

# CRITICAL (SUB-CRITICAL) FACILITIES



**IAEA**  
International Atomic Energy Agency

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## INTERNATIONAL ATOMIC ENERGY AGENCY DEPARTMENT OF SAFEGUARDS

# DESIGN INFORMATION QUESTIONNAIRE \*

IAEA USE ONLY

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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	
COUNTRY	
COUNTRY OFFICER	
TYPE	Critical (sub-critical) facilities
DATE OF INITIAL DATA	
VERIFICATION	
LAST REVIEW AND UPDATING	

## 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)			



**GENERAL STORAGE DATA**

**13. Number of critical assemblies in the facility and their location**

DIAGRAM(S) ATTACHED UNDER REF. NOS.)

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**14. Expected maximum operating power**

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**15. (1) Moderator  
(2) Reflector  
(3) Blanket  
(4) Coolant  
(5) Important items of equipment which use, produce or process nuclear material**

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**NUCLEAR MATERIAL DESCRIPTION**

**16. Main types of nuclear material/fuel and nominal weight of nuclear material in the facility**

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**17. Fuel enrichment range and Pu content**

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**18. Description of fuel elements**  
(For each type)

- physical and chemical form of fuel;
- geometrical form or type;
- dimensions;
- number of slugs per element;
- nuclear material and fissionable material and its quantity (with design tolerance);
- composition of alloy, etc.

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**19. Cladding Material**

- thickness;
- composition of material;
- bonding

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**20. Sub-assemblies of fuel**  
(number of fuel elements per nuclear assembly, arrangement of fuel elements in sub-assembly, configuration and nominal weight of nuclear material per sub-assembly [with design tolerance])

DRAWING(S) ATTACHED UNDER REF. NOS.

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**21. Basic operational accounting unit** (fuel elements/assemblies, etc.)

DRAWING(S) ATTACHED UNDER REF. NOS.

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**22. Other types of units**

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**23. Means of nuclear material/fuel identification**

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## NUCLEAR MATERIAL DESCRIPTION

<b>24. Other nuclear material in the facility</b> (each separately identified)	
<b>25. Core diagram</b> (for each critical assembly showing the general disposition, core support structure, shielding and heat removal arrangements, channels for fuel elements or sub-assemblies, control rods, moderator, reflector, beam tubes, dimensions, etc.)	DRAWING(S) ATTACHED UNDER REF. NOS. <div style="border: 1px solid black; height: 80px; margin-top: 5px;"></div>
<b>26. Ranges of critical mass and maximum radius</b>	
<b>27. Description of most common configurations</b>	DRAWING(S) ATTACHED UNDER REF. NOS. <div style="border: 1px solid black; height: 60px; margin-top: 5px;"></div>
<b>28. Average mean neutron flux in the core</b>  Thermal: Fast:	
<b>29. Instrumentation for measuring neutron and gamma flux:</b>  <ul style="list-style-type: none"> <li>• accuracy and type of principal instruments</li> <li>• location of indicator and recorder</li> </ul>	
<b>30. Radiation level outside/inside shielding at specified places</b>	RADIATION LEVEL DIAGRAM(S) ATTACHED UNDER REF. NOS. <div style="border: 1px solid black; height: 40px; margin-top: 5px;"></div>
<b>31. Maximum radiation activity of fuel after refueling</b> (at the surface and at a distance of 1 metre)	
<b>32. Schematic flowsheet for nuclear material</b> (identification of: <ul style="list-style-type: none"> <li>• measurement points;</li> <li>• accountability areas;</li> <li>• inventory location, etc</li> </ul> for operator purposes)	FLOWSHEET(S) FOR NORMAL OPERATION ATTACHED UNDER REF. NOS. <div style="border: 1px solid black; height: 80px; margin-top: 5px;"></div>
<b>33. Inventory</b> State quantity range and approximate uranium enrichment and plutonium content for:  i) Nuclear material storage(s)	



## NUCLEAR MATERIAL DESCRIPTION

ii) Core area(s)

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iii) Assembly core(s) itself

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iv) Other locations

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### 34. Nuclear material

i) Packaging (description)

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ii) Storage plan and arrangements

DRAWING(S) ATTACHED UNDER REF. NOS.

iii) Capacity of storage

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iv) Nuclear material preparation  
(description and identification of layout  
and general arrangement)

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### 35. Fuel transfer equipment, if any

DRAWING(S) ATTACHED UNDER REF. NOS.

