DARPA-PS-25-27 Rads to Watts
Frequently Asked Questions (FAQs)
as of 7/29/25

46Q: For the device that will go into the time capsule will DARPA take ownership of the radiation source delivered with the test device?

46A: There are no plans for DARPA to take ownership of radiation sources involved in the unit cell or time capsule tests. Nor does DARPA plan to baseline custody of the time capsule. A performer may request assistance from DARPA with the time capsule at the government support team location as stated in the Program Solicitation (PS).

45Q: Should UARC's be marked as a FFRDC in Appendix D? In Appendix D there was a question as to whether UARC personnel should mark yes to FFRDC question since the process will be similar to funding UARC's. Currently we have these marked as no, since the UARC's are not FFRDC's, but since this funding approach with UARC's is a relatively new process we want to verify we are correctly filling out the required information.

45A: A University Affiliated Research Center (UARC) is a research organization affiliated with a university or college, established by the Department of Defense (DoD) to maintain and advance specific engineering and technology capabilities. UARCs are essentially a type of Federally Funded Research and Development Center (FFRDC). The contracting process for these two entities is interchangeable and their funding processes are similar by nature. Regarding Attachment D, please check YES for FFRDC if UARCs are supporting the prime.

44Q: Regarding Attachment F: (i) could you explain Note 2 in blue at the bottom? I wasn't sure if the cells were an error (F11-12) but was confused on what is being asked; (ii) How would we note our project performance if it spanned 2 fiscal years in the Base Period for the required 15 months? Such as our Base Period is 12/1/25-2/28/27, meaning FY2026 is 12/1/25-6/30/26 and FY2027 is 7/1/26-2/28/27; (iii) Do the subcontractors use our Fiscal Year, since we are the prime, as their dates in their cost spreadsheet?

44A: (i) There was an error regarding Note 2 direction on the spreadsheet. The period of performance information should be included on rows 7-9, columns C and forward. (ii) If the Base Period spans across fiscal years and the rates change, proposers may duplicate/edit the cost elements to accurately capture the proposed cost information for the Base Year. The same applies for option period(s). (iii) It is highly recommended that the prime and subcontractors use the same fiscal year as the prime would need to capture the overall cost in their cost spreadsheet. In addition, CMO would need the cost information to be reported using the same timeframe in order to conduct the Government's cost analysis accurately.

43Q: Regarding Attachment F, I just wanted to be sure that the budget template provided in the SAM attachments is the correct template we should be using for the Rads to Watts proposal submission. I am used to seeing additional tabs for proposer constants (labor/fringe rates) and then tabs for each of the budget periods that roll up into the 'Total Amount' tab. I do not see any of those on the attached. I only see the Total Amount' tab. I thought perhaps the additional tabs were hidden but I do not see that they are.

43A: Yes, DARPA is striving for continuous improvement by streamlining our processes to enhance the customer's experience and make working with DARPA easier. The published Attachment F for Rads to Watts is a shorter, more concise cost proposal spreadsheet that is recently being used and is the correct cost spreadsheet for Rads to Watts.

42Q: Can you confirm that only one copy of Attachment I should be uploaded, representing the entire project team? One of our partners (a National Laboratory) is concerned that each partner must complete Attachment I separately.

42A: Yes, only one copy of Attachment I is included within the proposal. FFRDCs, UARCs, and National Labs are not required to provide separate milestone tables.

41Q: Could you please clarify how applicants should address Section 6 of Attachment D? Since the requested content is already detailed in Attachment H, should we replicate that information directly, or is a condensed overview acceptable? Given that Section 6 counts toward the Volume I page limit, we're hoping a summary is sufficient.

41A: Proposers must complete Attachment H and can reference Attachment H within Section 6 of Attachment D.

40Q: Could a UARC's effort be funded under its existing IDIQ contract with DARPA?

40A: DARPA may utilize existing agreements should the prime proposer that a UARC is supporting be selected for funding. See 26A.

39Q: Do "FFRDCs, UARCs, and Government Entities to include National Laboratories", as stated in the solicitation, broadly fall under the term "national laboratory"?

39A: Yes.

38Q: In reviewing the document Attachment_F_DARPA_Cost_Proposal_Spreadsheet_v3 I have found the following error about how to address when a phase or section spans more than one fiscal year. For example, since the base is 15 months it will definitely need a second fiscal year represented in the period base 1. The document included the following note on Row 59. "Note 2: Enter proposed PoP in C12 by Contractor Fiscal Year (CFY) in C11 that applies. If the Phase 1 PoP spans a second CFY enter the applicable PoP months by CFY2 in cells F12 and F11. If Phase 2 is applicable, the same logic applies and fill in "CFY X" with the appropriate CFY, otherwise leave blank. Ensure that the time periods match those stated in the technical proposal."

