MEL-Sponsored
Report 37/67

The investigation Reported Herein
Was Conducted Under
Contract Number 615 33 239866
for the

U. S. NAVY
MARINE ENGINEERING LABORATORY
Annapolis, Maryland
21402

FEASIBILITY OF USING THE GORATOR PUMP TO DISPOSE OF GALLEY WASTE

Submitted to:

U. S. Navy
Marine Engineering Laboratory
Annapolis, Maryland

Submitted by:

Dorr-Oliver Incorporated
Stamford, Connecticut

June 1966

I. CLIENT:

U. S. Navy
Marine Engineering Laboratory
Annapolis, Maryland

II. OBJECT OF TESTS:

To demonstrate the ability of the Gorator pump to produce a slurry of a submarine galley waste. A typical daily galley waste from a submarine is as follows:

Metal food containers	- 70#
Bottles and jars	- 5#
Paper, plastics, treated cartons	- 15#
Cloth, sacks, oil rags	- 5#
Fibre board cases	- 31#
Wood	- 13#
Bones, egg shells	- 5#
Garbage	- 75#
	219#

III. SAMPLE:

The prementioned galley waste materials were collected separately from the Hazleton, Pennsylvania area. They were stored in cardboard containers until the demonstration tests.

IV. TEST APPARATUS:

Figure 1 of the Appendix is a schematic diagram of the Gorator test stand. The waste material was fed into a hopper which contained at least 15 gallons of water for all tests. The waste material entering the pump, which operated at 1100 rpm, was powered by a 50 horsepower motor. The material crushed in the pump was recycled and was detained in the system at times ranging between 2 to 15 minutes. At the end of the test the valve was opened and solid material (what remained) was caught on a DSM screen for a visual observation.

Figure 2 of the Appendix is a photograph of the internal construction of the pump. The photo shows the rotor and the basket containing the stator teeth.

Figure 3 of the Appendix is a photograph of the discharge bars used for size control. The openings of the bars used in the tests reported herein were 1-1/2 inches.

V. DETAILS OF TEST:

A. The first test was run on a mixture of cans, soda bottles, jars, an oily glove, and a belt. The test was run for two minutes and then the valve was opened and the waste material was sprayed onto a DSM screen. A visual observation was made of the grind. All the material was less than 3/4 of an inch and this consisted of slivers of metal.

B. The second test was conducted by first making a slurry of water and cardboard. Tin cans were then added until it was noticed that the recycle system was plugged. The recycle pipe was dismantled and unplugged. Apparently a tin can had plugged the system from the previous week's run when no restriction bars were used within the unit. The recycle was reassembled and a water test was made which demonstrated excellent velocity of the recycle stream.

C. The third test consisted of weighing 5.0 pounds of combined waste material (tin cans, rags, paper, wood, etc.) and feeding it along with 15.2 gallons of water to the pump. The test was run for a period of 15 minutes. At the end of the test the sample was sprayed onto the DSM screen and a sample was collected for the client.

