

UNOFFICIAL TRANSLATION



SULTANATE OF OMAN

**MINISTRY OF REGIONAL MUNICIPALITIES,
ENVIRONMENT AND WATER RESOURCES**

**REGULATIONS FOR THE
CONTROL AND MANAGEMENT OF
RADIOACTIVE MATERIALS**

ISSUED BY: MD (249/97) DATED 6 JULY 1997

AMENDED BY: MD (281/2003) DATED 31 DECEMBER 2003



**P.O. BOX 323 MUSCAT, P.C. 113
TEL. 692550**



REGULATIONS FOR THE CONTROL & MANAGEMENT OF RADIOACTIVE MATERIALS

Article (1) : The terms used in these regulations shall have the following meanings:

- 1 - *The Ministry* : Ministry of Regional Municipalities, Environment and Water Resources.
- 2 - *The Minister* : Minister of Regional Municipalities, Environment and Water Resources.
- 3 - *Permit* : The approval granted to an organization to import, transport, use, store or dispose of radioactive materials.
- 4 - *Approved work Plan* : A plan defining working procedures and the limits of exposure dose to a person working in an area containing radioactive materials.
- 5 - *Classified worker* : A Person working in a controlled area which ensures that the person will not receive an annual dose exceeding 10 mSv.
- 6 - *Technical Guidelines for the control and management of radioactive materials* : The guidelines set by the Ministry to provide acceptable methods to meet requirements of this regulation.
- 7 - *Consignment* : Radioactive materials packages being transported under one shipment.
- 8 - *Contamination* : The presence of uncontained radioactive materials in a body or on a surface where it is undesirable and could prove to be harmful.
- 9 - *Contractor / Subcontractor* : The person(s) or organisation performing operations on behalf of another organisation in compliance with their rules.

- 10- **Controlled Area** : An area where immediate dose rates can exceed $7.5 \mu\text{Sv}$ (0.75 mrem)/h.
- 11- **Supervised Area** : An area where the immediate dose rates exceed $2.5 \mu\text{Sv}$ (0.25 mrem)/h but does not exceed $7.5 \mu\text{Sv}$ (0.75 mrem)/h. The area might be subjected to exposure conditions that need to be kept under review.
- 12- **Dose** : The Quantity of Energy imparted to matter by ionising radiation per unit mass of matter.
- 13- **Excepted package** : Packages containing radioactive materials in limited quantities as given in the technical guidelines, set by the Ministry, or radioactivity in the instruments used.
- 14- **The Organisation** : Any Government or Private body involved in the import, transport, storage, usage or disposal of radioactive materials.
- 15- **Packaging** : Material used to protect the radioactive material and the public from radiation during transport.
- 16- **Radioactive materials** : Any material with an activity concentration greater than 100 KBq/kg or 100 Bq/g .
- 17- **Radioactive waste** : Unwanted radioactive material that contains concentrations greater than the levels given above in item (16).
- 18- **Shippers certificate** : A document that accompanies a shipper, consignee, material and quantity being transported and the type of packing used.
- 19- **Sealed Source** : Radioactive material that is per-

manently encapsulated in a solid form so as to maintain leak tightness in all conditions.

- 20- **Unsealed Source** : Source that does not meet the definition of sealed source, usually a liquid or solution.
- 21- **Transport Index** : Equals 0.1 multiplied by the value of the dose rate measured by $\mu\text{Sv/h}$ at one meter distance from the surface of the radioactive material package (the internationally accepted index for classification of packages and how they can be grouped for storage and transport).
- 22- **Packages (Type A & Type B)** : An internationally accepted classification of packages to allow the safe transport of Radioactive materials.
- 23- **Transport** : The Controlled movement of radioactive materials from one location to another.
- 24- **Becquerel (Bq)** : The System International (SI) Unit for measurement of radioactivity (one Bq = 1 Nuclear disintegration/sec).
- 25- **Contingency Plan** : A set of procedures to be implemented in the event of radioactive emergency.
- 26- **Curie (Ci)** : The traditional unit for measurement of radioactivity (1 Ci = 37 GBq).
- 27- **Dose Rate** : Absorbed dose measured per unit of time.
- 28- **Gray (Gy)** : The unit absorbed or organ dose (1 Gy = 1 J/kg).
- 29- **Monitoring** : The measurement of exposure, dose rate or contamination for assessment and control of

exposure of persons and the environment to radioactive materials.

