SB 492

SENATE COMMITTEE REPORT
FIRST COMMITTEE OF REFERRAL

DATE: 2/12/90 FURTHER: Finance

Date of 5-Day Notice: 3/1/90
(in accordance with Uniform Rule 23)

DATE TURNED INTO OFFICE: 3/6/90

L & C Committee considered SB 492

"An Act relating to the inspection of boilers and pressure vessels."

and recommended:

[✓] replace with _____ CS SB 492 (L+C) [ ] same title [✓] new title

[ ] attached amendment(s)

[ ] _____ letter of intent adopted

[✓] do pass

[ ] do not pass

[ ] no recommendation

[ ] individual recommendations

[ ] further referral to _____

ATTACHES NEW FISCAL NOTE(S):

Department(s)/Date:

[ ] fiscal note(s) _____

Department(s)/Date:

[✓] zero fiscal note(s) Dept of Labor 3/5/90 (for SB 492 & CSSB 492 (L+C))

[ ] appropriation-no fiscal note

[ ] Governor's bill w/fiscal note

SIGNING DO PASS:

OTHER RECOMMENDATIONS:

Jan Faits No Rec

Chair: Signature and Recommendation

6-2077H
Bannister
3/5/90

Original sponsor(s): SEN. FRANK, Coghill, Sturgulewski

IN THE SENATE BY THE LABOR & COMMERCE COMMITTEE

CS FOR SENATE BILL NO. 492 (L&C)

IN THE LEGISLATURE OF THE STATE OF ALASKA

SIXTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to the inspection standards for boilers and pressure vessels."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. AS 18.60 is amended by adding a new section to read:

Sec. 18.60.315. INSPECTION STANDARDS. The 1989 edition of the National Board Inspection Code Manual for Boiler and Pressure Vessel Inspectors constitutes the minimum boiler and pressure vessel inspection standard of the state for repaired or altered boilers and pressure vessels. The Department of Labor may adopt regulations for the maximum practical implementation of the manual and may grant an exception from a specific provision of the manual when the department determines that the implementation of the provision would be impractical.

STEVE FRANK
DISTRICT K
SEAT A

119 N. Cushman, Rm. 213
Fairbanks, Alaska 99701

While in Juneau
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Alaska State Legislature

Senate

MEMBER
Finance Committee
Resources Committee
Legislative Council
Special Committee on Banking & Economic Development

VICE-CHAIR
Community & Regional Affairs Committee

MEMORANDUM

TO: Senator Dick Eliason, Chairman
Labor & Commerce Committee

FROM: Senator Steve Frank

RE: Request for a hearing on SB 492 "An Act relating to the inspection of boilers and pressure vessels."

DATE: February 26, 1990

SB 492 would allow the Department of Labor to adopt by regulation the 1989 edition of the National Board Inspection Code Manual for Boiler and Pressure Vessel Inspectors.

The Department does not have the authority to adopt this new code without statutory provision. Currently, the inspection standards do not have flexibility to accommodate older boilers and pressure vessels. However, the National Board Code allows the on site inspector some discretion in approving a boiler and to what level the boiler must be pressure tested.

Adopting the National Board Code through regulation will still allow the department to determine what portions of the National Code are appropriate for Alaska and those that are not, as well as giving industry the opportunity to comment on the proposed regulations.

The Department of Labor Supports this legislation as do private sector companies that would be given some relief from the current inflexible regulations.

Thank you for your consideration.

STATE OF ALASKA

STEVE COWPER, GOVERNOR

DEPARTMENT OF LABOR

OFFICE OF THE COMMISSIONER

P.O. BOX 21149
JUNEAU, ALASKA 99802-1149
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March 5, 1990

The Honorable Dick Eliason, Chairman
Labor & Commerce Committee
Alaska State Senate
P.O. Box V
Juneau, AK 99811

Dear Senator Eliason:

The Department has reviewed the draft committee substitute for Senate Bill 492 (L&C), which adopts the 1989 National Board Inspection Code Manual for boilers and pressure vessels.

We have worked closely with the sponsor on this bill, and support it.

Thank you.

Sincerely,

Eileen Plate
Special Assistant

EP:kh

07-G9LH

AMENDMENT

IN THE SENATE BY FRANK

TO: CS for SB 492 (L&C)

Page 1, line 13;
Delete: "repaired or altered"

Page 1, line 14;
After "Vessels"
Insert: "after they have received their initial inspection certificates from the Department of Labor"

Unocal Chemicals Division
Unocal Corporation
P.O. Box 575
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Telephone (907) 776-8121

UNOCAL 76

March 12, 1990
A-23-1990

Alaska State Legislature
P. O. Box V (MS3100)
Juneau, Alaska 99811

Dear Senators Frank, Coghill, and Sturgulewski:

Re: Senate Bill No. 492,
An Act relating to the inspection
of boilers and pressure vessels.

We, at Unocal Chemicals Division, Unocal Corporation are in full support of the adoption of the 1989 edition of the National Board Inspection Code as proposed in Senate Bill No. 492. The state of Alaska has adopted the ASME Codes which covers only new construction of boilers and pressure vessels, but the state of Alaska has never had a code which covers inspection and repair of boilers and pressure vessels.

Consequently, the Department of Labor has been trying to strictly apply the ASME Codes to the repair of boilers and pressure vessels. As a result, there have been many situations where this strict application of a construction code to a repair has been impractical or beyond reason.

Examples include the following: 1) welding of a non-pressure part such as an insulation support to a pressure part has been interpreted by the Department of Labor as requiring a hydrostatic pressure test of the entire pressure vessel at 150 percent of design pressure (unless a waiver is received), or 2) replacement of thin wall nozzle which has experienced corrosion with a thicker wall nozzle to provide more corrosion allowance is not permitted by the Department of Labor without a waiver because it is considered an alteration rather than a like-and-kind repair, or 3) welding of a plug into the end of a heat exchanger tube which has developed a leak has required a hydrostatic pressure test (unless a waiver has been received) even though the tube is completely internal to a pressure vessel.

This strict application of the ASME Construction Codes to the repair of boilers and pressure vessels has caused us a great deal of frustration and expense. While the Department of Labor will often bow to reason and grant a waiver, the process of obtaining a waiver can be quite time consuming. Also, if a waiver cannot be obtained because a repair must be made on a weekend, holiday, or after normal working hours, the repair can entail undue expense and additional down-time. The case-by-case waiver system used by the Department of Labor is frustrating in another way in that issuance of waivers has not been consistent,

i.e., sometimes a particular repair may be acceptable one time (depending on whom one talks to at the Department of Labor) but an identical repair another time may not receive a waiver.

We feel that the adoption of a nationally recognized repair code such as the National Board Inspection Code will provide the guidance the Department of Labor has been seeking and also alleviate many of the frustrations and unnecessary expenses experienced by industry.

However, we feel there are some changes to the wording of the bill that should be made. These changes are itemized below:

1) On lines 11 and 12, the phrase "with the National Board of Boiler and Pressure Vessel Inspectors and" should be deleted. The reason is that many boilers and pressure vessels have been manufactured in accordance with the ASME Construction Codes, but not registered with the National Board. These boilers and pressure vessels will still need to be inspected and repaired in accordance with a nationally recognized inspection and repair code. The National Board has provided a registration service where, for a fee, they would maintain on file a copy of the Manufacturers Data Report for a boiler or pressure vessel. If the owner lost his Manufacturers Data Report and if the manufacturer went out of business, a copy of the Manufacturers Data Report could be obtained from the National Board.

2) On lines 15 and 16, the phrase "as amended as the department determines necessary" should be deleted. The reason is that this empowers the Department of Labor to amend the National Board Inspection Code as they <u>want</u> to and there is no governmental system of checks and balances on the department to ensure that amendments are indeed necessary.

3) On line 17 the words "and repair" should be inserted following "inspection". (The National Board Inspection Code is a code for both inspection and repairs).

4) On lines 22 through 24, the phrase "as amended and interpreted as of December 31, 1983, and as amended as the department determines necessary" should be deleted. Amendments through 1983 do not apply if the 1989 ASME Construction Code is adopted. Amendments as the department "determines necessary" should be stricken for reasons given in 2) above.

