# APPLICATION FOR PACKAGE DESIGN APPROVAL FOR TRANSPORT OF RADIOACTIVE MATERIAL

(This form shall be duly filled in by the designer / consignor who proposes to deploy the packaging for transport of radioactive materials and submitted to the Atomic Energy Regulatory Board. It should be ensured that the necessary submissions such as **the Safety Analysis Report (SAR)** and a cut-away sketch of 21 cm x 30 cm showing make-up of the packaging are attached along with the application. The SAR shall contain details of analyses / tests to demonstrate compliance with the regulatory design requirements. No para should be left blank. If not applicable, write NA. Words and expressions used in this form shall have the same meaning assigned to them in the Atomic Energy Regulatory Board Safety Code on Transport)

**Part 1: General Information**

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|---|---|---|---|
| 1.1 | Name, address, telephone and fax number; and e-mail ID of the Applicant | : | |
| 1.2 | Type of design approval required | : | |
| 1.3 | Design approval required | : | First approval/Renewal |

**Part 2: Details of Radioactive Contents**

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| 2.1 | Identity of radioactive material and its maximum strength in TBq | : | |
| 2.2 | Whether it is a mixture of radionuclides, if yes the fraction of activity concentration of each radionuclide | : | |
| 2.3 | Physical form | : | |
| 2.4 | Chemical form | : | |
| 2.5 | Special Form | : | Yes / No |
| 2.6 | If Yes, Certification Details,( if obtained already, attach copy of Certificate and Special Form Test Reports) | : | |
| 2.7 | Mass and volume of Contents | : | |
| 2.8 | Mass and volume of fissile material. (if applicable) | : | |
| 2.9 | Fissile material composition with percent enrichment (if applicable) | : | |
| 2.10 | Any other dangerous property | : | |

**Part 3: Packaging Details**

| | | | |
|---|---|---|---|
| 3.1 | Packaging model name | : | |
| 3.2 | Whether approved earlier | : | Yes / No |
| 3.3 | Competent authority identification mark if previously allocated. | : | |
| 3.4 | Date of expiry of the Certificate issued by the competent authority, if applicable. | : | |
| 3.5 | The gross mass of the package | : | |
| 3.6 | External dimension of the packaging (Relevant detailed drawings of the containment system and also tie-down should be attached.) | : | |
| 3.7 | Whether there is any protruding feature on the external surface of the packaging. | : | Yes / No |
| 3.8 | Whether behaviour of radioactive material under varying conditions of temperature and pressure have been taken into account | : | Yes / No |
| 3.9 | Whether the packaging is provided with facilities for enabling safe handling | : | Yes / No |
| 3.10 | Whether the materials of the packaging and components of structures are physically and chemically compatible with each other and with the package contents, taking into account their behaviour under irradiation | : | Yes / No |
| 3.11 | Whether the packaging material can withstand temperature range of –40$^{o}$ C to +70$^{o}$ C | : | Yes / No |
| 3.12 | Whether a cut-away sketch of dimensions 21 cm x 30 cm has been provided showing make-up of the package | : | Yes / No |
| 3.13 | Whether specifications of packaging construction materials have been attached | : | Yes / No |
| 3.14 | Whether the outer layer of the packaging is designed to prevent the collection and retention of water | : | Yes / No |
| 3.15. | Whether the external surface of the packaging is so designed as to facilitate easy and swift decontamination | : | Yes / No |
| 3.16 | In case lifting attachments are included in the design of the packaging, whether such attachments are capable of supporting the weight of the packaging without imposing stresses on the structure of the package, in excess of the yield | : | Yes / No / Not applicable |

