

STATEMENT OF WORK

Recharge of Cobalt-60 Irradiator at the Naval Research Laboratory, Washington DC (NRL-DC)

Glossary

Assembled Source Rods or Source Rod Assembly – Structure consisting of Co rod doubly encapsulated in stainless steel tube with welded end caps

Source Can Assembly – Structure consisting of 10 assembled source rods in an annular ring with welded base and removable cap

Purpose: The purpose of this procurement is to recharge the Cobalt-60 irradiator at NRL-DC to approximately 20 kCi. The irradiator was last recharged in 1988, and its current activity level is approximately 1.8 kCi.

The Co source is located at NRL-DC at the bottom of a pool, approximately 5' x 5' x 12' deep. The pool has a welded stainless steel liner to provide additional integrity against water leakage. The present source consists of 10 Co rods 1 cm dia x approx. 5.25" long, each singly encapsulated in a stainless steel tube 0.382" dia x 0.025" wall with welded end caps. (All materials are stainless steel for the remainder of this document except as noted.) The dimensions of the assembled source rods are 0.382" dia x 7.25" long, including end caps. The assembled rods are arranged in an annular ring of 3.875" diameter and inserted into the source can assembly. This consists of a machined piece with ID 3.187" x OD 4.563" x 6.5" sealed with a welded base. This source-can assembly has the capability of being raised approx. 9" and being locked into place in order to place the source at the center of large spools of fiber cables for irradiation. The source-can assembly has a top secured with 3 bolts; after the bolts have been removed, which can be done in position under water, the individual assembled source rods can be removed and replaced with a vendor-supplied remote handling tool.

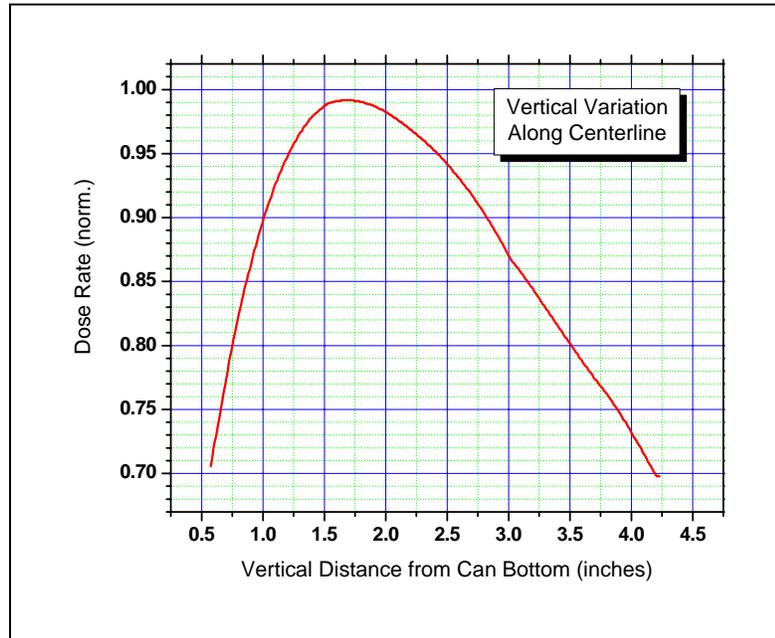
When the source-can assembly is in its normal, lowered position, sample cans are inserted into its center for irradiation. The source can assembly is located at the center of a removable and reusable carousel consisting of 2 rings of holes into which sample cans can also be inserted to provide a range of 3 fixed dose rates (center plus 2 rings).

Detailed drawings of the existing source can be provided upon request through 14 Feb 2006. A list of the drawings is contained in Appendix A.

Requirements:

1. The design and configuration of the new or recharged Co-60 source being procured shall meet all applicable requirements of 10 CFR 36.
2. The source must be configured to provide the maximum dose rate on the center line of the assembled source can at a distance of approx. 1.75" from the bottom of a sample can with a maximum deviation of 10% from the peak dose rate between 1.25 and 2.75" above the sample can bottom. See Figure 1 below for an axial dose rate profile of the present source.

Figure 1



1. The vendor is responsible for removal of the existing Co source (See contract option 7) and installation of the new, recharged Co source; this shall be in compliance of all applicable federal, District of Columbia and state regulations, e.g. 10 CFR and 49 CFR. This may require either rental or purchase of and installation of, a new hoist capable of lifting the lead casks in which the sources will be transported into and out of the pool. There is currently a 1-ton hoist in the room that can be removed.
2. The assembled source rods or source-can assembly will be transferred to and from their transfer cask under water such that radiation levels do not exceed 2 mR/hr at one foot from the surface of the water. The radiation level at one foot from the surface of the transfer cask will not exceed 2 mR/hr at any time while the cask is at NRL and not in the pool.
3. The vendor shall not contaminate the water in the pool or in any area at NRL with radioactive material. The isotope contamination levels in the water shall be less than the effluent release concentrations specified in 10 CFR 20, Appendix B, Table 2 for water. Residual radioactive contamination that is distinguishable from background radiation shall not result in a Total Effective Dose Equivalent in excess of 15 mrem per year to an average member of the public or to personnel who may be present at NRL. Removable contamination on surfaces also shall not exceed 300 dpm per 100 cm-squared. If contamination occurs, it is solely the responsibility of the vendor to decontaminate the water or other areas at NRL to the satisfaction of the NRL Radiation Safety Officer, Code 3540. The requirements of 10 CFR 20 apply. If decontamination of facility surfaces is required, the methodology in NUREG-1575, the Mutli-Agency Radiation Survey and Site Investigation Manual (MARSSIM) shall be used. No additional funds will be provided for this decontamination. The offeror may conduct a radiation survey of the pool irradiator facility and sample the pool water prior to and following removal of the existing source and installation of the new source if he wishes. If such surveys are conducted or samples are taken, a copy of the results will be provided to NRL within 10 business days from the date the samples were collected and within 2 business days of the date the contractor receives its report.