5) On page 2, lines 1 and 2, the phrase "as amended as the department determines necessary" should be deleted for reasons given in 2) above.

The text of this bill should then read as shown in Attachment 1.

Cordially yours,

UNOCAL Corporation
Unocal Chemicals Division

William B. White
Plant Manager

dgf
Attachments 1 & 2

cc: DDKorver - LAHO
JRBuller - LAHO
DCHaring - Kenai
MRPeterson - Kenai
HMRooper - Kenai

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Governor of Alaska
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ATTACHMENT 1 - As UNOCAL believes bill should be worded.

Introduced: 2/12/90
Referred: L&C and Finance

6-2077A

BY SEN. FRANK, Coghill, Sturgulewski

IN THE SENATE

SENATE BILL NO. 492

IN THE LEGISLATURE OF THE STATE OF ALASKA

SIXTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to the inspection of boilers and pressure vessels."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. AS 18.60 is amended by adding a new section to read:

Sec. 18.60.315. INSPECTION STANDARDS. (a) For boilers and pressure vessels that are registered with the state and that were built before the effective date of this Act, the Department of Labor shall adopt by regulation the 1989 edition of the National Board Inspection Code Manual for Boiler and Pressure Vessel Inspectors as the minimum boiler and pressure vessel inspection and repair standard of the state.

(b) For boilers and pressure vessels built on or after the effective date of this Act, the Department of Labor shall adopt by regulation

(1) the 1989 edition of the American Society of

Mechanical Engineers' Boiler and Pressure Vessel Construction Code as the minimum boiler and pressure vessel inspection standard of the state during the construction of the boilers and pressure vessels and until the boilers and pressure vessels receive their initial inspection certificates from the Department of Labor;

(2) the 1989 edition of the National Board Inspection Code Manual for Boiler and Pressure Vessel Inspectors as the minimum boiler and pressure vessel inspection standard of the state for the boilers and pressure vessels after they have received their initial inspection certificates from the Department of Labor.

Introduced: 2/12/90
Referred: L&C and Finance

6-2077A

ATTACHMENT 2 - As Senate Bill 492 is presently worded.

BY SEN. FRANK, Coghill, Sturgulewski

IN THE SENATE

SENATE BILL NO. 492

IN THE LEGISLATURE OF THE STATE OF ALASKA

SIXTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to the inspection of boilers and pressure vessels."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. AS 18.60 is amended by adding a new section to read:

Sec. 18.60.315. INSPECTION STANDARDS. (a) For boilers and pressure vessels that are registered with the National Board of Boiler and Pressure Vessel Inspectors and with the state and that were built before the effective date of this Act, the Department of Labor shall adopt by regulation the 1989 edition of the National Board Inspection Code Manual for Boiler and Pressure Vessel Inspectors, as amended as the department determines necessary, as the minimum boiler and pressure vessel inspection standard of the state.

(b) For boilers and pressure vessels built on or after the effective date of this Act, the Department of Labor shall adopt by regulation

(1) the 1980 edition of the American Society of Mechanical Engineers' Boiler and Pressure Vessel Construction Code, as amended and interpreted as of December 31, 1989, and as amended as the department determines necessary, as the minimum boiler and pressure vessel inspection standard of the state during the construction of the boilers and pressure vessels and until the boilers and pressure vessels receive their initial inspection certificates from the Department of Labor;

(2) the 1989 edition of the National Board Inspection Code

Municipal Utilities System

March 2, 1990

Senator Steve Frank
Alaska State Legislature
P.O. Box V
Juneau AK 99811

Dear Senator Frank:

I have had the opportunity to review the Labor and Commerce Committee Substitute for Senate Bill No. 492. The original Senate Bill 492 and the Labor and Commerce Committee Substitute both address a present legislative need for the State of Alaska. The owners and users of pressure vessels throughout the state and the Department of Labor all recognize the necessity for adoption and use of the National Board Inspection Code Manual for boiler and pressure vessel inspectors. However, the legislative procedure has not existed which would allow the Alaska Department of Labor to administratively adopt applicable portions or all of the National Board Inspection Code. The Committee Substitute for Senate Bill No. 492 clearly paves the way and provides the necessary vehicle the Department of Labor needs to continue to perform a valuable service to the citizens of Alaska.

I heartily support the Labor and Commerce Committee Substitute for Senate Bill No. 492 and certainly hope that the remaining necessary steps are completed and fruitful so as to allow the bill to become a very useful piece of legislation.

Sincerely,

Marty M. Lanum
Fairbanks Municipal Utilities System
Electric Utility Superintendent

bj

Introduced by: Deputy City Manager - Utilities
Department: Electric
Date: October 10, 1989

PUB RESOLUTION NO. 89 558, As Amended

A RESOLUTION RECOMMENDING THAT THE STATE OF ALASKA ADOPT THE MOST RECENT EDITION OF THE NATIONAL BOARD INSPECTION CODE AS THE CODE FOR ALASKA DEPARTMENT OF LABOR TO USE FOR THE OPERATION, TESTING AND REPAIR OF PRESSURE VESSELS.

WHEREAS, the State of Alaska, Department of Labor, currently uses the ASME Boiler and Pressure Vessel Code as the enforcement code for the construction, operation and repair of new and existing boilers; and

WHEREAS, this code was intended only for the construction of new units, and 40 of the 50 states use the National Board Inspection Code as the code for the operating inspection, testing and repair of existing boilers such as those at the Fairbanks MUS power plant; and

WHEREAS, adoption of this code will avoid considerable needless expense when MUS repairs and rehabilitates its power plant boilers which is necessary to come into air quality inspection that is required by the State of Alaska in order to use the older boilers at their maximum efficiency.

NOW, THEREFORE, BE IT RESOLVED BY THE PUBLIC UTILITIES BOARD OF THE MUNICIPAL UTILITIES SYSTEM as follows:

Section 1. The Public Utilities Board recommends that the State of Alaska adopt the most recent edition of the National Board Inspection Code as the code for the Alaska Department of Labor to use for the operation, testing and repair of pressure vessels.

Section 2. That a copy of this Resolution be sent to the Commissioner of the Alaska Department of Labor, to Governor Steve Cowper and to the Fairbanks Legislative Delegation.

PASSED and APPROVED this 7th day of November, 1989.

ROBERT J. SUNDBERG, Chair

ATTEST:

SAM HELMS, Secretary

Alaska Boiler and Pressure Vessel Inspector's Association
c/o W. C. Lunsford, Chairman
P. O. Box 100360 - PMC
Anchorage, Alaska 99510-0360

Mr. Jim Sampson
Commissioner of Labor
P.O. Box 21149
Juneau, AK 99802-1149

Subject: Alaska Boiler and Pressure Vessel Code

Dear Commissioner:

At the special meeting on 2/8/90, the Alaska Boiler and Pressure Vessel Inspector's Association members voted unanimously to recommend and support the adoption of the National Board Inspection Code, 1989 Edition (NB-23) into Title 8, Part 4, Chapter 80 of the Alaska Administrative Code (8AAC80) for repairs or alterations to boilers or pressure vessels.

We feel that this would better meet the intent of Alaska Statutes (AS 18.60.180) which require the Department of Labor to formulate rules and regulations for repairs and alterations in addition to new construction. Our recommendation follows generally accepted nationwide engineering standards and practices for repairs and alterations. Please note that the ASME codes which are currently used for this cannot meet this claim for repairs and alterations.

The Association is comprised of inspectors who hold NB authorization, as well as representatives from shops that have an ASME Code Stamp or State letter of authorization, for welded repairs or alterations to boilers or pressure vessels.

We encourage your prompt approval by adoption of the 1989 Edition of NB-23 into the Alaska Administrative Code.

Sincerely,

W. Chris Lunsford

W. C. Lunsford, Chairman
Representing the Members of ABPVIA

wcl/vmo

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Revised: 2/21/90

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Revised: 2/22/90

ALASKA PULP CORPORATION
4600 SAWMILL CREEK ROAD
SITKA, AK 99835-9801

January 24, 1990

The Honorable Richard Eliason
Alaska State Senate
Room 417, Capitol
P.O. Box V
Juneau, Alaska 99811

Dear Senator Eliason:

Some time ago, I spoke to you about urgent need for Alaska adopting a Uniform Boiler and Pressure Vessel Safety bill.

