U.S. NUCLEAR REGULATORY COMMISSION

REGULATORY GUIDE

OFFICE OF STANDARDS DEVELOPMENT

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REGULATORY GUIDE 1.85

CODE CASE ACCEPTABILITY ASME SECTION III MATERIALS

A. INTRODUCTION

Section 50.55a, "Codes and Standards," of 10 CFR Part 50, "Licensing of Production and Utilization Facilities," requires, in part, that components of the reactor coolant pressure boundary be designed, fabricated, erected, and tested in accordance with the requirements for Class 1 components of Section III, "Nuclear Power Plant Components,"* of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code or equivalent quality standards. Footnote 6 to Section 50.55a states that the use of specific Code Cases may be authorized by the Commission upon request pursuant to §50.55a(a)(2)(ii), which requires that proposed alternatives to the described requirements or portions thereof provide an acceptable level of quality and safety.

General Design Criterion 1, "Quality Standards and Records," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50 requires, in part, that structures, systems, and components important to safety be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety function to be performed. Where generally recognized codes and standards are used, Criterion 1 requires that they be identified and evaluated to determine their applicability, adequacy, and sufficiency and be supplemented or modified as necessary to assure a quality product in keeping with the required safety function.

Criterion 30, "Quality of Reactor Coolant Pressure Boundary," of the same appendix requires, in part, that components which are part of the reactor coolant pressure boundary be designed, fabricated, erected, and tested to the highest quality standards practical.

Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50 requires, in part, that measures be established for the control of special processing of materials and that proper testing be performed.

This regulatory guide lists those Section III ASME Code Cases oriented to materials and testing that are generally acceptable to the NRC staff for implementation in the licensing of light-water-cooled nuclear power plants.

B. DISCUSSION

The Boiler and Pressure Vessel Committee of the ASME publishes a document entitled "Code Cases."* Generally, the individual Code Cases that make up this document explain the intent of Code rules or provide for alternative requirements under special circumstances.

Most Code Cases are eventually superseded by revision to the Code and then are annulled by action of the ASME Council. In such cases the intent of the annulled Code Case becomes part of the revised Code, and therefore, continued use of the Code Case intent is sanctioned under the rules of the Code. In other cases the Code Case is annulled because it is no longer acceptable or there is no further requirement for it. A Code Case that was approved for a particular situation and not for a generic application should be used only for construction of the approved situation, because annulment of such a Code Case could result in construction that would not meet Code requirements.

The Code Cases listed in this guide are limited to those cases applicable to Section III that are oriented toward materials and testing.

All published Code Cases in the area of materials and testing that are applicable to Section III of the Code and were in effect on September 1, 1974, were reviewed for

*Copies may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, New York 10017.

USNRC REGULATORY GUIDES

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Comments and suggestions for improvements in these guides are encouraged at all times, and guides will be revised, as appropriate, to accommodate comments and to reflect new information or experience. This guide was revised as a result of substantive comments received from the public and additional staff review.

Comments should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Section.

The guides are issued in the following ten broad divisions:

1. Power Reactors
2. Research and Test Reactors
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4. Environmental and Siting
5. Materials and Plant Protection
6. Products
7. Transportation
8. Occupational Health
9. Antitrust Review
10. General

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inclusion in this guide. In addition to the listing of acceptable Code Cases, this revision of the guide includes listings of (1) Code Cases that were identified as acceptable in a prior version of this regulatory guide and that were annulled after the original issuance of this guide (June 1974) and (2) Code Cases that were identified as acceptable in a prior version of this regulatory guide and that were superseded by revised Code Cases after the original issuance of this guide (June 1974). Code Cases that are not listed herein are either not endorsed or will require supplementary provisions on an individual basis to attain endorsement status.

The endorsement of a Code Case by this guide constitutes acceptance of its technical position for applications not precluded by regulatory or other requirements or by the recommendations in this or other regulatory guides. Contingent endorsement is indicated in Regulatory Position C.1.a for specific cases. However, it is the responsibility of the user to make certain that no regulatory requirements are violated and that there are no conflicts with other recommended limitations resulting from Code Cases usage.

Acceptance or endorsement by the NRC staff applies only to those Code Cases or Code Case revisions with the date of "Council Approval" as shown in the Regulatory Position of this guide. Earlier or later revisions of a Code Case are not endorsed by this guide. New Code Cases will require evaluation by the NRC staff to determine if they qualify for inclusion in the approved list. Because of the continuing change in the status of Code Cases, it is planned that this guide will require periodic updating to accommodate new Code Cases and any revisions of existing Code Cases.

