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

Sales ~~Office~~
VH gas 6/4/68

June 3, 1968

PLAINTIFF'S EXHIBIT
ALL-STATE LEGAL®
SLM-26

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

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

Dear Sir:

Supplementing my letter of May 8, 1968, attached are copies of two additional letters of comment from pump manufacturers who attended the conference of March 25, 1968, in Washington, D. C., on the subject of military specifications for pumps. These letters deal specifically with problems concerning metallurgical requirements of the military specifications for pumps.

Copies of this letter and its attachments are being sent to all manufacturers on the Qualified Products List for Pumps.

Very truly yours,

[signature]

Frank P. Anderson
Secretary

FPA:eu
Attachments: Comments from DeLaval Turbine Inc. - 5/10/68
Ingersoll-Rand Co. - 5/20/68

cc: All Manufacturers on QPL for Centrifugal Pumps

Waukesha Foundry Company
1300 LINCOLN AVENUE, WAUKESHA, WISCONSIN 53186 • 414-542-6655

R. E. CAIRNS
Vice President — Sales, Casting Division

JUNE 14, 1968

SUPERIOR-LIDGERWOOD-MUNDY CORP.
SUPERIOR
WISCONSIN 54880

ATTENTION: MR. D. W. SHEA
PURCHASING AGENT

GENTLEMEN:

REPLYING TO YOUR LETTER OF JUNE 6, WE CAST BOTH ALLOYS G BRONZE AND 70-30 CUPRO NICKEL. WE CAST THESE FOR COMMERCIAL APPLICATIONS AND TO MILITARY SPECIFICATIONS.

OUR COST RECORDS REVEAL THAT THE 70-30 Cu Ni WILL CONSISTENTLY RUN HIGHER THAN G BRONZE - FIRST BECAUSE THE BASE PRICE OF THE METAL IS APPROXIMATELY 20¢ PER POUND HIGHER; AND SECOND, THE YIELD ON Cu Ni IS LOWER. THERE IS ALSO THE ADDED EXPENSE FOR BEND BARS THAT ARE REQUIRED ON THE MILITARY SPECIFICATIONS.

WE WOULD AGREE THAT THE G METAL IS EASIER TO MANUFACTURE, AND DELIVERY SCHEDULES WOULD BE SHORTER. THE MAIN REASON FOR THIS, OF COURSE, WOULD BE THAT LESS TESTING BEFORE SHIPMENT IS REQUIRED.

PLEASE LET US KNOW IF YOU HAVE ANY FURTHER QUESTIONS.

VERY TRULY YOURS,

WAUKESHA FOUNDRY COMPANY

R. E. CAIRNS

REC:JH

6/17

Copy to L W H

VACATION
Our plant will be closed
from JULY 26 to AUG. 12
Please anticipate your needs
Raw Material will not be
received during shut-down
WAUKESHA FOUNDRY CO.

SLM00096

DE LAVAL
TURBINE INC.

TRENTON, NEW JERSEY 08602 • TELEPHONE: 609-887-8000
CABLE ADDRESS: TURBINCO - TRENTON

May 10, 1968
Serial WIHB-564

The Hydraulic Institute
122 East 42nd Street
New York, New York 10017

Attention: Mr. Frank P. Anderson
Secretary

Subject: HI/NAVSEC Meeting 25 March 1968 to
Discuss Problems of 70-30 Copper Nickel

Reference:
(a) Aurora Pump letter by Mr. I. A. Jelly dated
2 April 1968 with copy to Mr. Anderson, HI

Gentlemen:

1. Reference (a) requested a reply to be directed to the Hydraulic Institute.

2. We have no particular information, pro or con, to add concerning the specification, MIL-C-20159B, pertaining to 70-30 and 90-10 copper nickel castings.

3. The two military specifications, MIL-P-18472E, and MIL-P-17639C, covering pumps for fresh water service, permit a selection of materials for construction which we believe is adequate and do not, at this time, recommend any additional choices. We do agree, however, that Composition G should not be ruled out in favor of 70-30 copper nickel when the pump is non-critical and the life expectancy will be satisfactory for the service intended.

4. A copy of the minutes of the subject meeting will be appreciated.

Very truly yours,

DE LAVAL TURBINE INC.

W. I. H. Budd

W. I. H. Budd
Manager - Marine Engineering

FJM/cc

Ingersoll-Rand Company
Established 1871

PHILLIPSBURG, N. J. 08865

May 20, 1968

Hydraulic Institute
122 East 42nd Street
New York, N.Y. 10017

Attention: Frank P. Anderson
Secretary

Subject: Military Specification MIL-C-20159
Copper-Nickel Alloy

Reference: NAVSEC-Hydraulic Institute Meeting of
March 25, 1968, Washington, D.C.

Gentlemen:

Our concern has been successfully manufacturing pumps made of MIL-C-20159B Type I and II castings for many years. Reliable sources of supply and sound casting techniques have been determined. While we can appreciate the problems a non-ferrous foundry may encounter in developing the technique and controls necessary to successfully cast a different material, we do not feel that producing Subject material causes the problems of expense and scheduling that one often hears.

The ingot and spout cost of MIL-C-20159 Type I 70-30 Cu Ni is about the same as MIL-B-16541 valve bronze, and is less than MIL-B-16576 gun metal. As long as the world tin prices remain high there is no reason to believe this situation will change. The cost of MIL-C-20159 Type II 90-10 Cu Ni, is less than any of the materials listed above. Ingersoll-Rand Company converted one line of pumps we supply the Navy from valve bronze to 90-10 Cu Ni because of the manufacturing problems and shipping delays associated with the use of valve bronze as pressure castings.

The machining time for MIL-C-20159 is greater than MIL-B-16541 and MIL-B-16576.

MIL-P-18682B allows the use of gun metal or 70-30 copper nickel casings for surface ships. Since 90-10 copper nickel castings are accepted as being equal to or better than gun metal we hereby request that 90-10 be added to the list of acceptable materials.

A great deal of discussion has taken place concerning corrosion erosion resistance of the various bronzes, copper-nickels, nickel-copper and austenitic stainless steels in fresh and sea water. While there is little doubt that the tin bronzes appear to offer the least resistance to this phenomona the relative ratings of the balance of these materials are subject to conjecture. We feel a government sponsored test of these mater in the cast and wrought form in fresh and sea water at velocity increments up to perhaps 100 feet per second would be of tremendous value to all concerned.

These test results will permit the setting up of realistic material speed and velocity limitations. Such limits would permit utilization of the least expensive material suitable for the intended service.

Very truly yours,
INGERSOLL RAND COMPANY,

C.G.McGinnis
Assistant Chief Engineer
Cameron Pump Division
Cameron Engineering Dept.

C.G.McGinnis
fm

C-2 I.A.Jelly,Aurora
J.M.Bartos
M.F.Hagerstrom
R. Fischer
K. Cann