

國立臺北大學自然資源與環境管理研究所

106 學年度第二學期『環境災害與風險管理』

課程講義 (05)：人為災害與技術災害
Anthropogenic and Technologic Hazards

● NATURE OF TECHNOLOGICAL HAZARDS (S. Chp.13)

- “Man-Made” Accidents *c.f.* ‘Social’ Hazards => Deliberately harmful use of technology
- Definition of Technological Hazards: *Accidental failures of design or management relating to large-scale structures, transport systems or industrial processes that may cause death, injury, property loss or environmental damage on a community scale.*
- Technological Accidents
 - ⇒ Structures (Fire and Explosion)
 - ⇒ Structures (Collapse): Dam, Building, and Bridge => Stadium?
 - ⇒ Public Transport: Air, Sea, Rail => Tunnel and Highway; Ferry
 - ⇒ Industrial Accident => Physical, Chemical, Biological, and Complex Accidents
- Arising Factors of Technological Hazards
 - ⇒ Defective Design
 - ⇒ Inadequate Management
 - ⇒ Sabotage or Terrorism
 - ⇒ Climate Change?
- Transportation of Hazardous Material: PRTR (Pollutant Release and Transfer Register)
- Facility Siting: NIMBY => Safety Distance (?) => Buffer Zone, Land Use Planning

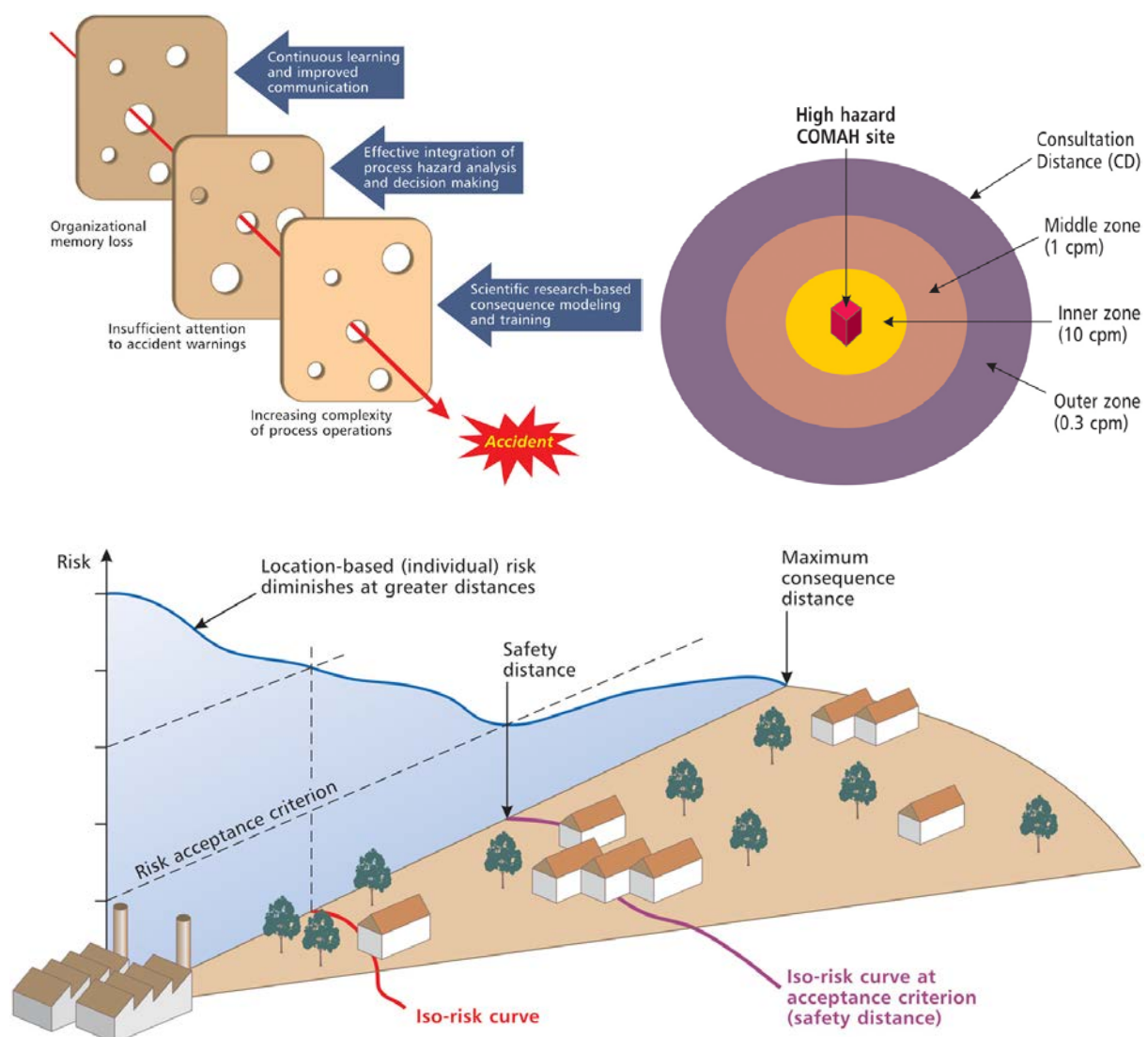
● MAJOR TECHNOLOGICAL DISASTERS

- Technological disasters archived by CRED (Centre for Research on the Epidemiology of Disasters, http://emdat.be/emdat_db/) in the period 1900-2017: 8,527.
- Bhopal Disaster: Bhopal India
 - ⇒ Dec. 03, 1984; official record: 3,800 deaths; general belief: 6,400 deaths
 - ⇒ Methyl isocyanate (MIC 異氰酸甲酯) => Phosgene (光氣)
 - ⇒ Emergency Planning and Community Right-to-Know Act
 - ⇒ Emerging Technology, Emerging Chemicals => Emerging Pollutants
- Exxon Valdez Oil Spill: Alaska’s Prince William Sound
 - ⇒ Mar. 24, 1989; spilled almost 11 million gallons of crude oil (total 53 million gallons)
 - ⇒ 阿瑪斯號貨輪油污事件 (2001 年 1 月 14 日)：墾丁國家公園龍坑生態保護區
- Deepwater Horizon drilling accident in the Gulf of Mexico
 - ⇒ April 21, 2010, a sea-floor oil gusher flowed for 87 days
 - ⇒ Average flow rate of oil: 12,000 to 100,000 barrels per day
 - ⇒ Technological disasters causing major environmental pollution
- 高雄氣爆(2014/07/31)、八仙樂園氣爆(2015/06/27)

- Nuclear Disasters
 - ⇒ Chernobyl Disaster (1986)
 - ⇒ Fukushima Nuclear Disaster (2011)

- INDUSTRIAL HAZARDS AND RESPONSIBLE CARE

- Industrial Hazards Related to the “Operation” of Toxic Chemicals
- 「[中央毒災防救體系](#)」
- [OECD Guiding Principles for Chemical Accident Prevention, Preparedness and Response](#)
 - ⇒ Responsible Care is an initiative developed and adopted by chemical industry associations to improve the health, safety and environmental performance of their member companies' operations and products, and the level of community involvement and awareness of the industry.
 - ⇒ Second Addendum (2015): Natechs--Natural Hazards Triggering Technological Accidents



- Homework Assignment #3 (2018/04/10 Due)

請註冊 Emergency Events Database (EM-DAT, <http://www.emdat.be/>), Centre for Research on the Epidemiology of Disasters (CRED) 使用者帳號，以查詢、彙整該資料庫收錄之台灣地區技術災害事件，並擇 2 災害概述事件歷程與其所造成之損失。