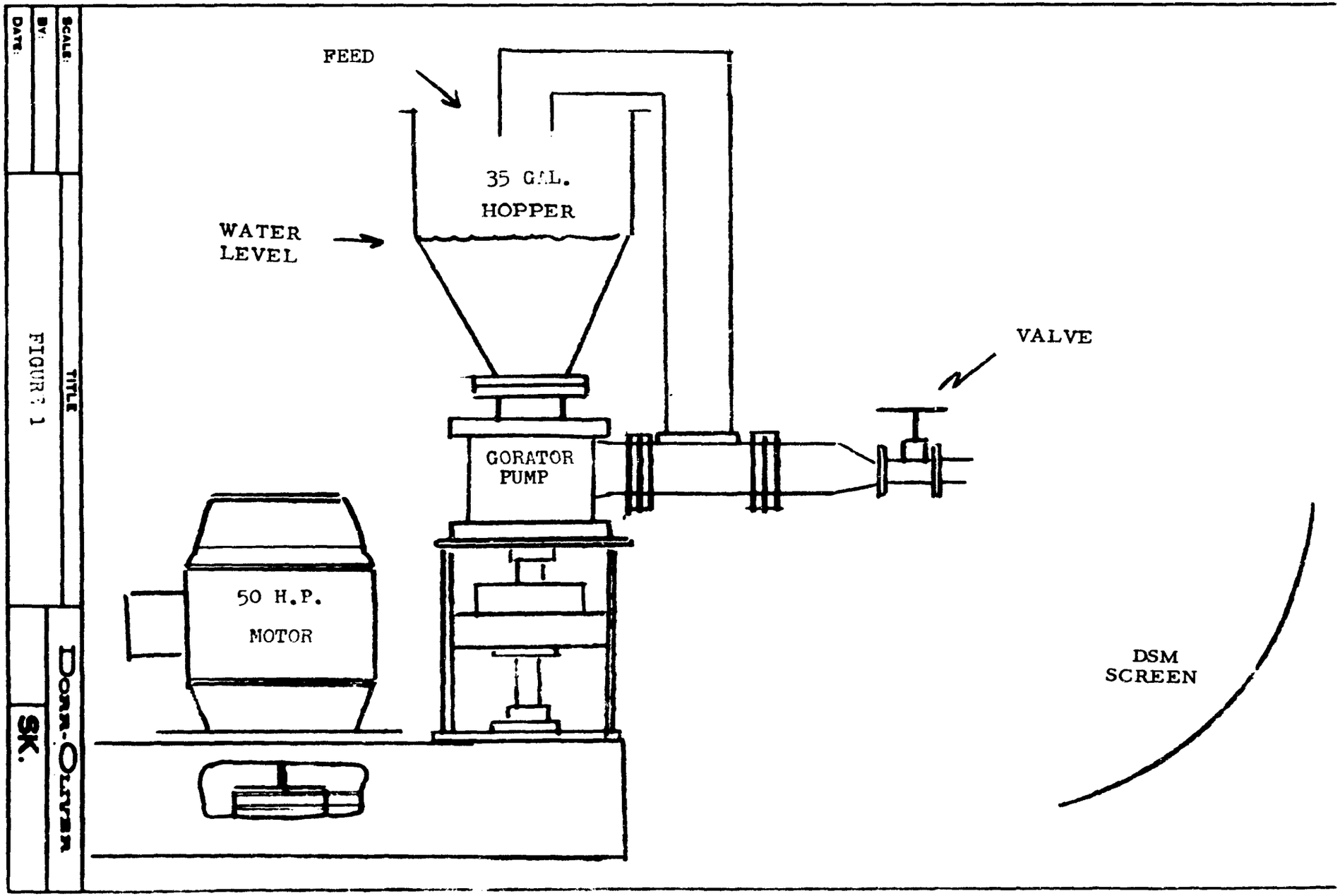
D. The fourth test was run with a beef bone fed along with some cardboard and tin cans. The test was discontinued after thirteen minutes when it was noted that the water level was not constant due to the inlet water not having been turned off. An excellent grind was attained and the client obtained a sample.

