INSPECTION REPORT-BOILERS
NAVFAC 9-11014/41 (3/67)
Supersedes NAVDOCKS 2544
S/N 0105-LF-004-0000

DATE OF INSPECTION: 17-24 JUNE 1987

TYPE OF INSPECTION: A ☐ INTERNAL & EXTERNAL B ☒ INTERNAL & EXTERNAL WITH PRESSURE TEST C ☒ OPERATIONAL

1. FROM: BASE MAINT. OFFICER, CAMP LEJEUNE N. C.
2. TO: NAVFACENGCOM, NORFOLK, VA.

14. CERTIFICATE ISSUED ☒ YES ☐ NO — EXPIRE 17 JUNE 1988
15. BOILER INSPECTOR: Thomas L Lanier — NAVY OR NATIONAL BOARD NO: NAVFAC 239
16. REASON FOR NOT ISSUING CERTIFICATE:

BOILER DATA

3. MANUFACTURER: CLEAVER BROOKS
4. PROPERTY NO.: 65
5. MFG. SERIAL NO.: C-80611
6. MFG. MODEL NO.: N.B. 61798
7. BUILDING NO.: BA-106
8. YEAR BUILT: 1986
9. CAPACITY: 6,900 LB/HR.
10. FUEL (Check): ☐ COAL ☒ OIL ☐ GAS
11. PRESSURE: DESIGNED 150 psi; OPERATING 50 psi; TEST 90 psi
12. FEED WATER TREATMENT: ☐ SATISFACTORY ☒ UNSATISFACTORY
13. TYPE: ☐ WATER TUBE ☒ FIRE TUBE ☐ C. I.

17. BOILER USE: EXPORT
18. COMBUSTION CONTROL (Mfg. Name): FIREYE
19. COMBUSTION: 12.5 % CO_2 6.0 % EXCESS O_2
20. FLUE GAS TEMPERATURE: AFTER BOILER 300 °F AFTER HEAT TRAP _____ °F

SAFETY DEVICES

SAFETY VALVES

21. MANUFACTURER	22. NUMBER AND SIZE	23. PSI SETTING	24. CONDITION
KUNKLE	2-2"	65-70	SAT.

STEAM PRESSURE GAUGE

25. MANUFACTURER: CLEAVER BROOKS
26. CORRECTIONS: WATER LEG CONSTANT _____ psi; OTHER _____ psi
27. REASON IF NOT TESTED:

FIRING EQUIPMENT

ITEM	IN SERVICE	ALTERNATE
28. MANUFACTURER	CLEAVER BROOKS	
29. TYPE	NOZZLE SPRAY - AIR ATOM.	
30 FUEL GRADE	#2	

31. INSPECTOR'S COMMENTS:
W/S HEAVY SCALE (SLUDGE) IN LOWER HALF OF BOILER, ADJUST CHEMICAL PROGRAM TO CLEAN UP BOILER.

32. ATTACHMENT(S) (Check): ☒ COPY OF INSPECTOR'S REPORT ☐ SPECIAL COMMENTS

33. SIGNATURE: Timothy Jones 6/26/87 BY DIRECTION

* U.S. GOVERNMENT PRINTING OFFICE: 1982 – 605 – 965

5ND LANTDIV 9-4730/6 (Rev. 8/68)
Boiler Inspection - Addendum to NAVFAC 9-11014/41

DATE: 1-23-87

ACTIVITY: MCRCL

BUILDING NO: BA 106 BOILER NO: 65

Based on the existing condition and present rate of deterioration, it is estimated that the boiler has a remaining life of

☐ 5 or more years ☐ ( ) years

The following corrective action is recommended:

WATER LEAKING FROM BACK DOOR OF BOILER, INSPECTION DOOR WAS OPEN AND SEVERAL TUBES WERE LEAKING AT 2ND PASS. THE 2ND PASS TUBES HAD BEEN RE-ROLLED ON 1-9-87. SEVERAL TUBES WERE SEPERATED FROM TUBE SHEET AND STICKING THROUGH TUBE SHEET ABOUT 1/8" PAST BEAD WHERE ROLLED & BEADED.

ALL TUBES WERE SEAL WELDED BY HARRIS CONST. CO. (PERRY SHAW) WHO INSTALLED BOILER. HYDRO AT 225 PSI NO LEAKS AT TUBE ENDS. (RETESTED) BOILER 3 TIMES TO GET SATISFACTORY TEST DUE TO 4 OR 5 WEEPS AT WELDS.) ALL TUBES IN 2ND PASS WERE WELDED (46).

1-26-87

BOILER ON LINE AND STEAMING ABOUT 1/3-1/2 CAPACITY. STACK TEMP. 350-400 °F. BOILER IS NOW HOT AND HAS EXPANDED ABOUT 3/32 - 4/32 AS CLOSE AS I CAN MEASURE.

Tom Lanier

UNITED STATES MARINE CORPS
BASE MAINTENANCE DIVISION
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA 28542-5000

IN REPLY REFER TO
4835
MAIN
23 JAN 1987

Harris Construction Co.
P. O. Box 1499
Moncks Corner, SC 29461

Re: Contract #[illegible]
Replace Boiler, Bldg BA-106
Marine Corps Base,
Camp Lejeune, NC

Gentlemen:

As discussed during the telephone conversation on January 22, 1987 between Mr. Bob Anderson of your company and Mr. David Southerland of Utilities, Base Maintenance, Marine Corps Base, Camp Lejeune, North Carolina and persuant to the warranty clause of the contract the following warranty item is being brought to your attention:

[illegible] at Building BA-106 - The tubes are leaking in the boiler, which is caused by ineffitient water [illegible] in the boiler itself.

[illegible] Bldg Shoemaker, Contract Manager, (919) 451-5794.

Please notify by letter when repairs have been made.

Sincerely,

T. D. Jewell

T. D. JEWELL
Director of Operations

HARRIS CONSTRUCTION COMPANY, INC.
BOILERS, PRESSURE VESSELS & PIPING SYSTEMS
P.O. BOX 1499
MONCKS CORNER, SOUTH CAROLINA 29461
(803) 761-3890

January 27, 1987

Sub: Contract # N62470-84-C-7893

Ref: Model 100-200-150# Steam Boiler w/Feed Pump
CB S.O. CU 8501819-01

Gentlemen;

After receiving a call from Mr. David Southerland at Camp Lejeune at 3:40 p.m. on 1-22-87 concerning boiler at BA-106.

I attempted to contract Applied Engineering in NC and did get their answering service and they said they would contact the Manager and have him call me.

I did not receive an answer from Applied Engineering, so I called Mr. Southerland and he informed me that if we did not come up and fix the boiler, they would get a contractor to fix it and bill us whatever they were charged.

At this point I told them we would have some one there in the morning of 1-23-87.

Mr. Anderson and a welder were at Camp Lejeune at 0800, 1-23-87.

Mr. Tom Lanier the Base Boiler Inspector recommended the hot pass be seal welded as they already had been rerolled by Applied Engineering.

At this time a phone call was made to Mr. Robert Howell of Applied Engineering of Greensboro NC. Lt. King of ROICC Camp Lejeune, NC, was on the phone with me, the government was concerned if welding these tubes would void the warranty on the boiler. Mr. Howell informed us that if the job was done properly it would not affect the warranty.

At this point we commenced preparation to seal weld the hot pass. Which was completed at approximately 2100 with the acceptance of a 1½ design Hydro-Test by Mr. Tom Lanier, Base Boiler Inspector.

Base personnel still insists that this is a warranty problem caused by the (tubes expanding and the boiler not expanding). I, Robert Anderson tried explaining to them, that it was caused by low water again and pointed out to them that their make up feed system was inadequate for this boiler at full power. ie (Cleaver-Brooks Rep. Cleave Beasley & Robert Anderson experienced inadequate water supply to make up feed tank during full power test and made reports of same to ROICC and in their daily reports.) The feed make up system starts out at the demineralizer with 1½" pipe and reduces down to 3/4" pipe, then through a 3/4" electric operated solenoid valve which further restricts the flow to the make up tank.

HARRIS CONSTRUCTION COMPANY, INC.
BOILERS, PRESSURE VESSELS & PIPING SYSTEMS
P.O. BOX 1499
MONCKS CORNER, SOUTH CAROLINA 29461
(803) 761-3890

This pipe is old and possibly has lime build up inside, further restricting the flow of make up water. Still after having all this pointed out plus the fact that they had two feed water check valve failures prior to these two casualitys. Base personnel still insists this has nothing to do with the problem.

I am submitting this letter along with our invoice for repairs to Cleaver Brooks Boiler Inc., and Camp Lejeune.

Date of written report of feed tank problem 8-21-86.

Base personnel present during meeting
Mr. David Southerland
Mr. Greg Shumaker
Lt. King ROICC
Mr. Tom Lanier, Base Boiler Inspector
Mr. Ray Hunt, ROICC Inspector
Mr. Robert B. Anderson, Harris Construction Company, Inc.

Respectfully yours,

Harris Construction Company, Inc.

James W. Harris

James W. Harris
Vice President/ Gen. Mgr.

JWH/swg

Encl.
Letter-Applied Engineering Co. 19 Jan. 87
Letter- U.S. Marine Corps, Camp Lejeune, NC, 22 Jan. 87

cc: Mr. David Southerland
Mr. Greg Shumaker
Lt. King,
Mr. Tom Lanier
Mr. Ray Hunt
Applied Engineering
Cleaver Brooks Boiler Inc.
T.D. Jewewll

P.S. Encl. Copy of Daily Report To Inspector, 8-21-86

Applied Engineering Company
INDUSTRIAL SERVICES DIVISION
351 Industrial Avenue, Greensboro, North Carolina 27406
P.O. Box 16266 • 919/275-1631

Mr. Bruce Hoffman
Base Maintenance Operations Division
Building 1202
Marine Corp Base
Camp Lejeune, NC 28542

January 19,1987

Re: Building BA-106
Cleaver-Brooks Boiler, Model CB 100-200, Unit L-80611

Dear Mr. Hoffman,

On January 8, 1987 we responded to a request for immediate service on the boiler which is the subject of this letter. We were advised that the boiler was shut down with "water running out the front and rear." Our serviceman, Mark Kimbro, was diverted from another job and arrived at Camp Lejeune at approximately 6:00 PM.

