DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON, DC 20362-5101

IN REPLY REFER TO
NAVSEAINST 9593.1B
SEA 56Y35/198
3 Jul 85

NAVSEA INSTRUCTION 9593.1B

From: Commander, Naval Sea Systems Command
To: All Offices Reporting Directly to COMNAVSEA
Distribution List

Subj: CERTIFICATION PROGRAM FOR SEWAGE MARINE SANITATION DEVICES (MSDS) IN THE U.S. NAVY SURFACE SHIPS AND CRAFT

Ref: (a) OPNAVINST 5090.1 of 26 May 83
(b) OPNAVINST 7400.31 of 19 Apr 78, Subj: Operation, Maintenance and Sanitation of Sewage Systems on U.S. Navy Ships
(c) NAVSEAINST 9593.1 of 15 Nov 78
(d) NAVSEAINST 9593.1A of 8 Aug 81

Encl: (1) Marine Sanitation Device (MSD) Inspection and Certification Procedures For Previously Certified "Provisional" Ships, Boats or Craft, dtd 15 Apr 85
(2) Marine Sanitation Device (MSD) Inspection and Certification Procedures for New Construction and Conversion of Surface Ships, Service Craft and Boats, dtd 15 Apr 85
(3) Certification Checklist For Sewage Collection, Holding and Transfer (CHT) Systems on Surface Ships, dtd 15 Apr 85
(4) Certification Checklist for Sewage Collection, Holding and Transfer (CHT) Systems on Permanently Moored Craft, dtd 15 Apr 85
(5) Certification Checklist for Modified Vacuum Marine Sanitation Devices (MSD) (DD 963/DDG 993 Class), dtd 15 Apr 85
(6) Certification Checklist for Biological Sewage Treatment Systems (LHA 1 through LHA 5 only), dtd 15 Apr 85
(7) Certification Checklist for GATX MK I Systems, dtd 15 Apr 85
(8) Certification Checklist for GATX MK II Systems, dtd 15 Apr 85
(9) Certification Checklist for Koehler-Dayton Systems, dtd 15 Apr 85
(10) Certification Checklist for Monomatic Systems, dtd 15 Apr 85
(11) Certification Checklist for Vacuum Sewage Powered Eductor Systems, dtd 15 Apr 85

S-101

1. Purpose.

This instruction revises and updates the Naval Sea Systems Command (NAVSEA) policy regarding the certification of sewage marine sanitation devices (MSDs) and deletes procedures which are no longer applicable due to the essential completion of MSD installations on all applicable Fleet Modernization Program (FMP) ships and craft. The revised certification policy uses a single certification level instead of the previous dual level which employed "provisional" and "full" certification categories. Specific requirements, procedures and responsibilities for implementation of the single level certification program and obtaining "Certification of MSDs on new construction ships and craft, ships and craft receiving MSDs during reactivation, or for ships with MSDs which are currently "provisionally certified" are defined herein.

2. Cancellation.

a. NAVSEAINST 9593.1A dated 8 August 1981 (NAVSEAINST 9593.1 dated 15 November 1978 was previously cancelled.)

b. NAVSEA ltr 5341/6159B/JRJ, 9505/593.12 Ser 119 dated 22 October 1979, Subj: Revised Checklist for CHT Inspection and Certification Program

c. NAVSEA Spdltr 5341/RWP/593.111/70 dated 10 April 1980, Subj: Certification of the Jered Modifications in the DD 963 Class (NOTAL)

d. NAVSEA ltr 5341/RWR, 9505/593.12 Ser 28 dated 27 February 1980, Subj: Certification for Biological Sewage Treatment Systems (NOTAL)

e. NAVSEA ltr 5341/CS, 9505/593.12 Ser 30 dated 29 February 1980, Subj: Certification Checklists for GATX MK I AND MK II, Koehler-Dayton and Monomatic MSD's (NOTAL)

f. NAVSEA ltr 5341/JJ, 9505/593.12 Ser 27 dated 5 March 1980, Subj: Certification Checklists for Sewage Collection, Holding and Transfer (CHT) Systems on Permanently Moored Craft (NOTAL)

3. Applicability and Scope.

This instruction is applicable to all U.S. Navy surface ships including service craft and boats in which sewage Marine Sanitation Devices have been installed or are being installed during new construction or conversion. The term Marine Sanitation Device (MSD) includes all types of sewage treatment and handling systems as defined in reference (a) including sewage collection, holding and transfer (CHT) systems, vacuum collection systems, reduced volume flush systems and recirculating toilet systems.

4. Background.

a. Reference (b) required that a program be established for certification of shipboard installed MSDs. References (c) and (d) established a certification program which included a "provisional" certification category indicating the installed MSD met the mandatory requirements for operation, health, sanitation, safety and maintainability cited in the applicable checklists. A

"full" certification was awarded when the installation met all the mandatory and desirable requirements of the applicable checklists. The dual level of certification permitted ships to operate with MSDs installed which met the mandatory requirements for safe operation, health and maintainability, but which were not scheduled or programmed to receive the additional desirable ship alteration (SHIPALT) or boat alteration (BOATALT) design improvements until after the legal deadline of April 1981 for compliance with sewage discharge regulations. The update SHIPALTs incorporate features that are desirable but are not essential for safe and sanitary operation of the MSD. Deferrals and cancellations of update SHIPALTs for various reasons have allowed the fleet to operate at two levels of certification. In order to maintain conformity throughout the fleet, all future MSD inspections shall be conducted using the single level of certification criteria specified in this instruction and, upon correction of certification deficiencies, the MSD shall be designated "certified" without further reference to "full" or "provisional" certification. The requirements to achieve "certification" will be the same as those previously required to achieve "provisional" certification on any MSD. These are identified by the "asterisked" items in enclosures (3) through (11). Any additional deficiencies or recommendations noted will not be required for certification, but will be identified and recommended for accomplishment as funding and time permits.

5. Action and Responsibilities. All ships and craft which have received "full" certification under the provisions of references (c) and (d) are hereby considered "certified" and require no further inspection. Certification procedures for new construction ships, or ships receiving MSDs during vessel reactivation remain essentially the same except that only a single level of certification is invoked. CHT update SHIPALTs will no longer be required for certification; however they will still be accomplished on a case basis where they are required to correct a particular problem or condition. In the unusual situation where a basic MSD must be installed on a ship by SHIPALT or BOATALT, or where any unusual situation exists not specifically covered by this instruction, the certification procedure will be determined by NAVSEA 56Y35 on a case by case basis. This instruction revises the MSD certification program to achieve a single level of certification for MSDs on all U.S. Navy ships. Procedures for conducting ship, boat or craft inspections and certification under this revised program are contained in enclosures (1) and (2). Specific action and responsibilities for carrying out this single level certification program are as follows:

a. Environmental Protection Program Manager (NAVSEA 56Y35)

(1) Act as overall program coordinator, monitor program progress, submit necessary budget input and provide program status to the Commander, Naval Sea Systems Command (COMNAVSEA) and higher authority, as required.

(2) Provide engineering input for the overall program. Prepare and update the general specifications, pertinent military specifications, design data sheets and standard drawings so as to reflect certifiable systems.

(3) Maintain the design baseline and inspection checklists, review modifications to the baseline and checklists, and issue updated changes only after fully evaluating the impact and necessity of the modifications.

(4) Review and evaluate requests for waivers from the requirements of enclosures (3) through (11) where system installation modifications are not considered cost-effective. Any waivers from compliance with enclosures (3) through (11) considered necessary are to be requested by the installing activity and reviewed by NAVSEA for approval.

(5) Determine when recertification inspections are required after MSD system SHIPALTs.

(6) Ensure all new ship specifications and conversion specifications incorporate all design requirements for certification as well as all of the latest MSD design requirements.

(7) Determine certification procedures on a case by case basis for unusual craft or situations not specifically covered by this instruction.

b. Amphibious and Combat Support Ship Logistics Division, SEA 911; Aircraft Carrier Ship Logistics Division; SEA 912, Surface Combatant Ship Logistic Division, SEA 913; Gas Turbine Surface Combatant Ship Logistic Division, SEA 914.

(1) The Ship Logistics Manager (SLM) shall ensure all SHIPALTs effecting MSD systems are properly developed or reviewed by the Environmental Program Manager (SEA 56Y35) to insure all certification requirements are properly considered and that proper test and Integrated Logistic Support (ILS) requirements are specified.

(2) For MSDs installed by SHIPALT or BOATALT, or for any situation or MSD not covered by this instruction, contact SEA 56Y35 to determine certification process.

c. Ship Acquisition Project Managers (SHAPMs).

(1) Ensure that sewage MSDs in new construction ships and craft are properly installed and inspected, utilizing appropriate checklists, and that deficiencies are corrected before ship or craft delivery.

(2) Issue MSD certification to the ship upon correction of all certification deficiencies noted in the NAVSEA certification inspection report before ship or craft delivery.

d. Support Activities Including Naval Sea Support Center Pacific (NAVSEACENPAC) San Diego, Naval Ship Systems Engineering Station (NAVSSES), Philadelphia, Supervisor of Shipbuilding (SUPSHIP), Naval Shipyard (NAVSHIPYD). Responsibilities for the various support activities in the certification programs are contained in enclosures (1) and (2).

e. Type Commanders (TYCOMs)

(1) Issue implementing instructions covering responsibilities and procedures of TYCOM organizational elements to achieve certification of each ship sewage system.

(2) Certify MSDs for ships under TYCOM cognizance.

(3) Ensure ship's force monitors correction of certification deficiencies identified by the certification inspectors.

(4) Ensure MSD inspections are periodically conducted by fleet personnel to ensure that the system is performing properly. System Operational Checklists for each MSD are provided on Maintenance Requirement Cards (MRCs) for this purpose. This inspection should also be conducted every time the system is reactivated after a period of nonuse due to maintenance activity.

(5) Ensure ship's force is adequately trained in the operation and maintenance of the system components, conducts required maintenance actions (PMS) and operates the system where pier sewers are available. As provided in PMS, the system should be periodically operated, even if not required to meet local regulations, to ensure components do not "freeze up" and are operable when required.

(6) In the event of sewage system malfunction, casualty, inoperability or risk to safety, health or sanitation, submit a casualty report (CASREPT) in accordance with NWP 7 article 400 to ensure management attention is directed to the difficulty.

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MARINE SANITATION DEVICE (MSD)
INSPECTION AND CERTIFICATION PROCEDURES
FOR
PREVIOUSLY CERTIFIED "PROVISIONAL" SHIPS,
BOATS OR CRAFT

APRIL 15, 1985

Sewage System Inspection and Certification Procedures for Previously Certified "Provisional" Ships, Boats or Craft

1. Commander, Naval Surface Force, U.S. Atlantic Fleet (COMNAVSURFLANT) and Commander, Naval Surface Force, U.S. Pacific Fleet (COMNAVSURFPAC) shall establish liaison with the designated sewage system inspector at NAVSSES or NAVSEACENPACDET as appropriate to develop a schedule to conduct certification inspections of ships, boats or craft previously certified as "provisional". Where possible, inspections should be scheduled just in advance of either an overhaul or other availability to permit rapid correction of any certification deficiencies identified. In no case shall the inspection be delayed until after each ship's next overhaul.

NOTE: Ships which have been previously inspected under the COMNAVSURFLANT CHT System Improvement Program need not be re-inspected. These reports will be reviewed by NAVSEA, and the ship and TYCOM will be notified of items which will be required for certification.

2. The certification inspections shall be conducted using the applicable checklist contained in this instruction. A post inspection conference to categorize deficiencies shall be held with representatives from the inspection staff and the ship's force in attendance. The deficiencies shall be recorded and an inspection report using the format outlined in attachment B of this enclosure, shall be issued by the senior designated inspector no later than three weeks after completion of the inspection visit. The report shall be issued to the ship, the TYCOM, NAVSEA 56Y35 and the cognizant NAVSEA SLM.

3. Ship's force shall assign job control numbers for certification deficiencies noted in category A of attachment B during the post inspection conference and as outlined in the inspection report. Where practical, job control numbers shall also be assigned for other deficiencies not required for certification, but which are listed under category B.1 of attachment B. NAVSEA shall consider category B.2 and category D deficiencies for accomplishment by SHIPALT on a case by case basis. Category C deficiencies shall be accomplished by TYCOM only when replacement is required.

4. The TYCOM shall issue MSD certification upon notification from the ship and the appropriate repair activity that all category A deficiencies have been corrected. NAVSEA 56Y35, the cognizant NAVSEA SLM and the certification inspector should receive information copies of the certifying document.

5. All provisionally certified ships shall maintain that status until they are inspected and the certification deficiencies (Category A) are corrected. The ship will then be accorded certification. As stated previously, all ships which are currently fully certified will automatically be accorded "certification" under the new single level certification concept instituted by this instruction.

6. Individual activity responsibilities are as follows:

a. Inspector NAVSSES/NAVSEACENPAC, or designated agent

(1) Inspect the system using the appropriate checklist. Identify deficiencies in appropriate categories as specified by Attachment B to enclosure (1).

(2) Conduct post certification conference with ships force to categorize deficiencies.

(3) Provide a written report of deficiencies to the TYCOM, ship, cognizant SLM and NAVSEA 56Y35 no later than three weeks after completion of inspection.

b. TYCOM

(1) Review deficiency report and schedule maintenance activities or ship's force to complete repairs or corrective action. Certification deficiencies must be corrected as a minimum. Other deficiencies should also be scheduled for correction as funding and time permit.

(2) Notify inspectors and NAVSEA 56Y35 when corrective action is complete.

(3) Grant MSD certification upon correction of certification deficiencies.

(4) Advise NAVSEA 56Y35, cognizant SLM and inspector upon certification.

c. Ship's Force

(1) Provide assistance to certification inspector during MSD inspections.

(2) Attend post inspection conference.

(3) Assign Job Control Numbers (JCNs) to all certification deficiencies (Category A. of attachment B).

(4) Assign JCNs to other repair deficiencies not required for certification (category B.1 of attachment B) where practical.

(5) Accomplish correction of deficiencies within capability of ship's force.

(6) Notify TYCOM when all certification deficiencies (Category A of attachment B) have been corrected.

d. NAVSEA 56Y35 (Environmental Program Manager)

(1) Act as overall program coordinator, monitor program progress and submit necessary budget input.

(2) Provide engineering input for overall program. Prepare and update the general specifications, pertinent military specifications, design data sheets and standard drawings to reflect certifiable systems.

(3) Review and evaluate requests for waivers from the requirements of enclosures (3) through (11).

Typical Sequence of Events in the Sewage System Certification Process for Previously Certified "Provisional" Ships, Boats or Craft

INSPECTION

- COMNAVSURFLANT or COMNAVSURFPAC notify inspectors concerning inspection schedule.
- Conduct inspection.
- Post-Inspection Conference (Inspectors and vessel representative).
- Inspector forwards inspection results to NAVSEA 56Y35, ship, TYCOM and cognizant SLM.

DEFICIENCIES

- TYCOM and Ship's Force take action to correct deficiencies.

CERTIFICATION

- TYCOM/Ship confirms that all deficiencies have been corrected and the vessel can be certified.
- TYCOM grants certification.

CATEGORIES FOR REPORTING DEFICIENCIES ON PROVISIONALLY CERTIFIED SHIPS

A. Deficiency items which are mandatory for correction prior to system certification (asterisked items of enclosures (3) through (11) only):

B. Deficiencies not required for certification, but which should be corrected at the earliest opportunity. (non asterisked items of enclosures (3) through (11)).

1. Repair items (ship or TYCOM responsibility).

a. Missing or incorrect valve label plates (excluding diverter valve labeling showing direction of flow and required posted operating placards and health warning placards).
b. Missing or incorrect pipe stenciling.
c. Inoperable ROG (valve must still be operable locally.)
d. Other as deemed appropriate.

2. Design items.

a. Use of non MIL-SPEC valves.
b. Lack of clean out fittings.
c. Lack of quick disconnect fittings on ROG.
d. Other as appropriate.

C. Items which should be corrected only when replacement is required (ship or TYCOM responsible).

1. Saltwater piping which is not Cu-Ni.
2. Incorrect bolting material.
3. Incorrect piping material in photo drain or battery acid drains.
4. Other as appropriate.

