

# GEOLOGICAL REPOSITORIES



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International Atomic Energy Agency

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## INTERNATIONAL ATOMIC ENERGY AGENCY DEPARTMENT OF SAFEGUARDS

# DESIGN INFORMATION QUESTIONNAIRE \*

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The purpose of this document is to obtain the facility design information required by the Agency in order to discharge its safeguards responsibilities. It will also serve as a checklist for examination of design information by Agency inspector(s). If, in any area, insufficient space is available add further sheets to the extent necessary.

IAEA USE ONLY	
<b>COUNTRY</b>	
<b>COUNTRY OFFICER</b>	
<b>TYPE</b>	<b>Geological Repositories</b>
<b>DATE OF INITIAL DATA</b>	
<b>VERIFICATION</b>	
<b>LAST REVIEW AND UPDATING</b>	

## ALL FACILITIES

### GENERAL INFORMATION

<b>1. Name of the facility</b> (include usual abbreviation)			
<b>2. Location and postal address</b>			
<b>3. Owner</b> (Legally responsible)			
<b>4. Operator</b> (Legally responsible)			
<b>5. Description</b> (Main features only)			
<b>6. Purpose</b>			
<b>7. Status</b> (e.g., planned; under construction, in operation; shut down; closed down; decommissioned)			
<b>8. Construction schedule dates</b> (if not in operation)	<b>Start of Construction (MM/DD/YYYY)</b>	<b>Commissioning (MM/DD/YYYY)</b>	<b>Operation (MM/DD/YYYY)</b>
<b>9. Normal operating mode</b> (days only, two shift, three shift; number of days/annum, etc.)			
<b>10. Facility layout</b> (structural containment, fences, access, nuclear material storage areas, laboratories, waste disposal areas, routes followed by nuclear material, experimental and test areas, etc.)	DRAWING(S) ATTACHED UNDER REF. NOS.		
<b>11. Sitting of facility</b> (Maps showing in sufficient detail: location, premises and perimeter of facility, other buildings, roads, railways, rivers, etc.)	DRAWING(S) AND/OR MAPS ATTACHED UNDER REF. NOS.		
<b>12. Names and/or titles and address of responsible officers</b> (for nuclear material accountancy and control and contact with the Agency. If possible attach organization charts showing position of officers)			



### OVERALL PROCESS PARAMETERS

<b>13. Facility description</b> (indicating important items of equipment which use, produce or process nuclear material)	GENERAL LAYOUT(S) ATTACHED UNDER REF. NOS.)  
i) Information on the host geology of the geological repository (including geological stratification; geochemistry; geophysics; identification of radionuclides found in the repository environment; and evidence and conclusions on the integrity of the host rock)	
ii) Description of restricted zone and other controlled areas established around the repository	
iii) Geological repository characterization activities (e.g., subsurface excavations and exploratory activities)	
iv) Information on the design of the geological repository underground area, (including layout, isolation doors, measures to strengthen or stabilize walls and ceilings of excavations; and shaft and vent size and features)	
v) Information on design of the surface areas (including receipt, storage, and preparation of canisters for disposal)	
vi) Information on accesses to the underground area for personnel and materials; on provision of utilities and on areas for receipt and storage of disposal canisters	
vii) Hoist and transport vehicle capacity (e.g., maximum weight loads)	
viii) Information on the presence of nearby mines and other nearby excavation activities (including identification of structures that might conceal an entrance to excavations)	
ix) Other safeguards-relevant information	
<b>14. Process description</b> (including above ground and underground facility operations; canister preparation process; canister storage; ramp, tunnel, and shaft excavation; rock removal and storage; canister, materials, and back fill transport; backfilling and tunnel closure; and nominal schedule of excavation, receipts, transfers to underground, emplacement and backfilling)	

### GENERAL FACILITY DATA

**15. Design capacity**  
(As number of disposal canisters and quantity of nuclear material)

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**16. Anticipated annual disposals**  
(in the form of a projected programme, and including disposal of other radioactive materials other than spent fuel, if applicable)

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**17. Other important items of equipment**

i) Monitoring system for excavation activities (including types, locations, and depths of sensors)

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ii) Other monitoring systems (including safety monitoring)

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iii) Other equipment (including testing and experimental equipment)

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### NUCLEAR MATERIAL DESCRIPTION AND FLOW

**18. Main material description**

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i) Types of nuclear material, including other nuclear, and other radioactive, material in the facility besides spent fuel (type, form, quantity, and location)

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ii) Types of accountability units to be handled in the facility