Upon inspection, Kimbro determined that the second pass tubes were leaking where they joined the tube sheet. Some of the tubes had separated from the tube sheet by as much as 1/8 of an inch. Kimbro worked until after 11:00 PM re-rolling all the second pass tubes. He returned the following morning and the boiler was hydrostatically tested under the supervision of the base inspector, Mr. Lanier. The test was conducted at 225 psi for fifteen minutes, and was satisfactory.

The main purpose in writing this letter, Mr. Hoffman, is to advise those who are involved with the operation of this boiler that, from what we observed, it is apparent that the boiler has been subjected to some extreme and unusual operating conditions. To have a boiler develop leaking tubes after only about six months of service is very rare. To find a boiler with tube separation to the extent observed by our serviceman is indicative of the unit having been subjected to some extreme conditions.

What these conditions are, we do not know. However, from our experience we know what commonly causes tubes to expand away from, the tube sheet. One cause is improper water treatment which results in scale forming on the tube. Scale prevents the transmission of heat through the tube, and ultimately the tube will overheat and expand away from the tube sheet. Another possible cause is thermal shock which results from the rapid introduction of cold feed water into a hot boiler. There are other reasons, certainly, but these two are common.

The secondary purpose of this letter is to advise you that we will invoice Camp Lejeune for our labor and expenses to repair this unit.

Startup on this boiler was completed on July 31,1986. Before startup, the pressure vessel was subjected to a hydrostatic test, and met this test satisfactorily. If there had been a defect in the manufacture of this unit, it would have shown up here, and the repairs to correct any defect would have been covered by the manufacturer's warranty. The pressure vessel, then, was sound when the boiler was put into service. The leaking tubes developed after the boiler had been in service for almost six months. The leaks were the result of the conditions under which this boiler was operated. They were not caused by a defect in manufacturing, and, as such, the repairs to correct the leaks are not covered under warranty.

We incurred a great deal of labor and travel expenses to repair this pressure vessel, Mr. Hoffman, and we believe we justifiably deserve to be compensated for our service. Accordingly, herewith is our invoice at our standard labor rates. Will you please forward it for processing?

Very truly yours,
APPLIED ENGINEERING COMPANY

Robert W. Howell
Branch Manager

RWH/kh

cc: Rick Jackson
Bob Anderson-Harris Construction Co.

DAILY REPORT TO INSPECTOR

DATE: 8-21-86

CONTRACT NO. 84-C 7893 | TITLE AND LOCATION | REPORT NO. 25

CONTRACTOR (Prime or Subcontractor) | NAME OF SUPERINTENDENT OR FOREMAN

WEATHER—A.M. | TEMPERATURE—A.M. °F

WEATHER—P.M. | TEMPERATURE—P.M. °F

PRIME CONTRACTOR/SUBCONTRACTOR WORKFORCE
(If space provided below is inadequate, use additional sheets)

NUMBER	TRADE	HOURS	EMPLOYER
1		12	P

LOCATION AND DESCRIPTION OF WORK PERFORMED

PBA

TOTAL WORK HOURS ON JOB SITE THIS DATE: 12

CUMULATIVE TOTAL OF WORK HOURS FROM PREVIOUS REPORT: 513

TOTAL WORK HOURS FROM START OF CONSTRUCTION: 525

WERE THERE ANY LOST TIME ACCIDENTS THIS DATE?

☐ YES ☑ NO

IF "YES", A COPY OF THE COMPLETED OSHA REPORT IS REQUIRED

INSPECTION AND/OR TESTING PERFORMED TODAY—FOLLOW WITH REPORT	LOCATION AND/OR ELEMENT OF WORK	REMARKS RESULTS OF INSPECTIONS/TESTING

SPEC. PARA. /OR DRAWING NO.	EQUIPMENT/MATERIAL RECEIVED TODAY TO BE INCORPORATED IN JOB *(Description, Sizes, Quantity)*	SUBMITTAL NO. OR CERTIFICATION	DATE APPROVED

AREA AND PHASE CODE NO.	LOCATION AND DESCRIPTION OF DEFICIENCIES (Materials, Equipment, Safety, and/or Workmanship)	ACTION TAKEN OR TO BE TAKEN

DEFICIENCIES CORRECTED THIS DATE	REFERENCE	
	REPORT NO.	COMPLIANCE NOTICE NO.

CONSTRUCTION AND PLANT EQUIPMENT LEFT ON JOB SITE UNTIL USE IS COMPLETED

DESCRIPTION	DATE FIRST ON JOB (First time only)	HOURS WORKED THIS DATE	HOURS IDLED	DATE OF FINAL REMOVAL FROM JOB SITE

CONSTRUCTION AND PLANT EQUIPMENT NOT LEFT ON JOB SITE PERMANENTLY
(This will include pickup trucks and mobile mounted items, such as compressor, that are also used for transportation to and from the job)

DESCRIPTION	HOURS WORKED	HOURS IDLED

REMARKS *(Include directions received from ROICC/AROICC, visitors, compliance notices received, errors and/or omission in P/S; pertinent information)*

no show on employees
make up water had to be hand fed as
automatic feeder was inadequate

CONTRACTOR/SUPERINTENDENT DATE

CONSTRUCTION REPRESENTATIVE'S REMARKS AND/OR EXCEPTIONS TO THIS REPORT

CONSTRUCTION REPRESENTATIVE DATE

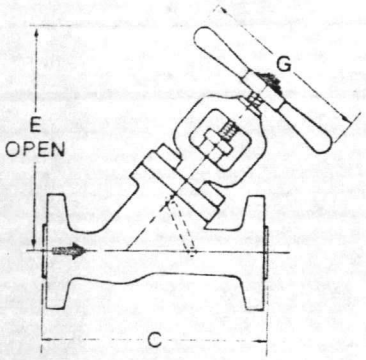
Rockwell Edward Steam Jack (Hand Wheel) Valves
Class 300 PN 50 740 psi 51 bar

29 AUG-84
BA-106
#65
NEW Boiler

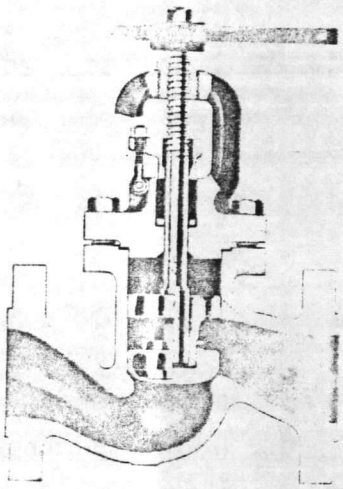
Globe and angle; bolted bonnet, integral stainless hard surfacing alloy on body seating surface and backseat, integral hardfaced alloy disk seating surface; disk body-guided, equipped with Equalizer; flanged or buttwelding ends

FIGURE NUMBERS

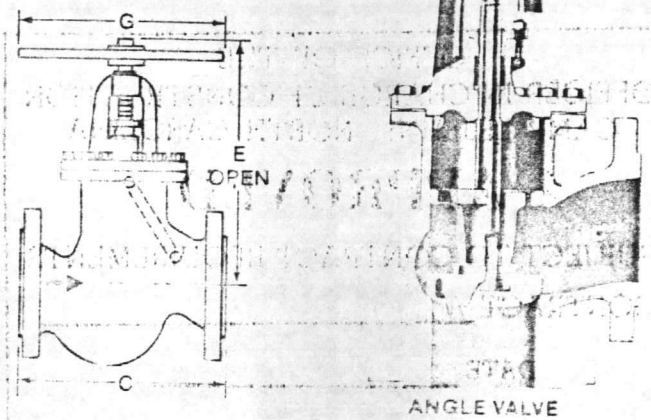
Globe	Fig. 302 - Flanged Fig. 302Y - Buttwelding Ends*
Angle	Fig. 303 - Flanged Fig. 303Y - Buttwelding Ends*



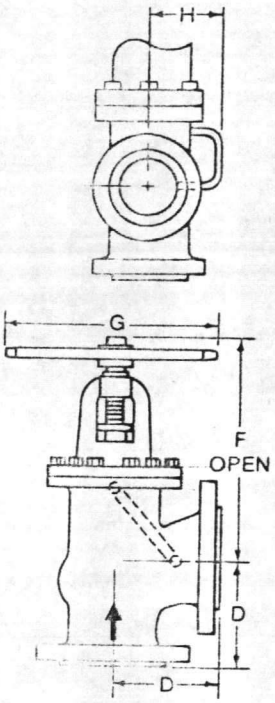
DWG. FOR 2½ VALVE ONLY



GLOBE VALVE



ANGLE VALVE



GLOBE & ANGLE VALVES - SIZE 2½ THRU 12

Bold face numerals are in inches and pounds.
Orange numerals are in millimeters and kilograms.