4. Prior to bringing any source on board NRL, the offeror will provide NRL with a copy of the leak test certificate for each source rod.
5. Prior to bringing any source on board NRL, the offeror shall provide NRL with a copy of a survey of the shipping cask(s) to be used, demonstrating that removable gross alpha activity is less than 20 dpm/100 cm² and that removable gross beta activity is less than 100 dpm/100 cm². Each swipe for removable activity will be taken on an area of 100 cm². Sufficient measurements must be taken in the most appropriate locations to yield a representative assessment of the non-fixed contamination levels. It is expected that the measurements for removable activity will include at least 6 swipes on the outside surface of each cask and at least 3 swipes on the inside surface of each cask. The surface concerned shall be wiped with an absorbent material ("swipe"), using moderate pressure, and the activity will be measured on the wiping material. The survey of each cask shall occur prior to placing the source to be delivered to NRL inside each cask but after each cask was used for holding other radioactive sources or stored in a potentially contaminated area. The intent of this requirement is to provide a measure of assurance that the cask(s) itself will not contaminate NRL property or the NRL pool while not resulting in a survey that is difficult for the offeror to conduct.
6. The transfer shall occur on weekends. The source may only be at NRL out of the pool during the designated weekend (i.e. on Saturday and Sunday and on an adjoining federal holiday, if there is one). Deviation from this time limit must be approved in writing and in advance by the NRL Radiation Safety Officer. The NRL Radiation Safety Officer or his designated representative must be present at all times during the on-site work by the contractor.
7. If the pool lining is damaged during the procedure, it will be the vendor's responsibility to repair the pool to at least the integrity it had prior to the transfer.
8. The contractor will follow the radiation safety requirements of the NRL Radiation Safety Officer.
9. After the source is installed, the vendor shall submit a complete copy of the final design drawings, without restrictive markings, which will become property of the US Government

Proposal Requirements:

1. Offerors shall submit a detailed proposal, including drawings and a Safety and Health Plan, which must be approved by the NRL Radiation Safety Officer, Code 3540 and be in compliance with all OSHA, Navy Radiological Affairs Support Office (RASO) and NRC regulations.
2. Offerors must propose at least one (and may bid on more than one) of the following 3 recharge options (a) through (c):
 - a. Vendor will fabricate 10 ea source rod assemblies and load the source can with assembled (doubly encapsulated and sealed) source rods to provide a source of the required activity. This can be done either:
 - (i) on-site at NRL in accord with paragraph 5 above and providing the total on-site activity does not exceed the NRL NRC license or
 - (ii) at the vendor's facility. A concern with sub-option (ii) is the time required to unload and reload the assembled source can at the vendor's facility, including transportation between the vendor's facility and NRL. This issue should be addressed if proposing this sub-option.
 - b. Offerors may propose an alternative design for the assembled source can with dimensions such that it is compatible with the existing carousel and sample cans. Minor modifications to the existing carousel to accommodate the alternative design may be proposed.

- c. Offerors may propose a completely new design for the assembled source can that may be incompatible with the existing carousel and sample cans. In this case, the offeror will be required to fabricate and provide new sample cans (number and type to be determined; offeror must bid on contract option 2 below) and either a new carousel or an alternate means of locating sample cans at fixed distances from the source to provide fixed, lower dose rates than available at the center position in the assembled source can.
3. Offerors must provide design and engineering quality assurance criteria that the assembled source rods will maintain the integrity of the source rods inside the assembly, keeping the cobalt-60 from the outside environment in water for a period of at least 50 years. Offeror will obtain approval of the NRL Radiation Safety Officer of said criteria and assembled source rod design. The assembled source rods must not corrode in water with a conductivity of less than or equal to 750 microSiemens per cm. Offerors may assume that the water in the pool is maintained with a conductivity of 20 microSiemens per cm.
4. Offerors must provide a brief history of their company and a description of their production facilities. Offerors must provide a summary of the experience, training, and qualifications of personnel who will be performing the on-site work. The Offeror must be in possession of all licenses necessary to perform the required work and must provide a copy of said licenses.

