

<b>Health and Safety Executive</b>		<b>Sector Information Minute</b>	
Services, Transport and Safety Unit (STSU)		<b>SIM 05/2003/57(rev)</b> (formerly SIM 07/2003/29)	
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Target Audience:  
FOD Inspectors

## **INSPECTION OF AMMONIUM NITRATE (AN) FERTILISER STORAGE AT PORTS**

This SIM provides guidelines for inspectors who encounter fertiliser storage on dock premises, receive notifications of new storage facilities, or receive complaints regarding storage standards.

- 1 An explosion in Toulouse in 2001 led to a significant lowering of ammonium nitrate threshold quantities for notification under the Notification of Installations Handling Hazardous Substances 1982 (NIHHS) and the Control of Major Accident Hazards Regulations 1999 (COMAH).
- 2 A subsequent two-year inspection initiative from 2003 to 2005 examined standards of fertiliser storage at ports. These were found to be generally acceptable
- 3 HIDS12 (Explosives Inspectorate) enforce at sites where storage quantities bring the site within the scope of COMAH and most sites where consent is required under the Planning (Hazardous Substances) Regulations 1992. For AN fertilisers with nitrogen content >28% this threshold is 1000 tonnes. Planning legislation is in the process of being amended to bring thresholds in line with COMAH but this is not yet complete. Quantities to which COMAH applies are detailed in Schedule 1, Part 2 of the Regulations.
- 4 FOD inspectors enforce at NIHHS sites, most likely to be farms and ports. HSE has given an undertaking to the government that all new notifications will be inspected. Field teams may also receive information concerning other ports, for example through complaints or incidents, and should follow these up where they qualify for selection under standard criteria. The NIHHS threshold for qualifying AN fertilisers is 150 tonnes.
- 5 Guidance on the effect of the changes under NIHHS is found in OM 2006/10. This guidance also explains notification procedures.
- 6 Where the quantity at a port exceeds the limits for COMAH but is in intermediate temporary storage the Regulations do not apply. Intermediate temporary storage covers the situation where the material is temporarily held

at a port as part of its onward delivery to customers. Further guidance on intermediate temporary storage can be found in HID SPC/Enforcement/02

7 Site visits should assess the standard of storage of fertiliser based on the guidance in INDG230 Storing and Handling Ammonium Nitrate and the web-based guidance Storage of Ammonium Nitrate Fertiliser: Dutyholder's Self-Help Checklist. Advice on each aspect of the self-help form is found in the Appendix. At the time of writing INDG230 had not been updated to include the 2005 amendments to COMAH

8 If Inspectors find sites to which COMAH applies they should confirm with HID SI2 that they are aware of such sites. If such information only becomes apparent whilst the inspector is on site, they should continue with the visit to establish that the basic precautions in the Dutyholder's checklist are in place, and discuss further action with HID SI2 post-visit. Inspectors are advised to record the international dangerous goods classification number (commonly known as the 'UN Number'), as this can be useful in determining the COMAH limits that apply.

#### SECURITY OF INFORMATION

9 Care is required in the handling of information on fertiliser stores, as it remains sensitive. Any paperwork arising from a visit should be marked 'Restricted' and staff should follow the procedures when handling and transferring this information.

#### ENFORCEMENT GUIDANCE

10 Storage of AN is not a high-tech activity, but the basic elements of safe operation outlined in the self-help guide must be present. Enforcement is appropriate to achieve acceptable physical standards for buildings as well as systems of work to maintain good standards of storage and housekeeping. The latter do not need to be sophisticated.

11 SG assistance (process safety) should be sought where significant provision of fire fighting water is proposed, or where fire/smoke detection equipment may be necessary. The latter is likely to be a site-specific issue based on risk assessment and emergency response matters. Expert advice should also to be sought where unbagged AN fertiliser is stored in large stacks.