SIZE NPS / DN	2½ / 65	3 / 800	4 / 100	5 / 125	6 / 150	8 / 250	10 / 250	12 / 300
C Contact Face to Contact Face, (Globe)•	**11.5** 292	**12.5** 318	**14** 356	**15.76** 400	**17.5** 445	**22** 559	**24.5** 622	**28** 711
D Center to Contact Face, (Angle)•	**5.75** 146	**6.25** 159	**7** 178	**7.88** 200	**8.75** 222	**11** 279	**12.25** 310	**14** 356
E Center to Top, Globe	**16** 406	**16.2** 411	**16.7** 424	**20.1** 510	**24.8** 630	**28.4** 721	**34.3** 871	**39.7** 1008
F Center to Top, Angle	**13.6** 345	**14.4** 366	**19.6** 371	**17.7** 450	**21.4** 544	**24.2** 615	**28.8** 731	**32.9** 836
G Handwheel Diameter†	**11** 279	**11.5** 292	**11.5** 292	**15** 381	**18** 457	**22** 559	**22** 559	**26** 660
H Clearance for Equalizer**	**5.9** 150	**8.7** 221	**8.5** 216	**10** 254	**9.6** 244	**11** 279	**13.7** 348	**15** 381
Weight, Globe (Flanged)	**70** 32	**100** 45	**139** 63	**226** 103	**370** 168	**525** 238	**890** 404	**1500** 680
Weight, Globe (Welding)	**56** 25	**75** 34	**94** 43	**172** 78	295 134	400 181	**720** 327	**1270** 576
Weight, Angle (Flanged)	**65** 29	**94** 43	**126** 57	206 93	300 136	**450** 204	**700** 318	**1200** 544
Weight, Angle (Welding)	**51** 23	**69** 31	**81** 37	**152** 69	**225** 102	**325** 147	**530** 240	**970** 440

*See table (pages 52 and 53) for buttwelding end dimensions

†Regular handwheel standard on all sizes except 12" has impactor handwheel
2½ has impactor handle

**Equalizer pipe standard
Drain plug on application at extra charge
Material specifications page 48
Pressure drop data pages 54 and 55
Pressure-temperature ratings for Rockwell Edward valves pages 46 and 47

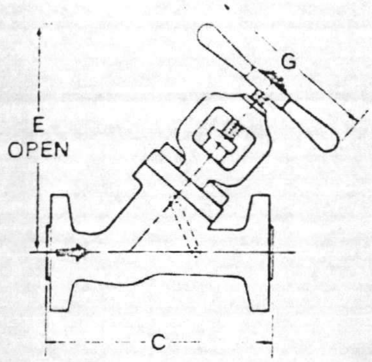
•Center to end or end to end dimensions for welding end valves same as center to contact face or contact face to contact face dimensions for flanged end valves

... (...) Valves
... 300 PN 50 ... 51 bar

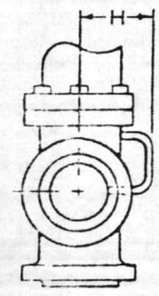
Globe and angle, bolted bonnet, integral stainless ... surfacing alloy on body seating surface and backseat, integral hardfaced alloy disk seating surface, disk body-guided, equipped with Equalizer; flanged or buttwelding ends.

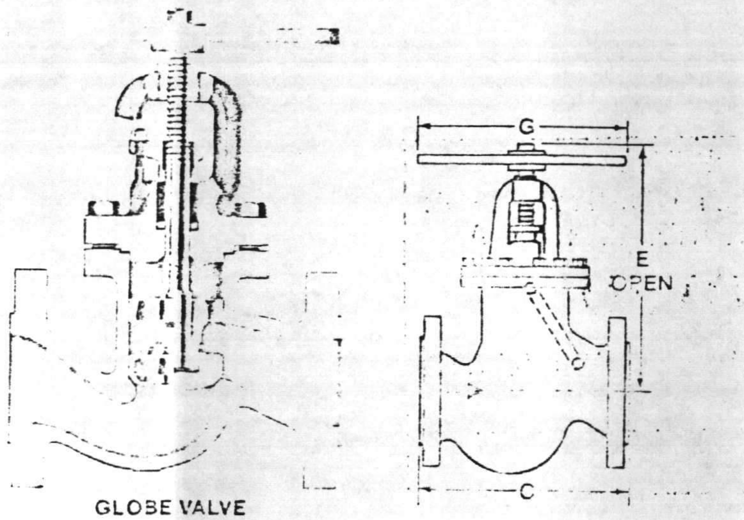
FIGURE NUMBERS

Globe	Fig 302 - Flanged Fig 302Y - Buttwelding Ends*
Angle	Fig 303 - Flanged Fig 303Y - Buttwelding Ends*

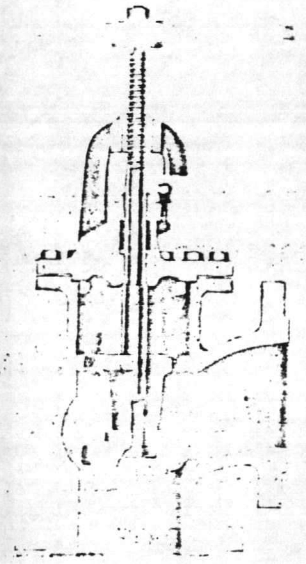


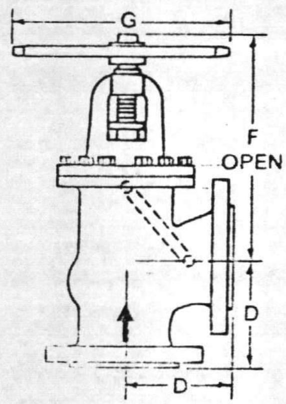
DWG. FOR 2½ VALVE ONLY





GLOBE VALVE





ANGLE VALVE

GLOBE & ANGLE VALVES - SIZE 2½ THRU 12

Bold face numerals are in inches and pounds.
Orange numerals are in millimeters and kilograms

SIZE NPS / DN	2½ 65	3 800	4 100	5 125	6 150	8 250	10 250	12 300
C Contact Face to Contact Face, (Globe)•	**11.5** 292	**12.5** 318	**14** 356	**15.76** 400	**17.5** 445	**22** 559	**24.5** 622	**28** 711
D Center to Contact Face, (Angle)•	**5.75** 146	**6.25** 159	**7** 178	**7.88** 200	**8.75** 222	**11** 279	**12.25** 310	**14** 356
E Center to Top Globe	**16** 406	**16.2** 411	**16.7** 424	**20.1** 510	**24.8** 630	**28.4** 721	**34.3** 871	**39.7** 1008
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G Handwheel Diameter†	**11** 279	**11.5** 292	**11.5** 292	**15** 381	**18** 457	**22** 559	**22** 559	**26** 660
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Weight, Globe (Flanged)	**70** 32	**100** 45	**139** 63	**226** 103	**370** 168	**525** 238	**890** 404	**1500** 680
Weight, Globe (Welding)	**56** 25	**75** 34	**94** 43	**172** 78	**295** 134	**400** 181	**720** 327	**1270** 576
Weight, Angle (Flanged)	**65** 29	**94** 43	**126** 57	**206** 93	**300** 136	**450** 204	**700** 318	**1200** 544
Weight, Angle (Welding)	**51** 23	**69** 31	**81** 37	**152** 69	**225** 102	**325** 147	**530** 240	**970** 440

*See table pages 5? and 5? for butt welding end dimensions
†Regular handwheel standard on all sizes except 12 has impactor handwheel
2½ has impactor [illegible]
**Equalizer [illegible]
Drain plug [illegible] discharge
[illegible] pages 46
[illegible]
[illegible] Edward valves pages 46 and 47

•Center to end or end to end dimensions for welding end valves same as center to contact face or contact face to contact face dimensions for flanged end valves

[illegible] ([illegible]) Valves
[illegible]s 300 PN 50 [illegible] 51 bar

Globe and angle, bolted bonnet, integral stainless [illegible] surfacing alloy on body seating surface and backseat, integral hardfaced alloy disk seating surface, disk body-guided, equipped with Equalizer; flanged or buttwelding ends

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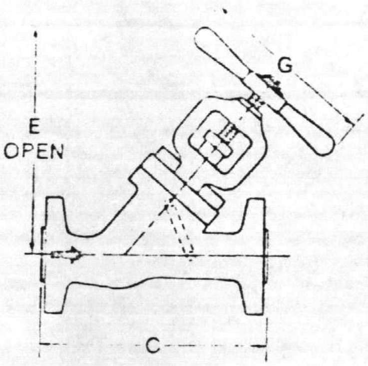
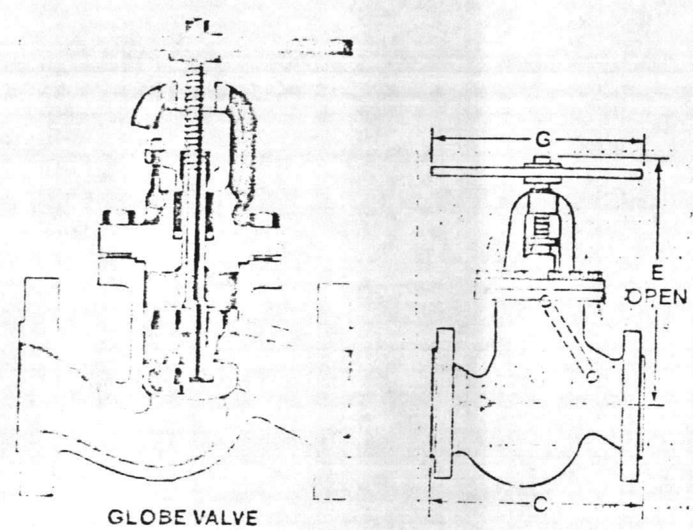
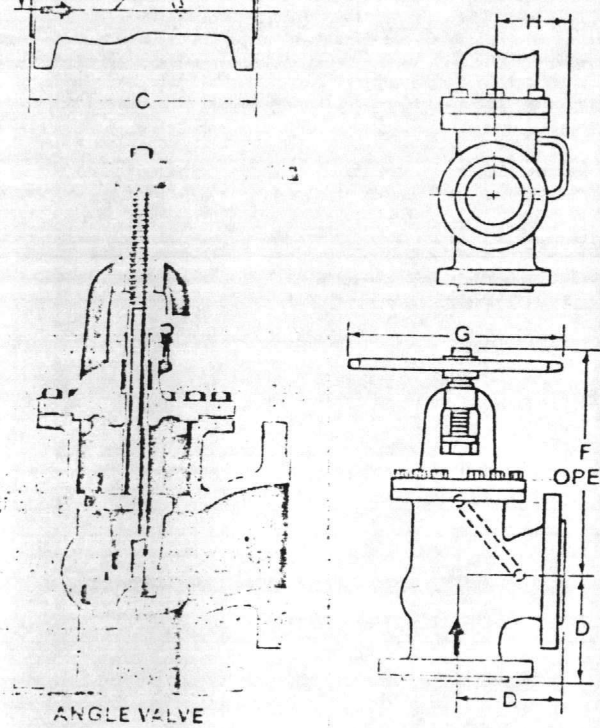


DWG. FOR 2½ VALVE ONLY



GLOBE VALVE



ANGLE VALVE

GLOBE & ANGLE VALVES - SIZE 2½ THRU 12

Bold face numerals are in inches and pounds.
Orange numerals are in millimeters and kilograms

SIZE	NPS / DN	2½ / 65	3 / 800	4 / 100	5 / 125	6 / 150	8 / 250	10 / 250	12 / 300
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2½ has [illegible] handle
** Equalizer [illegible] standard
Drain [illegible]
Material [illegible] page 45
Pressure [illegible] pages 54 and 55
Pressure [illegible] Edward valves pages 40 and 47

• Center to end or end to end dimensions for welding end valves same as center to contact face or contact face to contact face dimensions for flanged end valves

SND LANTDIV 9-4730/6 (Rev. 8/68)
Boiler Inspection - Addendum to NAVFAC 9-11014/41

DATE: 1-23-87

ACTIVITY: MCRCL

BUILDING NO: BA 106 BOILER NO: 65

Based on the existing condition and present rate of deterioration, it is estimated that the boiler has a remaining life of

☐ 5 or more years ☐ ( ) years

The following corrective action is recommended:

WATER LEAKING FROM BACK DOOR OF BOILER, INSPECTION DOOR WAS OPEN AND SEVERAL TUBES WERE LEAKING AT 2Nd PASS. THE 2Nd PASS TUBES HAD BEEN RE-ROLLED ON 1-9-87. SEVERAL TUBES WERE SEPERATED FROM TUBE SHEET AND STICKING THROUGH TUBE SHEET ABOUT 1/8" PAST BEAD WHERE ROLLED & BEADED.

