

Introduction

Environmental Risk Management (ERM) is a relatively new strategy that uses both qualitative and quantitative information. It is very important since it can save lives, maintain environmental values, and prevent unbudgeted or unforeseen costs.

Two issues that should be considered when delivering this material are (1) the risk and consequences of low-probability catastrophic events and (2) the presence of on-site and off-site hazards. The APELL program was designed to handle off-site hazards of major accidents. See the UNEP website to access the APELL series:

<http://www.uneptie.org/pc/apell/index.html>

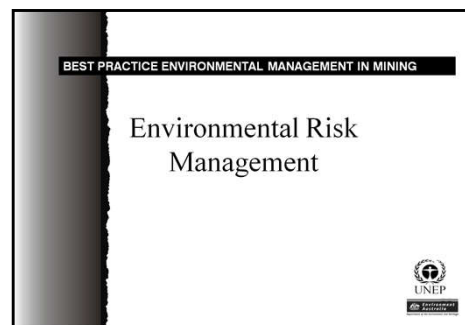
This module is based on material presented in the accompanying BPEM in Mining booklet. Trainers using this kit are encouraged to adapt the ideas in the slides and notes to their own national environmental, social and industrial circumstances by seeking similar information and case studies with a local flavour. Site visits, 35 mm slides, or simple videos may be used to add local content to the presentation.

The mining industry is going through a period of rapid change. The issues and the procedures to address these issues are in constant evolution, and the material presented here will need to be frequently updated.

Environment Australia has established a website where updates, feedback and supplementary material will be posted. In addition, the website includes the entire content of the BPEM booklets and this kit. It can be accessed at:

<http://www.ea.gov.au/industry/sustainable/mining/bpem.html>

The objective of this module is to demonstrate the principles of applying **ERM** to the overall management of environmental issues that occur during the mining cycle. The module introduces a systematic approach to hazard identification and quantitative and qualitative risk estimation. It incorporates practical advice for developing management programs to allow efficient resource



TIPS

Training materials for this module:

Hard copy

- Summary Sheets

CD ROM

- Complete PowerPoint text of slides and trainers' notes
- Case studies: See case study index for suggestions
- Handouts
 1. Definitions
 2. ERM Methodology (Figure 1 in booklet)
- Worksheets
 1. What is Environmental Risk Management
 2. Uncertainty and Hazard Identification
 3. Hazard Identification and Environmental Aspects
 4. Case Study: Los Frailes Tailings Dam Failure
 5. Environmental Risk During the Mining Cycle
 6. Case Study Questions

Note that Volume 1 contains general guidance for trainers, a glossary, and references and sources of further information. The *General Trainers' Guide* provides suggestions for using case studies and other ideas for developing successful training programs.

Before beginning this module the trainer should be thoroughly familiar with the *Environmental Risk Management* booklet. The module highlights key points and issues and does not cover all of the material and case studies contained in the booklet in an exhaustive manner. Issues relevant to environmental risk are also covered in other modules in this training kit, as almost every aspect of environmental management in mining has some level of uncertainty attached to it.

The time required for this module will depend on your objective. Since the ideas about estimating risk using both qualitative and quantitative information may be new to some participants a full day is recommended.

allocation and environmental protection.