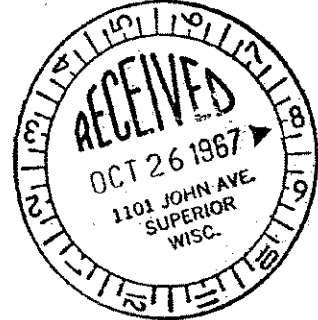


HYDRAULIC INSTITUTE



122 EAST 42nd STREET • NEW YORK, N. Y. 10017

October 19, 1967



Commanding Officer
Naval Ship Engineering Center
18th & Constitution Avenue, N.W.
Washington, D. C. 20360

Attention: Head
Pumps, Blowers & Compressors Section
Auxiliary Equipment Branch

Dear Sir:

Supplementing my letters of June 16 and June 23, 1967, we have received additional comments from Delaval Turbine Inc. on MIL-P-17639B, MIL-P-17881B, MIL-P-18472D, and MIL-P-18682A.

A copy of these comments is attached hereto, and we would appreciate your including these with the comments mailed to you previously.

Very truly yours,

Frank P. Anderson

Frank P. Anderson
Secretary

FPA:eu

Enclosure

cc:(usoo) Committee to Review Military Specifications
Institute Member Companies and Non-Member Companies on
Navy Qualified Products List for Centrifugal Pumps

SLM00126

Oct. 19, 1967

Enclosure (A)
Serial EF-97

MIL-P-17639B, 1 Oct., 1966

3.2.11.3

...Mounting bolts for fastening the equipment shall conform to grade 2 of MIL-B-857.

De Laval Comments:

(1) Note that Table I - "Studs, bolts, nuts, and washers (submarine and surface ships)" calls for nickel copper alloy, however, 3.2.11.3 requires mounting bolts of grade 2 of MIL-B-857, which is carbon steel. This appears to be contradictory. We request clarification.

(2) See also following comment on Table I Note 5.

3.2.16.2

Flexible coupling hubs ... For pump shafts one inch diameter and larger the hubs shall be fitted on a taper with keys parallel to the taper.

De Laval Comment:

Our standard practice is to have keys parallel to the shaft center line. We request 3.2.16.2 be revised to indicate this is acceptable.

3.2.19

Threaded parts such as bolts, studs, and nuts shall conform to Handbook H-28 ...

De Laval Comments:

We propose this be revised to indicate:

- (1) Class 5 interference fits shall conform to ASA Publication B1.12 in lieu of interference fit specified in Handbook H-28. Studs may be bottomed in lieu of using Class 5 fit; however, details of bottoming shall be approved by the NAVSEC.
- (2) For fasteners 1 inch diameter and larger, the eight thread series shall be used wherever practicable.
- (3) Stud bolts (one nut) may be used. Where bottoming of stud bolt occurs, the thread fit shall be Class 2A or Class 3A. Class 5 interference fits shall not be bottomed.

The proposed is taken from MIL-T-17600C (Main Propulsion Turbines) paragraphs 3.19.2.3, 3.19.1.3, 3.19.3.7, and we feel it should also be applicable to the subject pumps.

3.2.21

Welding shall be in accordance with MIL-STD-278.

De Laval Comments:

Review of MIL-STD-278 has raised many questions. In particular, MIL-STD-278 says:

- (a) Par. 6.1 - "... Fillet welds in machinery and pressures subject to dynamic and alternating bending stresses shall be ground smooth or where approved by the Bureau or agency concerned, a wash pass weld may be used."
- (b) Par. 6.2 - "Machinery Class M - This classification includes all welded assemblies of plate, forgings and castings joined completely or partially by welding for use as dynamically loaded or moving machinery parts."
- (c) Par. 6.2.4.1 - "Radiographic inspection - All strength welds in gears, rotors, shafts, pumps, and machinery subjected to fatigue or impact shall be radiographed..."

These requirements are vague. We feel the above underlined words need definition to clearly indicate to what pump parts, if any, these requirements apply.