ALL TUBES WERE SEAL WELDED BY HARRIS CONST. CO. (PERRY SHAW) WHO INSTALLED BOILER. HYDRO AT 225 PSI NO LEAKS AT TUBE ENDS. (RETESTED BOILER 3 TIMES TO GET SATISFACTORY TEST DUE TO 4 OR 5 WEEPS AT WELDS.) ALL TUBES IN 2Nd PASS WERE WELDED (46).

1-26-87

BOILER ON LINE AND STEAMING ABOUT 1/3-1/2 CAPACITY. STACK TEMP. 350-400 °F. BOILER IS NOW HOT AND HAS EXPANDED ABOUT 3/32-4/32 AS CLOSE AS I CAN MEASURE.

Tom Lanier

5ND LANTDIV 9-4730/6 (Rev. 8/68)
Boiler Inspection - Addendum to NAVFAC 9-11014/41

DATE: 1-9-87

ACTIVITY: MCRCL

BUILDING NO: BA-106 BOILER NO: 65

Based on the existing condition and present rate of deterioration, it is estimated that the boiler has a remaining life of

☐ 5 or more years ☐ ( ) years

The following corrective action is recommended:

WATER LEAKING FROM BOTH ENDS OF BOILER, 18 PSI ON PRESSURE GAGE AND NORMAL WATER LEVEL IN WATER GAGE GLASS, BOILER WAS NOT RUNNING, LOCKED OUT ON PROGRAMER.

OPEN FIRE SIDE OF BOILER, WATER IS STANDING IN FIRE BOX AND TUBES ARE WET ALSO WATER IS SPRAYING FROM SOME OF THE TUBE AT TUBE-SHEET REAR OF BOILER AT 2ND PASS.

FACTORY REPRESENTATIVE REROLLED ALL TUBE IN 2ND PASS (46 TUBES) HYDRO BOILER AT 214 PSI, TWO (2) TUBE HAS VERY SMALL WEEP. DON'T RECOMMEND ANY MORE ROLLING. AT PRESENT TIME TUBES ARE SATISFACTORY

1. ONE LEAK LEFT SIDE, TOP ROW 3RD TUBE FROM LEFT.
2. ONE LEAK RIGHT SIDE 3RD ROW FROM TOP, 4TH TUBE FROM R/SIDE

Tom Lyon

Cleaver-Brooks
PACKAGED BOILER SYSTEMS

MARK D. KIMBRO

SERVICE REPRESENTATIVE
APPLIED ENGINEERING COMPANY
GREENSBORO, NC

919/275-1631
800/772-9072

Applied Engineering Company
INDUSTRIAL SERVICES DIVISION
151 Industrial Avenue, Greensboro, North Carolina 27406
P.O. Box 16266 • 919/275-1631

Mr. Bruce Hoffman
Base Maintenance Operations Division
Building 1202
Marine Corp Base
Camp Lejeune, NC 28542

January 19,1987

Re: Building BA-106
Cleaver-Brooks Boiler, Model CB 100-200, Unit L-80611

Dear Mr. Hoffman,

On January 8, 1987 we responded to a request for immediate service on the boiler which is the subject of this letter. We were advised that the boiler was shut down with "water running out the front and rear." Our serviceman, Mark Kimbro, was diverted from another job and arrived at Camp Lejeune at approximately 6:00 PM.

Upon inspection, Kimbro determined that the second pass tubes were leaking where they joined the tube sheet. Some of the tubes had separated from the tube sheet by as much as 1/8 of an inch. Kimbro worked until after 11:00 PM re-rolling all the second pass tubes. He returned the following morning and the boiler was hydrostatically tested under the supervision of the base inspector, Mr. Lanier. The test was conducted at 225 psi for fifteen minutes, and was satisfactory.

The main purpose in writing this letter, Mr. Hoffman, is to advise those who are involved with the operation of this boiler that, from what we observed, it is apparent that the boiler has been subjected to some extreme and unusual operating conditions. To have a boiler develop leaking tubes after only about six months of service is very rare. To find a boiler with tube separation to the extent observed by our serviceman is indicative of the unit having been subjected to some extreme conditions.

What these conditions are, we do not know. However, from our experience we know what commonly causes tubes to expand away from, the tube sheet. One cause is improper water treatment which results in scale forming on the tube. Scale prevents the transmission of heat through the tube, and ultimately the tube will overheat and expand away from the tube sheet. Another possible cause is thermal shock which results from the rapid introduction of cold feed water into a hot boiler. There are other reasons, certainly, but these two are common.

The secondary purpose of this letter is to advise you that we will invoice Camp Lejeune for our labor and expenses to repair this unit.

Startup on this boiler was completed on July 31,1986. Before startup, the pressure vessel was subjected to a hydrostatic test, and met this test satisfactorily. If there had been a defect in the manufacture of this unit, it would have shown up here, and the repairs to correct any defect would have been covered by the manufacturer's warranty. The pressure vessel, then, was sound when the boiler was put into service. The leaking tubes developed after the boiler had been in service for almost six months. The leaks were the result of the conditions under which this boiler was operated. They were not caused by a defect in manufacturing, and, as such, the repairs to correct the leaks are not covered under warranty.

We incurred a great deal of labor and travel expenses to repair this pressure vessel, Mr. Hoffman, and we believe we justifiably deserve to be compensated for our service. Accordingly, herewith is our invoice at our standard labor rates. Will you please forward it for processing?

Very truly yours,
APPLIED ENGINEERING COMPANY

Robert W. Howell
Branch Manager

RWH/kh

cc: Rick Jackson
Bob Anderson-Harris Construction Co.

Applied Engineering Company

151 Industrial Avenue
Greensburo, N. C. 27406

INVOICE

Customer No. | | | | | | |

Invoice Date: 1-19-87

Invoice No. 8791

Our Order No. _____ Your Order No. _____ Date Shipped _____ Via _____

From _____ F. O. B. _____ Collect ____ Prepaid ____ Terms _____

Ref. No. | | | | | | | | |

To: Base Maintenance Operations Division
Building 1202
Marine Corps Base, Camp Lejeune, NC
ATTN: Mr. Bruce Hoffman

Shipped to: Camp Lejeune, NC
Building BA-106

Cost	Quan.	Shipped	B. O.	Part No.	Description	Unit Price	Amount
					Service by our represenative,		
					M. Kimbro, on your Cleaver-Brooks		
					Boiler Model CB 100-200,		
					Unit L-80611, on January 8,9,1987		
					Building BA-106		
					5 RT Job Hours @ 40.00		200 00
					5 OT Job Hours @ 60.00		300.00
					4.0 Travel Hours @ 36.00		144.00
					230 Miles @ 0.40		92.00
					Motel @ 48.60		48.60
					Meals @ 10.20		10.20
						Tax	
						Total	794 80

Copies to Cus. 2 Copies to Salesman _____ Total 794.80

Sales Tax Exemption Certificate # _____

AMOUNT DEBIT	AMOUNT CREDIT	State Code	Sales Code	GENERAL Led. Acct. #	Func. or Dept.	OTHER DETAIL Job #	OTHER DETAIL Cost code
		32		8601052			
		32		5270200			
		32	37	8611052			
		32	37	1343100			
		32	37	8611052			
		32	37	8609042	00	348	
		32	37	8619052			

Approved by: _____

AF-8 DP COPY

Applied Engineering Company

151 Industrial Avenue
Greensburo, N. C. 27406

Customer No. | | | | | | |

INVOICE

Invoice Date: 1-19-87

Invoice No. 8791

Our Order No. _____ Your Order No. _____ Date Shipped _____ Via _____

From _____ F. O. B. _____ Collect ____ Prepaid ____ Terms _____

Ref. No. | | | | | | | | |

To: Base Maintenance Operations Division
Building 1202
Marine Corps Base, Camp Lejeune, NC
ATTN: Mr. Bruce Hoffman , NC

Shipped to: Camp Lejeune, NC
Building BA-106

Cost	Quan.	Shipped	B. O.	Part No.	Description	Unit Price	Amount
				0	Service by our represenative,		
					M. Kimbro, on your Cleaver-Brooks	6	
					Boiler Model CB 100-200,		
					,Unit L-80611, on January 8,9,1987		
					Building BA-106		
					5 RT Job Hours @ 40.00		
					5 OT Job Hours @ 60.00		200 00
					4.0 Travel Hours @ 36.00		309.87
					230 Miles @ 0.40		144.00
					Motel @ 48.60		92.00 4.00
					Meals @ 10.20		43.60
							10.20

Copies to Cus. 2 Copies to Salesman _____ Total 794.80 Tax

Sales Tax Exemption Certificate # _____ Total 794.80

AMOUNT DEBIT	AMOUNT CREDIT	State Code	Sales Code	GENERAL Led. Acct. #	Func. or Dept.	OTHER DETAIL Job #	OTHER DETAIL Cost code
		32		8601052			
		32		5270200			
		32	37	8611052			
		32	37	1343100			
		32	37	8611052			
		32	37	8609042	00348		
		32	37	8619052			

Approved by: _____

AF-8 DP COPY

APPLIED ENGINEERING COMPANY
INDUSTRIAL SERVICES DIVISION

P.O. Box 16266, **Greensboro, N.C.** 27406
151 Industrial Avenue 919/275-1631

P.O. Box 1327, **Orangeburg, S.C.** 29116-1327
1525 Charleston Road 803/534-2424

P.O. Box 17303, **Greenville, S.C.** 29606
28 Doolittle Rd. 803/297-1783

P.O. Box 450046, **Atlanta, GA.** 30345
2004 Weems Road, Tucker, GA. 404/934-0420

Customer CAMP LEJUNE Date 1-9-87

Street Bldg. BA-106 City JACKSONVILLE State N.C.

