SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: INTRODUCTION TO INDUSTRIAL HYGIENE

Code No.: CHM 216-~~4~~3

Program: PULP & PAPER ENG. TECH.

Semester: ONE

Date: AUGUST 1983

Author: D. HEGGART

New: _____ Revision: X

APPROVED: _____ _____

Chairperson Date

INTRODUCTION TO INDUSTRIAL HYGIENE
Course Name

CHM 216-4
Course Number

PHILOSOPHY/GOALS:

The goal of this course is to give the student a comprehensive knowledge of the principles of industrial hygiene - Recognition, Evaluation and Control Methods - to qualify him/her to function in the Health and Safety Department of a Pulp or Paper mill.

METHOD OF ASSESSMENT (GRADING METHOD):

Student will be evaluated on the basis of their performance on tests, literature-search projects, assignments, final exam and class participation.

TEXTBOOK(S):

Industrial Hygiene, Allen, Ells & Hart, Prentice-Hall (1976)

REFERENCE TEXTS:

1. "The Industrial Environment - Its Evaluation and Control" U.S. Dept. of Health, Education and Welfare (1973)
2. Niosh Publication. U.S. Government Printing Office, Washington, D.C.
3. "Basic Industrial Hygiene" - American Industrial Hygiene Assoc. (1975)

PRINCIPLES OF INDUSTRIAL HYGIENE

INTRODUCTION

AIHA definition of Industrial Hygiene
Historical Developments, ACGIH, AIHA, OSH Act, NIOSH
Bills 139 and 70
Personnel responsible for Occupational Health Programs

PRINCIPLES OF INDUSTRIAL HYGIENE

Recognition of potential hazards assimilation of process and procedures data

Evaluation - preliminary survey
- environmental survey

Control - engineering
- administrative

Toxicity vs Hazard

CLASSIFICATION OF STRESSES

A. Chemical: gases, vapours, dusts
B. Physical: noise, radiation, thermal, stresses, pressure, vibration
C. Biological: bacteria, fungi, moulds, viruses,
D. Ergonomic

A. Chemical Stresses

1. Recognition
   - Dose - response relationship
   - LD50, LC50 concepts
   - Routes of entry
   - Mode of action
   - TLV concept
   - Documentation of the TLV
   - Classification of toxic effects

2. Evaluation
   - Preliminary survey
   - Envinonmental survey
   - Grab sampling - bags
     - syringes
     - bombs
     - detector tubes
     - direct-reading instruments
     - hi-vol samples

Integrated sampling

(a) personal and personnel sample bags
adsorbent tubes
paper tapes
long-term detector tubes
gas badges
filters
cyclones
(b) area or "fixed-station"
monitoring

3. Control
Substitution
Isolation, segregation
Local exhaust, ventilation
Dilution ventilation
Personal protective devices
Area monitoring as a control method
Work rotation
Education and training

B. Physical Stresses

1. Noise

1. Recognition
Classification of hearing loss
Audiograms
Effects of excessive noise
Subjective aspects of sound
Hazards associated with hearing loss
Principles of sound
Sound pressure and sound pressure level
Combination of sound pressure levels
Frequency bandwidths, octave bands
Equal loudness contours
Weighting scales
Noise exposure guidlines
Noise dosage

2. Evaluation
Sound level meters-types
Calibrators
Octave band analyzers
Dosimeters

3. Control
   - Substitution
   - Isolation, segregation
   - Specifications on new equipment purchases
   - Maintenance
   - Acoustical treatment
   - Enclosures, noise alternation at source
   - Andiometric examinations
   - Work rotation
   - Personal protective devices
   - Noise conservation programs

2. Ventilation

   - basic design
   - parts of a system
   - terminology
     - dilution
     - local exhaust
     - K valve
     - dilution for fire & explosion control
     - TLV vs LEL
   - inerting

C. Legislation

- historical overview
- the occupation Health & Safety Act.
- regulations
- designated substances