



DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND
1333 ISAAC HULL AVE SE
WASHINGTON NAVY YARD DC 20376-0001

IN REPLY TO:

9085
Ser 399A38/0127
APR 10 2009

From: Commander, Naval Sea Systems Command (PMS399)
To: Commander, Portsmouth Naval Shipyard (Code 206)
Subj: ADVANCED SEAL DELIVERY SYSTEM (ASDS); ENGINEERING CHANGE PROPOSAL (ECP) ASDS-ECP-081 REVISION B, HYDRAULIC OIL REPLACEMENT

Ref: (a) NGC ltr 1900.0609 of 03 April 2007
(b) ASDS Engineering Change Proposal ASDS-ECP-081 Revision B, Hydraulic Oil Replacement
(c) NAVSEA ltr 9556 Ser 399A32/0506 of 12 October 2005
(d) NAVSHPYD PTSMH ltr Ser 206/265 of 21 December 2007

Encl: (1) Signed Copy of Engineering Change Proposal ASDS-ECP-081 Revision B, Hydraulic Oil Replacement
(2) NAVSEA Comments to Engineering Change Proposal ASDS-ECP-081 Revision B, Hydraulic Oil Replacement


1. **Background:** Reference (a) submitted reference (b) to the ASDS Planning Yard (PY) for review. Reference (b) incorporated NAVSEA comments from reference (c). The ASDS PY submitted reference (b) to NAVSEA for review and approval via reference (d).

2. **Discussion:** NAVSEA has reviewed and concurs with reference (b) and includes as enclosure (1) a signed copy of the Engineering Change Proposal DD Form 1692. Reference (b) includes the required information for it to be approved as an Engineering Change Proposal (ECP), but there is more information required for the Field Change (FC). Enclosure (2) is NAVSEA comments to reference (b) and is forwarded to the ASDS PY to be incorporated into the submission of the FC and associated Technical Data Package (TDP).

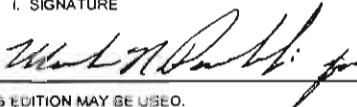
3. **ASDS PY Action:** The ASDS PY shall incorporate the comments from enclosure (2) and forward the final FC and TDP to NAVSEA for review and approval. The ASDS PY shall submit to NAVSEA no later than 30 September 2009, an updated schedule of the effort from submission of the FC and TDP to the installation of the FC kit on ASDS.

Subj: ADVANCED SEAL DELIVERY SYSTEM (ASDS); ENGINEERING CHANGE
PROPOSAL (ECP) ASDS-ECP-081 REVISION B, HYDRAULIC OIL
REPLACEMENT

4. The NAVSEA point of contact for this is Mr. Kevin Lewis at
(202) 781-1576 or e-mail kevin.m.lewis1.ctr@navy.mil.


D. M. DURYEA, CAPT, USN
Program Manager
SOF Undersea Mobility Program

Copy to:
COMNAVSPECWARCOM N84
NAVSHIPYD Portsmouth, NH (206, 200DSS.01, 206.2, 206.2BS)
Northrop Grumman Corporation (Cefaratti, Rindos)