There is a good deal of interest statewide on this issue because of the arbitrary and constantly changing interpretation of the current law by the Department of Labor. As an example, Department of Labor has required proof testing on boilers and pressure vessels after even very minor repairs. This practice leads to premature leaking and is a step backwards as a safety practice. Boiler manufacturers, insurance underwriters, and the National Board disagree with the State's implementation of this practice of proof testing.

The Municipality of Fairbanks Utilities is currently drafting a bill, and we understand that that bill will be forwarded to the Legislature very shortly.

There is widespread support around the State for this law change. Fundamentally, it would adopt National standards and implement a boiler and pressure vessel law similar to what is currently in use in most of the other states. The current Alaska law was adopted in 1955, which was before the time when there was much in the way of pressure vessel or industrial application in the State.

In any event, we hope that you will be able to support the law revisions when the bill is drafted and gets to your committee.

Very truly yours,

ALASKA PULP CORPORATION

Franklin C. Roppel
Executive Vice President

FCR:lc

cc: John Dapcevich

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ALASKA PULP CORPORATION
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February 17, 1990

Senator Richard Eliason
Alaska State Legislature
P O Box V
Juneau, AK 99811

Dear Senator Eliason:

RE: Hearings on Senate Bill No. 492; Adoption of the National Board Inspection Code

I am enclosing a position argument on why relief is sought by Senate Bill No. 492. The material was prepared and copied to me by Andrew Snyder, Western Regional Quality Assurance Manager for General Electric. In case you have not seen this, you may be interested in its content.

Sincerely Yours,

G. L. Bowen, Ph. D., P.E.
Chief Engineer
Alaska Pulp Corporation

Subject: State of Alaska Requirement to Hydro to 1.5 time MAWP after Repair of Boilers or Pressure Vessels.

Purpose: Provide Code Data and logical information to convince the State of Alaska to govern repairs to the NBIC, and allow for operating pressure or MAWP hydro test after repair without AI's on site attendance.

References:

1. AS 18.60.180

2. Letter To: Weld Repair firms holding "Letter of Authorization"
   Alaska Boiler Inspection Commission Holders
   Dated: October 20, 1989
   Author: Don Cather, Chief, Mechanical Inspection, State of Alaska.

3. ASME Boiler and Pressure Vessel Code 1986 Edition 1989 Addenda
   Section I, Power Boilers, (Forward)
   Section VIII Div. 1 Unfired Pressure Vessels (Forward)

4. National Board Inspection Code 1987 Edition
   Preamble:
   Purpose and Scope of the National Board Inspection Code.:

5. ASME Boiler and Pressure Vessel Code 1986 Edition 1989 Addenda
   Section VII, Recommended Guidelines for the Care of Power Boilers,
   (Sub Sec C7) Repairs, Alterations, and Maintenance

6. National Board Inspection Code 1987 Edition
   R-200
   R-201
   R-201
   R-301.3
   R-301.3.1
   R-308
   R-308.1
   R-308.2
   R-308.3
   I-303.23
   I-502.10

Information Presentation:

AS 18.60.180 REGULATIONS. The Department of Labor shall formulate definitions, rules and regulations for the safe and proper construction, installation, repair, use and operation of boilers and for the safe and proper construction, installation, and repair of unfired pressure vessels. The definitions and regulations must be based upon and shall follow the generally accepted

nationwide engineering standards, formula, and practices established for boiler and unfired pressure vessel construction and safety. The Department of Labor may adopt the existing published codification of these definitions and regulations, known as the Boiler Construction Code of the American Society of Mechanical Engineers, and may adopt the amendments and interpretations made and published be that society. The Department of Labor shall adopt amendments and interpretations to the code immediately upon their adoption by the American Society of Mechanical Engineers so that the definitions and regulations at all times follow generally accepted nationwide engineering standards.

Comment: It is this authors opinion that a general theme is set by the underlined sections of the above law. I believe the intent is to follow generally accepted nationwide engineering standards, formula, and practices established for boiler and unfired pressure vessel construction and safety.

Letter: To: Weld Repair firms holding "Letter of Authorization"
Alaska Boiler Inspection Commission Holders
Dated: October 20, 1989
Author: Don Cather, Chief, Mechanical Inspection, State of Alaska.

Paragraph 2)

Clarification of the requirements for pressure testing of a Boiler or Vessel after a repair or alteration has been requested:

All weld repairs or alterations to boilers or vessels which entail a complete weld penetration of the shell or tube will be hydrostaticlly pressure tested at 1.5 working pressure.

Comment: Subsequent conversations with Tom Laret, Assistant Chief, State of Alaska, inquiring as to the basis of the hydrostatic test of 1.5 MAWP after a repair to a boiler or pressure vessel. Mr. Laret informed the author that the 1.5 MAWP hydrotest was a requirement of the ASME Boiler and Pressure Vessel Code and AS 18.60.180.

Position: It is the opinion of this author that the requirement of the State of Alaska to conduct a 1.5 MAWP hydrostatic test after repairs to a boiler or a unfired pressure vessel is not in keeping with the intent or general theme of the Alaska State Law AS 18.60.180 and is a misapplication of the ASME Boiler and Pressure Vessel Code as stated below:

ASME Boiler and Pressure Vessel Code 1986 Edition 1989 Addenda
Section I, Power Boilers, (Forward)
Section VIII Div. 1 Unfired Pressure Vessels (Forward)

The American Society of Mechanical Engineers set up a committee in 1911 for the purpose of formulating standard rules for the construction of steam boilers and other pressure vessels. The committee is now called the Boiler and Pressure Vessel Committee.

The Committee's function is to establish rules of safety governing the design, fabrication, and inspection during construction of boilers and pressure vessels and interpret these rules when questions arise regarding their intent.

Comment: In order to remain in keeping with nationwide standards for boilers and pressure vessels inservice, the National Board Inspection Code should be the standard, not ASME B&PVC Section 1 PG-99, PW-54, or Section VIII Div 1 UG-99.

National Board Inspection Code 1987 Edition

Preamble:

The National Board of Boiler and Pressure Vessel Inspectors is an organization comprised of Chief Inspectors of states and cities of the United States, and provinces of Canada and is organized for the purpose of promoting greater safety to life and property by securing concerted action and maintain uniformity in the construction, installation inspection and repair of boilers and other pressure vessels and their appurtenances, thereby assuring acceptance and interchangeability among Jurisdictional Authorities responsible for the administration and enforcement of various sections of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.

Purpose and Scope of the National Board Inspection Code.:

The ASME Boiler and Pressure Vessel Code establishes rules of safety governing the design, fabrication and inspection during construction of boilers and pressure vessels.

It is the purpose of the NATIONAL BOARD INSPECTION CODE to maintain the integrity of such boilers and pressure vessels after they have been placed in service by providing rules and guidelines for inspection after installation, repair, alteration and rerating, thereby helping to insure that these objects may be continued to be safely used.

Note: The State of Alaska, Don Cather is a member of the National Board.

ASME Boiler and Pressure Vessel Code 1986 Edition 1989 Addenda
Section VII, Recommended Guidelines for the Care of Power Boilers,
(Sub Sec C7) Repairs, Alterations, and Maintenance

C7.100 Repairs and Alterations

This Subsection provides guidance to the owner or user of power boilers

for welded repairs and alterations to boiler pressure parts, in accordance with most jurisdictional authority requirements. Welded repairs should be in accordance with the rules of the National Board Inspection Code.

National Board Inspection Code 1987 Edition

R-200 Definition of Terms
R-201 Repair

A repair is any work necessary to restore the boiler or pressure vessel to a safe and satisfactory operating condition, provided there is no deviation from the original design.

R-301.3 Duties of the Inspector
R-301.3.1 Repairs: Before the acceptance of a repair, the inspector shall satisfy himself that the welding was done in accordance with R-302 below, witness any pressure test he may require (see R-308, page 48) and assure that the other functions he deems necessary to assure compliance with the requirements of this code, have been preformed.

R-308 Pressure Test
R-308.1 Repairs

The inspector may require a pressure test after the completions of a repair to a boiler or pressure vessel.

