

## AIMING FOR ZERO HARM THROUGH TRAINING AND COMMUNICATION

### 1 General information

**Country:** Hungary.

**Available language:** Hungarian.

The **sector covered** in this case study is manufacture of chemicals and chemical products.

**Tasks covered:** handling chemicals, manufacturing, processing materials.

**Worker groups covered** (vulnerable groups): all workers (no specific groups).

The **purpose of this example of good practice** was training, raising awareness of and improving risk assessments in relation to REACH and CLP.

The **target groups** are workers, workers' representatives and supervisors.

### 2 Initiator/organisations involved

BorsodChem.

### 3 Description of the case

#### 3.1 Introduction/background

**Biological agents:** none.

**Hazard — physical state:** not applicable.

**Hazard — health effect:** allergens, asphyxiants, carcinogens, mutagens, irritants, neurotoxic substances and toxic substances.

**Exposure route:** inhalation, skin absorption and dermal contact.

**Substance description (CAS/EC) (only if possible):** Diphenylmethane 4,4'-diisocyanate (101-68-8/202-966-0), toluene diisocyanate (584-84-9/209-544-5), chlorine (7782-50-5/231-959-5), toluene (108-88-3/203-625-9), formaldehyde (50-00-0/200-001-8), aniline (62-53-3/200-539-3), methanol (67-56-1/200-659-6), carbon monoxide (630-08-0/211-128-3), mercury (7439-97-6/231-106-7), vinyl chloride (75-01-4/200-831-0)

BorsodChem was established in 1949, when it started producing fertilisers. In 1963, it became the first Hungarian polyvinyl chloride (PVC) plant. Isocyanate production (including production of methylene diphenyl diisocyanate (MDI) and toluene diisocyanate (TDI)) was launched in the early 1990s as the company stopped manufacturing fertilisers. In the 2000s, the company acquired chemical plants abroad. Currently, BorsodChem is a leading European producer of the above materials, base chemicals and specialty chemicals. In 2011, the company became part of the Wanhua Industrial Group. Around 2,700 workers are employed in plants where hazardous materials such as chlorine, toluene, formaldehyde, aniline, methanol, carbon monoxide, mercury and vinyl chloride are used.

#### 3.2 Aims

Through the initiative, the company aimed to achieve zero injuries, zero events and zero emissions. As part of this, it wanted to ensure that relevant safety information on chemicals used in the plant was

readily and easily available for every worker affected. The management wanted every worker to master the information on dangerous substances used at his or her workstation. Furthermore, it wanted to minimise the risks posed by maintenance and the uncontrolled flow of chemicals.

