G.L. Ballast Water Collaborative

Duluth, MN

August 2, 2012

BALLAST WATER TREATMENT

ACTIVITIES UPDATE

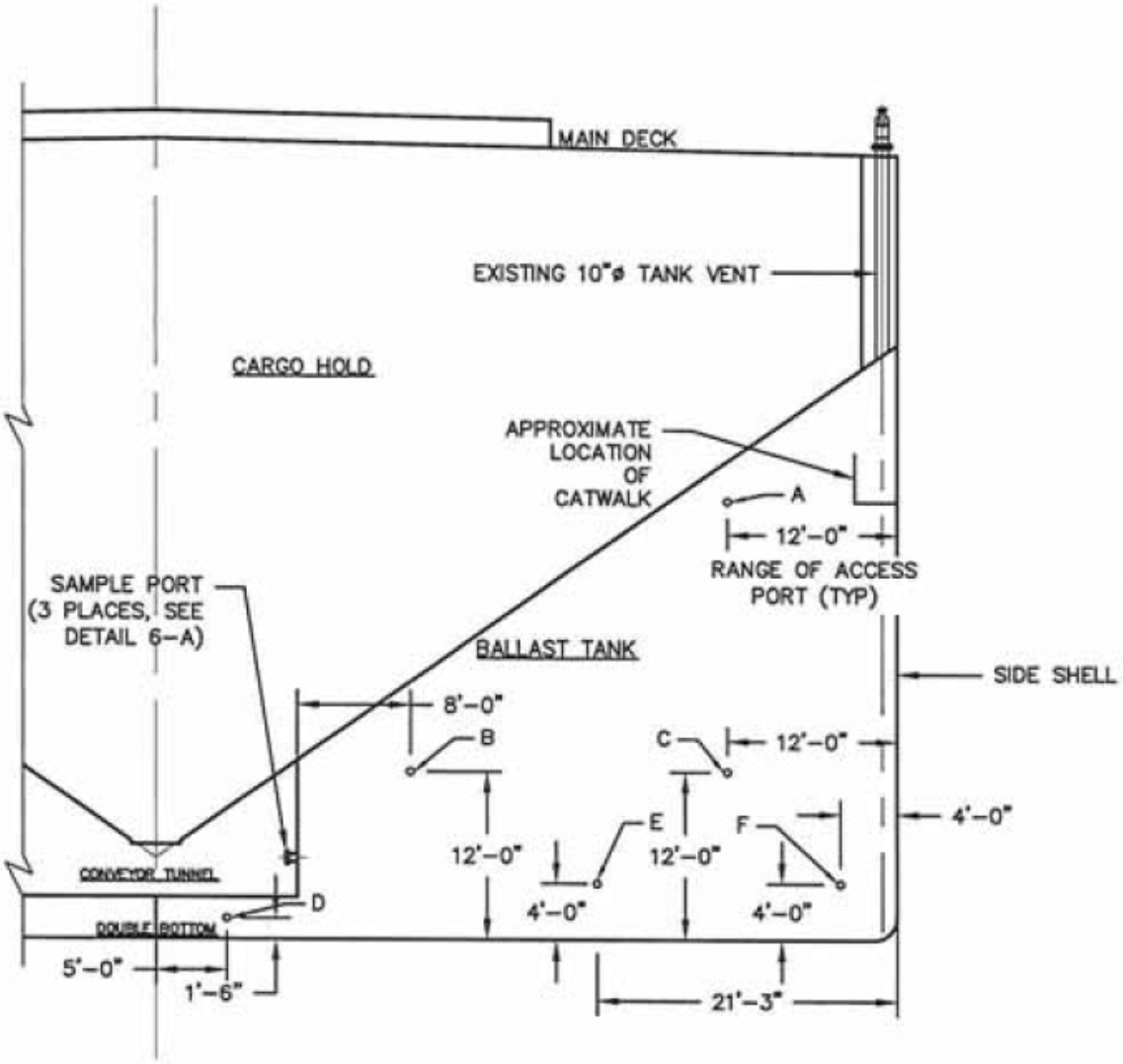
Noel L. Bassett – VP Operations

American Steamship Company

Activities Recap - 2009:

- Fit the Indiana Harbor with in-tank sampling ports/locations
- Tested various biocide introduction techniques
- Assist with “emergency dosing” tests
- Supported publication of NPS Emergency Guide