R-308.2 Alterations

A pressure test as required for new construction shall be applied. Subject to the acceptance of the jurisdiction, an alternate test may be used.

R-308.3 Requirement

Pressure test shall be carried out in accordance with I-303.23, page 22 or I-502.10 page 36 as applicable.

I-303.23 Hydrostatic Test.

a. If an inspector requires additional information regarding a leak in a boiler or the extent of a possible defect, he may require that a hydrostatic test be performed.

b. To determine tightness, the hydrostatic test pressure need be no greater than the set pressure of the safety valve having the lowest setting.

c. The hydrostatic test pressure shall not exceed 1 1/2 times the maximum allowable working pressure (MAWP).....

Comment: Subsection c. is precautionary as if you were to exceed 1.5 (MAWP) you would have to provide engineering calculations to prove non detrimental effect on the pressure parts.

I-502.10 Pressure Test

a. When there is doubt as to the extent of the defect or detrimental condition found in a pressure vessel, the inspector may require a pressure test. A pressure test normally need not be made as part of a periodic inspection. However, a test shall be made when unusual, hard to evaluate forms of deterioration possibly affecting the safety of the vessel are disclosed by inspection and also after certain repairs.

b. To determine tightness, the test pressure need be no greater than the set pressure of the relief valve having the lowest setting.

c. The pressure test pressure should not exceed 1 1/2 times the maximum allowable working pressure (MAWP).....

Comment: Subsection c. is precautionary as if you were to exceed 1.5 (MAWP) you would have to provide engineering calculations to prove non detrimental effect on the pressure parts

40 states. See next page

Summary

All other states accepts the National Board Inspection Code for repairs. Further, hydro testing after repairs is in accordance with NBIC R-308.1, where as the inspector may require a hydro and general practice is to require a hydro to I-303.23 b. and I-502.10 b. ie. test to operating pressure. Additionally, witness of the hydrotest by the inspector for repairs of a routine nature is not generally done, as per NBIC Chapter III C. ,R-301.1.1, R-308.1

NATIONAL BOARD SURVEY

The National Board has surveyed its members regarding their requirements and stamping for boilers and pressure vessels covered by these jurisdictions. The findings are as follows:

NB MEMBERS	STAMPING	REPAIR STAMPS		
Alaska	BP ASME			
Arizona	BP ASME/NB			
Arkansas	BP ASME/NB		VR	NR
California	BP ASME/NB			
Colorado	BP ASME	R		
Connecticut	BP ASME/NB		VR	
Delaware	BP ASME/NB	R	VR	NR
Florida	B ASME/NB	R	VR	NR
Georgia	BP ASME/NB	R	VR	
Hawaii	BP ASME/NB	R	VR	
Illinois	BP ASME/NB			
Indiana	BP ASME			
Iowa	BP ASME/NB	R		
Kansas	BP ASME/NB**	R	VR	NR
Kentucky	BP ASME/NB			
Louisiana	BP ASME/NB	R	VR	
Maine	BP ASME/NB**			
Maryland	BP ASME			
Massachusetts	BP ASME/NB	R		
Michigan	B ASME/NB			
Minnesota	BP ASME/NB	R	VR	
Mississippi	BP ASME			
Missouri	BP ASME/NB	R	VR	NR
Nebraska	B ASME/NB	R	VR	
Nevada	BP ASME/NB	R	VR	
New Hampshire	BP ASME			
New Jersey	BP ASME/NB**			NR
New York	BP ASME/NB	R	VR	
North Carolina	BP ASME/NB	R		
North Dakota	BP ASME/NB		VR	
Ohio	BP ASME/NB	R	VR	NR
Oklahoma	BP ASME/NB			
Oregon	BP ASME/NB			
Pennsylvania	BP ASME			

NB MEMBERS	STAMPING	REPAIR STAMPS		
Rhode Island	BP ASME/NB	R	VR	NR
Tennessee	BP ASME/NB	R	VR	NR
Texas	B ASME/NB			
Utah	BP ASME/NB		VR	
Vermont	BP ASME	R		
Virginia	BP ASME/NB			
Washington	BP ASME/NB	R	VR	
West Virginia	BP ASME/NB**	R	VR	
Wisconsin	BP ASME/NB	R	VR	NR
Chicago, IL	BP ASME			
Detroit, MI	BP ASME/NB			
Los Angeles, CA	BP ASME/NB		VR	
Memphis, TN	BP ASME	R		
Milwaukee, WI	BP ASME/NB	R	VR	NR

CANADIAN MEMBERS

NB MEMBERS	STAMPING	REPAIR STAMPS
Alberta	BP ASME*	
British Columbia	BP ASME*	
Manitoba	BP ASME*	
New Brunswick	BP ASME*	
Newfoundland & Labrador	BP ASME/NB*	
Nova Scotia	BP ASME*	
Ontario	BP ASME*	
Prince Edward Island	BP ASME*	
Quebec	BP ASME*	
Saskatchewan	BP ASME*	

Not NB States

*ASME or must use procedure of the Canadian province to ensure equivalent safety standards.
**ASME/NB or must use state special procedure to ensure equivalent safety standards.

B = Boilers P = Pressure Vessels

Each individual jurisdiction should be contacted directly if further information or explanation is required.

Continued on next page

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CO: NAT'L BD FAX #: 614 847 1828
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NO. OF PAGES

References:

ALASKA STATUTES
TITLE 18. CHAPTER 60. ARTICLE 3.
BOILERS.

Section
- 180. Regulations
- 190. Effect of regulations
- 200. New boilers and unfired pressure vessels
- 210. Exemptions
- 220. Duties of the Department of Labor
- 230. Appointment of deputy inspectors
- 240. Appointment and qualifications of special inspectors
- 250. Compensation for special inspectors prohibited
- 260. Duty of special inspectors
- 270. Report of inspection
- 280. Right of inspection
- 290. Examination for deputy and special inspectors
- 300. Revocation or suspension of state commission
- 310. Replacement of lost or destroyed certificate or commission
- 320. Inspection of boilers and unfired pressure vessels
- 330. Rules of inspection
- 340. Inspection certificates
- 350. Suspension of inspection certificate
- 360. Inspection fees
- 370. Appeals
- 380. [Repealed 1963 -- Creation of boiler fund]
- 390. Inspection certificate required
- 395. Licensing of boiler operators

AS 18.60.180. REGULATIONS. The Department of Labor shall formulate definitions, rules and regulations for the safe and proper construction, installation, repair, use and operation of boilers and for the safe and proper construction, installation and repair of unfired pressure vessels. The definitions and regulations must be based upon and shall follow the generally accepted nationwide engineering standards, formula , and practices established for boiler and unfired pressure vessel construction and safety. The Department of Labor may adopt the existing published codification of these definitions and regulations, known as the Boiler Construction Code of the American Society of Mechanical Engineers, and may adopt the amendments and interpretations made and published by that society. The Department of Labor shall adopt amendments and interpretations to the code immediately upon their adoption by the American Society of Mechanical Engineers so that the definitions and regulations at all times follow generally accepted nationwide engineering standards. (§ 1(c) ch 132 SLA 1955)

AS 18.60.190. EFFECT OF REGULATIONS. (a) The regulations adopted by the Department of Labor have the force and effect of law. However, the regulations applying to the construction of new boilers and unfired pressure vessels do not prevent their installation until the regulations become mandatory as provided in (b) of this section.

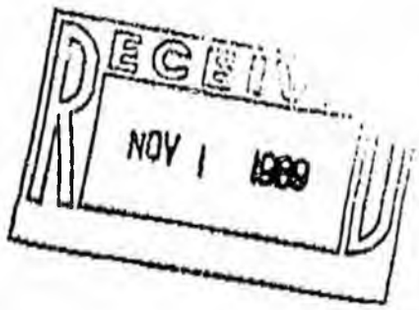
(b) Amendments in the regulations are permissive immediately upon adoption and become mandatory 12 months after adoption. (§ 1(d) ch 132 SLA 1955)

STATE OF ALASKA

STEVE COWPER, GOVERNOR

DEPARTMENT OF LABOR

LABOR STANDARDS & SAFETY DIVISION
MECHANICAL INSPECTION SECTION



October 20, 1989

To: Weld Repair firms holding
"Letter of Authorization"
Alaska Boiler Inspection
Commission Holders

IR-5

The following information should clarify several points of the welding tracer program and make it work more efficiently:

1) The State of Alaska is the authorized inspector for all weld alterations or repairs. When prior Department approval is received, an Insurance Company inspector, Owner-User inspector, or the repair firm's Authorized Inspector may be used. All repairs or alterations and ensuing tests must be witnessed by an authorized inspector, unless PRIOR arrangements have been made to waive those inspections. These arrangements will be so noted on the tracer.