3.5 to

Drawings ... MIL-D-963

3.5.7.4

De Laval Comment:

The report on Joint Conference, March 16, 1967, states the Navy indicated that MIL-D-1000 and MIL-D-1000/2 supersede MIL-D-963H.

Before making comments on MIL-D-1000 and MIL-D-1000/2, we request the opportunity to review the revision to MIL-P-17639 invoking these specifications, in order to determine whether they will be invoked completely or partially, with or without modification or additional requirements.

3.6.1

Manuals ... Unless otherwise specified (see 6.1) manuals shall include pump, driver, controls and all appurtenances and all applicable drawings.

De Laval Comments:

- (1) The only reference to manuals in 6.1 is item (o) Quantity of manuals required.

We request the following be added to 6.1:

Whether or not manuals shall include pump, driver, controls and all appurtenances and all applicable drawings (see 3.6.1).

3.6.1

(2) We feel that when the pump manufacturer is not furnishing the driver, controls, appurtenances, it should not be required that manuals to be furnished by the pump manufacturer include these items.

4.4.1

... Completed Part Examination Check List (see 4.3.2) shall be furnished in duplicate to the cognizant Government quality assurance office and to the procuring agency.

De Laval Comment:

Our quality control system makes available all the information required by 4.3.1, but not in the tabulated form called the "Completed Parts Examination Check List."

We request that, in lieu of requiring preparation and furnishing of this list, it be required that records of the information specified in 4.3.1 be made available for the procuring agency and the Government inspector. This request agrees with 4.3.1, last sentence.

4.4.1.3

Overspeed test - vibration

De Laval Comment:

The permissible vibration indicated in the acceptance criteria is too stringent at low speeds. It should be considered a function of speed.

Note that the Hydraulic Institute has recently issued a curve indicating this relationship.

4.4.1.6

Radiography - When specified in the contract or order, centrifugal pump casings for submarine application shall be 100 percent radiographed in accordance with MIL-STD-271 in the areas which act as pressure boundaries. The contractor shall indicate on drawings submitted, to the procuring agency, for approval, the area to be radiographed ...

De Laval Comment:

We feel the extent of radiographic coverage required may be excessive and unwarranted depending on the application and pressure involved, and we request it be deleted from 4.4.1.6 and included in the Ordering Data when radiography is specified. (see 6.1 item (cc)).

4.4.3.2.3

The unit shall be mounted on the shock machine or barge essentially identical to the actual shipboard installation.

The procuring agency will furnish the supplier a drawing of the shipboard mounting arrangement...

De Laval Comment:

These requirements appear to be contradictory to 4.4.3 which classifies the shock test as a design evaluation test required for one pump of each type, design, and size - not for each contract or order with additional specified shock test requirements or change in shipboard installation. We request clarification.

Do 4.4.3.2 and 4.4.3.2.3 infer that the shock test may have to be redone wherever additional shock test requirements are specified or there is a change in actual shipboard installation? If so, this must be made known to the pump manufacturer at the proposal stage.

6.2

Table I note 5 - Bolt, stud, and nut design shall be in accordance with MIL-B-857.

De Laval Comment:

We request the addition of MIL-S-1222 as acceptable for stud and nut design.

This specification is invoked for the following, and we see no reason why it should not also be acceptable for the subject pumps.

Pumps, Centrifugal, Boiler Feed	MIL-P-17881
Main Propulsion Turbines	MIL-T-17600
Auxiliary Turbines	MIL-T-17523
Main Propulsion Gears	MIL-G-17859

Enclosure (B)
Serial EF-97

MIL-P-17881 B and Amend. 2, 5 Dec., 1966

3.3.10.5

... The (flexible coupling) hubs shall be fitted on a taper with keys parallel to the taper.

De Laval Comment:

Our standard practice is to have keys parallel to the shaft center line. We request 3.2.16.2 be revised to indicate this is acceptable.

3.4.1.2

Welding shall be in accordance with MIL-STD-278.