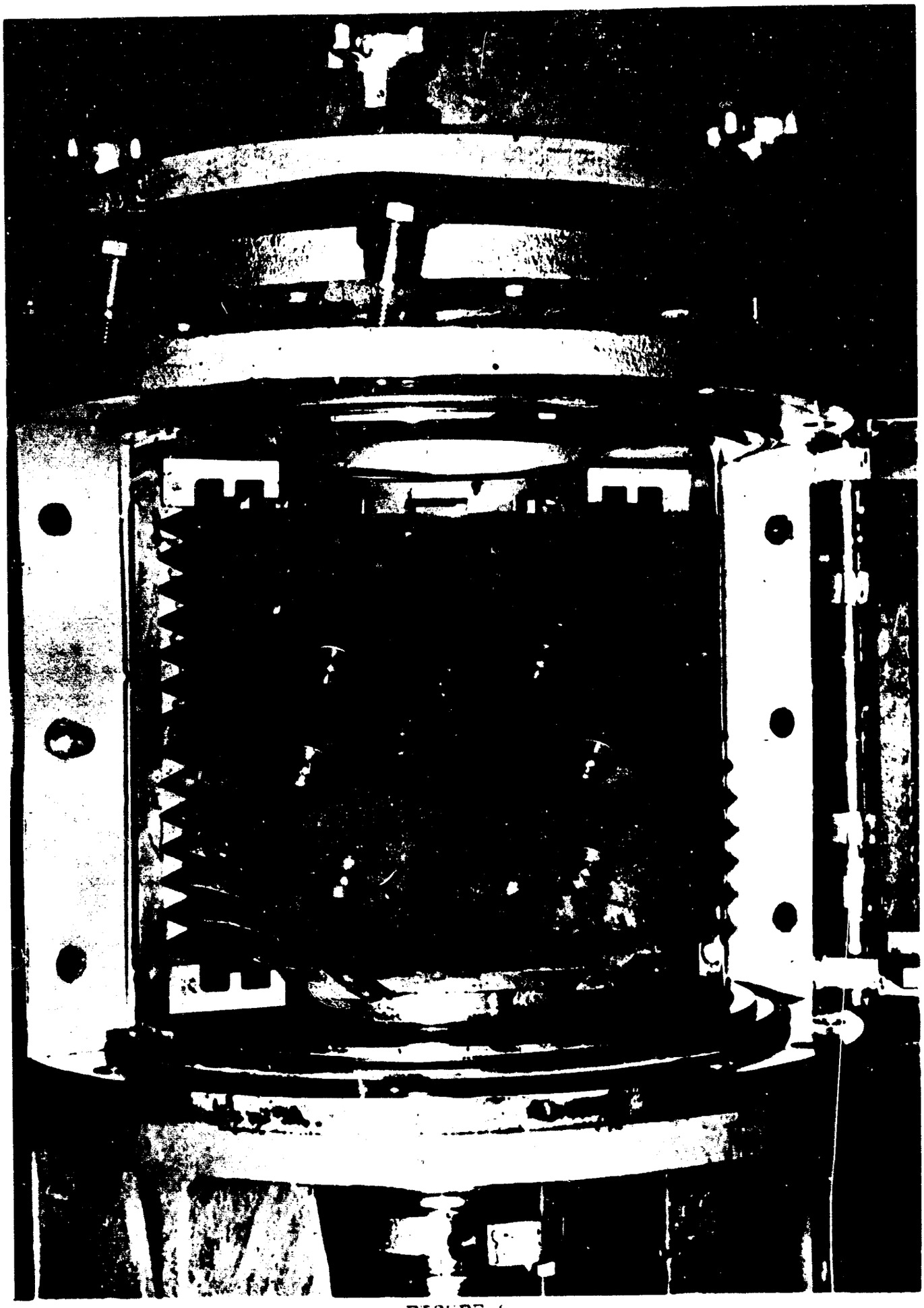
E. The fifth test consisted of weighing 12.0 pounds of solids containing various materials (mostly bones and tin cans) and feeding to the unit. Fifteen gallons of water were used for the slurry. The test was run for 15 minutes and then sprayed onto the DSM screen. The grind appeared to be very fine (< 1/4 inch) and a sample was obtained for the client.

