

PREPRODUCTION INITIATIVE-NELP ARRESTING GEAR CABLE AUTOMATIC LUBRICATOR TEST PLAN

SITE(S): NAWC LAKEHURST TEST SITE AND USS HARRY S TRUMAN

1.0 OBJECTIVE

This test plan describes the data collection procedure for determining the environmental and financial returns of the arresting gear cable automatic lubricator. The data will be reviewed to establish return on investment via indicators such as cost/benefit analysis, payback period, internal rate of return (IRR), and net present value (NPV).

Due to the usage options available for the lubricator, a phased approach has been chosen for the prototype test period. First, the Product Evaluation and Verification Department, Code 4.8.12.1, will select the usage/disposal method and develop criteria for monitoring lubricant quality. The lubricator will then be tested aboard the USS George Washington in an operational environment, where data will be collected regarding environmental and financial returns. Specifically, the unit will be evaluated on its ability to:

- reduce wasted lubricant caused by spills and inefficient application techniques
- reduce the amount of hazardous waste requiring disposal
- reduce the time and costs associated with lubricating the purchase cable.

2.0 DESCRIPTION

The wire rope is currently lubricated by pouring lubricant over the cable and wiping it with rags or by running the cable through a trough of lubricant, which is typically a 55-gallon drum cut in half with a round slot for the cable to fit through. The process is messy—resulting in lubricant spills on deck and lubricant-laden rags being disposed of as hazardous waste. The arresting gear cable automatic lubricator will eliminate spills by applying lubricant to the wire rope in a closed-loop system.

The cable lubricator has two main components—the main housing and the lubricant supply filtering system. The main housing unit is clamped around the wire rope with two brass nuts that are fitted to swing bolts. Two chains anchor the housing while the rope is pulled through. Low viscosity lubricant is pumped into a central chamber and, under pressure, is forced between the strands of the wire rope—thereby removing contaminants and spent lubricant. Air seals on either end of the liner remove (1) moisture before lubricant is introduced and (2) excess lubricant after application. These seals prevent lubricant from leaking outside the unit.

The supply filter system consists of a lubricant container with strainers, pump, air regulator, hoses, and fittings. Depending on the pressure used, the lubricant can be

strained and reused by passing through a strainer that removes large particulate matter and returning to the lubricant supply. For the direct disposal method, spent and excess lubricant is deposited into a disposal container rather than the lubricant supply. The entire process is controlled by two adjustments—an air regulator (which adjusts the volume of lubricant) and a needle valve (which adjusts air flow to the air seals).

3.0 TEST PLAN

The automatic lubricator will be tested at the Product Evaluation and Verification Department, Code 4.8.12.1, to determine whether the straining or direct disposal method will be used. If the straining method is chosen, the test department will develop criteria for monitoring lubricant quality and will determine the point at which lubricant changeout is required. The test department will also make any procedural changes required (*e.g.*, altering the frequency of cable changeout).

The lubrication method selected at the Product Evaluation and Verification Department will then be tested shipboard in an operational environment. Once in an operational environment, data will be collected to evaluate the unit's effectiveness in saving time and money and reducing waste volume.

3.1 Approach

Quantitative and qualitative data will be acquired by completion of Tables 1a, 1b, and 2.

3.1.1 Instructions for Completing Tables

The following data will be collected to evaluate the performance of the automatic lubricator. The data collected will be appropriate to the method selected by the Product Evaluation and Verification Department. In other words, use Table 1a if the straining method is selected and Table 1b if the direct disposal method is selected.

- **Straining Method—Table 1a**
 - **Date:** Indicate dates the unit was used.
 - **Cable Number:** Indicate which cable was lubricated on a given day.
 - **Length of Cable:** Indicate the length of cable lubricated on a given day.
 - **Time/Task:** Record the length of time required to lubricate each cable.
 - **Waste Volume:** Indicate the volume of lubricant requiring disposal.
 - **Number of Arrestments:** Indicate the number of arrestments of the cable prior to each lubrication.

- **Quality:** Based on the results of the criteria developed by the Product Evaluation and Verification Department for monitoring lubricant quality, indicate the quality of the lubricant at the time of lubrication.
- **Direct Disposal Method—Table 1b**
 - **Date:** Indicate dates the unit was used.
 - **Cable Number:** Indicate which cable was lubricated on a given day.
 - **Length of Cable:** Indicate the length of cable lubricated on a given day.
 - **Time/Task:** Record the length of time required to lubricate each cable.
 - **Waste Volume:** Indicate the volume of lubricant requiring disposal.
 - **Number of Arrestments:** Indicate the number of arrestments of the cable prior to each lubrication.
- **Consumables—Table 2**
 - **Date:** Indicate the date consumables were ordered.
 - **Item:** Record the item number (if known) and provide a brief description of the consumables ordered.
 - **Quantity/Volume:** Indicate the quantity or volume of any consumables ordered (*e.g.*, lubricant, liners, rags, etc.).
 - **Cost:** Indicate the cost of the consumables ordered.
- **Downtime/Month**
 - **Time Period:** Record dates when the unit was not in use.
 - **Reason:** Explain whether downtime was due to repairs, maintenance, workload, or other factors.
- **Repairs**
 - **Time:** Indicate the time required to repair the system.
 - **Parts:** List the repair parts required.
 - **Cost:** Record the cost of the parts and the labor required for repair.

- **Qualitative Assessment:** Provide a narrative evaluation of the capabilities of the cable lubricator. Briefly discuss:
 - efficiency and cost-effectiveness of the unit
 - ease-of-use and the unit’s ability to successfully interface with site operations.

4.0 REPORTING

The data entry forms are a concise method of data collection. Forms should be completed on a daily basis. 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 2

Consumables

Date	Item		Quantity/Volume	Cost
	Number	Description		

Downtime

Time Period	Reason

Time	Parts	Cost	
		Parts	Labor

Repairs

Qualitative Assessment*:

Please comment on the effectiveness and efficiency of the unit.

* Attach additional sheet if needed.