ENGINEERING CHANGE PROPOSAL (ECP), PAGE 1				1. DATE (YYYYMMDD) 20070328		FORM APPROVED OMB No. 0704-0188	
<p>The public reporting burden for this collection of information is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.</p> <p>PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THIS ADDRESS. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICER FOR THE CONTRACT/PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THIS FORM.</p>						2. PROCURING ACTIVITY NO.	
						3. DODAAC	
4. ORIGINATOR		b. ADDRESS (Street, City, State, Zip Code)		5. CLASS OF ECP			
a. TYPED NAME (First, Middle initial, Last)		P.O Box 1488 MS 9105		Class 1			
Paul Kretschmer		Annapolis, MD 21404		6. JUST. CODE		7. PRIORITY	
				O		Enhancement	
8. ECP DESIGNATION				9. BASELINE AFFECTED			
a. MODEL/TYPE		b. CAGE CODE		c. SYSTEM DESIGNATION		FUNCTIONAL <input type="checkbox"/> PRODUCT <input checked="" type="checkbox"/>	
5793316		31442		ASDS		ALLOCATED <input type="checkbox"/>	
d. ECP NO.			e. TYPE	f. REV	10. OTHER SYS./CONFIG. ITEMS AFFECTED		
ASDS1-ECP-03-05			F	B	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>		
11. SPECIFICATIONS AFFECTED				12. DRAWINGS AFFECTED			
	CAGE Code	Specification/Document No.		Rev.	SCN	CAGE Code	Number
e. SYSTEM	53711	5793384				Various	See attached DCACS
b. DEVELOPMENT							
c. PRODUCT	53711	6394994					
13. TITLE OF CHANGE							
Hydraulic Oil Replacement							
14. CONTRACT NO. AND LINE ITEM				15. PROCURING CONTRACTING OFFICER			
N00024-04-G-6202				a. NAME (First, Middle Initial, Last) John Piuanno			
				b. CODE SEA02622P		c. TELEPHONE NO. 202-781-1535	
16. CONFIGURATION ITEM NOMENCLATURE						17. IN PRODUCTION	
ASDS Submersible Auxiliary Subsystem						YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	
18. ALL LOWER LEVEL ITEMS AFFECTED							
a. NOMENCLATURE			b. PART NO.		c. NSN		
/arious			Various		TBD		
19. DESCRIPTION OF CHANGE							
Changes will occur under 2 phases. First phase will update all documentation to switch hydraulic working fluid to Bio-Ultimax 1000 ISO 32 and develop a field change data package. Phase 2 will drain the current working fluid from ASDS and refill/test the hydraulic system with Bio-Ultimax 1000 ISO 32.							
20. NEED FOR CHANGE							
1) The current oil, Castrol Food Grade Oil – Grade 130, was to be discontinued by Castrol in 1995. BP Lubricants bought Castrol in 1996. BP has not been clear whether production of Castrol 130 will continue or if it will be discontinued. 2) The proposed hydraulic fluid, Bio-Ultimax 1000 ISO 32, improves the kinematic viscosity at fluid operating temperatures below 50°F. It will reduce the pressure drop in the suction line of the pumps at cold operating temperatures and delay the onset of pump cavitation. At temperatures above 50°F, system pumps, actuators and winch motors will have better volumetric efficiency. The slight rise in pressure losses above 50°F due to higher kinematic viscosity will not affect system performance.							
21. PRODUCTION EFFECTIVITY BY SERIAL NUMBER				22. EFFECT ON PRODUCTION DELIVERY SCHEDULE			
01				None (See attached SOW for ECP development schedule)			
23. RETROFIT							
a. RECOMMENDED ITEM EFFECTIVITY				b. SHIP/VEHICLE CLASS AFFECTED			
01				ASDS			
c. ESTIMATED KIT DELIVERY SCHEDULE				d. LOCATIONS OR SHIP/VEHICLE NUMBERS AFFECTED			
See attached SOW				Pearl Harbor, HI			
24. ESTIMATED COSTS/SAVINGS UNDER CONTRACT				25. ESTIMATED NET TOTAL COSTS/SAVINGS			
				\$601,000			
26. SUBMITTING ACTIVITY				b. TITLE			
a. AUTHORIZED SIGNATURE				ASDS Engineering Manager			
27. APPROVAL/DISAPPROVAL							
a. CLASS I		b. CLASS II		c. CLASS II			
<input type="checkbox"/> APPROVAL RECOMMENDED	<input type="checkbox"/> DISAPPROVAL RECOMMENDED	<input type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED	<input type="checkbox"/> CONCUR IN CLASSIFICATION OF CHANGE	<input type="checkbox"/> DO NOT CONCUR IN CLASSIFICATION OF CHANGE		
d. GOVERNMENT ACTIVITY				e. SIGNATURE		f. DATE SIGNED (YYYYMMDD)	
APPROVAL				h. GOVERNMENT ACTIVITY		i. SIGNATURE	
APPROVED <input checked="" type="checkbox"/>	DISAPPROVED <input type="checkbox"/>	NAVEA PMS399				2007/04/10	

DD FORM 1692, AUG 96 (EG)

PREVIOUS EDITION MAY BE USED.