VI. CONCLUSIONS:

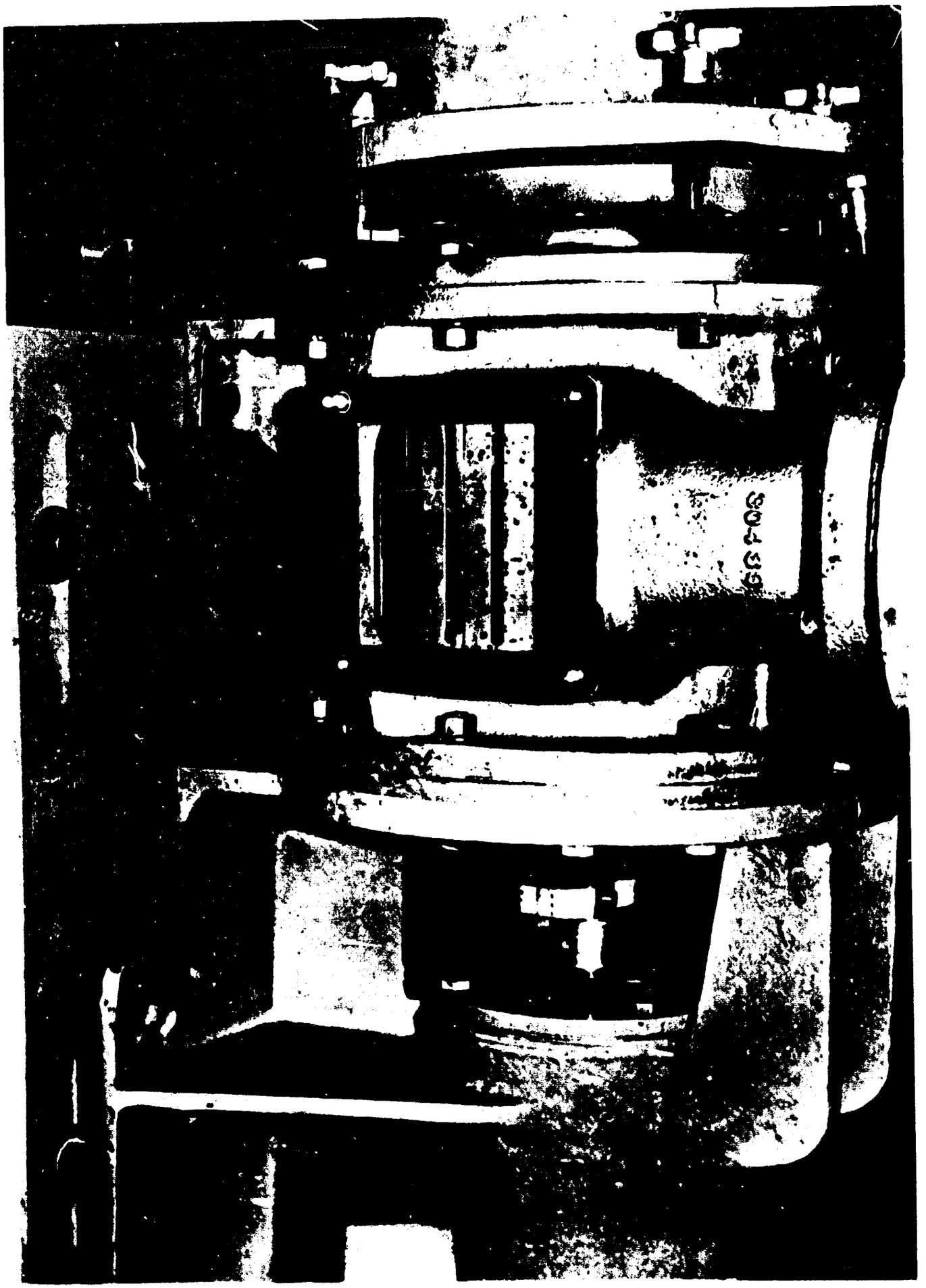
A. The test run successfully demonstrated the feasibility of using a Gorator pump to produce a fine grind for submarine galley waste disposal.

Pages 1 and 2 retyped for reproduction purposes.


FEED
35 GAL.
HOPPER
WATER
LEVEL
VALVE
GORATOR
PUMP
50 H.P.
MOTOR
DSM
SCREEN
DATE:
BY:
SCALE:
TITLE
FIGURE 1
DORR-OLIVER
SK.



FIGURE



FIGURE

UNITED STATES NAVY
MARINE ENGINEERING LABORATORY
ANNAPOLIS, MARYLAND — 21402
AREA CODE 301 268-7711

IN REPLY REFER TO:

NP/9470(733 WRC)
Assigt 73 126
Rept 37/67
10 MAR 1967

From: Commanding Officer and Director
To: Commander, Naval Ship Engineering Center (SFC 6136D)

Subj: MEL Research and Development Phase Report 37/67; Transmittal of

1. Transmitted herewith is MEL Research and Development Report 37/67, "Feasibility of Using the Gorator Pump to Dispose of Galley Waste," covering work done by Dorr-Oliver, Inc., under MEL Assignment 73 126, Contract No. 61533-2398-66.

E. M. Herrmann

E. M. HERRMANN
By direction

Copy to:
NAVSHIPS (SHIPS 2021) (2)
NAVSHIPS (SHIPS 031)
NAVSHIPS (SHIPS 03413)
NAVSECPHILADIV
DTMB
DDC (20)

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA · R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*

U. S. Navy Marine Engineering Laboratory
Annapolis, Maryland 21402

2a. REPORT SECURITY CLASSIFICATION

Unclassified

2b. GROUP

3. REPORT TITLE

Feasibility of Using the Gorator Pump to Dispose of Galley Waste

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

Contractor's report

5. AUTHOR(S) *(Last name, first name, initial)*

Corporate author -- Dorr-Oliver Incorporated

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
June 1966	4	

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
615 33 239866 b. PROJECT NO. S-F013 08 10 c. Task 2709 d.	MEL Report 37/67 9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)* Assigt 73 126

10. AVAILABILITY/LIMITATION NOTICES

4

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY

13. ABSTRACT

Waste materials, typical of shipboard refuse, were reduced using a Gorator pump. The resultant products were less than 1/4 inch.

