



HEALTH, SAFETY & ENVIRONMENT REPORT 2009

Botlek, The Netherlands

Nufarm bv Botlek manufactures the methyl range of phenoxy herbicides

The plant

is located on the site of Akzo Nobel and was purchased by Nufarm in 1996. Several services and raw materials such as chlorine are supplied by Akzo Nobel.

Since 1965, Botlek has been producing MCPA and CMPP. In 1991, the product range was expanded to include the optical isomers D-CMPP and D-2,4-DP. In 2001, the product range was again expanded to include the butyrics MCPB and 2,4-DB. From 2005 onward, the plant was predominantly set up and optimised for MCPA production.

Health and safety performance

Throughout the years, Botlek site showed considerable improvements regarding good housekeeping and compliance to procedures and instructions. Regular internal audits and workplace inspections have helped to reinforce these priorities.

The achieved ratio between the reported Unusual Incidents and Injuries was 16.9, well above the limit of 11.0 that was set amongst the European sites. In contrast with this pleasing result, we sustained a lost time injury when a contractor employee was hit in the face and neck by a water/cresol mixture during cleaning operation of chlorination off gas pipelines. The safety hazard exposed by unsuitable equipment used for this specific cleaning action was not identified during the risk assessment and work preparation. Combined with a mistake regarding the use of appropriate personal protection equipment, this incident resulted in the employee not being able to work for 8 days.



New fall protection while loading containers

Health and safety improvement initiatives (cont)

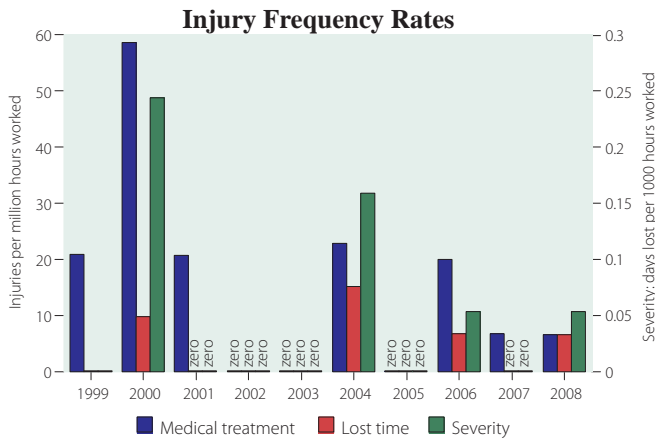
incident, but focuses more on the preconditions that contributed to these “active failures” in the first place. There need not be a causal connection between the “active failure” and the precondition(s). This results in systematically identifying a limited number of “latent failure” categories that were the feeding ground for those preconditions to grow on. Provided the investigations are carried out on a frequent basis, this provides a powerful information base that will contribute to adjusting priorities on an organisational level.

Emissions to air

The emission of Freon R22 are estimated figures during leakage incidents. These are later checked against mass balances carried out when the system is emptied and refilled during a maintenance shutdown. The last such action was carried out in October 2007, the next one is scheduled for April 2009. Therefore, no mass balance figures are available for the year 2008. The estimated emission in 2008 was 70 kg.

The substantial rise of xylene and VOC emissions are currently under investigation. These investigations are directed by the following indications: isobutanol (IBA) appeared in only one of the measurements and we suspect it is related to re-running an IBA-containing quantity of waste into the waste water treatment section of the plant; a missing orifice in the offgas line of the effluent plant; bypassing the flashing equipment in the MCPA synthesis plant in order to reduce steam usage.

Despite the increased production volume, phenoxy dust emission was 20% lower than the previous year. This is achieved by adjusting operational conditions.



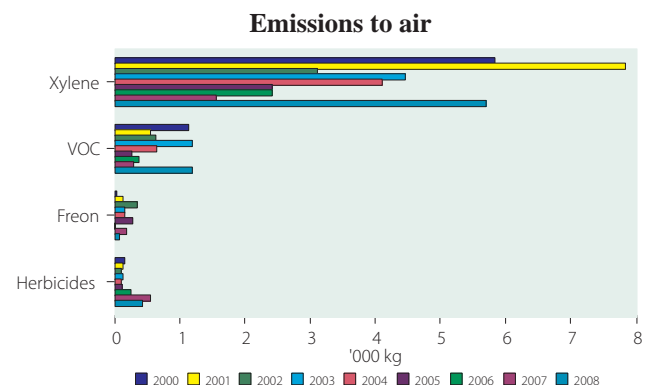
Note: All lost time injuries are also counted as medical treatment injuries

Health and safety improvement initiatives

In 2008, we continued to implement the Risk Based Maintenance project. By systematically identifying the failure modes and the effects of equipment failure, and reflecting these results against the company objectives, we changed our maintenance philosophy. We re-create our maintenance and inspection program, the criteria of which are now supported by the database thus obtained. Moreover, some unacceptable risk factors which were, until now, not obvious are now identified by actively and systematically seeking them.

We continued the development of a protocol regarding the use of DCA as an antidote treatment (both on site as well as in the hospital) against MCA poisoning. This was done in co-operation with the hospital, our 3rd party health services provider and the MCA supplier. The protocol is expected to be rolled out in March 2009.