38A: See 44A.

37Q: How many use cases can we have for the operational unit during the last 6 months?

37A: DARPA only requires one strong use case for the operational system, using the data from the unit cell tests collected during the program. Performers are not limited to one.

36Q: How many "unit cells" can we submit for radiation testing? Is there a size which is too small or too large?

36Q: There is not a size that is too large for the linac test, although it is anticipated that the unit cells will be on the same order of magnitude diameter as the linac's beam. The typical electron beam diameter is 0.1-2cm. The target will be open to air, with positioning

of target (active area of the charge generation region) adjacent to electron beam emission (surface of Van de Graaf).

35Q: Will unit cells tested in the linear accelerator required to be coated with the radioisotope material? If so, who is responsible for transportation of radioactive material and are there any special requirements (e.g. encapsulated in a special form container)?

35A: The purpose of the linac test is to dose a unit cell in the same way that a radioisotope (or any other radiation source of the performer's choosing) would do so for the given flux levels (chosen by the performer) multiplied by time duration (chosen by the performer) with both of those numbers equaling at least 1E+17/cm2. It would not make sense for the radioisotope to be included on top of this dose.

34Q: Is it expected and/or encouraged for performers to develop a process for coating the semiconductor substrate with an alpha- or beta-emitting material? The simpler alternative is to expose a unit cell to flux from a radioactive source in close proximity during testing.

34A: The question of whether a performer's operational system requires them to develop a "coating" solution is dependent on the proposer's unique approach, and if their approach requires coating for their unit cell to be representative of what will be used in the operational system. As stated in the PS, DARPA will allow proposers to use a 100% source collection efficiency term in calculating their power density performance of the unit cell, with the understanding that a performer's specific architecture may require more than one unit cell to accomplish this efficiency. With that being said, it is required that a proposer's architecture for the operational system has a solution for maximally absorbing their radiation source terms flux. As stated in the Program Solicitation, for the purposes of the program, DARPA defines a unit cell as the smallest viable radiovoltaic, scalable for a given power density (W/cm2), and consisting of at least one of each of the most fundamental sections of a radiovoltaic: the charge generation region (CGR), the charge collection region (CCR), and the source or radiation-emitting region. The performers' unit cells will be evaluated to inform the 15-month downselect. Also, the Option Period 2 spanning months 24 through 30 is for a scalability study to create the design of an operational system. Performers will strive to put more fidelity on the high-power system design, with the design using many unit cells in an array or stacked formation, with refined power output and weight estimates for specific power, in order to inform potential follow-on expansion or transition efforts.

33Q: Will time capsule experiments be performed at the performer site or at an alternate site selected by DARPA?

33A: DARPA does not have a specific location identified for the time capsule experiments. Proposers should identify a location in their proposal.

32Q: If services are sought from an FFRDC or UARC, other than the use of radiological materials and radiological laboratories, can that FFRDC or UARC be a subcontractor to the proposer?

32A: Should prime proposers require Federally Funded Research and Development Centers (FFRDC) or University Affiliated Research Centers (UARCs) support for their efforts, they must clearly define the proposed supporting role of the national lab(s) in

their technical proposal, as DARPA will fund those activities separately through those entities' existing agreements should the proposer be selected for funding. FFRDC/UARC/National Labs cannot be subcontractors due to organizational conflicts of interest (OCI). See 26A.

31Q: Would it be possible to fund a Department of Energy lab via a MIPR rather than an OT?

31A: DOE Lab participation will not be funded through an OT issued to a Prime. They would be funded through a separate funding action. Depending on the entity, that funding action might be a MIPR, or 7600B issued through G-Invoicing. The OT for Prototype Rads to Watts award is only for eligible primes. Labs do not count as eligible primes and therefore would be funded separately by DARPA to support a prime, if the Lab happens to be identified by the prime to be part of their team.

30Q: As an FFRDC, to whom (name, email, phone) do we submit our proposed scope of work document to? To whom at DARPA (name, email, phone) do we submit the cost estimate/detail?

30A: The prime who is submitting the proposal should include the FFRDC's contact information, so DARPA can directly reach out to the FFRDC. See 26A.

29Q: After having submitted an abstract which was considered as "encouraged" by DARPA, I'd like to confirm whether personnel and budget increases from abstract to full proposal are allowable within the current solicitation framework?