   To waiver an inspection, each weld repair or alteration will be addressed on its own merit. To obtain a waiver, the weld repair concern must be able to outline the procedures that will be used in making the repairs, including the preliminary, interpass and final nondestructive testing; and must advise this office of the welder doing the work. The final Repair Reporting form prepared by the repair firm must also document all of these procedures.

2) Clarification of the requirements for pressure testing of a Boiler or Vessel after a repair or alteration has been requested:

   All weld repairs or alterations to boilers or vessels which entail a complete weld penetration of the shell or tube will be hydrostatically pressure tested at 1.50 working pressure. Lined hot water heaters will be hydro-tested as outlined in the ASME code.

   Unique circumstances will be addressed on an individual basis by the Chief Inspector.

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3) "Alterations" means any physical change to a boiler or pressure vessel as described on the Manufacturers' Data Report which affects the pressure containing capabilities of the boiler or pressure vessel. Non-physical changes, such as an increase in the maximum allowable working pressure (internal or external) or design temperature of a boiler or pressure vessel, shall be considered an alteration.

4) As a note of interest, neither the NB-23 nor the API-510 are controlling references for the repairs of boilers or pressure vessels. They are advisory only. Regulations which address the use of National Board Inspection Code (NB-23) or American Petroleum Institute (API-510) will be promulgated in the near future.

Sincerely,

Don Cather
Chief
Mechanical Inspection

0348j

ASME Code
Section I & VIII

FOREWORD

The American Society of Mechanical Engineers set up a committee in 1911 for the purpose of formulating standard rules for the construction of steam boilers and other pressure vessels. This committee is now called the Boiler and Pressure Vessel Committee.

The Committee's function is to establish rules of safety governing the design, fabrication, and inspection during construction of boilers and pressure vessels, and to interpret these rules when questions arise regarding their intent. In formulating the rules, the Committee considers the needs of users, manufacturers, and inspectors of pressure vessels. The objective of the rules is to afford reasonably certain protection of life and property and to provide a margin for deterioration in service so as to give a reasonably long, safe period of usefulness. Advancements in design and material and the evidence of experience have been recognized.

The Boiler and Pressure Vessel Committee deals with the care and inspection of boilers and pressure vessels in service only to the extent of providing suggested rules of good practice as an aid to owners and their inspectors.

The rules established by the Committee are not to be interpreted as approving, recommending, or endorsing any proprietary or specific design or as limiting in any way the manufacturer's freedom to choose any method of design or any form of construction that conforms to the Code rules.

The Boiler and Pressure Vessel Committee meets regularly to consider revisions of the rules, new rules as dictated by technological development, Code Cases, and requests for interpretations. Requests for interpretation must be addressed to the Secretary in writing and must give full particulars in order to receive consideration and a written interpretation (see Mandatory Appendix covering preparation of technical inquiries). Proposed revisions to the Code resulting from inquiries will be presented to the Main Committee for appropriate action. The action of the Main Committee becomes effective only after confirmation by letter ballot of the Committee and approval by ASME.

Proposed revisions to the Code approved by the Committee are submitted to the American National Standards Institute and published in *Mechanical Engineering* to invite comments from all interested persons. After the allotted time for public review and final approval by ASME, revisions are published annually in Addenda to the Code.

Code Cases may be used in the construction of components to be stamped with the ASME Code symbol beginning with the date of their approval by ASME.

After Code revisions are approved by ASME, they may be used beginning with the date of issuance shown on the Addenda. Revisions become mandatory as minimum requirements six months after such date of issuance, except for boilers or pressure vessels contracted for prior to the end of the six-month period.

Manufacturers and users of components are cautioned against making use of revisions and Cases that are less restrictive than former requirements without having assurance that they have been accepted by the proper authorities in the jurisdiction where the component is to be installed.

Each state and municipality in the United States and each province in Canada that adopts or accepts one or more Sections of the Boiler and Pressure Vessel Code is invited to appoint a representative to act on the Conference Committee to the Boiler and Pressure Vessel Committee. Since the members of the Conference Committee are in active contact with the administration and enforcement of the rules, the requirements for inspection in this Code correspond with those in effect in their respective jurisdictions. The required qualifications for an Authorized Inspector under these rules may be obtained from the administrative authority of any state, municipality, or province which has adopted these rules.

The Boiler and Pressure Vessel Committee in the formulation of its rules and in the establishment of maximum design and operating pressures considers materials, construction, methods of fabrication, inspection, and safety devices. Permission may be granted to regulatory bodies and organizations publishing safety standards to use a complete Section of the Code

by reference. If usage of a Section, such as Section IX, involves exceptions, omissions, or changes in provisions, the intent of the Code might not be attained.

Where a state or other regulatory body, in the printing of any Section of the Boiler and Pressure Vessel Code, makes additions or omissions, it is recommended that such changes be clearly indicated.

The National Board of Boiler and Pressure Vessel Inspectors is composed of chief inspectors of states and municipalities in the United States and of provinces in Canada that have adopted the Boiler and Pressure Vessel Code. This Board, since its organization in 1919, has functioned to uniformly administer and enforce the rules of the Boiler and Pressure Vessel Code. The cooperation of that organization with the Boiler and Pressure Vessel Committee has been extremely helpful.

It should be pointed out that the state or municipality where the Boiler and Pressure Vessel Code has been made effective has definite jurisdiction over any particular installation. Inquiries dealing with problems of local character should be directed to the proper authority of such state or municipality. States, provinces, municipalities, or other regulatory bodies may, if there is any question or doubt as to the proper interpretation, refer the question to the Boiler and Pressure Vessel Committee.

The Specifications for base materials given in Section II, Parts A and B, are identical with or similar to those of The American Society for Testing and Materials. When reference is made in an ASME Material Specification to an ASTM Specification for which a companion ASME Specification exists, the reference shall be interpreted as applying to the ASME Material Specification. Specifications for welding materials given in Section II, Part C, are identical with or similar to those of the American Welding Society. Not all materials included in the ASME Material Specifications in Section II have been adopted for Code use. Usage is limited to those materials and grades adopted by at least one of the other Sections of the Code for application under rules of that Section. All materials allowed by these various Sections and used for construction within the scope of their rules shall be furnished in accordance with ASME Material Specifications contained in Section II except where otherwise provided in Code Cases or in the applicable Section of the Code. Materials covered by these Specifications are acceptable for use in items covered by the Code Sections only to the degree indicated in the applicable Section. Materials for Code use should preferably be ordered, produced, and documented on this basis; however, material produced under an ASTM Specification may be used in lieu of the corresponding ASME Specification, provided the requirements of the ASTM Specification are identical (excluding editorial differences) or more stringent than the ASME Specification for the Grade, Class, or Type produced and provided that the material is confirmed as complying with the ASTM Specification. Material produced to an ASTM specification with requirements different from the requirements of the corresponding ASME Specification may also be used in accordance with the above, provided the material manufacturer or vessel manufacturer certifies with evidence acceptable to the Authorized Inspector that the corresponding ASME Specification requirements have been met. Material produced to an ASME or ASTM Material Specification is not limited as to country of origin.

When required by context in this Section, the singular shall be interpreted as the plural, and vice-versa; and the feminine, masculine, or neuter gender shall be treated as such other gender as appropriate.

Publication of the SI (Metric) Edition of the ASME Boiler and Pressure Vessel Code was discontinued with the 1986 Edition. Effective October 1, 1986, the SI Edition was withdrawn as an ASME Boiler and Pressure Vessel Code document.