Model No. CTS 101-200 Unit No. L-80611

Contract ☐ Time and Material ☑ Warranty ☐ Start-up ☐

DATE	TIME		FROM - TO	MILES	TRAVEL TIME		JOB TIME	
	Start	Finish			RT	OT	RT	OT
1-8-87	5:00	11:30	New Bern - Jacksonville	~~100~~		~~+5~~		5.0
1-9-87	8:00	5:00	Jacksonville - Greensboro	230	3.0	1.0	5.0	

Expenses: Motel 48.60 Meals 10.20 Other _____

QTY	PART NO.	PARTS USED		

Work Performed: 1-8-87 Rolled All 2ND pass tubes. 1-9-87 Hydrostatically tested boiler to 225 lb. under the supervision of BASE Equipment inspector @ 225 lb for 15 min. Tested good.

Service Man: M.D. K Accepted by: _____ P.O. # _____

REVISED 4-85
AF-150

Cleaver Brooks
DIVISION OF AQUA-CHEM, INC.
P.O. BOX 421
MILWAUKEE, WISCONSIN 53201

FIELD REPORT INFORMATION SHEET

Date _____ (Job Concluded) 19 86

Model No. CB101-200

Serial No. L-80611

Design Pressure 150#

Working Pressure: Steam 50#

Hot Water _____

BA-106 #65

Name MARINE CORPS BASE Bld. BA-106

Address ONSLOW BEACH

City, State and Zip CAMP LEJUNE, NORTH CAROLINA

Name & Initials & Title of Person in Charge (Print) BOB ANDERSON

Company Represented HARRIS CONSTRUCTION

Operating Instructions Given To: R.H. Weston, Steven Parson, Frank Bowing, Bobby Meadows Bobby [redacted] Edens, Seth Mills

Company Represented MARINE CORPS BASE, BASE MAINTANCE

Who Has The Manual? BOB ANDERSON Manual No. 750- 91

Company Represented HARRIS CONSTRUCTION CO.

Boiler Water Treatment Discussed With: Name (Print) RAY HUNT

Company CONTRACT OFFICE, CAMP LEJUNE, BLD 1005

TIME AND TRAVEL DATA

Date	From City	To City	Miles	Travel Time	Job Time
FROM 7-29 THRU 8-29-86		TOTAL	891	Reg. Time 740	Overtime 26.0

Is call to be paid for by customer? NO Other? _____

ACCEPTED: Name Robert B Anderson

Signed 8-29-86

Company HARRIS CONST. CO. INC

Print Name ROBERT ANDERSON

This unit received complete start-up, operator trained, and equipment operating satisfactorily.

SERVICES BY: Clive Beasley
Field Representative

Applied Engineering Co.
Company

APPROVED BY: _____
Service Manager

STARTING SERVICE

OIL ☒ GAS ☐

PLEASE ATTACH APPROPRIATE SUPPLEMENTAL FORMS

- General Form C10-1275A ☒
- Oil Fuel Form C10-1269A ☒
- Gas Fuel Form C10-1270A ☐
- Model 3 Form C10-1283A ☐
- Model 4 Form C10-1487A ☐
- Deaerator Form C10-1267A ☐
- Water Conditioner Form C10-1268A ☐

REV. 1/71 C10-265A
Printed in U.S.A.

Cleaver Brooks

DIVISION OF AQUA-CHEM, INC.
P. O. BOX 421
MILWAUKEE. WISCONSIN 53201
U. S. A.

FIELD REPORT
MODEL CB 15-800 HP
GENERAL

MODEL CB101-200

SERIAL L-60811

1. What is general condition of boiler room at time of starting? _____
   New Construction ☐ Damp ☐ Dusty ☐ Clean ☐ Roof Only ☐ Outdoor ☐
2. At time of start-up is there an adequate supply of combustion air? yes 2A. Boiler Room Ambient Temperature 90
3. Is boiler level? yes 4. Are blow down valves provided on boiler shell? Front yes Rear yes
5. Are water column and/or level control drain valve tight? yes
6. Are all blow down valves piped to a safe point of discharge? _____
7. Have all hand hole covers, yokes, and gaskets been checked for tightness? yes Man hole cover? yes
8. Has unit been boiled out? yes if not, has this been discussed with party signing this report? _____
   (Boil-out is owner's responsibility since the requirement is necessitated by system condition. Cleanliness of pressure vessel is of extreme importance to boiler owner.)
8A. Was boiler used for temporary heat during construction period? _____
9. Electrical Characteristics:
   a. Blower motor connected for 208 volts. b. 'T' terminal voltage at blower motor starter during high fire _____
   c. Blower motor name plate amperage rating at connected voltage 29.3 ; draw (each leg at high fire) 28.0 28.5 28.0
   d. Lowest actual control circuit voltage during starting cycle 120
   e. 'T' terminal voltage at air pump motor starter during high fire N/A
   f. Air pump motor name plate amperage rating at connected voltage N/A ; draw (each leg at high fire) _____ _____ _____
   g. Electric oil heater voltage during operation N/A ; heater amperage (each leg) _____ _____ _____
   If control circuit transformer furnished, is it properly wired for existing voltage condition? yes

CIRCUIT	FUSE SIZE	FUSE TYPE	STARTER OVERLOADS
Blower Motor	FLNR35	Little Fuse	FH53
Air Pump Motor	N/A		
Oil Heater	N/A		
Oil Pump Motor			
Control Circuit	FLNR6 1/4	Little Fuse	X X X
Others			

10. Load on unit (circle one) moderate, heavy, (light,) extremely light, extremely heavy, sudden peak loads. _____
11. Safety or relief valve(s) name plate pressure setting 65# @ 70#
12. Are safety or relief valves piped to a safe point of discharge and are there proper drains? yes
    Does it appear that discharge piping is adequately supported so that weight of piping does not rest on valve body? yes
    Are drip-pan ells or flexible connections used? yes
13. Incoming water temperature: Feedwater (steam boiler) 160°F
    Return water (hot water boiler) _____
14. Actual height of water above top of tubes at lowest visible point in gauge glass 3 1/8"
15. List dimensions in inches measured above lowest portion of gauge glass at operating pressure (steam boiler only):

	MASTER	AUXILIARY
Pump Off	2 1/8"	
Pump On	[redacted] 1 3/4"	
Low Water Cut Off	1/2"	1/4"
High Water Cut Off	5 1/2"	7 1/2"

CLEAVER-BROOKS

16. Type of return system used (steam boiler) Preheat TANK + Pump

Type of system (hot water boiler) three-way valve ☐ primary-secondary ☐ reverse-return ☐ accumulator-tank ☐

or explain. _____

17. Pressure or temperature control settings:

Operating Control	Cut-In	42#	Cut-Out	50#
Modulating Control	To Low	44#	To High	
High Limit Control	Cut-In		Cut-Out	58#

NOTE: Reliable safety or relief valve operation is perdicated on operating pressure or temperature being no higher than 85% of valve(s) set pressure.

a. If hot water boiler, what is operating pressure? _____

b. If equipped with minimum temperature Aquastat, what is "On" setting? _____

c. If equipped with low fire hold Aquastat, what is "On" setting? _____

d. If hot water boiler, are there system devices to stop burner firing or to shut-off circulating pump on a rise of outdoor temperature? _____

e. If hot water boiler, are there system devices to provide night, weekend, or holiday setback of system temperature? _____

18. If day-nite set-up installed on steam boilers, have controls been set according to customer's requirments? _____

19. Was operation of combustion control explained and demonstrated to operator? _____

Make Fireye Model 70D10 Serial No. 8605 Code No. 3

20. Safety timing (Flame response) 1.1 sec. 21. Latchout switch timing 35 sec.

22. Was rear door opened before firing? yes Closing and resealing explained? yes

23. Were front doors opened before firing? yes Closing and resealing explained? yes

24. Furnace and rear door refractory inspected? yes 25. Was care of refractory and wash coating explained? yes

26. Was burner removed and its operation explained prior to firing? yes 27. Type of pilot: Gas _____ Oil _____

28. Was customer shown how to clean pilot and adjust pilot flame? yes 29. Was proper electrode(s) setting explained? yes

30. Was ignition system, tightness of connectors etc., explained? yes

31. Was function of scanner explained? yes

32. If fuel oil preheated with steam, is condensate wasted? N/A Piped to drain? _____

33. Was operation with manual potentiometer versus automatic operation by the modulating control potentiometer demonstrated and explained? yes

Have you cautioned operating personnel against practice of operating on manual potentiometer only thus creating unwanted condition of "On-Off" firing resulting in undue expansion and contraction? _____

34. At what pressure or temperature was burner turned to automatic position? 40#

35. If boiler equipped with rotary damper, was alignment checked and operation explained? _____

36. Was linkage and cam adjustment fully explained? yes

37. Was setting or adjusting of operating amd modulating temperature or pressure controls fully demonstrated? yes

38. Was water column and auxiliary low water cut-off drain procedure demonstrated? yes

39. Have functions of all operating controls been reviewed with operator? yes Has operator(s) _____ been instructed on trouble-shooting? yes