- 30- *Rad* : Traditional unit of absorbed dose (1 Rad = 0.01 Gy).
- 31- *Radiation Monitoring Devices* : Detection Device used by classified worker for monitoring ionising Radiation.
- 32- *Shielding* : Material used to reduce emission of radiation.
- 33- *Test Certificate* : Issued by the manufacturer of a sealed source certifying that the source has been satisfactorily tested in accordance with the recognised international standards.
- 34- *Concerned Department* : Environmental Inspection and Control Department.

Article (2) : It is not permissible to any person to import, transport, store or use radioactive materials, or equipment containing radioactive materials unless the required permit is obtained. In order to obtain the permit, it is conditional for the person to submit the duly filled prescribed application form to the concerned department with the supporting documents. The permit shall be valid for one renewable year and shall not contain more than four radioactive sources. The permit for the consumable markers (Marker, Tracers, Bullets) shall not contain more than four boxes.

The permit for use shall be renewed within a maximum period of one month from the date of expiry and in the event of radioactive materials use after the expiry of this period, a fine of R.O. 200 shall be imposed and shall be doubled every three months provided that it shall not exceed in total R.O. 1000.

- Article (3) :** The Organisation shall, after the Ministry's approval, provide qualified persons to monitor and control radioactive materials and ensure that the provisions of these regulations are complied with.
- Article (4) :** The Organisation shall be responsible for providing the Ministry, Royal Oman Police (Directorate General of Civil Defence) and other concerned authorities with information, maps and plans indicating locations of using and storage of radioactive materials.
- Article (5) :** The Organisation shall identify the "Controlled" and "Supervised" areas within which dose levels as indicated in the permit or as per the terms of the Guidelines are complied with.
- Article (6) :** A person under the age of 18 is not allowed to be a classified worker. Female workers shall be subject to additional restraints in accordance with the terms and guidelines set by the Ministry.
- Article (7) :** The organisation shall notify the Ministry in the following cases :
- A - Before the import and use of radioactive materials, or any other relevant work in the Sultanate.
 - B - If there is any release of radioactive materials in excess of that specified in the permit.
 - C - If anyone or worker has received a radiation dose in excess of the level indicated in the permit.
- Article (8) :** Any organisation dealing with radioactive materials shall establish an internal management system including: staff structure with well defined responsibilities, written procedures of work, quality assurance procedures, staff training and emergency procedures so as to meet the Ministry's requirements.

Article (9) : The internal rules of the organisation shall be written and made available to all workers in the "Controlled" and "Supervised" areas and users of radioactive materials covering the working procedures and practices that shall be followed by workers in the area, including :

- A - A full description of the controlled and supervised area and any associated restrictions.
- B - Ordering and receipt of radioactive material.
- C - Dealing with radioactive material.
- D - Disposal of radioactive material.
- E - Record keeping.
- F - Procedures for contractor and visitors.
- G - Actions to be taken in the event of accidents and emergencies.
- H - Training.

Article (10) : All classified workers must receive adequate training on their field of work, before dealing with radioactive materials. This shall be suitably recorded.

Article (11) : Worker in the controlled areas are prohibited from eating, drinking, smoking, using cosmetics, licking glued labels and using mouth pipettes or personal handkerchiefs.

Article (12) : Packaging of all types of radioactive materials shall be in accordance with the current regulations issued by the International atomic energy agency concerning safe transport of radioactive materials and, the requirements and Guidelines issued by the Ministry. In cases where packaging of radioactive materials is made by the supplier, the organisation must obtain copies of the approval certificates for that packaging to be submitted to the

Ministry. But, in cases where these materials have not been packed by the supplier, approval of the Ministry must be obtained before use.

Article (13) : The international classification and radiation dose limitation on type A and type B excepted packages shall conform to maximum surface dose rate of 2 mSv/h and transport index of 10 for each package.

Article (14) : Packages of radioactive materials must be labelled in accordance with the current regulations issued by the international atomic energy agency for the safe transportation of radioactive materials.

Article (15) : Transportation of radioactive materials into or out of the Sultanate of Oman shall be carried out in accordance with the International Atomic Energy Agency regulations for the safe transport of radioactive materials. All imports of radioactive material shall be accompanied by the appropriate shipping certificates.

