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Target Audience:
All FOD Inspectors dealing with Agriculture

APPLICATION OF THE NOTIFICATION OF INSTALLATIONS HANDLING HAZARDOUS SUBSTANCES (AMENDMENT) REGULATIONS 2002: INSPECTION OF AMMONIUM NITRATE STORAGE FACILITIES ON AGRICULTURAL PREMISES

This SIM gives guidance to inspectors on the storage of ammonium nitrate fertilisers at agricultural premises based on a sample inspection of farms that notified under the amendment regulations at the beginning of 2003.

BACKGROUND

- 1 On 21 September 2001, an explosion occurred in an ammonium nitrate stack at the Grande Paroisse/AZF factory in Toulouse. Thirty people died – 22 inside the factory and eight members of the public. A further 2500 people were injured and 10 000 homes were damaged together with five schools and a hospital.
- 2 The building involved held 300-400 tonnes of ammonium nitrate (of various compositions), included downgraded and off-specification material. From information supplied by the French authorities, HSE has estimated that approximately 200 tonnes of stored ammonium nitrate exploded.
- 3 Prior to this incident, the Notification of Installations Handling Hazardous Substances Regulations 1982 (NIHHS) required the notification to HSE of all stocks of ammonium nitrate equal to or in excess of 500 tonnes. The threshold was based on existing knowledge of the hazardous properties of ammonium nitrate at the time the regulations were made.
- 4 Notification was intended to serve two main purposes:
 - 1) To enable HSE to gather strategic information as a basis for its inspection programme of major hazard installations; and
 - 2) To allow HSE to fulfil its statutory duty to provide advice to local planning authorities on proposed developments at and in the vicinity of sites holding significant quantities of hazardous substances.

5 The incident in Toulouse demonstrated that not only was the quantity of ammonium nitrate involved considerably less than the NIHHS threshold quantity but also that the worst effects to people resulted from the fire and explosion rather than from toxic effects.

6 As a result, HSE proposed amendment of the NIHHS Regulations to reduce the notification threshold to 150 tonnes. This amendment was implemented by the Notification of Installations Handling Hazardous Substances (Amendment) Regulations 2002 which came into effect on 30 December 2002.

7 Expertise within HSE on the hazardous properties of ammonium nitrate is vested in the Explosives Inspectorate in the Hazardous Installations Directorate (HID SI2D).

INFORMATION

8 All sites, including agricultural premises, which hold or are likely to hold at any one time ammonium nitrate fertilisers where the nitrogen content exceeds 15.75% by weight and the aggregate quantity equals or exceeds the 150 tonne threshold are required to notify HSE. The notification should include the details set out in Part 1 of Schedule 2 to NIHHS 1982 which are reproduced on the form available on the HSE website to assist with submitting the necessary information. No official form has been printed for this purpose.

9 Those already holding or intending to hold stocks of ammonium nitrate in excess of 150 tonnes at the time the Amendment Regulations came into effect were required to notify HSE by the end of January 2003. Since then any new site should have been notified at least four weeks in advance of the commencement of the activity which attracted the application of the NIHHS 1982 Regulations.

10 The Agriculture and Food Sector manages the register of sites storing ammonium nitrate fertiliser above the NIHHS threshold (but below the COMAH thresholds) on behalf of FOD. It has been agreed that all notifications will be submitted to the Sector. The Sector will maintain the notification database and distribute the necessary information to FOD Divisions and other government departments.

11 Potential duty holders under the Regulations should be advised to submit notifications to HSE either:

- 1) Electronically to ANNIS.Notifications@hse.gsi.gov.uk; or
- 3) In writing to HSE, Agriculture and Food Sector, National Agriculture Centre, Stoneleigh, Kenilworth, Warwickshire, CV8 2LG; or
- 4) By telephone on 02476 698350; or
- 5) By fax on 02476 696542

FOD Divisions should forward any notifications received in divisional offices to the Agriculture and Food Sector at Stoneleigh.

12 Details of all new notifications will be distributed to FOD Heads of Operations (HoPs) under a 'RESTRICTED' security classification at regular intervals.