INDIANA HARBOR



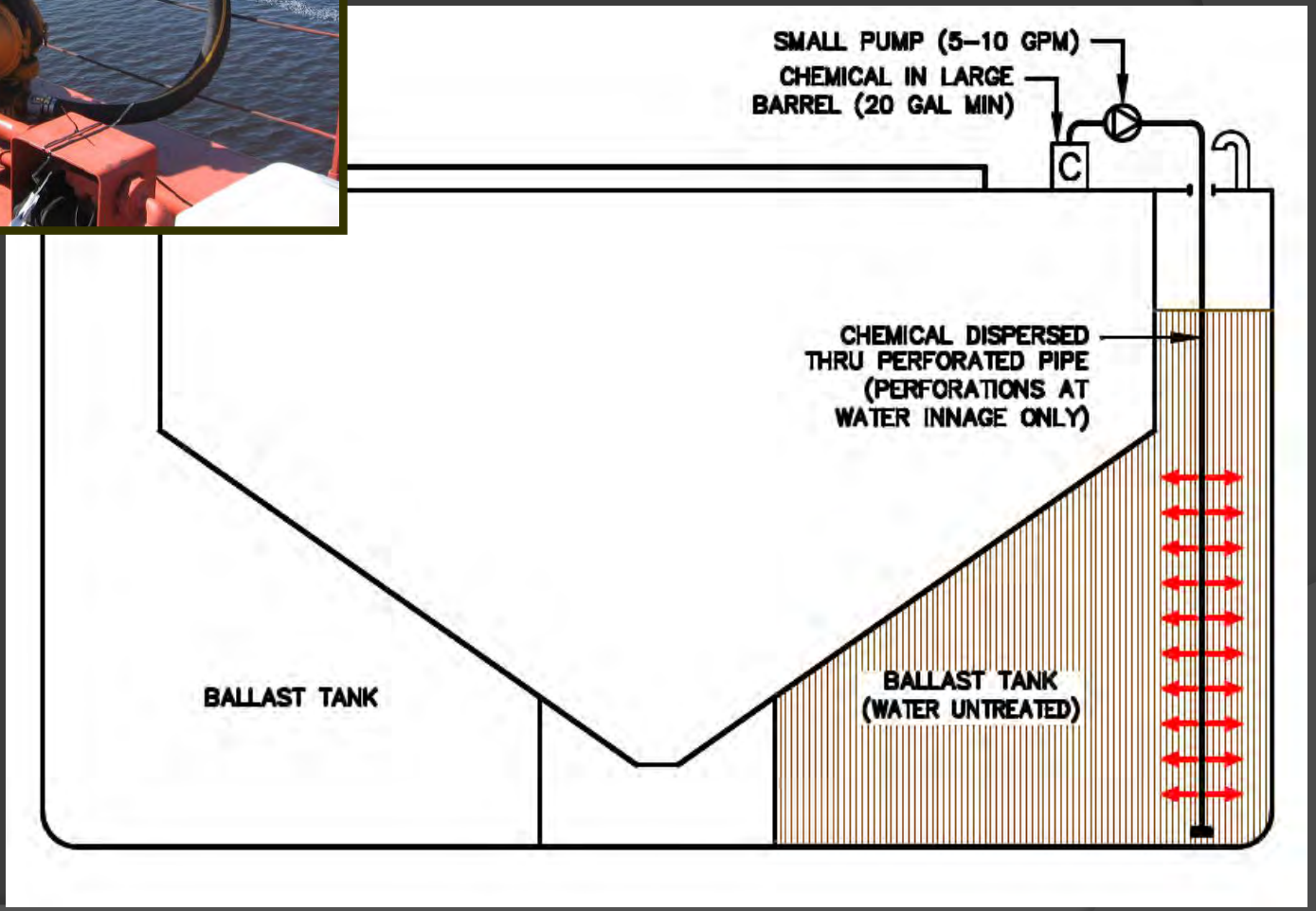
SECTION 5-B

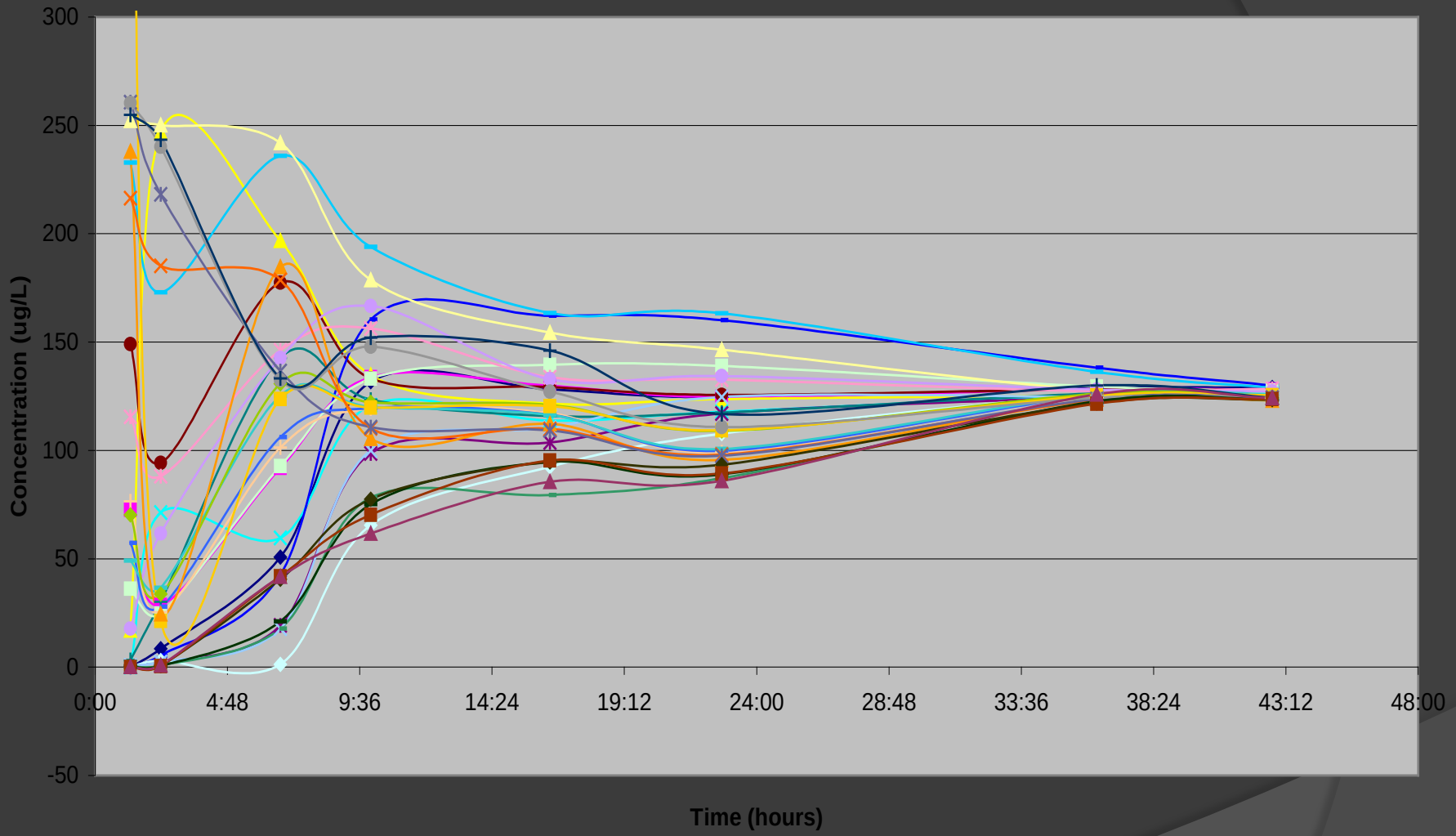
TYPICAL BALLAST TANK SAMPLE POINTS

STBD TANK SHOWN LOOKING FWD, PORT TANKS SIMILAR & OPPOSITE

SCALE: 1/16"=1'-0"

