桃園縣蘆竹鄉某公司爆炸事故

Accidental explosion at a certain company in Luzhu Township, Taoyuan County

一、摘要

成品一課技術員徐○○於當晚 23 時 10 餘分從蒸餾區走出時，發現環工課厭氧塔有反射的紅光且會飄動，該員當下覺得不對勁，隨即走往承租地（包材倉庫）方向查看，發現包材倉庫中的棧板擺置區有起火，故立即跑回成品一課辦公室通知領班楊○○一起前往協助滅火；但因就近的消防栓水壓不足，當現場人員重新從成品二課拉水袋前往試圖滅火時，因當時風速頗大，火勢已迅速擴大波及隔壁間的危險物品，接著再波及毒化物儲存區、溶劑區、成品二課及成品倉庫。

關鍵詞：(1)危險物品、(2)毒化物、(3)溶劑區

Abstract

When Technician Hsu in finished product subsection 1 walked out of the distillation area after 23:00, he discovered a flickering red light reflected from the anaerobic tower in the environmental operations subsection. Feeling that something was wrong, Hsu immediately walked in the direction of the leased area (packaging material warehouse) to see what had happened, and discovered that there was a fire in an area where pallets were stacked in the packaging material warehouse. Hsu immediately ran back to the office of finished product subsection 1 and notified shift supervisor Yang, who joined Hsu in an effort to extinguish the fire. However, water pressure from the hydrant close to the fire was insufficient, and by the time on-site personnel had dragged water bladders from finished product subsection 2 in order to fight the fire, the wind was blowing strongly, and the fire had spread to hazardous substances nearby. The fire spread to the toxic chemical storage area, solvent area, finished product subsection 2, and finished product warehouse.

Keywords: (1) hazardous materials, (2) toxic chemical substances, (3) solvent area

新竹縣橫山鄉某公司製程異常事故

Accident caused by a process abnormality at a certain company in Hengshan Township, Hsinchu County

一、摘要

本公司於民國 102 年 11 月 11 日下午 14 時 36 分所屬廠內 1 號反應槽，因開發新產品（床墊、記憶枕之泡棉）致槽內 500kg 二異氰酸甲苯（TDI）、115 克抑制劑及 250kg 聚乙烯甘油醚化學反應異常，產生大量氣化白煙。狀況發生後本公司立即依「危害預防及應變計畫」規定啟動應變機制，除本廠人員依規定設立熱、暖、冷三區封鎖外，並立即通報新竹縣環保局、北區環境事故技術小組、消防隊、當地派出所共同應變，防止虛驚事件狀況擴大。

關鍵字詞：二異氰酸甲苯、抑制劑、聚乙烯甘油醚

Abstract

Reaction tank No. 1 at this company's plant was being used for the development of new products (foam for mattresses and memory pillows) when an abnormal reaction of 500 kg toluene diisocyanate (TDI), 115 g inhibitor, and 250 kg polyethylene guaiacol occurred at 14:36 on the afternoon of November 11, 2013, producing large amounts of white fumes. After this situation occurred, the company immediately activated response mechanisms in accordance with its "hazard prevention and response plan." Apart from having plant personnel seal hot, warm, and cold areas in accordance with regulations, the company immediately notified the Hsinchu County Bureau of Environmental Protection, northern environmental accident technology team, fire department, and local police station to initiate joint response actions, which prevented the false alarm situation from expanding.

