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**INTERNATIONAL ATOMIC ENERGY AGENCY**
**DEPARTMENT OF SAFEGUARDS AND INSPECTION**

# DESIGN INFORMATION QUESTIONNAIRE *

**(CONTINUED)**

The "Confidential" marking on this form is for IAEA purposes only. It indicates that the IAEA considers the information in the completed form to be 'safeguards confidential' and is not to be confused with any U.S. security classification.

* Questions which are not applicable may be left unanswered.

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## REPROCESSING PLANTS

### OVERALL PROCESS PARAMETERS

| | |
|---|---|
| 13. FACILITY DESCRIPTION (indicating all process modification stages, storage areas and feed, product and waste points as pertaining to the measurement control and accountancy of nuclear material) | GENERAL FLOW DIAGRAM(S) ATTACHED UNDER REF. NOS. (The diagram(s) should also indicate equipment, hoods, cells, and those areas which contain nuclear material, as well as those specific areas where hold-up of nuclear material can occur) |
| 14. PROCESS DESCRIPTION (Also indicating the modification of physical and chemical forms) | |

| OVERALL PROCESS PARAMETERS | |
|---|---|
| 15. DESIGN CAPACITY<br>(in weight of principle products per annum) | |
| 16. ANTICIPATED ANNUAL THROUGHPUT<br>(in the form of a forward programme (if applicable), indicating the proportion of various feeds and products) | |
| 17. OTHER IMPORTANT ITEMS OF EQUIPMENT USING, PRODUCING, OR PROCESSING NUCLEAR MATERIAL, IF ANY<br>(such as testing and experimental equipment) | |

# REPROCESSING PLANTS

DATE:

| NUCLEAR MATERIAL DESCRIPTION AND FLOW | | | |
|---|---|---|---|
| 18. MAIN MATERIAL DESCRIPTION | FEED | PRODUCT (1) | |
| i) Main Types of Accountability Units to Be Handled in the Facility | | | |
| ii) Chemical and Physical Form (for feed include types of fuel element/ assemblies, give detailed description indicating general structure and overall dimensions of fuel element/assemblies, including nuclear material content and enrichment) Attach drawing(s) | | | |
| iii) Throughput, Enrichment Ranges and Pu contents (for normal flow sheet operation indicating if blending and/or recycling takes place) | | | |
| iv) Batch Size/Flow Rate and Campaign Period, Means of Batch Identification | | | |

(1) For example, uranium and plutonium.

| NUCLEAR MATERIAL DESCRIPTION AND FLOW | | | |
|---|---|---|---|
| 18. MAIN MATERIAL DESCRIPTION (Continued) | FEED | PRODUCT (1) | |
| v) Storage and Plant Inventory (indicating any change with throughput) | | | |
| vi) Frequency of Receipt or Shipment (batches/units per month) | | | |
| 19. WASTE MATERIAL (including contaminated equipment, measured discards, and retained waste). Describe for each waste stream: i) Major Contributions (sources) | | | |
| ii) Type of Waste | | | |
| iii) Chemical and Physical Form (liquid, solid, etc.) | | | |
| iv) Estimated Enrichment Ranges, and Uranium/Plutonium Content | | | |

(1) For example, uranium and plutonium.

| NUCLEAR MATERIAL DESCRIPTION AND FLOW | |
|---|---|
| 19. WASTE MATERIAL (Continued)<br>v) Estimated Quantities Per Year, Period of Storing | |
| vi) Waste Generated Rates (as % of input/throughput, quantities per month) | |
| vii) Store Inventory Range and Maximum Capacity | |
| viii) Method and Frequency of Recovery/Disposal | |
| 20. WASTE TREATMENT SYSTEM | DIAGRAM(S) ATTACHED UNDER REFERENCE NUMBERS: |

| NUCLEAR MATERIAL DESCRIPTION AND FLOW | |
|---|---|
| 21. OTHER NUCLEAR MATERIAL IN THE FACILITY AND ITS LOCATION, IF ANY | DIAGRAM(S) ATTACHED UNDER REFERENCE NUMBERS: |
| 22. SCHEMATIC FLOW SHEET FOR NUCLEAR MATERIAL (identifying sampling points, flow and inventory measurement points, accountability areas, inventory locations, etc.) | DIAGRAM(S) ATTACHED UNDER REFERENCE NUMBERS: |

DATE:

| NUCLEAR MATERIAL DESCRIPTION AND FLOW | |
|---|---|
| 23. TYPES, FORM, RANGES OF ENRICHMENT, PU CONTENT, RANGES OF QUANTITIES OF NUCLEAR MATERIAL FLOW FOR EACH NUCLEAR MATERIAL HANDLING AREA, i.e.:<br><br>-- process area<br>-- storage area<br>-- other locations<br><br>(Also indicate maximum quantities of nuclear material to be handled in accountability areas at the one time.) | |
| 24. RECYCLE PROCESSES<br>(briefly describe any such processes giving source and form of material, method of storage, normal inventory, frequency of processing, duration of temporary storage, schedules for any external recycling, measurement method of fissile content of recycle material) | DIAGRAM(S) ATTACHED UNDER REFERENCE NUMBERS: |

