



Waste ammonium nitrate reaction

References

A. "Summary of accident reports 1995"; Department of Mines and Energy, WA, 1995, pp 9 (www.dmp.wa.gov.au/documents/Reports/DG_AccReps_1995.pdf)

Purpose

1. This alert is to advise persons involved with the management of ammonium nitrate of the hazards in relation to contaminated and waste ammonium nitrate.

Scope

2. This alert provides important safety information for all persons involved with the storage, handling transport, manufacture, use, import and export of ammonium nitrate

Background

3. Ammonium nitrate is the most commonly used chemical in the manufacture of commercial explosives.

4. An incident occurred at an explosives manufacturing plant, where an exothermic reaction took place inside a bulka bag containing waste ammonium nitrate. The unwanted reaction was detected when fumes were observed coming from the bag. The reaction was brought under control using water. Photographs of the ammonium nitrate and bulka bags involved in this incident are shown below.

5. It is understood that waste sodium nitrite powder and ammonium nitrate waste may have inadvertently been mixed. From past incidents (reference A) it is known that ammonium nitrate and sodium nitrite wastes can react violently when in contact.



Issues

6. Once ammonium nitrate has become contaminated, the chemical properties including its reactivity may change. The increased hazards as a result of the change in the properties are not recognised or properly understood by most personnel exposed to the contaminated product. This is particularly important when the nature of the contamination has not been identified and the waste is being managed as if it were 'in specification' ammonium nitrate. For any contamination that is organic in nature, the ammonium nitrate product must be managed as an explosive rather than as an oxidizing agent. It should also be noted that some inorganic materials can act as a catalyst to cause the decomposition of ammonium nitrate and eventually create a risk of explosion.

7. A safety management system is critical to the management of ammonium nitrate in its life cycle. The control of contaminated ammonium nitrate and waste ammonium nitrate must be addressed in each aspect of the life cycle including manufacturing plants, storage warehouses, transport depots, ports, road and rail transport, etc.

8. The risk control hierarchy must be used in developing the risk management approach in the safety management system. Control measures based at the top of the hierarchy will be

more effective than control measures based at the lower end of the control hierarchy. The prevention or elimination of contamination or waste is the preferred outcome. However when this is not possible, risk control measures should be based on engineering controls and when this is not reasonable, control measures should be administrative control measures including procedures in addition to higher level control measures.

9. Procedures for the management and control of contaminated and waste ammonium nitrate must be specific to the activity being undertaken and its location and should be based upon a risk assessment. Generic procedures may be used in conjunction with specific procedures developed for use at the particular site, location, activity, etc. For example, discrete quarantine storage areas with applied time and quantity limits for the management of contaminated and waste ammonium nitrate should be operational.

10. Other material such as packaging materials, pallets, bags, ropes and slings contaminated with ammonium nitrate must also be managed as waste ammonium nitrate

Recommendations

11. All license holders should immediately review their safety management system to ensure that the management of contaminated and waste ammonium nitrate is properly addressed for all activities involving ammonium nitrate during its entire life cycle.

12. All licence holders should check that the control measures are in place, the procedures under their safety management systems are being followed and that records are being kept.

13. The correct identification and classification of contaminated and waste ammonium nitrate together with the risk control measures including procedures should be reviewed. The way ammonium nitrate becomes contaminated should be reviewed with particular attention to the quantity and storage of waste.

14. Ensure that all persons in your organisation receive a copy of this safety alert.

Further Information

15. Further information is available by contacting the Explosives Inspectorate's Regional Offices at the contact numbers below.

16. More safety alerts, information bulletins and reports are available on the Inspectorate's website: http://www.dme.qld.gov.au/mines/safety_compliance.cfm

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