DPA26BZ04-NV017
Non-Volatile Memory for Extreme Environments
Frequently Asked Questions (FAQs)

1. Which extreme condition is most critical to prioritize: cryogenic temperature, high temperature, radiation exposure, or combined exposure?
   A: There is no prioritization; solutions should address all of the metrics as described in the solicitation.

2. What tradition tolerance levels or test profiles are expected for Phase II validation?
   A: The radiation environments and levels are described in the solicitation.

3. How should memory density, operation frequency, endurance, and retention be traded against environmental survivability?
   A: There are no trades; solutions should address all of the metrics as described in the solicitation.

4. Is specific packaging approaches preferred for integrating memory cells with control logic?
   A: There are no specific preferred packaging approaches, provided the proposed approaches address all metrics as described in the solicitation.

5. What application environments should guide prototype requirements: space, hypersonic, nuclear, high-temperature industrial or another domain?
   A: An application environment is not specified; prototype requirements are provided as metrics in the solicitation.

6. Is the -269°C to 600°C range intended to be demonstrated by a *single device* across the full span, or is a multi-tier/composite architecture (e.g., different memory elements optimized for different sub-ranges) an acceptable interpretation of the requirement?
   A: A single device that operates across the entire temperature range is required.

7. What radiation environment(s) should proposers design against specifically — total ionizing dose, single-event effects, neutron fluence, or a combination — and are target dose/fluence levels available, even as illustrative reference points?
   A: The radiation requirements are stated in the metrics within the solicitation.

8. Is the 1 Mb density and 10 MHz frequency a minimum floor only, or are there unstated upper bounds (power envelope, die size, etc.) proposers should assume?
   A: The 32 Mb and 1 MHz metrics are the minimum that should be demonstrated; there are no upper bounds.

9. Should endurance and retention targets be assumed at the extremes of the temperature range, or only within a nominal operating band?

A: The endurance and retention targets should be assumed at the extremes of the temperature range.

10. What specifically qualifies as sufficient "prior hardware demonstration data" for DP2 eligibility — does data generated outside a government contract (e.g., peer-reviewed results) satisfy this, or must it originate from proposer-funded work?
    A: Peer-reviewed academic results and/or proposer-funded work would qualify.

11. Is there a minimum TRL DARPA expects proposers to already be at when submitting?
    A: No. Proposals should include evidence of a credible path to achieving the program metrics within the proposed period of performance.

12. Given that the solicitation places responsibility for classification determination on the proposer, is there a specific DoW Security Classification Guide (SCG) reference proposers should consult, or a point of contact for classification guidance prior to submission?
    A: No.

13. If a proposed approach uses only commercially available CMOS nodes for peripheral logic, does that materially simplify the classification/export posture, or does the extreme-environment memory application itself trigger additional scrutiny regardless of node?
    A: Proposers are solely responsible for determining the appropriate security classification of their proposed effort.

14. Is a prime/subcontractor teaming structure — where the prime holds program management and compliance responsibility and a subcontractor holds the core device IP and technical execution — viewed favorably, or does DARPA expect the prime to hold the core technical capability directly?
    A: There is no preferred teaming structure. The contribution of each team member should be evident in the proposal.

15. What does DARPA consider a credible Phase II demonstration milestone for this topic — a packaged device, a bare die on a test fixture, or a system-level integration?
    A: Per the solicitation, "By the end of Phase II, the performers must deliver ten packaged 32Mb memory prototype units meeting the program metrics and a final program report detailing the fabrication process, radiation survivability, and characterization data for delivered prototypes. All prototypes should be provided with adequate instructions and interface boards to support government testing and evaluation using standard environmental and radiation laboratory equipment."

16. Will proposals that address only part of the environmental envelope (e.g., high temperature with radiation as a secondary/parallel research thread) be considered responsive, or is full-envelope coverage a submission requirement?
    A: Full-envelope coverage is a submission requirement, and partial solutions will not be viewed as responsive.

17. Is there any voltage and power specification for the solicitation topic. Somewhere it is mentioned low-power, but no target number is specified.
    A: No.

18. For the feasibility demonstration report to be included in the proposal in lieu of Phase I, no numbers are specified. So is the proposer supposed to consider that the Phase II target numbers as guidelines when generating the Phase II report.
    A: Per the solicitation, "Proposers must provide data demonstrating that the following has been achieved outside of the SBIR program: (1) initial hardware demonstration of proposed memory technology (2) simulated and/or experimental data that support the feasibility of temperature-hard radiation tolerant memory system capable of meeting SBIR program metrics." The proposals must include a research plan that charts credible path to achieving the program metrics.