Cleaver-Brooks

DIVISION OF AQUA-CHEM, INC.
PO BOX 421
MILWAUKEE WISCONSIN 53201

FIELD REPORT
MODEL CB 15-800HP
OIL FUEL

MODEL CB101-200

SERIAL L-60811

1. Grade of Oil #2F.O 2. Oil suction line size 3/4" 3. Oil return line size 3/4"
4. Is fuel supply tank above or below level of boiler? Above 5. Length of horizontal suction line run
6. Length of vertical lift of suction line Day tank in Boiler room Type of check valve used location
8. Inches of vacuum with unit running NONE Location of reading
9. Time required for oil pressure to come to running pressure 1 sec.
10. Was flow of oil completely outlined to operator? yes
11. If more than one unit, does each unit have an individual fuel pump? yes ; common ☐, individual ☐ suction line?
Pump Make and model Thill , Motor LA H.P., Type of Drive Direct
12. If belt-driven equipment involved, was operator shown how to adjust belts? yes
13. Was servicing and cleaning of strainers explained? yes
14. Was relative position of diffuser and nozzle checked and explained? yes
15. Was lube-oil level, its importance, and maximum and minimum level explained? yes Grade Sae Brand
16. Was atomizing air pressure system checked out and explained? yes
17. Was air filter and lube-oil strainer cleaning shown? yes 18. Was operation of oil metering valve explained? yes
19. Was secondary air adjustment, its importance on lighting, and affects on combustion explained? yes
20. Was metering valve packing adjustment or replacement demonstrated? yes
21. Were functions of combustion air proving switch and atomizing air proving switch explained? yes
22. Was adjustment and function of fuel oil controller and the flow of oil through it explained? yes
23. Was proper method of cleaning burner gun and nozzle assembly demonstrated? yes
24. Oil termperature at fuel oil controller N/A 25. Primary air pressure: low fire high fire
26. Oil supply pressure 75#
27. Has oil piping, including fuel oil controller, from last strainer to solenoid valve been flushed and cleaned? yes
Have solenoid valve(s) been disassembled to check cleanliness of seat and disc? yes
28. If equipped, has nozzle post purge been explained? N/A
And is operation proper? Nozzle size
29. If gas pilot, what is pressure with solenoid valve open 1"W.C. closed 10"W.C
30. If light oil pilot, what is oil pressure?

COMBUSTION TEST RESULTS

Fuel Oil — Low Fire — High Fire

Cam Position	1	2	3	4	5	6	7	8	9	10	11	12
% CO_2	10.9	11.6	11.8	11.9	12.4	13.1	13.6	13.6	13.7	13.9	13.6	13.7
% O_2	6.2	5.3	5.0	5.0	4.2	3.3	2.7	2.6	2.5	2.3	2.6	2.5
Smoke Spot												
Stack Temp. Net	185°F	205°F	206°F	222°F	23?°F	23?°F	238°F	229°F	245°F	249°F	231°F	239°F
Oil Burner Pressure	38	38	39	37	37	37	37	37	37	36.5	36.5	36.5
~~Oil Return Pressure~~ Ambient Temp.	86°F	87°F	88°F	88	88°F	88°F	88°F	88°F	89°F	89°	89°F	89°F

31. Type of Combustion Analysis Equipment used: KANE MAY

CB30-2581

[illegible] Engineering Company, Inc.

Manufacturer's Representative Division

• PHONE (919) 275-1631

COMBUSTION TEST RESULTS

Fuel Gas

	% CO_2	% O_2	% C_0	Gas Supply Press.	Stock Temp.	Steam Press.	Steam Flow	Steam Temp.	Feed W Temp
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

Fuel Oil

	% CO_2	% O_2	Oil Press. Burner	Atom Air or Steam Press.	~~Oil Temp.~~ F.O. Gal per hr	Stock Temp. Net	Steam Press.	~~Steam Flow~~ Ambient Air	Steam Temp.	Feed Wa Temp.
1	10.9	6.2	38#	13.5	9.6	185° F	47#	86 °F		155°F
2	11.6	5.3	38#	16.0	21.9	202°F	49#	87°F		155°F
3	11.8	5.0	37#	19.0	31.5	206°F	43#	88° F		180°F
4	11.9	5.0	37#	20.5	40.1	222°F	46#	88°F		200°F
5	12.4	4.2	37#	21.5	45.4	231° F	45#	88°F		205°F
6	13.1	3.3	37#	22.5	53.8	237°F	46#	88°F		205°F
7	13.6	2.7	37#	23.0	57.9	238°F	44#	88°F		200°F
8	13.6	2.6	37#	23.5	59.1	229°F	38#	88°F		195°F
9	13.7	2.5	37#	24.0	60.1	245°F	46#	89°F		190°F
10	13.9	2.3	36.5#	24.0	60.2	249	47#	89°F		180°F
11	13.6	2.6	36.5#	24.0	60.5	231	34#	89°F		180°F
12	13.7	2.5	36.5#	24.0	61.1	239	37#			175°F

CAmpLejune
BA-106
ContractNo, 7893
CB101-200, unit L-80611
8-20-86
#2F.O.

Comments, etc.

Accepted By ______________________

____

Field Representative

INSPECTION REPORT-BOILERS
NAVFAC 9-11014/41 (3/67)
Supersedes NAVDOCKS 2544
S/N 0105-LF-004-0000

DATE OF INSPECTION: 26 JUNE, 29 AUG. 1986

TYPE OF INSPECTION: A ☐ INTERNAL & EXTERNAL B ☒ INTERNAL & EXTERNAL WITH PRESSURE TEST C ☒ OPERATIONAL

1. FROM: COMMANDING GENERAL, MCB, CAMP LEJEUNE, NC

2. TO: NAVFACENGCOM, NORFOLK, VA

14. CERTIFICATE ISSUED ☒ YES ☐ NO — EXPIRES 26 JUNE 1987

15. BOILER INSPECTOR: Thomas L. Lozier — NAVY OR NATIONAL BOARD NO.: NAVFAC 239

16. REASON FOR NOT ISSUING CERTIFICATE:

BOILER DATA

3. MANUFACTURER: CLEAVER BROOKS

4. PROPERTY NO.	5. MFG. SERIAL NO.	6. MFG. MODEL NO.
65	C-80611	N.B. 61798
7. BUILDING NO.	**8. YEAR BUILT**	**9. CAPACITY**
BA-106	1986	6,900 LB/HR

10. FUEL (Check): ☐ COAL ☒ OIL ☐ GAS

11. PRESSURE

DESIGNED	OPERATING	TEST
150 psi	50 psi	225 psi

12. FEED WATER TREATMENT: ☒ SATISFACTORY ☐ UNSATISFACTORY

13. TYPE: ☐ WATER TUBE ☒ FIRE TUBE ☐ C. I.

17. BOILER USE: EXPORT

18. COMBUSTION CONTROL (Mfg. Name): FIREYE

19. COMBUSTION: 13.5 % CO_2 2.7 % EXCESS O_2

20. FLUE GAS TEMPERATURE: AFTER BOILER 245 °F ; AFTER HEAT TRAP _____ °F

SAFETY DEVICES

SAFETY VALVES

21. MANUFACTURER	22. NUMBER AND SIZE	23. PSI SETTING	24. CONDITION
KUNKLE	2 - 2"	165-170	SAT.

STEAM PRESSURE GAUGE

25. MANUFACTURER: CLEAVER BROOKS

26. CORRECTIONS: WATER LEG CONSTANT _____ psi; OTHER _____ psi

27. REASON IF NOT TESTED:

FIRING EQUIPMENT

ITEM	IN SERVICE	ALTERNATE
28. MANUFACTURER	CLEAVER BROOKS	
29. TYPE	NOZZLE - AIR ATOM.	
30. FUEL GRADE	#2	

31. INSPECTOR'S COMMENTS:

NEW BOILER INSTALLED UNDER CONTRACT ~~#~~ 84-7893

BOILER WILL RETAIN SAME PROPERTY NO. AS OLD BOILER.

32. ATTACHMENT(S) (Check): ☐ COPY OF INSPECTOR'S REPORT ☐ SPECIAL COMMENTS

33. SIGNATURE: [signature] 9/2/86 BY DIRECTION

*U.S. GOVERNMENT PRINTING OFFICE: 1984-505-909

MFGRS. SERIAL NO. 89443

MFGRS. MODEL NO. CB 200-150

MANUFACTURER CLEAVER BROOKS

DATE OF SHEET 20 AUG - 86

TYPE OF SUPERHEATER N/A

TEMPERATURE AT SUPERHEATER OUTLET N/A °F

NORMAL FEEDWATER TEMPERATURE 200 °F

(See Reverse Side for Fittings)

FURNACE VOLUME 44 CU. FT.

HEATING SURFACE (SQ. FT.)

BOILER 1000

WATER WALL

ECONOMIZER

SUPERHEATER

DRUMS

NO. 1

DIAMETER 60 IN.

LENGTH 14 FT. 0 IN.

- [ ] RIVETED
- [ ] FORGE WELDED
- [X] FUSION WELDED

OPERATION

- [X] AUTOMATIC
- [ ] SEMI-AUTOMATIC
- [ ] MANUAL

PRESSURE (psig)

DESIGN

150 MAWP

50 INSTALLED WP

AIR HEATER

- [X] NONE
- [ ] TUBULAR
- [ ] REGENERATIVE
- [ ] STEAM

USE

- [X] EXPORT
- [ ] ELEC. POWER GENERATION
- [ ] LAID UP - WET
- [ ] LAID UP - DRY

CAPACITY

200 HP

6,900 LB./HR

EDR

BTU/HR.