De Laval Comment:

Review of MIL-STD-278 has raised many questions. In particular, MIL-STD-278 says:

- (a) Par. 6.1 ... "Fillet welds in machinery and pressure vessels subject to dynamic and alternating bending stresses shall be ground smooth or where approved by the Bureau or agency concerned, a wash pass weld may be used."
- (b) Par. 6.2 - "Machinery Class M - This classification includes all welded assemblies of plate, forgings and castings joined completely or partially by welding for use as dynamically loaded or moving machinery parts."
- (c) Par. 6.2.4.1 - "Radiographic inspection - All strength welds in gears, rotors, shafts, pumps and machinery subjected to fatigue or impact shall be radiographed ..."

These requirements are vague.

We feel the above underlined words need definition to clearly indicate to what pump parts, if any, these requirements apply.

3.4.1.3

Threaded parts such as bolts, studs, and nuts shall conform to Handbook H-28... The setting end of studs shall be class 5 fit and the nut end shall be class 3 fit.

De Laval Comments:

We propose that this be revised to indicate:

- (1) Class 5 interference fits shall conform to ASA Publication B 1.12 in lieu of interference fit thread specified in Handbook H-28. Studs may be bottomed in lieu of using Class 5 fit; however, details of bottoming shall be approved by the NAVSEC.

4.4.3.2.3

The unit shall be mounted on the shock machine or barge essentially identical to the actual shipboard installation. The procuring agency will furnish the supplier a drawing of the shipboard mounting arrangement ...

De Laval Comment:

These requirements appear to be contradictory to 4.4.3 which classifies the shock test as a design evaluation test required for one pump of each type, design and size - not for each contract or order with additional specified shock test requirements or change in shipboard installation. We request clarification.

Do 4.4.3.2 and 4.4.3.2.3 infer that the shock test may have to be redone whenever additional shock test requirements are specified or there is a change in actual shipboard installation? If so, this must be made known to the pump manufacturer at the proposal stage.

6.2

Table I - Last item - casing bolts, studs, nuts 7/ - MIL-S-1222

De Laval Comment:

Note 7 says: Bolts, studs, and nuts design shall be in accordance with MIL-B-857.

This appears contradictory since MIL-S-1222 specifies design of studs and nuts. We request Table I be revised to indicate that Note 7 is not applicable to studs and nuts conforming to MIL-S-1222.

Enclosure (C)
Serial EF-97

MIL-P-18472D, 1 Oct., 1966

3.4.2.4

... Mounting bolts for fastening the equipment shall conform to grade 2 of MIL-B-857.

De Laval Comments:

- (1) Note that grade 2 of MIL-B-857 is carbon steel. Is this intended?
- (2) See also following comment on Table I Note 4

3.4.6

Welding shall be in accordance with MIL-STD-278

De Laval Comment:

Review of MIL-STD-278 raised many questions.

In particular MIL-STD-278 says:

- (a) Par. 6.1 - "...Fillet welds in machinery and pressure vessels subject to dynamic and alternating bending stresses shall be ground smooth or where approved by the Bureau or agency concerned, a wash pass weld may be used."
- (b) Par. 6.2 - "Machinery Class M - This classification includes all welded assemblies of plate, forgings and castings joined completely or partially by welding for use as dynamically loaded or moving machinery parts."
- (c) Par. 6.2.4.1 - "Radiographic inspection - All strength welds in gears, rotors, shafts, pumps and machinery subjected to fatigue or impact shall be radiographed."

These requirements are vague. We feel that the underlined words need definition to clearly indicate to what pump parts, if any, these requirements apply.

3.4.7

Threaded parts such as bolts, studs, and nuts shall conform to Handbook H-28.

De Laval Comments:

We propose this be revised to indicate:

- (1) Class 5 interference fits shall conform to ASA Publication B 1.12 in lieu of interference fit thread specified in Handbook H-28. Studs may be bottomed in lieu of using Class 5 fit; however, details of bottoming shall be approved by the NAVSEC.

3.4.7

- (2) For fasteners 1 inch diameter and larger, the eight thread series shall be used wherever practicable.
- (3) Stud bolts (one nut) may be used. Where bottoming of stud bolt occurs, the thread fit shall be Class 2A or Class 3A. Class 5 interference fits shall not be bottomed.