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National Board Inspection Code

A Manual for Boiler and Pressure Vessel Inspectors

1987

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NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS
1055 Crupper Avenue, Columbus, Ohio 43229
614/888-8320

NB-23 Rev. 6

Preamble

The National Board of Boiler and Pressure Vessel Inspectors is an organization comprised of Chief Inspectors of states and cities of the United States, and provinces of Canada and is organized for the purpose of promoting greater safety to life and property by securing concerted action and maintaining uniformity in the construction, installation, inspection and repair of boilers and other pressure vessels and their appurtenances, thereby assuring acceptance and interchangeability among Jurisdictional Authorities responsible for the administration and enforcement of the various sections of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code.

Purpose and Scope of the National Board Inspection Code

The ASME Boiler and Pressure Vessel Code establishes rules of safety governing the design, fabrication and inspection during construction of boilers and pressure vessels.

It is the purpose of the NATIONAL BOARD INSPECTION CODE to maintain the integrity of such boilers and pressure vessels after they have been placed into service by providing rules and guidelines for inspection after installation, repair, alteration and rerating, thereby helping to ensure that these objects may continue to be safely used.

It is recognized that an American Petroleum Institute Inspection Code, API-510, exists covering the maintenance inspection, repair, alteration and rerating procedures for pressure vessels used by the petroleum and chemical process industries, which is applicable in these special circumstances. It is the intent that this Inspection Code cover installations other than those covered by API-510 unless the jurisdiction rules otherwise.

ASME Code
Section VII

SUBSECTION C7
REPAIRS, ALTERATIONS, AND MAINTENANCE

C7.100 REPAIRS AND ALTERATIONS

This Subsection provides guidance to the owner or user of power boilers for welded repairs and alterations to boiler pressure parts, in accordance with most jurisdictional authority requirements. Welded repairs and alterations should be in accordance with the rules of the National Board Inspection Code.[1] For the purpose of this Subsection, mechanical joints are not considered as a repair.

No welded repairs to a boiler pressure part should be initiated without the authorization of the Authorized Inspector who should satisfy himself that the welding procedures and welders are qualified and that the repair methods are acceptable. Subject to the administrative procedures of the jurisdiction, the Authorized Inspector may give prior approval for limited repairs provided he has ensured himself that the repair organization has acceptable procedures covering the repairs.

Each welded repair should be made by an appropriate Certificate Holder or other organization recognized by the jurisdictional authority.

Alterations to boiler pressure parts should be made by an organization that holds a valid ASME Certification of Authorization provided the alterations are within the scope of such authorization.

No alteration to boiler pressure parts should be initiated witnout the authorization of the Authorized Inspector, who should satisfy himself that the welding procedures and welders are qualified, that the alteration methods are acceptable, and that all applicable calculations are available.

Each owner or user of a boiler should verify with the jurisdictional authorities at the location of the power boiler that welded repair or alteration in accordance with the National Board Inspection Code is acceptable to the jurisdictional authorities.

The welded repair or alteration should be documented on the appropriate form shown in the National Board Inspection Code.[1]

Caution is recommended in the following regard: an unauthorized welded repair or alteration may make continued use of the boiler unsafe as well as illegal in many jurisdictions.

C7.200 MAINTENANCE

C7.210 General

Unscheduled outages of power equipment can result in production losses and an increase in power maintenance costs. This Subsection has been prepared to assist in the prevention of unscheduled outages by defining in general terms the potential trouble spots and conditions that should be checked during regularly scheduled maintenance outages. A thorough check of these critical parts will ensure that the equipment is put into sound operating condition before being returned to service and will help to eliminate the causes of unscheduled outages.

Due to the multiplicity of equipment types and plant layouts, the following is in sufficiently general terms to ensure that it is applicable to equipment types and not to Manufacturer's individual products. This makes it necessary to advise reference to individual Manufacturer's instruction books for data on clearances, part construction, controls, etc., when applying the information given in the guide to specific plant installations. Manufacturers should be contacted personally when required information is not given in instruction books.

C7.220 Information to Assist in Maintenance

The ability to recognize symptoms of impending equipment failure and to identify the faulty part is an

[1]This document may be ordered from the National Board of Boiler and Pressure Vessel Inspectors, 1055 Crupper Avenue, Columbus, OH 43229.

build up of corrosive deposits between the disk and seat. If this condition is noted, the valve should be repaired by the valve manufacturer or replaced.

c. It is recommended that under normal operating conditions[2] the safety or safety relief valve on a steam or hot water heating boiler should be tested manually once each month and pressure tested once each year.

I-303.21 PRESSURE GAGES

a. The Inspector should determine that, where required, all the pressure gages have been removed, tested and their readings compared to the readings of a standard test gage or a dead weight tester.

b. The location of a steam pressure gage should be noted by the Inspector to determine whether it is exposed to high temperature from an external source or to internal heat due to lack of protection by a proper siphon or trap. The Inspector should check that provisions are made for blowing out the pipe leading to the steam gage.

I-303.22 TUBE ROLLING

When tubes have been rerolled or replaced, the Inspector should observe whether the workmanship is proper. Where tubes are readily accessible, they may be over rolled. Conversely, when it is difficult to reach the tube ends they may have been under rolled.

I-303.23 HYDROSTATIC TEST

a. If the Inspector requires additional information regarding a leak in a boiler or the extent of a possible defect, he may require that a hydrostatic test be performed.

b. To determine tightness, the hydrostatic test pressure need be no greater than the set pressure of the safety valve having the lowest setting.

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[2]Under certain operating conditions, these recommendations may not apply.

c. The hydrostatic test pressure shall not exceed 1½ times the maximum allowable working pressure (MAWP). For the test, the safety spring should not be compressed to prevent the valve from opening. The safety valve or valves should be removed or each disk shall be held down by means of a testing clamp. A plug device designed for this purpose may be used. The temperature of the water used to apply a hydrostatic test should not be less than 70°F (21°C), and the maximum temperature during inspection should not exceed 120°F (49°C). If a test is conducted at 1½ times the MAWP and the owner specifies a temperature higher than 120°F (49°C) for this test, the pressure should be reduced to the MAWP and the temperature to 120°F (49°C) for the close examination.

I-303.24 RECORD REVIEW

A review of any boiler log, records of maintenance and feed water treatment should be made by the Inspector to determine what regular tests have been made on the boiler and controls. The owner or user should be consulted regarding any repairs which have been made since the last inspection. The Inspector should review the record of such repairs for compliance with applicable requirements. All repairs should be carried out in accordance with Chapter III of this Code.

I-303.25 CONCLUSIONS

Any defects or deficiencies in the condition, operating and maintenance practices of the boiler and auxiliary equipment should be discussed by the Inspector with the owner or user at this time and, if necessary, recommendations made for the correction of such defects or deficiencies.

I-502.8 MANHOLES AND OTHER OPENINGS

a. Manholes, reinforcing plates, nozzles or other connections flanged or screwed into a pressure vessel should be thoroughly examined by the Inspector for cracks, deformation or other defects. Bolts and nuts should be checked for corrosion or defects.

b. Wherever possible an inspection should be made from the inside of the pressure vessel to determine the condition of pipe connections at the vessel.

c. On threaded connections the Inspector should ensure that an adequate number of threads are engaged.

d. All openings leading to any external fittings or controls should be examined as thoroughly as possible by the Inspector to ensure they are free from obstructions.

I-502.9 SPECIAL CLOSURES

Any special closures including those on autoclaves, normally termed quick actuating (quick opening) closures which are used frequently in the operation of a pressure vessel, should be checked by the Inspector for adequacy and wear. A check should also be made for cracks at areas of high stress concentration.

I-502.10 PRESSURE TEST

a. When there is doubt as to the extent of a defect or detrimental condition found in a pressure vessel, the Inspector may require a pressure test. A pressure test normally need not be made as part of a periodic inspection. However, a test shall be made when unusual, hard to evaluate forms of deterioration possibly affecting the safety of a vessel are disclosed by inspection and also after certain repairs.

b. To determine tightness, the test pressure need be no greater than the set pressure of the pressure relief valve having the lowest setting.

c. The pressure test should not exceed 1½ times the maximum allowable working pressure adjusted for temperature. When the original test pressure includes consideration of corrosion allowance, the test pressure may be further adjusted based upon the remaining corrosion allowance.

d. During a pressure test, where the test pressure will exceed the set pressure of the pressure relief valve having the lowest setting, the pressure relief valve or valves should be removed or each valve disk be held down by means of a test clamp and not by applying additional load to the valve spring by turning the compression screw.

e. The temperature of the water used to apply a hydrostatic test should not be less than 60°F (15.6°C) unless the owner provides information on the toughness characteristics of the vessel material to indicate the acceptability of a lower test temperature.