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| | stresses of the relevant parts of the said structure (snatch lifting taken into consideration) | | |
| 3.17 | Whether the lifting attachments on the outer surface of the packaging, which are to be used to lift the package, are removable during transport | : | Yes / No / Not applicable |
| 3.18 | Whether any other features on the outer surface of the cask which are not designed for lifting are inoperable for lifting during transport | : | Yes / No / Not applicable |
| 3.19 | Whether the tie down attachments on the package are so designed that under both normal and accident conditions of transport, the forces in these attachments will not impair the ability of the package to meet the requirements of the regulations. | : | Yes / No / Not applicable |
| 3.20 | Whether neutron absorbers have been provided, where applicable, if fissile material is transported | : | Yes / No / Not applicable |
| 3.21a | Specification/code followed for Quality Assurance Programme in manufacture of packaging, | : | |
| 3.21b | Whether maintenance programme for packaging is prepared | | Yes/No |
| 3.22 | Whether a feature such as seal is incorporated on the exterior of the package as proof against tamper. | : | Yes / No |
| 3.23 | Mode of Transport | : | Road / Rail / Air / Water / |

**Part 4: Containment System**

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| 4.1 | Whether the containment system has adequate leak-tightness | : | Yes / No |
| 4.2 | Whether the material of the containment system is likely to be degraded by the contents? | : | Yes / No |
| 4.3 | Whether the containment system is capable of retaining its radioactive contents under the reduction of ambient pressure to 60 kPa | : | Yes / No |
| 4.4 | Whether pressure relief valves are provided in the packaging | : | Yes / No |
| 4.5 | Whether the radioactive contents could escape through valves other than pressure relief valves and, if yes, | : | Yes / No / Not applicable |

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| | Whether such valves are protected against unauthorised operation and provided with an enclosure to retain leakage | | Yes/No/Not applicable |
| 4.6 | Whether radiolytic decomposition of the liquids or other vulnerable materials and the generation of gas by chemical reaction and radiolysis have been taken into account in the construction of the containment system | : | Yes / No / Not applicable |
| 4.7 | Whether the fastening device of the enclosure is designed in such a way as to prevent unintentional opening and opening by a pressure which may arise within the package | : | Yes / No / Not applicable |
| 4.8 | In case the containment system forms a separate unit of the packaging, whether it is capable of being securely closed by a positive fastening device which is independent of any other part of the packaging | : | Yes / No / Not applicable |
| 4.9 | Whether the package meets the additional requirements for packages transported by air | : | Yes / No / Not applicable |

**Part 5: Radiation shielding in the packaging**

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|---|---|---|---|
| 5.1 | Shielding material and thickness | : | |
| 5.2 | Estimated maximum radiation level on external surface of the package for designed activity of the radioactive content | : | mSv/h |
| 5.3 | Estimated maximum radiation level at 1 m from the external surface of the package for designed activity of the radioactive content | : | mSv/h |
| 5.4 | Transport Index(TI) (estimated) | : | |

**Part 6: Package Analyses and Tests**

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| 6.1 | Whether the package will be able to withstand effects of any acceleration, vibration or vibration resonance which may arise under routine conditions of transport without any deterioration in the | : | Yes / No: |

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| | closing devices on the various receptacles or in the integrity of the package as a whole, e.g. nuts, bolts, and other securing devices becoming loose or being released unintentionally, even after repeated use. | | |
| 6.2 | Whether evaluation has been done to demonstrate design of the packaging under normal and accident conditions of transport as per the regulatory requirements | : | Yes / No |
| 6.3 | Maximum temperature at any accessible surface of package in presence / absence of insolation | : | |
| 6.4 | Maximum surface heat flux ($W/m^2$) | : | |
| 6.5 | The expected absolute maximum normal operating pressure(MNOP) of the containment system | : | |
| 6.6 | Whether details of actual tests on prototype / scale model have been provided | : | Yes / No / Not applicable |
| 6.7 | If calculation / analytical methods have been used for demonstrating compliance with test requirements, please state whether the analysis is based on computer codes validated by experiments | : | Yes / No / Not applicable |

**Part 7: Information required only for packages of fissile material**

| | | | |
|---|---|---|---|
| 7.1 | Whether at least two Water Barriers are found effective under Accident conditions | : | Yes / No/Not applicable |
| 7.2 | Maximum number of package that remain subcritical under normal conditions of transport | : | |
| 7.3 | Maximum number of packages that remain subcritical under accident conditions of transport specified for fissile material | : | |
| 7.4 | Criticality Safety Index(CSI) | : | |

**Part 8: Any other relevant information**