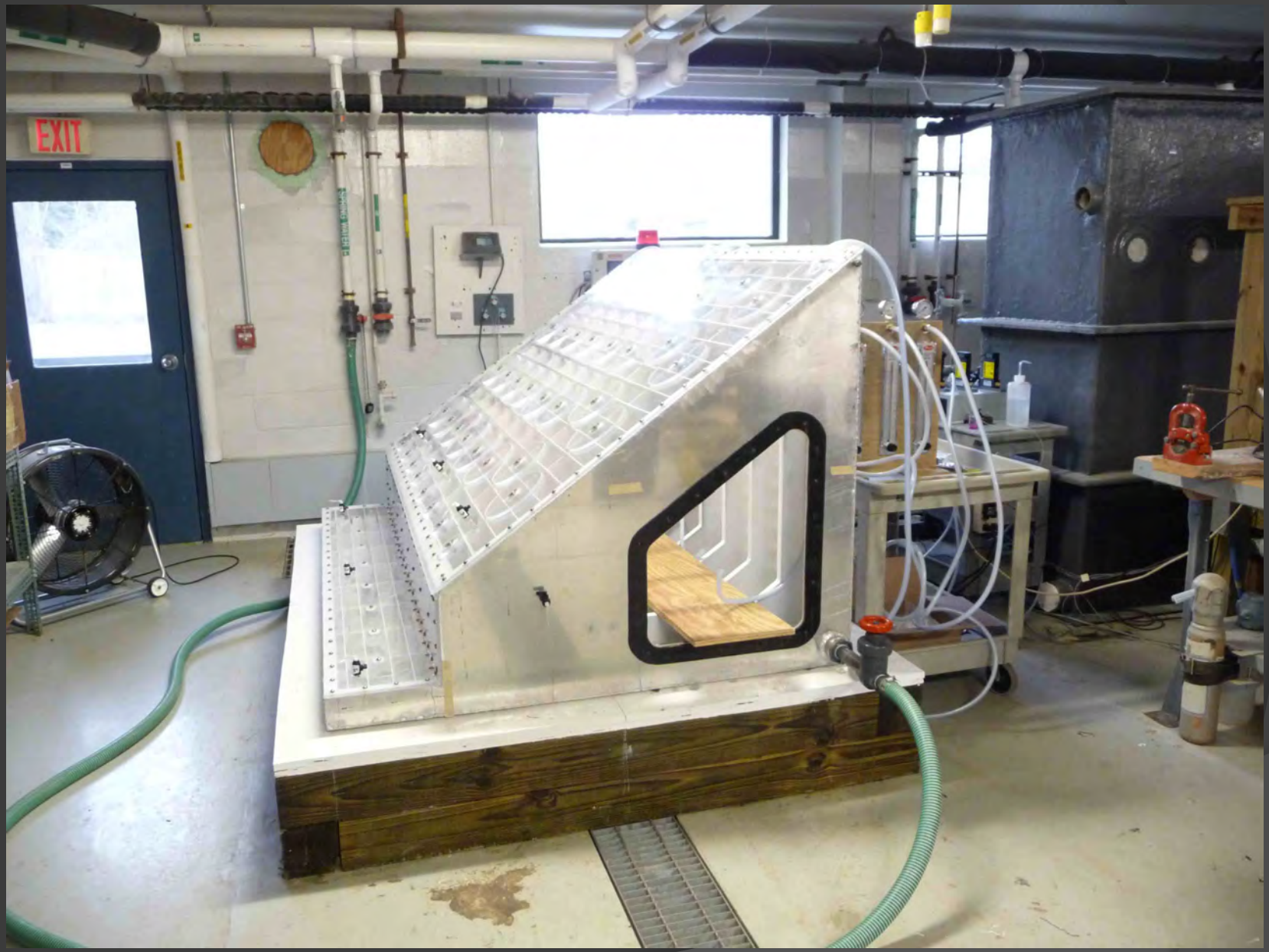

D3
D2
D1
3PT
B1
A2
A1
3PT

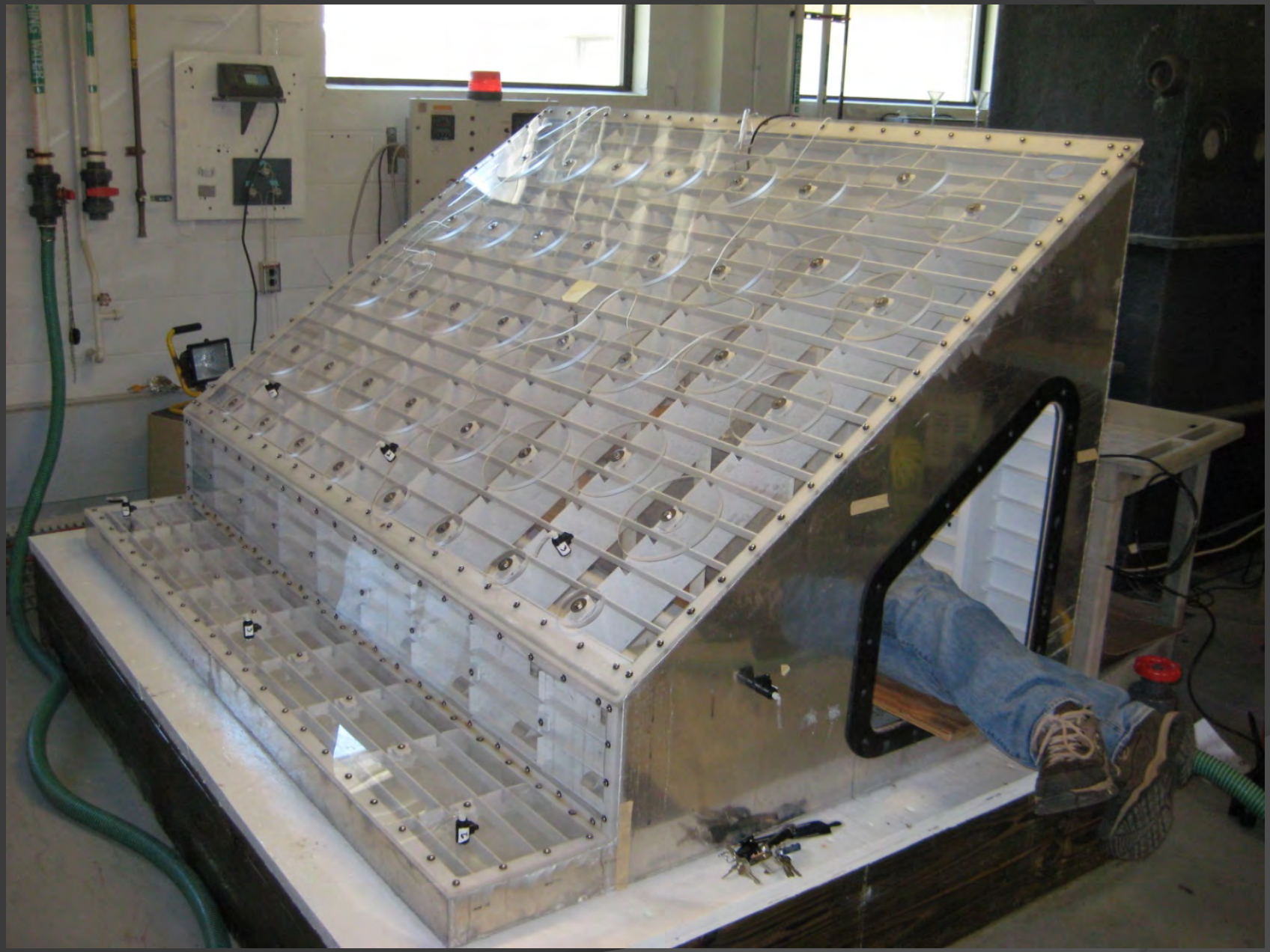

SMALL PUMP (5–10 GPM)
CHEMICAL IN LARGE BARREL (20 GAL MIN)
C
CHEMICAL DISPERSED THRU PERFORATED PIPE (PERFORATIONS AT WATER INNAGE ONLY)
BALLAST TANK
BALLAST TANK (WATER UNTREATED)


300
250
200
150
100
50
0
-50
Concentration (ug/L)
0:00
4:48
9:36
14:24
19:12
24:00
28:48
33:36
38:24
43:12
48:00
Time (hours)

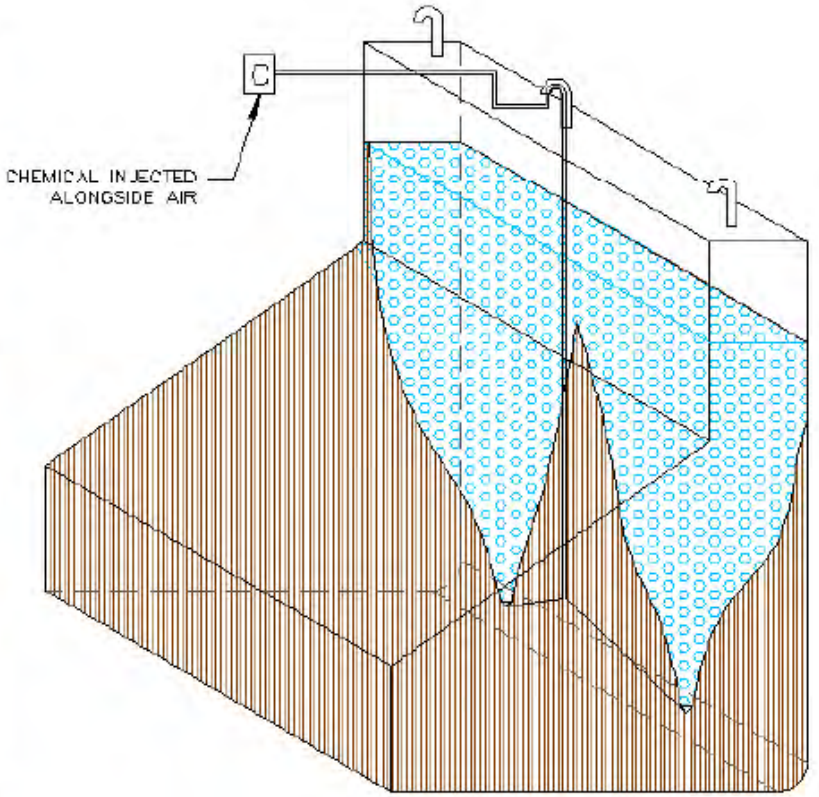
Activities Recap - 2010:

