

**PREPRODUCTION INITIATIVE-NELP  
OIL RECYCLER (NC-8A-1 MEPP AND A/S 32A-30A TOW TRACTOR)  
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 support equipment (SE) 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 two different types of SE. One is a NC-8A MEPP unit and the other is an AS-32A-30A tow tractor. The equipment will be maintained by AIMD maintenance ship, Building 1553.

**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 NC-8A and 32A-30A SE units. These procedures shall incorporate the manufacturer's recommended maintenance schedule for filter change and oil sampling.

**3.1.1 Installation Procedures**

At the time of installation, oil samples of the old oil were taken and tested by a laboratory to provide baseline data on the condition of the engine. The oil and full flow filters were changed when the TF purifier systems were installed. Also, oil samples of the new oil were take and tested by a laboratory to provide baseline information on the new oil. In

addition, particle testing using a Diagnostics portable contamination monitor was performed and logged in Tables 1 and 2, respectively.

- Take a sample of the old oil for laboratory testing and conduct a particle count on the old oil using a Diagnostics Portable Contamination Monitor.
- Drain the old oil and change the full flow oil filter.
- Install the TF Purifier filtration system.
- Take a sample of the new oil for laboratory testing and conduct a particle count on the new oil using a Diagnostics Portable Contamination Monitor.
- Fill the engine with the new oil.
- The following information was determined during installation for the NC-8A-1 MEPP unit:
  - SE model number: NC-8A-1
  - SE part number: 65A81-J1-03
  - SE serial number: 261-046
  - Engine manufacturer: Detroit Diesel
  - Engine model number: 50437201
  - Engine serial number: 400068565
  - Crankcase capacity: 7 qts.
  - Oil specification: MIL-L-2104E, OE/HDO-30, 30 wt.
  - TF Purifier model no.: TF-24-P
  - TF Purifier serial no.: 0295381
  - Date Installed: 7 March 1995
  - Hours on engine: 643.53
  - Purifier filter no.: TF-24F
- The following information was determined during installation for the A/S 32A-30A tow tractor.
  - SE model number: S32A-30A
  - SE part number: 60D60V
  - SE serial number: RYR310
  - Engine manufacturer: Continental, Teledyne WF Industries
  - Engine model number: TMD 27
  - Engine serial number: 92090381
  - Crankcase capacity: 16 qts.
  - Oil specification: MIL-L-2104E, OE/HDO-30, 30 wt.
  - TF Purifier model no.: TF-12-P
  - TF Purifier serial no.: 0295379

- Date installed: 9 March 1995
- Hours on engine: 336.0
- Purifier filter no.: TF-12F

### **3.1.2 Normal Operating Procedures**

- Take an oil sample every 30 days and send to the laboratory for testing. Conduct a particle count on the oil using a Diagnostics Portable Contamination Monitor.
- Log the particle count data and other applicable data in Tables 1, 2, and 3, as appropriate.
- Change the full flow filter and TF Purifier filter after 12 weeks. Only add oil. Do not change the oil.
- Continue taking an oil sample every 30 days and send to the laboratory for testing. Conduct a particle count on the oil using a Diagnostics Portable Contamination Monitor.
- Change the full flow filter and TF Purifier filter after 24 weeks. Only add oil. Do not change the oil.

### **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 Purifier filter systems. Oil samples will be taken every 30 days and when the filter is changed.

Follow these procedures when taking an oil sample.

1. Always take an oil sample when the oil is hot.
2. Remove the dustcap from the Purifier oil sample valve at the bottom of the unit.
3. With the engine running, open the sample valve and fill up (1) the oil sample bottle provided in the laboratory kit and (2) a test bottle for the particle count. Label the samples appropriately.
4. Make sure the sample valve is closed tightly and replace the dust cap.
5. Complete the laboratory submission data sheets shown in Table 3. Provide the following information on the sheet:
  - Sample number
  - Date taken

- Miles/hours on oil
  - Miles/hours on unit
  - Oil added (quarts)
  - Full flow filter change (yes/no)
  - Purifier filter change (yes/no)
6. Place the completed sheet in the shipping container with the oil sample and place in the mail.

#### **4.0 REPORTING**

Each month, the test site shall forward copies of the data logged in Tables 1, 2, and 3 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 3  
Laboratory Submission Data Sheet**

<b>Sample number:</b>		
<b>Date taken:</b>		
<b>Mile/hours on oil:</b>		
<b>Mile/hours on unit:</b>		
<b>Oil added (quarts):</b>		
<b>Full flow filter change:</b>	<b>Yes</b>	<b>No</b>
<b>Purifier filter change:</b>	<b>Yes</b>	<b>No</b>

**Qualitative Assessment\*:**

Please comment on the effectiveness and efficiency of the unit.

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\*Attach extra sheet if required