

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

1. Name of the facility (include usual abbreviation)			
2. Location and postal address			
3. Owner (Legally responsible)			
4. Operator (Legally responsible)			
5. Description (Main features only)			
6. Purpose			
7. Status (e.g., planned; under construction, in operation; shut down; closed down; decommissioned)			
8. Construction schedule dates (if not in operation)	Start of Construction (MM/DD/YYYY)	Commissioning (MM/DD/YYYY)	Operation (MM/DD/YYYY)
9. Normal operating mode (days only, two shift, three shift; number of days/annum, etc.)			
10. Facility layout (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.		
11. Sitting of facility (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.		
12. Names and/or titles and address of responsible officers (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.)

14. Expected maximum operating power

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

NUCLEAR MATERIAL DESCRIPTION

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

17. Fuel enrichment range and Pu content

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.

19. Cladding Material

- thickness;
- composition of material;
- bonding

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.

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

DRAWING(S) ATTACHED UNDER REF. NOs.

22. Other types of units

23. Means of nuclear material/fuel identification

NUCLEAR MATERIAL DESCRIPTION

24. Other nuclear material in the facility (each separately identified)

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25. Core diagram

(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.

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26. Ranges of critical mass and maximum radius

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27. Description of most common configurations

DRAWING(S) ATTACHED UNDER REF. NOs.

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28. Average mean neutron flux in the core

Thermal:
Fast:

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29. Instrumentation for measuring neutron and gamma flux:

- accuracy and type of principal instruments
- location of indicator and recorder

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30. Radiation level outside/inside shielding at specified places

RADIATION LEVEL DIAGRAM(S) ATTACHED UNDER REF. NOs.

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31. Maximum radiation activity of fuel after refueling
(at the surface and at a distance of 1 metre)

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32. Schematic flowsheet for nuclear material

- (identification of:
- measurement points;
 - accountability areas;
 - inventory location, etc

for operator purposes)

FLOWSHEET(S) FOR NORMAL OPERATION ATTACHED UNDER REF. NOs.

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33. Inventory

State quantity range and approximate uranium enrichment and plutonium content for:

i) Nuclear material storage(s)

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NUCLEAR MATERIAL DESCRIPTION

ii) Core area(s)	
iii) Assembly core(s) itself	
iv) Other locations	
34. Nuclear material	
i) Packaging (description)	
ii) Storage plan and arrangements	DRAWING(S) ATTACHED UNDER REF. NOs. <div></div>
iii) Capacity of storage	<div></div>
iv) Nuclear material preparation (description and identification of layout and general arrangement)	<div></div>
35. Fuel transfer equipment, if any	DRAWING(S) ATTACHED UNDER REF. NOs. <div></div>
36. Routes followed by the nuclear material	DRAWING(S) ATTACHED UNDER REF. NOs. <div></div>
37. Main equipment used for	
i) Nuclear material assembling	<div></div>
ii) Nuclear material testing	<div></div>
iii) Nuclear material measuring	<div></div>

PROTECTION AND SAFETY MEASURES

38. Basic measures for physical protection of nuclear material	<div></div>
39. Specific health and safety rules for inspector compliance (If extensive, attach separately)	<div></div>

NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL

<p>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.</p> <p>under the following headings:</p>	<p style="text-align: center;">SPECIMEN FORMS USED IN ALL PROCEDURES ATTACHED UNDER REF. No.</p> <div style="border: 1px solid black; height: 120px; margin-top: 10px;"></div>
<p>i) General</p>	<div style="border: 1px solid black; height: 30px; margin-top: 10px;"></div>
<p>ii) Receipts</p>	<div style="border: 1px solid black; height: 30px; margin-top: 10px;"></div>
<p>iii) Shipments</p>	<div style="border: 1px solid black; height: 30px; margin-top: 10px;"></div>
<p>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</p>	<p style="text-align: center;">LIST OF MAJOR ITEMS OF EQUIPMENT REGARDED AS NUCLEAR MATERIAL CONTAINERS ATTACHED UNDER REF. NOs.</p> <div style="border: 1px solid black; height: 90px; margin-top: 10px;"></div>
<p>v) Operational records and accounting records (including method of adjustment or correction and place of preservation and language)</p>	<div style="border: 1px solid black; height: 70px; margin-top: 10px;"></div>
<p>41. How often is core disassembled to permit the verification of contained nuclear material</p>	<div style="border: 1px solid black; height: 40px; margin-top: 10px;"></div>
<p>42. Features related to containment and surveillance measures (general description of applied or possible measures)</p>	<div style="border: 1px solid black; height: 40px; margin-top: 10px;"></div>
<p>43. For each measurement point of accountability areas identified under Qs. 32, Give the following:</p> <p>For each measurement point fill in separate sheet. Number of measurement points: 1</p> <p>i) Description of location, type identification</p>	<p>SEPARATE SHEET(S) CAN BE ATTACHED FOR EACH MEASUREMENT POINT IF NECESSARY, ATTACH DRAWING(S)</p> <div style="border: 1px solid black; height: 120px; margin-top: 10px;"></div>

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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

**44. Decommissioning
schedule dates**

End of operations (MM/DD/YYYY)

Decommissioned (MM/DD/YYYY)

**45. Facility decommissioning
plan**

PLAN(s) ATTACHED UNDER REF. NOS

i) Key events of the
decommissioning plan

ii) Removal and recovery of
nuclear material

iii) Removing or rendering inoperable
of essential equipment

OPTIONAL INFORMATION

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

Signature of Responsible Officer

Date (MM/DD/YYYY)