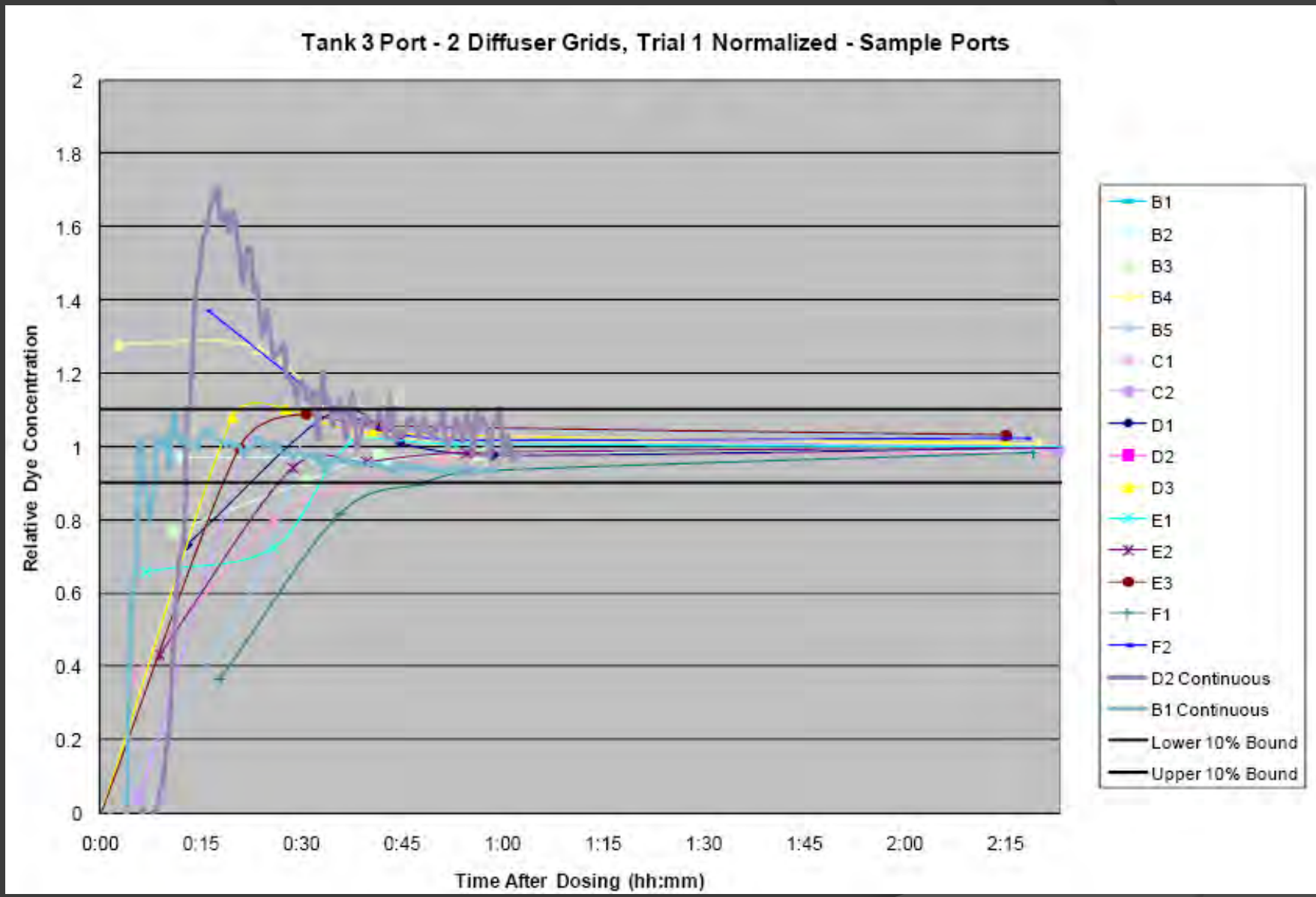
- NPS and USGS performed CFD and scale model tests to fine-tune mixing methodologies.
- Shipboard tests confirmed CFD and 1/10th scale model tests


EXIT






C
CHEMICAL INJECTED
ALONGSIDE AIR


Tank 3 Port - 2 Diffuser Grids, Trial 1 Normalized - Sample Ports
Relative Dye Concentration
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0:00
0:15
0:30
0:45
1:00
1:15
1:30
1:45
2:00
2:15
Time After Dosing (hh:mm)
B1
B2
B3
B4
B5
C1
C2
D1
D2
D3
E1
E2
E3
F1
F2
D2 Continuous
B1 Continuous
Lower 10% Bound
Upper 10% Bound

Activities Recap - 2011:

- Full scale in-tank treatment of two ballast tanks with NaOH
- All performed at the tank
- Neutralization with CO_2


US 22T8
TARE
WEIGHT


DANGER
HIGH VOLTAGE

2012 Activities

- Support shipboard testing of ETV sampling skid built by NRL for USCG/MARAD
- Continue treatment testing with NaOH in parallel with ETV sampling testing
  - Chemical injection at the ballast pump in the engine room
  - Treatment and neutralization of the water in the ballast pipe header
  - Neutralization of ballast at the tank (as previously done) with CO_2
- Evaluation of engine exhaust as alternative to liquid CO_2 for neutralization

EPA/###/X-11/###
2012

GENERIC PROTOCOL FOR THE VERIFICATION OF BALLAST WATER TREATMENT TECHNOLOGY IN SHIPBOARD INSTALLATIONS

Produced by

NSF International
Ann Arbor, MI

For

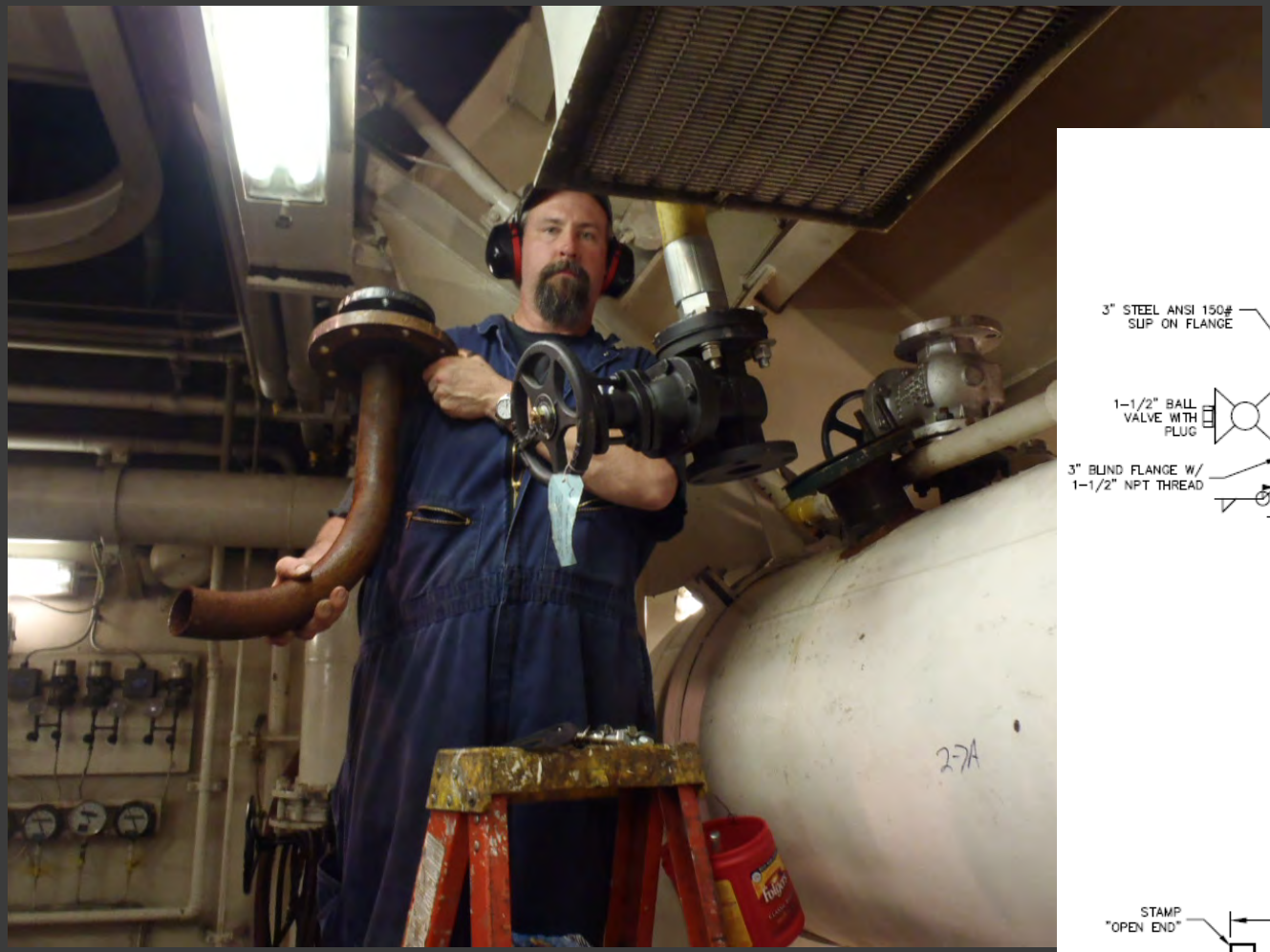
U.S. Environmental Protection Agency
Environmental Technology Verification Program