The proposed is taken from MIL-T-17600C (Main Propulsion Turbines) paragraphs 3.19.2.3, 3.19.1.3, 3.19.3.7, and we feel it should also be applicable to the subject pumps.

3.5.12.2

Flexible coupling hubs... For pump shafts one inch diameter and larger the hubs shall be fitted on a taper with keys parallel to the taper.

De Laval Comment:

Our standard practice is to have keys parallel to the shaft center line. We request 3.5.12.2 be revised to indicate this is acceptable.

3.6 to
3.6.7.5

Drawings ... MIL-D-963

De Laval Comment:

The report on Joint Conference, March 16, 1967, states the Navy indicated that MIL-D-1000 and MIL-D-1000/2 supersedes MIL-D-963.

Before making comments on MIL-D-1000 and MIL-D-1000/2, we request the opportunity to review the revision to MIL-P-18472 invoking these specifications, in order to determine whether they will be invoked completely or partially, withoor without modification or additional requirements.

3.9.1

... Unless otherwise specified (see 6.1) manuals shall include pump, driver, controls, and all appurtenances and all applicable drawings.

De Laval Comments:

- (1) The only reference to manuals in 6.1 is item (q) Manuals (quantity and distribution) (see 3.9.6).

We request the following be added to 6.1:

Whether or not manuals shall include pump driver, controls, and all appurtenances and all applicable drawings (see 3.9.1).

- (2) We feel that when the pump manufacturer is not furnishing the driver, controls, appurtenances, it should not be required that manuals to be furnished by the pump manufacturer include these items.

4.4.1

... Completed Part Examination Check List (see 4.3.2) shall be furnished in duplicate to the cognizant Government quality assurance office and to the procuring agency.

De Laval Comment:

Our quality control system makes available all the information required by 4.3.1, but not in the tabulated form called the "Completed Parts Examination Check List."

We request that, in lieu of requiring preparation and furnishing of this list, it be required that records of the information specified in 4.3.1 be made available for the procuring agency and the Government inspector. This request agrees with 4.1.3, last sentence.

4.4.1.3

Overspeed test - vibration

De Laval Comment:

The permissible vibration indicated in the acceptance criteria is too stringent at low speeds. It should be considered a function of speed.

Note that the Hydraulic Institute has recently issued a curve indicating this relationship.

4.4.3

Design evaluation tests - One pump of each type, design, and size complete with the driver and all appurtenances and controls shall successfully undergo the herein specified design evaluation test. Separate design evaluation tests of the pump proper and the driver proper are not acceptable.

De Laval Comment:

This means new design evaluation tests are required wherever actual driver is changed. This requirement is excessive to the pump manufacturer.

4.4.3.1.4

The pump shall be under continuous surveillance throughout the duration of the endurance test ... Data shall be collected and the pump inspected at four hour intervals ...

De Laval Comment:

Continuous surveillance and collection of data at four hour intervals are excessive and unwarranted requirements. Collection of data at the beginning and end of the test should be sufficient.

4.4.3.2.3

The unit shall be mounted on the shock machine or barge essentially identical to the actual shipboard installation. The procuring agency will furnish the supplier a drawing of the shipboard mounting arrangement...

De Laval Comment:

These requirements appear to be contradictory to 4.4.3 which classifies the shock test as a design evaluation test required for one pump of each type, design, and size - not for each contract or order with additional specified shock test requirements or change in shipboard installation. We request clarification.

Do 4.4.3.2 and 4.4.3.2.3 infer that the shock test may have to be redone whenever additional shock test requirements are specified or there is a change in actual shipboard installation? If so, this must be made known to the pump manufacturer at the proposal stage.

6.2

Table I Note 4 - Bolts, studs, and nuts design shall be in accordance with MIL-B-857...

De Laval Comment:

We request the addition of MIL-S-1222 as acceptable for stud and nut design.

This specification is invoked for the following, and we see no reason why it should not also be acceptable for the subject pumps.

