SNU-WPI FRE Program

Process Management System

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Introduction

- Introduction to course
  - To prevent major industrial accidents as well as construction accident prevention methods by studying process safety management technique
  - To training the capability including expert knowledge of process safety
  - Contents of the course
    - Process Safety Management System
    - Integrated Risk Management System
    - Quantitative Risk Assessment Technique
    - Qualitative Risk Assessment Technique

Course Logistics

- Student evaluation will be based on class participation, group projects and final examination. They will be weighted as follows
  - Class Participation 20%
  - Group Projects 30%
  - Final Exam.(include quiz) 50%
- Group projects will be announced in class

Contents of the Course

- Process Safety Management
  - Comprehensive sets of policies, procedures and practices designed to ensure that barriers to episodic incidents are in place, in use and effective
- IRMS (Integrated of Risk Management System)
  - Integration system of PSM(Process Safety management) and off-site risk assessment using GIS and other application
- Qualitative Risk Assessment Technique
- Quantitative Risk Assessment Technique

Overview of Process Safety

Trend of Chemical and Energy Industries

- More dangerous operating conditions
  - high pressure, low temperature
- More toxic and environment-dependent products
- Increased work and information overload for human operators
- The public and the international society are more sensitive and regulation-minded about the safety

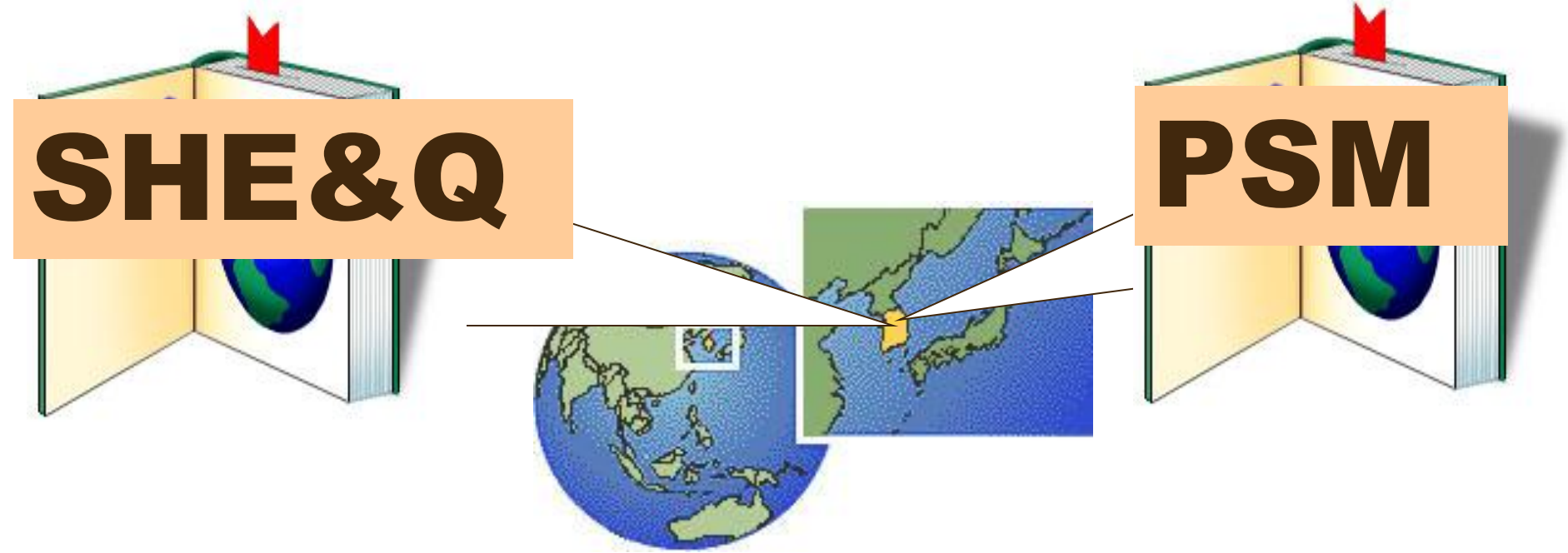
Future Features of Chemical Plant Accidents

- More severe personal injuries
- More potential for major accidents
  - Fire, explosions and toxic material releases
- Greater economic loss
- International environmental damage
- Human casualties in the wider surrounding area

The Status of Industrial Accident in Korea

	1997	1998
Casualties	66,770	51,514
Deaths	2,742	2,212
Loss of Working Day(Thousand day)	46,634	41,511
Economic Loss(Billion $)	**55**	**52**

