Use Chemicals Safely Seminar

25th May, 2016
Radisson Blu Hotel and Spa, Lough Atalia Road, Galway
Chemical Agent Risk Assessment
CHEMICALS- Identification

READ the label
BUT …. Not all chemicals have labels

Risk Assessment???

“no asbestos material was found during the 2004 demolition” ????

© Health and Safety Authority
CARBON MONOXIDE AWARENESS WEEK
SEPTEMBER 22nd-28th
CARBONMONOXIDE.IE
• Are sensitive risk groups included?
  
• e.g. children in creche
• E.g. pregnant employees
Compliance

- www.irishstatutebook.ie
- Safety, Health and Welfare at Work, (Chemical Agents) Regulations 2001
- Safety, Health and Welfare at Work, (Chemical Agents) (Amendment) Regulations 2015

Only the courts can interpret statutory legislation with any authority
Hazardous Properties e.g. H2O
Information

Examples Include:
- Asbestos Survey
- Incidents
- Equipment Manuals
- Maintenance Requirements
- Regulatory Websites
- Safety Alerts
- Noise Survey
- Etc....
Level, Type & Duration of Exposure
+ Dermal Exposure– “Sk”

Circumstances of work
Quantities - use & stored
Examples from Monitoring reports

“total inhalable dust ....7.3mg/m3....the results are within the limits.. no risk to employees...”

BUT Wood dust limit is 5mg/m3

&

“We used the standard NIOSH method 12345 modified with PVA filters ....”

Difference between Environmental Monitoring and Occupational Hygiene Monitoring

Combined and Sequential Exposure
Controls & Surveillance
Maintenance and Accidental Release
Storage
Transport
consultations

Staff Training
Assess the exposure

Consider:

- WHAT IS THE EXPOSURE?
- WHO uses the chemical?
- HOW LONG is user exposed to chemical?
- HOW OFTEN is chemical used?
- HOW will user be exposed?
- HOW MUCH is used?
- Can NON-USERS be exposed?
Risk Assessment

- SDS & Label & Other
- Environment
- Process / Task
- Who & How?

Controls

- Process ?
- LEV ?
- PPE ?

CHECK

- Training
- Maintenance
- Monitoring – audit, air, HS
Potential Approaches
Can you combine with other documents?

• Cleaning Regime?
• SOP?
• NOP?
• Method Statement?
• Quality Procedure?
• Laboratory Protocol?
<table>
<thead>
<tr>
<th>HAZARD</th>
<th>WHO</th>
<th>RISK (Severity and Likelihood)</th>
<th>CONTROLS IN PLACE</th>
<th>FURTHER ACTION</th>
<th>PRIORITY</th>
<th>ACTION DATE</th>
<th>ACTION BY</th>
</tr>
</thead>
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<td>Example</td>
<td>3 process employee</td>
<td>Splashing – skin/eye burns (very likely &amp; extreme harm) Unacceptable Risk</td>
<td>PPE only Face shield gloves</td>
<td>Consider eliminating pouring. Restructure process</td>
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<td>-----------</td>
</tr>
<tr>
<td>Example</td>
<td></td>
<td>Pouring Sodium Hydroxide Solution from bulk tank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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- Area is restricted to those trained in the processes carried out in the Darkroom.
- Only items used for the processing of screens to be kept in this area.
- No food or drink to be consumed in this area.
HACCP

- Hazard Analysis & Critical Control Point
  - food safety management system
  - identify and control any hazards that could pose a danger to the preparation of safe food.
  - It involves identifying what can go wrong, planning to prevent it and making sure you are doing it.

- A big folder on a shelf is not a food safety management system! [https://www.fsa.ie/food_businesses/haccp/haccp.html](https://www.fsa.ie/food_businesses/haccp/haccp.html)

Are you using chemicals as part of your controls?
Can your chemical agents risk assessment be included?
Chemical Agent Risk Assessment (By band see pg. 2 + 3)

Experiment Risk Assessment

Project Risk Assessment

Specific Chemical Agent Risk Assessment for non covered applications and on 1st receipt