D. Recommended Design Improvements for consideration in future SHIPALTs.

1. Items included in Design Guidance or General Specifications, but not addressed above or in certification checklist.
2. Other as appropriate.

Note: Only paragraph A items are required for certification.

MARINE SANITATION DEVICE (MSD)
INSPECTION AND CERTIFICATION PROCEDURES
FOR
NEW CONSTRUCTION AND CONVERSION
OF
SURFACE SHIPS, SERVICE CRAFT AND BOATS

APRIL 15, 1985

Sewage System Inspection and Certification Procedures
for
New Construction and Conversion Surface Ships, Service Craft and Boats

1. Each SHAPM shall task the NAVSEA designated inspection representative at NAVSEACENPAC San Diego, or NAVSSES, Philadelphia as appropriate, to accomplish the required MSD inspection as designated by this instruction. Each SHAPM shall also ensure that the cognizant SUPSHIP notifies the inspectors that the sewage system is ready for inspection at least three weeks prior to the inspection. For ships currently under contract, it is not intended that this milestone be formalized into the shipbuilding contract or that the inspection interfere with the shipbuilding schedule. SUPSHIP and the inspectors should coordinate the timing of the inspection visit at the convenience of all parties so as not to impact on delivery. The sewage system inspection should be considered as a pre-INSURV audit and should be scheduled early enough (no later than builder's trials) to allow for the identification of deficiencies and determination of responsibility for corrective action as a minimum, and the correction of all contractor responsible deficiencies prior to INSURV as a maximum. If the contractor responsible deficiencies are not corrected prior to INSURV, the SUPSHIP should present the items as INSURV items. Each SHAPM shall ensure that the SUPSHIP provides copies of installation drawings and subsystem test results to the inspector prior to or at the time of the inspection.

NOTE: For service craft and boats, contracts may be administered by a Defense Contract Administration Service (DCAS) rather than a SUPSHIP. Also, conversions and ships in the Service Life Extension Program (SLEP) may be accomplished by NAVSHIPYDS.

2. A post-inspection conference shall be held following the inspection and shall be chaired by the inspector, with SUPSHIP and ship's force representatives in attendance. The purpose of the conference is to review the deficiencies identified by the inspector and establish responsibility for correction of deficiencies. Prior to ship delivery, the SUPSHIP shall ensure that the contractor corrects those contractor responsible deficiencies agreed to be within the scope of the ship's contract specifications. If responsibility for corrective action of a deficiency cannot be resolved, or if it is of a design nature clearly beyond the scope of the contract specifications, the inspection report shall so state. The inspection report shall categorize deficiencies as shown in attachment (B) of this enclosure. The SHAPM shall then resolve the issue of responsibility and determine corrective action. In most cases, it is intended that the SHAPM direct the SUPSHIP to negotiate a contract modification (within authorized responsibility) with the contractor for corrective action while the ship is still under construction or conversion. The SUPSHIP shall advise the SHAPM of action taken to correct the contractor responsible deficiencies identified in the inspection report. The SHAPM shall notify SEA 56Y35, respective SLM and TYCOM of the resolution of all deficiencies.

3. After resolution of all certification deficiencies, the SUPSHIP shall recommend to the SHAPM that the MSD should be certified. The SHAPM shall then issue a letter of certification. In the event all of the criteria necessary for certification cannot be satisfied during construction or conversion, the action of granting certification shall be the responsibility of the TYCOM.

4. A formal inspection report will be issued by the inspector within three weeks following the inspection. Distribution of these reports will be to SUPSHIP and SHAPM (for action), and to SEA 56Y35, TYCOM and the ship (for information).

5. Individual activity responsibilities are as follows:

a. Inspector (NAVSSES Philadelphia, or NAVSEACENPAC San Diego, or designated agent)

(1) Inspect the system for deficiencies using the appropriate authorized checklist, enclosures (3) through (11).

(2) Provide a list of deficiencies to attendees at the post-inspection conference.

(3) Provide a formal inspection report to the SUPSHIP and SHAPM using the format outlined in attachment (2) of this enclosure within three weeks following the inspection.

b. Supervising Activity (SUPSHIP, NAVSHIPYD, or DCAS)

(1) Provide copies of installation drawings and subsystem test results to NAVSEACENPACDET San Diego or NAVSSES Philadelphia inspectors prior to or at the time of inspection.

(2) Designate a person as point-of-contact for sewage system certification.

(3) Notify the SHAPM and the inspector of the system inspection schedule at least three weeks prior to the inspection. The inspection should occur prior to builder's trials.

(4) Accompany inspectors during the inspection. Make the determination for each deficiency, whether it is contractor responsible or government responsible.

(5) Take action to have contractor correct all items determined to be within contractor responsibility and notify SEA 56Y35 and SHAPM when deficiencies have been corrected.

(6) Advise SHAPM of feasibility of correction of government responsible deficiencies while the ship is under construction or conversion.

(7) Recommend system certification upon correction or resolution of all certification deficiencies.

c. NAVSEA SHAPM

(1) Ensure that specific procedures and responsibilities of the SUPSHIP as outlined herein for the implementation of this program are properly followed.

(2) Monitor the SUPSHIP to ensure contractor responsible deficiencies are corrected.

(3) Upon receipt of the inspection report, initiate correction of outstanding contract specification deficiencies, preferably during the construction or conversion period.

(4) Upon receipt of certification recommendation from SUPSHIP, grant certification. Notification of certification shall be in the form of a letter from the SHAPM to the TYCOM with information copies to SUPSHIP, Ship, cognizant NAVSEA SLM, SEA 56Y35, NAVSEACEPTAC San Diego and NAVSSES Philadelphia.

(5) If all deficiencies are not corrected by the construction or conversion cut-off date, inform the cognizant SLM of outstanding deficiencies and status of corrective action on each item.

(6) Task and fund appropriate certification inspector.

d. TYCOM. For ships that have been delivered and are beyond the construction or conversion envelope, certify systems when all inspection deficiencies have been corrected.

(Attachment A briefly outlines the sequence of actions in the certification process for new construction ships.)

e. Environmental Protection Program Manager (NAVSEA 56Y35)

(1) Ensure all new ship specifications and conversion specifications incorporate all design requirements for certification as well as all of the latest MSD design requirements.

(2) Review and evaluate requests for waivers from the requirements of enclosures (3) through (11).

Typical Sequence of Events in the Sewage System Certification Process for New Construction and Conversion of Surface Ships, Service Craft and Boats

INSPECTION

- SUPSHIP notifies inspectors concerning inspection schedule
- Shipboard inspection
- Post-Inspection Conference (SUPSHIP, Inspectors, Ship's Rep)
- Inspectors forward inspection results to SUPSHIP, SHAPM, TYCOM, SEA 56Y35 and ship.

CONTRACTOR RESPONSIBLE DEFICIENCIES	GOVERNMENT RESPONSIBLE DEFICIENCIES
o SUPSHIP takes action to have deficiencies corrected.	o SUPSHIP advises SHAPM of feasibility of correcting government responsible deficiencies.
o Contractor reports corrective action.	o Contract modification or correction during PSA.
o SUPSHIP verifies corrective action.	o Contractor reports corrective action.

CERTIFICATION

- If deficiencies exist, SHAPM & SUPSHIP take appropriate action to obtain certification if possible during PSA for lead ship & before delivery of follow-on ships if applicable.
- SUPSHIP recommends certification to SHAPM.
- SHAPM grants certification.

NOTES: (1) This chart is intended to include ships that are still under construction and ships that have been delivered but are still within the construction or conversion envelope. If a ship is not certified prior to completion of construction or conversion, TYCOMs will have the responsibility for certification.

Attachment (A)
Enclosure (2)

(2) For service craft and boats, contracts may be administered by a DCAS rather than a SUPSHIP. Also, conversions and ships in the Service Life Extension Program (SLEP) may be accomplished by NAVSHIPYDS.

Categories of Deficiencies to be Specified in Certification Reports for New Construction Ships

A. Deficiencies requiring correction prior to certification and operation of the system (asterisked items only on the applicable certification checklist).

1. Contractor responsible deficiencies.

2. Deficiencies not within the scope of the ship specifications.

B. Other deficiencies requiring correction to fully conform to ship specifications (Contractor responsible).

C. Other deficiencies on applicable checklist (not in categories A or B) which should be corrected at the earliest possible date.

D. Recommended design improvements for future consideration.

NOTE: This format, modified as applicable, shall also be applied to conversion ships.

Attachment (B)
Enclosure (2)

CHECKLIST FOR

SURFACE SHIP SEWAGE

COLLECTION, HOLDING AND TRANSFER

(CHT)

SYSTEMS

April 15, 1985

Reference (a) General Design Guidance for Surface Ship Sewage Collection, Holding and Transfer (CHT) Systems (1977), Encl (1) to NAVSEA ltr 5341/JRJ 9505/593.12 ser 138 dtd 13 Dec 1979

Appendix (a) Certification Requirements for CHT Sewage Receiving Station
(b) Certification Requirements for Air Aspirator Systems
(c) Remote Operating Gear Requirements for CHT Backfits

I. Comminutor

1. The comminutor must have mechanical seals on cutter shafts. (Sanitary Requirement).

* 2. Note proper direction of rotation. This is counterclockwise facing belt guard for Airmaster Comminutors.

3. Maintenance access on drive belt side of Airmaster Comminutors must be 20 inches minimum for blade removal. (Reference (a), paragraph 2.6 applies).

4. Bypass around comminutor must be free flowing. No diverter valves are allowed in the bypass. Any other valves in the bypass must be locked open. (Reference (a), paragraph 2.6 applies).

5. A cleanout and drain must be installed immediately upstream of the comminutor. (Reference (a), paragraph 2.6 and reference (a), figure 6 apply).

6. Isolation valves must be installed just downstream of the comminutor and just upstream of the comminutor cleanout access. (Reference (a), paragraph 2.6 applies).

7. Comminutor and cleanout must have a drip pan beneath if not installed above an area enclosed by a coaming. (Reference (a), paragraph 8.2.3 applies).

8. Where comminutors are located on the deck in a separate space apart from the CHT pump room, they must be surrounded by a 2 to 4 inch coaming. This coaming shall incorporate a deck drain to the CHT tank or a separate sump and eductor in accordance with Section VI.3 of this checklist. (Reference (a), paragraph 8.2.3 applies).

II. Pump Through Capability

1. CHT pump discharge to the port and starboard deck connection stations must be through a "Tee" vice a diverter valve. (Reference (a), paragraph 5.0 applies).

III. Pump Room and Comminutor Space Washup Facilities

1. Sink with potable water, soap dish or soap dispenser and hand drying fixture (either paper towel dispenser or electric dryer) must be located in the pump room or adjacent thereto. Transit to the washup facility via berthing, messing, food preparation, food storage, etc. is not permitted. Identical requirements apply to situations where comminutors must be located in separate spaces. Sink shall drain to the pump room or comminutor space sump. (Reference (a), paragraph 7.3 applies).

* Identifies those items mandatory for certification

IV. Firemain

1. A fixed hard pipe connection must be provided for flushing and cleaning the CHT tank. (Reference (a), paragraph 7.1 applies).

2. Tank flushing nozzle must thoroughly spray the interior of the tank. (Reference (a), paragraph 7.1 applies).

* 3. A sewage flushing connection must be provided from the firemain to the sewage pump discharge line just downstream of the discharge plug and check valves. Flushing connection must contain a cutout valve and a check valve. (Reference (a), paragraph 7.1 applies).

4. Sewage flushing connection must be hard piped. (Reference (a), paragraph 7.1 applies).

5. A hose connection must be provided to wash down the pump room space. Hose connection may be salt or potable water; however, if potable water is used, a vacuum breaker must exist in the line. (Reference (a), paragraph 7.1 applies).

6. If the firemain pressure is over 125 psig, a relief valve is required to protect the sewage hose. The relief valve must discharge overboard via the discharge piping, or back to the tank at or near the tank top. (Reference (a), paragraph 7.1 applies).

V. Pump Overboard Discharge

1. The sewage pumps shall discharge overboard, either via a separate hull penetration, or via the hull penetration provided for the tank overflow. (Reference (a), paragraph 5.2 applies).

2. The sewage pumps shall discharge via a gagged scupper valve. (Reference (a), paragraph 5.2 applies).

3. Where the sewage pumps discharge via the hull penetration provided for the tank overflow, the configuration shall not permit sewage to be pumped back to the tank via the overflow. (Reference (a), paragraph 5.2 applies).

4. If the sewage pumps and the CHT tank overflow line both discharge through a single hull penetration, the sewage gravity overboard line may not discharge through the same penetration.

VI. Pump Room Sump and Eductor

1. Each pump room must be provided with a sump and eductor located inside the coaming. (Reference (a), paragraph 7.2 applies).

2. The eductor must discharge into the CHT discharge line via a check valve, so that it may be directed overboard or to the deck riser. The eductor suction line shall incorporate a cutout valve, a check valve

* Identifies those items mandatory for certification

and a vacuum gauge in that order downstream of the suction inlet. (Reference (a), paragraph 7.2 and reference (a), figures 1 and 2 apply).

3. Where a comminutor must be located in a separate space from the pumps, the comminutor must incorporate a deck drain (within the comminutor coaming) which is directed to the CHT tank. The drain line shall incorporate a cutout valve and a check valve. If this cannot be done, a separate sump and eductor (discharging to CHT pump discharge) must be provided within the coaming. (Reference (a), paragraph 8.2.3 applies).

4. If the pump room or comminutor space deck and/or sump is an integral part of a fresh or potable water tank top, a coating system approved by NAVSEA 56Y35 must be installed to serve as an additional barrier against contamination of the fresh or potable water tanks. (Reference (a), paragraph 8.4 applies). Refer to paragraph XIII, item 15, of this checklist for pumps located in spaces above bilges where bilge water contacts potable or fresh water tanks.

5. Operational Check: Activate eductor system and check for proper operation of components.

VII. Posted Operating Instructions and Health Warning Placards

* 1. Operating instructions and associated schematic must be posted in the CHT pump rooms, and should reflect the CHT installation. Health warning placards must be provided in pump and comminutor spaces. Operational and health warning placards must be provided at deck connections. (Reference (a), paragraph 8.2.7 applies).

VIII. Communications Circuits

1. A telephone circuit must be located in the pump room, at the deck connection station and in DC central or other continuously manned space where a high level alarm is located. Reference (a), paragraph 7.4. applies.

2. Operational Check: Determine if telephone circuit operates properly.

IX. Level Sensors (Reference (a), paragraphs 4.1 and 4.2 apply for items 1.a through 1.d below).

1. Approximately 85 percent (high level alarm):

(a) An audible alarm must be provided in each pump room.

(b) A visual alarm must be provided in each pump room.

* (c) An audible alarm must be provided in a continuously manned space.

* (d) A visual alarm must be provided in a continuously manned space.

* Identifies those items mandatory for certification

* 2. Level sensor located at about 2/3 tank capacity must activate standby pump.

* 3. Level sensor located at about 1/3 tank capacity must activate duty pump.

* 4. Level sensor located at tank low level must stop either or both pumps. This sensor must be located to ensure pump suction remains flooded after pump(s) have stopped.

5. Variations from the levels outlined above are permitted for certain reasons provided their intended functions are met. Another system which may be encountered on newer comminutor installations, and which is acceptable is as follows:

(a) Level sensor located at approximately 15 percent tank capacity activates low level alarm.

* (b) Level sensor located at approximately 1/3 tank capacity cuts off either or both pumps.

* (c) Level sensor located at approximately 2/3 tank capacity cuts in duty pump.

* (d) Level sensor located at approximately 85 percent tank capacity activates high level alarm and starts standby pump.

X. Motor Controller, Alternation Feature

1. The motor controller is provided with a pump alternating feature. This must be satisfactorily demonstrated. (Reference (a), paragraph 4.1 applies).

XI. Aeration System

1. Tanks of 2000 gallons or greater should be provided with aeration. (Reference (a), paragraph 6.1 applies).

2. The air compressor must be fitted with a discharge pressure gauge, check valve, stop valve, and relief valve. (Reference (a), paragraph 6.2.4 applies).