12 Applicable legislation includes:

- Health and Safety at Work etc Act 1974;
- Management of Health and Safety at Work Regulations 1999;

- Dangerous Substances and Explosive Atmospheres Regulations 2002 (especially regulations 5 and 6);
- Workplace (Health, Safety and Welfare) Regulations 1992 (especially regulations 5, 9 and 12)
- Notification of Installations Handling Hazardous Substances Regulations 1982 (as amended);
- Control of Major Accident Hazard Regulations 1999.

13 The Ammonium Nitrate Materials (High Nitrogen Content) Regulations 2003 apply to the import of certain fertilisers. The regulations are enforced by local authority trading standards officers, with assistance from HID SI 2. OC 279/3(rev) refers.

14 The standard criteria in the Enforcement Management Model (EMM) should be applied to enforcement decisions. The following general comments should be borne in mind:

- Explosions or fires involving AN fertiliser can result in multiple casualties. Therefore, risk gap table 2.2 should be used.
- The guidance on storage has been in place for some 15 years. It should be regarded as 'established' for the purposes of tables 5.1 and 5.2

15 Given the concentration of activity and people at ports, and the likely residential hinterland, the consequences of an incident are likely to be greater than at relatively isolated storage facilities, such as those at a farm.

16 Therefore, where deficiencies are found a letter or FOD IR form should be the normal minimum. Where numerous deficiencies are found, or a serious matter is discovered, an improvement notice or notices should be considered.

### ACTION BY INSPECTORS

17 Inspectors are asked to follow the guidance given in this SIM when conducting inspections of AN storage at docks. Any problems arising out of using this SIM should be referred, in the first instance to the Transportation Section

### APPENDIX (Para 7)

Question	Comments
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<p>1 Has the site been notified (i) in accordance with NIHHS guidance or (ii) as required by COMAH</p>	<p>(i) See OM 2006/10</p> <p>(ii) Information in accordance with Schedule 3 of the Regulations should be sent to: HM Explosives Inspectorate, Redgrave Court, Merton Road, Bootle, Merseyside L20 7HS</p>
<p>2 Is the building or floor constructed from combustible materials?</p>	<p>Research into the storage of AN on tarmac has been inconclusive. No further action is therefore required where AN is stored on a tarmac base. Wood floors are not suitable for the storage of AN.</p>
<p>3 Is the floor in poor condition, i.e. large cracks or holes?</p>	<p>Floor should be repaired ASAP and particular attention paid to housekeeping in the meantime.</p>
<p>4 Are there any open or uncovered drains or channels in the floor [i.e. could molten ammonium nitrate run into an underground drain/pipe]?</p>	<p>Short term - cover using sandbags or portable drain covers if available. Medium term - purpose built drain/channel seals. Long term - can drains be filled in or re-routed?</p>
<p>5 Is there evidence of 'significant' oil/diesel spillages on the floor?</p> <p>'Significant' means there are a number of stained areas on the floor as opposed to a few isolated stained areas.</p>	<p>Spills to be cleaned up and action taken to prevent further spills. (i.e. what is the source and why is it spilling)</p>
<p>6 Is the building used for the co-storage of any of the incompatible substances listed below?</p> <ul style="list-style-type: none"> <li>• urea/flammable</li> <li>• liquids/chlorates/oil/grease/gas</li> <li>• cylinders/acids/</li> <li>• zinc or copper including their</li> <li>• salts/nitrites/powdered metals/</li> <li>• sulphur/alkalis/reducing</li> <li>• agents/organic (carbonaceous)</li> <li>• materials.</li> </ul>	<p>Should not be permitted unless absolutely necessary and then only if stringent segregation measures in place. (See IND(G)230L p 5)</p>
<p>7 Is the building used for the co-storage of combustible materials (such as stacks of pallets, packaging materials, etc.)? If so, how are they separated from the ammonium nitrate?</p>	<p>Dedicated storage would normally be expected. Where it is absolutely necessary to keep pallets in the store, they should be separated from the AN by a suitable fire break partition or by a separation distance such that a fire</p>