Article (16) : It is not permissible for radioactive materials or equipment containing them to enter the Sultanate unless by air and also it is not permissible to transport radioactive materials within the Sultanate unless by land.

Article (17) : Vehicles used for the transport of radioactive materials within the Sultanate of Oman must obtain approval of the Directorate General of Civil Defence (Royal Oman Police) before being used.

Article (18) : The limitations for the transport of radioactive materials shall be as follows :

A - The maximum dose rate at any point on the outer surface of any vehicle loaded with radioactive material shall be 2 mSv/h.

B - The maximum dose rate at one meter distance from

the outer surface of any vehicle carrying radioactive material shall be 0.1 mSv/h.

C - The maximum dose rate at the driver's seat shall be 2.5 μ Sv/h.

unless he is classified, taking into account the time required for the trip.

D - Any radioactive packages must be placed in a tightly sealed containers that securely fixed on the vehicle's floor. The container must be placed in a manner that minimises the dose rate at the driver's seat and, should not be close to the rear of the vehicle.

E - No radioactive material shall be kept in the driver's compartment of any vehicle.

F - Nobody is allowed to travel with any radioactive consignment other than the driver and those authorized to do so.

G - Agricultural products, livestock, flammable materials or explosives shall not be transported as part of radioactive materials consignment.

Article (19) : Vehicles carrying radioactive materials shall be labeled on both sides and the rear with labels indicating that radioactive materials are being carried. The labels shall be written in Arabic and English languages, as per the Ministry's requirements. These labels shall be removed when the vehicle is not carrying radioactive materials.

Article (20) : Each consignment of radioactive materials being transported shall be accompanied by Shipper's certificate. Any movement of the materials shall be recorded in a special record as per requirements of the Ministry.

Article (21) : Radioactive materials shall be transported with a mini-

imum stop-overs enroute to its destination. Vehicle shall stop only at places specified in the permission. Each driver of vehicles carrying radioactive materials shall not drive for more than "4" hours without a break and the working hours shall not exceed "10" per day.

Article (22) : Permanent storage of radioactive materials shall be permitted only at locations approved by the Ministry. The Organisation using these locations should have written procedures of operation, security facilities, dose rate limitations, notices and labels as per the enclosed design model.

A prior approval from the Ministry must be obtained for any proposed temporary locations for storing radioactive material for a period not exceeding 24 hours.

Article (23) : The storage locations must fulfill the following :

- A - Should be away from populated areas.
- B - All radioactive materials shall be adequately shielded, labeled and kept in locked and secure places to protect them from theft, damage or use by unauthorised persons.
- C - Special procedures shall be established for control of the storage facilities keys.
- D - Clearly label "Radioactive Materials" both in Arabic and English on each store containing radioactive materials as per instructions of the Ministry.
- E - The dose rate outside the storage facility shall not exceed $2.5 \mu\text{Sv/h}$.

Regular measurement of dose rates should be conducted on the boundaries of storage location and results of measurement shall be recorded. The dose figures shall

be compiled and recorded for a trial period at the beginning of any period of work. All sealed source storage facilities shall be regularly wipe-tested and the results to be communicated to the Ministry.

Article (24) : The sealed sources shall be returned to the manufacturer for disposal. While solid radioactive waste shall be stored until their radiation levels become low to the extent that they are considered inactive. In all cases, the Ministry shall be notified thereof.

Before storing any liquid radioactive material it should be transformed to solid or absorbed in accordance with the conditions set by the Ministry.

Article (25) : Liquid radioactive waste shall be disposed of in drain in accordance with the Ministry's regulatory conditions.

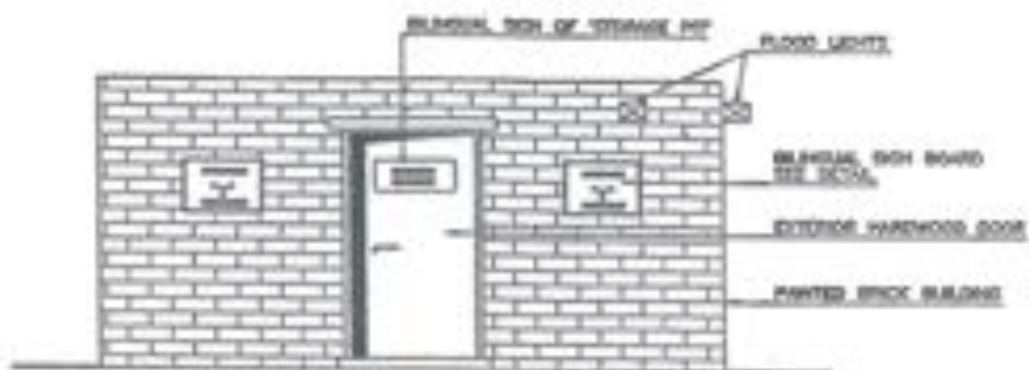
Article (26) : Importation of radioactive waste for final disposal in the Sultanate of Oman is absolutely prohibited.