Keywords: toluene diisocyanate, inhibitor, polyethylene guaiacol

桃園縣楊梅市不明氣體外洩事故

Accident involving leakage of an unknown gas in Yangmei, Taoyuan County

一、摘要

（一）廢水處理化學藥液補充添加作業，因供應商槽車作業人員操作疏失，將鹽酸注入漂白水儲存桶，此時因酸鹼混和而產生劇烈化學反應，造成瞬間釋出大量氯氣的外洩事件。

（二）北區化學毒災應變小組於 20 分鐘內抵達現場，針對反應立即採取以水澆注外桶的降溫行動，有效的掌控意外事件的擴大，同時以最先進的儀器，監控空氣中氯離子的殘留濃度。

（三）廠即刻啟動緊急應變救援行動，由總經理指揮各小組成員配合各單位行動。首先通知醫院與消防隊，以救護車將吸入氯氣人員送醫救治，同時通知相鄰工廠人員立即疏散

關鍵詞：(1)廢水處理、(2)鹽酸、(3)氯氣

Abstract

（一）When topping off chemical liquor used for wastewater treatment, hydrochloric acid was accidentally poured into a bleach storage tank due to negligence on the part of a vendor tank truck's operating personnel. The mixing of acid and alkali initiated an intense chemical reaction, which caused the immediate release of large amounts of chlorine gas.

（二）The northern toxic chemical accident response team arrived at the scene within 20 min., and immediately began spraying water on the outer tank to reduce the temperature of the reaction, which successfully kept the scope of the accident from expanding. The team also used advanced instruments to monitor the air's residual chlorine concentration.

（三）The plant immediately initiated emergency response and rescue measures, and the general manager led team members in assisting the response units. After a hospital and the fire department had been notified, personnel who had inhaled chlorine gas were taken in ambulances to receive medical care, and personnel at neighboring factories were notified to perform immediate evacuation.

Keywords：(1) wastewater treatment, (2) hydrochloric acid, (3) chlorine gas

新北市五股區某公司火警事故

Fire alarm at a certain company in the Wugu District, New Taipei

一、摘要

本事故發生在新北產業園區 SGS 材料暨工程實驗室，操作員工以卡式瓦斯爐加熱石蠟以作為烤漆試片封邊之用料時，由於過程中因故離開現場，再折返後發現該區域有火苗伴隨濃煙竄出，該員第一時間嘗試滅火未能成功，對外求助後火勢已無法控制，立即展開人員疏散並通報相關單位，經消防隊趕赴現場後順利將火勢撲滅。

關鍵詞：(1)卡式瓦斯爐、(2)加熱石蠟、(3)試片封邊

Abstract

The accident occurred at the New Taipei Industrial Park SGS Material and Engineering Laboratory. When staff operated gas cassette stove for heating paraffin as edge sealing of paint test piece material. Because of some reason the staff just left few minutes, after he came back that fire accompanied smoke over there. The Staff tried to extinguish fire but failed at the first moment emergency, then called help to other staffs and government fire brigade to control the fire finally.

Keywords：(1)Gas Cassette stove、(2)Paraffin Heating、(3)Test Piece Edge Sealing

苗栗縣某公司三氯化磷外洩事故

Leakage of phosphorus trichloride at a certain company in Miaoli County

一、摘要

今年 6 月 4 日下午 3:45 分、位於苗栗縣之長春石油化學股份有限公司抗氧化劑 一場、在製程進行三氯化磷補料作業過程、因該中間儲桶之翻牌式液位計之隔膜手閥發生異常而導致三氯化磷洩漏之工安事故意外。

該洩漏事故幸運的是並未造成任何人員的傷亡及設備的損傷、檢討本次三氯化磷的洩漏事件、其危害來致於三氯化磷液態狀態下產生之反應產物是以氣態的方式擴散、體積的膨脹放大效應及氣體散佈擴大效應是其造成重大危害的原因之一、尤其要注意的、具有腐蝕特性的產物鹽酸及亞磷酸更是加劇其對設備、人員危害的本質、所以此類化學物質的特殊危害是要被重視。

本次洩漏量並不算大、但是在上述的條件下、使本次的洩漏事故擴大其危害面積、對於具有如此特性的化學物質、建立一套應變處理程序及快速的處置手段是有其必要性的、應變過程中如何避免災害擴大及擴散是一項重要的課題、更是事故發生當下應變指揮官要掌握的重要事項。

