

Questions Received for BAA 09-013 (Component Development for Advanced Shipboard Desalination) through 27 March 2009

1. It seems ONR is looking for pretty practical, almost pilot level systems to evaluate, without much room for basic research. Is this accurate?

A: The BAA development is mainly focused on component development categorized as 6.2 and 6.3 R&D type of efforts. It is not focused on the basic 6.1-type research area. However if some of the concepts/technologies developed by your organization could be matured within an 18 month period then I would encourage you to submit. Also check out the ONR website www.onr.navy.mil/02/baa which lists all the other R&D efforts being solicited.

2. We are planning to submit a white paper for the Broad Agency Announcement "Component Development for Advanced Shipboard Desalination Systems". Our technology could encompass two of the specific areas of interest namely:
6.2 Advanced Chemical Pretreatment Enhancements
6.3 Advanced Reverse Osmosis Membranes
Should we submit two separate papers or only one encompassing the two aspects?

A: If you are developing a single technology that covers both areas, then you should only submit one white paper. If you are developing two distinct technologies, one for area 6.2 and one for area 6.3, then you should submit two white papers.

3. What is the size of the RO membrane module that should be ready for government testing within 18 months of award? For example, 4" OD x 40" length module, a 4" OD x 20" length module, or other size?

A: We have capability and prefer to test 4" OD x 40" long modules, however, we may be able to accommodate membrane modules of other sizes. Please contact us further if you would like to utilize an alternative size, as modifications to test equipment may be necessary.

4. Is sensor development encouraged under section 6.5, "Alternative Approaches, Miscellaneous Enhancements" of BAA 09-013?

A: Yes, the development of water quality sensors is encouraged under this section of the BAA. The objectives of the sensors should be to enhance operation and permit diagnostics of the desalination system, and align with the program goals as defined in the BAA. Sensors that do not specifically enhance the operations of the desalination system, although valuable, are not within the scope of this particular BAA. Additional ONR research opportunities may be found on the ONR website at <http://www.onr.navy.mil/02/baa>.

5. If my process requires air for operation (compressed or ambient pressure), what options are available in the testing facilities and a shipboard environment?

A: The utilities available at the government testing facilities may be seen in the 'Industry Day' brief, on pages 119 through 145. Ambient and low pressure air systems (130 psi) are available in a shipboard environment.

6. What is an acceptable scale / level of water production for the unit to be delivered after 18 months?

A: The prototype device to be delivered after 18 months should be at a sufficient size to readily demonstrate the process as well as be easily scaled to the eventual shipboard size of 12,000 gpd.

7. Is low-grade waste heat readily available for the desalination operation?

A: The availability of waste heat depends on the type of ship class in question. If a heating source is required for the operation of your technology, it is preferred that you provide it as part of the prototype system to be delivered after 18 months.

8. How significant are the following factors in designing the desalination system/process?

Thermal signature (or other) of the discharges/exhausts.
Produced water quality. Any specifications?
Energy efficiency vs size

- A: For the purpose of this BAA, the thermal signature (or other) of the discharges / exhausts is not significant. It may, however, may become an important consideration when developed systems are built after the conclusion of this BAA. The product water specifications are referenced in the Industry Day Talks (Page 74). Although energy efficiency is important (see also the following question on energy efficiency), the size is more of an important consideration. Effluent discharges that are different from the feed seawater need to be identified in the proposal for test site discharge considerations.

9. What developmental efforts have been undertaken with respect to evaluation of commercial products, especially in terms of automated screens and evaluation of seawater materials? What type of cyclone separator does the Army employ on the 1500 GPH TWPS?

A: The Navy has done pilot, field, and shipboard testing of commercial products including automated screens and seawater materials. The majority of the commercial units evaluated, while they operated well in the open ocean, experienced problems closer to shore. The materials of construction of many of the tested products were not completely compatible with seawater, and as a result, experienced premature degradation. The Army's TWPS is equipped with a Lakos IL-0150-S cyclone separator. The Navy is interested in self-cleaning filtration devices that have low maintenance requirements and enhanced removal capabilities over the conventional techniques.

10. Can you tell me whether the centrifugal separator as depicted in your figure shown in your presentation as seen in Industry Day is a COTS article? If so, could you give me the vendor and part number, so that I can get specifications on it as well as what we can expect downstream of the device? And is it to be part of the prototype we are to furnish?