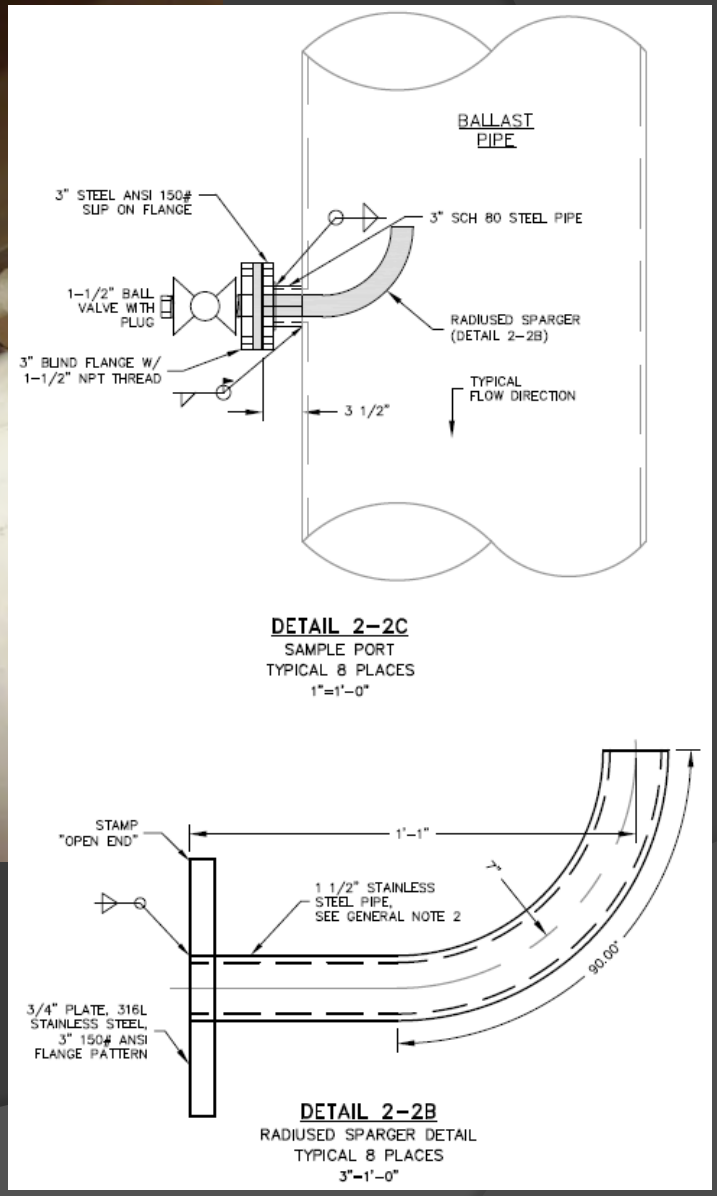
In cooperation with

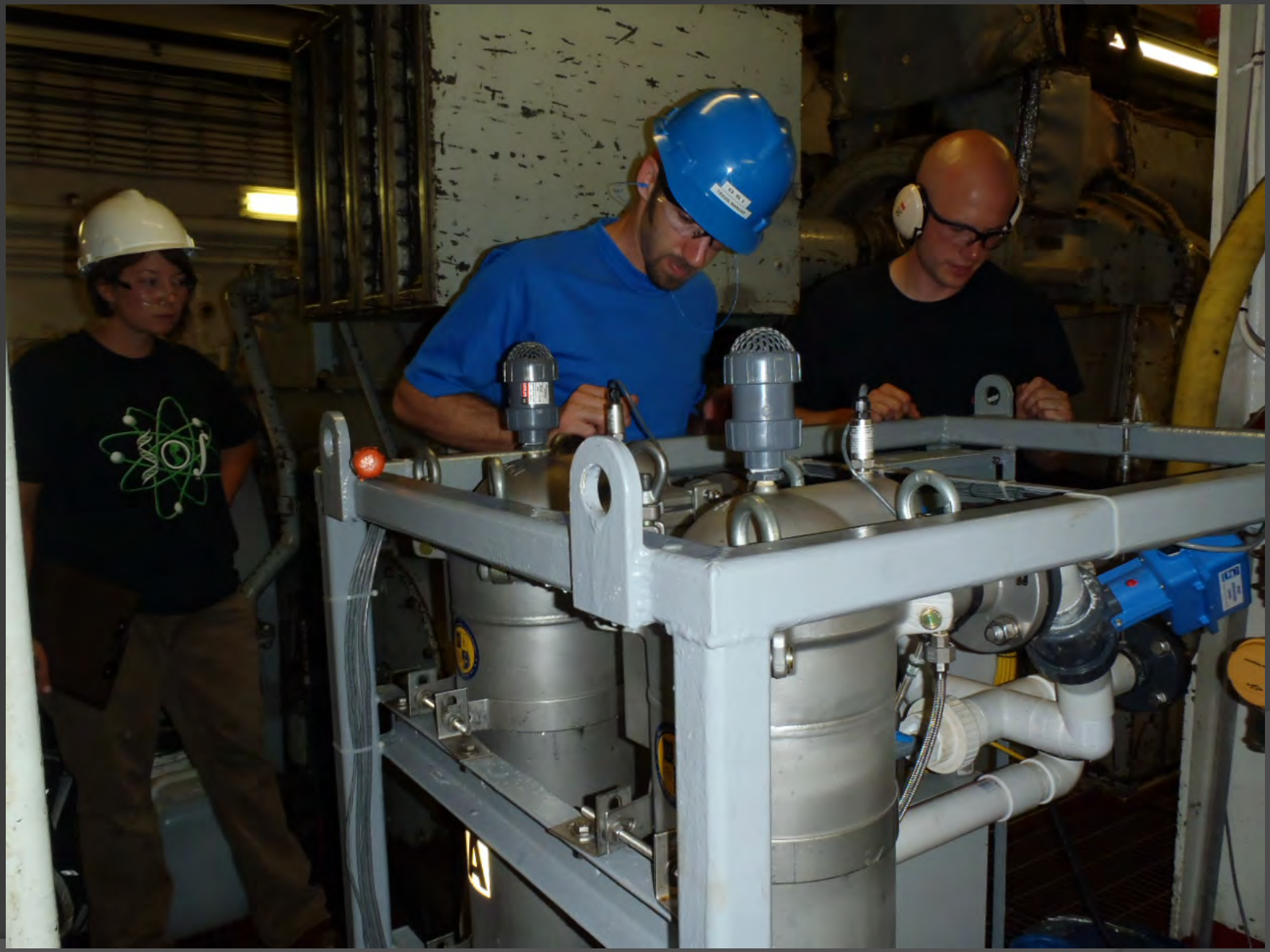
U.S. Coast Guard
Environmental Standards Division
Washington, DC

And

STEP or CEA or as appropriate.