DD FORM 1 JAN 64 1473

UNCLASSIFIED

Security Classification

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
1. Waste disposal 2. Shipboard refuse 3. Gorator pump						

INSTRUCTIONS

1. **ORIGINATING ACTIVITY:** Enter the name and address of the contractor, subcontractor, grantee, Department of Defense activity or other organization *(corporate author)* issuing the report.

2a. **REPORT SECURITY CLASSIFICATION:** Enter the overall security classification of the report. Indicate whether "Restricted Data" is included. Marking is to be in accordance with appropriate security regulations.

2b. **GROUP:** Automatic downgrading is specified in DoD Directive 5200.10 and Armed Forces Industrial Manual. Enter the group number. Also, when applicable, show that optional markings have been used for Group 3 and Group 4 as authorized.

3. **REPORT TITLE:** Enter the complete report title in all capital letters. Titles in all cases should be unclassified. If a meaningful title cannot be selected without classification, show title classification in all capitals in parenthesis immediately following the title.

4. **DESCRIPTIVE NOTES:** If appropriate, enter the type of report, e.g., interim, progress, summary, annual, or final. Give the inclusive dates when a specific reporting period is covered.

5. **AUTHOR(S):** Enter the name(s) of author(s) as shown on or in the report. Enter last name, first name, middle initial. If military, show rank and branch of service. The name of the principal author is an absolute minimum requirement.

6. **REPORT DATE:** Enter the date of the report as day, month, year, or month, year. If more than one date appears on the report, use date of publication.

7a. **TOTAL NUMBER OF PAGES:** The total page count should follow normal pagination procedures, i.e., enter the number of pages containing information.

7b. **NUMBER OF REFERENCES:** Enter the total number of references cited in the report.

8a. **CONTRACT OR GRANT NUMBER:** If appropriate, enter the applicable number of the contract or grant under which the report was written.

8b, 8c, & 8d. **PROJECT NUMBER:** Enter the appropriate military department identification, such as project number, subproject number, system numbers, task number, etc.

9a. **ORIGINATOR'S REPORT NUMBER(S):** Enter the official report number by which the document will be identified and controlled by the originating activity. This number must be unique to this report.

9b. **OTHER REPORT NUMBER(S):** If the report has been assigned any other report numbers *(either by the originator or by the sponsor)*, also enter this number(s).

10. **AVAILABILITY/LIMITATION NOTICES:** Enter any limitations on further dissemination of the report, other than those imposed by security classification, using standard statements such as:

(1) "Qualified requesters may obtain copies of this report from DDC."

(2) "Foreign announcement and dissemination of this report by DDC is not authorized."

(3) "U. S. Government agencies may obtain copies of this report directly from DDC. Other qualified DDC users shall request through _____."

(4) "U. S. military agencies may obtain copies of this report directly from DDC. Other qualified users shall request through _____."

(5) "All distribution of this report is controlled. Qualified DDC users shall request through _____."

If the report has been furnished to the Office of Technical Services, Department of Commerce, for sale to the public, indicate this fact and enter the price, if known.

11. **SUPPLEMENTARY NOTES:** Use for additional explanatory notes.

12. **SPONSORING MILITARY ACTIVITY:** Enter the name of the departmental project office or laboratory sponsoring *(paying for)* the research and development. Include address.

13. **ABSTRACT:** Enter an abstract giving a brief and factual summary of the document indicative of the report, even though it may also appear elsewhere in the body of the technical report. If additional space is required, a continuation sheet shall be attached.

It is highly desirable that the abstract of classified reports be unclassified. Each paragraph of the abstract shall end with an indication of the military security classification of the information in the paragraph, represented as *(TS)*, *(S)*, *(C)*, or *(U)*.

There is no limitation on the length of the abstract. However, the suggested length is from 150 to 225 words.

14. **KEY WORDS:** Key words are technically meaningful terms or short phrases that characterize a report and may be used as index entries for cataloging the report. Key words must be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context. The assignment of links, roles, and weights is optional.