	<p>involving these materials will not affect the AN. If significant quantities of combustibles are to be stored in the same building as the fertiliser further advice should be sought from HID SI2.</p>
<p>8 Where the ammonium nitrate is stored in bags/big bags, are the housekeeping standards 'poor'? 'Poor' means there are several bags of ammonium nitrate which are spilled/split or there are piles of loose ammonium nitrate in one or several areas in the warehouse.</p>	<p>Any spills should be cleaned up quickly and examined / assessed re: level of contamination and contaminants. In particular, awareness re: organic contamination and incompatible materials.</p>
<p>9 For manufacturing, blending and bagging sites, is the ammonium nitrate stored as loose bulk? If so, are the prills/granules stuck together in lumps? [Note: they should be free flowing]</p>	<p>Need to address the causes of the prills sticking together Perhaps enquire re: proposed handling methods to break up the stacks. Awareness that the product is now likely to fail the Detonation Resistance Test (DRT). [This would be an area where we would most likely want to sample and check if DRT certificate still valid. If this action is proposed, consult HID SI2 first].</p>
<p>10 Is there any waste/contaminated/off-spec material held in the store?</p>	<p>Segregate from "good" material and arrange regular disposal Awareness re: oil/organic contamination i.e. organic content &gt; 0.2% = Class 1 and explosives legislation applies (see below).</p>
<p>11 For manufacturing, blending and bagging sites, does the company carry out any oil coating of the ammonium nitrate prills/granules?</p>	<p>For certain materials containing ammonium nitrate, organic content (such as oil) above defined levels make the product an explosive, and therefore subject to explosives legislation. Such levels of organic content should only occur by accident in the preparation of fertiliser e.g. if the coating process went wrong. In such cases urgent action is needed to render the material safe. For small quantities this should be by dissolution in water. In the unlikely event of inspectors coming across gross contamination, the Explosives Inspectorate should be consulted as a matter of urgency.</p>

	<p>The important thing is that companies undertaking coating are aware of the issue and have measures in place to ensure the limits are not exceeded An important aspect being that the coating operation produces an even distribution of oil.</p>
<p>12 Are there any sources of ignition in the building? This include not having:</p> <ul style="list-style-type: none"> <li>• Not having a 'no smoking policy' , hot work policy/permit (for welding, etc.); or</li> <li>• Having open or broken electrical fittings, lights; or</li> <li>• Having electrical junction boxes, vehicles or equipment other than that required for handling the fertiliser.</li> </ul>	<p>Any deficiencies here should be rectified as a matter of urgency</p>
<p>13 Where the ammonium nitrate is stored outside, are there combustible materials stored in the vicinity (i.e. within 30 metres), such as stacks of pallets or packaging materials/storage of timber or wooden products/tyres, or vehicles/gas cylinders?</p>	<p>Advisable separation depends on the nature and quantity of the combustibles which will cause a threat to AN in the event of fire. If it's only a handful of pallets, 5m is acceptable. If it's a large pallet store or stack of timber / tyres for example, 30 m is recommended. Also, as per 14. need to assess the risk [but practicability here is more difficult as pallets and drums can be moved more easily than fixed tanks]</p>
<p>14 Where the ammonium nitrate is stored outside, are there storage tanks in the vicinity (i.e. within 50 metres) used for extremely flammable/highly flammable/flammable/organic or carbonaceous liquids, e.g. diesel/fuel oil/other substances?</p>	<p>Lesser distances may be acceptable if the quantity is not large and e.g. flammable liquids are banded. Need to be sure that leaks cannot reach the AN. Boils down to assessing the risk and reasonable practicability of increasing the distance.</p>
<p>15 Are any bags of ammonium nitrate not labelled with an UN number or marked as 5.1 Oxidising Substance? [Appropriate UN numbers are 1942, 2067,</p>	<p>Only mixtures with &gt;70% AN (N value &gt; 24.5) are hazardous goods and require labelling in this way, other than AN/Ammonium sulphate mixtures UN 2069 where &gt;45% AN (N value &gt;15.75) applies.</p>