Pumps, Centrifugal, Boiler Feed	MIL-P-17881
Main Propulsion Turbines	MIL-T-17600
Auxiliary Turbines	MIL-T-17523
Main Propulsion Gears	MIL-G-17859

Oct. 19, 1967

Enclosure (D)
Serial EF-97

MIL-P-18682A, 1 Oct., 1966

3.2.10

Threaded parts such as bolts, studs, and nuts shall conform to Handbook H-28...

De Laval Comments:

We propose this be revised to indicate:

- (1) Class 5 interference fits shall conform to ASA Publication B1.12 in lieu of interference fit specified in Handbook H-28. Studs may be bottomed in lieu of using Class 5 fit; however, details of bottoming shall be approved by the NAVSEC.
- (2) For fasteners 1 inch diameter and larger, the eight thread series shall be used wherever practicable.
- (3) Stud bolts (one nut) may be used. Where bottoming of stud bolt occurs, the thread fit shall be Class 2A or Class 3A. Class 5 interference fits shall not be bottomed.

The proposed is taken from MIL-T-17600C (Main Propulsion Turbines) paragraphs 3.19.2.3, 3.19.1.3, 3.19.3.7, and we feel it should also be applicable to the subject pumps.

3.2.12

Welding shall be in accordance with MIL-STD-278...

De Laval Comment:

Review of MIL-STD-278 has raised many questions.

In particular MIL-STD-278 says:

- (a) Par. 6.1 - "...Fillet welds in machinery and pressure vessels subject to dynamic and alternating bending stresses shall be ground smooth or where approved by the Bureau or agency concerned, a wash pass weld may be used.
- (b) Par. 6.2 - "Machinery Class M - This classification includes all welded assemblies of plate, forgings, and castings joined completely or partially by welding for use as dynamically loaded or moving machinery parts."
- (c) Par. 6.2.4.1 - "Radiographic inspection - All strength welds in gears, rotors, shafts, pumps and machinery subjected to fatigue or impact shall be radiographed.

These requirements are vague. We feel the underlined words need definition to clearly indicate to what pump parts, if any, these requirements apply.

SLM00137

3.3.3.5

Bolts, studs, and nuts (casing) shall be designed in accordance with MIL-B-857.

De Laval Comment:

See also Table I note 4 - Bolts, studs, and nuts design shall be in accordance with MIL-B-857.

We request the addition of MIL-S-1222 as acceptable for stud and nut design. This specification is invoked for the following, and we see no reason why it should not also be acceptable for the subject pumps.

Pumps, Centrifugal, Boiler Feed	MIL-P-17881
Main Propulsion Turbines	MIL-T-17600
Auxiliary Turbines	MIL-T-17523
Main Propulsion Gears	MIL-G-17859

3.3.9.3

... The (flexible coupling) hubs shall be fitted on a taper with keys parallel to the taper.

De Laval Comment:

Our standard practice is to have keys parallel to the shaft center line. We request 3.3.9.3 be revised to indicate this is acceptable.

3.6

Drawings ... MIL-D-963

to

3.6.7.5

De Laval Comment:

The report on Joint Conference, March 16, 1967, states the Navy indicated that MIL-D-1000 and MIL-D-1000/2 supersede MIL-D-963.

Before making comments on MIL-D-1000 and MIL-D-1000/2 we request the opportunity to review the revision to MIL-P-18682 invoking these specifications, in order to determine whether they will be invoked completely or partially, with or without modification or additional requirements.

3.7.1

... Unless otherwise specified (see 6.1) manuals shall include pump driver, controls and all appurtenances and all applicable drawings.

De Laval Comment:

- (1) The only reference to manuals in 6.1 is item (p) Manuals (quantity and distribution) (see 3.7.6).

We request the following be added to 6.1:

Whether or not manuals shall include pump driver, controls and all appurtenances and all applicable drawings (see 3.7.1).

3.7.1

- (2) We feel that when the pump manufacturer is not furnishing the driver, controls, appurtenances, it should not be required that manuals to be furnished by the pump manufacturer include these items.