3. The air piping must enter the tank above the high level alarm sensor, or be looped up to a point above the high level alarm sensor. A lift check valve must be installed in the air piping upstream of the tank penetration. Diffusers should be provided in the bottom of the tank. (Reference (a), paragraph 6.2.4 applies).

4. Operational Check: Activate compressor to ensure it operates properly.

* Identifies those items mandatory for certification

XII. Backup Aeration System

1. A backup aeration system must be provided from the ship's service air supply via a 150/XX reducer with appropriate cutout valves, and valved bypass. (Reference (a), paragaph 6.2.4 applies).

2. Operational Check: Activate backup aeration system to check for proper operation.

XIII. CHT Pumps

1. Pumps must have mechanical seals. (Reference (a), paragraph 4.0 applies).

2. A spool piece or means of access to the pump suction must be provided in the pump suction line between the pump suction valve and the pump inlet. (Reference (a), paragraph 4.4 applies).

3. The pump suction piping must be installed so that the pump suction remains flooded after the low level sensor has deactivated the pump. Inlet to pump suction must be at least 1/2 diameter above the tank bottom. Suction must not be configurated to allow settling of solids or debris into the suction (e.g. extending vertically upward into the tank). (Reference (a), paragraph 4 applies).

4. Each pump shall have a separate suction inlet in the tank. (Reference (a), paragraph 4.0 applies).

* 5. Each suction line shall incorporate a full port ball or plug cutout valve. (Reference (a), paragraph 4.0 applies).

6. Each pump discharge line must have a check valve and a full port ball or plug cutout valve, in that order, downstream of the pump. The check valve must have a jack open device or a means of bypasing the check valve to allow drainage back to the tank. (Reference (a), paragraph 4.0 and figures 1 and 2 apply).

7. For strainer systems, flow shall enter the tank through an inflow strainer located just above each pump discharge. Influent connection shall be just above these strainers. (Reference (a), figure 2 applies).

8. For strainer systems, the inflow strainers must be installed in vertical positions. (Reference (a), figure 2 applies).

9. Each strainer system inlet line to the tank must incorporate a check valve and a full port ball or plug cutout valve, in that order, upstream of where this piping connects to the pump discharge piping. (Note: Strainer flushing connections are not required. Reference (a), figure 2 applies).

* Identifies those items mandatory for certification

10. For strainer systems an overflow box must be correctly installed in the tank. (Reference (a), figure 2 applies).

11. Diaphragm type pump suction and discharge gauges must be installed. (Reference (a), paragraph 4.5 applies).

* 12. Ensure pumps fitted with mechanical seals have lube oil in the reservoir.

13. The CHT pumps, spool pieces, pump suction and discharge valves, discharge check valves and strainers shall be surrounded by a 2 to 4 inch coaming. A grating located 2 to 4 inches above the pumproom deck is a suitable substitute for a coaming. (Reference (a), paragraph 8.2.3 applies).

14. Where CHT pumps are located in main or auxiliary machinery spaces, a 24 inch coaming must surround the pumps, spool pieces and associated valves. The coaming must incorporate the following (Reference (a), paragraph 8.3 applies):

(a) A sump and eductor discharging via a check valve to the pump discharge piping.

(b) An audible and visual flooding alarm activating in the pump space and in a continuously manned station (other than the pump space) to indicate flooding in the coaming.

(c) Plexiglass spray shields must be provided over pump seals and packing glands.

15. Where CHT pumps are in spaces above bilges where bilge water contacts potable or fresh water tanks, a 24 inch coaming with all the features described above must be provided. In addition, a second containment must be located beneath the first containment and shall:

(a) Be designed such that the lip of the coaming extends 6 inches beyond the periphery of the first containment.

(b) Incorporate separate sump and eductor as described above.

(c) Incorporate separate flooding alarm as described above.

(d) Incorporate bolted access to allow cleaning of the containment. (Reference (a), paragraph 8.3 applies).

XIV. <u>CHT Tank</u>

* 1. The interior of the tank should be coated with MIL-P-24441 (epoxypolyamide) coating. If a coal tar epoxy coating is already installed, it is satisfactory. (Reference (a), paragraph 3.4 applies). See NOTE 1.

NOTE 1 - This item is required for certification only on new construction vessels or newly installed tanks.

* Identifies those items mandatory for certification

* 2. A tank maintenance access should be provided. (Reference (a), paragraph 3.3 applies).

* 3. A tank vent and overflow line must be provided. The tank vent may branch off the overflow. If the vent line has a valve it must be provided with a lock open device and be locked open. (Reference (a), paragraph 3.5 applies).

4. The overflow must discharge via a gagged scupper valve at the hull penetration. The overflow may tie into the gravity overboard discharge via a separate gagged scupper valve. (Reference (a), paragraph 3.5 applies).

5. Where fixtures and/or soil drains exist below the level of the tank overflow, a cutout valve must be provided in the drain line from the fixture to prevent progressive flooding. (Reference (a), paragraph 3.5 applies).

XV. Garbage Grinder Diverter

1. The garbage grinder drain line shall incorporate a diverter valve to permit diversion overboard or to the CHT. This diverter is not required for small garbage disposers, 3/4 HP or less, which do not utilize eductors. Diverters do not require ROG unless they are classified "Z". In this case they must be operable from the DC deck. (Reference (a), paragraph 2.2 and reference (a), figure 4 apply).

2. All tubing downstream of garbage grinders which utilize salt water must be CuNi. Reference (a) paragraph 2.2 applies.

3. A check valve must be installed in the garbage grinder drain prior to its entry into the waste main. Reference (a), paragraph 2.2 and reference (a), figure 4 apply.

4. The hull penetration from the garbage grinder which existed prior to CHT installation is satisfactory. Remote operation to the garbage grinder location is not required but is satisfactory where installed. No remote operation is required for damage control unless specified in Appendix C.

XVI. Laundry, Commissary, and Medical Drains

1. All laundry, commissary, and medical waste drains and deck drains from these spaces must incorporate a swing check valve prior to entering the waste main. (Reference (a), paragraph 2.4.1 and reference (a), figure 4 apply).

2. All medical soil drains must be checked prior to entering the soil main. Reference (a), paragraph 2.4.1 and reference (a), figure 4 apply.

XVII. Piping

1. Piping should be stenciled "soil" or "waste" or "combined soil and waste" and show direction of flow. (Reference (a), paragraph 1.4 applies).

* Identifies those items mandatory for certification

2. CHT piping in the pump room must not be lagged or insulated. Non-CHT piping in the pump room may be lagged. (Reference (a), paragraph 8.2.8 applies).

3. Removable drip pans are to be installed beneath CHT valves and/or takedown joints in horizontal piping runs, which are required in the following areas. (Reference (a), paragraph 8.2.4 applies):

(a) Dry provision storerooms

(b) Food preparation/serving areas

(c) Food and medical utensil washing and storage areas

(d) Medical and dental spaces and storerooms

(e) Berthing spaces

(f) Above bilges where bilge water contacts potable or fresh water tank boundaries.

XVIII. Valves

1. All valves must be full ported and manufactured in accordance with MIL-V-24509. (Reference a), paragraph 2.3 applies).

2. Valves should be marked as follows (Reference (a), paragraph 1.4 applies):

(a) If the valve is operable from both the remote operating station and from the local station, the valve and the remote operating station must bear the damage control or basic location number of the location of the valve, and the positive indication of the valve position. Damage control classification must be posted at both locations.

(b) If the valve is operable from only the remote station (e.g., the valve is located in a void), the valve number assigned must be the location number or damage control number of the remote operating station. Damage control classification of the valve must be posted at the remote station.

(c) Valve markings must include the valve service, the valve location number and the direction for opening and closing. Damage control classifications should also be posted where applicable.

* (d) In the case of a diverter valve, valves must be labeled "to overboard" or "to CHT tank," etc. (Reference (a), paragraph 2.3 applies).

3. All remotely operated valves within accessible spaces are required to be fitted with quick disconnect devices and a means of operating the valve at the local station. This includes valves fitted with mechanical advantage devices. (Reference (a), paragraph 2.3 applies).

* Identifies those items mandatory for certification

4. Operational check: Valves fitted with mechanical advantage devices must be checked to ensure that the valve is fully open and fully closed when the gear drive mechanism hits the stops.

5. Reach rods attached to plug valves must have sufficient yoke clearance to permit removal of the lubricating screw. (Reference (a), paragraph 2.3 applies).

* 6. Diverter valves must be properly positioned in the line.

* 7. Operational check: The ability to operate all valves locally must be demonstrated. This does not include valves located in inaccessible voids.

8. Operational check: The ability to operate all valves with ROG from their remote stations must be demonstrated.

9. Valves shall have remote operators where required by Appendix C. (Reference (a), paragraph 2.3 applies).

XIX. Deck Connection Station

* 1. The deck connection station must be fitted with a Camlock fitting or equal. NAVSHIPS Drawing 804-4444650B applies. Deck connection shall not block or cause undue interference to a transit. (Reference (a), paragraph 5.1 applies).

2. A padeye or similar fitting must be provided to assist in haul-up and lashing the sewage hose in place.

* 3. A health warning and operational placard must be posted at the station. (Reference (a), paragraph 8.2.7.2 applies).

XX. Fire Protection

* 1. Where existing firefighting equipment is not in close proximity to the pump room, 15 lb. CO_2 extinguishers must be provided. (Reference (a), paragraph 7.5 applies).

XXI. Ventilation

1. Pump room ventilation supply and exhaust must be arranged such that the exhaust does not empty into an area where it could be recycled through a ventilation supply system. (Reference (a), paragraph 7.6. outlines ventilation requirements).

XXII. Software (All software requirements listed below are considered necessary for proper CHT system operation and maintenance).

1. Technical Manuals

(a) The pump technical manual is supplied as part of the equipment and must be furnished to the ship by the installer.

* Identifies those items mandatory for certification

(b) The comminutor technical manual is supplied as part of the equipment, and must be furnished to the ship by the installer.

(c) The air compressor manual has been furnished to the ship by the installer.

2. CHT System Drawings

(a) The installing activity is required to furnish the ship with a set of CHT system drawings.

3. Ship's Information Book

(a) The ship's information book reflects the CHT installation.

4. Damage Control Diagrams and Damage Control Book

(a) The damage control diagrams and damage control book must reflect the CHT installation, including waste mains, soil mains and associated bulkhead stop valves.

5. PMS Coverage

(a) PMS documentation is available for all CHT equipment. If the ship does not receive its package through the normal procedure, a feedback requesting coverage should be submitted.

XXIII. Miscellaneous

1. Joining of soil and waste mains - Where soil waste mains join, the waste main must be provided with a swing check valve prior to tying into the soil main. (Reference (a), paragraph 2.5 applies).

2. All equipment must function in the proper manner.

* 3. There must be no evidence of system leakage.

4. Inspection requirements for CHT Sewage Receiving Stations are outlined in Appendix A.

5. Inspection requirements for Air Aspirator Systems are outlined in Appendix B.

6. Inspection requirements for remote operating gear are outlined in Appendix C.

XXIV. Training Status

A. Ship's force has received formal training.

B. PQS on board.

* Identifies those items mandatory for certification

APPENDIX A

Certification Requirements for CHT Sewage Receiving Stations

The following are certification items for CHT sewage receiving stations. These stations are used to transfer soil and waste to the CHT tank from drains which cannot reach the tank by gravity.

I. Pump

1. Receiving station must normally incorporate a single transfer pump of the macerator transfer type. Where there is no capability to drain soil and waste overboard by gravity, either upstream or via the tank, a second pump must be present. (Reference (a), paragraph 10.1.2 applies).

2. The pump(s) must incorporate mechanical seals. Reference (a), paragraph 10.1.2 applies).

3. The pump(s) must discharge to a dedicated line transferring sewage to the main CHT tank or to a gravity soil main. (Reference (a), paragraph 10.1.5 applies).

4. Pump(s) must incorporate a full port ball or plug valve on both the suction and discharge side of the pump(s). (Reference (a), paragraph 10.1.5 applies).

5. The pump(s) must incorporate a spool piece or a removable piece of piping (e.g. elbow) between the pump and the pump suction isolation valve to allow clearing debris from the pump suction. (Reference (a), paragraph 10.1.5 applies).

6. Pump(s) may take suction through the side or the bottom of the tank. Pump must take suction through a 90° elbow or a trap such that the centerline of the suction piping at its lowest point is at least 6 inches below the eye of the impeller. (Reference (a), paragraph 10.1.5 applies).

* 7. Ensure pump(s) are properly lubricated.

II. Pump Controls and Alarms

1. Pump controls and alarms must consist of a controller and three level sensors. The controller must function in an automatic and manual mode as follows (Reference (a), paragraph 10.1.3 applies):

* (a) Automatic Mode - Pump start sensor starts pump at level designated on drawings. Pump stop sensor stops pump at level designated on drawings.

(b) Manual Mode - Operates pump independent of level sensors.

(c) Where two pumps are used, controls must permit manual selection of the service pump. Automatic alternation of pumps is not required.

* Identifies those items mandatory for certification

* 2. The tank must incorporate an audible and visual high level alarm at a continuously manned station. (Reference (a), paragraph 10.1.4 applies).

3. Operational check: Activate pumping system and check for proper operation.

III. Tank

* 1. The interior of the tank must be coated with MIL-P-24441 (epoxyplyamide) coating. A coal tar epoxy coating, if already applied, is satisfactory. (Reference (a), paragraph 10.1.1 applies).

* 2. A tank vent and overflow must be provided. (Reference (a), paragraph 10.1.1 applies).

3. A tank access must be provided large enough to allow wash down of the tank interior with a hose (not less than 12 inches, but larger if required). (Reference (a), paragraph 10.1.1 applies).

IV. Communications Circuits

1. A telephone circuit must be located in the vicinity of the pump and should provide communications between the pump area and the location of the high level alarm. (Reference (a), paragraph 10.1.6 applies).

2. Operational check: Check to ensure the telephone is operating properly.

V. Pump Space Washup Facilities

1. A sink with potable water, soap dish or soap dispenser and hand drying fixture (either paper towel dispenser or electric hand dryer) must be located in the pump room or adjacent thereto. (Reference (a), paragraph 10.1.7 applies).

VI. Firemain

1. A valved hose connection to the firemain must be provided to wash down the pump room space. (Reference (a), paragraph 10.1.6 applies).

2. A fixed hardpiped connection must be provided for flushing and cleaning the tank.

VII. Coaming

1. The macerator transfer pump must be surrounded by a 2 to 4 inch coaming. (Reference (a), paragraph 10.1.7 applies).

VIII. Pump Space Sump and Eductor

1. Each pump space must be provided with a sump and eductor located inside the coaming. The eductor shall discharge to the pump discharge piping downstream of the pump discharge isolation valve. Sections VI, 1, and 2 of

* Identifies those items mandatory for certification

the main CHT checklist shall apply. (Reference (a), paragraph 10.1.6 applies).

IX. Posted Operating Instructions

1. The posted operating instructions and associated schematic drawing must reflect the CHT sewage receiving station installation. (Reference (a), paragraph 10.1.7 applies).

X. Health Warning Placards

1. Health warning placards must be provided in the pump space. (Reference (a), paragraph 10.1.7 applies).

XI. Fire Protection

* 1. Where existing firefighting equipment is not in close proximity to the sewage receiving station, 15 lb. CO_2 extinguishers must be provided. (Reference (a), paragraph 10.1.7 applies).

XII. Discharge Piping

1. Where the pump discharge ties directly into the main CHT tank, the pump discharge line must rise to or descend from a point above the main CHT tank high level alarm and slope down into the tank. (Reference (a), paragraph 10.1.5 applies).

2. Where the pump discharge ties into a gravity soil main, it must rise to a level above the main and then descend down to the point of connection. (Reference (a), paragraph 10.1.5 applies).

3. The pump discharge line must incorporate a swing check valve. (Reference (a), paragraph 10.1.5 applies).

4. Discharge piping in the pump space(s) must not be lagged or insulated. (Reference (a), paragraph 10.1.7 applies).

XIII. Collection Piping

1. Collection piping for receiving stations must conform to all piping requirements for standard CHT systems. Comminutor or strainers are not required.