13 Duty holders are required to keep the notification up to date and in particular must inform HSE if there has been a change to the maximum quantity of the hazardous substance, which **is liable** to be on site (NIHHS 1982 regulations 4 and 5). This means that a duty holder does not need to re-notify HSE every time a fresh batch of fertiliser is delivered to the site. Farmers do not need to make annual re-notifications unless the particulars already notified have changed.

14 Instructions for the inspection of notified sites are to be found in the FOD annual work plans. However inspectors will be aware when planning visits that the quantities of fertiliser stored on sites, especially farms, will vary through the year. Many farmers will buy fertiliser from merchants in the summer at discounted prices and store on site for application in the spring.

GUIDANCE

15 HSE has produced a Self-Help Checklist for the Storage and Handling of Ammonium Nitrate Fertiliser to assist duty holders determine whether they have taken the necessary precautions to ensure its safe storage and handling.

16 Advice and guidance on the safe storage and handling of ammonium nitrate is contained in HSE free booklet IND(G) 230 and is applicable to the storage of ammonium nitrate fertilisers on farms and elsewhere. However, in order to provide advice targeted at and appropriate to storage on farms, the Sector together with explosives inspectors carried out sample joint inspections in 2003. Based on these inspections, the table in the appendix sets out a range of common storage issues together with guidance for dealing with a number of foreseeable scenarios.

ACTION BY INSPECTORS

17 Enforcement is dependent on being able to demonstrate risk to the health and safety of persons present on the farm or living or working in the vicinity. The following factors should be taken into account.

- 2) Composition, in particular the nitrogen content, of the fertiliser. Fertilisers that contain 28% or less nitrogen by weight do not normally present an explosion hazard;
- 3) The probability of a fire in the vicinity of the fertiliser that may escalate without detection;
- 4) The probability of contamination of the fertiliser;
- 5) The probability of confinement of molten fertiliser;
- 6) The proximity of farm workers, their ability to deal with incidents and/or to escape to a place of safety;
- 7) The proximity and number of residential properties;
- 8) The call-out time of the emergency services

18 In the majority of cases it is expected that the risk of serious personal injury to people either on or off the farm will be remote against a corresponding benchmark of 'Nil'/'Negligible'. Thus **in most cases** action is likely to be limited to the provision of advice.

19 More formal enforcement action may be appropriate where it is judged that residents either on or in the vicinity of the farm are at increased risk because of the proximity of residential accommodation to the storage facility where a fire could develop without detection, e.g. at night resulting in an explosion or a plume of toxic fumes.

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APPENDIX
(para 16)