4.4.1

... Completed Part Examination Check List (See 4.3.2) shall be furnished in duplicate to the cognizant Government quality assurance office and to the producing agency.

De Laval Comment:

Our quality control system makes available all the information required by 4.3.1, but not in the tabulated form called the "Completed Parts Examination Check List."

We request that, in lieu of requiring preparation and furnishing of this list, it be required that records of the information specified in 4.3.1 be made available for the procuring agency and the Government inspector. This request agrees with 4.1.3, last sentence.

4.4.1.6

All pump casings for submarine application shall be radiographed in accordance with MIL-STD-271 in those areas which act as pressure boundaries. The supplier shall indicate on drawings submitted to the procuring agency for approval, the areas to be radiographed...

De Laval Comments:

- (1) Referring to 4.4.1 (f) we request "When specified in the contract or order (see 6.1)" be prefixed to 4.4.1.6.
- (2) We feel that requiring complete radiographic coverage "in those areas which act as pressure boundaries" may be excessive and unwarranted depending on the application and the pressure involved. We request these words be deleted from 4.4.1.6 and the extent of radiographic coverage be included in the Ordering Data when radiography is specified.

4.4.2.3

Acceptance criteria, vibration

De Laval Comment:

The permissible vibration indicated in the acceptance criteria is too stringent at low speeds. It should be considered a function of speed.

Note that the Hydraulics Institute has recently issued a curve indicating this relationship.

4.4.3

Design evaluation tests - One pump of each type, design and size complete with the driver and all appurtenances and controls shall successfully undergo the herein specified design evaluation test. Separate design evaluation tests of the pump proper and the driver proper are not acceptable...

De Laval Comment:

This means new design evaluation tests are required whenever actual driver is changed. This requirement is excessive to the pump manufacturer.

4.4.3.1.4

The pump shall be under continuous surveillance throughout the duration of the endurance test... Data shall be collected and the pump inspected at four hour intervals ...

De Laval Comment:

Continuous surveillance and collection of data at four hour intervals are excessive and unwarranted requirements. Collection of data at the beginning and end of the test should be sufficient.

4.4.3.2.3

The unit shall be mounted on the shock machine or barge essentially identical to the actual shipboard installation. The procuring agency will furnish the supplier a drawing of the shipboard mounting arrangement...

De Laval Comment:

These requirements appear to be contradictory to 4.4.3 which classifies the shock test as a design evaluation test required for one pump of each type, design and size - not for each contract or order with additional specified shock test requirements or change in shipboard installation.

We request clarification.

Do 4.4.3.2 and 4.4.3.2.3 infer that the shock test may have to be done whenever additional shock test requirements are specified or there is a change in actual shipboard installation? If so, this must be made known to the pump manufacturer at the proposal stage.

Reservation Manager
The Mayflower Hotel
Connecticut Ave. at DeSales Street
Washington, D. C.

PLEASE RETURN TO =
FRANK P. ANDERSON
122 E. 42nd STREET
NEW YORK 17, N. Y.

Subject: Meetings - Hydraulic Institute
Monday and Tuesday, November 13-14, 1967

Dear Sir:

In connection with the meetings of the Hydraulic Institute
on Monday and Tuesday, November 13-14, 1967, please reserve accommoda-
tions for me, as follows:

Date of Arrival: _____

Date of Departure: _____

Type of Room: _____

Please confirm this reservation directly to me and send one
copy to Mr. Frank P. Anderson, 122 East 42nd Street, New York, New
York, for his records.

Very truly yours,

JAMES A. DONOHUE
NAME

M. T. DAVIDSON COMPANY
COMPANY

7 DEY STREET, NEW YORK, N.Y.
ADDRESS

DATE: OCT. 24, 1967

I do not require hotel accommodations; however, I will ☒ will not ☐
(check one) attend the Hydraulic Institute Meetings on November 13-14, 1967.

James A. Donohue
Signed

Date: OCT. 24, 1967

M. T. DAVIDSON COMPANY
Company

SLM00141