DATE BUILT 1986

DATE INSTALLED July 1986

BOILER

TYPE

- [ ] C.I.
- [ ] WATER TUBE
- [X] FIRE TUBE

DRAFT

- [ ] NATURAL
- [X] FORCED
- [ ] INDUCED

PRODUCES

- [X] STEAM
- [ ] LOW TEMP. WATER
- [ ] HIGH TEMP. WATER

CIRCULATION

- [X] NATURAL
- [ ] FORCED

FUEL & FIRING EQUIPMENT IN SERVICE

FUEL

COAL
- [ ] ANTHRACITE
- [ ] BITUMINOUS

OIL
- [X] COMMERCIAL 1, (2), 4, 5, 6
- [ ] NAVY
- [ ] OTHER

GAS
- [ ] NATURAL
- [ ] MANUFACTURED

FIRING EQUIPMENT

- [ ] COAL-HAND FIRED

COAL - STOKER
- [ ] UNDERFEED - MULTIPLE RETORT
- [ ] UNDERFEED - SINGLE RETORT
- [ ] SPREADER - DUMP GRATE
- [ ] SPREADER - VIBRATING GRATE
- [ ] SPREADER - TRAVELING GRATE
- [ ] CHAIN GRATE

GAS
- [ ] GAS RING
- [ ] VENTURI TYPE

COAL - PULVERIZER
- [ ] ATTRITION
- [ ] BALL & RACE
- [ ] BOWL MILL
- [ ] TUBULAR

OIL BURNERS
- [ ] MECHANICAL
- [ ] STEAM ATOMIZED
- [X] AIR ATOMIZED
- [ ] ROTARY CUP

ALTERNATE FUEL & FIRING EQUIPMENT

COAL
- [ ] ANTHRACITE
- [ ] BITUMINOUS

OIL
- [ ] COMMERCIAL 1, 2, 4, 5, 6
- [ ] NAVY SPECIAL
- [ ] OTHER

GAS
- [ ] NATURAL
- [ ] MANUFACTURED

- [ ] COL-HAND FIRED

COAL - STOKER
- [ ] UNDERFEED - MULTIPLE RETORT
- [ ] UNDERFEED - SINGLE RETORT
- [ ] SPREADER - DUMP GRATE
- [ ] SPREADER - VIBRATING GRATE
- [ ] SPREADER - TRAVELING GRATE
- [ ] CHAIN GRATE

GAS
- [ ] GAS RING
- [ ] VENTURI TYPE

COAL - PULVERIZER
- [ ] ATTRITION
- [ ] BALL & RACE
- [ ] BOWL MILL
- [ ] TUBULAR

OIL BURNERS
- [ ] MECHANICAL
- [ ] STEAM ATOMIZED
- [ ] AIR ATOMIZED
- [ ] ROTARY CUP

FIRING EQUIPMENT MANUFACTURER: CLEAVER BROOKS

PROPERTY NO. 65

BUILDING OR LOCATION BA-106

BOILER 65

ACTIVITY MCBCL

DATA RECORD SHEET - BOILERS
NAVFAC 9-11014/40 (9-69) Supersedes NAVDOCKS 2509
S/N 0105-003-7010

FITTING	NUMBER	SIZE	MANUFACTURER	TYPE	SETTING	RANGE	PRESSURE CLASS
SAFETY VALVES	2	2"	KUNKLE - 6021		65-70		
STEAM OUTLET VALVES	1	6"	ROCKWELL EDWARD	NON-RETURN ANGLE			300
BLOW-OFF VALVES	2	1 1/2"	EVERLASTING	QUICK ACTING			250
FEEDWATER VALVES	2	2"	MILWAUKEE	GLOBE GATE			300
WATER COLUMN			McDONNELL & MILLER				150
FEEDWATER REGULATOR	1		McDONNELL & MILLER	#157			
WATER GAGES							
STEAM GAGES	1	6"	CLEAVER BROOKS			0-200	
SOOT BLOWERS	N/A		N/A				
FUSIBLE PLUGS	N/A						

NAT'L BD. # 61798

CONTROL - FIREYE

SAFETY VALVE - SET 65 = 4744 LB/HR, SET 70 = 5045 LB/HR.

MAX FIRING RATE 60 GPH #2 OIL.

A-7138

DATA RECORD SHEET - BOILERS
NAVFAC 9-11014/40 (9-69) *Supersedes NAVDOCKS 2509*
S/N 0105-003-7010

MFGRS. SERIAL NO.: 89443

MFGRS. MODEL NO.: CB 200-150

MANUFACTURER: Cleaver Brooks

DATE OF SHEET: 20 Aug 86

TYPE OF SUPERHEATER: N/A

TEMPERATURE AT SUPERHEATER OUTLET: N/A °F

NORMAL FEEDWATER TEMPERATURE: ____ °F

(See Reverse Side for Fittings)

FURNACE VOLUME: 44 CU. FT.

HEATING SURFACE (SQ. FT.)

BOILER 1000
WATER WALL ____
ECONOMIZER ____
SUPERHEATER ____

DRUMS

NO. 1
DIAMETER 60 IN.
LENGTH 14 FT. 0 IN.

- [ ] RIVETED
- [ ] FORGE WELDED
- [X] FUSION WELDED

OPERATION

- [X] AUTOMATIC
- [ ] SEMI-AUTOMATIC
- [ ] MANUAL

PRESSURE (psig)

____ DESIGN
150 MAWP
50 INSTALLED WP

AIR HEATER

- [X] NONE
- [ ] TUBULAR
- [ ] REGENERATIVE
- [ ] STEAM

USE

- [X] EXPORT
- [ ] ELEC. POWER GENERATION
- [ ] LAID UP - WET
- [ ] LAID UP - DRY

CAPACITY

200 HP
6,900 LB./HR
____ EDR
____ BTU/HR.

DATE BUILT: 1986

DATE INSTALLED: July 1986

BOILER

TYPE
- [ ] C.I.
- [ ] WATER TUBE
- [X] FIRE TUBE

DRAFT
- [ ] NATURAL
- [X] FORCED
- [ ] INDUCED

PRODUCES
- [X] STEAM
- [ ] LOW TEMP. WATER
- [ ] HIGH TEMP. WATER

CIRCULATION
- [X] NATURAL
- [ ] FORCED

	FUEL & FIRING EQUIPMENT IN SERVICE	ALTERNATE FUEL & FIRING EQUIPMENT
FUEL	**COAL** [ ] ANTHRACITE [ ] BITUMINOUS **OIL** [X] COMMERCIAL 1, (2), 4, 5, 6 [ ] NAVY [ ] OTHER ____ **GAS** [ ] NATURAL [ ] MANUFACTURED	**COAL** [ ] ANTHRACITE [ ] BITUMINOUS **OIL** [ ] COMMERCIAL 1, 2, 4, 5, 6 [ ] NAVY SPECIAL [ ] OTHER ____ **GAS** [ ] NATURAL [ ] MANUFACTURED
FIRING EQUIPMENT	[ ] COAL-HAND FIRED **COAL - STOKER** [ ] UNDERFEED - MULTIPLE RETORT [ ] UNDERFEED - SINGLE RETORT [ ] SPREADER - DUMP GRATE [ ] SPREADER - VIBRATING GRATE [ ] SPREADER - TRAVELING GRATE [ ] CHAIN GRATE **GAS** [ ] GAS RING [ ] VENTURI TYPE **COAL - PULVERIZER** [ ] ATTRITION [ ] BALL & RACE [ ] BOWL MILL [ ] TUBULAR **OIL BURNERS** [ ] MECHANICAL [ ] STEAM ATOMIZED [X] AIR ATOMIZED [ ] ROTARY CUP	[ ] COL-HAND FIRED **COAL - STOKER** [ ] UNDERFEED - MULTIPLE RETORT [ ] UNDERFEED - SINGLE RETORT [ ] SPREADER - DUMP GRATE [ ] SPREADER - VIBRATING GRATE [ ] SPREADER - TRAVELING GRATE [ ] CHAIN GRATE **GAS** [ ] GAS RING [ ] VENTURI TYPE **COAL - PULVERIZER** [ ] ATTRITION [ ] BALL & RACE [ ] BOWL MILL [ ] TUBULAR **OIL BURNERS** [ ] MECHANICAL [ ] STEAM ATOMIZED [ ] AIR ATOMIZED [ ] ROTARY CUP

FIRING EQUIPMENT MANUFACTURER: Cleaver Brooks

PROPERTY NO.: 65

BUILDING OR LOCATION: BA-106

BOILER 65

ACTIVITY: Marine Corps Base
Camp Lejeune

FITTING	NUMBER	SIZE	MANUFACTURER	TYPE	SETTING	RANGE	PRESSURE CLASS
SAFETY VALVES							
STEAM OUTLET VALVES							
BLOW-OFF VALVES							
FEEDWATER VALVES							
WATER COLUMN							
FEEDWATER REGULATOR							
WATER GAGES							
STEAM GAGES							
SOOT BLOWERS							
FUSIBLE PLUGS							

BA-106

L-9072

89443

UNIT L-80611 MODEL CB 200-150# Stm psi

S.O. 8501819 PART NO. 524-1209

FORM P-2 MANUFACTURERS' DATA REPORT FOR ALL TYPES OF BOILERS EXCEPT WATERTUBE

As Required by the Provisions of the ASME Code Rules

C25-1978A 10/82

LEBANON PA PLANT

1. Manufactured and Certified by Cleaver-Brooks Division of Aqua-Chem, Inc., Milwaukee, Wisconsin
(Name and address of manufacturer)

2. Manufactured for Camp Le Jeune - Jacksonville, North Carolina
(Name and address of purchaser)

3. Location of Installation Camp Le Jeune - Jacksonville, North Carolina
(Name and address)

4. Type Internally Fired (HRT, etc.) Boiler No. 89443 (Mfgr's Serial No.) N/A (CRN) 524-1209 (Drawing No.)

61798 (Nat'l. Board No.) Year Built 19 86

5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME BOILER AND PRESSURE VESSEL CODE. The design, construction, and workmanship conform to ASME Rules, Section I, 19 83 (Year) and Addenda to SUMMER, 1985 (Date).

