



NUKLEARNA ELEKTRARNA KRŠKO


TO.RZ-4/2016

TECHNICAL SPECIFICATION FOR
LOW RADIOACTIVE WASTE INCINERATION
2017

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Classification: AQ

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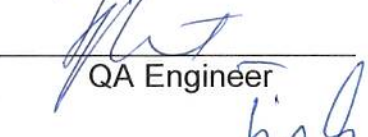
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1. Description and content activities

Bidder shall propose all crucial steps required for conducting activities of incineration of low-level radioactive waste (LLRW) packed in 350 standard 208 liter carbon steel drums. LLRW includes compacted waste (CW) which includes dry contaminated protective clothing, footwear and other protective gear, contaminated plastic, paper and textile waste and solid non-compressible waste (O) which includes wood.

2. Scope of the service

Main steps of incineration campaign are:

- 2.1. Transport of drums with LLRW to incineration site and drums with final product of incineration to NPP Krško (two-way transportation).
- 2.2. Incineration of CW and O.
- 2.3. Solidification of incineration products with concrete.
- 2.4. Gamma spectrometry analysis of drums with incineration products.
- 2.5. Alpha spectrometry of final incineration product.

3. Classification of the service

AQ (augmented quality).

4. Type of service

N/A

5. Applicable regulations, standards and procedures

- 5.1. Transport of the waste shall comply with European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) and International Atomic Energy Agency (IAEA) regulation. The permits are defined in 2006/117/EURATOM, and its application for authorization is defined in section A-1 and A-5.
- 5.2. The waste processing shall follow appropriate national regulation of bidder and/or European regulation.

- 5.3. Solidification of the ashes and dust shall comply with appropriate procedures, national bidder regulations and IAEA safety standards.
- 5.4. Solidified waste shall be properly characterized to enable defining all the physical and chemical characteristics of the waste form necessary for temporary and final storage.
- Radionuclide specific data.
 - Total activity (alpha and beta/gamma)
 - Dose rate of packages
 - Total net weight
 - Packaging description
- 5.5. Radiochemical laboratory shall follow well established quality assurance program. All calibration standards shall be traceable to primary standards and all analytical methods shall be under consistent quality control program.
- 5.6. In case if bidder will sign subcontract for conducting any activity from contract subsupplier/subcontractor shall satisfy all QA criteria given in this specification.

6. Identification equipment and devices

N/A

7. Technical requirements

The LLRW to be incinerated is segregated in accordance with waste stream and it is compacted to average density of approximately 0,4 kg/dm³. Activity concentrations of principal gamma emitters in waste in every drum are measured by gamma spectrometry and data of activity concentrations of all detected isotopes will be provided to contractor. Most abounded principle gamma emitters are Co-60 and Cs-137, and less abounded, but often measurable in waste, are Cr-51, Mn-54, Nb-95, Zr-95, Cs-134, Ag-110m, Sb-125, Co-57, Sb-124, Sn-113. Beside activity concentrations of principal gamma emitters, activity concentrations of isotopes of transuranic elements (TRU) will be provided (Pu-239+240, Pu-238, Am-241, Cm-243+244 and Cm-242). Activity concentrations of TRU are derived using scaling factors.

The activity concentration of each measured gamma emitters and activity concentrations of all derived TRU specified per drum will be provided to contractor. Total activity of shipment will be given as sum of activity concentrations of gamma emitters and alpha emitters separately. Average ratio of α to β -gamma emitters is 0,2 %.

- 7.1. It is expected that the overall volume reduction factor after incineration of both LLRW waste types will be not less than 14.
- 7.2. It is required from contractor to send a copy of certificate for solidifying material (concrete) that will be used.
- 7.3. The bidder shall provide references about technology of packaging of incineration products. Such references shall be nationally approved procedure or/and procedure that is already approved as waste packaging criteria of bidder national radioactive waste repository.
- 7.4. Incineration products shall be packed into 100 liters drums, and after solidification procedure inserted in 208 l standard drums. All drums need to satisfy internationally recognized criteria for radioactive material disposal.
- 7.5. NPP Krško 208 l standard carbon steel drums may be used as mold for solidification. Final packaging dimensions shall be precisely specified.
- 7.6. Bidder (or subcontractor) shall have developed methods for determination of gamma emitters in final packages and method(s) for TRU isotopes speciation. Methods should be accredited in accordance with ISO 17025 standard.

8. Qualification requirements

- 8.1. Bidder shall be licenced by his national authority for the incineration services.

9. The dynamics of work implementation

- 9.1. Bidder shall be prepared to accept and process complete LLRW waste in year 2017. The return date of solidified waste shall be indicated in the proposal. Exact schedule of all main activities defined in 1st paragraph of this specification shall be proposed.

10. Bidder's obligations

- 10.1. Final activity concentrations of each principle gamma emitter for every package shall be reported as average value obtained by 10 measurement of package.
- 10.2. Activity concentrations of transuranic nuclides listed 4th paragraph of this specification shall be obtained from analysis of two representative samples.
- 10.3. Bidder shall keep empty NPP Krško drums without any additional cost or it will arrange return shipment.

- 10.4. Any out sorted waste shall be packed in NPP Krško drums and returned together with incinerated waste.
- 10.5. Bidder shall ensure all necessary permits from his national authorities for waste return shipment.
- 10.6. Bidder shall provide controlled copy of approved QA Manual together with the proposal.

11. NPP KRŠKO obligations

- 11.1. NPP Krško will provide all available data about LLRW requested by bidder.
- 11.2. NPP Krško will accept incinerated and out sorted waste processed in accordance with this specification.
- 11.3. NPP Krško will ensure approval from the Slovenian Nuclear Safety Administration for LLRW transportation (section A-1, form 2006/117/EURATOM) and description of LLRW consignment description with appropriate packages list (section A-5, form 2006/117/EURATOM).

12. Special requirements

N/A

13. QA requirements

All activities shall be performed in accordance with suppliers QA program (see attachment 14.1). Bidder shall provide QA Manual with the proposal.

14. Attachments

- 14.1. QS- 610 – Generic Quality Assurance Program Requirements

15. Contact person in NPP Krško

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