SOPs

Where Required:
- For experiments outside the norms in the project risk assessment
- Assessment of the risks associated with the project including chemicals, reactions, and manipulations and equipment. Also lists controls, precautions other risk assessments, MSDSs and limits of the assessment
- Assessment of the risks associated with equipment or process with required safety procedures and controls.
<table>
<thead>
<tr>
<th>Formulation XYZ Risk Assessment</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Add 50l water to Tank A</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Weigh and add 50kg powder to tank</strong></td>
<td>Wear dust mask, wear goggles, wear gloves</td>
</tr>
<tr>
<td><strong>Close lid and turn on mixer</strong></td>
<td>No PPE required</td>
</tr>
<tr>
<td><strong>Add 5L of solvent directly to tank</strong></td>
<td>Wear half face mask and safety glasses</td>
</tr>
<tr>
<td><strong>Weigh and add 34kg powder to tank</strong></td>
<td>Wear dust mask, goggles and wear gloves</td>
</tr>
<tr>
<td><strong>Mix and slowly add 10l of solvent to tank</strong></td>
<td>Wear half face mask, eye protection, gloves</td>
</tr>
</tbody>
</table>

Is this compliant? ? ? ? ?
Hazard information

- Powder contains silica - Exposure to silica dust during weighing, addition to tank and sweeping – can cause silicosis
- Solvent vapours can cause headaches, dizziness, and defatting of skin
- Process takes approximately 1 hour and is carried out 6 times per day
- There is 1 hour clean up at end of shift – dry sweeping of dust, rinsing of tank using solvent containing benzene which causes cancer
- Manual handling of powder and solvent drums
- There is an annual maintenance and clean of the tank
- In event of malfunction contact Service Technician immediately.
Controls

1. Wear powered respirator with A2P3 filter
2. Wear nitrile rubber gloves to EN374, 1 mm thick. Dispose of after each cycle.
3. The powder is delivered to weighing location by pallet truck.
4. The solvent is piped directly to area beside tank.
5. Powder to be weighed in 10kg batches.
6. In event of spill, continue wearing PPE and use spill material located in area and dispose of waste in chemical shed containers
7. Health surveillance provided– all staff trained on skin checks and lung function questionnaire once per year with follow up as required
<table>
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<th>Risk Reduction Plan</th>
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<tr>
<td>1. Correct RPE and training – immediately</td>
</tr>
<tr>
<td>2. Eliminate Dry sweeping</td>
</tr>
<tr>
<td>3. Investigate elimination of weighing and measuring—can powder be purchased in preweighed bags or automatic dispensing of powder or liquid?</td>
</tr>
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<td>4. Local exhaust ventilation to be investigated</td>
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<td>5. Consider monitoring as part of above project – see Code of Practice for Chemical Agents.</td>
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<td>6. Alternative methods for cleaning to be investigated</td>
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| 1. New RPE to be purchased and personnel trained - A. N. Other |
| 2. Vacuum with HEPA filter to be purchased by 13 November 2015- A. N. Other |
| 3. - 5 Project for A Baker (advice of a competent occupational hygienist to be sought) |
Initial report due by 13 December 2015 |
| Risk Reduction Plan | 1. New RPE purchased and personnel trained - A. N. Other - COMPLETE-
2. Vacuum with HEPA filter to be purchased by 13 November 2015- COMPLETE- risk assessment of use and emptying and training carried out – Documented in Clean up SOP
3. & 4 & 5 - Project for A Baker
Initial report due by 13 December 2015
| Initial report indicates:
| • preweighed bags - cost €X,
• Automatic dispensing of powder - cost by €Y
• Bulk purchase of solvents and a solvent line with inline metering will cost €Z
• Possible elimination of RPE so reduction in fit test costs, cost of filters and health surveillance
• Alternative cleaning method identified with no benzene – See Carcinogens Regulations, Cost neutral as increased cost of new method off set against reduced disposal (waste is non-hazardous)|
1. Eliminate Dry sweeping
2. Investigate elimination of weighing and measuring– can powder be purchased in preweighed bags or automatic dispensing of powder or liquid?
3. Local exhaust ventilation to be investigated - Responsibility of A Baker by 13 December 2015 (advice of a competent occupational hygienist to be sought)
4. Consider monitoring as part of above project – see Code of Practice for Chemical Agents.
5. Alternative methods for cleaning to be investigated
Life Cycle Risk Assessment

- Ordering
- Delivery
- Storage
- Transport
- Use
- Disposal

Emergency & Interaction
Next Steps
Further Information

- Guidelines to the Safety, Health and Welfare at Work Chemical Agents Regulations 2001
  (this is being updated)
- HSA- Your Steps to Chemical Safety
- https://besmart.ie/learn-more/hazard-control-and-training-info/
- www.irishstatutebook.ie
Thank You
On the move-considerations for the transport of dangerous goods
Jean Shannon
Dangerous Goods Transport Legislation

United Nations Model Regulations

- Road (ADR)
- Rail (RID)
- Inland Waterways (ADN)
- Sea (IMDG Code)
- Air (ICAO)