Article (27) : The Ministry shall issue the technical guidelines for control and management of radioactive materials.

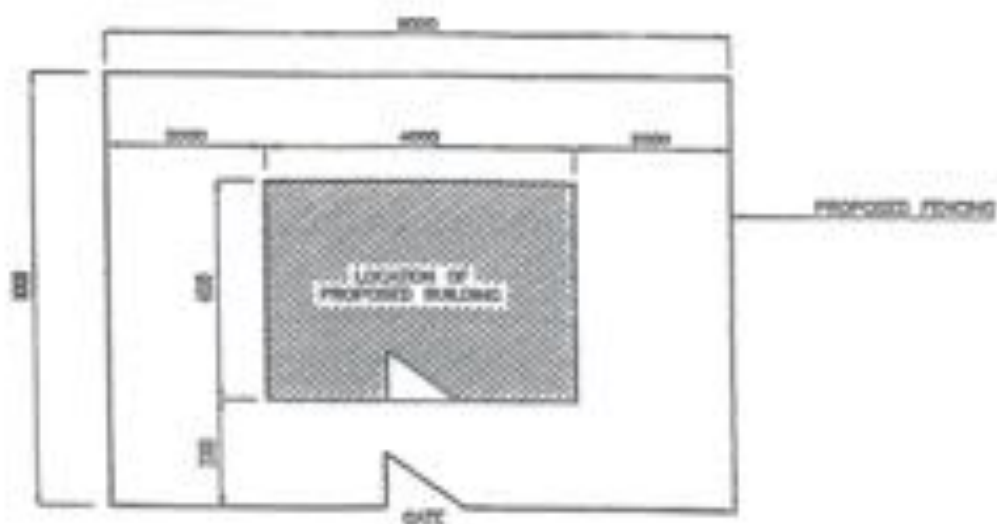
Article (28) : Without prejudice to the penalties stipulated in the mentioned Law for Conservation of Environment and prevention of Pollution, anyone violating the provisions of this regulations shall be subject to a fine not exceeding R.O. 3000. In the event of repeating the same violation or a serious risk to the public health or environmental damage, the Ministry may close down the establishment until the rectification of the causes of violation provided that the closure should not exceed one month and this may be extended to another period in the event of continuous violation.