Proposal Requirements - Contract Options:

1. The Co in the assembled source rods shall be shaded to provide the maximum dose rate on the center line of the assembled source can at a distance of 1.75" +/- 0.25" from the bottom of a sample can with a maximum deviation of 5% times the peak dose rate between 1 and 3" above the sample can bottom.
2. Offerors shall fabricate stainless steel single walled and double walled sample cans with corresponding tops. Offerors shall price these on a per-piece basis.
3. After installation of the source, the offeror will provide dose rate calibrations of the center hole, one hole (to be specified) in each ring of the carousel, and all 4 holes in the sample holding shelf attached to the east wall of the pool. The offeror shall also provide vertical and horizontal profiles of the dose rate of these holes with a resolution of 0.5". Dosimetry shall be accurate to +/-10% and traceable to a NIST standard.
4. Offerors are responsible for bringing the room housing the Co-60 irradiator into compliance with 10 CFR 36 regulations regarding a source of the new activity.
5. Offerors will deliver to NRL one or more lead casks capable of storing the new 20 kCi source or all new assembled source rods out of the pool. If the offeror proposes to store the assembled source rods rather than the source can assembly, the design of the source can assembly must be such that the assembled source rods can be removed under water and transferred to the cask(s). Likewise if the offeror proposes to store the entire source can assembly, it must be removable from the carousel under water. The cask(s) shall be of sufficient thickness that the radiation level at one foot from the surface of the cask(s) will not exceed 2 mR/hr. The cask(s) must be free of contamination. Individual casks must be sufficiently small that both they and the source can assembly will fit on the bottom of the existing pool.

6. Offeror will either: 1) properly dispose of existing source per applicable federal, state and local laws; or 2) provide one or more lead casks capable of storing the existing source rods, on-site at NRL. The cask(s) shall be of sufficient thickness that the radiation level at one foot from the surface of the cask(s) will not exceed 2 mR/hr. The cask(s) must be free of contamination. Individual casks must not weigh more than 5,500 pounds and collectively must fit within NRL's storage facility. It is desirable to keep the weight of the cask(s) as low as possible subject to the above criteria.

Site Visit:

A site visit will be conducted on 16 Feb 2006 at 10:00 am. Offerors are urged and expected to inspect the site where the recharging of the Co-60 irradiator is required and to satisfy themselves regarding all general and local conditions that may affect the price. In no event shall failure to inspect the site constitute grounds for a claim after contract award.

Questions WILL NOT be answered during the site visit. All questions shall be submitted in writing at the site visit or within three (3) days of the site visit via telecopies to (202) 767-6197. Offerors are required to supply their own writing materials. Inquiries should contain the Solicitation Number (N00173-06-R-JR04) and must be addressed to the attention of Code 3230.JR, Mr. Jerry Riles.

To make arrangements to attend, offerors should contact Mr. Jerry Riles, Contract Specialist via e-mail at jriles@contracts.nrl.navy.mil by 1:00 PM on 15 Feb 2006. The e-mail request MUST include the following information:

1. Name of the Contractor
2. Name of Each Individual to Attend*
3. Telephone Number of Each Individual to Attend

** Please try to limit the number of people to two (2) from each contractor.*

Offerors are hereby notified that the site visit will take place at the Naval Research Laboratory, Washington, DC. Offerors who are scheduled to attend the site visit should meet at Building 216. No cameras, firearms, or alcoholic beverages are allowed on the Laboratory.

All Attendees Must Be U.S. Citizens With Valid I.D., And/Or Must Have A Valid Green Card In Their Possession The Day Of The Site Visit To Enter The Naval Research Laboratory.
(No Exceptions Will Be Made)

Period of Performance: The period of performance shall be from date of award through 30 July 2006. All supplies shall be delivered FOB Destination, NRL, Washington, DC

APPENDIX A

1. Source Can Assemblies & Details, Drw. No. 210097, sheet 1 of 2, Oct 26, 1987
2. Source Can Assemblies & Details, Drw. No. 210097, sheet 2 of 2, Oct 26, 1987
3. .382 Dia x 7-1/4 Lg. Source, Drw. No. 200331, May 29, 1987
4. Source Can Preliminary Design, Feb 09, 1987
5. Source Can Assembly, Preliminary, May 28, 1987
6. Installation Pool Irradiator, Dwg. No. 210099, October 26, 1987
7. Cap, Top, Sample Can, Dwg. No. 210095, sheet 1 of 2, October 26, 1987
8. Detail Sheet, Cap, Top, Sample Can, Dwg. No. 210095, sheet 2 of 2, October 26, 1987
9. Sample Can, Single Wall, Dwg. No. 210094, sheet 1 of 2, October 26, 1987
10. Detail Sheet, Sample Can, Single Wall, Dwg. No. 210094, sheet 2 of 2, October 26, 1987
11. Sample Can, Double Wall, Dwg. No. 210093, sheet 1 of 2, October 26, 1987
12. Detail Sheet Double Wall Sample Can, Dwg. No. 210093, sheet 2 of 2, October 26, 1987
13. Installation, Pool Irradiator, Dwg. No. 210099, October 26, 1987