The temperature is not to be more than 120°F (49°C) unless the owner specifies the requirement for a higher test temperature. If the test is conducted at 1½ times the MAWP and the owner specifies a temperature higher than 120°F (49°C), the pressure should be reduced to the MAWP and the temperature to 120°F (49°C) for close examination.

f. When contamination of the vessel contents by any other medium is prohibited or when a hydrostatic test is not possible, other testing media may be used providing the precautionary requirements of the applicable section of the ASME Code are followed. In such cases, there shall be agreement as to the testing procedure between the owner and the Inspector.

I-502.11 RECORD REVIEW

The Inspector should review any pressure vessel log, record of maintenance, corrosion rate record or any other examination results. The Inspector should consult with the owner or user regarding repairs made, if any, since the last internal inspection. The Inspector should review the records of such repairs for compliance with applicable requirements.

I-502.12 CONCLUSIONS

The Inspector should discuss with the owner or user, any defects or deficiencies in condition, maintenance practices or misuse of the pressure vessel and, if necessary, recommended corrective action. All repairs should be carried out in accordance with the requirements of Chapter III of this Code.

R-200 DEFINITION OF TERMS

R-201 REPAIR[3]

A repair is any work necessary to restore a boiler or pressure vessel[4] to a safe and satisfactory operating condition, provided there is no deviation from the original design.

R-202 ALTERATION[5]

An alteration is any change in the item described on the original Manufacturers' Data Report which affects the pressure containing capability of the boiler or pressure vessel. Nonphysical changes such as an increase in the maximum allowable working pressure (internal or external) or design temperature of a boiler or pressure vessel shall be considered an alteration. A reduction in minimum temperature such that additional mechanical tests are required shall also be considered an alteration.

R-300 GENERAL REQUIREMENTS FOR REPAIRS AND ALTERATIONS

The requirements of the following paragraphs apply to all repairs and alterations to boilers and pressure vessels. In addition, the provisions of Chapter III, Supplement 4, page 74 apply to the repair of ASME Code Section VIII, Division 2, Pressure Vessels.

R-301 INSPECTION

R-301.1 AUTHORIZATION

R-301.1.1 Repairs: No repair to a boiler or pressure vessel shall be initiated without the authorization of the Inspector who shall satisfy himself that the welding procedures and welders are

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[3]Examples of repairs are shown in Supplement 1(B), page 61.

[4]For additional requirements for the repair of ASME Code Section VIII, Division 2, Pressure Vessels, see Chapter III, Supplement 4, page 74.

[5]Examples of alterations are shown in Supplement 1(D), page 64.

qualified and that the repair methods are acceptable. Subject to the administrative procedures of the jurisdiction, the Inspector may give prior approval for limited repairs provided he has assured himself that the repair organization has acceptable procedures covering the repairs. Examples of such repairs are described in Supplement 1(C), page 63. In every case, however, the Inspector shall be advised of each repair under such prior agreement.

R-301.1.2 Alterations: No alteration to a boiler or pressure vessel shall be initiated without the authorization of the Inspector who shall satisfy himself that the welding procedures and welders are qualified, that the alteration methods are acceptable, and that calculations have been made available. If he considers it necessary, he shall make an inspection of the object before granting such authorization.

R-301.2 ACCEPTANCE OF REPAIRS AND ALTERATIONS

R-301.2.1 General: It shall be the responsibility of the organization making the repair or alteration to provide for inspection, documentation and certification of the work and to ensure prior acceptance of the procedures for the work.

Inspection and certification of repairs and alterations shall be made by an Authorized Inspector employed by one of the following:

a. a jurisdictional Authorized Inspection Agency;

b. the Authorized Inspection Agency of the organization making the repair or alteration;

c. the Authorized Inspection Agency which insures the boiler or pressure vessel;

d. the owner-user inspection agency provided the work was not performed by his employer except as permitted in R-301.2.2 following.

R-301.2.2 Owner-User Acceptance Inspection of Repairs: An Inspector employed by an owner-user inspection agency[6] may perform acceptance inspections of repairs to pressure vessels

[6] See Appendix D, page 217, for Owner-User Inspection Agencies.

when such repairs have been performed by his employer provided the employer's organization and inspection procedures have specific approval of the jurisdiction or in the absence of a jurisdiction, by the National Board when requested by the owner-user. Such acceptance inspection procedures shall be subject to the concurrence of the Authorized Inspection Agency responsible for the inservice inspection of the pressure vessel.

R-301.3 DUTIES OF THE INSPECTOR

R-301.3.1 Repairs: Before acceptance of a repair, the Inspector shall satisfy himself that the welding was done in accordance with R-302 belo , witness any pressure test he may require (see R-308, page 48), and assure that the other functions he deems necessary to assure compliance with the requirements of this Code, have been performed.

R-301.3.2 Alterations: Before signing for acceptance of an alteration, the Inspector shall make the required inspections, satisfy himself that, except as provided for in R-502.1(a)(2), the design change has been certified by an organization described in R-505.1, the welding was done in accordance with R-302, witness the pressure test applied (see R-308, page 48), and assure that the required nondestructive examinations have been performed satisfactorily and that the other functions he deems necessary to assure compliance with the requirements of this Code have been performed.

R-302 WELDING

R-302.1 WELDING PROCEDURE SPECIFICATIONS

The organization making repairs or alterations under these rules shall list the parameters applicable to welding that are to be performed in the welding procedure specification (WPS) document, such document having been qualified by the organization as required by the applicable section of the ASME Code. Such organization shall qualify its WPS by the welding of test coupons and the testing of specimens and recording the welding data and test results in its procedure qualification record (PQR) document. Welding procedure specificatons shall be in accordance with the requirements of Section IX of the ASME Code.

R-302.2 WELDING PERFORMANCE QUALIFICATION

A welder or welding operator shall qualify for each welding process that he uses in the repair or alteration of a boiler or pressure vessel. Such qualification shall be in accordance with the requirements of Section IX of the ASME Code and a qualified welding procedure specification of the organization making the repair or alteration.

R-302.3 WELDING QUALIFICATION RECORDS

The organization making the repair or alteration shall maintain a record of the results obtained in welding procedure and welding performance qualifications. These records shall be certified by the organization and shall be available to the Inspector prior to the start of welding.

R-303 THERMAL HEAT TREATMENT

R-303.1 PREHEATING

Preheating may be employed during welding to assist in completion of the welded joint. The need for and the temperature of preheat are dependent on a number of factors, such as chemical analysis, degree of restraint of the parts being joined, material thickness and mechanical properties. The welding procedure specification for the material being welded shall specify the preheat temperature requirements.

For recommended preheating temperatures, see Supplement 2, page [illegible].

R-303.2 POSTWELD HEAT TREATMENT

R-303.2.1 General: The detailed postweld heat treatment requirements and exemptions shall be in accordance with the applicable section of the ASME Code except as described below.

R-303.2.2 Alternative Methods: Under certain conditions, postweld heat treatment as outlined above may be inadvisable or impractical. In such instances, any other method of postweld heat treatment or special welding method acceptable to the Inspector may be used. Examples of special welding methods

for P1 and P3 materials are described in Supplement 3, page 69. Where deemed necessary, competent technical advice should be obtained from the manufacturer of the object or from another qualified source.

R-304 NONDESTRUCTIVE EXAMINATION

The nondestructive examination (NDE) requirements, including technique, extent of coverage and acceptance criteria, shall be in accordance with the applicable sections of the ASME Code. Weld repairs and alterations should be subjected to the same nondestructive examination requirements as the original welds. Where this is not possible or practical, alternate NDE methods acceptable to the Inspector may be used.