In order to introduce Tripod Beta as an incident investigation methodology, we started providing training sessions for the use of this method. Tripod Beta is used to not only find the defense barrier failures (in the hazard-event-target chain) that lead to an





Nufarm bv Botlek

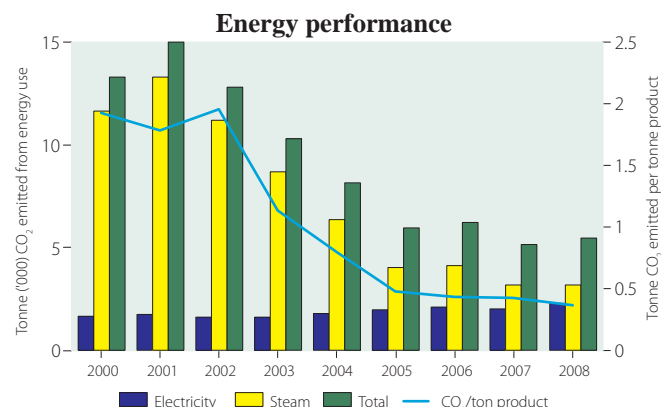
We aim to carry out our business with no adverse effects on our people, the community or the environment. We strive for sustainable development and continuous improvement.

Emissions to water

Botlek returns surface water into the harbour after having used it as coolant. Based on maximum flow and measured temperature rise of the water, our contribution to heat input in the harbour is 3 MJ/s.

Energy performance

Our energy use in 2008 was a little higher than in 2007, due to a significant increase in production. Production volumes in 2008 were similar to those in 2006, but 2007 was about 20% lower. The usage figures (energy per tonne product) have continued to improve. Some of the improvements in CO₂ release per tonne of production are due to our efforts to minimise energy use, but there is also a component in the numbers which is dependent on the efficiency of the electricity and steam production in the AKZO Nobel cogeneration plant which supplies us.



Safety Management System and Major Hazards Control

In December the authorities audited our operation against various regulations related to the MHF (Major Hazard Facility) activities. There was one criticism of poor implementation of regulations in relation to flammable liquids and vapors, and improvement is expected from us. Otherwise the safety management system that is in place was found to be adequate, well documented and well implemented. The authorities commented on the openness and co-operation shown by all staff at our facility.

In June 2008, our OHSAS 18001 certified occupational health and safety system was audited by BVQI. The audit results were pleasing, with good recommendations and no major or minor non-conformances. A credit to all those involved.

Complaints

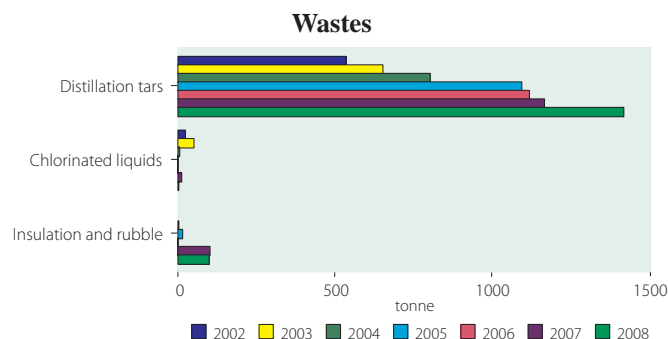
On December 19 the plant tripped because of a power failure. The correct action was to empty the o-cresol feedline by blowing it with air back to the storage tank. Amidst all the other activities, our people missed closing the purge air valve. In combination with an open valve in the vapour return line of the unloading station and the storage tank, some o-cresol vapour was blown into the atmosphere causing 34 people to complain about this single incident.

	Complaints	Accepted	Doubtful
1999	3	1	0
2000	3	2	1
2001	5	2	3
2002	0	0	0
2003	2	2	0
2004	1	0	1
2005	1	1	0
2006	0	0	0
2007	2	2	0
2008	1	1	0

Wastes

Apart from plant effluent water, 'tars' is by far the largest waste stream, which is plant output related. The increase in tars waste from 2006 onwards is under investigation and thought to be caused by 1) the higher hourly rate through the same distillation columns and 2) the newly installed wiped film evaporator for which we are developing the optimal process settings.

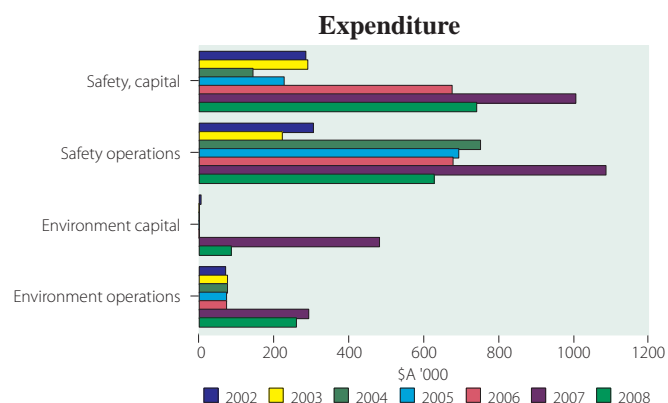
Our effluent is treated in the biological effluent treatment installation run by a 3rd party on the Botlek industrial park. During the course of 2007 and 2008 it became clear that the operational margin was gradually reduced during the years of volume increase by Nufarm and other effluent suppliers. The resulting increase in risk of harbour pollution made it necessary to take temporary measures pending a final integrated solution for all parties involved. As a result, we installed a 7 meter tall carbon filter and plan to modify the Fenton's Reactant treatment plant. Moreover, investigations are carried out with regard to improving the monitoring of the effluent composition.



Expenditure

A selection of HSE related capital spent in 2008

- Replacement of emergency bath in case of MCA exposure
- Installation of earth connections on equipment
- Renovation of the chemical sewer
- Installation of automatic hose reels for flushing with water/caustic soda/steam at the tanker unloading platform
- Burst sensor on rupture disks on chlorination reactors
- Temporary carbon filters for waste water treatment
- Engineering costs for the phase out of Freon 22 use in refrigeration
- Engineering costs for the replacement and relocation of the new effluent pipeline
- Additional manpower to re-design the synthesis plant in order to mitigate an identified environmental risk (cresol odour).
- Total amendment of organisation, work processes and preparation of the site maintenance shutdown activities.



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