FEB 17 1988

DEPARTMENT OF THE NAVY

SHORE INTERMEDIATE MAINTENANCE ACTIVITY, LITTLE CREEK
NORFOLK, VIRGINIA 23521

4700
Ser R-2/ 114
FEB 11 198

From: Commanding Officer, Shore Intermediate Maintenance Activity, Little Creek
To: Commander, Naval Surface Force, U. S. Atlantic Fleet

Subj: WATER BASED IN-SERVICE ENGINE CLEANER TEST RESULTS

Ref: (a) COMNAVSURFLANT ltr 4000 Ser N4212A/00128 of 6 Jan 88

Encl: (1) Diesel Inspector's Report

1. In accordance with reference (a), a used 6 cylinder boat engine was obtained, prepared and tested by SIMA Little Creek Engine Shop. SIMA Little Creek Diesel Inspector ENCS(SS) J. D. Spencer inspected the engine prior to and after the test.

2. Enclosure (1) is forwarded for your information.

J. B. TABOR

Copy to:
COMNAVSURFLANT (Code N42)
NAVSSES Philadelphia Division (Code 031B)
COMNAVSURFLANT READSUPPGRU Norfolk (Code 442)
NAVSEACENLANT (Code 512)
COMNAVSYSCOM (Code 56X33)
SIMA LCREEK Diesel Inspector
TELEFLEX, Inc.

A. DIESEL INSPECTION REPORT

1. As directed by reference (a) a 6/71 DETROIT Diesel Boat Engine was obtained by SIMA Little Creek for the purpose of testing a water based in-service diesel engine cleaner.

2. Number 3 and 4 Power Units and the scavenging air blower were replaced with new units. The internal parts of the engine were inspected prior to the operational test of the engine.

3. The findings of the first inspection are as follows:

(a) Engine hours are unknown.

(b) There was minor accumulation of carbon in the exhaust manifold, on the piston crowns, on the combustion area of the cylinder head and liners of Numbers 1, 2, 5 and 6 units.

(c) There was minor accumulation of oily sludge and dirt in the air boxes.

(d) Number 1, 2, 5 and 6 pistons and piston rings appeared to be new.

4. The engine operational test was conducted by SIMA Little Creek Engine Shop on the shop's dynometer for a 12 hour period at various speeds and loads up to 100% load. The engine cleaner was injected at 30 minute intervals while the engine was at a idle, no load condition.

5. The engine was disassembled and the internal parts re-inspected. The findings of the second inspection are as follows:

(a) The accumulation of carbon in the exhaust manifold had increased slightly. However the carbon had a gray color as would be expected of an engine operated under a load and in good mechanical condition.

(b) The accumulation of oily sludge and dirt in the air box on the blower side of the engine was cleaned to bare metal except in the corner pockets.

(c) The sludge in the air box opposite the blower side of the engine was no longer a sludge but a thin oily deposit.

(d) Number 5 piston crown was wet and obviously had not been firing properly. The cause was hard to determine as the piston did not have the normal appearance of a misfiring cylinder. There was no appreciable accumulation of carbon on the piston or indication of excess fuel in the cylinder. In my opinion the wet appearance was caused from the cleaner not being dissipated in the cylinder.

(e) All cylinder liners had a minor accumulation of carbon in the combustion spaces.

(f) The carbon deposits in the top ring grooves of the "old" pistons were beginning to dissolve.

6. DISCUSSION. It is my opinion that the engine cleaner was working to clean the engine, especially in the air box on the blower side of the engine and at the top piston ring grooves. I feel that the cleaner would have shown better results if it had been injected

while the engine was under a load. Considering the periods which the engine was operated at idle speed with no load, I expected more carbon accumulation in the combustion spaces and the ring grooves.

J. D. Spencer

J. D. SPENCER
Fleet Diesel Inspector