### 3.3 What was done and how?

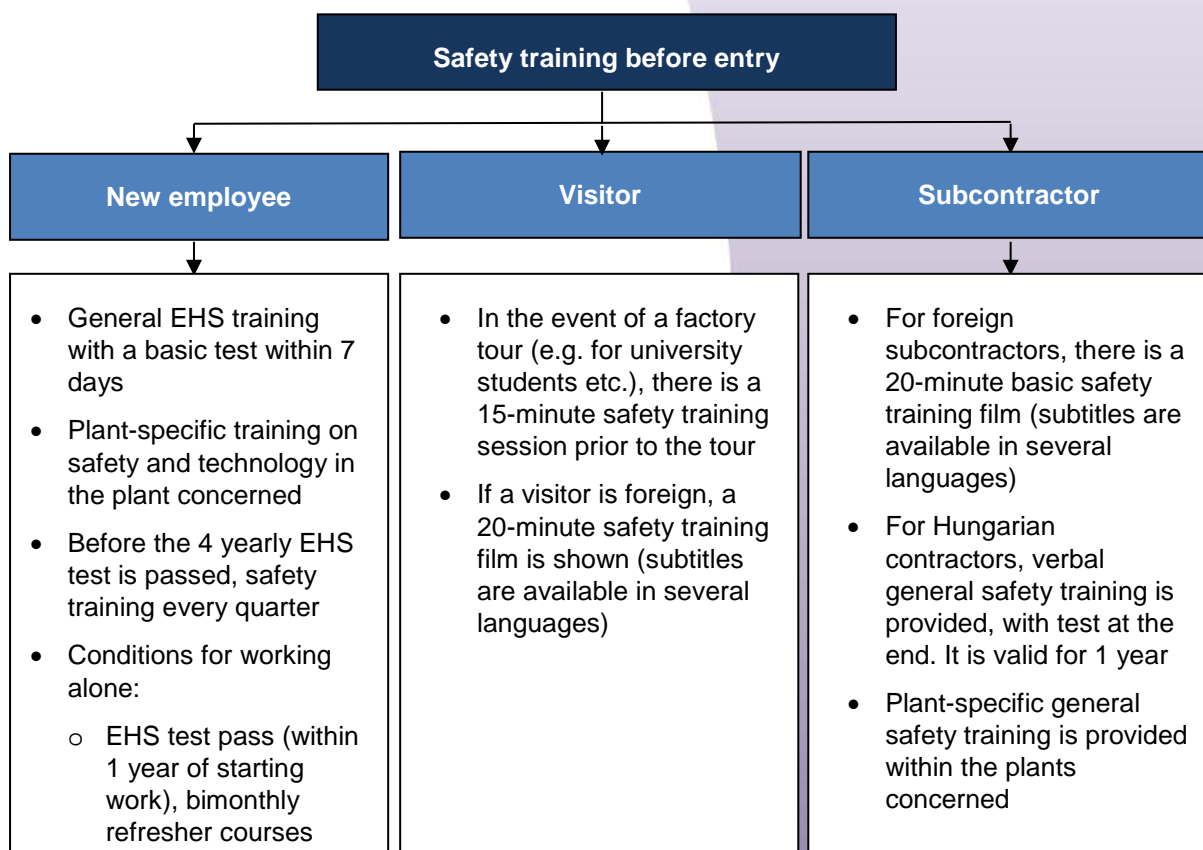
#### 3.3.1 Brief user manuals

The environmental health and safety (EHS) unit has created around 300 brief (half-page to one page) leaflets from material safety data sheets. The concise texts on each chemical used to a substantial extent in the company contain the essential information required for safe work in easy-to-understand language. The leaflets summarise the most important facts regarding the following aspects: physical characteristics, fire hazards, chemical hazards, signs of exposure, hazards to health, what happens if the chemical is released and other precautions. The first aid parts of the leaflets were written by the occupational health service. The leaflets are available on the company intranet. The information on the substances specific to a given unit is included in an annual technology test for workers (job position tests).

#### 3.3.2 Multiple-level training and test

A standalone company regulation was issued dealing with EHS training (Figure 1). There are various tests for workers regarding safety and health, all covering dangerous substances management issues. There is a basic test, which is taken at the start of a person's employment. After a minimum of 6 months' with the company, the employee must pass the position test, which is repeated annually. The unit-specific EHS test has to be passed every 4 years. The position and EHS tests are mandatory to be allowed to work alone, without supervision. There are around 30 local EHS coordinators who teach EHS courses and refresher courses every 2 months; the courses comprise general and unit-specific occupational safety and health (OSH) topics with elementary practice. Formerly, these were taught by supervisors, but that proved to be ineffective. The local EHS coordinators are trained on a monthly basis by the company's EHS unit. The unit also developed the training materials that are used in the courses that are held every 2 months. The training takes place during working hours. Since 2018, written tests have been taken at the end of each training session to ensure the effectiveness and quality thereof, and to motivate workers to actively engage. The company is planning to introduce electronic examinations and a central database on training/certificates.

Figure 1. Safety training in BorsodChem.



### **3.3.3 Authorisation of maintenance and subcontractor works**

Subcontractors need to have a pass, which is valid for 1 year. It is issued following an occupational medical examination, a general OSH training course followed by a test, and plant-specific OSH training provided by the local EHS coordinator. The local EHS coordinator provides information on general safety must-know issues at the plant in question (first aid sites, dangerous exposures and machines, etc.).

Specific task-related issues are addressed by an authorisation process and through in-person on-site briefings before work starts. The work of external contractors and certain high-risk or non-routine maintenance tasks (work in confined spaces, work involving fire hazards and activities that are not regulated by a company operation manual) are subject to authorisation. Written permission needs to be given by the manager of the unit concerned. An authorisation form is filled in and the necessary prevention measures are prescribed using a checklist. A special training session and test on this authorisation process is required for those who will have the right to give permission.

### **3.3.4 Company database of dangerous substances**

By linking safety data sheets, enterprise software and risk assessment data, the company is developing comprehensive management of dangerous substances. In this way, any incoming material will be linked to the unit or person working with it, enabling personalised exposure monitoring. Based on the characteristics of the use, a brief user manual may be written on the substance. The EHS unit can identify substances of high concern and may recommend substitution (of course, this applies not to very basic raw materials but to additives). No new compound can be ordered (even by the research laboratory) without the consent of the EHS unit. The occupational health service has access to safety data sheets and personal exposure data, so it can prescribe special medical examinations. The database provides the basis for registers on biological monitoring and exposures to occupational carcinogens, which must be kept by law.

### **3.3.5 Mainstreaming near-miss reports into training**

Previously, near misses were rarely reported and reports had no substantial effect. By including these in the key performance indicators (KPIs) for the plants, the company motivated reporting and also the learning from near misses. Employees report near misses to the supervisor and the EHS coordinator. The effectiveness of reporting is measured for KPIs in two ways: first, the number of investigation reports produced by the EHS coordinator about reported events and, second, the discussion of relevant recent events in plants' quarterly OSH training sessions. This approach can increase the EHS awareness of employees and provide themes for the sessions that are relevant in practice.

### **3.3.6 Downstream risk communication in the supply chain**

Every year, the company sends out a reminder email to every partner enquiring about the responsible person for REACH communication and material safety data sheets. It is recommended that partners in the downstream supply chain have a dedicated (impersonal) email address for this purpose that does not change when another person becomes responsible.