XIV. Software

1. All software identified in Section XXII of the main CHT checklist must be modified to reflect the receiving station installation.

* Identifies those items mandatory for certification

APPENDIX B

Certification Requirements for Air Aspirator Systems

I. Pump

1. Pump(s) must have mechanical seals. (Reference (a), paragraph 6.3.2 applies).

II. Aspirator Discharge Piping

1. Aspirator discharge piping must incorporate a spool piece and a full port discharge cutout valve in that order downstream of the aspirator nozzle. (Reference (a), paragraph 6.3 applies).

2. A hose connect must be installed in the discharge piping between the aspirator discharge and the discharge cutout valve. (Reference (a), paragraph 6.3 applies).

III. Aspirator Intake

1. A pressure gage must be installed between the pump discharge and the aspirator inlet. A full port pump suction valve must be installed in the aspirator pump suction. (Reference (a), paragraph 6.3 applies).

2. Aspirator suction from tank must be low in the tank. In no case shall it be above the low level (pump cutout) sensor. (Reference (a), paragraph 6.3 applies).

IV. Aspirator Vent Piping

1. Aspirator vent piping below the top of the CHT tank must be CuNi. (Reference (a), paragraph 6.3 applies).

2. Aspirator vent piping must terminate in the weather, either in the hull or above the main deck. If it terminates in the hull, it shall be carried above FWL's I and II. Any valves at the hull in the vent line must be locked open. (Reference (a), paragraph 6.3 applies).

3. If vent terminates above the main deck, the vent piping shall contain a cross connect to the tank above the the high level alarm sensor. The cross connect must contain a check valve to prevent flow from the tank into the aspirator vent piping. (Reference (a), paragraph 6.3 applies).

4. Aspirator vent piping must contain a check valve between the aspirator nozzle and the tank cross connect (where present) preventing water flow up to the vent line. (Reference (a), paragraph 6.3 applies).

5. Aspirator vent piping must contain a hose connect with attached cap between the vent line check valve and the aspirator nozzle. (Reference (a), paragraph 6.3 applies).

V. Aspirator Controls

1. Aspirator pump must have manual start/stop controller. Automatic level sensor actuated pump stop is optional.

2. Aspirator pump controller must not be tied into CHT discharge pump cutout sensor.

VI. Software

1. Aspirator pump technical manual must be on board.

VII. Operating Instructions

1. Posted operating instructions must reflect aspirator installation. (Reference (a), paragraph 8.2.7 applies).

VIII. Miscellaneous

1. Aspirator pumps and components must be contained within the equipment coaming or have a separate 2 to 4 inch coaming. (Reference (a), paragraph 8.2.3 applies).

APPENDIX C

Remote Operating Gear Requirements for CHT Backfits

Remote Operating Gear (ROG) is required on the following CHT system valves (Reference (a), paragraph 2.3 applies):

1. Bulkhead Stop Valves - All bulkhead stop valves or diverter valves serving as bulkhead stop valves, which are located below the damage control deck shall have ROG operable from the damage control deck.

2. Overboard discharge valves shall have ROG if the valve is classified ZEBRA and is located in a compartment classified X-RAY, Circle X-RAY, YOKE or Circle YOKE and these compartments are unmanned during condition ZEBRA (General Quarters). These valves must be operable from the damage control deck or from a compartment classified ZEBRA.

3. Other CHT system valves shall have ROG if:

a. Valve is positioned in such a manner that it cannot be locally operated with the wrench supplied.

b. Valve is located in a void or compartment accessible only through a bolted access.

c. Valve is located in a storeroom or other such compartment which could be stowed in such a manner as to preclude access to the valve.

d. Valve is located in a storeroom or other such compartment which is normally locked.

Such valves shall be operable from a location as close to the valve as practical.

4. Overboard discharge valves from medical spaces (classified W) shall have ROG operable from the damage control deck.

CERTIFICATION CHECKLIST

FOR

SEWAGE COLLECTION, HOLDING AND TRANSFER (CHT)

SYSTEMS ON PERMANENTLY MOORED CRAFT

April 15, 1985

CHECK LIST FOR

SEWAGE

COLLECTION, HOLDING AND TRANSFER

(CHT)

SYSTEMS

ON PERMANENTLY MOORED CRAFT

Reference: (a) General Design Guidance for Surface Ship CHT Systems September 1974
(b) Design Criteria for Sewage CHT Systems; NAVSEA memo 1136 of 12 January 1977
(c) General Specifications for Ships of the United States Navy, 1 January 1975
(d) NAVSEA ltr 04F/JM, 9593.2 Ser 51 dtd 6 May 1978

Appendix: (A) Certification Requirements for CHT Sewage Receiving Stations

Scope: This check list applies to APL's, YFN:'s, YR's, YRBM's, YRST's and any nonself-propelled craft utilized for berthing, office space or work space which utilize CHT systems. This check list also applies to gravity transfer systems (systems draining to pier sewers or pier collection facilities by gravity only) where noted herein.

I. DISCHARGE TO PORT AND STARBOARD DECK CONNECTIONS

1. CHT pump discharge to the port and starboard deck connection stations must be through a "Tee" or a diverter valve. Reference (a), paragraph 5.0 applies.

II. PUMP ROOM SPACE WASH UP FACILITIES

1. Sink with potable water, soap dish or soap dispenser and hand drying fixture (either paper towel dispenser or electric dryer) must be located in the pump room or adjacent thereto. Transit to the wash up facility via berthing, messing, food preparation, food storage, etc. is not permitted. Sink shall drain to the pump room or space sump. Reference (a), paragraph 6.4 applies.

III. FIREMAIN

1. A fixed hard pipe connection must be provided for flushing and cleaning the CHT tank. Reference (a), paragraph 6.2 applies.

2. Tank flushing nozzle must thoroughly spray the interior of the tank. Reference (a), paragraph 6.2 applies.

*3. A sewage flushing connection must be provided from the firemain to the sewage pump discharge line just downstream of the discharge plug and check valves. Flushing connection must contain a cutout valve and a check valve. Reference (a), paragraph 6.2 applies.

4. A sewage flushing connection must be hard piped.

5. A hose connection must be provided to wash down the pump room space. Hose connection may be salt or potable. Reference (a), paragraph 6.2 applies.

6. If the firemain pressure is over 125 psig, a relief valve is required to protect the sewage hose. The relief valve must discharge overboard via the discharge piping or back to the tank at or near the tank top. Reference (a).

7. Back flow preventer must be installed in firemain supply.

IV. PUMP OVERBOARD DISCHARGE

NOTE: A pump overboard discharge via a separate hull penetration is optional and not required; however where one is installed it shall meet the requirements below.

1. The sewage pumps shall discharge overboard either via a separate hull penetration or via the hull penetration provided for the tank overflow.

2. The sewage pumps shall discharge overboard via a gagged scupper valve.

3. Where the sewage pumps discharge via the hull penetration provided for the tank overflow, the configuration shall not permit sewage to be pumped back to the tank via the overflow.

4. If the sewage pumps and the CHT tank overflow line both discharge through a single hull penetration, the sewage gravity overboard line may not discharge through the same penetration.

V. PUMP ROOM SUMP AND EDUCTOR

1. Each pump room must be provided with a sump and sump pump or eductor located inside the coaming. Reference (a), paragraph 6.3 and reference (b), paragraph I.a. apply.

2. The sump pump or eductor shall discharge into the CHT discharge line via a check valve so that it may be directed overboard or to the deck riser. The eductor suction line shall incorporate a cutout valve, a check valve and a vacuum gauge in that order downstream of the suction inlet. Where a sump pump is utilized it is also permissible to discharge back to the CHT tank via a check valve and a stop valve. Reference (a), paragraph 6.3 and reference (a), figures 1 and 2 apply.

3. Activate eductor or sump pump system and check for proper operation of components.

*Identifies those items mandatory for certification.

VI. POSTED OPERATING INSTRUCTIONS AND HEALTH WARNING PLACARDS

*1. Operating instructions and associated schematic must be posted in the CHT pump rooms and should reflect the CHT installation. Operational and health warning placards must be provided at deck connections. Reference (b), paragraph III.g and reference (c), section 602 apply.

VII. LEVEL SENSORS (Reference (a), paragraphs 4.1 and 4.2 apply for items 1.a through 1.d below.)

1. Approximately 85 percent (high level alarm)

a. An audible alarm must be provided in each pump room.

b. A visual alarm must be provided in each pump room.

*c. An audible alarm must be provided in a continuously manned space.

*d. A visual alarm must be provided in a continuously manned space.

*2. Level sensor located at about 2/3 tank capacity must activate standby pump.

*3. Level sensor located at about 1/3 tank capacity must activate duty pump.

*4. Level sensor located at tank low level must stop either or both pumps. This sensor must be located to insure pump suction remains flooded after pump(s) have stopped.

VIII. MOTOR CONTROLLER, ALTERNATION FEATURE

1. The motor controller is provided with a pump alternating feature. This must be satisfactorily demonstrated. Reference (a), paragraph 4.1 applies.

IX. CHT PUMPS

1. Pumps must have mechanical seals. Reference (a), paragraph 4.0 applies.

2. A spool piece or means of access to the pump suction must be provided in the pump suction line between the pump suction valve and the pump inlet. Reference (a), paragraph 4.3 applies.

3. The pump suction piping must be installed so that the pump suction remains flooded after the low level sensor has deactivated the pump. Inlet to pump suction must be at least 1/2 diameter above the tank bottom. Suction must not be configured to allow settling of solids or debris into the suction (e.g., extending vertically upward into the tank). Reference (a), paragraph 4 applies.

*Identifies those items mandatory for certification.

4. Each pump shall have a separate suction inlet in the tank.

*5. Each suction line shall incorporate a full port ball or plug cutout valve.

6. Each pump discharge line must have a check valve and a full port ball or plug cutout valve, in that order, downstream of the pump. The check valve must have a jack open device or a means of by-passing the check valve to allow drainage back to the tank. Reference (a), figures 1 and 2 apply.

7. Flow shall enter the tank through an inflow strainer located just above each pump discharge. Connection shall be just above these strainers. Reference (a), figure 2 applies.

8. The inflow strainers must be installed in vertical positions. Reference (a), figure 2 applies.

9. Each inlet line to the tank must incorporate a check valve and a full port ball or plug cutout valve, in that order, upstream of where this piping connects to the pump discharge piping. Note: Strainer flushing connections are not required. Reference (a), figure 2 applies.

10. An overflow box must be correctly installed in the tank.

11. A diaphragm type pressure gage must be installed in the pump discharge piping between the pump discharge valves and the pump discharge diverter valve.

*12. Insure pumps fitted with mechanical seals have lube oil in the reservoir. This is required by the pump technical manual.

13. The CHT pumps, spool pieces, pump suction and discharge valves, discharge check valves and strainers shall be surrounded by a 2 to 4 inch coaming. Reference (b), paragraph I.a applies. A grating located 2 to 4 inches above the pump room deck is a suitable substitute for a coaming.

X. CHT TANK

*1. The interior of the tank should be coated with MIL-P-24441 (epoxy-polyamide) coating. If a coal tar epoxy coating is already installed, it is satisfactory. Reference (a), paragraph 3.4 and reference (d) apply.

*2. A tank maintenance access should be provided. Reference (a), paragraph 3.3 applies.

*3. A tank vent and overflow line must be provided. The tank vent may branch off the overflow. If the vent line has a valve at the hull penetration it must be provided with a lock open device and locked open. Reference (a), paragraph 3.5 applies.

*Identifies those items mandatory for certification.

4. The overflow must discharge via a gagged scupper valve at the hull penetration. The overflow may tie into the gravity overboard discharge via a separate gagged scupper valve. Reference (a), paragraph 3.5 applies.

5. Where fixtures and/or soil drains exist below the level of the tank overflow, a cutout valve must be provided in the drain line from the fixture line to prevent progressive flooding. Reference (c) section 505 applies.

6. If a tank drain valve exists, it must be blanked.

XI. GARBAGE GRINDER DRAIN (This item applies to both CHT and gravity transfer systems.)

1. All tubing downstream of garbage grinders which utilize salt water must be CuNi or GRP (A. O. Smith Green Thread or equal). Reference (a), paragraph 2.2 applies.

XII. PIPING (All items in section XII below except item 5 apply to both CHT and gravity transfer systems.)

1. All soil piping must be CuNi or GRP (A. O. Smith Green Thread or equal). Reference (c), section 528 applies.

2. Waste piping downstream of garbage grinders that use salt water must be CuNi or GRP (A. O. Smith Green Thread or equal). Reference (a), paragraph 2.2 applies.

3. Waste piping that carries salt water must be CuNi (or A. O. Smith Green Thread or equal). Reference (c), section 528 applies.

4. Piping should be stenciled "soil" or "waste" or "combined soil and waste" and show direction of flow. Reference (a), paragraph 1.4 applies.

5. CHT piping in the pump room must not be lagged or insulated. Non-CHT piping in the pump room may be lagged. Reference (b), paragrah 1.d applies.

6. Valves and take down joints in the CHT or gravity transfer system should not be lagged. Reference (b), paragraph 1.d applies.

7. Removable drip pans are to be installed beneath CHT valves and/or take down joints in horizontal piping runs which are required in the following areas:

a. Dry Provision Storerooms

b. Food Preparation/Serving Areas

c. Food and Medical Utensil Washing and Storage Areas

d. Medical and Dental Spaces and Storerooms

*Identifies those items mandatory for certification.

XIII. VALVES (All items below except item 2.b apply to both CHT and gravity transfer systems.)

1. All valves must be full ported and manufactured in accordance with MIL-V-24509. Reference (a), paragraph 2.3 applies.

2. Valves should be marked as follows:

a. Valve markings must include the valve service, the valve location number and the direction for opening and closing. Reference (c), sections 505b and 507d applies.

* b. In the case of a diverter valve, valves should be labeled "to overboard" or "to CHT tank," etc. Reference (c), section 507d applies.

*3. Diverter valves must be properly positioned in the line.

*4. The ability to operate all valves locally must be demonstrated.

XIV. DECK CONNECTION STATION

*1. The deck connection station must be fitted with a Camlock fitting or equal. NAVSHIPS Drawing 804-4444650 applies. Deck connection shall not block or cause undue interference to a transit. Reference (a), paragraph 5.1 applies.

2. A padeye or similar fitting must be provided to assist in haul-up and lashing the sewage hose in place. Reference (a), paragraph 7.0 applies.

*3. A health warning and operational plaque must be posted at the station. Reference (a), paragraph 7 applies.

XV. GRAVITY OVERBOARD DISCHARGE

1. System shall have the capability to divert drains overboard by gravity in the event of power loss or equipment failure. Overboard discharge shall be via a gagged scupper valve.

XVI. FIRE PROTECTION

*1. Where existing fire fighting equipment is not in close proximity to the pump room, 15 lb. CO_2 extinguishers must be provided. Reference (a), paragraph 6.6 and reference (c), article 555 applies.

XVII. VENTILATION

1. Pump room ventilation supply and exhaust must be arranged such that the exhaust does not empty into an area where it could be recycled through a ventilation supply system. Reference (c), section 512 outlines ventilation requirements.

*Identifies those items mandatory for certification.

XVIII. SOFTWARE (All items below except item 1.a apply to both CHT and gravity transfer systems.)

1. Technical Manuals

a. The pump technical manual is supplied as part of the GFM equipment and must be in possession of the user activity.

2. CHT System Drawings

a. The user activity must have a set of CHT or gravity transfer system drawings.

3. Ship's Information Book

a. As part of the overhaul package (selected record update) the ship's information book must be updated to reflect the CHT or gravity transfer system installation.

XIX. MISCELLANEOUS (All items below apply to both CHT and gravity transfer systems.)

1. Joining of soil and waste mains - Where soil waste mains join, the waste main must be provided with a swing check valve prior to tying into the soil main. Reference (a), paragraph 2.5 applies.