A: The centrifugal separator on the Navy Standard RO is made specifically for the Navy. The NSRO separator removes 95% of all particles greater than or equal to 50 microns in size at a maximum pressure drop of 25 psid across the separator. This separator basically removes heavy particles that are roughly 1.5x or greater than the specific gravity of water. There will not be a separate centrifugal separator available during the prototype testing. If your technology requires the use of a centrifugal separator for operation, it should be provided as a part of the prototype delivered for testing.

11. What are the current energy requirements for a shipboard desalination system, and how does that compare to the energy requirements of an entire ship?

A: The energy requirements for a shipboard desalination system is small relative to the energy requirements for an entire ship. We expect that the energy requirements for components developed under this BAA will be less than or equal to 30 kW/kgal. Energy efficiency is not the primary driver for system design, as system size is of greater significance.

12. Where does one go to get a detailed view of current equipment/practice?
We'd like to be able estimate the energy and weight savings with new technology options.

A: The current Navy equipment / practice is described in Industry Day Presentations, available on the ONR website, <http://www.onr.navy.mil/02/baa> under BAA 09-013, "Industry Day", under "Current Navy Desalination Capabilities".

13. Regarding chemical pretreatment and prefiltration, does the Navy use just one "recipe" or is there an on-board expert adjusting the chemistry? What recipes are in use? Different foulants will respond differently to different treatments. The variability in littoral environments might call for some ability to adjust the pretreatment.

A: Chemical pretreatment or enhancement is not currently used in the NSRO, however, under this BAA, we are interested in safe, reliable alternatives if enhanced performance and operation is gained. If chemical addition enhances operation of the desalination system, it is desired to have future systems work with minimal manning and desire a system that could treat most waters without manual adjustment.

14. What prefiltration has the feedwater gone through prior to introduction to the desalination system?

A: Prior to introduction to the desalination system, the seawater has passed through a screen of 1/8" mesh, used to prevent the intake of fish, very large particles (rocks), and other debris. When the seawater enters the desalination system, it is then treated with the centrifugal separator (see previous question), and the 20 and 3 micron filters.

15. I am preparing a white paper in response to BAA 09-13. I have a question on the white paper to clarify with you. On page 10, the 5th line from the bottom: "The cover page shall be signed by an authorized officer." I am not clear who is the "authorized officer." Since only electronic submission is required for the white paper, does that mean I need to scan the signed cover page and combine it with the rest and send them to you by email?

A. The authorized officer is the individual with the authorization to make a business commitment for your business or university. Customarily, that would be the Contracts Manager or Vice President of Finance.

16. Is there a product water storage capacity onboard the type of Navy Ships under consideration in the RFP? If so, what is the range of storage capacity for desalted water on board of Navy Ships (w.r.t present RFP)?

A: In general, Navy ships usually have enough storage capacity for 1 day of unrestricted (and up to 2 weeks of restricted) potable water use. As an example, the DDG 51 Class ships that have the 12k NSROs can store just under 16,000 gallons of potable water (4 tanks x 3900 gal per tank).

17. Is it appropriate to propose an optimized UF/RO control and operational strategy under this BAA?

A: The BAA was written to discourage proposals addressing the complete system design and fabrication. This was done so that we could obtain a broad look at as many new and maturing technologies as possible. Control strategies are important and, if novel enough, could come in under BAA topic 6.5. It might also be possible to address prefiltration control strategies under BAA topic 6.1 or 6.2.

The average grant sizes are expected to be in the \$200k-\$500k range. If the pilot system you already have is robust and large enough to be used as an accurate representation of a larger scale system, then the expected grant size may allow for a proposed effort purely to develop and demonstrate novel control strategies. Control strategies that improve performance or reduce fouling, scaling, and/or maintenance are preferred.

18. Could you please tell us where we can find your norm for the prefiltration section in terms of capacity, flux, flow rate, expected duration for the module, volume, weight, as well as energy consumption for this section?