| NUCLEAR MATERIAL DESCRIPTION AND FLOW | |
|---|---|
| 25. INVENTORY<br><br>i) In-Process<br>(within plant and equipment during normal operation; indicate quantity, range of enrichment, Pu content, form and principal locations and any significant change in time or throughput; also indicate anticipated residual hold-up and mechanism) | |
| ii) Feed and Product Storage | |
| iii) Other Locations<br>(quantity, range of enrichment, Pu content, form and location of inventory not already specified) | |

| NUCLEAR MATERIAL HANDLING (FOR EACH ACCOUNTABILITY AREA) | |
|---|---|
| 26. CONTAINERS, PACKAGING, AND STORAGE AREA DESCRIPTION | DRAWING(S) ATTACHED UNDER REFERENCE NUMBERS:<br><br>SEPARATE NOTE TO BE ATTACHED.<br>Describe for feeds, products, and wastes: the type and size of storage and shipping containers and packaging used, (including nominal capacity and capacity for normal operation, and type of material); method of storage or packing, filling and emptying procedures, shielding; and any special identification features. |

| NUCLEAR MATERIAL HANDLING (FOR EACH ACCOUNTABILITY AREA) | |
|---|---|
| 27. METHODS AND MEANS OF TRANSFER OF NUCLEAR MATERIAL (Describe also equipment used for handling of feed, product, and waste.) | |
| 28. TRANSPORTATION ROUTES FOLLOWED BY NUCLEAR MATERIAL (with reference to plant layout) | DRAWING(S) ATTACHED UNDER REFERENCE NUMBERS: |
| 30. SHIELDING (for storage and transfer) | |

| PLANT MAINTENANCE | |
|---|---|
| 30. MAINTENANCE, DECONTAMINATION, CLEAN-OUT | SEPARATE NOTE TO BE ATTACHED<br><br>Describing plans and procedures for decontamination and clean-out of equipment containing nuclear material, defining all sampling and measurement points associated with:<br><br>i) Normal Plant Maintenance;<br><br>ii) Plant and Equipment Decontamination and Subsequent Nuclear Material Recovery;<br><br>iii) Plant and Equipment Clean-out Including Means of Ensuring Vessels Are Empty;<br><br>iv) Plant Start-up and Plant Shutdown (if difference from normal operations)<br><br>(In cases where clean-out and/or sampling is not possible, indicate how the hold-up of nuclear material is measured or calculated.) |
| **PROTECTION AND SAFETY MEASURES** | |
| 31. BASIC MEASURES FOR PHYSICAL PROTECTION OF NUCLEAR MATERIAL | |

DATE:

| PROTECTION AND SAFETY MEASURES | |
|---|---|
| 32. SPECIFIC HEALTH AND SAFETY RULES FOR INSPECTOR COMPLIANCE (if extensive, attach separately) | |

| NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL | |
|---|---|
| 33. SYSTEM DESCRIPTION<br>Give a description of the nuclear material accountancy system, the method of recording and reporting accountancy data and establishing material balances, frequency of material balances, procedures for account adjustment after plant inventory, mistakes, etc., under the following headings:<br><br>i) General<br><br>(This section should also state what general and subsidiary ledgers will be used, their form (hard copies, tapes, microfilms, etc.), as well as who has the responsibility and authority. Source data (e.g., shipping and receiving forms, the initial recording of measurements and measurement control sheets). The procedures for making adjustments; the source data and records should be covered as well as how the adjustments are authorized and substantiated). | SPECIMEN FORMS USED IN ALL PROCEDURES ATTACHED UNDER REFERENCE NUMBERS: |

## NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL

33. SYSTEM DESCRIPTION (Continued)

i) General (continued)

## NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL

33. SYSTEM DESCRIPTION (Continued)

ii) Receipts
(including method of dealing with shipper/ receiver differences and subsequent account corrections, the checks and measurements used to confirm nuclear material content and the persons responsible for those determinations should be defined)

iii) Shipments
(products, waste, measured discards)

## NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL

| | |
|---|---|
| 33. SYSTEM DESCRIPTION (Continued)<br><br>iv) Physical Inventory<br>Description of procedures, scheduled frequency, estimated distribution of nuclear material, methods of operator's inventory taking (both for item and/or bulk accountancy, including relevant assay method), accessability and possible verification method for irradiated nuclear material, expected accuracy, and access to nuclear material.<br>(In particular, the description of procedures should also provide the basic inventory approach to be used, i.e., planning, organizing, and conducting the inventory, pre-listing, use of prior measurement data; who has primary responsibility for the inventory; how process clean-out is accomplished; the accountancy of process residual hold-up.) | LIST OF MAJOR ITEMS OF EQUIPMENT REGARDED AS NUCLEAR MATERIAL CONTAINERS ATTACHED UNDER REFERENCE NUMBERS: |
| v) Measured Discards.<br>(Methods of estimation of quantities per year/month, method of disposal. | |

## NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL

33. SYSTEM DESCRIPTION (Continued)

vi) Retained Waste
(Method of estimation of quantities per year, method and envisaged period of storage; indicate also possible subsequent uses of retained waste)

vii) Unmeasured Losses
(Indicate the methods used to estimate unmeasured losses)

| NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL | |
|---|---|
| 33. SYSTEM DESCRIPTION (Continued)<br><br>viii) Operation Records and Accounts (Including log books, general ledgers, internal transfer forms, method of adjustment or correction and retention location, and languages; control measures and responsibility for records) | |
| 34. FEATURES RELATED TO CONTAINMENT AND SURVEILLANCE MEASURES (General description of applied or possible measures) | |

DATE:

| NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL | |
|---|---|
| 35. FOR EACH FLOW AND INVENTORY MEASUREMENT POINT, AND SAMPLING POINTS OF ACCOUNTABILITY AREAS, IDENTIFIED IN PARTICULAR UNDER QS. 13, 22, 23, GIVE THE FOLLOWING*<br><br>i) Description of Location, Type, Identification | IF NECESSARY, ATTACH DRAWING(S) |
| ii) Type of Inventory Change Expected at This Measurement Point | |
| iii) Possibilities to Use This Measurement Point for Physical Inventory Taking | |
| iv) Physical and Chemical Form of Nuclear Material (including enrichment range, Pu content, and cladding materials description) | |

* For each measurement point, fill in separate sheet.

| NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL | |
|---|---|
| 35. FOR EACH FLOW AND INVENTORY MEASUREMENT POINT, AND SAMPLING POINTS OF ACCOUNTABILITY AREAS, IDENTIFIED IN PARTICULAR UNDER QS. 13, 22, 23, GIVE THE FOLLOWING* (Continued)<br><br>v) Nuclear Material Containers, Packaging, and Method of Storage | |
| vi) Sampling Procedure and Equipment Used<br>(including number of samples taken, frequency and rejection criteria) | |
| vii) Measurement/Analytical Method(s) and Equipment Used and Corresponding Accuracies | |

* For each measurement point, fill in separate sheet.

DATE:

| NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL | |
|---|---|
| 35. FOR EACH FLOW AND INVENTORY MEASUREMENT POINT, AND SAMPLING POINTS OF ACCOUNTABILITY AREAS, IDENTIFIED IN PARTICULAR UNDER QS. 13, 22, 23, GIVE THE FOLLOWING* (Continued)<br><br>viii) Source and Level of Random and Systematic Errors for Feed, Products, Waste (weight, volume, sampling, analytical) | |
| ix) Calculative and Error Propagation Techniques | |
| x) Technique and Frequency of Calibration of Equipment Used, and Standards Used | |

* For each measurement point, fill in separate sheet.

| NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL | |
|---|---|
| 35. FOR EACH FLOW AND INVENTORY MEASUREMENT POINT, AND SAMPLING POINTS OF ACCOUNTABILITY AREAS, IDENTIFIED IN PARTICULAR UNDER QS. 13, 22, 23, GIVE THE FOLLOWING* (Continued)<br><br>xi) Programme for the Continuing Appraisal of the Accuracy of Weight, Volume, Sampling and Analytical Techniques and Measurement Methods | |
| xii) Programme for Statistical Evaluation of Data from (x) to (xi) | |
| xiii) Method of Converting Source Data to Batch Data<br>(standard calculative procedures, constants and empirical relationships for feed, products in sub-accounting areas, and waste) | |

* For each measurement point, fill in separate sheet.

DATE:

| NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL | |
|---|---|
| 35. FOR EACH FLOW AND INVENTORY MEASUREMENT POINT, AND SAMPLING POINTS OF ACCOUNTABILITY AREAS, IDENTIFIED IN PARTICULAR UNDER QS. 13, 22, 23, GIVE THE FOLLOWING* (Continued)<br><br>xiv) Means of Batch Identification | |
| xv) Anticipated Batch Flow Rate Per Year | |
| xvi) Anticipated Number of Inventory Batches Present at Measurement Point | |
| xvii) Anticipated Number of Items Per Flow and Inventory Batches | |

* For each measurement point, fill in separate sheet.

| NUCLEAR MATERIAL ACCOUNTANCY AND CONTROL | |
|---|---|
| 35. FOR EACH FLOW AND INVENTORY MEASUREMENT POINT, AND SAMPLING POINTS OF ACCOUNTABILITY AREAS, IDENTIFIED IN PARTICULAR UNDER QS. 13, 22, 23, GIVE THE FOLLOWING* (Continued)<br><br>xviii) Type, Composition and Quantity of Nuclear Material Per Batch (with indication of batch data, total weight of each element of nuclear material and form of nuclear material) | |
| xix) Features Related to Containment-Surveillance Measures | |
| 36. OVERALL LIMIT OF ERROR<br><br>Describe procedures to combine individual measurement error measurements to obtain the overall limit of error for:<br><br>i) S/R Differences<br><br>ii) Book Inventory<br><br>iii) Physical Inventory<br><br>iv) MUF | |

* For each measurement point, fill in separate sheet.

DATE:

| OPTIONAL INFORMATION | |
|---|---|
| 37. OPTIONAL INFORMATION (that the operator considers relevant to safeguarding the facility) | |

Signature of Responsible Officer:

Date: