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DEPARTMENT OF THE NAVY

Memorandum

FROM: Lori L. Fanney (Code 23 – Navy Standard RIB Project Engineer)
Naval Surface Warfare Center,
Carderock Division, Norfolk Detachment
Combatant Craft Department (CCD)

TO: Robert Trivett
Defense Supply Center Columbus

REF: (a) NSWC DET NORFOLK Memorandum dtd 11 Jul 2000
(b) Technical Memorandum, CDNSWC-TM-20-93-78

SUBJECT: BEST VALUE TECHNICAL INPUT FOR INFLATABLE TUBE ASSEMBLIES

1. The Navy Standard 7 meter or 24 foot Rigid Inflatable Boat (RIB) utilizes a seven chamber inflatable tube which is mechanically fastened to the fiberglass boat structure. The current National Stock Number (NSN) for the inflatable tube is 9C2040-01-411-4558, Cage 58367, part number 111-001.
2. Reference (a) identifies suitable alternative tube assemblies for the Navy Standard 7 meter or 24 foot Rigid Inflatable Boat (RIB). The purpose of this memo is to document the Combatant Craft Department's experience with and the technical advantages of tubes constructed of polyurethane coated fabric vice Hypalon coated fabric.
3. Over 300 Navy Standard 7 meter or 24 foot RIBs have been in use for up to 13 years. Until 1999, all Navy Standard 7 meter or 24 foot RIB tubes were constructed of Hypalon coated fabric (nominal coated fabric weight of 41 oz/sq yd). Beginning in 1999, as RIBs were overhauled and tubes replaced, the Navy began systematic replacement of the Hypalon coated tube with polyurethane coated tubes (nominal coated fabric weight of 40 oz/sq yd). In addition, most recently procured RIBs have been configured with polyurethane coated tubes. The most readily notable difference of the polyurethane coated tubes is their superior air retention capability. The difference between the two materials is dramatic and can be readily seen by examining RIBs with both types of tubes in storage under identical conditions at the FISC, Cheatham Annex boat storage facility. The use of polyurethane tubes on boats in service dramatically reduces the fleet's daily operational effort of inflating (i.e., topping off) the seven tube chambers on a RIB. RIBs with polyurethane tubes need not be inflated nearly as frequently as RIBs with Hypalon tubes.
4. Tubes constructed of polyurethane coated fabric exhibit better key physical properties than tubes constructed of Hypalon coated fabric. Reference (b) provides

specific details and shows polyurethane coated fabric has better tensile strength, tearing strength, puncture resistance, coating adhesion and abrasion resistance. These improved properties result in a longer expected service life for the tubes. Anecdotal evidence of polyurethane tubes in service confirms this. The expected service life of a Hypalon tube is five years; the expected service life of a comparable polyurethane tube is seven to eight years.

5. The required operational capabilities for Navy Standard 7 meter or 24 foot RIBs have changed from those when the RIB was originally introduced to the fleet in 1987 as a ship's ready service life boat and liberty boat. The versatility of the RIB and mission needs have resulted in the RIB being used for a variety of Maritime Interdiction Operations and Anti-Terrorism/Force Protection Operations. The conduct of these operations puts the tube in a severe service environment and any readily available improvement in tube performance can facilitate successful mission completion.

6. The Navy Standard 7 meter/24 foot RIB is a weight critical boat. That is, the boat's hoisting weight is very close to the limits of many of the ship's davits. Hypalon coated tubes are manufactured using adhesives. Because polyurethane tubes are constructed using a heat welded joining process, a lower overall tube weight can be achieved using comparable weight coated fabric. The weight reduction is typically on the order of 8 percent and this is significant in the case of the Navy Standard 7 meter or 24 foot RIB application.

7. For these reasons, polyurethane coated tubes, manufactured of nominal coated fabric weight of 40 oz/sq yd material are deemed the best value for the Navy Standard 7 meter or 24 foot RIB application.