BALLAST
PIPE
3" STEEL ANSI 150#
SLIP ON FLANGE
3" SCH 80 STEEL PIPE
1-1/2" BALL
VALVE WITH
PLUG
RADIUSED SPARGER
(DETAIL 2-2B)
3" BLIND FLANGE W/
1-1/2" NPT THREAD
TYPICAL
FLOW DIRECTION
3 1/2"
DETAIL 2-2C
SAMPLE PORT
TYPICAL 8 PLACES
1"=1'-0"
STAMP
"OPEN END"
1'-1"
1 1/2" STAINLESS
STEEL PIPE,
SEE GENERAL NOTE 2
90.00°
3/4" PLATE, 316L
STAINLESS STEEL,
3" 150# ANSI
FLANGE PATTERN
DETAIL 2-2B
RADIUSED SPARGER DETAIL
TYPICAL 8 PLACES
3"=1'-0"

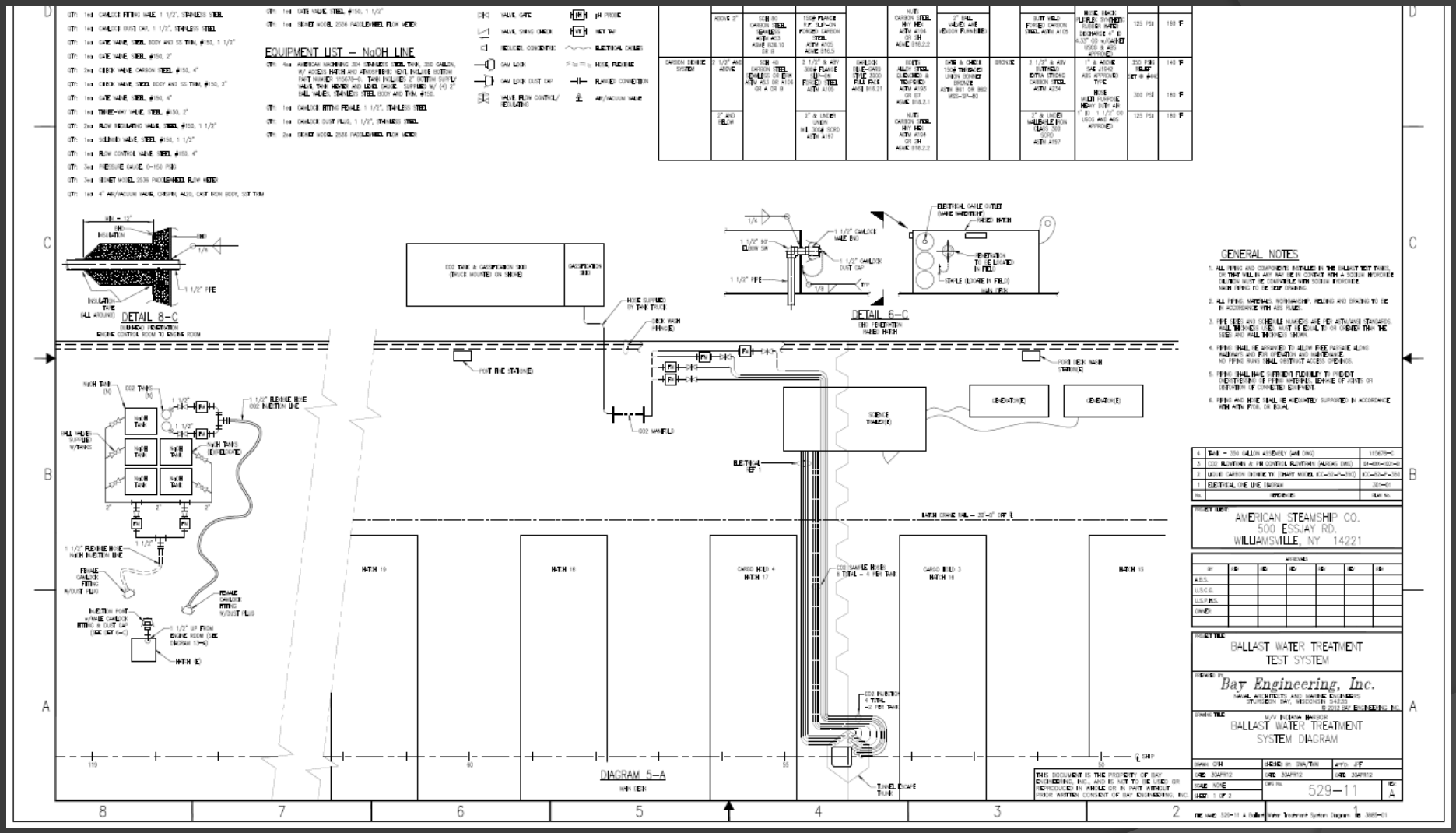


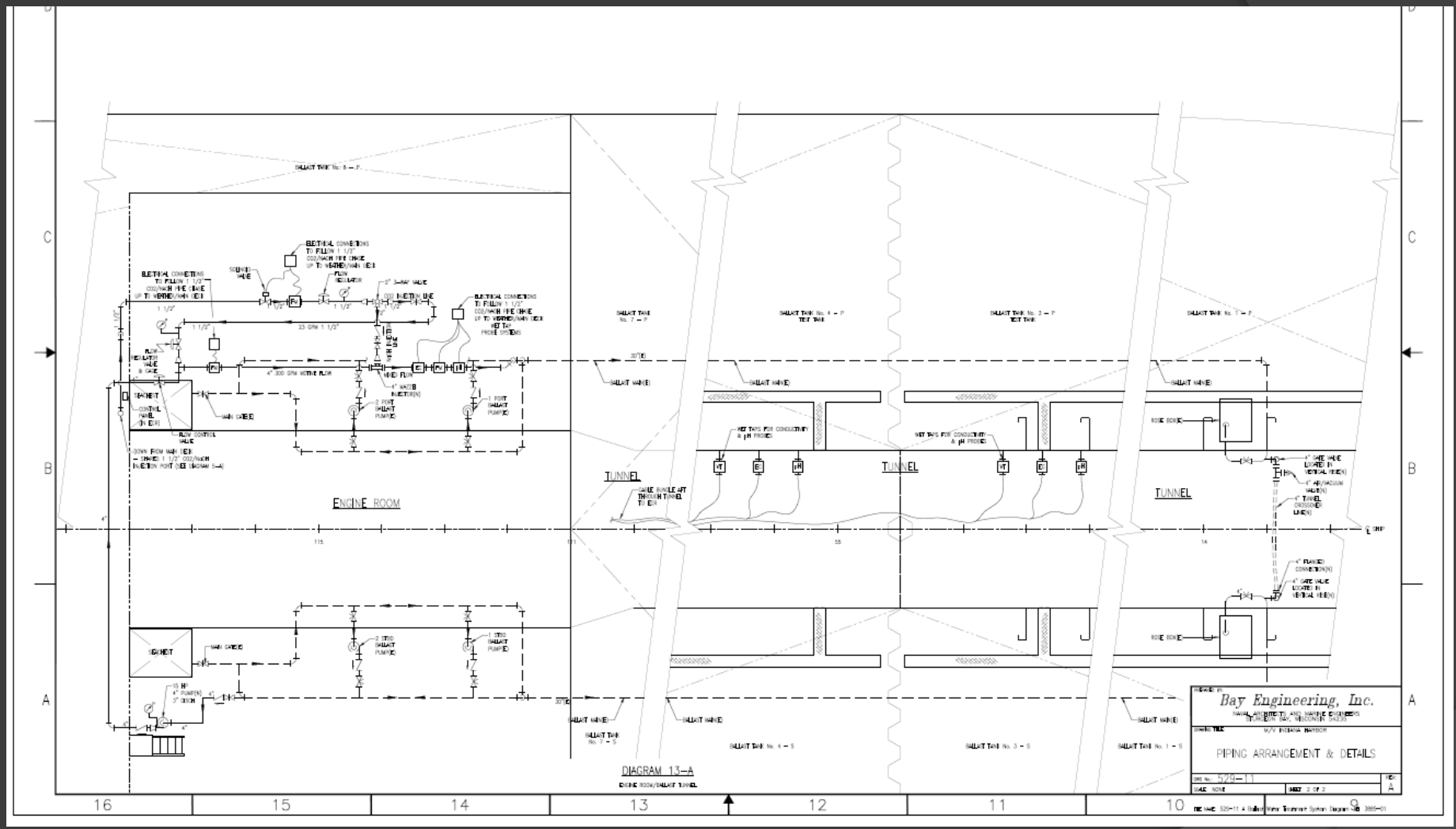

A
B

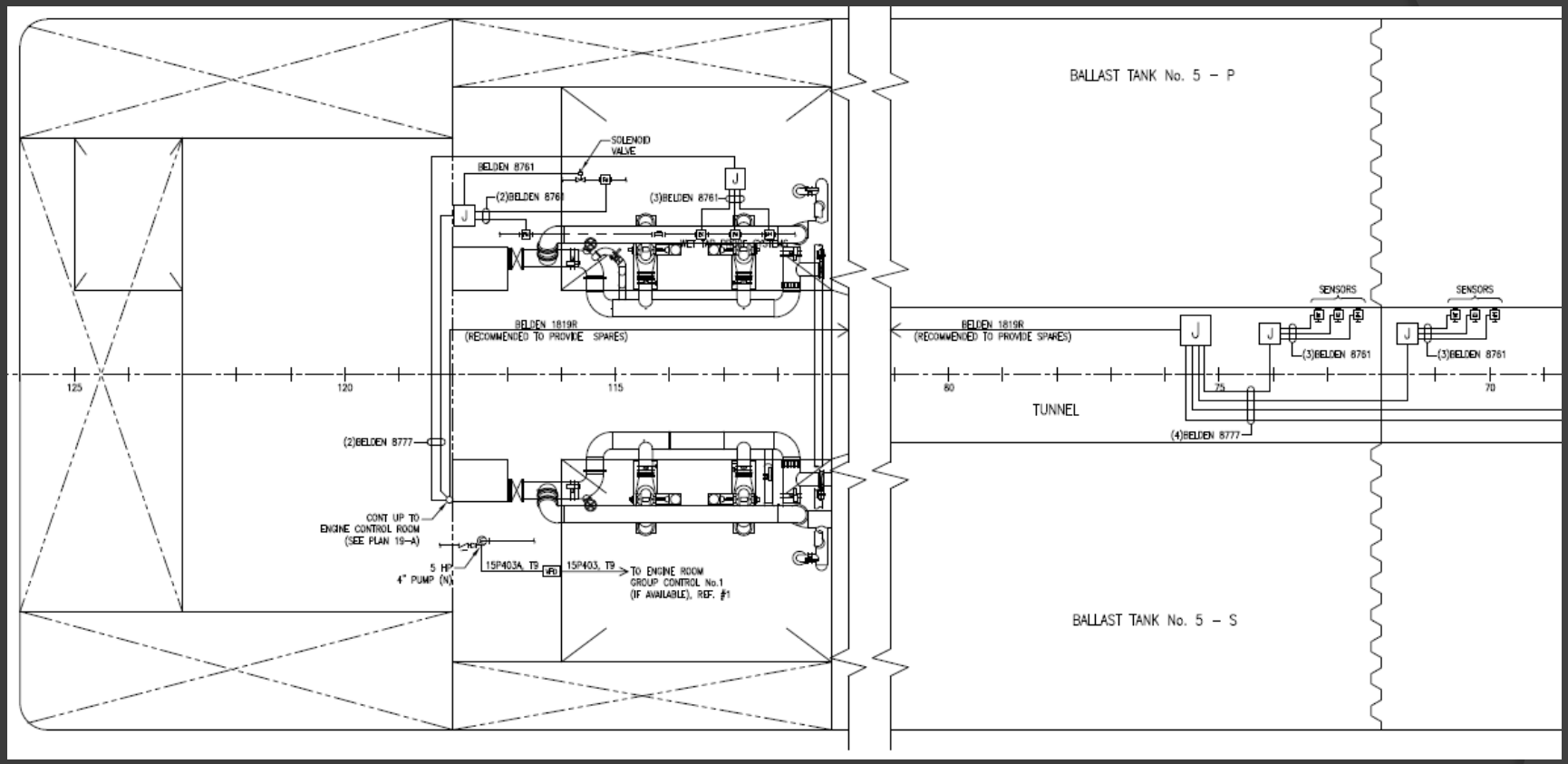

TRU2
A
PRE-MED
BBQ CLUB

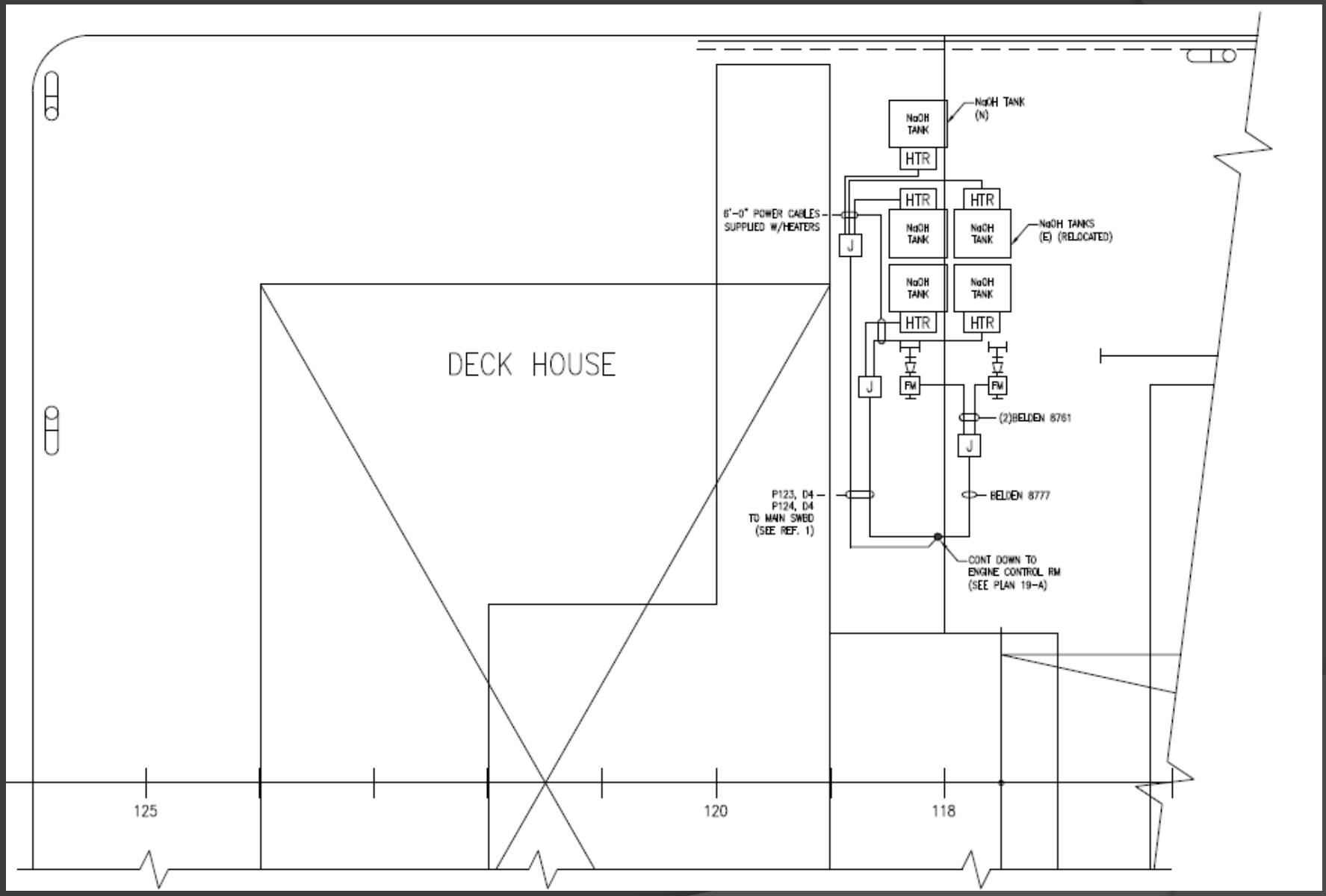

A

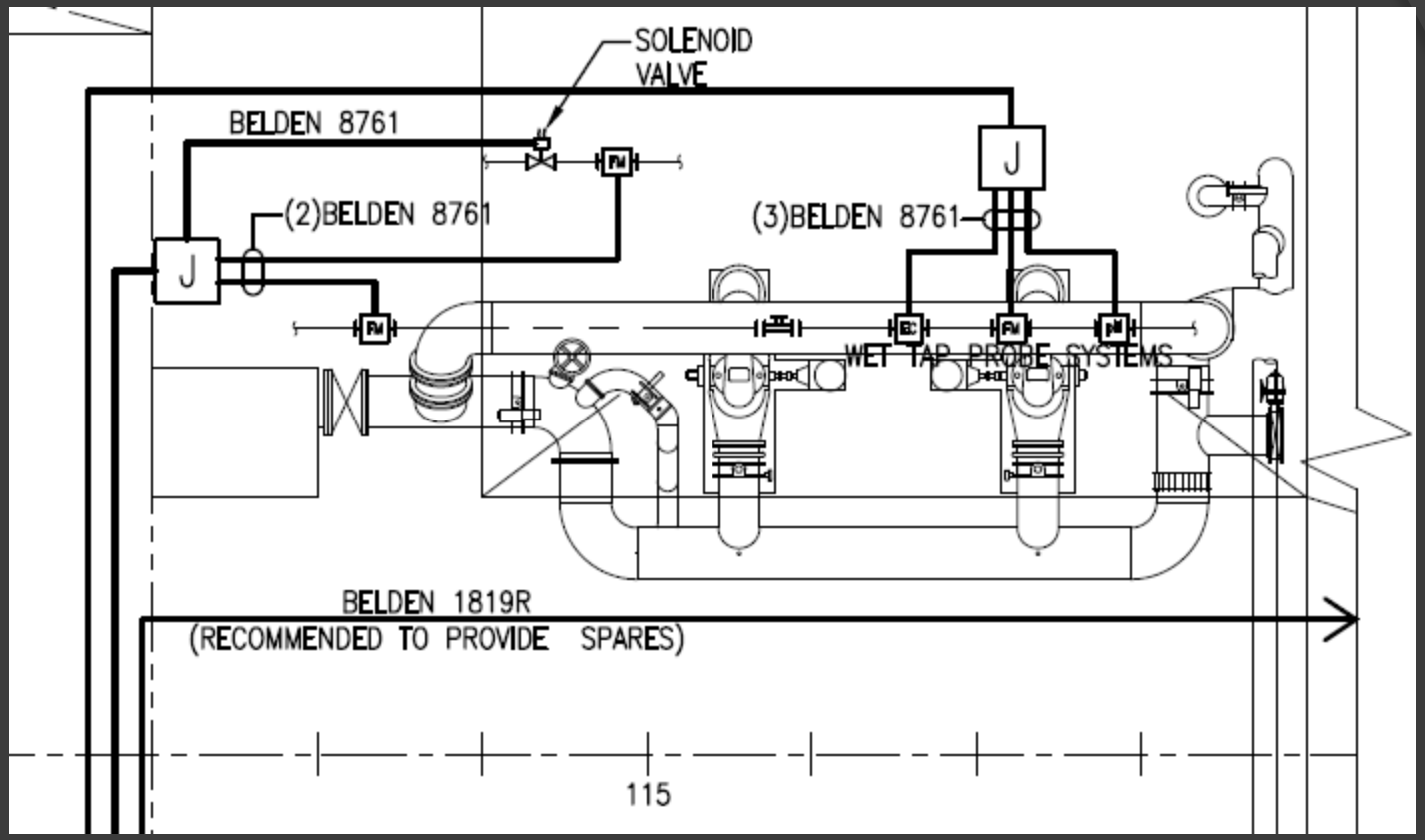

V3