C. REGULATORY POSITION

1. The Section III ASME Code Cases* listed below (by number, date of Council approval, and title) are acceptable to the NRC staff for application in the construction of components for water-cooled nuclear power plants. Their use is acceptable within the limitations stated in the "Inquiry" and "Reply" sections of each individual Code Case, such NRC or other requirements as may exist, and the additional limitations recommended by the NRC staff given with the individual Code Cases in the list. The categorization of Code Cases used in this guide is intended to facilitate the Code Case listing and is not intended to indicate a limitation on its usage.

a. Materials-oriented Code Cases (Code Case number, date of council approval, and title):

(1) Code Cases involving plate:

1141-1	8/31/61	Foreign Produced Steel
1492	10/29/71	Postweld Heat Treatment, Sections I, III, and VIII, Division 1 and 2
1571	3/3/73	Additional Material for SA-234 Carbon Steel Fittings, Section III
1648	8/12/74	SA-537 Plates for Section III, Class 1, 2, 3, and MC Components

(2) Code Cases involving pipe and tubes:

1423-2	3/9/72	Wrought Type 304 and 316 with Nitrogen Added, Sections I, III, VIII, Division 1 and 2

Code Case 1423-2 is acceptable subject to the conditions established in Regulatory Guides 1.31, "Control of Stainless Steel Welding," and 1.44, "Control of the Use of Sensitized Stainless Steel."

1474-1	10/29/71	Integrally Finned Tubes for Section III
1475-1	3/2/74	Ferritic - Austentic Stainless Steel Seamless Tubes for Section III, Class 2 and 3 Construction
1484-1	4/29/74	SB-163 Nickel-Chromium-Iron Tubing (Alloy 600) at a Specified Minimum Yield Strength of 40.0 ksi, Section III, Class 1
1527	6/6/72	Integrally Finned Tubes, Section III
1529	6/26/72	Materials for Instrument Line Fittings, Section III
1578	6/25/73	SB-167 Nickel-Chromium Iron (Alloy 600) Pipe or Tube, Section III
1602-1	4/29/74	Use of SB-42 Alloy 122, SB-111 Alloy 122, 715, and 706, SB-171 Alloys 715 and 706, and SB-466 Alloys 706 and 715, Section III, Class 2 and 3 Components
1615	12/17/73	Use of A587-73, Section III, Class 3 Construction

(3) Code Cases involving bars and forgings:

1332-6	3/9/72	Requirements for Steel Forgings, Section III and VIII, Division 2
1334-3	4/29/74	Requirements for Corrosion-Resisting Steel Bars and Shapes, Section III

*A numerical listing of the Code Cases appears in the Appendix.

1335-9	4/29/74	Requirements for Bolting Materials, Section III
1337-9	4/29/74	Special Type 403 Modified Forgings or Bars, Section III
1395-3	11/6/72	SA-508, Class 2 Forgings with Modified Manganese Content, Section III or Section VIII, Division 2
1498-1	11/6/72	SA-508 - Class 2 and 3, Minimum Tempering Temperature, Section III
1542-1	4/29/74	Type 403 Forgings or Bars for Bolting Material, Section III
1587	8/13/73	SA-508 - Class 3 Forgings with 0.4/1.0 Ni for Section III and VIII, Division 2 Construction
1605	11/5/73	Cr-Ni-Mo-V Bolting Material for Section III, Class 1 Components
1612	12/17/73	Use of Type 308 Stainless Steel Rod and Bar for Section III, Class 1, 2, 3, and CS Construction
1613	12/17/73	Use of SA-372 Class IV Forgings, Section III Construction
1626	3/2/74	Normalized and Tempered 1 1/4 Cr Low Alloy Steel Forgings, Section I, Section III, and Section VIII, Division 1 and 2
1649	8/12/74	Modified SA 453-GR 660 for Class 1, 2, 3, and CS Construction

(4) Code Cases involving general usage:

1344-5	4/29/74	Nickel-Chromium, Age-Hardenable Alloys, (Alloy X750) Section III
1345-2	3/9/72	Requirements for Nickel-Molybdenum-Chromium-Iron Alloys, Section III
1434-1	3/9/72	Postweld Heat Treatment of SA-487 Class 8N Steel Castings, Section III
1521-1	4/29/74	Use of H-Grades of SA-240, SA-479, SA-336, and SA-358, Section III

Code Case 1521-1 is acceptable subject to the conditions established in Regulatory Guides 1.31, "Control of Stainless Steel Welding," and 1.44, "Control of the Use of Sensitized Stainless Steel."

1531	8/14/72	Electrical Penetrations. Special Alloys for Electrical Penetration Seals. Section III
1532	8/14/72	Section III, Class 3 Components Made of 8 Percent and 9 Percent Nickel Steel
1557-2	12/17/73	Steel Products Refined by Secondary Remelting
1567	3/3/73	Testing Lots of Carbon and Low Alloy Steel Covered Electrodes. Section III
1568	3/3/73	Testing Lots of Flux Cored and Fabricated Carbon and Low Alloy Steel Welding Electrodes. Section III
1583	6/25/73	Use of 80-40 Carbon Steel Castings, Section III
1590	8/13/73	Chemical Analysis Variations. Section III Construction
1608-1	12/17/73	Use of ASME SB-265, SB-337, SB-338, SB-348, and SB-381, Grades 1, 2, 3, and 7 Unalloyed Titanium and ASTM B-363 Titanium Welding Fittings. Section III, Classes 2 and 3 Components
1618	3/2/74	Material for Core Support Structures - Section III, Subsection NG

Code Case 1618 is acceptable subject to the following conditions in addition to those specified in the Code Case:

(1) Welding of age hardenable alloy SA-453 Grade 660 and SA-637 Grade 688 should be performed when the material is in the solution-treated condition.

