td>Mod</td>
<td>Mod</td>
<td>Mod</td>
<td>Mod</td>
</tr>
<tr>
<td>Powders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>cyclohexanone</td>
<td>Mod</td>
<td>Mod</td>
<td>Mod</td>
<td>Mod</td>
<td>Mod</td>
</tr>
<tr>
<td>ammonium chloride</td>
<td>Mod</td>
<td>Min</td>
<td>Min</td>
<td>Mod</td>
<td>Min</td>
</tr>
<tr>
<td>potassium dichromate</td>
<td>EXT</td>
<td>Min</td>
<td>Min</td>
<td>High</td>
<td>EXT</td>
</tr>
<tr>
<td>potassium hydrogen phthalate</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Min</td>
</tr>
</tbody>
</table>
PETRONAS Online Chemical Database

Issues/Challenges

- Online PETRONAS DataKimia
  - Network disruption
  - Slow response
- Chemical Register
  - Incomplete list
  - Outdated list
  - Some values on the chemical quantity are not available
- MSDS
  - Some are not available onboard ChemWatch
  - Scheduled wastes MSDS not available
- 2nd phase implementation – International Operations
In conclusions (1 of 2)

- Corporate
  - Able to identify chemicals which are commonly/widely used in PETRONAS
  - Assist in corporate planning for a chemical management program
  - Assist in future GHS (Global Harmonisation System) implementation
In conclusions (2 of 2)

- **Operating Units**
  - Database will provide important info and assist in managing chemicals at their workplace
  - Encourage OPU to include their product MSDS in the database
  - Better utilisation of Datakimia and its functions
  - Increase awareness on chemicals safety / health hazards & effects
  - Complete MSDSs in Malay and English
  - Labels available in Malay and English according to CPL requirements
THANK YOU

Azizin Zainudin
Group Industrial Hygienist
PETRONAS, Malaysia
Tel: 603-23311613
Email: azizin@petronas.com.my