PREPRODUCTION INITIATIVE-NELP
OIL RECYCLER (TUG BOAT)
TEST PLAN

SITE: NS MAYPORT

1.0 OBJECTIVE

This test plan describes the data collection procedures that will be used to gather performance data on the TF Purifiner ultra-high bypass filter for diesel engine oil.

2.0 BACKGROUND

Currently, NS Mayport generates more than 50,000 pounds of waste engine oil per year. The costs associated with oil usage (such as material, labor, storage, and waste disposal) make usage reduction a primary consideration. At this time, oil changes in government equipment are determined by one of two ways—either the oil is contaminated or the time interval maintenance cycle has been reached. Although this maintenance concept ensures that the equipment is well-maintained, it does not help reduce oil consumption and waste. Studies on oil degradation, contamination, and engine wear have shown that if the oil is filtered to remove contaminants greater than 1 micron, the oil does not have to be changed. In fact, some data have shown that in-service, highly-filtered oil improves with age. To better assess this technology and its viability for government equipment, an ultra-high batch filtration system was selected for evaluation. The filtration system selected is manufactured by TF Purifiner, Inc. The filtration system will be evaluated for 1 year on a tug boat at NS Mayport. The equipment will be maintained by Harbor Operations.

3.0 TEST PLAN

This test plan describes the test, procedures for performing the test, and directions for collecting and recording the test data.

3.1 Test Description

This section describes the test plan for the tug boat. These procedures shall incorporate the manufacturer's recommended maintenance schedule for filter change and oil sampling. The following is a general outline of the test plan for the tug boat main diesels in conjunction with the TF Purifiner batch filtration system.

3.1.1 Installation Procedures

- Install the hydraulic quick disconnects on the heater preheater for interfacing with the TF Purifiner system.
- At the time of installation, oil samples of the old oil will be taken and tested by a laboratory to provide baseline data on the

condition of the engine. Also, oil samples of the new oil will be taken and tested by a laboratory to provide baseline information on the new oil.

- The following information was determined during installation:

- Tug boat number: Tug #1
- Tug boat serial number: 769
- Engine manufacturer: Fairbanks Morse
- Engine model number: 38D 8 1/8
- Engine serial number: 9702812
- Crankcase capacity: 215 main with a preheater 350 gallons
- Oil specification: 10W50
- Date installed: 19 April 1995
- Hours on engine: 621 hours since rebuild

3.1.2 Normal Operating Procedures

- Run the engine for 30 minutes, take an oil sample, and mail the sample for testing.
- Connect the TF Purifiner batch filtration system to the oil warmer system.
- Run the TF Purifiner system for 15 continuous hours on the first day.
- Take an oil sample and mail the sample for testing.
- Run the TF Purifiner system for 15 continuous hours on the second day.
- Take an oil sample and mail the sample for testing.
- Change the oil filters in the TF Purifiner system.
- Use the engine in normal operations.
- Run the engine for 2 weeks.
- Repeat filtration cycle for a period of 6 months.

Note: If daily/weekly oil samples show significant fuel/water dilution:

- Connect the TF Purifiner batch filtration system and run for 15 continuous hours.

- Shut down the engine and take an oil sample.
- Mail the sample for testing.

3.2 Oil Sampling

The site was provided with oil analysis test kits to simplify the testing and analysis of the oil being filtered by the TF Purifiner filter systems. Oil samples will be taken prior to and at the end of every batch filtration process.

Follow these procedures when taking oil samples.

1. Always take an oil sample when the oil is hot and after the engine has run for 30 minutes.

2. Remove the dust cap from the Purifiner oil sample valve at the bottom of the unit.

3. With the engine running, open the sample valve and flush the sample bottle twice with oil before taking the final sample. After flushing, fill up the oil sample bottle. Label the sample appropriately.

4. Make sure the sample valve is closed tightly and replace the dust cap.

5. Complete the laboratory submission data sheet shown in Table 1. The sheet is partially completed. Complete a new sheet each time a sample is taken.

6. Place the completed sheet in the appropriate shipping container with the oil sample and mail to the laboratory for testing.

4.0 REPORTING

Each month, the test site shall forward copies of the data logged in Table 1 to the Naval Air Warfare Center, Aircraft Division, Lakehurst (NAWCADLKE). The data entry form is a concise method of data collection. Data will be collected for 1 year. During this time, periodic status reports on the testing will be submitted to NAWCADLKE. The final report will include detailed results and observations, assess the efficiency and cost-effectiveness of the unit, and evaluate its ability to interface with site operations.

Table 1
Laboratory Submission Data Sheet

Sample number:	
Date taken:	
Time on engine:	
Sample taken before or after filtration:	
Tug boat number:	Tug #1
Tug boat serial number:	769
Engine manufacturer:	Fairbanks Morse
Engine model number:	38D 8 1/8
Engine serial number:	9702812
Oil specification:	10W50
Hours on engine at the start of test:	621 hours since rebuild

Qualitative Assessment*:
Please comment on the effectiveness and efficiency of the unit.

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*Attach extra sheet if required