

環己烷工場管線洩漏引起火災事件

The Fire Accident Caused by Piping leakage in Cyclohexane Plant

一、摘要

中石化頭份廠之環己烷工場於 99 年 4 月 4 日上午 9:33 因管線洩漏引起火災事件，當日事件未發生前，值班主管進行例行性巡檢時發現靠近液相反應液循環冷卻器之管線有環己烷噴漏，遂即判斷需要緊急停車，依作業程序書進行緊急停車釋壓的過程中，發生火災事故，此時系統壓力約 13Kg/cm²G (操作壓力為 20.5 Kg/cm²G)。

在引火事件發生後，立即啟動緊急化學災害應變通報程序，各應變單位在接獲通報後，立即前往支援救災，火勢延燒約 40 分鐘即被控制，並於 1 小時完全撲滅，估計環己烷之洩漏燃燒量約 9.7 噸。火勢撲滅後，環保署北區毒災應變隊仍於廠區持續進行周界之 VOC 濃度檢測至 18:00，皆未發現 VOC 濃度超限。現場立即拉起封鎖線禁止人員進出，以避免現場遭破壞，並進行現場周遭化學泡沫、廢液之清理。4 月 5 日上午由消防局火災調查課進行火場勘查後，清理周遭之保溫棉、鋁皮及整理斷裂之管線，與進行系統之出空煮洗…等必要措施，以避免二次災害發生。

事件之災因分析，從現場目擊者說法與現場設備之狀態顯示，應是取樣點(AE-604)之取樣管線洩漏，取斷裂之取樣管線，量測其管外徑，管線中段處之外徑為 21.3mm，與設計值相同(外管徑為 21.3mm、管厚為 2mm)，但減薄處之管外徑為 19.65mm，最薄處之管厚度為 0.5 mm，計算其減薄率為 75%，研判此管線有外部腐蝕的現象，導致在接近焊接點的位置，因管壁減薄而使管線發生斷裂。

關鍵詞：環己烷、管線、阮尼鎳觸媒、洩漏

Abstract

In this case, the fire accident caused by piping leakage in the cyclohexane plant of CPDC toufen works at April, 4, 2010. Before this accident, the shift

superior found the cyclohexane spurted from the pipe near the pump around cooler in daily patrol and inspection. On the spot, he decided to take emergency shut down obeyed standard operation procedure, and the fire accident occurred in the time of the releasing pressure procedure when the system pressure was in 13 Kg/cm²G. (Operation pressure is 20.5 Kg/cm²G)

We took the chemical disaster response emergency notification procedures immediately. When the authorities receive the notification, they provided the fire scene relief as soon as possible. The fire was controlled in 40 min. and stamp out in 1 hour. The leakage of cyclohexane is 9.7 MT as estimation. After that, The EPAERT (Northern) detected the VOC concentration continually until 18:00, and it was not over the control valve. In order to protect the integrity of fire scene, it pulls up the blockade line to forbid people to enter the control area. After the fire investigation processed by Miaoli County Fire Department Fire Investigation section at April, 5, 2010, it needed to prevent second disaster occurring necessarily, like cleaning insulation, aluminum plate and broken pipe around the surrounding, system cleaning, and ...etc..

According to the witness and the state of equipment in the scene, the reason of the fire accident caused by piping leakage which is near sampling point (AE-604). Base on the measurement data, The O.D. of broken pipe is 21.3mm, the O.D. of decreasing site is 19.65 mm, and the thinning thickness is 0.5mm. It could be calculated that the wall dethickness is 75%. (Design valve: O.D. 21.3mm, Thickness 2mm). The measurement shows external corrosion of the pipe happened due to pipe walls thinning which cause leakage near weld point.

Keywords : Cyclohexane, Piping, Raney Nickel Catalyst, leakage

台中縣化學公司火災事故

Fire at a chemical company in Taichung country

一、摘要

民國 99 年 3 月 25 日晚上 18 時 36 分許永日化學工業股份有限公司發生甲醇外洩火災，該事故地點為本公司 C 棟 3F 甲醇回收之 C1305 反應槽與 C4501 母液儲存槽發生火災。約當日 19 時 13 分火災完全撲滅。環保單位會同本廠人員確認毒化物儲存與使用未受到波及。後續加強廠內設備修繕、工程改善、環境異常初期應變機制及緊急應變教育訓練等作業。

關鍵詞：甲醇、反應槽、母液儲存槽

Abstract

On March 25th, 2010, the methanol leak caused fire was occurred at the third floor of building C of Yung Zip Chemical company located in youth industrial district, Tachia when the recover tank (C1305) and the storage tank (C4501) were recovered methanol. The area of fire did not affect the storage and area related to toxic chemical substance which was under the regulatory controlled by the environmental protection administration (EPA). Yung Zip Chemical company will enhance the training of equipment repair and upkeep, engineering improvement, initial response mechanisms for environmental irregularities and emergency response.