Directive 2008/68/EC

European Agreement – ADR
National Legislation
Regulations 2011 - 2015
Participants/Duty Holders

Unloader

Tank container/portable tank operator

Packer

Driver and Vehicle Crew

Filler

Consignee

Dangerous Goods Safety Adviser (DGSA)

Loader

Consignor

Carrier

CONTRACT OF CARRIAGE
Training Requirements

• **DGSAs** must hold appropriate certification (valid for 5 years)
  - may specialise in multi-modal transport
• **Drivers** must participate in a mandatory training course with examination - training certificate valid for 5 years
• **All participants** must receive training appropriate to responsibilities and duties before assuming them
  - general awareness
  - function specific
  - safety (and security)

Note that training for those operating under **ADR exemptions** (e.g. LQ exemption) should include relevant elements of all three...
Incident, Moscow, 2013
Incident, Moscow, 2013
ADR Danger / Class Labels

1. Explosives
2. Gases
3. Flammable liquids
4. Flammable solids
5. Oxidising / org. peroxide
6. Toxic / Infectious
7. Radioactive
8. Corrosive (acid/base)
9. Miscellaneous
New Class 9 label (No. 9A)
Classification for transport

- Responsibility of Consignor
- For substances/mixtures already classified – use available data
  
  Determine UN number, proper shipping name and class
  
  Packing group indicates the level of danger, PGI, PG II, or PG III
  
  Tunnel code: tunnels and dangerous goods are assigned a code restricting movement through tunnels

UN number, name (PSN) and hazard class, packing group, tunnel code

E.g. UN1230, Methanol, 3 (6.1), PGII, (D/E)

- Self classification
  (DGSA/laboratory testing/ADR/UN Manual of T&C)
Packaging

DGs may only be carried in appropriate packaging – generally “UN” approved.
UN Package Testing and Marking

UN mark identifies packaging as tested and approved

Code provides further important information, e.g.
4G - type of package
Y - packing group suitability
S – packaging intended for solids or inner packagings
Labelling/Additional Marking

Provides immediate warning to all (e.g. handlers/users/emergency services)

Packaging must be labelled with
- Hazard class label(s) (min 100mm)
- UN number
- additional marks as necessary
CLP Article 33

Classified for transport and supply

Outer & Inner packaging

Product identifier
Signal word
Hazard statements
Precautionary statements
Contact details

Product identifier
Signal word
Hazard statements
Precautionary statements
Contact details
Overpacks
Vehicle/tank marking and placarding
Exemptions

• Summarised in published ADR Guide for Business
• Some exemptions very complex
• If in doubt, always seek the advice of a DGSA
## Exemptions

| National Exemptions                                                                 | • National regulations  
|                                                                                   | • Carriage within the state only |
| ADR Exemption 1.1.3.1 (c)                                                        | • Carriage by enterprises which is **ancillary to their main activity** |
| Small load exemption                                                             | • Can carry up to specific threshold quantities with minimal requirements |
| Limited and Excepted Quantities                                                    | • LQ – small quantities, up to 5 Kg or 5 litres  
|                                                                                   | • EQ – very small quantities, 1 – 30 g / ml per inner packaging |
| Special Provisions                                                                | • Prohibitions, exemptions, explanations re classification, additional marking... |
| CA Authorisations                                                                | • CA Exemptions and Approvals, multilateral agreements (MLAs) |
Carriage of DG by enterprises which is **ancillary to their main activity**, e.g. carriage of oxygen and acetylene cylinders for welding/maintenance/repair work

- Cylinders must be ADR compliant/marked and labelled
- Specific quantity limits
- Secured in vehicle/unlikely to leak/all valves shut
- Risk assessment to determine requirement for additional measures
- Open or ventilated vehicles
- Signs/labels on vehicle
- Hazard awareness training

Note that this exemption **does not apply** to logistics companies, couriers etc.
Small Load Exemption

• Reduced requirements imposed when DG carried below certain threshold quantities (listed in Table 1.1.3.6.3 of the ADR)
• Quantity limits depend on the TRANSPORT CATEGORY of the DG (ranging from 0 to 4)
• Two scenarios:

(A) All DG the same or within the same transport category

UN No. 3343, Nitroglycerin mixture, desensitized...  TC 0  0
Most PG I, Class 2 toxic  TC 1  20
Most PG II, Class 2 flammable  TC 2  333
Most PG III, Class 2 groups A and O  TC 3  1000
Empty, uncleaned packagings, safety devices  TC 4  Unlimited
Small Load Exemption
Ethanol Solution, UN No. 1170, PG III, TC3
**Small Load Exemption**