A: For the 12,000 gpd NSRO plant, the capacity is 40 gal/min. The flux for the 20 and 3 micron cartridge filters is 2.5 and 3.2 gpm/sq. ft, respectively. The expected duration for the pretreatment section is to significantly outlast the current cartridge filters, which typically have durations of less than one day to 4 to 6 weeks, depending on near-shore or open-ocean operations. The weight and volume requirements are described in section 6 of BAA 09-013. The energy consumption is not necessarily a concern for cartridge filters, as there is only a small pressure drop across the filters. The overall system efficiency should be equal or less than 30 kW/kgal, including the pretreatment, treatment, and energy recovery systems. Additional information on the current pretreatment section may be found in the Industry Day slides, which are posted on the ONR website (<http://www.onr.navy.mil/02/baa>), as well as preceding questions regarding energy efficiency.

19. According to this BAA, desired technologies should be TRL 4 or 5, however, the Industry Day Briefs (Page 61) lists my technological area as TRL 3. Does this mean my proposal is automatically excluded?

A: A description of Technology Readiness Levels (TRLs) may be found at http://www.onr.navy.mil/ctto/naval_needs.asp. The intention of this BAA is to develop components that are at a readiness level suitable for consideration for use in a robust shipboard desalination system. A second program is anticipated to build complete shipboard desalinations to TRL 6 in 2012, with a clear path to commercialization. The development of a technology from TRL 3 to TRL 5 typically requires more than two years, which would extend past the dates defined in this BAA and the overall desalination program. We encourage you to review the description of TRLs and rate your technology. If you will be able to meet the criteria defined in the BAA, we encourage you to submit a White Paper for your technology.

20. On page 11 of this BAA announcement, it says that the "Technical Section" of the white paper should include references. Because only three pages of space are allocated to this section, I would like to know if it is allowed to omit the reference portion and thus leave more space for the technical description.

A: The limitation of three pages for the White Paper is to enable preliminary evaluation by Navy personnel to provide feedback for the construction of full proposals. The technical description should be concise and provide sufficient detail to allow the reviewers to successfully evaluate your proposal. The use of three pages should be sufficient for the technical description and a few select references that are necessary. Additional details and references may be provided in the full proposal if required.

21. I am interested in preparing a white paper for BAA 09-013, in the area of Advanced Energy Recovery Systems. Which is preferred, an effort to develop a combined recovery/pump system or just the recovery portion?

A: Under BAA 09-013, both combined recovery / pump devices and stand-alone recovery devices are appropriate. If your proposed technology focuses solely on the energy recovery device and NOT the combination with the feed pump, please make sure to specify the inlet conditions required to evaluate your device. If your proposed technology involves the integration of the energy recovery device with the main feed pump or requires a specific pump for operation, please specify your technology appropriately. Please make sure that your technology is at a suitable level of development for the timeline required in this BAA.

22. Are the dates defined in the BAA final? They are marked as "estimates as the date of this announcement".

A: The White Paper and Full Proposal Due Dates are final, and will not be changed. The remaining dates are estimates, however, we will ensure that you are notified of the status of your proposal in a timely fashion. The issuance of awards is estimated for mid-October 2009.

23. In a previous question, ONR specifies that the preferred geometry is 4" diameter, 40" length, but to contact you if we require a different geometry. We are currently able to make 2" diameter, 12" length RO modules. We can prepare larger modules, however this requires the use of production-scale equipment and will dramatically change the scope of work due to cost at this scale.

A: The 4" by 40" membranes provide the most information on all aspects of module performance, followed by 2.5" x 40", followed by smaller sizes. We would determine a way to test any of these sizes if necessary. In this case, it may be best for the offeror to provide an estimated cost for producing the various module sizes in the proposed research effort. That way the review panel can decide between the risks associated with extrapolating data from small modules to real system performance versus cost of the research effort. The risk we are willing to assume really depends on which aspects of the membrane/ membrane module you are trying to improve and how much potential improvement may be achieved. Any modifications may be addressed pending Navy evaluation in preparation for the submission of a full proposal.

24. In order to obtain the best evaluation of a technology, it is preferred to have a control test for comparison's sake. Will there be a control technology testing along with our proposed technology, or should we factor this into our proposal as part of our deliverable?

A: Due to the broad nature of this BAA, it is not possible for us to make comments or commitments about specific equipment and testing procedures that will be used to test each deliverable received under the BAA awards. We will, however, ensure that all prototypes submitted are evaluated in accordance with sound scientific principles. If there are specific concerns about the test equipment necessary to evaluate your technology, we will share this feedback with you at the appropriate time.