ENGINEERING CHANGE PROPOSAL (ECP), PAGE 2

**FORM APPROVED
OMB NO. 0704-0188**

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PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THIS ADDRESS. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICE FOR THE CONTRACT/PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THE COMPLETED DD FORM 1692.

ECP NUMBER
ASDS1-ECP-03-05

EFFECTS ON FUNCTIONAL/ALLOCATED CONFIGURATION DOCUMENTATION

28. OTHER SYSTEM AFFECTED

None

29. OTHER CONTRACTORS/ACTIVITIES AFFECTED

PNSY
NAVICP

30. CONFIGURATION ITEMS AFFECTED

There are no drawings outside of the purview of NGC.
See Section 6.3 in Design Certification Attribute Check Sheet.

31. EFFECTS ON PERFORMANCE ALLOCATIONS AND INTERFACES IN SYSTEM SPECIFICATION

Current hydraulic fluid (Castrol 130), when operating at cold temperatures, exhibits pressure losses in the suction piping that can cause cavitation of the pumps due to increased viscous effects. The proposed hydraulic fluid, Bio-Ultimax 1000 ISO 32, is less viscous at lower working temperatures (< 50 °F) and therefore, system pump performance is improved. The result is an increase in suction pressure at the hydraulic pump inlet and less likelihood of pump cavitation. Less line pressure losses in flow paths to hydraulic services will result in better actuator and winch operation at cold temperatures. At temperatures between 55 – 100 °F, increased pressure losses, because of increased viscosity, will not adversely affect system performance. At higher operating temperatures between 100-140° F, the higher viscosity will improve volumetric efficiency of the pump, actuators and anchor winch because of less leak-by. Differences in pressure losses at these temperatures are negligible.

32. EFFECTS ON EMPLOYMENT, INTEGRATED LOGISTICS SUPPORT, TRAINING, OPERATIONAL EFFECTIVENESS OR SOFTWARE

The current fluid is bought via a Vendor Item Drawing (VID) 6394994 titled "ASDS Hydraulic Working Fluid". A new VID will be released titled "Bio-Ultimax 1000, ASDS Hydraulic Working Fluid" with document number 7327248. Components of the hydraulic system that are controlled by VID's and CID's will replace 6394994 with 7327248 wherever it is referenced within the VID or CID. The difference in viscosity and chemistry between the old and proposed fluid over ASDS operating temperature range is not sufficient to change performance requirements of components. See list of affected documents in Section 6.3 of Certification Attribute Check Sheet.

33. EFFECTS ON CONFIGURATION ITEM SPECIFICATIONS

A new A-sized specification drawing for ASDS Hydraulic Working Fluid will be developed. The number will be 7327248. The drawing title will be "Bio-Ultimax 1000, ASDS Hydraulic Working Fluid".

34. DEVELOPMENTAL REQUIREMENTS AND STATUS

No major revision of the development program is required.

35. TRADE-OFFS AND ALTERNATIVE SOLUTIONS

See Enclosure 1c for trades between MIL-PRF-17672D, 2075 T-H and Bio-Ultimax 1000, ISO 32. The major difference is the use of Bio-Ultimax will result in lower system pressure losses at temperatures less than 90 °F over 2075 T-H. The use of 2075 T-H will make system performance below 50 °F worse than is presently realized from the use of Castrol 130. Bio-Ultimax represents a slight improvement over Castrol at these temperatures. 2075 T-H will also require a monitoring program to mitigate off-gassing in the OC and LIO compartments in the event of spills or leakage. The level of mitigating action is higher than that required if using Bio-Ultimax (see Enclosures f and g).