DESIGN FOR THE RADIOACTIVE MATERIALS STORAGE FACILITY

A) EXTERNAL STRUCTURE

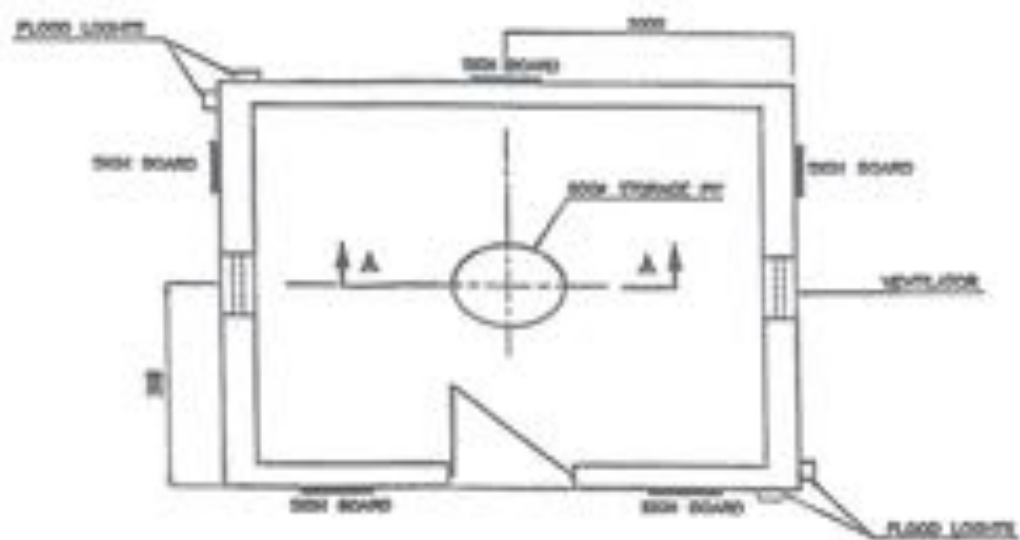


ELEVATION
SCALE 1/200

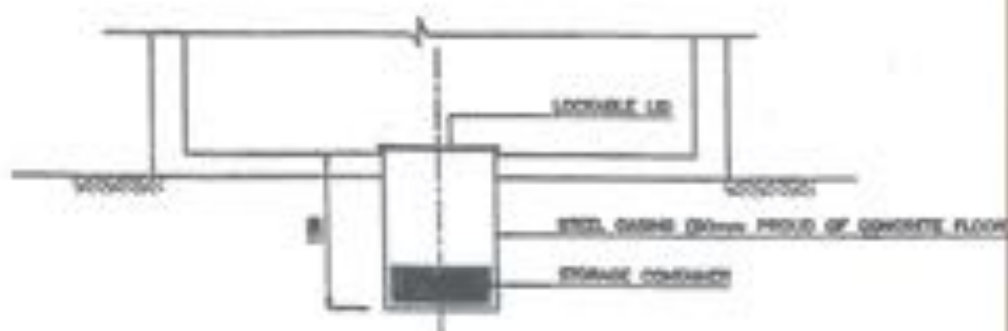


SETTING OUT PLAN
SCALE 1/200

B) STORAGE PIT

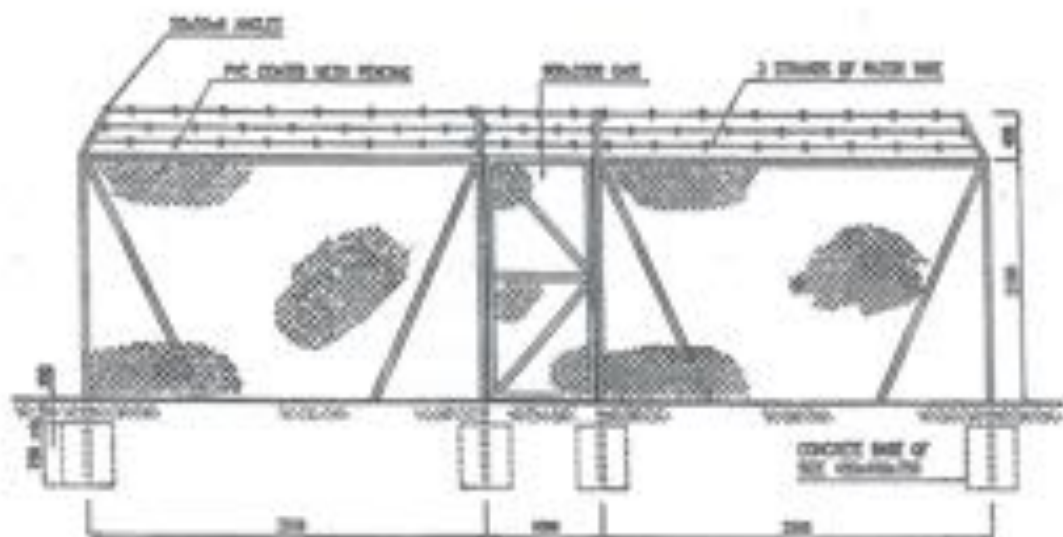


PLAN OF STORAGE PIT
SCALE 1:50



SECTION AA
SCALE 1:50

C) FENCING AND LABELING



ELEVATION OF FENCE AND GATE
SCALE 1:20



MD (21/99) Amended by MD (81/2002)
Relating to the fees structure of
Import, Transport, Storage and use of
Radioactive Materials Approvals

Type of Approval	Fees for Industrial & Commercial Applications (Omani Rial)	Fees for Medical Applications (Omani Rial)
Import and Transport of Radioactive Materials	100	50
Use and Storage of Radioactive Materials	100	15
All	200	65