2. Disinfectant connections are <u>not</u> required.

3. All equipment must function in the proper manner.

4. There must be no evidence of leakage or any potential unsafe or unsanitary conditions.

5. Inspection requirements for Sewage Receiving Stations are outlined in Appendix A.

6. Where drains tie into a manifold mounted externally on the craft, each drain line shall contain at least one of the following: (1) A gag scupper valve at the hull penetration; (2) a full port ball or plug valve at the hull penetration or (3); a cut out valve at some accessible point in the line which isolates the drains from seawater flooding.

*Identifies those items mandatory for certification.

APPENDIX A

CERTIFICATION REQUIREMENTS FOR CHT SEWAGE RECEIVING STATIONS (Items below apply to CHT and gravity transfer systems.)

The following apply to CHT sewage receiving stations. These stations are used to transfer soil and waste to the CHT tank or to a gravity main from sources which can not drain to the CHT tank by gravity.

I. PUMP

1. Receiving station must normally incorporate a single transfer pump of the macerator transfer type. Where there is no capability to drain soil and waste overboard by gravity, either upstream or via the tank, a second pump must be present.

2. The pump(s) must incorporate mechanical seals.

3. The pump(s) must discharge to a dedicated line transferring sewage to the main CHT tank or to a gravity soil main.

4. Pump(s) must incorporate a full port ball or plug valve on both the suction and discharge side of the pump(s).

5. The pump(s) must incorporate a spool piece or a removable piece of piping (e.g., elbow) between the pump and the pump suction isolation valve to allow clearing debris from the pump suction.

6. Pump(s) may take suction through the side or the bottom of the tank. Pump must take suction through a 90° elbow or a trap such that the centerline of the suction piping at its lowest point is at least 6 inches below the eye of the impeller.

*7. Insure pump(s) are properly lubricated.

II. PUMP CONTROLS AND ALARMS

1. Pump controls and alarms must consist of a controller and three level sensors. The controller must function in an automatic and manual mode as follows:

*a. Automatic Mode - Pump start sensor starts pump at level designated on drawings. Pump stop sensor stops pump at level designated on drawings.

b. Manual Mode - Operates pump independent of level sensors.

c. Where two pumps are used, controls must permit manual section of the service pump. Automatic alternation of pumps is not required.

*2. The tank must incorporate an audible and visual high level alarm at a continuously manned station.

*Identifies those items mandatory for certification.

3. Activate pumping system and check for proper operation.

III. TANK

*1. The interior of the tank must be coated with MIL-P-24441 (epoxy-polyamide) coating. A coal tar epoxy coating, if already applied, is satisfactory. Section X.1 of main CHT check list applies.

*2. A tank vent and overflow must be provided. Section X.3, 4 and 5 of the main CHT check list shall apply.

3. A tank access must be provided large enough to allow wash down of the tank interior with a hose (not less than 12 inches, but larger if required).

IV. PUMP SPACE WASH UP FACILITIES

1. A sink with potable water, soap dish or soap dispenser and hand drying fixture (either paper towel dispenser or electric hand dryer) must be located in the pump room or adjacent thereto. Section II.1 of the main CHT check list shall apply.

V. FIREMAIN

1. A valved hose connection to the firemain must be provided to wash down the pump room space. Section III.5 of the main check list shall apply.

2. A fixed hard pipe connection must be provided for flushing and cleaning the tank.

VI. COAMING

1. The macerator transfer pump must be surrounded by a 2 to 4 inch coaming. Section IX.13 of the main CHT check list applies.

VII. PUMP SPACE SUMP AND EDUCTOR

1. Each pump space must be provided with a sump located at a low point within the coaming.

2. The sump will be equipped with either an eductor or sump pump which discharges to the pump discharge piping via a check valve downstream of the pump discharge isolation valves. Where a sump pump is utilized, it is also permissible to discharge back to the CHT tank via a check valve and a stop valve. Section V.1 and 2 of the main CHT check list shall apply.

VIII. POSTED OPERATING INSTRUCTIONS

1. The posted operating instructions and associated schematic drawing must reflect the CHT installation. Section VI of the main CHT check list applies.

*Identifies those items mandatory for certification.

IX. HEALTH WARNING PLACARDS

1. Health warning placards must be provided in the pump space. Section VI of the main CHT check list applies.

X. FIRE PROTECTION

*1. Where existing fire fighting equipment is not in close proximity to the pump room, 15 lb. CO_2 extinguishers must be provided.

XI. DISCHARGE PIPING

1. Where the pump discharge ties directly into the main CHT tank, the pump discharge line must rise to or descend from a point above the main CHT tank high level alarm and slope down into the tank.

2. Where the pump discharge ties into a gravity soil main, it must rise to a level above the main and then descend down to the point of connection.

3. The pump discharge line must incorporate a swing check valve.

4. Discharge piping must be CuNi where it will be exposed to salt water.

5. Discharge piping in the pump space(s) must not be lagged or insulated.

XII. COLLECTION PIPING

1. Collection piping for receiving stations must conform to all piping requirements for standard CHT systems. Comminutor or strainers are not required.

XIII. SOFTWARE

1. All software identified in section XVIII of the main CHT check list must be modified to reflect the receiving station installation.

*Identifies those items mandatory for certification.

CERTIFICATION CHECKLIST

FOR

MODIFIED VACUUM MARINE SANITATION DEVICE (MSD)

DD 963/DDG 993 CLASS

April 15, 1985

CERTIFICATION CHECKLIST FOR MODIFIED VACUUM MARINE SANITATION DEVICE (MSD) DD 963/DDG 993 CLASS

I. GENERAL ITEMS

A. Hardware/Installation

B. Habitability/Safety

* (1) Washup facilities installed

* (2) Protective clothing available and stowage locker installed

(3) Absence of sewage odors

* (4) Fire extinguishers installed

(5) Padeyes

* (6) Potable water isolated from freshwater supply

* (7) Drip pans under takedown joints in health sensitive areas

* (8) Coaming around plant with means for evacuation

* (9) Health warning plaques posted

(10) Provision for seawater washdown of deck connections

C. Operability/Supportability

(1) Updated technical manual onboard

(2) Plant updated APLs onboard

(3) Spare parts onboard, iaw APL

(4) Tools onboard

(5) PMS package available & correct

* (6) Trained plant operators onboard

* (7) Posted operating instructions are correct

* (8) Telephone circuits functional

(9) Isolation of system component availability

* (10) Leakage, not evident on equipment

*REQUIRED FOR CERTIFICATION

* (11) Plant equipment is fumetight and watertight

II. FLUSHING FIXTURES

A. Hardware/Installation

(1) Water closets and urinals adequately installed

* (2) In-line strainers removed from urinal drain lines

(3) Urinal drain valves are vacuum interface type

B. Habitability/Safety

* (1) Water remains in WC after flush

(2) No excessive deposits in urinals

* (3) Placard warning against foreign objects posted

C. Operability/Supportability

* (1) All WCs flush properly

a. Discharge valves remain open at least 1.5 sec.

* b. Discharge valves seat properly

c. Water spray ring operates for 2 seconds

* d. Water discharges stop when flush complete

(2) Urinal flushing valve operates properly

a. 1 pint of water per flush

* b. Water does not splash out of urinal

* c. Flushing valve does not leak

* (3) Vacuum Interface Valves (VIV) operate properly

a. VIV operates after 3 flushes

b. VIV seats properly

c. VIV piping does not leak

*REQUIRED FOR CERTIFICATION

III. VACUUM PUMP (VP) ASSEMBLY

A. Hardware/Installation

(1) Equipment installed correctly

(2) VPs have mechanical seals and any cooling tubing is stainless steel

* (3) Single disk-type check valves mounted horizontally

* (4) VP tank vents routed to weather

(5) Vent bypass and SS water gage stops installed when required

(6) Steel-coupled Synflex hoses installed

(7) Rain cap installed on seal water vent stack

B. Habitability/Safety

(1) Guards around VP couplings

* (2) No evidence of seal water leakage

C. Operability/Supportability

* (1) Freshwater supply available to seal water tank

* (2) Seal water is at proper level

* (3) VP recovery time is OK (not more than 1 minute to draw 16 to 20 inches Hg with VCT below B Level, i.e., with effluent pumps not running)

* (4) VPs free of excessive noise and vibration

(5) VPs have nearly equal times of operation

IV. GRINDER PUMP ASSEMBLY (GP)

A. Hardware/Installation

(1) Installation satisfactory. Modified GP Discharges to bottom of VCT

(2) Modified oil reservoir installed and no leakage evident

B. Habitability/Safety

GP canopy and piping can be removed safely for pump maintenance

*REQUIRED FOR CERTIFICATION

C. Operability/Supportability

* (1) GP motor free of excessive noise and vibration

(2) Operates independently and in coincidence with effluent pumps

V. EFFLUENT PUMP ASSEMBLIES (Incinerator Feed, and Transfer and Dump Pump)

A. Hardware/Installation

(1) Equipment modified correctly, suction at seal end (side) of pump

* (2) Pumps have double mechanical seals and oil reservoirs

(3) Permanent sewage flushing connection available from freshwater to pump discharge line

(4) Transfer and dump pump discharge pressure gage is suitable for sewage service

B. Habitability/Safety

* Guards around pump drive system

C. Operability/Supportability

* (1) Effluent pumps and motors free of excessive noise and vibration

(2) Correct amount of oil in reservoirs

(3) Adequate tension on all pump drive belts

VI. VACUUM COLLECTION TANK ASSEMBLY

A. Hardware/Installation

(1) Equipment installed correctly

(2) Hose connection for space washdown

(3) Relief valves discharge to vent filter

B. Habitability/Safety

(1) Ship's service air supplied at not more than 15 lb/in^2 gage

* (2) Emergency blow valve secured by chain and lock

*REQUIRED FOR CERTIFICATION

C. Operability/Supportability

* (1) "D" (uppermost) level switches are functional; VPs deactivate; VHL alarms locally and at CCS

* (2) "C" level float switch functional (high level); alarms locally and at CCS

* (3) "B" level switch is functional; activates transfer/dump pump in transfer/dump mode; and lights off incinerator in incinerate mode

* (4) "A" level switch is functional; incinerator or transfer pumps deactivate

(5) All gage calibrations are current

VII. INCINERATOR ASSEMBLY

A. Hardware/Installation

(1) Equipment Modified correctly

* (2) Dry ship's service air is provided at 100 lb/in^2 gage

(3) Incinerator liners are Inconel 690 alloy and air cooled

(4) Sight glass in exhaust stack

(5) Air water separator installed (one serves both plants)

(6) Modified spark plug air feed installed

* (7) Automatic electropneumatic sludge feed valve installed

(8) Incinerator ash door studs and access door studs serviceable

(9) Incinerator ash removal door serviceable

B. Habitability/Safety

* (1) Insulation and cages provided to protect personnel from hot surfaces

* (2) Fire/Smoke detectors installed and operational

* (3) Fuel safety shutoff valves provided

* (4) No signs of fuel leakage

* (5) Exhaust stacks do not smoke excessively

*REQUIRED FOR CERTIFICATION

(6) Incinerator ashes are not wet or odorous

C. Operability/Supportability

* (1) Internal incinerator components free of cracks, holes or warpage

* (2) Fuel nozzle pressure stable at 100 lb/in^2 gage

* (3) Stack operating temperature between 620 and 675°F

* (4) Sewage nozzle atomizing properly

* (5) Clear stable flame established

* (6) Fuel pump, motor, and blower free of vibration

(7) No evidence of scorched paint on incinerator exterior

VIII. MASTER CONTROL PANEL

A. Hardware/Installation

(1) VP isolation switches provided

(2) Transfer/dump pump overrun timer installed

* (3) Audible and visual summary fault alarms provided

B. Habitability/Safety

* (1) Multiple-power-source warning plates installed

* (2) All power supplies can be isolated

C. Operability/Supportability

(1) Qualified and trained electrician available

(2) Power on and all controls in automatic

* (3) Vacuum pump low water circuit operational

* (4) Five motor overload circuits operational

* (5) Vacuum pump overrun circuit operational

* (6) Summary alarm circuit operational

* (7) Level sensing circuits operational

* (8) GP timing/control circuit operational

*REQUIRED FOR CERTIFICATION

IX. INCINERATOR CONTROL PANEL

A. Hardware/Installation

* (1) Power isolation switch installed

(2) Incinerator has separate alarm circuit

* (3) Audible and visual summary alarms installed

B. Habitability/Safety

* (1) Multiple-power-source warning plates installed

* (2) All power supplies can be secured

C. Operability/Supportability

* (1) Power on and controls in automatic

* (2) Combustion control (flame scanner) operational

* (3) Overtemp circuit operational

* (4) Motor overload circuits operational

* (5) Summary fault alarm operational

X. PIPING SYSTEM

A. Hardware/Installation

* (1) Deck discharge connection installed correctly

* (2) Adequate equipment available for connecting sewage hose

(3) No sharp bends in piping system

(4) Provision for emergency flushing of WCs and urinals with seawater

(5) Protection from sharp point impacts provided

B. Habitability/Supportability

(1) Piping is stenciled "Soil"

(2) Incinerator exhaust stack is insulated and extends 6 inches above stack

* (3) Sewage discharge connections not near potable water lines

*REQUIRED FOR CERTIFICATION

(4) Piping in sewage plants not lagged

(5) Gravity drains are at least 1-1/4 inch IPS

(6) Incinerator exhaust spectacle flanges installed

XII. VALVING SYSTEM

A. Hardware/Installation

(1) All valves are provided and installed

(2) All valves are fully ported

B. Habitability/Safety

(1) Valves are labeled and stenciled correctly

(2) Damage control classifications are posted

* (3) Exhaust stack valve closure provides signal to CCS and to incinerator for shutdown

C. Operability/Supportability

* (1) All valves operate locally

(2) System is in fresh water flush mode

*REQUIRED FOR CERTIFICATION

CERTIFICATION CHECKLIST

FOR

BIOLOGICAL SEWAGE TREATMENT SYSTEMS

(LHA-1 THRU LHA-5 ONLY)

APRIL 15, 1985

CERTIFICATION CHECKLIST FOR

BIOLOGICAL SEWAGE TREATMENT SYSTEMS

(LHA-1 THRU LHA-5 ONLY)

II. General

A. Habitability/Safety

* 1. Wash-up facilities installed (cold water, detergent, drying facilities, pump)

* 2. Plaques posted in plant spaces:

a. Spill and leak clean-up procedures

b. Personnel clean-up procedures

c. Smoking, eating or drinking prohibition

d. Deck discharge connection procedures (at deck connections only)

* 3. Protective clothing availability and locker stowage

* 4. Drip pans under valves and take down joints in sensitive areas

* 5. Absence of septic odors

6. Hinges and props on effluent tank and skimmer compartment covers

* 7. Six inch coaming around plant (Plants #1 & #2)

* 8. Coaming around plant extending to deck plate (Plant #3)

* 9. Manual evacuation from coaming to influent line

10. Secured aluminum deck grating around plant

* 11. Fire extinguishers installed

B. Operability/Supportability

* 1. Updated Plant Technical Manual on board

2. Updated Comminutor Technical Manual on board

3. Plant APL on board

*Required For Certification

4. Updated PMS package on board

* 5. Adequate supply of sodium hypochlorite solution on board

* 6. Sodium hypochlorite storage facilities available

* 7. Test apparatus on board

8. Inspect operating logs for fidelity

9. Review operating logs for trends

* 10. Plant operators trained

11. Spare parts on board

* 12. Telephone circuits functional

C. Installation/Ship Interface

1. Inspect auxiliary air system

* 2. Check local operation of all valves and labeling of all diverter valves

3. Capability to direct troop soil to plants 1 and 2 installed

4. Check operation and labeling of all effluent discharge valves and inspect piping.

5. Check plumbing drain lines correctly specified as "Soil Drain" or "Waste Drain"

* 6. Operating instructions and piping schematics posted in compartment near plant

7. Deck discharge hose connecting procedures posted

* 8. Treatment plant schematics posted on plant

III. System Components

A. Influent Box

* 1. Inspect bar screen and flip gate

*Required-For Certification

LHA-1 CLASS SEWAGE TREATMENT SYSTEM CHECKLIST (Cont'd)