29A: Cost realism will be evaluated in accordance with the PS for all proposal submissions without regard to any comments resulting from the review of an abstract. Proposed costs should be realistic for the proposed technical approach and tasks being performed.

28Q: Regarding Subrecipient Commitment Form, is this required to be submitted by a UARC to the lead organization?

28A: No. See 26A for a summary of what is required for UARCs.

27Q: Regarding Organizational Conflicts of Interest (OCI) Affirmation, should this be submitted by a UARC to the lead organization?

27A: No. See 26A for a summary of what is required for UARCs.

26Q: Regarding Subcontract Scope of Work for an FFRDC/National Lab/UARC, is there guidance on the level of detail required? Are budget files Attachment E and F required?

26A: FFRDCs, UARCs and National Labs will submit their scope of work through the prime. The prime will submit a full proposal to DARPA, and it should include the name of the UARC, the scope of the work that the UARC will be providing to support the prime, a Rough Order of Magnitude (ROM) or estimated budget for the UARC, and a way for DARPA to contact the UARC. According to Section IV: Special Considerations under FFRDC paragraph, FFRDCs/UARCs/National Labs are essential to Rads to Watts program, but they will not be subcontractor due to OCI. DARPA will fund these entities (if selected) directly via existing Government's agreement(s) or through Government's internal process. They will support the Government directly and as such, they are not required to provide subcontractor level documents except those mentioned above.

----------↑↑↑New Q/A↑↑↑----------

25Q: Will DARPA allow a single proposal team to submit multiple unit cells, each based on a different material, or must each team propose only one unit cell?

25A: Yes, a single proposal team can submit multiple unit cells. With that being said, the proposer team must ensure their plan adheres to the schedule and the metrics expected within that schedule by DARPA. In other words, if the proposal team submits a plan for multiple unit cells, a proposer must consider if they can evolve any one unit cell enough within the allotted time to pass the competitive down-select points. The proposal team is encouraged to submit an abstract in order to receive additional feedback from DARPA.

24Q: Do the tests performed during the first two phases need to directly demonstrate the three performance parameters? For instance, could we use less (uCi) fuel for a longer period of time to reach 10^14 cm^-2? Or could we use a fuel with a lower specific activity (either less pure source or a different species)?

24A: The first performance parameter (power density) must be directly demonstrated using a radioactive source of the performer's choosing. The second performance parameter (degradation of that power density after being dosed by the linac) must also be directly demonstrated using your radioactive source of your choosing. The third performance parameter (specific power) can be calculated and inferred from the results of the first two parameters. With respect to what species, Curie content, specific activity, or other considerations, that is up to the proposer to decide in order to meet the metrics as described in the PS (in particular for pages 5-7) and must adhere to the schedule set by DARPA.

23Q: In your size and weight figures of merit (excluding time), the response to Q12 indicates that the full scale system be included in the white paper and proposal. Since the type of power electronics, thermal management system, are highly ConOps (concept of operation) and mission dependent; requiring a full trades study to be made, is there any guidance as to how to limit the application analysis so that resources are not expended on system level optimization?

23A: The PS contains guidance on the level of detail needed to satisfactorily address the power density and specific power metrics in the proposal. A proposer must include at least one recommended mission ConOps for the operational system in their proposal, but it is also acceptable to alert DARPA to your range of ideas if you propose to look at different ideas in a trades study in the program. However, the majority of the investment in this program should go towards developing the radiovoltaic unit cells. Your resources should not be all expected on system level optimization. The "bonus period" after month 24 is the only part of the program specifically meant for this purpose.

22Q: Is it expected that the proposer delivers the unit cell with a radioisotope of choice for the 9-month time capsule test? Or will the time capsule be an unirradiated control for the 1e17/cm2 test?

22A: We expect a single "capstone" time capsule to be placed to the side for 9 months combined with your chosen source radiation for a continuous period. The capstone time capsule will be opened after 9 months and examined for degradation effects over real-

time. As the PS elaborates, we also expect performers to develop multiple other time-durations (weeks, days, months…) to pre-emptively examine effects on the unit cells over time both in Period 1 and Period 2. The time capsule will not participate in the linac tests. The linac tests are meant to do accelerated lifetime/aging/damage testing of your CGR and CCR, such that (when it's handed back to you) you measure the W/cm2, and tell us how much that performance has degraded by after we've dosed it.