EQUIPMENT LIST – NaOH LINE
GENERAL NOTES
DETAIL 8-C
DETAIL 6-C
DIAGRAM 5-A
BALLAST WATER TREATMENT TEST SYSTEM
Bay Engineering, Inc.
AMERICAN STEAMSHIP CO.
500 ESSJAY RD.
WILLIAMSVILLE, NY 14221
BALLAST WATER TREATMENT SYSTEM DIAGRAM
529-11
THIS DOCUMENT IS THE PROPERTY OF BAY ENGINEERING, INC., AND IS NOT TO BE USED, OR REPRODUCED IN WHOLE OR IN PART WITHOUT PRIOR WRITTEN CONSENT OF BAY ENGINEERING, INC.


ENGINE ROOM
TUNNEL
TUNNEL
TUNNEL
Bay Engineering, Inc.
PIPING ARRANGEMENT & DETAILS
DIAGRAM 13-A


BALLAST TANK No. 5 – P
SOLENOID VALVE
BELDEN 8761
(2)BELDEN 8761
(3)BELDEN 8761
BELDEN 1819R
(RECOMMENDED TO PROVIDE SPARES)
125
120
115
(2)BELDEN 8777
CONT UP TO ENGINE CONTROL ROOM (SEE PLAN 19–A)
5 HP 4" PUMP (N)
15P403A, T9
15P403, T9
TO ENGINE ROOM GROUP CONTROL No.1 (IF AVAILABLE), REF. #1
BELDEN 1819R
(RECOMMENDED TO PROVIDE SPARES)
SENSORS
SENSORS
(3)BELDEN 8761
(3)BELDEN 8761
80
75
70
TUNNEL
(4)BELDEN 8777
BALLAST TANK No. 5 – S


DECK HOUSE
NaOH TANK (N)
NaOH TANK
HTR
6'-0" POWER CABLES SUPPLIED W/HEATERS
NaOH TANKS (E) (RELOCATED)
J
FM
(2)BELDEN 8761
P123, D4
P124, D4
TO MAIN SWBD
(SEE REF. 1)
BELDEN 8777
CONT DOWN TO ENGINE CONTROL RM (SEE PLAN 19-A)
125
120
118


SOLENOID
VALVE
BELDEN 8761
(2)BELDEN 8761
(3)BELDEN 8761
J
J
WET TAP PROBE SYSTEMS
BELDEN 1819R
(RECOMMENDED TO PROVIDE SPARES)
115


INDIANA HARBOR
WILMINGTON DEL
INDIANA HARBOR

Thank you for your
interest and attention

Questions?