Remarks: Manufacturers' Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of this report: NONE
(Name of part, item number, mfgr's name and identifying stamp)

6. Boiler Shells or Drums: No. 1 Dia. 60" Length 168" Dia. _____ Length _____

7. Shell Plates SA 515-70, 3/8"
(For each Shell or Drum state: Material Specification No. & grade, nominal thickness)

8. Longitudinal Joint(s) Welded (Seamless, Welded) Joint Efficiency 90% (As compared to Seamless)

9. Heads NONE
(Material Specification No.; Thickness—Flat, Dished, Ellipsoidal—Radius of Dish)

10. Girth Joint(s) Welded (Seamless, Welded) No. of Shell Courses 2

11. Tube Sheet SA 285-C, ½" (Mat'l Spec., Grade, Thickness) Tube Holes 2.525" (Dia.)

12. Boiler Tubes: No. 108 SA 178-A (Mat'l. Spec., Grade) Straight (Straight or Bent)

Dia. 2-½" Length 168-½" (If various, give max. & min.) Gauge .105" (or thickness)

13. Furnace No. 1 Size 24" O.D. (O.D. or W x H) Length, each section PL 24" CORR 144-¼" Total 168-¼"

Type Combination - Plain and Corrugated

PLAIN SA 53-B .500" (Plain, Adamson, Ring Reinforced, Corrugated, Combined or Stayed)

CORR SA 53-B .375" (Mat'l Spec., Grade, Thickness) Seams: Type Seamless (Welded Girth) (Seamless, Welded)

14. Staybolts: No. NONE Size N/A
(Diam., Mat'l. Spec. Grade Size Telltale, Net Area)

Pitch N/A (Hor. and Vert.) Max. AWP N/A psi.

15. Stays or Braces

Location	Material Spec. No.	Type	No. & Size	Max. Pitch	Total Net Area	Fig. PFT-32 L/1	Dist. Tubes to Shell	Area to be Stayed	Max. A.W.P. psi.
(a) F.H. above tubes	SA675-60	Diag	*	7	5.0264	1.09	16-½	343	154
(b) R.H. above tubes	SA675-60	Diag	*	7	5.0264	1.09	16-½	343	154
(c) F.H. below tubes	N/A								
(d) R.H. below tubes	N/A								
(e) Through stays	N/A					*8 @ 1"			
(f) Dome braces	N/A								

16. Other Parts. 1. Water Column Assy½. 2. N/A 3. N/A
(Brief Description—i.e. Dome, Boiler Piping, etc.)

1. Threaded pipe - SA 106-B, 1" & ½" Sch 80, M.A.W.P. 150# PSI

2. Other pressure piping installed by contractor.

3. _____
(Mat'l. Spec. Grade Size Material Thickness Max. AWP)

Form P-2 (Back)

17. Openings. (a) Steam 1 @ 6" 300# Flg. (No., Size, and Type) (b) Safety Valve 2 @ 2" NPT (No., Size, and Type)

(c) Blowoff 2 @ 1-½" NPT Bottom CL (No., Size, Type and Location) (d) Feed 2 @ 2" NPT (R & L Side) (No., Size, Type, and Location)

(e) Manholes: No. 1 Size 11" x 15" Location Shell - Ring

(f) Handholes: No. 6 Size 3-¼" x 4-½" Location Shell

No Connections to Item 17.

18. Fusible Plug (if used) N/A (No., Diam., Location, Mfrs. Stamp)

19. Boiler Supports: No. 4 Type Legs (Saddles, Legs, Lugs) Attachment Welded (Bolted or Welded)

20. Max. AWP 150 psi Based On PG-27 (Code Par. and/or Formula) Heating Surface 1000 (Total) sq ft

21. Shop Hydrostatic Test 225# psig. N/A (Electric Boilers) kw.

CERTIFICATE OF COMPLIANCE

We certify the statements in this data report to be correct. Date March 26, 1986 Signed Cleaver-Brooks Division of Aqua-Chem, Inc. (Manufacturer) by Samuel R. Carroll SAMUEL R. CARROLL (Authorized Representative)

Our Certificate of Authorization No. 10905 to use the (A) or (S) S Symbol expires January 15 19 89.

CERTIFICATE OF SHOP INSPECTION

BOILER MADE BY Cleaver-Brooks Division of Aqua-Chem, Inc. at Lebanon, PA

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of Pennsylvania and employed by The Hartford Steam Boiler I & I Co. of Hartford, Conn. have inspected parts of this boiler referred to as data items 1-8, 10-13, 15, 17-21 and have examined Manufacturer's Partial Data Reports for items NONE

and state that, to the best of my knowledge and belief, the manufacturer has constructed this boiler in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the boiler described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date April 3, 1986

David L. Rose Inspector Commissions NB 8884 PA 2309 Nat'l Board, State, ~~Province~~ and No.

CERTIFICATE OF COMPLIANCE

We certify that the field assembly of all parts of this boiler conforms with the requirements of SECTION I of the ASME BOILER AND PRESSURE VESSEL CODE.

Date _____ Signed _____ (Assembler) By _____ (Representative)

Our Certificate of Authorization No. _____ to use the (A) or (S) _____ Symbol expires _____ 19 _____

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province of _____ and employed by _____ of _____ have compared the statements in this Manufacturer's Data Report with the described boiler and state that the parts referred to as data items _____, not included in the certificate of shop inspection, have been inspected by me and that to the best of my knowledge and belief the manufacturer and/or the assembler has constructed and assembled this boiler in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE. The described boiler was inspected and subjected to a hydrostatic test of _____ psi.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the boiler described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date _____

_____ Inspector Commissions _____ Nat'l Board, State, Province and No.

[illegible] Construction Co.
P. O. Box [illegible]
[illegible] Corner, S.C. 29461
803-[illegible]

[illegible] RECORD OF WELDING OPERATOR QUALIFICATION TESTS

(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

Welder Name: Perry Shaw Check No. ______ Stamp No. (D)

Using WPS No 002 Rev 0

The above welder is qualified for the following ranges.

	Record Actual Values Used in Qualification	Qualification Range
Process	SMAW	SMAW
Process Type	Manual	Manual
Backing [illegible] (QW-402)	Weld Metal & Open Root	[illegible]
Material Spec. (QW-403)	P1 to P1	P1 to P1
Thickness		
Groove	.432	[illegible] .432
Fillet		
Diameter		
Groove	6.625	2 7/8+
Fillet		
Filler Metal (QW-404)		
Spec. No.	SFA 5.1	
Class	E-6010 & E7018	
F-No.	3 4	
Position (QW-405)	6-G	All Positions
Weld Progression (QW-410)	Vertical Up	
Gas Type (QW-408)		
Electrical Characteristics (QW-409)		
Current	DC	
Polarity	RP	

Guided Bend Test Results QW-462.2(a), QW-462.3(a), QW-462.3(b)

Type and Fig. No.	Result
Face Bend 1	Satisfactory
Face Bend 2	Satisfactory
Root Bend 1	Satisfactory
Root Bend 2	Satisfactory

Radiographic Test Results (QW-304 & QW-305)

For alternative qualification of groove welds by radiography

Radiographic Results ______

Fillet Weld Test Results (See QW-462.4(a), QW-462.4(b))

Fracture Test (Describe the location, nature and size of any crack or tearing of the specimen) ______

Length and Percent of Defects ______ inches ______ %

Macro Test—Fusion ______

Appearance—Fillet Size (leg) ______ in. x ______ in. Convexity ______ in. or Concavity ______ in.

Test Conducted by Harris Construction Company Laboratory—Test No ______

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Organization Harris Construction Co.

6/2/86 By [signature]

[illegible] may be modified to conform to the type and number of tests required by the Code.
[illegible]

1-23-87

HARRIS CONST CO.

SEAL WELD ALL TUBES IN 2ND PASS (46)

BA-186

#65 BOILER

INSPECTION REPORT-BOILERS
NAVFAC 9-11014/41 (3/67)
Supersedes NAVDOCKS 2544
S/N 0105-LF-004-0000

DATE OF INSPECTION: 9 MAY - 19 DEC 1980

TYPE OF INSPECTION: A ☐ INTERNAL & EXTERNAL B ☒ INTERNAL & EXTERNAL WITH PRESSURE TEST C ☒ OPERATIONAL

1. FROM: BASE MAINT. OFFICER
CAMP LEJEUNE, N. C.

2. TO: NAVFACENGCOM
NORFOLK, VA.

14. CERTIFICATE ISSUED ☒ YES ☐ NO
EXPIRES 9 MAY 1981

15. BOILER INSPECTOR: Jesse L. Sellers
NAVY OR NATIONAL BOARD NO.: NAVFAC 225

16. REASON FOR NOT ISSUING CERTIFICATE:

BOILER DATA

3. MANUFACTURER: YORK SHIPLEY

4. PROPERTY NO.	5. MFG. SERIAL NO.	6. MFG. MODEL NO.
38	63-8242-H30038	SPH-188-6-97209
7. BUILDING NO.	**8. YEAR BUILT**	**9. CAPACITY**
M-230	1963	6,500 LBS/HR

10. FUEL (Check): ☐ COAL ☒ OIL ☐ GAS

11. PRESSURE

DESIGNED	OPERATING	TEST
150 psi	50 psi	105 psi

12. FEED WATER TREATMENT: ☒ SATISFACTORY ☐ UNSATISFACTORY

13. TYPE: ☐ WATER TUBE ☒ FIRE TUBE ☐ C. I.

17. BOILER USE: EXPORT

18. COMBUSTION CONTROL (Mfg. Name): FIREYE

19. COMBUSTION: 9.0 % CO_2 _____ % EXCESS O_2

20. FLUE GAS TEMPERATURE: AFTER BOILER 350 °F ; AFTER HEAT TRAP _____ °F

SAFETY DEVICES

SAFETY VALVES

21. MANUFACTURER	22. NUMBER AND SIZE	23. PSI SETTING	24. CONDITION
CONSOLIDATED	2-2"	65-75	GOOD

STEAM PRESSURE GAUGE

25. MANUFACTURER: U S GAGE

26. CORRECTIONS: WATER LEG CONSTANT _____ psi; OTHER _____ psi

27. REASON IF NOT TESTED:

FIRING EQUIPMENT

ITEM	IN SERVICE	ALTERNATE
28. MANUFACTURER	YORK SHIPLEY	
29. TYPE	NOZZLE SPRAY	
30. FUEL GRADE	#2	

31. INSPECTOR'S COMMENTS:
OK

32. ATTACHMENT(S) (Check): ☐ COPY OF INSPECTOR'S REPORT ☐ SPECIAL COMMENTS

33. SIGNATURE: R. M. Dillon
BY DIRECTION

★ U. S. GOVERNMENT PRINTING OFFICE: 1978—604—467