21Q: The BAA states "Payments are triggered by completed performance of observable technical events (milestones).". Please clarify what is implied by "…completed performance of observable technical events," and specifically under what circumstances DARPA will not make payments to performers after they have conducted research toward Milestones. Please also advise specifically whether DARPA will not make payments if: a) metrics are not met at Milestones; or b) Milestones are not met on the specified Program schedule; or c) … for other outcomes.

21A: Milestones represent technically relevant, tangible events/ activities/ accomplishments on the program critical path that would demonstrate program progression to achieve performance metrics to reach program goals. In an OT-P fixed milestone arrangement, this approach involves a fixed sum paid to the performer for executing the agreed-upon work described in the milestone completion criteria. Payments are made for completing specified tasks as negotiated and identified in the milestones and payments section of the OT. Payments are not based specifically on the success of the technology. The value of the milestones should be commensurate with the value the Government receives during that phase of the agreement. Any deviation from the program's schedule and milestones must be coordinated and approved by the Program Manager to be definitized onto the Agreement via a modification.

20Q: Where can I find the solicitation and attachments?

20A: The solicitation (Amendment 1) is posted to SAM.gov: https://sam.gov/opp/bb29898410fa46a7ba52e930b44ebeea/view

19Q: Can we add to the list of milestones or are they fixed?

19A: Proposers are at liberty to propose/schedule additional performer-defined milestones that are structured to work towards completing program goals, as required to meet the specific performance metrics. Proposers may also suggest edits to program's expected milestones as prescribed within the Program Solicitation (PS). Please note that any suggested edits may not be accepted by DARPA.

18Q: Can we use the CFR de minimis rate of 15% if we don't have gov approved rates yet?

18A: Yes, proposers are allowed to use the CFR de minimus rate of 15% to propose or provide actual support documentation to justify other proposed indirect cost rate. The award instrument is an OT-P, and as such, the rate is fixed once Agreement is awarded and not subject to change.

17Q: Does DARPA permit us to use our negotiated F&A rate, or is it limited?

17A: Yes, DARPA permits the use of negotiated F&A rate.

16Q: Where do the abstracts get sent to?

16A: Please review Attachments A and B for abstract formatting and submission instructions. Abstracts must be submitted per the instructions outlined therein and received by DARPA no later than the due date and time listed in the Overview Information section in the Program Solicitation (PS). Abstracts received after this time and date may not be reviewed. Please visit Proposer Instructions and General Terms and Conditions for instructions on how to submit your abstract through DARPA's Broad Agency Announcement Tool (BAAT).

15Q: Does the proposer need to have found a Transition Partner for this effort?

15A: DARPA will pursue a transition partner for the effort. However, the proposal must include a recommendation for a domain, power level, and operational duration that the radiovoltaic is expected to operate in as described in the PS.

14Q: What if we don't have a radiation source? Can we substitute dose on the radiovoltaic with a high-energy, high-flux particle device such as another linac to measure W/cm^2?

14A: This is not allowed per the structure of the program, because performers will not be able to perform time capsule experiments, and using an idealized radiation source would not meet the intent of the program to develop power sources for operational use. In particular, a performer will not be able to put their unit cell into a "time capsule" at month 15 for the capstone test, which is expected to be encapsulated along with their respective source. If they rely on a device (e.g., a linac) as a substitute for a radiation source, then the linac would have to be running continuously for 9 months at low flux to get the real time degradation effect data. This is not realistic nor is it representative of an operational unit cell.

13Q: Is the development of scintillators in scope?

13A: No. Rads to Watts will only invest in experimentation and development of radiovoltaic hardware.

12Q: How should shielding be considered, in particular when considering mass for the W/kg estimate?

12A: The W/kg estimate should only include the mass of the full-scale, operational system radiovoltaic. You may assume the device is stand-alone in space, not around humans.

11Q: What is the expected level of funding? What size of teams should we aim for?

11A: The level of funding for individual awards will depend on the quality of the proposals received and the availability of funds. Proposers are encouraged to assemble teams that can address the full scope of the challenges presented in the program solicitation and meet and exceed the metrics therein.

10Q: For (1) PIs, (2) Co-PIs and (3) Institutions, how many proposals may each respectively be on?

10A: There is no limit on the number of proposals that a given prime or subcontractor may submit, however, the unique aspects of each approach should be clear, and should

explain how performance would be managed to ensure success and potential conflicts of interest would be handled should multiple proposals be selected for award.

9Q: How should proposers reconcile the linac fluence metric, if the proposer plans to use a different source other than a beta (eg, an alpha, gamma, etc.) with respect to a different source's fluence level? Should the proposer also test their own unit cell with alphas at 1E+17/cm^2 of alphas, for example?