After work that required radiographic examination has been completed, the repair or alteration organization shall retain the radiographs for a period specified in the applicable section of the ASME Code or alternatively, the radiographs may be turned over to the owner-user of the boiler or pressure vessel for retention.

R-305 MATERIALS

The materials used in making repairs or alterations shall conform to the requirements of the applicable section of the ASME Code. Carbon or alloy steel having a carbon content of more than 0.35% shall not be welded.

R-306 WELDED JOINTS

Butt joints shall have complete penetration and complete fusion for the full length of the weld. The surfaces of the weld may be left "as-welded", provided they are sufficiently free from coarse ripples, undercuts, grooves, overlaps, abrupt ridges and valleys to avoid stress concentration points and do not interfere with interpretation of NDE results, when used.

R-307 REPLACEMENT PRESSURE PARTS

R-307.1 GENERAL

Replacement parts may be classified as follows:

a. Replacement parts which will be subject to internal or external pressure that consist of materials which may be

formed to the required shape by casting, spinning, forging, die forming and on which no fabrication welding is performed, shall be supplied as material. Such parts shall be marked with the material and part identification and the name or trademark of the parts manufacturer. Such markings shall be considered as the parts manufacturer's certification that the part complies with the applicable section of the ASME Code. Examples include seamless or welded tubes or pipe, forged nozzles, heads or tube sheets, or subassemblies attached together mechanically.

b. Replacement parts which will be subject to internal or external pressure that are preassembled by attachment welds shall have the welding performed in accordance with the applicable section of the ASME Code and Section IX of the ASME Code. The supplier or manufacturer shall certify that the material and fabrication are in accordance with the applicable section of the ASME Code. This certification shall be supplied in the form of bills of material and drawings with the statement of certification. Examples include boiler furnace wall or floor panel assemblies, prefabricated openings in boiler furnace walls, such as burner openings, air ports, inspection openings or sootblower openings. Design changes of parts in this category shall be certified by an organization described in R-505.1, page 60.

c. Replacement parts subject to internal or external pressure fabricated by welding and which require shop inspection by an Authorized Inspector shall be fabricated by a manufacturer having an ASME Certificate of Authorization and the appropriate Code symbol stamp. The item shall be inspected and stamped as required by the applicable section of the ASME Code. A completed Manufacturers' Partial Data Report shall be supplied by the manufacturer. When the part is added to the vessel, the partial data report is to be attached to Form R-1, Report of Welded Repair or Alteration (see Supplement 5, page 75).

R-307.2 INSTALLATION OF REPLACEMENT PRESSURE PARTS

When replacement pressure parts are installed in conjunction with a repair, they shall be installed by organizations authorized in accordance with paragraph R-404, page 54. When replacement pressure parts are installed in conjunction with an alteration, they shall be installed by an organization authorized in accordance with paragraph R-505, page 60.

R-308 PRESSURE TEST

R-308.1 REPAIRS

The Inspector may require a pressure test after the completion of a repair to a boiler or pressure vessel. See R301.3.1

R-308.2 ALTERATIONS

A pressure test as required for new construction shall be applied. Subject to the acceptance of the jurisdiction, an alternate test may be used.

R-308.3 REQUIREMENT

Pressure tests shall be carried out in accordance with I-303.23, page 22, or I-502.10, page 36, as applicable.

R-400 REPAIRS TO BOILERS AND PRESSURE VESSELS

This section provides specific rules for repairs to boilers and pressure vessels. It is intended that these requirements be used in conjunction with the general requirements of R-300, page 42.

R-401 REPAIR METHODS

R-401.1 DEFECT REPAIRS

R-401.1.1 General: A repair of a defect, such as a crack in a welded joint or base material, shall not be made until the defect has been removed. A suitable nondestructive examination method

Chapter III

Supplement 1

Examples of Repairs and Alterations

A. INTRODUCTION

The purpose of this supplement is to provide owners, users, repair organizations and Inspectors with assistance in evaluating whether contemplated work on boilers or pressure vessels should be categorized as repairs or alterations. The significance of this categorization affects the qualifications of the organization performing the work as well as the resultant documentation and symbol stamping of the boiler or pressure vessel.

B. EXAMPLES OF REPAIRS

Repairs are defined in R-201, page 42. Examples of repairs are:

1. weld repairs or replacement of pressure parts or attachments that have failed in a weld or in the base material;
2. the addition of welded attachments to pressure parts, such as:
   a. studs for insulation or refractory lining
   b. hex steel or expanded metal for refractory lining
   c. ladder clips
   d. brackets
   e. tray support rings
   f. corrosion resistant strip lining
   g. corrosion resistant weld overlay
   h. weld build-up of wasted areas;
3. replacement of heat exchanger tube sheets in accordance with the original design;
4. replacement of boiler and heat exchanger tubes where welding is involved;
5. in a boiler, a change in the arrangement of tubes in furnace walls, economizer or superheater sections;

6. replacement of pressure retaining parts identical to those existing on the boiler or pressure vessel and described on the original Manufacturers' Data Report. For example:
   a. replacement of furnace floor tubes and/or sidewall tubes in a boiler
   b. replacement of a shell or head in accordance with the original design
   c. rewelding a circumferential or longitudinal seam in a shell or head
   d. replacement of nozzles of a size where reinforcement is not a consideration;
7. installation of new nozzles or openings of such a size that reinforcement is not a consideration [for example, the installation of a 3 in. (76 mm) pipe size nozzle to a shell or head of 3/8 in. (10 mm) or less in thickness or the addition of a 2 in. (50 mm) pipe size nozzle to a shell or head of any thickness];
8. the addition of a nozzle where reinforcement is a consideration may be considered to be a repair provided the nozzle is identical to one in the original design, located in a similar part of the vessel, and not closer than three times its diameter from another nozzle. The addition of such a nozzle shall be restricted by any service requirements;
9. the installation of a flush patch to a boiler or pressure vessel;
10. the replacement of a shell course in a cylindrical pressure vessel;
11. welding of gage holes;
12. welding of wasted or distorted flange faces;
13. replacement of slip-on flanges with weld neck flanges or vice-versa;
14. seal welding of butt straps and rivets;
15. subject to the administrative procedures of the jurisdiction and approval of the Inspector, the replacement of a riveted section or part by welding;

16. the repair or replacement of a pressure part with a Code accepted material that has a nominal composition and strength that is equivalent to the original material, and is suitable for the intended service.

C. REPAIRS OF A ROUTINE NATURE

Subject to the administrative procedure of the jurisdiction and the approval of the Inspector, the types of repairs listed below may be given prior approval as described in R-301.1.1, page 42, or the requirement for the repair report or stamping, as described in R-402.2, page 52, and R-403.4, page 54, respectively, may be waived. The repairs listed below are examples intended to provide the Inspector with general guidelines and are not intended to be all inclusive:

1. weld repair or replacement of tubes or pipes and attachments;
2. the addition of non-pressure attachments to pressure parts where postweld heat treatment is not required;
3. weld build-up of wasted areas;
4. corrosion resistant weld overlay;
5. replacement of boiler and heat exchanger tubes where welding is involved;
6. in a boiler, a change in the arrangement of tubes in furnace walls, economizer or superheater sections;
7. rewelding or replacing heat exchanger channel partition plates;
8. replacement of nozzles where reinforcement is not a consideration;
9. welding of gage holes;
10. replacement of slip-on flanges with weld neck flanges or vice-versa where NDE of the welded joint is not a requirement of the applicable ASME Code.

D. EXAMPLES OF ALTERATIONS

Alterations are defined in R-202, page 42. Examples are:

1. an increase in the maximum allowable working pressure (internal or external) or temperature of a boiler or pressure vessel regardless of whether or not a physical change was made to the boiler or pressure vessel;
2. a decrease in the minimum temperature such that additional mechanical tests are required;
3. the addition of new nozzles or openings in a boiler or pressure vessel except those classified as repairs;
4. a change in the dimensions or contour of a pressure vessel;
5. in a boiler, an increase in any heating surface;
6. the addition of a pressurized jacket to a pressure vessel;
7. replacement of a pressure retaining part in a pressure vessel or boiler with a material of different nominal strength or nominal composition from that used in the original design.