

-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

**Hanover House
24 Douglas Street
GLASGOW G2 7NG**

NATIONAL CERTIFICATE MODULE DESCRIPTOR

-Module Number-	0077706	-Session-1987-88
-Superclass-	PL	
-Title-	RADIOACTIVE WASTE HANDLING	
-DESCRIPTION-		
Type and Purpose	A <u>specialist</u> module designed for operators in the atomic energy industry.	
Preferred Entry Level	0077702 Atomic Energy and Radiation Control	
Learning Outcomes	The student should: <ol style="list-style-type: none">1. know the need for safe handling and storage of radioactive waste;2. know the origins, categories and methods of storage and disposal of radioactive waste;3. know testing procedures carried out on containers of radioactive material;4. know recommended methods of transport for radioactive materials;5. know procedures for declassification of waste.	
Content/Context	<u>Corresponding to Learning Outcomes 1-5:</u> <ol style="list-style-type: none">1. Effects of radiation: genetic and somatic; radiotoxicity 1 - v classification; permissible levels of radiation.2. Waste from reactors, reprocessing and fabrication plants: solid, liquids and gases; how radioactive gases are prevented escaping from stack. Types of liquid and solid wastes from a site: nature of radioactivity; half life activities: U, Th;	

Different categories of waste and where they originate.

Methods of storage: liquids stored in cooled tanks; converted to solids; vitrification cementation; disposal on seabed, salt mines in underground caverns, in space.

Gases: automatic monitoring of chimneys for gaseous fission products (I, and Ra, C, inert gases); taking and counting of air samples, positioning of air samples.

Liquids: waste levels, limit allowed to discharge to sea; treatment of liquid waste: concentration, recycling of material; costing.

Solids: recategorising of waste, active from non-active waste;

Techniques of incineration, pyrolyses and acid digestion; compaction of waste.

3. A variety of different tests carried out on high active containers to examine ability to withstand impact, shock, weather conditions, variations in temperature.
4. Radioactivity categories, methods of packaging, rules and regulations; time of transit; off site; via road, sea.
5. Aim to reduce bulk of waste. Decontamination and burning of non active material, separation of non active from active.

Suggested Learning and Teaching Approaches

In this content based module, the emphasis should be on student centred learning packages which require active participation in, eg. consulting textbook sources / UKAEA codes of practice / publicity. material and films / press reports/ articles in professional and scientific journals and relevant audio visual material. Computer simulation exercises would be ideal if available. The involvement of UKAEA personnel on site would be valuable, eg. in helping the student to prepare a written report relating to one or more of the learning outcomes

Assessment Procedure

Acceptable performance in the module will be satisfactory achievement of the performance criteria specified for each Learning Outcome.

Where cutting scores are stated these are intended to be guidance. The precise cutting score for a test will depend

on the difficulty of the test and will have to be decided by
the Tutor aided by the Assessor.

The following abbreviations are used below:

LO Learning Outcome
IA Instrument of Assessment
PC Performance Criteria

LO1 IA 15 multiple choice questions and 3-5 short answer questions which should elicit answers of not more than 1 or 2 brief sentences.

PC The student should identify and outline the need for safe handling and storage of radioactive waste.

Cutting score 75%.

LO2 IA 15 multiple choice questions and 5 short answer questions which should elicit answers of not more than 1 or 2 brief sentences.

PC The student should identify and outline the origins, categories and methods of storage and disposal of radioactive waste.

Cutting score 75%.

LO3 IA 5 short answer questions which should elicit answers of not more than 1 or 2 brief sentences.

PC The student should outline the testing procedures carried out on containers of radioactive material.

Cutting score 75%.

LO4 IA 5 short answer questions which should elicit answers of not more than 1 or 2 brief sentences.

PC The student should outline the recommended methods of transport for radioactive materials.

Cutting score 75%.

LO5 IA 5 short answer questions which should elicit answers of not more than 1 or 2 brief sentences.

PC The student should outline the procedures for declassification of waste.

Cutting score 75%.

- LO3, IA 4&5 Project report of approximately 2 to 3 pages.
- PC (a) Report on treatment and disposal of waste from a nuclear reactor eg. on a CEGB reactor.
- (b) The report should include case history, worksheet completion, report on work environment.

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