9A: The linac test will be an unbiased way to damage and dose all of the materials with a common energy level and fluence of high energy electrons. This is a way to compare radiation degradation for all performers. Then, the performance of the unit cell subject to its own native particles (e.g., an alpha, gamma, etc.) will be captured in a separate metric via the Figure of Merit (FOM). The FOM will capture the performer's own unique, proposed way to reach (i.e., different radiation source types) their chosen power density and time data points within the range specified by DARPA. DARPA recognizes that the "fluence corridor" which has been illustrated in the Proposers Day slides is illustrated for betas, but a similar corridor could be drawn for the same power density and time values for all unit cells, using correlations for different particles. For example, the 1E+17/cm^2 ceiling is likely to correlate to a 1E+13/cm^2 ceiling for alphas for two given unit cells (one using betas at x W/cm^2 and another using alphas that could equal that same x W/cm^2 value).

8Q: What is the procedure for FFRDCs, UARCs, and National Labs to be involved?

8A: Federally Funded Research and Development Centers (FFRDC), University Affiliated Research Centers (UARCs), and Government Entities to include National Laboratories are not eligible to propose to this solicitation as prime contractors. Should prime proposers require national laboratory support for their efforts, to include the provision of radioisotopes, they must clearly define the proposed supporting role of the national lab(s) in their technical proposal and ensure that proposed costs are segregable in the cost proposal, as DARPA will fund those activities separately through those entities' existing agreements should the proposer be selected for funding.

7Q: What data does DARPA require with regards to waste heat during the unit cell tests?

7A: DARPA is interested primarily in radiation degradation and does not expect performers to iterate on improvements to the device to minimize thermal degradation. The "time capsule" at month 15 will be an opportunity to document the effects of heat on the unit cell performance at month 24; but radiation degradation will be the principal metric from this test that will be used to score performers.

6Q: How are performers expected to quantify the W/cm^2 metric using data from the unit cell experiments, taking into consideration that source radiation may be lost with a single layer?

6A: As stated in the PS, assume source collection efficiency is 100% for singular unit cell experiments in order to validate W/cm^2.

5Q: How much flexibility do performers have when proposing the radiation source for the vision system? What is the level of interest in a nuclear reactor as a source versus isotopes?

5A: Proposers have total flexibility when proposing a radiation source in their proposal as long as they are addressing the requirements of the PS. A reactor is an example of a radiation source which could be possible in the vision system. However, performers need to be mindful of the schedule and application constraints of the program. Neutrons and gamma emissions from a reactor will likely be more difficult to capture, convert, and then drive the resultant energy into current in Rads to Watts via a unit cell in the timeframes needed to meet the competitive metrics.

4Q: What quantity of isotope in relation to licensing limits is expected?

4A: DARPA expects that Rads to Watts performers will not be working with or handling an abundance of isotopes whose radioactivity levels will go beyond the licensing limits of the proposers. Unit cells are expected to be small, using small quantities of radioisotopes within licensing limits.

3Q: What are the expectations for performers to acquire radioisotopes?

3A: DARPA expects that performer teams have experience acquiring the radioisotope that they propose to incorporate into their radiovoltaic and/or that performers are able to reach out to radioisotope providers directly to do the procurement directly. Proposers should refer to the PS, for exact language to address this question.

2Q: What is within bounds with regards to solutions to heat for estimating the W/kg metric?

2A: DARPA is allowing performers to creatively suggest ways to manage waste heat for the full-scale operational system and in order to estimate the W/kg specific power metric. For example, efficiency "topping cycles" that allow added ways to generate energy (besides radiovoltaics) are allowed. However, performers will be competitively down-selected based on the performance of their radiovoltaic as it pertains to the radiovoltaic's Figure of Merit (FOM) described in the PS at each down-select point, which is a value that is measured by the unit cell in experiments. In other words, even if a performer has met the 10 W/kg with creative assumptions on top of their radiovoltaic, if their radiovoltaic's FOM is lower than another performers', then they will not "win" the competition to move onto the next phase.

1Q: Can you elaborate on why the example list of candidate advanced materials was presented; does it refer to a broad class in a more general sense or specific way to harnessing energy?

1A: The examples which listed out candidate advanced materials depict possible, encouraging ideas for charge-carrying, radiation-tolerant solutions that haven't necessarily been applied in radiovoltaics before. The example list of materials is not meant to be exclusive or comprehensive but provide some suggestions to give a sense of the breadth of possible materials of interest to direct energy conversion.