加強管理、管控使其無機會洩漏是使用三氯化磷的首要策略、但是一但發生洩漏、如何減低傷害及傷害範圍也是不容被忽視的課題。

本公司長期秉持無安全即無一切的企業文化、加上管理階層對於工安的重視、希望藉由本次所發生的三氯化磷洩漏案、分享洩漏事故處理過程的經驗及應變組織、政府機關在本事件中所給予協助、指導內容整理彙總成文、希望對於日後的類似事件提供任何助益。

關鍵詞：(1)三氯化磷、(2)擴散、(3)應變

Abstract

At 3:45 on the afternoon of June 4 this year, in a process involving make-up phosphorus trichloride at the No. 1 antioxidant plant of the Chang-Chun Petrochemical Co., Ltd. in Miaoli County, leakage of phosphorus trichloride occurred due to the malfunction of the diaphragm hand valve of a card-type liquid indicator on an intermediate tank, causing a work safety accident.

Fortunately, the leak did not cause any deaths, injuries, or damage to equipment. A review of the leak indicated that the hazardous situation had been caused when reaction products from the liquid phosphorus trichloride dispersed in gaseous form, and the increase in volume and dispersal of gas led to a major hazard. In particular, because the highly corrosive products hydrochloric acid and phosphorous acid pose a serious threat to personnel and equipment, special care must be paid to the hazard of phosphorus trichloride.

While the leak was not especially large, the aforementioned circumstances caused the scope of potential hazard to expand. As a consequence, it is necessary to establish response procedures and rapid disposal methods for chemical substances with similar characteristics, and avoiding the expansion and dispersal of hazardous substances during the response process is a major issue, and an important matter that the on-site response commander must attend to after an accident occurs.

While the ideal safety strategy in the handling of phosphorus trichloride is to rely on reinforced management and control measures to ensure that there are no opportunities for leaks, how to minimize the scope of damage and injury after a leak has occurred is an issue that may not be ignored.

Thanks to this company's long-term corporate culture of "without safety there is nothing," as well as management's emphasis on work safety, it wishes to share its leak handling process experience derived from this phosphorus trichloride leak incident, as well as the response organization, and assistance and guidance provided by government units during the incident, in the form of a written summary, and hopes that this information will be of assistance in dealing with similar future incidents.

Keywords：(1) phosphorus trichloride, (2) dispersal, (3) response

雲林縣元長鄉台 19 線苯乙烯槽車翻覆事故

A styrene tank truck rollover accident on Highway 19 in Yuanchang Township, Yunlin County

一、摘要

本公司司機莊○○於 102 年 11 月 16 日駕駛 750-H9 槽車載運原料苯乙烯，自六輕工業區前往台塑新港廠，重車行駛至台 78 線元長匝道與台 19 線路口翻覆致原料外洩，接獲通知後本公司立即動員，緊急應變車，載運應變器材，調動真空吸廢油車趕赴現場防止災害擴大。咎以原因有二：1.司機警覺性不足，胎壓不足情況下仍繼續行駛。2.安全防護駕駛觀念不足，未能提前剎車導致意外；事故槽車吊離現場後，恢復地面清潔，並於三日內修復道路、花圃、電桿等設施。

關鍵詞：(1)苯乙烯、(2)外洩、(3)緊急應變車

Abstract

Driver Yang was driving tank truck 750-H9, which was carrying raw materials styrene, from the Sixth Naphtha Cracker industrial area to the Formosa Plastics Corp.'s Xingang plant on November 16, 2013. The heavy vehicle rolled over, causing the leakage of the raw material chemical, as it proceeded from the Yuanchang ramp on Highway 78 to the intersection with Highway 19. After receiving notification, the company immediately mobilized emergency response vehicles carrying response equipment, and dispatched a waste oil vacuum suction vehicle to the scene to prevent the scope of the incident from expanding. The accident was attributed to two causes: (1) The driver failed to maintain sufficient vigilance, and continued to drive in spite of insufficient tire pressure. (2) The driver had inadequate safety consciousness, and failed to brake in time, causing the accident. The ground was cleaned up after the tank truck had been towed from the scene, and the road, flowerbeds, and utility poles were repaired within three days.