Keywords: methanol 、 the recover tank 、 the storage tank

高雄市小港區某公司加熱爐火警事故

Fire incident at China Steel Chemical Corporation,

Siaogang District, Kaohsiung City

一、摘要

某工廠於今(99)年 8 月 05 日下午 19 點，於該廠東北側之循環油加熱爐爐管破孔造成內容物洩漏，洩漏後即於高溫的爐內起火燃燒、並沿廢氣管線竄燒造成火災，經現場人員發現後立即進行滅火並通報消防隊，火勢於 20 分鐘內獲得控制並迅即撲滅。

關鍵詞：加熱爐、火災

Abstract

On August 5 (2010) at 1900, a broken hole occurred with the circulation oil heating furnace tube at the northeast side of a factory, causing content leakage and then fire after in contact with high temperatures inside the furnace. The fire spread along the exhaust pipelines and resulted in a fire accident. Workers at the scene immediately begin to extinguish the fire and informed the fire department. The fire was brought under control within 20 minutes and later soon extinguished.

Keywords : heating furnace 、 fire

台南縣山上鄉某工廠火警事故

Fire incident at Everest Textile, Shanshang Township,

Tainan County

一、摘要

民國 99 年 3 月 4 日上午 08 時 28 分於研發大樓 4 樓塗佈上膠區因起火燃燒，持續燃燒波及 3 樓實驗室之毒化物運作場所。

關鍵詞：塗佈、實驗室

Abstract

On March 4, 2010, at 0828, the coating area at the 4th floor of the R&D Building caught fire. The fire continued to burn and affected the laboratory's toxic chemicals operation site at the 3rd floor.

Keywords : coating、laboratory

竹南科學園區展旺生命科技公司火警事故

Fire incident at Savior Lifetec Corporation, Chunan Science Park

一、摘要

本公司位於竹南科學園區內之二廠製程原液回收區，於進行乙酸乙酯蒸餾回收分裝時，疑似靜電所引起的燃燒事故，因該區域另存放有異丙醇、丙酮等易燃性化學品，進而導致延燒至相鄰的製程區。

關鍵詞：乙酸乙酯、靜電

Abstract

The company's recycling area for its original produced solution within the second factory at Chunan Science Park occurred with a fire incident from static electricity due to distillation recovery and distribution of ethyl acetate. Because the area also had storage of isopropyl alcohol, acetone and other flammable chemicals, the fire spread to adjacent process areas.

Keywords : ethyl acetate 、electricity

桃園縣中壢工業區某科技火警事故

Factory fire at Zhongli Industrial Park, Taoyuan County

一、摘要

此事故發生於 99 年 05 月 20 日，疑似係因丙酮儲槽(約 13 噸)之液位計視窗破裂，導致丙酮洩漏而引發火源，火勢於 08 時 50 分撲滅，災損約 5 坪，未波及毒化物，廢水導入廠內污水系統進行處理，事後不僅加強人員訓練槽車標準作業，且廠內危險性槽體，新增高液位警報系統.斷路閥安全措施。。

關鍵詞：火災、丙酮、儲槽

Abstract

The incident occurred on May 20, 2010, which the liquid-level indicating window of the acetone storage tank (about 13T) was suspect to broke, leading to acetone leakage and causing fire. The fire was extinguished at 0850, with an area of loss around 5 pings (16.5 square meters). The fire did not reach the toxic chemicals. The wastewater was handled via the factory's wastewater treatment system. After the incident, not only the training towards workers with the SOP of storage tanks was enhanced, but also the adding of an alarm system of high liquid levels and breaker security measures for hazardous storage tanks were implemented.

Keywords : Fire 、 Acetone 、 Tank

台中工業區某公司火警事故

Fire incident at Sin Hun Chemical Company, Taichung Industrial Park

一、摘要

(一) 生產特用化學添加劑，屬批式化學反應。

(二) 發生事故主要因為產品終點取樣分析判斷，因操作不慎導致槽內反應物及溶劑大量外洩而發生閃燃爆炸。

關鍵詞：溶劑、爆炸

Abstract

(一) The company produces specialty chemical additives via batch reaction processes.

(二) The main reason for the incident was caused by the sampling of the end product for analysis; careless handling resulted in large leakages of reactants and solvent from the tank to cause flash explosion.

Keywords : Solvent 、 explosion

宜蘭縣蘇澳鎮某公司氨氣外洩事故

Ammonia leak accident at Jiafu Co., Ltd, Suao Town, Yilan County

一、摘要

此事故發生於 99 年 02 月 23 日為廠內三樓廠區之氨氣管線洩漏，應變初期先以水霧進行防護並降低現場氨氣濃度，再經由勘查洩漏處後，嘗試多種止漏方式，最後選擇將洩漏點管槽注滿水，以稀釋的方式進行止漏作業，現場仍持續進行環境監控，於止漏完成及現場氨氣濃度已降低後，其善後復原作業後續交由環保局督導。

關鍵詞：氨氣

Abstract

The accident occurred on February 23, 2010, in which a leakage occurred at the ammonia pipeline on the 3rd floor of the factory. The initial response was first performed by applying water mist for protection and to reduce the level of ammonia. The location of the leakage was then investigated, using different methods in attempt to stop the leakage, which the method by filling the leakage pipe and tanks with water was chosen to dilute and stop the leakage. The site continued with environmental monitoring. After operations of stopping the leakage and the ammonia level at-site was reduced, the follow-up recovery operations was transferred to the Environmental Protection Bureau for supervision.