B. Aeration Tank and Aerators

1. Plant has not been operated or is not fully operating

a. Epoxy coating complete and unbroken

* b. Air diffuser assemblies intact

* c. Diffuser sleeves undamaged and clamped

d. Lift cable coating undamaged

2. Plant is fully operating

* a. Earthy brown color and solid particles in liquid

* b. Damp peat odor present

* c. Proper liquid level and roll

* d. If poor liquid roll, check diffusers

C. Aeration Tank Heaters

* 1. Verify fluid level

* 2. Verify fluid temperature (85°F - 105°F) if operating

3. Verify tank thermoswitch set at 95°F

4. Heater No. 1 thermoswitch set 260°F

5. Heater No. 2 thermoswitch set 260°F

D. Air Supply System

* 1. Blower oil level normal when off

* 2. Blower operates smooth, quiet and not too hot

* 3. Air pressure is 3 $\pm$1/4 psi

* 4. Air control valves operate freely:

* a. Aerator supply valves

* b. Squirt header valves

*Required For Certification

* c. Front air lift supply valve

* d. Back air lift supply valve

* e. Surface skimmer air supply valve

E. Sludge Returns

* 1. Plant used but off line

a. Verify tank is clean

* b. Epoxy coating complete

* c. Air lift clean and undamaged

* 2. Plant is Operating

a. Flow is visible in return lines

F. Surface Skimmer

* 1. 4 Vee notch weirs on bowl

* 2. Skimmer operates

G. Effluent Discharge Pumps

* 1. Plant not in operation - verify motor rotation

2. Plant operating:

* a. Verify motor rotation

* b. No leakage into space

* c. Test level probes and alarm with pump off

* d. Test level probes with pump on

H. Chemical Treatment System and Contacting Tank

1. Verify 90° elbow influent to tank

2. Plant not operating:

a. Check tank baffles for cracks

*Required For Certification

b. Verify tank cleanliness

* c. Check hypochlorite pump operation using water

* d. Verify that hypochlorite pump discharge hose is secure

* e. Check for leakage from disinfection system

* f. Verify automatic operation of hypochlorite pump and timer

g. Check for chlorine corrosion on tank exterior

3. Plant Operating:

a. Verify presence of 2 hypochlorite solution jerricans

b. Check for chlorine corrosion on tank exterior

* c. Verify hypochlorite injection sequence

I. Comminutor

1. Verify unit is Air Master Model AM 5600 6 inch

* 2. Verify smooth and continuous operation of comminutor

3. Comminutor Installation

J. Drainage, Piping and Valves

* 1. Check for free operation

* a. Aeration tank drain valve

* b. Front sedimentation drain valve

* c. Back sedimentation drain valve

* d. Effluent holding tank drain valve

* e. Effluent pump No. 1 suction

* f. Effluent pump No. 2 suction

* g. Effluent pump No. 1 discharge

*Required For Certification

* h. Effluent pump No. 2 discharge

* i. Effluent pump No. 2 prime valve

* j. Effluent pump No. 1 prime valve

* k. Aeration tank sample valve

* l. Sedimentation tank sample valve

* m. Effluent holding tank sample valve

* n. Effluent discharge header sample valve

* o. Auxiliary drain valve (and fire hose adapter installed)

* p. 3-way air source selector valve

2. Check existence of system valves against schematics

3. Check plant valves for identification and labeling

* 4. Check for removable drip pans under valves flanges and take down joints in sensitive areas

5. Insure sewage valve not lagged

6. Insure damage control classifications are posted

7. Insure piping stenciled as soil

* 8. Insure sewage discharge connections are not located near potable water line

* 9. Check for "kamlock" type quick disconnect on deck connections

10. Check for hauling and lashing equipment for shore line

11. Check for provision to flush out discharge piping

12. Verify that all valves are fully ported

*Required For Certification

IV. Certification Criteria for Operating Plant

A. Process Performance

1.	SV:30	20-40%
2.	D.O.:	1-3 ppm
3.	Residual Chlorine	1-3 ppm

B. Effluent Quality

1.	Coloform	200 MPN/100 ml Max.
2.	Suspended Solids	150 mg/1 Max.

CERTIFICATION CHECKLIST

FOR

GATX MK I SYSTEMS

APRIL 15, 1985

Ref: (a) General Design Manual; GATX MK I MARINE SANITATION DEVICE Jan 1980

CERTIFICATION CHECKLIST FOR

GATX MK I SYSTEMS

I. Reduced Flush Commode

A. Installation

1. Commodes on board are GATX Corp. controlled volume flush type. Ref (a) 3.2

2. Each commode shock mounted. Ref (a) 3.3.1

* 3. Standard wax seal installed between commode insert and 4-inch soil line. Ref (a) 3.3.3

4. Commodes should be located sufficiently far away from bulkhead (approximately 16-18 inches from center of soil line) to permit access to flush valve microswitch and cam assemblies. REf (a) 3.3.2

5. If commode equipped with emergency flush capability (direct overboard discharge) following is noted: Ref (a) 3.3.6

a. Emergency flushing connection located in vicinity of commode vent.

b. Commode vent line fitted with plug attached to pipe with chain/lanyard. (if Necessary)

* c. Diverter valve installed between commode and macerator/transfer pump to allow direct overboard discharge.

* 6. Commode vent line discharge to atmosphere away from personnel (typically 7-1/2 feet above weatherdeck). Ref (a) 3.3.4

7. One inch vent line tied into 4-inch commode drain line directly below head deck. Ref (a) 3.3.4

8. Flush valve mounted so distance from deck surface to centerline of bulkhead mounting bracket is at least 25 inches. Ref (a) 3.3.5

9. Flush valve handle properly positioned to avoid being hazard to user. Ref (a) 3.3.5

10. Flush cable properly installed and secured between clevis and cable collar/retainer.

11. Flushing water supply pressure 15-45 psig. Ref (a) 3.3.5

*Required for certification

12. Microswitch and cam assemblies properly installed in rear of commode. Ref (a) Figure 3-1

13. Electrical connection to microswitch well insulated and watertight. Ref (a) 3.2

B. Operation

* 1. With flush pedal in up position, microswitch plunger fully depressed.

* 2. Upon pushing flush pedal, following is observed:

* a. Flush cable pulls flush valve handle and allows water to enter bowl in even spray pattern.

b. Flapper valve swings open until almost in vertical position.

* c. Click can be heard as macerator/transfer pump is energized and runs for approximately 10 - 12 seconds.

* 3. When flush pedal released, flapper valve swings back to horizontal position and seals bowl, trapping small amount of flush water.

4. Pushing flushometer handle once releases exactly one pint of flush water.

5. Flushometer handle easily operated.

* 6. When two pints are added to bowl (two flushes) water level stays constant for at least 15 minutes.

* 7. During operation of commode, leaks were not observed around commode, soil line, vent line, diverter valve or macerator/transfer suction piping.

II. Macerator/Transfer Pump

a. Installation

1. Macerator/transfer pumps are 1.0 HP manufactured by HYDR-O-MATIC Pump Co. Ref (a) 4.2.1

2. Macerator/transfer pump has mechanical seal. Ref (a) 4.2.1

* 3. Each commode has macerator/transfer pump downstream as close as possible.

*Required for certification

* 4. Drip pan installed under pump in health sensitive areas. Ref (a) 4.3.2.1

5. Pump mounts suitable for supporting 120lbs and fastened to permanent structural member. Ref (a) 4.3.1.1

6. Cleanout fitting installed on suction side of macertor/transfer pump to facilitate draining/unclogging pump inlet. Ref (a) 4.3.2.3

7. Pump suction piping installed so that pump suction remains flooded. Ref (a) 4.3.2.5

8. Takedown joints provided on each side of pumps to facilitate removal. Ref (a) 4.3.2.4

9. Pump accessible for maintenance. Ref (a) 4.3.1.2

* 10. Isolation valve installed immediately downstream of discharge side takedown joint. Ref (a) 4.3.2.4

* 11. Check valve installed in pump discharge line in horizontal position. Ref (a) 4.3.2.6

B. Operation

* 1. Flushing associated commode initiates 10 - 12 second pump cycle.

* 2. Pump rotates in proper direction (counter-clockwise when viewed from suction end).

* 3. Macerator/transfer pump does not make excessive noise when operating, indicating proper axial alignment.

* 4. Pump associated plumbing does not allow leakage.

III. Sewage Discharge Pump

A. Installation

1. Sewage discharge pump same as M/T pump. Ref (a) 4.2.1

2. Pump has a mechanical seal. Ref (a) 4.2.1

3. Sewage discharge pump attached securely to permanent ship structure. Ref (a) 4.3.1.1

4. Pump accessible for maintenance. Ref (a) 4.3.1.2

* 5. Coaming/drip pan assembly for sewage discharge pump and holding tank provides partition within drip pan to isolate section

*Required for certification

beneath pump motor. Isolated portion under motor has separate drain plug. Ref (a) 4.3.3.1

6. Take down joints installed on either side of pump.

* 7. The following items are installed between the sewage discharge pump and the sewage holding tank and discharge side also.

a. Union (where applicable)

* b. Ball valve

B. Operation

* 1. Sewage discharge pump operates quietly without vibration.

* 2. Pump and associated plumbing does not allow leakage.

IV. Sewage Evaporator

A. Installation

* 1. Evaporator tank of 80-gallon capacity lined with Teflon, insulated with fiberglass, and covered with protective metal shroud. Ref (a) 5.2

2. Evaporator tank installed level. Ref (a) 5.4.1

* 3. Following easily accessible: Ref (a) 5.4.1

* a. Control box

* b. Isolation valve

* c. Overboard discharge valve

* d. Water fill line for steam jacket

* e. Cleanout viewing port

* f. Water level gage glass

* g. Pressure gage

* h. Sewage discharge pump

4. Space adequate to permit removal of top shroud. Ref (a) 5.4.1

5. Saltwater or feedwater flushing and rinsing service installed. Backflow preventer in freshwater flushing line.

6. Ventilation system arranged to prevent redistribution of treatment room air within ship. Ref (a) 6.2

*Required for certification

7. System can bypass evaporator tank. Ref (a) Figure 1-1

* 8. Jacket top cover and viewing port tightly gasketed. Ref (a) 5.2

B. Operation

* 1. Low level indicator functional.

* 2. High level indicator functional.

* 3. Control panel indicator lamps functional.

* 4. Indicator lamps in heads energized when 80-percent level sensor activated.

V. Vapor Treatment System

A. Installation

* 1. Blower has enough clearance to ensure adequate source of oxidation air and motor cooling air. Ref (a) 6.3.2

2. Sufficient clearance for service or replacement of heater. Ref (a) 6.3.3

* 3. Bypass tee installed with through axis vertical and aligned with VTS bypass. Ref (a) 6.3.4

* 4. VTS 3-way valve easily accessible and operable. Ref (a) 6.3.5

5. Vent line installed so: Ref (a) 5.4.2

* a. Carries as high as feasible above superstructure but limited to 40-foot length.

b. Clears bridge and other personnel area.

* c. No rain cap on hood.

d. Pitched towards tank with minimal right-angle bends and horizontal reach.

e. Lagged for personnel safety and to reduce condensation.

* f. Installation of a drain valve at the lowest point of the VTS inlet line to the catalytic column.

* g. A differential pressure switch is piped to both sides of an orifice in the blower discharge line.

* h. The blower has an ON/OFF switch locking device.

*Required for certification

B. Operation

* 1. Allows bypass to catalyst bed.

VI. Piping System

A. Installation

1. Valves are full ported (or effectively full ported) and made of alloy suitable for saltwater application. Ref (a) 7.2.10

* 2. Diverter valves are marked to indicate their service and direction for opening and closing. Ref (a) 7.2.3.13

3. Valves installed in locations accessible for operation and maintenance. Ref (a) 7.2.11

4. Check valves installed horizontally and properly aligned.

5. Soil piping is copper-nickel. Ref (a) 7.2.1

6. No lagging on pipes in immediate vicinity of pumps or tanks, or in any machinery space. Ref (a) 7.2.14

7. Horizontal runs of gravity drainage lines pitched toward outlet at minimum of 1/2 inch per foot. Ref (a) 7.2.3

8. Sufficient cleanouts installed in soil lines. Ref (a) 7.2.4

* 9. Takedown joints not installed in medical spaces or food storage, preparation, and handling areas. Ref (a) 7.2.5

10. MSD piping labeled according to specific service (i.e., soil, saltwater, etc.) and direction of flow. Ref (a) 7.2.9

b. Operation

* 1. Valves operate locally.

* 2. MSD piping free from leaks.

VII. Electrical Circuitry

A. Installation

* 1. Electrical connections properly insulated and watertight. Ref (a) 9.2

* 2. Adequate circuit protection provided. Ref (a) Figure 9-2

*Required for certification

B. Operation

* 1. Electrical components operate satisfactory.

VIII. Deck Connection Station

A. Installation

* 1. Deck connection station fitted with 1-1/2 inch flush mounted fitting and should be placed in accessible location. Ref (a) 8.2

* 2. Proper adapters for deck connection available on board. Ref (a) Figure 8-1

3. The deck plate properly labeled. Ref (a) 8.2

B. Operation

1. Deck plate easily removed and replaced.

* 2. Camlock 1-1/2 inch IPS adapter easily installed and removed.

IX. General

A. Software

1. Following items available on board:

a. MSD Technical Manual

b. MSD system drawings

c. NSTM CH 593 "Pollution Control"

d. NAVMED P5010, Chapter 7

e. Updated PMS coverage

f. Updated COSAL coverage

g. Updated compartment checkoff lists

h. Updated SIB

B. Placards

1. The following placards shall be posted: Ref (a) 10.0

*Required for certification

* a. GATX sanitation system operating diagram in pump room.

* b. Personnel health precautions in pump room.

c. Sewage system transfer operations at deck connection station.

d. GATX MSD electrical control schematic inside control panel.

e. Holding tank high level indicator instructions in head adjacent to high level indicator.

* f. Emergency flushing procedure adjacent to emergency flush valve.

g. Commode operating instructions in head adjacent to commode.

X Training Status

A. Ship's force has received formal training.

B. PQS on board.

**Required for certification

CERTIFICATION CHECKLIST

FOR

GATX MK II SYSTEMS

April 15, 1985

Ref: (a) General Design Manual; GATX MK II MARINE SANITATION DEVICE JUNE 1979

CERTIFICATION CHECKLIST FOR
GATX MK II SYSTEMS

I. Reduced Flush Commode

A. Installation

1. Commodes on board are GATX Corp controlled volume flush type. Ref (a) 3.2

2. Each commode shock mounted. Ref (a) 3.3.1

* 3. Standard wax seal installed between commode insert and 4-inch soil line. Ref (a) 3.3.3

4. Commodes should be located sufficiently far away from bulkhead (approximately 16 - 18 inches from center of soil line) to permit access to flush valve microswitch and cam assemblies. Ref (a) 3.3.2

5. If commode equipped with emergency flush capability (direct overboard discharge) following is noted: Ref (a) 3.3.6

a. Emergency flushing connection located in vicinity of commode vent.

b. Commode vent line fitted with plug attached to pipe with chain/lanyard. (if necessary)

* c. Diverter valve installed between commode and macerator/transfer pump to allow direct overboard discharge

* 6. Commode vent line discharges to atmosphere away from personnel (typically 7-1/2 feet above weatherdeck). Ref (a) 3.3.4

7. One inch vent line tied into 4-inch commode drain line directly below head deck. Ref (a) 3.3.4

8. Flush valve mounted so distance from deck surface to centerline of bulkhead mounting bracket is at least 25 inches. Ref (a) 3.3.5

9. Flush valve handle properly positioned to avoid being hazard to user. Ref (a)3.3.5

10. Flush cable properly installed and secured between clevis and cable collar/retainer.

11. Flushing water supply pressure 15-45 psig. Ref (a) 3.3.5

*Required for certification

12. Microswitch and cam assemblies properly installed on rear of commode. Ref (a) Figure 3-1

13. Electrical connection to microswitch well insulated and water-tight. Ref (a) 3.2

B. Operation

* 1. With flush pedal in up position, microswitch plunger fully depressed.