| Situation | Comment |
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| 1. Part of the storage building is constructed of combustible material, e.g. gable end constructed of open timber boarding | 1. Storage buildings should be constructed of non-combustible materials. Where it is not reasonably practicable to store the fertiliser in another building, fertiliser should be stored as far away as possible from combustible materials. A separation distance of at least 2m should be maintained in all cases. (This also allows access for inspection of stocks). |
| 2. Internal walls of building are lined with plywood or similar combustible material | 2. Remove plywood. If for any reason this is not reasonably practicable, consider storage in a different building or part of the building. If there are no suitable alternatives, a minimum separation distance of 2m should be maintained. |
| 3. Steel framework of building reinforced/repared with timber members. | 3. The limited introduction (or presence) of timber members in the sides and/or roof of the building does not introduce a significant fire loading |
| 4. Electrical services and equipment maintained in poor condition | 4. Faulty or damaged electrical equipment is a major cause of building fires. Remove redundant equipment and question the need for other equipment/services being retained in the area where fertiliser is stored. Essential equipment should be inspected and tested at regular intervals. Fertiliser should be stored at least 1m away from electric lights, switchgear etc. |
| 5. Diesel/oil storage tank located adjacent to outside wall of storage building | 5. Risk of contamination and fire. The degree of risk depends on several factors including the flammability of the fuel, the capacity, construction and bunding of the tank, the construction and integrity of the intervening wall, the location of potential ignition sources, the proximity of stored fertiliser, the direction of the slope of the land etc. The most significant factors are the construction and integrity of the intervening wall and the slope of the land. If necessary the fertiliser should be relocated to a different building or, if retained in the same building, should be moved away from storage tank. |
| 6. Vegetation growing around storage building | 6. All combustible vegetation should be removed from the immediate vicinity of the building |
| 7. Equipment constructed of combustible material, e.g. timber ducting from a grain drying plant is located in or adjacent to the fertiliser storage area | 7. Immediate action: disconnect any associated electrical equipment. Longer term action: dismantle and remove if redundant or clad with fire resistant board. Alternatively, consider relocating the fertiliser. |
| 8. Open channels or holes in floor of storage area | 8. Fill all channels or holes with non-combustible material and seal to prevent any molten AN from a fire entering any confined space. |
| 9. Fertiliser stored against wall of building | 9. A minimum separation distance of 1m should be maintained to allow examination of stocks and access/egress in an emergency. It will also allow bait to be placed to control rodents. |
| 10. Silage clamp located in adjacent bay of storage building and separated from fertiliser by wall of vertical timber railway sleepers | 10. A minimal fire risk but the hazard is significant were the sleepers to be involved in a fire. A firebreak separation distance of 5m or a barrier of inert material of at least 1.5m should be maintained for fertilisers where the nitrogen content >28%. The firebreak separation distance can be reduced to 2m for fertilisers where the nitrogen content is < 28%. Alternatively, a fire resistant barrier e.g. breezeblock perlite barrier could be constructed. |
| 11. 'Big-Bags' (500kg) of fertiliser stored on timber pallets inside a building | 11 Unless necessary for handling, there is no reason to store "big-bags" as opposed to sacks on pallets. Establish the reason for storage on pallets. It is not necessary to store "big-bags" on pallets to |

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| | <p>keep the product dry where the building has a concrete or similar floor.</p> <p>If stored on pallets, the pallets should be in good condition to prevent damage to the bags of fertiliser.</p> |
| 12. Timber pallets stored in immediate vicinity of fertiliser | 12. Remove the pallets from the building or store at least 5m away from fertiliser. Alternatively place a barrier of inert material between pallets and fertiliser. The barrier should be at least 1.5m wide (one pallet width). |
| 13. Hay, straw, grain, feedstuffs or other combustible material stored adjacent to fertiliser | 13. Remove from building or store at least 5m away from fertiliser. Alternatively place a barrier of inert material between combustible material and fertiliser. The barrier should be at least 1.5 m wide (one pallet width). |
| 14. Loose hay, straw, timber or other combustible material (including used fertiliser bags) accumulated on floor of storage building | 14. Good housekeeping. Clear all loose combustible materials from the building. |
| 15. Tractor, forklift truck (diesel or LPG powered) or diesel bowser parked in storage building adjacent to fertiliser | 15. Dedicated parking bays should be provided at least 5m away from fertiliser and positioned so that any fuel/oil spillage will run away from the stored fertiliser. All vehicles/bowsers should be properly maintained to prevent leakage of fuel or oil that could contaminate the fertiliser. |
| 16. No fire extinguisher. No hose reel | <p>16. A portable water fire extinguisher or properly maintained fire hose reel should be provided to tackle incipient fire in or around storage building.</p> <p>The local fire authority should already have been informed that ammonium nitrate fertiliser is stored on the premises as storage of 25 tonnes or more are notifiable under The Dangerous Substances (Notification and Marking of Sites) Regulations 1990. Arrangements should be made for providing early warning of a fire, for suitable access to the site (at all times) and for making sure that an adequate supply of water is available, or can be made available, to tackle an incident.</p> |
| 17. No general warning sign erected at access points to farm. No warning signs on building | <p>17. Suitable warning signs should be erected at access points to a farm on which 25 tonnes or more of dangerous substances are liable to be present as required by The Dangerous Substances (Notification and Marking of Sites) Regulations 1990. Ammonium nitrate fertilisers that are classified for carriage as "Oxidising Agents" fall within the definition of dangerous substances for the purposes of the 1990 Regulations (check label on bag to make sure – relevant UN numbers are 1942, 2067, 2068, 2069, 2070 and 2072).</p> <p>NB. The requirement to erect signs is enforced by the local fire authority.</p> |