Keywords：(1) styrene, (2) leakage, (3) emergency response vehicle

高雄市林園工業區某化工廠火警事故

Fire alarm at a certain chemical plant in Kaohsiung's Linyuan Industrial Area

一、摘要

2013 年 12 月 30 日 BPA 工場停爐進行年度歲修，2014 年 1 月 9 日，BPA 工場在開車過程中原料酚慢慢飼入系統，酚進入系統被收集在結晶塔內，約數小時間歇性排放一次。操作員在此區域的最後時間點為 1 月 17 日凌晨 01:30 例行巡檢，當時尚未發現任何不尋常的地方；02：30 於休息室外發現丙二酚工場失火，立即通報控制室，同時丙二酚工場盤面操作員發現結晶溶液槽攪拌機跳電，BPA 工場人員至現場察看確認發生火警，經以滅火器進行滅火，隨即於 02：41 通報監測中心，並通知林園消防隊進廠協助救災。03:00 消防隊派出五部消防車支援，03:30 火勢受到控制。經確認失火範圍約限於丙二酚工場過濾機系統的溶液槽及週邊設備約 4 平方米面積，餘火於 04：10 完全撲滅，並未造成任何人員傷亡及環境污染。BPA 工廠除持續冷卻週邊設備，並進行事故調查以確定原因。

關鍵詞：(1)丙二酚、(2)旋轉真空過濾機、(3)攪拌機軸封、(4)結晶塔、(5)機械完整性計畫

Abstract

On December 30, 2013, a BPA plant shut down operations for its annual overhaul. When raw material phenol was gradually re-introduced into the system as part of the re-start process on January 9, 2014, the entering phenol was collected in a crystallization tower, and an intermittent release occurred once every few hours. Operating personnel failed to discover any signs of abnormality when conducting a routine inspection patrol of this area at a final time 01:30 on the night of January 17. At 02:30, personnel outside the employee lounge noticed that the BPA plant had caught fire, and immediately notified the control room. At that time, personnel operating the BPA plant control panel discovered that the crystallization solution tank mixing machine had tripped. BPA plant personnel went to the scene, confirmed the fire, and attempted to put out the fire using fire extinguishers. They promptly notified the monitoring center at 02:41, and also notified the Linyuan Fire Department to assist with response actions at the plant.

The Fire Department sent five fire trucks to provide support at 03:00, and the fire had been brought under control by 03:00. After confirming that the scope of the fire was limited to a roughly 4 m^2 area containing a solution tank and peripheral equipment comprising part of the BPA plant's filter system, all remaining fire was eradicated by 04:10. The blaze did not result in any deaths, injuries, or environmental pollution. Apart from cooling adjacent equipment, the BPA plant performed an investigation to confirm the cause of the accident.

Keywords：(1) BPA, (2) rotating vacuum filter machine, (3) mixing machine seals, (4) crystallization tower, (5) mechanical integrity plan

台南市仁德區某公司疑似甲醛氣爆事故

Suspected formaldehyde gas explosion at a certain company in the Rende District, Tainan

一、摘要

疑似操作人員未依照操作 S.O.P.作業操作(安全性間段式加熱)，導致水性酚醛樹脂因溫度過高而氣爆(樹脂自加水口、入料口蓋目視鏡噴濺)。

關鍵詞：(1)水性酚醛樹脂、(2)氣爆、(3)噴濺

Abstract

It was suspected that failure to comply with S.O.P. (safe intermittent heating) by operating personnel caused aqueous phenolic resin to undergo a gas explosion due to an excessively high temperature (the resin spattered from the water filling inlet and the observation window on the feed inlet).

Keywords：(1) aqueous phenolic resin, (2) gas explosion, (3) spatter