(2) Use of alloy ASTM A-564 Grade 631 is not acceptable on a generic basis.

1622	3/2/74	PWHT of Repair Welds in Carbon Steel Castings, Section III, Class 1, 2, and 3
1644	8/12/74	Additional Materials for Component Supports - Section III, Subsection NF, Class 1, 2, 3, and MC Construction

Code Case 1644 is acceptable subject to the following condition in addition to those specified in the Code Case: The maximum measured ulti-

mate tensile strength of the component support material should not exceed 170 Ksi.

1645	8/12/74	Use of DeLong Diagram for Calculating the Delta Ferrite Content of Welds in Section III, Class 1, 2, and CS Construction
1650	8/12/74	Use of SA-414, Grade C for Class 2 and 3 Components, Section III

b. Testing-oriented Code Cases (Code Case number, date of council approval, and title):

(1) Code Cases involving plates:

1407-3	7/1/74	Time of Examination for Classes 1, 2, and 3, Section III Vessels
1456-2	6/25/73	Substitution of Ultrasonic Examination for Progressive Penetrant or Magnetic Particle Examinations of Partial Penetration and Oblique Nozzle Attachment Welds, Section III
1625	3/2/74	Repairs of Section III, Class 2 and 3 Tanks

(2) Code Cases involving bars and forgings:

1515	3/9/72	Ultrasonic Examination of Ring Forgings for Shell Sections, Section III, Class 1 Vessels

(3) Code Cases involving pipe and tubes:

1616	12/17/73	Ultrasonic Examination of Seamless Austenitic Steel Pipe, Section III, Class 1 Construction
1634-1	8/12/74	Use of SB-359 for Section III, Class 3 Construction

2. Code Cases that were endorsed by the NRC in a prior version of this guide and were later annulled by action of the ASME Council should be considered as deleted from the list of acceptable Code Cases as of the date of the ASME Council action that approved the annulment. Such Code Cases that were annulled on or after July 1, 1974, are listed in the following by number, date of Council action, and title.*

1603	7/1/74	Toughness Tests When Cross-Section Limits Orientation and Location of Specimens

*Code Cases 1401-1, 1493-1, and 1599, which were listed in the original issue of this guide, were annulled by Council action prior to July 1, 1974.

3. Code Cases that were endorsed by the NRC in a prior version of this guide and were superceded by revised Code Cases on or after July 1, 1974, should be considered as not endorsed as of the date of the Council action that approved the revised version of the Code Cases. These Code Cases that are no longer endorsed are listed in the following by number, date of Council action that approved the new revision of the particular Code Case and thus specifies the date when the Code Case no longer has NRC endorsement, and title.**

1407-2	7/1/74	Time of Examination for Class 1, 2, and 3, Section III Vessels
1634	8/12/74	Use of SB-359 for Section III, Class 3 Construction

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants regarding the utilization of this regulatory guide.

1. Except for those Code Cases that have been annulled by action of the ASME Council, the Code Cases listed in this guide under Regulatory Position C.1. may be used by the applicant in complying with the Commission's regulations.

2. Components ordered to a specific version of a Code Case need not be changed because a subsequent revision to the Code Case is listed as the approved version in this guide.

3. Components ordered to a Code Case that was previously approved for use need not be changed because the Code Case has been subsequently annulled.

4. Code Cases on the approved list may be applied to components that were in process of construction prior to the effective date of the Code Case within the limits specified in the Code Case and applicable regulations or recommended in other regulatory guides.

5. Code Cases for Class 1 components that are not on the approved list of this or other regulatory guides, or for which authorization by the Commission has not been granted, should be considered not acceptable on a generic basis for Class 1 components.

6. Code Cases for other classes of components that are not on the approved list of this or other regulatory guides should not be considered acceptable on a generic basis.

**Code Cases 1344-2, 1337-7, 1344-3, 1484, 1521, and 1542, which were listed in the original issue of this guide, were revised by the ASME prior to July 1, 1974.

APPENDIX

NUMERICAL LISTING OF CODE CASES

1141-1	1515	1608-1
1332-6	1521-1	1612
1334-3	1527	1613
1335-9	1529	1615
1337-9	1531	1616
1344-5	1532	1618
1345-2	1542-1	1622
1395-3	1557-2	1624
1407-3	1567	1625
1423-2	1568	1626
1434-1	1571	1634-1
1456-2	1578	1644
1474-1	1583	1645
1475-1	1587	1648
1484-1	1590	1649
1492	1602-1	1650
1498-1	1605	