Workplace Health and Safety
Bulletin

Handling Sulphur

Recommended procedures for the safe handling and processing of solid sulphur in new facilities

General

- The latest revision of the National Fire Protection Association's Standard on the Prevention of Sulphur Fires and Explosions (NFPA No. 655) should be used as a reference.
- These procedures are intended to establish standards of practice in the design, construction, operation and maintenance of sulphur facilities in Alberta.
- New facility means any facility presently under design or any modification to an existing facility.

Buildings

- Buildings housing any equipment in which sulphur is handled or processed should be constructed with fire resistant materials.
- Where practical, dust producing processes should be confined and isolated.

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- Where possible, to prevent accumulation of dust, the design of the building should be such and the structural members so sloped and assembled or protected as to present the least possible surface (other than floor) on which the dust can lodge.

- Floor drains or troughs or gutters should be provided to carry off water from any area where cleaning is accomplished by flushing with hose streams.

- It is recommended that during the design stage and operating phase every effort be made to minimize the possibility of rusty metal components scraping or striking objects that may cause sparking inside the building during normal operations and/or failure, collapsing or falling situations. Metal surfaces of carbon steel, structural steel, hoppers, equipment, tools, etc. should be protected from iron oxide formation at all times by painting, covering or use of other types of metals where practical.

Explosion vents

- All parts of any building where sulphur dust may be present or handled should have adequate explosion proof vents.

- Building vents should be distributed as uniformly as possible to provide adequate ventilation consistent with good engineering practices.

- All parts of the building in which dust may be raised should be vented to the outside air.

- The design and installation of explosion proof vents should be assigned to a competent person who is familiar with their operation and effectiveness.

Bins

- All interior bins handling sulphur dust should be provided with facilities to prevent blowing or dust dispersion inside the building due to the displacement of air during filling.

- Sulphur bins should be filled and emptied through dust tight spouts or chutes.

Dust collection

- Dust should not be allowed to accumulate in any part of any building or structure. Dust should be carefully removed from the walls, floors, and machinery of the plant at regular intervals.

- Blowing down of any surface by compressed air or other gases in a confined space should not be allowed.

- Where floor drains or troughs or gutters are provided for the removal of dust, the dust may be washed down the drain, trough or gutter using water hoses. Where drains, troughs or gutters are not provided, the dust should be carefully collected and removed.

- Where there is a provision for the collection of dust by vacuum systems, the systems should be designed such that the build up of static electricity is prevented. Non-conducting ducts or hoses should not be used unless effectively bonded.

- Vacuum cleaners or other electrical devices for cleaning are required to be certified for use in the appropriate class and group of the Canadian Standards Association (CSA) Electrical Code Standards.

Hand tools, power tools, welding

- Before any repair or maintenance work including any welding, burning and cutting is undertaken on any machinery or equipment, the area within which it is to be undertaken plus an additional space of 2 metres all around, should first be carefully cleaned so that there is no sulphur dust present. If impractical, other acceptable prevention measures should be taken, i.e. covering, wetting, steam blanketing, etc.

- On completion of any burning, cutting or welding, the surrounding area should be carefully examined to ensure that no residual fragments or particles of burned or heated materials are left.

- Electrical power tools or any other piece of electrical equipment are required to be approved for use according to the appropriate class and group of the Canadian Electrical Code.

Ventilation

- Relative humidity should be maintained as high as practical inside enclosed area where dust is expected to be in suspension.

Electrical

- The electrical installation and electrical equipment are required to be constructed and installed in accordance with regulations adopted under the provisions of the *Safety Codes Act* of Alberta.

- Portable battery powered devices are required to be approved for use in the appropriate hazardous area.

Conveyor and V-Belts

- Where practical, conveyor belts should be of a type that are both fire resistant and anti-static. Provision for static discharge devices should be installed where it is impractical to use such type of conveyor belts.

- V-belts that drive machinery in an enclosed area should be fire resistant and anti-static.

Hydraulic oils in equipment in enclosed areas

- Oils used in enclosed areas for hydraulic circuits should be of fire resistant grade. Similar oils should also be used for any traction purposes, where practical.

Gasoline and diesel equipment

- Gasoline and diesel powered equipment should not be used in enclosed hazardous areas without special precautions such as a hot work permit.

Smoking

- Smoking is not allowed in any building in which sulphur is handled or processed.

- Local municipality and plant company regulations apply.

Developed jointly (April 1991) by:

- Industrial Task Force Hazards of Sulphur Handling Committee
- Alberta Human Resources and Employment

Industry endorsement from:

- Canterra Energy Ltd.
- Petrogas Processing Ltd.
- Chevron Standards Ltd.
- Shell Canada Resources Ltd.
- Procor Limited Sulphur Services Division
- Amoco Canada Petroleum Company Ltd.

Labour endorsement in principal from:

- Energy and Chemical Workers Union

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