Keywords : ammonia

台北縣貢寮鄉台 2 線 87 公里處貨車鹽酸洩漏事故

HCl Leakage Accident While Transportation

一、摘要

99 年 2 月 9 日上午本公司運輸供應商景山交通公司司機賴先生駕駛車號 AY-113 海鷗車於本公司觀音廠載運 11 顆 1M3 IBC 擬出貨至宜蘭利澤工業區旭弘光電，於中午 12:20 行經台 2 線濱海公路 87km 上坡路段轉彎處，因駕駛不慎，造成 4 顆 1M3 IBC (包括鹽酸(HCl) x 1、硝酸(HNO₃) x 3)自海鷗車上摔落地面，造成其中 1 顆裝有鹽酸(HCl)之 IBC 破裂洩漏。

本公司安衛人員於接獲通報後，立即派員攜帶緊急應變器材趕赴事故現場處理。在消防隊與環保署環境毒災應變隊(EPAERT)協助調派挖土機及移槽泵浦等緊急應變器材，以及交通警察與本公司應變人員共同積極處理，使現場儘速恢復。

關鍵詞：鹽酸、洩漏、緊急應變器材

Abstract

Mr. Lai, logistic service provider's driver, drove seagull truck (with chemical inside) from BEMT (Taoyuan) to customer site (I-Lan) along the coast road on Feb.09,2010. When the truck turned left on uphill road (around 87km) at PM12:20, 4 out of 11 IBCs fallen down to the road (incl. HCl x 1, HNO₃ x 3). 1 HCl IBC leaked.

After our EHS person received the call, we immediately dispatched our emergency response team members to go to the accident spot with emergency response equipments. With EPAERT, traffic police, fire brigade and our emergency response team members' positive treatment, we return the accident spot as soon as possible.

Keywords: HCl, leakage, emergency response equipment

高雄市九如一路民宅不明液體事故

An Unknown Liquid Incident in a Resident House in Kaohsiung City

一、摘要

98年10月22日高雄市九如一路239巷46號民宅有不明液體外洩，屋主一人死亡，地下室發現可疑三個10公升的空桶，應變人員配帶自給式空氣呼吸器(SCBA)進入現場，首先進行環境偵測，以光離子偵測器(PID)確認為現場有大量的揮發性有機化合物(VOCs)逸散，隨即移動式氣相層析質譜儀(Portable GC-MS)偵測鑑認，由分析的質譜圖中顯示，大多為C4-C12碳氫化合物，四用氣體偵測器O₂測值在持續通風後仍為19.8%，初步研判可能為石油醚或有機溶劑外洩揮發，間接導致缺氧，才釀成這起意外事故。本文描述此事件的應變方式及處理過程，以及原因分析。

關鍵詞：揮發性有機化合物、鑑認、缺氧

Abstract

On October 22 2009, a resident house has reported to have leaks of unknown liquid from three 10 Liter drums with one fatality in the basement. Emergency response team members wear SCBA and PPE entered the site to perform air monitoring and identification. PID confirmed there was large amount of VOCs, portable GC-MS identified C4~C12 hydrocarbons, and multiple gas detectors showed oxygen concentration of 19.8% even after extensive ventilation. It is suspected that the leak and vaporization caused oxygen deficiency and was probably the main cause of the fatality. This article describes the response procedures and the root cause analysis of this incident.

Keywords: Volatile Organic Compounds, identification, oxygen deficiency

台北縣樹林市某工廠火警事故

Fire incident of Taiwan Electroless Ltd on Wulin St., Taipei County

一、摘要

此事故發生於 98 年 10 月 02 日為該廠之重油及燃料油區，初期得知現場化學品有去漬油、甲苯皆遭受波及，廠內人員表示毒化物二氯甲烷已使用完，故未波及，現場進行環境監測，災損面積約 80 坪，廢水導入廠內污水處理場，廢棄物交由環保局督導。

關鍵詞：二氯甲烷、環境監測

Abstract

The incident occurred on October 2, 2009, at the factory's heavy oil and fuel oil area. Initial investigations showed that chemicals such as scouring agents and toluene at the fire scene were affected. Officials of the factory said that the toxic dichloromethane was completely used and therefore was not affected. An on-site environmental monitoring was conducted, which the area of damage loss was about 80 pings (265 square meters). The wastewater was handled via the factory's wastewater treatment system, and disposal of wastes was under the supervision of the Environmental Protection Bureau.

Keywords : dichloromethane 、 environmental monitoring