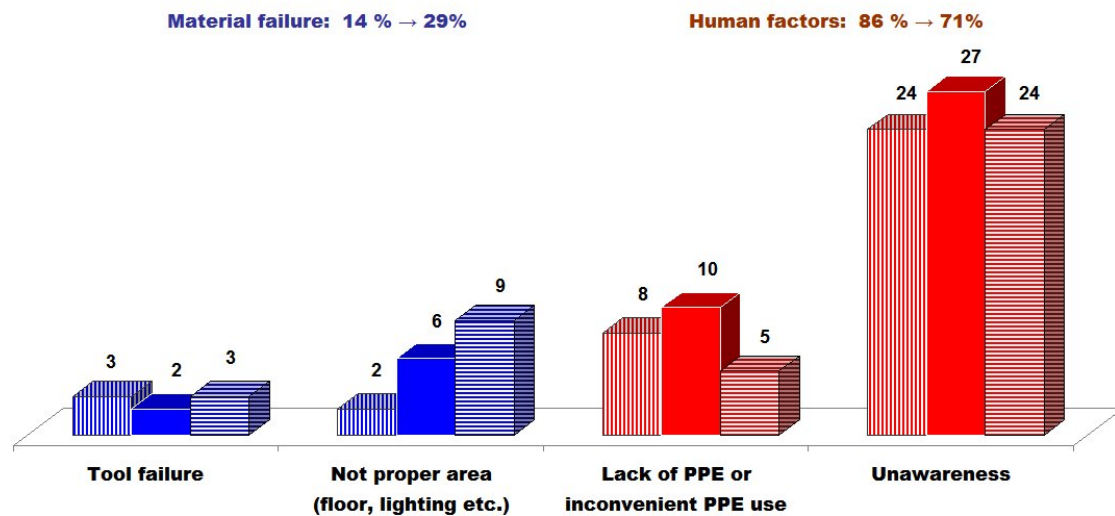
## **3.4 What was achieved?**

Information on the most important substances is available to all workers. The quality of training has improved significantly. Workers understood that changes in training were being made for their sake and most said that the training sessions became more interesting.

Since the introduction of the system, approximately 250 near misses have been reported each year, and the quality of the reports improved substantially.

EHS awareness rose, which is reflected in the slowly decreasing number of accidents due to disobeying OSH rules (Figure 2).

Figure 2. Root causes of injuries in 2015 (vertical stripes), 2016 (solid colour) and 2017 (horizontal stripes). Since the introduction of the system, adherence to rules has started to improve and more environmental causes have been discovered.



### 3.5 Problems faced

It can be difficult to make changes in large, developed structures; initially, employees had reservations. However, it was emphasised that the changes were being made for their safety, and they gradually understood the importance of the new training system. Lack of motivation and interest in the refresher courses is counteracted by introducing practical local issues (near misses) and a brief written test at the end of each session.

It was difficult to arrange the training time. It is legally specified that OSH training must take place during working hours. However, the plants cannot be left unattended, so the training had to be scheduled before or after shifts. The trade union was satisfied with the proposal that training hours be compensated for through time off in lieu (when staffing allows).

### 3.6 Success factors and challenges

The company's management is dedicated to safety, and provided funds and rights for the EHS unit. The participative approach helped in convincing unit managers to cooperate.

The company's EHS unit is assisted by the common representative body, which is a bipartite body inside BorsodChem. There are four members of this delegation: two members from the employer's side and two members from the employees' side. The labour safety committee, which cooperates with the body, has 17 head members; they are the safety and health representatives. These representatives work mainly in the technological area, for example in plants and laboratories or railway departments. Furthermore, there are two independent trade unions organising more than 300 members in BorsodChem. With regard to OSH issues, the bipartite body and the trade unions provide valuable feedback on the measures taken.

### 3.7 Transferability

The general approach and the separate activities are all transferable to other companies.

### 3.8 Costs and/or economic impacts

Not available.

### 3.9 Evaluation

The case study:

- is transferable to other companies/sectors/countries;
- focuses where possible on preventing risk at source;
- comes from a credible source;
- does not include/contain advertising;
- involves a realistic work situation;
- provides a contact for further information.

### 3.10 Further information

#### Contact

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About BorsodChem: <http://www.borsodchem-group.com/About-us/History.aspx?lang=en-GB>

## 4 References and resources

Liktor, D., 2016, 'A BorsodChem Zrt. Biztonságtechnikai oktatás rendszere':

<http://docplayer.hu/25901816-A-borsodchem-zrt-biztonsagtechnikai-oktatas-rendszere.html>

Dancsecz, B., Nagy, I. and Kudász, F., 2018, 'Worker participation — Hungary':

[https://oshwiki.eu/wiki/Worker\\_participation\\_-\\_Hungary](https://oshwiki.eu/wiki/Worker_participation_-_Hungary)