

Geologic Disposal of High Level Waste course I

Held : Las Vegas 4th-8th May 2006

Venue : MGM Grand Hotel, Las Vegas, Nevada USA

Course Programme: pdf file 112 kb
Course outline

This course covers international experience in key aspects of deep geologic disposal of spent fuel and high level radioactive waste that are needed to form the components of a national program, with a special emphasis on the current US HLW program.

The course program (attached) is designed so that the participants can reconfirm and update their present knowledge - from evaluating the wastes to be disposed of, right through all the technical stages of identifying and implementing geological disposal, to the societal interactions required of repository development projects.

The course is considered ideal for professionals working in the implementation, regulation or technical support areas at every stage in their national programs. It will be particularly valuable for those who may just be starting their management-level career on geological disposal projects who need to see geological disposal in its widest context.

The programme consists of 4 to 6 lectures per day in an informal classroom atmosphere with sufficient time allocated for participants to raise questions and answers. Participants will be encouraged to introduce the relevant issues from their own national program and discuss the issues with the tutors and the other participants from around the world.

The course will spend the last day at the Yucca Mountain (planned repository) Site to learn directly about the site investigations to demonstrate the feasibility and safety of geological disposal.

Course organisers

The course is organized by the ITC School of Underground Waste Storage and Disposal with the support of the United States Department of Energy (USDOE, one of the Member organisations of ITC).

Programme

Day 1 (Thursday May 4th 2006)

08:30 – 09:00

Introduction to the training session

Objectives; how the week will work (structure of course)

Participants introduce themselves.

ITC

09:00 – 09:30

Welcome and overview of current status of US program

Intended principally as orientation for non-US participants

Russ Dyer

Chief Scientist

DOE/OCRWM

09:30 – 10:30

Nuclear fuel cycle and radioactive waste

The nuclear fuel cycle; the origins of spent fuel and high-level waste; reprocessing and the wastes its produces; amounts of SF/HLW existing worldwide; how they are conditioned for disposal; advanced fuel cycles and their implications for repository design; other wastes (LL-ILW, DU, Pu, DRSS) requiring geologic disposal; what other countries are doing with their HLW/SF

Charles McCombie

McCombie Consulting

10:30 – 10:45

Break

10:45 – 11:45

The concept of geologic disposal

Radioactive wastes in context with other wastes; what geologic disposal means (generic concepts), its technical and non-technical objectives and why it has been selected; key current issues in geologic disposal worldwide

Neil Chapman

ITC

11:45 – 13:00

Lunch

13:00 – 14:00

Chemical, thermal and hazard characteristics of HLW/SF

Radionuclides that they contain; chemical form; radiological and toxic hazard potential with time; waste form characteristics with respect to disposal (half-lives, thermal impacts, radiation impacts); stability of fuel cladding; impacts of pre-disposal storage.

Mick Apted

Monitor Scientific

14:00 – 15:00

Geologic environments for disposal

Range of geologic environments being considered worldwide, the hydrogeologic, structural and geochemical properties that make them suitable and which need to be understood; the tectonic and natural evolution issues associated with the formations and the types of environment in which they can occur.

Neil Chapman

ITC

15:00 – 15:15

Break

15:15 – 16:15

Design concepts for repositories and underground stores

Basic safety concept of the multibarrier EBS - NBS system; different ways that this can be implemented for HLW and SF; how a safety concept integrates different geologic environment with different repository designs; why designs and safety concepts vary from country to country (different ways of achieving safety); examples of designs, why they were selected and how they have changed with development; how storage can be fitted into design concepts.

Mick Apted

Monitor Scientific

16:15 – 17:00

Open discussion of Day 1

Neil Chapman

17:00

Adjourn for Day 1

Day 2 (Friday May 5th 2006)

08:30 – 09:30

Safety standards and regulations

Basic international ethical and radiological principles underlying regulatory standards (IAEA, ICRP, etc); concepts of dose and risk; other components of regulations - e.g. non-human impacts, requirements for contents of safety assessment, treatment of timescales, uncertainty, etc; how standards and principles are applied in different countries; future developments internationally

09:30 – 10:30

Showing it is safe: presenting the evidence

The use of safety assessment results and multiple lines of evidence to present a set of reasoned arguments on long-term safety for the regulator and other audiences (geological stability, natural geochemical fluxes and concentrations, natural analogs, natural radiation background, etc)

Neil Chapman

ITC

10:30 – 10:45

Break

10:45 – 11:45

Experiments and demonstrations in URLs

A review of thirty years work in URLs, the main issues addressed by experimental studies and the future of full-scale demonstration work.

Neil Chapman

ITC

11:45 – 13:00

Lunch

13:00 – 14:30

The Yucca Mountain project: a historical perspective

Discussion of the history of the YMP and the US approach to nuclear waste disposal; drivers for waste policy and the current situation; technical insights from performance assessment; regulatory and policy issues.

Lake Barrett

Consultant

14:30 – 14:45

Break

14:45 – 16:15

Selecting a repository site

International guidelines on site suitability; national experience in selecting sites; political and technical constraints; stepwise narrowing down to an acceptable site; current status of national siting programs worldwide; contentious issues in siting

Charles McCombie

McCombie Consulting

16:15 – 17:00

Open discussion of Day 2

Neil Chapman

17:00

Adjourn for Day 2

Day 3 (Saturday May 6th 2006)

08:30 – 09:30

Repository site characterization in different geologic environments

Stages in characterising a site during the selection process; deployment of various field techniques - appropriate strategies for regional and site scale characterisation; advanced geosciences techniques; managing data & QA; data synthesis and interpretation of site properties; evolution into descriptive models; approaches for different geologic

environments and different repository concepts.

Neil Chapman

ITC

09:30 – 10:30

Total system performance assessment

Development and application of probabilistic modeling in assessing the performance of a geologic repository over thousands of years. Discussion will focus on scenario development, treatment of uncertainties and model abstraction. Results of other national program safety assessments.(putting YMP analyses in context). Some key issues internationally in developing and presenting TSPAs

Abe Van Luik, OCRWM/ORD

10:30 – 10:45

Break

10:45 – 11:45

International case studies on societal issues

The Forum on Stakeholder Confidence (FSC) facilitates sharing of experience in addressing the societal dimension of radioactive waste management, explores means of ensuring an effective dialogue with the public with a view to strengthen confidence in decision-making processes among players at national, regional and especially at local levels. A broader, more realistic view of decision making is taking shape.

Paula Alford

NWTRB

11:45 – 13:00

Lunch

13:00 – 14:30

International aspects of disposal and fuel cycle security

Safeguards for spent fuel repositories; impact of retrievability; current initiatives on internationalization of the nuclear fuel cycle to enhance global security; implications for spent fuel and HLW disposal: international fuel cycle facilities and shared regional repositories

Tom Isaacs

DOE/LLNL

14:30 – 14:45

Break

14:45 – 15:45

Geologic disposal, past and future

Where the concept originated and how it has developed since the 1950s; how national programmes started and developed; successes and failures; major evolutionary changes in the concept; alternative ideas that have been abandoned; future developments - international repositories, likely obstacles to national programmes, remaining technical issues to be solved.

Charles McCombie

McCombie Consulting

15:45 – 16:45

Orientation for the Yucca Mountain Field Visit

Background and preparation for the Monday tour

Abe van Luik

OCRWM

16:45 – 17:15

Open discussion of Day 3 and Course Wrap-up

Neil Chapman

17:15

Adjourn for Day 3

Day 4 (Monday May 8th 2006)

All day: early start

Field trip to the Yucca Mountain site, surface and underground

Guided by

OCRWM/YMP