6. DATE BY WHICH CONTRACTUAL AUTHORITY IS NEEDED (YYYYMMDD)

20050401

ENGINEERING CHANGE PROPOSAL (ECP), PAGE 3

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ECP NUMBER
ASDS-ECP-03-05

EFFECTS ON PRODUCT CONFIGURATION DOCUMENTATION, LOGISTICS AND OPERATIONS

<input checked="" type="checkbox"/>	FACTOR	ENCL.	PAR.	<input checked="" type="checkbox"/>	FACTOR	ENCL.	PAR.
	37. EFFECT ON PRODUCT CONFIGURATION DOCUMENTATION OR CONTRACT				39. EFFECT ON OPERATIONAL EMPLOYMENT		
<input checked="" type="checkbox"/>	a. PERFORMANCE	1c	Tab1	<input checked="" type="checkbox"/>	a. SAFETY	1b	7.3
<input checked="" type="checkbox"/>	b. WEIGHT-BALANCE-STABILITY (<i>Aircraft</i>)	1b	5.6		b. SURVIVABILITY		
	c. WEIGHT-MOMENT (<i>Other equipment</i>)				c. RELIABILITY		
	d. CDRL, TECHNICAL DATA				d. MAINTAINABILITY		
	e. NOMENCLATURE				e. SERVICE LIFE		
				<input checked="" type="checkbox"/>	f. OPERATING PROCEDURES	1b	7.1
	38. EFFECT ON INTEGRATED LOGISTICS SUPPORT (ILS) ELEMENTS				g. ELECTROMAGNETIC INTERFERENCE		
<input checked="" type="checkbox"/>	a. ILS PLANS	1b	7.6		h. ACTIVATION SCHEDULE		
<input checked="" type="checkbox"/>	b. MAINTENANCE CONCEPT, PLANS AND PROCEDURES	1b	7.4		i. CRITICAL SINGLE POINT FAILURE ITEMS		
	c. LOGISTICS SUPPORT ANALYSES				j. INTEROPERABILITY		
	d. INTERIM SUPPORT PROGRAMS						
<input checked="" type="checkbox"/>	e. SPARES AND REPAIR PARTS	1b	7.5		40. OTHER CONSIDERATIONS		
<input checked="" type="checkbox"/>	f. TECH MANUALS/PROGRAMMING TAPES	1b	7.6		a. INTERFACE		
	g. FACILITIES				b. OTHER AFFECTED EQUIPMENT/GFE/GFP		
	h. SUPPORT EQUIPMENT				c. PHYSICAL CONSTRAINTS		
<input checked="" type="checkbox"/>	i. OPERATOR TRAINING	1b	7.1		d. COMPUTER PROGRAMS AND RESOURCES		
	j. OPERATING TRAINING EQUIPMENT				e. REWORK OF OTHER EQUIPMENT		
<input checked="" type="checkbox"/>	k. MAINTENANCE TRAINING	1b	7.2		f. SYSTEM TEST PROCEDURES		
	l. MAINTENANCE TRAINING EQUIPMENT				g. WARRANTY/GUARANTEE		
	m. CONTRACT MAINTENANCE				h. PARTS CONTROL		
	n. PACKAGING, HANDLING, STORAGE, TRANSPORTABILITY				i. LIFE CYCLE COSTS		

41. ALTERNATE SOLUTIONS

Considered using MIL-PRF-17672D, 2075 T-H which is a standard submarine external hydraulic fluid.

42. DEVELOPMENTAL STATUS

No items under development.

43. RECOMMENDATIONS FOR RETROFIT

Retrofit into ASDS Boat 1 at first available maintenance interval.