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iii) Appearance, means of identification, and overall dimensions of accountability units (e.g., disposal canisters and other containers)

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iv) Number of fuel assemblies or other radioactive material per disposal canister or other container

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v) Number of disposal canisters or other containers per transport container

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vi) Range of weight of nuclear material per disposal canister or other container

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**NUCLEAR MATERIAL DESCRIPTION AND FLOW**

vii) Frequency of receipt of accountability units (e.g., batches or units per month)	
viii) Frequency of receipt of accountability units (e.g., batches or units per month)	
ix) Range of radiation levels and temperatures at surface of containers	
<b>19. Schematic flowsheet for nuclear material</b> (identifying measurement points, accountability areas, inventory locations, etc.)	DRAWING(S) ATTACHED UNDER REF. NOs.  
<b>20. Design range of inventories of nuclear material in each storage area</b>	

**FACILITY OPERATION AND HANDLING OF NUCLEAR MATERIAL**

<b>21. Transport and disposal container description</b> (including size, design, material of construction, special identifying features, internal basket design, capacity, closure, etc.)	DRAWING(S) ATTACHED UNDER REF. NOs.  
<b>22. Shielding</b> (for storage and transfer)	DRAWING(S) ATTACHED UNDER REF. NOs.  
<b>23. Methods and means of transfer of nuclear material</b> (include description of equipment used for transport and emplacement of disposal canisters)	DRAWING(S) ATTACHED UNDER REF. NOs.  
<b>24. Transportation routes followed by nuclear material</b> (with reference to plant layout)	DRAWING(S) ATTACHED UNDER REF. NOs.  
<b>25. Description of each nuclear material storage area</b> (with reference to plant layout)	DRAWING(S) ATTACHED UNDER REF. NOs.  
<b>26. Method of positioning of nuclear material in storage area</b> (with reference to plant layout)	DRAWING(S) ATTACHED UNDER REF. NOs.  
<b>27. Method of nuclear material Emplacement</b> (Describe unloading and/or emplacement procedures)	
<b>28. Description of each nuclear material Emplacement area</b> (Including number of disposal locations)	



**MAINTENANCE**

**29. Above ground and underground maintenance activities**

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**PROTECTION AND SAFETY MEASURES**

**30. Basic measures for physical protection of nuclear material**

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**31. Specific health and safety rules for inspector compliance**

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**NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL**

**32. System description**

SPECIMEN FORMS USED IN ALL PROCEDURES ATTACHED UNDER REF. No.

i. General  
(give a description of the nuclear material accountancy system, the method of recording and reporting accountancy data and establishing material balances. This section should also state what general and subsidiary ledgers will be used, their form as well as who has the responsibility and authority. Source data should be identified. The procedures for making adjustments should be covered.)

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ii) Physical inventory  
(description of procedures, frequency, estimated distribution of nuclear material, methods of operator's inventory taking, and accessibility of and possible verification method for irradiated nuclear material)

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iii) Receipts

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iv) Transfers between MBAs

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v) Shipments  
(describe provisions for removal and shipment of disposal canisters and nuclear waste, if applicable)

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vi) Operational records and accounting records  
(including logbooks, general ledgers, internal transfer forms, method of adjustment or correction, language, control measures and responsibility, retention location for records, and means of long-term preservation of records)

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**33. Features related to monitoring, containment and surveillance measures**

(general description of applied or possible measures in reference to facility plan)

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**NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL**

**34. For each flow and inventory measurement point of accountability areas, identified in particular under Qs. 13,19, and 23 Give the following:**

For each measurement point fill in separate sheet.  
Number of measurement points: 1

i) Description of location, type and identification

SEPARATE SHEET(S) CAN BE ATTACHED FOR EACH MEASUREMENT POINT. IF NECESSARY, ATTACH DRAWING(S)

ii) Expected types of inventory at this measurement point

iii) Possibilities to use this measurement point for physical inventory taking

iv) Means of batch identification

v) Features related to containment-surveillance measures

vi) Description of nuclear material containers used

vii) Measurement method(s) and equipment used

viii) Source and level of random and systematic errors (weight, NDA)

ix) Technique and frequency of calibration of equipment used

x) Program for statistical evaluation of data from (viii) and (ix)

xi) Anticipated number of inventory batches

xii) Anticipated number of items per flow and inventory batch

**OPTIONAL INFORMATION**

**35. Optional information**  
(that the operator considers relevant to safeguarding the facility)

**Signature of Responsible Officer**

**Date (MM/DD/YYYY)**