The Goal of Loss Prevention Technology in Korea

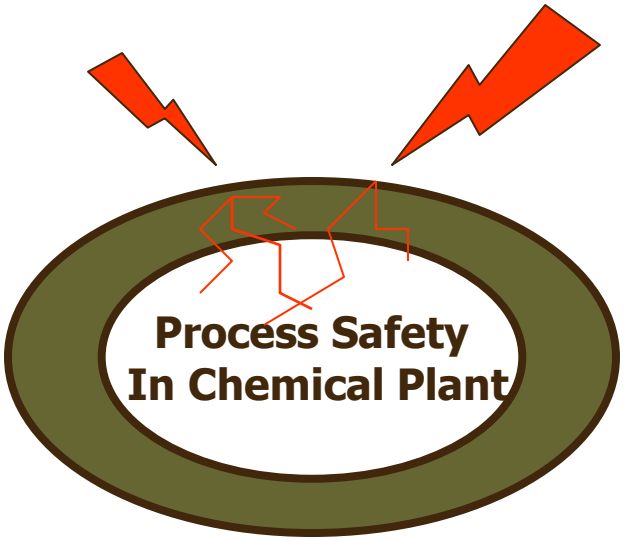


Risk Management System in Chemical Industries

Life-cycle of Chemical Process Industry

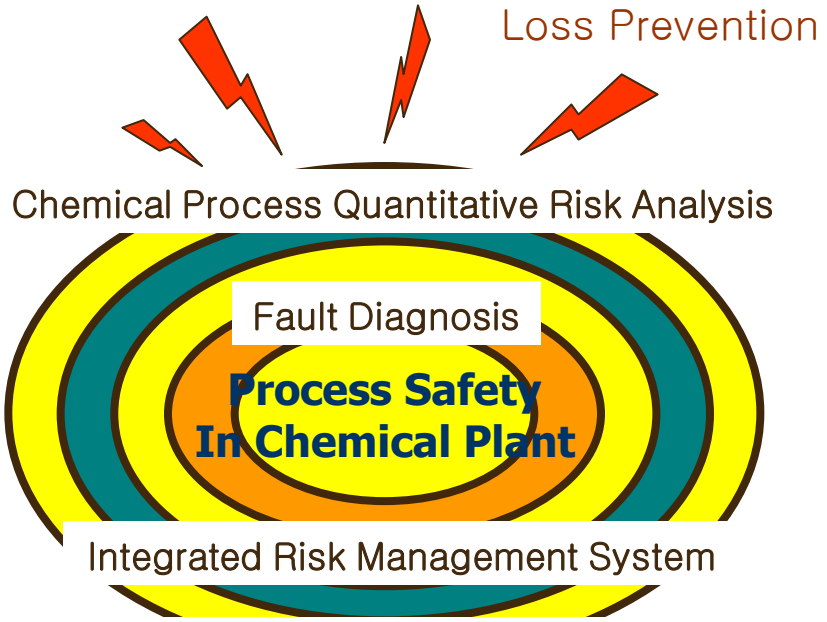
Total Risk Management Program

Existing Safety Management



Passive Risk Management Program

New Safety Management (Total Risk Management Program)



Integrated Safety and Environmental System

Goals for Safety and Environment in the 21st Century

- Handle disasters with local communities
- Prevent pollution
- Operate safe plants
- Distribute products in a way that reduces hazards to people and the environment
- Protect the health of people at plant sites
- Promote the safe use of chemicals from manufacture to recycling and disposal

Present Safety Problems

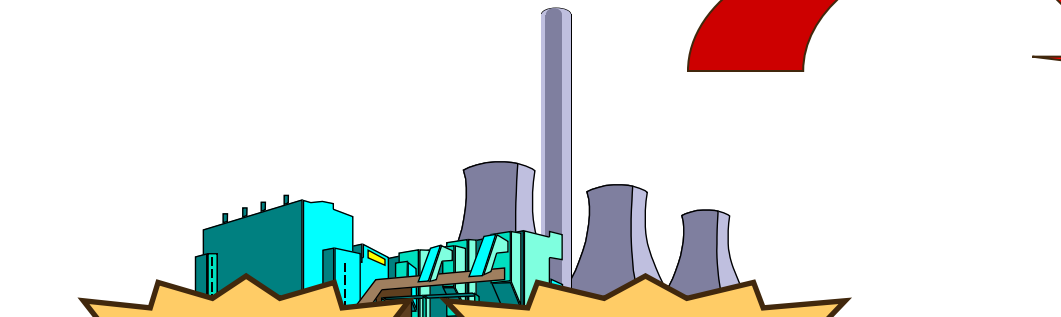
- Complex & diverse energy facilities
- Lower priority to safety-related investment
- Inspection only for facilities

↖ Present safety management reached its limit.

Urgent Need for New Safety Management

- Lack of systematic approach in present safety management systems
  - Focused on Hardware Problem
    - Technical Aspect Only
- New Safety Management System is needed
  - to reduce frequency & impact of accidents
  - to improve safety-level of energy industries

Motivation



Failure

Accident

Quality

Economic Loss

Personal Injuries

Environment

PSM (Process Safety Management)

CPQRA (Chemical Process Quantitative Risk Analysis)