DATE: October 29, 2004

TO: Dr. Peter Wiebe,Chair,UNOLS Council
Dr. Dave Hebert,Chair, FIC
Mike Prince, UNOLS Office

FROM: Tim Askew, Chair, RVOC

RE: RVOC input on X-Craft

The RVOC membership discussed the X-craft hull form as proposed by Admiral Cohen at the UNOLS annual meeting earlier in October. For the purposes of discussion, it is assumed that the R/V version of the X-craft would have a standard diesel propulsion plant giving a lower top-end speed and higher endurance. It is also assumed that arrangements details can be worked out as desired, such as adding a open aft deck section, location and number of permanent labs, location and number of portable mission modules (vans), and location/type of handling systems.

The UNOLS community will have to work with whatever hull form is decided on for thirty or more years. The following is a list of questions and concerns raised by the RVOC membership that we feel should be carefully addressed before any decision is made.

1. Experimental Hull Form: Concerns were raised about structural problems developing after delivery.
    a. Has a finite element analysis been conducted?
    b. Can the structural design meet commercial/ABS standards? Is the Alaska Ferry *FAIRWEATHER* classed?
    c. Have insurance costs been addressed for an experimental craft?

2. Weight Sensitivity: It is assumed that the hull form is somewhere between a mono-hull and a SWATH with regard to weight sensitivity.
    a. Because of mobilization needs in foreign ports, the vessel will need to carry several cruises worth of gear. Will this be possible?
    b. What is real scientific payload after taking out fuel and other factors normally considered "payload" by the Navy?
    c. How location sensitive is this hull form compared to a SWATH?

3. Station Keeping: Hull forms designed for speed normally don't perform well on station which is a significant part of an R/V's mission requirement. The RVOC membership recommends the following:
    a. Evaluate the Alaska Ferry *FAIRWEATHER* for station keeping ability. *FAIRWEATER* appears to be the only commercial X-craft in operation that is readily accessible, and an opportunity for field

evaluations should be pursued. This vessel normally operates only on sheltered waters, so chartering it for a day offshore for trials in a significant sea state would be desirable.

b. Damping systems as proposed by Admiral Cohen tend to be complex and expensive. Are these realistic alternatives?
c. The user community for the R/V *WALTON SMITH* should be approached to evaluate pros and cons of the catamaran hull form for science ops in higher sea states. The captain and crew should be interviewed to see how they have overcome the unique vessel motions associated with catamarans. This may necessitate a rethinking of how to position an X-Craft type vessel to perform science operations – for example, working beam to the seas as opposed to the conventional stern/bow into the seas. The captain of the *WATLTON SMITH* should be included in any trials of the *FAIRWEATHER* so a meaningful comparison can be made.

4. Endurance: What is actual endurance with a conventional power plant? Specific mission scenarios from the Ocean Class SMR's need to be compared to this endurance.

5. Necessity of High-Speed Hull Form: It has been shown time and again that science operations do not require high vessel speeds. It is apparent that federal funding constraints cannot support the cost associated with high speed transits – the only scenario where high speed might be desired. Because of these facts, there is a glaring disconnect between the proposed hull form and mission/cost constraints. It would seem imprudent to de-rate a high speed platform for the sake of having an innovative design.

6. Larger X-Craft: The JJMA presentation noted that it would take a 2400 ton version of the hull form to fully meet the Ocean Class SMR's. Admiral Cohen stated that 1800 tons was the Navy target for an R/V. How close would this be in meeting the SMR's? It is understood that this would translate into no change in gross dimensions, but only that the hulls would get wider. How much wider, and how does this affect the hull efficiency and vessel motions?

7. Manning/Operating Costs: The JJMA presentation indicated a crew of 20-21 as opposed to the 11- 13 on the current UNOLS Intermediates. It is therefore assumed that the vessel will be USCG inspected with an operating cost closer to the current Global class. Manning requirements should be considered in detail.

8. Vessel Profile: The proposed X-Craft looks like military vessel with a rather "hostile" profile. Given the foreign waters this vessel would have to operate in, the look should be "softened" so it appears more like a benign research vessel.