* 2. Upon pushing flush pedal, following is observed:

* a. Flush cable pulls flush valve handle and allows water to enter bowl in even spray pattern.

b. Flapper valve swings open until almost in vertical position.

* c. Click can be heard as macerator/transfer pump energized and runs for approximately 10 - 12 seconds.

* 3. When flush pedal released, flapper valve swings back to horizontal position and seals bowl, trapping small amount of flush water.

4. Pushing flushometer handle once releases exactly one pint of flush water.

5. Flushometer handle easily operated.

* 6. When two pints are added to bowl (two flushes), water level stays constant for at least 15 minutes.

* 7. During operation of commode, leaks are not observed around commode, soil line, vent line, diverter valve or macerator/transfer pump suction piping.

II. Macerator/Transfer Pump

A. Installation

1. Macerator/transfer pumps are 1.0 or 2.0 HP manufactured by HYDR-O-MATIC Pump Co. Ref (a) 4.2.1

2. Macerator/transfer pump has mechanical seal. Ref (a) 4.2.1

* 3. Each commode has macerator/transfer pump downstream

*Required for certification

* 4. Drip pan installed under pump in health sensitive areas. Ref (a) 4.3.2.1

5. Pump mounts suitable for supporting 120 lbs and fastened to permanent structural member. Ref (a) 4.3.1.1

6. Cleanout fitting installed on suction side of macerator/transfer pump inlet. Ref (a) 4.3.2.3

7. Pump suction piping installed so that pump suction remains flooded. Ref (a) 4.3.2.5

8. Takedown joints provided on each side of pumps to facilitate removal. Ref (a) 4.3.2.4

9. Pump accessible for maintenance. Ref (a) 4.3.1.2

* 10. Isolation valve installed immediately downstream of discharge side takedown joint. Ref (a) 4.3.2.4

* 11. Check valve installed in pump discharge line in horizontal position. Ref (a) 4.3.2.6

B. Operation

* 1. Flushing associated commode initiates 10 - 12 second pump cycle.

* 2. Pump rotates in proper direction (counter-clockwise when viewed from suction end).

* 3. Macerator/transfer pump does not make excessive noise when operating, indicating proper axial alignment.

* 4. Pump associated plumbing does not allow leakage.

III. Sewage Discharge Pump

A. Installation

1. Sewage discharge pump 1 HP manufactured by Oberdorfer Foundry Inc. Ref (a) 4.2.2

2. Pump has mechanical seal. Ref (a) 4.2.2

3. Sewage discharge pump bolted to pump foundation plate of holding tank coaming assembly. Ref (a) 4.3.3.1

4. Pump accessible for maintenance. Ref (a) 4.3.1.2

*Required for certification

* 5. Coaming/drip pan assembly for sewage discharge pump and holding tank provides partition within drip pan to isolate section beneath pump motor. Isolated portion under motor has separate drain plug. Ref (a) 4.3.3.1

6. Takedown joints installed on either side of pump. Ref (a) 4.3.1.3

* 7. The following items installed between sewage discharge pump and sewage holding tank and discharge side also.

a. Union (where applicable)

* b. Ball valve.

B. Operation

* 1. Sewage discharge pump operates quietly without vibration as long as PUMP START pushbutton depressed.

* 2. Pump and associated plumbing does not allow leakage.

IV. Sewage Holding Tank

A. Installation

* 1. Sewage holding tank of stainless steel construction and has capacity of 60 gallons. (or as per blueprint) Ref (a) 5.2

2. Holding tank has following fittings:

a. 1-1/2 inch flange on top for connection to inlet soil line. Ref (a) 5.3.6

b. One inch flange on top for connection to vent line. Ref (a) 5.3.6

* # c. Saltwater flushing line which penetrates tank top equipped with wide angle spray nozzle inside tank and tank flushing valve on the outside. Ref (a) 5.3.7

* # d. Manhole readily accessible. Ref (a) 5.3.5

e. 1-1/2 inch flange located on bottom for connection to sewage discharge pump. Ref (a) 5.3.6

* f. High water level sensor (60 gal. tank) located at 80 percent level. Ref (a) 5.3.9

#Service Craft Only

*Required for certification

* g. Low water level sensor located at 10 percent level. Ref (a) 5.3.9

* 3. Holding tank bolted to 2-6 inch coaming welded to deck (Boats 3") Ref (a) 5.3.2

4. Deck of coaming assembly slopes down to sump. Ref (a) 5.3.2

* 5. Coaming sump equipped with hand pump tied to overboard line from holding tank and has check valve to prevent tank output from flowing down to drip pan. Ref (a) 5.3.2

* 6. Internal surfaces of holding tank coated with MIL-P-24441 (Mare Island) coating system consisting of one coat each of formulas 150,151, 156 and 152. Total dry film thickness 10 mils. minimum. Ref (a) 5.3.1

* 7. Tank vent line extends above superstructure clear of personnel areas. Ref (a) 5.3.8

8. Vent line valve (if installed) provided with lock open device. Ref (a) 5.3.8

9. Minimum clearance of 18 inches is provided on left side of holding tank. Ref (a) 5.3.10

B. Operation

* # 1. Tank low level indicator functional.

* 2. Tank high level indicator functional.

* # 3. Hand pump functional.

4. Indicator lamps remain energized when audible alarm silenced. (optional)

* 5. Indicator lamps in heads are energized when 80 percent level sensor activated.

V. Piping System

A. Installation

1. Valves are full ported (or effectively full ported) and made of alloy suitable for saltwater application. Ref (a) 6.2.9

* 2. Diverter valves are marked to indicate their service and direction for opening and closing. Ref (a) 6.2.12

#Service Craft Only

*Required for certification

3. Valves installed in locations accessible for operation and maintenance. Ref (a) 6.2.10

4. Check valves installed horizontally and properly aligned.

5. Soil piping is copper-nickel. Ref (a) 6.2.1

6. No lagging on pipes in immediate vicinity of pumps or tanks, or in any machinery space. Ref (a) 6.2.7

7. Horizontal runs of gravity drainage lines pitched toward outlet at minimum of 1/2 inch per foot. Ref (a) 6.2.6

8. Sufficient cleanouts installed in soil lines. Ref (a) 6.2.13

* 9. Takedown joints not installed in medical spaces or food storage, preparation, and handling areas. Ref (a) 6.2.2

10. MSD piping labeled according to specific service (i.e. soil, saltwater, etc.) and direction of flow. Ref (a) 6.2.8

B. Operation

* 1. Valves operate locally.

* 2. MSD piping free from leaks.

VI. Electrical Circuitry

A. Installation

* 1. Electrical connections properly insulated and watertight. Ref (a) 8.2.

* 2. Adequate circuit protection provided. Ref (a) Figure 7-9

B. Operation

* 1. Electrical components operate satisfactory.

VII. Deck Connection Station

A. Installation

* 1. Deck connection station fitted with 1-1/2 inch flush mounted fitting and should be placed in accessible location. Ref (a) 7.3.1

*Required for certification

* 2. Proper adapters for deck connection available on board. Ref (a) Figure 7-1

3. The deck plate properly labeled. Ref (a) 7.2

B. Operation

1. Deck plate easily removed and replaced.

* 2. Camlock 1-1/2 inch IPS adapter easily installed and removed.

VIII. General

A. Software

1. Following items available on board:

a. MSD Technical Manual

b. MSD system drawings

c. NSTM CH. 593 "Pollution Control"

d. NAVMED P5010, Chapter 7

e. Updated PMS coverage

f. Updated COSAL coverage

g. Updated compartment checkoff lists.

h. Updated SIB

B. Placards

1. The following placards shall be posted: Ref (a) 9.0

* a. GATX sanitation system operating diagram in pump room.

* b. Personnel health precautions in pump room.

c. Sewage system transfer operation at deck connection station.

d. GATX MSD electrical control schematic inside control panel.

e. Holding tank high level indicator instructions in head adjacent to high level indicator.

*Required for certification

* f. Emergency flushing procedure adjacent to emergency flush valve.

g. Commode operating instructions in head adjacent to commode.

IX. Training Status

A. Ship's force has received formal training.

B. PQS on board.

*Required for certification

CERTIFICATION CHECKLIST

FOR

KOEHLER-DAYTON SYSTEMS

APRIL 15, 1985

Ref: (a) General Design Guidance for Koehler-Dayton Recirculating Toilet System.

CERTIFICATION CHECKLIST FOR

KOEHLER-DAYTON SYSTEMS

I. Recirculation Flush Commode

A. Installation

* 1. Recirculation flush commode installed level. Ref (a) 2.3.1

* 2. Seals between tank drain, floor drain and soil line are leak proof.

* 3. Flushing pump discharge hose in good material condition and installed properly. Ref (a) 2.3.4

* 4. Water and vent connections to commode are secure. Ref (a) 2.3.4

5. Commode fastened securely to four mounting feet and tank sits solidly on lugs. Ref (a) 2.3.1

6. Drain valve T-valve accessible and secured by two wire latches.

7. Commode vent line discharges to atmosphere away from personnel. Ref (a) 2.3.4

* 8. Electrical connections watertight and properly installed. Ref (a) 2.2.

* 9. Pushbutton housing properly secured and watertight. Ref (a) 2.2

* 10. Current interrupting device installed on electical feed wiring to toilet. Ref (a) Figure 8-2.

B Operation

* 1. Commode has been properly charged with four gallons of water and proper recirculating flush chemical.#

2. Electric pump installations:

* a. Pressing flush pump pushbutton initiates 10-second flush cycle. Fuse in good condition.

#NOTE: During winter operations, a four gallon solution of freshwater and ethylene-glycol base antifreeze is used in place of pure water. Ref (a) 2.3.5

* Required for certification

* b. Sufficient recirculation flush fluid supplied in even spray pattern to effectively clean bowl.

c. Flapper valve opens fully during flush cycle.

* d. At conclusion of flush cycle, flapper valve closes quickly trapping sufficient amount of water to act as odor seal.

e. Slide T-valve moves freely and easily and properly lubricated.

f. Rinse and fill line installation operates properly and free from leaks. Water pressure not excessive. Flow rate easily controlled.

3. Manual pump installations:

* a. Hand pump operates freely and easily.

b. Supplies sufficient amount of water to bowl to effectively clean bowl.

c. Flapper valve opens fully during flush cycle.

* d. At conclusion of flush cycle, flapper valve closes quickly trapping sufficient amount of water to act as odor seal.

e. Slide T-valve moves freely and easily and properly lubricated.

f. Rinse and fill line installation operates properly and free from leaks.

* 4. During operation of commode, leaks were not observed around commode, soil line, vent line, rinse and fill line, or flush pump.

II. Sewage Holding Tank (if installed)

A. Installation

* 1. Sewage holding tank is of stainless steel construction and capacity of 25-50 gallons. Ref (a) 4.2

* 2. Internal surfaces of holding tank coated with MIL-P-24441 (Mare Island) coating system consisting of one coat each of formulas 150,151,156 and 152. Total dry film thickness is 10 mils minimum. Ref (a) 4.3.1

*Required for certification

3. Holding tank has following fittings: Ref (a) 4.3.6

a. 1-1/2 inch threaded connection to inlet soil line.

b. 1-inch threaded connection to holding tank vent line.

c. 1-1/2 inch connection to sewage discharge pump.

* d. Flushing connection.

* e. Manhole installed and readily accessible. Gasket installed provides proper seal. Ref (a) 4.3.5

* 4. Tank bottom slopes to sewage discharge pump suction. Ref (a) 4.3.4

* 5. High level sensor installed to activate at approximately 80% capacity. Ref (a) 4.3.7

6. Tank foundation fastened securely to structural support members. Ref (a) 4.3.3

* 7. Coamings (approximately 2 - 4 inches high) and/or drip pans shall be installed around holding tank to contain leaks and spills. Ref (a) 4.3.2

8. Hose connection provided in vicinity of holding tank for space washdown. Ref (a) 10.1

9. Holding tank vent line discharges to atmosphere away from personnel. If vent line has valve at hull penetration, must be provided with lock open device and must be opened.

10. When required, proper hoses available to transport flushing water from source to tank.

B. Operation

* 1. Tank high level indicator functional.

* 2. Red warning light in head energized when 80% level reached.

3. Drip pan accessory hand pump functional.

III. Sewage Discharge Pump

A. Instruction

1. Sewage discharge pump one horsepower and manufactured by Oberdorfer Foundry Inc. Ref (a) 3.2.

2. If sewage discharge pump is hand pump, it is manufactured by Edson.

*Required for certification

3. Pump, mounted securely to structural support members. Ref (a) 3.3.1

4. Sewage discharge pump accessible for maintenance. Ref (a) 3.3.2

* 5. Pump installed so that pump suction remains flooded. Ref (a) 3.3.6

6. Sewage discharge pump equipped with mechanical seal. Ref (a) 3.2.

7. Takedown joints should be provided either side of pump. Ref (a) 3.3.4

* 8. Coaming (approximately 2 - 4 inches high) or drip pan installed around pump to contain leaks and spills. Ref (a) 3.3.3

9. Pushbutton switch for sewage discharge pump is of "Dead Man" type. Ref (a) 8.1

B. Operation

* 1. Sewage discharge pump operates quietly and without vibration as long as PUMP START pushbutton depressed.

* 2. Pump and associated plumbing does not allow leakage.

IV. Piping System

A. Installation

1. Valves are full ported (or effectively full ported) and made of alloy suitable for saltwater application. Ref (a) 5.1.9

* 2. Diverter valves are marked to indicate their service and direction for opening and closing. Ref (a) 5.1.11

3. Valves installed in locations accessible for operation and maintenance. Ref (a) 5.12.10

* 4. Check valves installed horizontally and properly aligned.

5. Soil piping copper-nickel. Ref (a) 5.1.1

6. No lagging on pipes in immediate vicinity of pumps or tanks, or in any machinery space. Ref (a) 5.1.7

7. Horizontal runs of gravity drainage lines pitched toward outlet at minimum of 1.2 inch per foot. Ref (a) 5.1.6

8. Sufficient cleanouts installed in soil lines. Ref (a) 5.1.2

*Required for certification

* 9. Takedown joints not installed in medical spaces or food storage, preparation, and handling areas. Ref (a) 5.1.2

10. MSD piping labeled according to specifice service (i.e. soil, saltwater, etc.) and direction of flow. Ref (a) 5.1.8

B. Operation

* 1. Valves operate easily.

* 2. MSD piping free from leaks.

V. Electrical Circuitry

A. Installation Ref (a) Figure 8-1

* 1. Electrical connections properly insulated and watertight.

* 2. Adequate circuit protection provided.

B. Operation

* 1. Electrical components operate satisfactory.

VI. Deck Conection Station

A. Installation

* 1. Deck connection station fitted with 1-1/2 inch flush mounted fitting and should be placed in accessible location. Ref (a) 6.3.1

* 2. Proper adapters for deck connection available on board. Ref (a) Figure 6-1.

3. The deck plate properly labeled. Ref (a) 6.2

B. Operation

1. Deck plate easily removed and replaced.

* 2. Camlock 1-1/2 inch IPS adapter easily installed and removed.

VII. General

A. Software

1. The following items are available on board:

a. MSD Technical Manual

b. MSD system drawings

*Required for certification

c. NSTM CH. 593 "Pollution Control"

d. NAVMED P5010, Chapter 7

e. Updated PMS coverage

f. Updated COSAL coverage

g. Updated compartment checkoff lists

h. Updated SIB

B. Placards

1. The following placards shall be posted: Ref (a) 9.0

* a. K-D sanitation system operating diagram in pump room.

* b. Personnel health precautions in pump room.

c. Sewage system transfer operation at deck connection station.

d. K-D MSD electrical control schematic inside control panel.

* e. Holding tank high level indicator instructions in head adjacent to high level indicator.

f. Commode operating instructions in head adjacent to commode.

VIII. Training Status

A. Ship's force has received formal training.

B. PQS on board.

CERTIFICATION CHECKLIST

FOR

MONOMATIC SYSTEMS

APRIL 15, 1985

Ref: (a) General Design Guidance for Monogram/Monomatic Recirculating Toilet

CERTIFICATION CHECKLIST FOR

MONOMATIC SYSTEMS

I. Recirculating Flush Commode

A. Installation

* 1. Recirculation flush commode installed level. Ref (a) 2.3.1

* 2. Seals between tank drain, floor drain and soil line are leak-proof.