44. WORK-HOURS PER UNIT TO INSTALL RETROFIT KITS

a. ORGANIZATION N/A	b. INTERMEDIATE N/A	c. DEPOT N/A	d. OTHER N/A
------------------------	------------------------	-----------------	-----------------

45. WORK-HOURS TO CONDUCT SYSTEM TESTS AFTER RETROFIT

324 man-hours (included in out of service time)

46. THIS CHANGE MUST BE ACCOMPLISHED

BEFORE WITH AFTER THE FOLLOWING CHANGES

47. IS CONTRACTOR FIELD SERVICE ENGINEERING REQUIRED?

YES NO

48. OUT OF SERVICE TIME

6 weeks

49. EFFECT OF THIS ECP AND PREVIOUSLY APPROVED ECP'S ON ITEM

50. DATE CONTRACTUAL AUTHORITY NEEDED FOR (YYYYMMDD)

a. PRODUCTION

b. RETROFIT

20050601

NAVSEA Comments to ASDS-ECP-081 Revision B,
Hydraulic Oil Replacement

1. Hazard Report Records (HRR) list required mitigating actions which are not included in this Engineering Change Proposal (ECP). These include drawing changes, Maintenance changes, Procedure changes, technical manual changes, and required testing.

2. Hazard Report Records General Comments:

a. HRR A015(A):

- i. The HRR needs to specify that Bio-Ultimax 1000 (Iso32) ASDS Formulation is the new Hydraulic Oil used.
- ii. Mitigating action 7 does not have the reference or approval columns filled out to correctly mitigate the concern.

b. HRR FH029(A):

- i. The HRR needs to specify that Bio-Ultimax 1000 (Iso32) ASDS Formulation is the new Hydraulic Oil used.
- ii. The reference and approval columns for the mitigating actions needs to be completely filled out. The approval can be included as part of the Field Change approval. Include the RN for the change to the toxicity and flammability list.
- iii. Change Mitigating action 2 to read "Add LIO Isolation Valves HM-201 and HM-208 to access to Vital Equipment List and test."
- iv. Remark 1 lists the flash point for Bio-Ultimax 1000 (Iso32) ASDS Formulation as 500 Deg F instead of the 457 Deg that is listed in the ECP.
- v. Revise the forth and fifth sentences of Remark 3 to read "HRR A044 has been added to capture EP changes. Existing ASDS HRR FH001, A015, A015(A), and FH013 address design and installation aspects for the hydraulic system."

c. HRR A044:

- i. HRR is still listing the risk as undesirable. Need to mitigate this to an acceptable level.
- ii. The HRR needs to specify that Bio-Ultimax 1000 (Iso32) ASDS Formulation is the new Hydraulic Oil used.
- iii. The reference and approval columns for the mitigating actions needs to be completely filled out. The approval can be included as part of the Field Change approval. This should also include the RN for the change to the Toxicity and Flammability list.
- iv. Mitigating action 2 also mitigates additional fire hazard concerns that may exist with an oil in a fine mist. Revise HRR to add this mitigating action.
- v. The OC hydraulic components and flex hoses located behind racks and cabinets limits exposure of personnel which further mitigates the risk. Revise HRR to add this mitigating action.
- vi. Mitigating action 5, delete "section V" in the last sentence.
- vii. Remark 1 lists the flash point for Bio-Ultimax 1000 (Iso32) ASDS Formulation as 500 Deg F instead of the 457 Deg that is listed in the ECP.

3. The Field Change submittal must be in the format described in the ASDS Configuration Management Plan.

NAVSEA Comments to ASDS-ECP-081 Revision B,
Hydraulic Oil Replacement

4. In the Design Certification Attribute Check Sheet Addendum, Paragraph 7.4, the MRC to deliver hydraulic sample to lab for testing is incorrectly identified as C81K rather than C8AK.
5. Drawing 6394994 will need to be updated with the new hydraulic fluid. There are several Maintenance Standards (MS) that refer to this drawing. Specifically, the drawing mentions that the oil should be a mineral based oil rather than a vegetable based oil.
6. Three Allowed Parts List (APL) , 990990718, 99A000099, and 58A060002, reference the Castrol oil NSN 9B-9150-01-518-0890 and ASDS drawing 6394994. A new part number will have to be assigned to the new oil and the APLs will have to be updated.