**(B) DGs carried belonging to different transport categories**

<table>
<thead>
<tr>
<th>Transport Category</th>
<th>Multiplying Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>1*</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

*Sum of DG must not exceed 1000*
Small Load Exemption – worked example

Company distributing paints and lacquers

• Flammable liquids
  (PG II and PG III)
• Corrosive cleaning liquid
Small load Exemption – worked example

<table>
<thead>
<tr>
<th>Dangerous Goods</th>
<th>Transport Category</th>
<th>Quantity (litres or Kg)</th>
<th>Multiplying Factor</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paint Group A</td>
<td>3</td>
<td>400</td>
<td>1</td>
<td>400</td>
</tr>
<tr>
<td>PG III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paint Group B</td>
<td>2</td>
<td>20</td>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>PG II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacquer</td>
<td>2</td>
<td>100</td>
<td>3</td>
<td>300</td>
</tr>
<tr>
<td>PG II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaning fluid</td>
<td>3</td>
<td>50</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>PG III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>810</td>
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Small load Exemption – worked example

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</tr>
<tr>
<td>PG II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lacquer</td>
<td>2</td>
<td>200</td>
<td>3</td>
<td>600</td>
</tr>
<tr>
<td>PG II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleaner</td>
<td>3</td>
<td>50</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>PG III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>1,110</strong></td>
</tr>
</tbody>
</table>
Small Load Exemption

Two important requirements are:

- The consignment must be accompanied by a **transport document**
- The driver and crew, although not required to be certified, must have received **training** in accordance with Chapter 1.3 of the ADR, i.e. must receive general awareness, function specific and safety training
Limited Quantities

• Specified small quantities in packages
  (e.g. 5 Kg / 5 litres per inner package)
• Gross mass limit 30 Kg /20 Kg
• Packaging does not have to be UN approved
• Minimal relevant provisions apply (e.g. waste aerosols)

No limit to the total quantity per shipment

• Transport units 12 tonnes carrying 8 tonnes of LQ packages must display mark as PLACARD
• Not required if the vehicle requires blank orange plates (other DG carried)
Load security still applies!
Load security

Guidelines:
• EU Best Practice for Cargo Securing
• IRU international guidelines for safe loading
Exemptions - summary

If unsure, the following options are available:

• ADR Guide for business
• DGSA
• Chemicals Helpdesk
I am a PARTICIPANT under the regulations, how do I know if I need to formally appoint a DGSA???

• Do all three of the following criteria apply to me?
  1. My main or secondary activity is not the carriage of dangerous goods (and related activities)
  2. I only occasionally carry/load/unload dangerous goods
  3. My activities do not create a significant danger or risk to persons or the environment

• Do my activities concern quantities of dangerous goods in each transport unit below the threshold quantities of the various ADR exemptions?
Examples:

1. I own a building company occasionally carry small amounts of fuel for use in machinery.
2. My company only unloads at the final destination (Consignee) ???

HSA guidance available:

- [Guidance on the appointment of a DGSA](#)
- [ADR Guide for Business](#)
- [Guidance on the duties of a DGSA](#)
Dangerous waste

- Clinical waste
- Batteries
- Chemical waste
- Aerosols
- Asbestos
Waste chemicals – public amenity site
Provisions for Waste

- Few provisions specifically for waste
- New provisions in ADR from 2009 for the classification of waste when the composition is not precisely known
  - ADR 2.1.3.5.5 – assignment of UN number and PG based on the **consignors knowledge of the waste** (if in doubt, highest danger level taken)
  - Technical name not required on the transport document

E.g. UN 3264, corrosive liquid, acidic, inorganic, N.O.S., 8, II, (E), waste in accordance with 2.1.3.5.5
Information is available

- Guidance on the carriage by road of asbestos containing materials (ACMs) including asbestos waste
- New ADR provisions for the carriage of lithium batteries for disposal or recycling (ADR Main Changes Report 2015)
- Industry notice on the packaging of waste laboratory chemicals ("lab smalls")
- Industry notice on the carriage of waste aerosols
Waste Aerosols – SP 327, P207?
Clinical waste
Chemical waste
Overpacks for hazardous waste
Use Chemicals Safely Seminar

25th May, 2016
Radisson Blu Hotel and Spa, Lough Atalia Road, Galway
Chemicals Helpdesk

- All chemical related queries
- chemicals@hsa.ie
- 1890 289 389
- Scope