* 3. Discharge hose in good material condition and installed properly. Ref (a) 2.3.2

* 4. Water and vent connections to commode are secure. Ref (a) 2.3.3

5. Commode fastened securely to deck mounting bracket. Ref (a) 2.3.1

* 6. Drain extension properly installed. Unused opening sealed. Ref (a) 2.3.2

7. Commode vent line discharges to atmosphere away from personnel. Ref (a) 2.3.3

B. Operation

* 1. Commode has been properly charged with three gallons of water and proper recirculation flush chemical. #

* 2. Actuating foot pedal recirculates tank fluid through filter and into toilet bowl.

3. Lifting lid fully opens flapper valve.

* 4. Sufficient recirculation fluid supplied to effectively clean bowl.

* 5. Lowering lid fully closes flapper valve.

6. Prismatic level indicator shows correct unit condition.

7. Rinse and fill line (optional installation) operates properly and leak free.

#NOTE: During winter operations, a four gallon solution of freshwater and ethylene-glycol base antifreeze is used in place of pure water. Ref (a) 2.3.5

* Required for certification

II. Sewage Transfer Pump

A. Installation

1. Sewage transfer pump one horsepower and manufactured by Oberdorfer Foundry Inc. Ref (a) 3.2.

2. If sewage transfer pump is hand pump, it is manufactured by Monogram Model 751. Ref (a) 3.2

3. Pump mounted securely to structural support members. Ref (a) 3.3.1

4. Sewage transfer pump accessible for maintenance. Ref (a) 3.3.2

* 5. Pump installed so that pump suction remains flooded. Ref (a) 3.3.2

6. Sewage transfer pump equipped with mechanical seal. Ref (a) 3.2

7. Takedown joints should be provided either side of pump. Ref (a) 3.3.4

* 8. Drip pans installed around pump to contain leaks and spills. Ref (a) 3.3.3

B. Operation

* 1. Sewage transfer pump operates quietly and without vibration.

* 2. Pump and associated plumbing does not allow leakage.

III. Piping System

A. Installation

1. Valves are full ported (or effectively full ported) and made of alloy suitable for saltwater application. Ref (a) 4.1.9

* 2. Diverter valves are marked to indicate their service and direction for opening and closing. Ref (a) 4.1.10

3. Valves installed in locations accessible for operation and maintenance. Ref (a) 4.1.5

* 4. Check valves installed horizontally and properly aligned.

5. Soil piping is copper-nickel.

6. No lagging on pipes in immediate vicinity of pumps or tanks, or in any machinery space.

*Required for certification

7. Horizontal runs of gravity drainage lines pitched toward outlet at minimum of 1/2 inch per foot. Ref (a) 4.1.3

8. Sufficient cleanouts installed in soil lines.

* 9. Takedown joints not installed in medical spaces or food storage, preparation, and handling areas. Ref (a) 4.1.2

10. MSD piping labeled according to specific service (i.e. soil, saltwater, etc.) and direction of flow. Ref (a) 4.1.7

B. Operation

* 1. Valves operate locally.

* 2. MSD piping free from leaks.

IV. Deck Connection Station

A. Installation

* 1. Deck connection station fitted with 1-1/2 inch flush mounted fitting and should be placed in accessible location. Ref (a) 5.3.1

* 2. Proper adapters for deck connection available on board. Ref (a) Figure 5-1

3. The deck plate properly labeled. Ref (a) 5.2

B. Operation

1. Deck plate easily removed and replaced.

* 2. Camlock 1-1/2 inch IPS adapter easily installed and removed.

V. General

A. Software

1. The following items are available on board:

a. MSD Technical Manual

b. MSD System Drawings

c. NSTM CH. 593 "Pollution Control"

d. NAVMED P5010, Chapter 7

e. Updated PMS coverage

*Required for certification

f. Updated COSAL coverage

g. Updated compartment checkoff lists

h. Updated SIB

B. Placards

1. The following placards shall be posted: Ref (a) 7.0

* a. Monomatic sanitation system operating diagram in pump room.

* b. Personnel health precautions in pump room.

c. Sewage system transfer operations at deck connection station.

d. Monomatic electrical control schematic inside control panel, if applicable.

e. Commode operating instructions in head adjacent to commode.

VI. Training Status

A. Ship's force has recived formal training.

B. PQS on board.

*Required for certification

CERTIFICATION CHECKLIST

FOR

VACUUM SEWAGE POWERED EDUCTOR SYSTEM

April 15, 1985

CERTIFICATION CHECK-LIST FOR THE VACUUM SEWAGE POWERED EDUCTOR SYSTEM

I. VACUUM FLUSH WATER CLOSET

A. Installation

1. Ensure that water closet securing bolts, washers, and nuts are properly in place.

* 2. Vacuum breakers must be installed on water closet flushing lines supplied by potable water.

3. Hose clamps must be installed on the rubber hose or rubber elbow between the discharge valve outlet and the vacuum discharge pipe.

4. Ensure flush water supply line connected using the union fittings water connection hose.

5. Ensure each water closet is isolated from deck by a gasket or mounting pad.

B. Operation

1. Ensure flush water supply pressure is between 22 and 85 psig.

* 2. Lift flush knob to test operation of vacuum water closet during normal conditions.

* (a) Ensure flush valve actuates.

* (b) Ensure the discharge valve opens to discharge the contents of the water closet into the vacuum collection piping. The discharge valve should remain open for approximately 4 seconds.

* (c) Ensure that a flow of residual flush water is directed into the water closet bowl to complete flush cycle.

* 3. Inspect for pressure or vacuum leaks at the flushing line inlet connections, vacuum hoses, and rubber discharge elbow.

II. VACUUM COLLECTION URINALS

A. Installation

* 1. All urinals supplied with potable flushing water must have vacuum breakers installed in the supply piping.

* 2. All urinal drains must be fitted with vacuum interface valves to isolate the drain from the vacuum collection piping.

3. The vacuum interface valve must be head pressure activated.

B. Operation

*Required for certification

* 1. Ensure that no pressure or vacuum leaks are present at the flush valve and vacuum interface valve connections.

* 2. Operate the urinal flush valve and ensure that flush water is dispensed.

* 3. Vacuum interface valve must activate after 1 or 2 urinal flushes with normal operating vacuum in the vacuum collecting piping.

III. COLLECTION TANK

A. Installation

1. The collection tank must be constructed of stainless or carbon steel.

2. Tank capacity should be compatible with crew size and holding time requirements.

* 3. A tank access must be provided to allow for internal maintenance .

(a) Gas free warning placards should be posted at the access.

* 4. A tank vent and overflow must be provided. The tank vent may branch off the overflow. The vent and overflow should be separate from other vents and overflows. If valves located in the vent piping, they must be locked open.

5. The tank overflow must discharge via a gag scupper valve at the hull penetration.

6. Two 1/2 inch nipples must be installed with threaded caps above the level sensor tank penetrations to provide flushing and drain ports.

* 7. A containment coaming 2 to 4 inches high with a drainage sump and means to evacuate the sump must be installed. If an eductor is installed to evacuate the sump it must be fitted with a check valve on the discharge side of the eductor and in the suction line to the eductor. The containment coaming must encompass the circulation pumps, ejector loops, tank, and as much system piping and as many system fittings as possible.

* 8. The interior of the collection tank must be coated in accordance with MIL-P-24441 .

IV. TANK LEVEL SWITCHES

A. Installation

* 1. Two tank level switches must be installed at the "high" and "low" levels of the tank. Approximately 85 and 15 percent level of tank capacity.

*Required for certification

* 2. The level switches must be resistant to salt water and sewage induced corrosion.

3. The level switches must be designed to operate with 120 V alternating current.

B. Operation

* 1. When the tank fluid falls below the low level switch during discharge, the switch must secure the circulation pump and energize low level indicator lamp on the control panel.

* 2. When the tank fluid reaches the high level switch, the switch must energize an audible and visual high level alarm at the control panel and in a continously manned space, and (if automatic discharge mode available) automatically energize the motorized discharge valve.

V. VACUUM PRESSURE SWITCH

A. Installation

* 1. A vacuum pressure switch must be installed on the suction distribution manifold or the pressure switch service manifold for each circulation pump.

* 2. The vacuum pressure switch must be diaphragm operated and protected.

3. The electrical cable must be installed to the switch via a conduit connector or with MIL-SPEC Navy cable connectors.

* 4. Access to the cable terminations and the differential adjustment switch must be provided.

* 5. The vacuum pressure switch should be adjustable and maintain the vacuum between 12 and 18 inches of mercury.

B. Operation

* 1. Ensure that the vacuum pressure switch energizes the circulation pump when vacuum has fallen below the preset lower limit.

* 2. Ensure that the vacuum pressure switch secures the circulation pump when the vacuum has been restored to the preset upper limit.

VI. PRESSURE GAGE

A. Installation

1. The vacuum pressure gage should be a Bourdon Tube design calibrated to indicate vacuum between 0 and 30 inches of mercury.

*Required for certification

* 2. The vacuum pressure gage should be installed on the pressure switch service manifold.

3. The gage must be removable for calibration.

B. Operation

* 1. The gage must be operational.

VII. SUCTION DISTRIBUTION MANIFOLD

A. Installation

* 1. A distribution manifold of 5 to 6 inches in diameter must be installed between the vacuum collection piping and the sewage ejector(s).

* 2. A blank flange must be installed for maintenance on one end of the manifold.

3. The other side of the manifold must be fitted with a one inch nipple and a one inch isolation ball valve.

4. The pressure switch service manifold must be installed with one port to the suction distribution manifold.

* 5. All vacuum collection mains must enter the suction distribution manifold separately via a full port ball/plug isolation valve.

VIII. PUMP/EJECTOR LOOP AND CONTROL PANEL

A. Installation

1. The circulation pump must be a centrifugal pump and meet MIL-P-24475 specifications.

2. The pump shall be horizontally installed with horizontal suction piping and vertical discharge piping flanged to the pump volute casing.

3. The pump must incorporate the use of oil lubricated double mechanical seals.

4. The pump motor shall be a 440 V 3 phase at 60 Hz and be fan cooled.

* 5. The pump shall have a operating capacity capable of discharging overboard and to the deck connections.

* 6. A full port isolation valve must be installed in the suction piping to the circulation pump.

* 7. A full port isolation valve should be installed on the discharge side of the circulation pump.

*Required for certification

* 8. A two inch line must branch off the 4 inch discharge line between the pump and the ejector to provide for discharging sewage to the deck connections or overboard.

* 9. The overboard line must incorporate a full port diverter valve to direct sewage overboard or to the deck connections.

10. A 2 inch full port sewage discharge valve fitted with a motorized actuator (if automatic discharge mode availabe) must be installed in the two inch discharge line upstream of the diverter valve.

* 11. The 4 inch discharge line from the circulation pump must discharge to the ejector nozzle via a flanged connection to allow for removal.

* 12. The ejector must be fitted with a stainless steel jet tube which extends into the collection tank.

* 13. The ejector must be fitted with a 90° off set flange connector block which houses a "Non Return Valve" or check valve.

* 14. The non return valve must be installed in a vertical position.

15. A vacuum piping reducer must be installed by a flanged connection to the non return valve housing with the larger of the two inside diameters on the suction distribution manifold side.

16. The vacuum piping line which is connected to the suction distribution manifold must be flanged connected to the vacuum piping reducer and welded to the suction distribution manifold.

17. The system control panel should be bolted to the tank mounting brackets on a commercial EVAK unit or in a accessible area in the vicinity of the tank.

18. Power supply input to the panel is 440 VAC 60 Hz. The control panel must be fitted with a stepdown transformer to stepdown voltage to 120 V single phase for the control logic circuitry.

19. An elapsed time indicator must be provided for each circulation pump.

20. The following indicator lamps must be on the control panel:

* (a) "Power On" lamp

(b) "Pump On" indicator lamp to indicate 440 VAC power to the pump, one lamp per pump.

(c) "Pump Motor Overload" indicator lamp must be provided, one lamp per motor.

(d) "Discharge Valve Closed" lamp to indicate that the motorized discharge valve is secured, one lamp per motorized valve.

*Required for certification

* (e) "Summary Fault" lamp to indicate that system is not ready for light off.

* (f) "Low Water" indicator lamp to indicate low water condition.

* (g) "Pump Overrun" indicator lamp must be provided, one lamp per pump.

* (h) "High Level" warning lamp to indicate high level condition.

* 21. The control panel must be fitted with a "Summary Fault" reset button to cancel circuit conditions to aid in troubleshooting system malfunction.

22. The control panel must be fitted with a "Lamp Test" control to test indicators at half brilliance.

* 23. The control panel must be fitted with a stop button to secure power to controller circuitry

* 24. The control panel must be fitted with a selector switch allowing for automatic discharge (if available), manual discharge and no discharge.

* 25. Each pump ejector loop must have separate tank suctions and discharge penetrations.

B. Operation

1. The vacuum gages should indicate vacuum as preset by the pressure switch before and after circulation pump cycles.

* 2. The motorized sewage discharge valve (if automatic discharge mode available) must operate automatically to discharge tank contents either overboard or to the deck risers. This valve should be controlled via the high level sensor or an automatic timing control.

* 3. When the circulation pump is operational the nonreturn valve must open allowing increased vacuum in the suction distribution manifold. Ensure that the discharge valve is secured and the vacuum increases as the pump operates.

* 4. The non return valve must close once the circulation pump has secured. Observe the vacuum gage to ensure no significant loss of vacuum results when the system is not in use.

5. The elapsed time indicator must be operational as long as power to the pump is supplied.

* 6. Ensure that the control panel operates correctly in no discharge and manual discharge modes.

*Required for certification

7. The lamp test button must illuminate all lamps at half brilliance.

* 8. Ensure all lamps function as required by presetting fault conditions.

IX. PIPING SYTEM

A. Installation

1. All vacuum piping must be painted or coated.

2. Vacuum piping must not be lagged within the VCHT Pump Room. Valves and flanged joints must not be lagged throughout the system.

* 3. Cleanouts must be installed on water closet and urinal headers and in vacuum piping at 90° turns to facilitate cleaning.

* 4. The deck risers must be fitted with full port isolation valves and camlock fittings.

5. Pump overboard piping must discharge above the full load water line via a gag scupper valve.

* 6. The vacuum collection piping must be GRP or 90-10 copper nickel.

7. Piping must be labeled for service and flow direction.

8. All valves must be labeled for service, DC location number and DC classification.

9. Valves installed in normally locked spaces must be fitted with remote operating gear assembly.

10. Damage control valves must be operable from the DC deck.

* 11. Diverter valves must be fitted with label plates to indicate flow direction, i.e., "To Deck Connection" "To Ovbd".

* 12. Drip pans must be installed below valves and take down joints in dry provisions storerooms, medical spaces or storerooms, food preparation, storage or serving areas and other health sensitive spaces.

13. Vacuum collection piping branch lines must be connected to the main line through Y-branch fittings. Short radius 90° elbows should be kept to a minimum. Reformer pockets shall be located and installed to facilitate replacement and cleaning.

B. Operation

* 1. All valves must be operable locally.

*Required for certification

2. All valves fitted with ROG must be operable from their remote stations.

* 3. No vacuum or sewage leaks may exist at any pipe fittings.

X. GENERAL SYSTEM REQUIREMENTS

* A. Washup facilities must be provided in the VCHT pump room area, or adjacent area.

* B. Fire fighting facilities must be immediately adjacent to the VCHT pump room area or the pump room must be fitted with a bulkhead mounted 15# CO_2 fire extinguisher.

* C. Operating instructions, health warning placards and associated system schematics must be installed in the VCHT pump room in the vicinity of the equipment.

D. Hose rigging procedures and health placards must be provided at the deck connections.

E. An electrical schematic for the control panel must be installed inside the control panel.

F. The following software must be on board:

1. PMS coverage
2. VCHT system tech manual
3. MSD installation drawings
4. COSAL coverage
5. NSTM Chapter 593 "Pollution Control"
6. BUMED notice 6240 of 6 Feb 78

*Required for certification