### 36. Routes followed by the nuclear material

DRAWING(S) ATTACHED UNDER REF. NOS.

### 37. Main equipment used for

i) Nuclear material assembling

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ii) Nuclear material testing

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iii) Nuclear material measuring

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## PROTECTION AND SAFETY MEASURES

### 38. Basic measures for physical protection of nuclear material

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### 39. Specific health and safety rules for inspector compliance (If extensive, attach separately)

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**NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL**

**40. System description**

give description of:  
• the nuclear material accountancy system;  
• the method of recording and reporting accountancy data;  
• the procedures for account adjustment after inventory and correction of mistakes, etc.

under the following headings:

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

[Empty box for specimen forms]

i) General

[Empty box for General]

ii) Receipts

[Empty box for Receipts]

iii) Shipments

[Empty box for Shipments]

iv) Physical inventory  
Description of procedures, scheduled frequency, methods of operator's inventory taking (both for item and/or bulk accountancy), including relevant assay methods and expected accuracy, access to nuclear material, methods of verification of nuclear material in the core

LIST OF MAJOR ITEMS OF EQUIPMENT REGARDED AS NUCLEAR MATERIAL CONTAINERS ATTACHED UNDER REF. NOs.

[Empty box for equipment list]

v) Operational records and accounting records  
(including method of adjustment or correction and place of preservation and language)

[Empty box for operational records]

**41. How often is core disassembled to permit the verification of contained nuclear material**

[Empty box for core disassembly frequency]

**42. Features related to containment and surveillance measures**  
(general description of applied or possible measures)

[Empty box for containment and surveillance measures]

**43. For each measurement point of accountability areas identified under Qs. 32, Give the following:**

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

i) Description of location, type identification

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

[Empty box for measurement point details]



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## NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL

ii) Anticipated types of inventory change and possibilities to use this measurement point for physical inventory taking

iii) Physical and chemical form of nuclear material (with cladding materials description)

IF NECESSARY, ATTACH DRAWING(S)

iv) Nuclear material containers, packaging

v) Sampling procedure and equipment used

vi) Measurement method(s) and equipment used

vii) Source and level of random and systematic errors (measurements)

viii) Technique and frequency of calibration of equipment used

ix) Method of converting source data to batch data

x) Means of batch identification

xi) Anticipated batch flow rate per year

xii) Anticipated number of items per flow and inventory batch

xiii) Type, composition and quantity of nuclear material per batch (with indication of batch data, total weight of nuclear material in item, and the isotopic composition (for uranium), and Pu content, when appropriate; form of nuclear material)

xiv) Features related to containment-surveillance measures



### POST-OPERATION INFORMATION

<b>44. Decommissioning schedule dates</b>	<b>End of operations (MM/DD/YYYY)</b>	<b>Decommissioned (MM/DD/YYYY)</b>
	<input type="text"/>	<input type="text"/>
<b>45. Facility decommissioning plan</b>	PLAN(s) ATTACHED UNDER REF. NOS	
	<input type="text"/>	
i) Key events of the decommissioning plan	<input type="text"/>	
ii) Removal and recovery of nuclear material	<input type="text"/>	
iii) Removing or rendering inoperable of essential equipment	<input type="text"/>	

### OPTIONAL INFORMATION

<b>46. Optional information</b> (that the operator considers relevant to safeguarding the facility)	<input type="text"/>
<b>Signature of Responsible Officer</b>	<input type="text"/>
<b>Date (MM/DD/YYYY)</b>	<input type="text"/>