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U.S. ATOMIC ENERGY COMMISSION

REGULATORY GUIDE

DIRECTORATE OF REGULATORY STANDARDS

REGULATORY GUIDE 1.84

CODE CASE ACCEPTABILITY ASME SECTION III DESIGN AND FABRICATION

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,"[1] 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 design and fabrication which are generally acceptable to the AEC Regulatory 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 documents entitled "Interpretations of the ASME Boiler and Pressure Vessel Code."[1] These documents, referred to as "Code Cases," explain the intent of Code rules or provide Code permission to use alternative requirements under special circumstances or with suitable precautions. Most Code Cases are eventually superseded by revision to the Code and then are annulled by action of the ASME Council.

The Code Cases listed in this guide are limited strictly to those applicable to Section III which are oriented toward design and fabrication.

All published Code Cases in the area of design and fabrication which are applicable to Section III of the Code and were in effect on November 5, 1973 were reviewed for inclusion in this guide. Code Cases which 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

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

USAEC REGULATORY GUIDES

Regulatory Guides are issued to describe and make available to the public methods acceptable to the AEC Regulatory staff of implementing specific parts of the Commission's regulations, to delineate techniques used by the staff in evaluating specific problems or postulated accidents, or to provide guidance to applicants. Regulatory Guides are not substitutes for regulations and compliance with them is not required. Methods and solutions different from those set out in the guides will be acceptable if they provide a basis for the findings requisite to the issuance or continuance of a permit or license by the Commission.

Published guides will be revised periodically, as appropriate, to accommodate comments and to reflect new information or experience.

Copies of published guides may be obtained by request indicating the divisions desired to the U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Director of Regulatory Standards. Comments and suggestions for improvements in these guides are encouraged and should be sent to the Secretary of the Commission, U.S. Atomic Energy Commission, Washington, D.C. 20545, Attention: Chief, Public Proceedings Staff.

The guides are issued in the following ten broad divisions:

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

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.c 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 Case usage.

The acceptance or endorsement by the Regulatory 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 as they are issued or future revisions of existing Code Cases will require evaluation by the Regulatory 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[2] listed in the following by number, title, and date of Council approval are acceptable to the Regulatory 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 Regulatory or other requirements as may exist, and the additional limitations recommended by the Regulatory staff given with the individual code cases in the list.

a. Design-Oriented Code Cases With Title and Date of Council Approval

(1) Code Cases Applicable to Piping Design

1477-1	3-9-72	Use of 1970 Addenda of ANSI B31.7 "Nuclear Power Piping"
1506	12-13-71	Stress Intensification Factors, Section III, Class 2 & 3 Piping
1601	11-5-73	Limits of Reinforcement for Two-thirds Area, Section III Class 1
1606	11-5-73	Stress Criteria for Section III Classes 2 and 3 Piping Subjected to Upset, Emergency, and Faulted Conditions
1614	11-5-73	Hydrostatic Testing of Piping Prior to or Following the Installation of Spray Nozzles for Section III, Classes 1, 2, and 3 Piping Systems

[2]These Code Cases are listed numerically in the Appendix to this guide.

(2) Code Cases Applicable to Valve Design

1533	6-14-72	Pressure Temperature Ratings of SA-351 Grades CF8A, CF3, and CF3M, Section III
1534	11-6-72	Overpressurization of Valves, Section III
1539	11-6-72	Metal Bellows and Metal Diaphragm Stem Sealed Valves, Section III, Classes 1, 2, and 3.
1540-1	3-3-73	Elastomer Diaphragm Valves Section III, Classes 2 and 3
1552	12-18-72	Design by Analysis of Section III Class 1 Valves
1555	12-18-72	Certification of Safety Relief Valves on Liquids
1573	4-30-73	Vacuum Relief Valves, Section III
1574	4-30-73	Hydrostatic Test Pressure for Safety Relief Valves, Section III, Classes 1, 2, and 3
1581	6-25-73	Power-Operated Pressure Relief Valves Section III, Class 1

(3) Other Code Cases Related to Design

1470-2	12-18-72	External Pressure Charts for High-Strength Carbon Steels and for Low-Alloy Steels
1508	12-13-71	Allowable Stresses, Design Stress Intensity, and/or Yield Strength Values of Section I, III, and VIII, Division 1 and 2
1536	8-14-72	Closing Seam for Electrical Penetration for Section III, Classes 2, 3, and MC
1575	4-30-73	Hub-to-Flange Fillet Radius for Bolted Flanges with Nut Stop
1607	11-5-73	Stress Criteria for Section III, Classes 2 and 3 Vessels Subjected to Upset, Emergency, and Faulted Operating Conditions

b. Fabrication-Oriented Code Cases with Dates of Council Approval

(1) Code Cases Related to Welding

1461	3-9-72	Electron Beam Welding, Sections I, III, VIII
1471-1	3-9-72	Vacuum Electron Beam Welding of Tube Sheet Joints
1494-1	3-3-73	Weld Procedure Qualification Tests, Section III
1516-1	6-25-73	Welding of Seats in Valves for Section III Applications
1554	3-3-73	Post-weld Heat Treatment of P-number 1 and P-number 12A, Subgroup 1 Longitudinal Welds, Section III Classes 1, 2, and 3 components
1580-1	11-5-73	Figure NB-4233-1(a), Section III

(2) Other Code Cases Related to Fabrication

1535-2	4-30-73	Hydrostatic Testing of Section III Class 1 valves
1541-1	8-13-73	Hydrostatic Testing of Embedded Class 2 and Class 3 Piping for Section III construction
1553	12-18-72	Upset Heading and Roll Threading of SA-453 for High-Temperature Bolting, Section III, Classes 1, 2, 3, and MC
1588	8-13-73	Electro-Etching of Section III Code Symbols

c. Code Cases with Contingent Approval

1355-3	3-9-72	Electroslag Welding, Section 1, III, and VIII, Division 1 and 2

This code case is approved subject to the conditions established in Regulatory Guide 1.34, "Control of Electroslag Weld Properties."

1361	3-9-72	Socket Welds, Section III

This code case is approved when used in connection with Section III, paragraph NB-3356, Fillet Welds.

1569	3-3-72	Design of Piping for Pressure Relief Valve Station

This code case is approved subject to the conditions established in Regulatory Guide 1.67, "Installation of Overpressure Devices."

2. Code Cases that are annulled by action of the ASME Council should be considered as deleted from the approved list as of the date of the ASME Council action.

D. IMPLEMENTATION

The following guidance is provided for the implementation of Section III ASME Code Cases involving materials and testing.

1. The effective date of this guide is July 1, 1974.

2. This listing of Code Cases is applicable after the effective date of this guide unless a particular Code Case has been annulled by action of the ASME Council.

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

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

5. Code Cases for Class 1 components which are not on the approved list of this guide or other regulatory guides, or for which authorization by the Commission has not been granted, are not acceptable on a generic basis for Class 1 components. Special authorization may be granted for individual cases upon special request to the Commission.

6. Code Cases for other Classes of components which are not on the approved list of this guide or other regulatory guides, or for which authorization by the Commission has not been granted, should not be considered acceptable on a generic basis. Special authorization may be granted for individual cases upon special request to the Commission.

APPENDIX

Numerical Listing of Code Cases

1355-3
1361-2
1461-1
1470-2
1471-1
1477-1
1494-1
1506
1508
1516-1
1533
1534
1535-2
1536
1539
1540-1
1541-1
1552
1553
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1580-1
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APPENDIX

NUMERICAL LISTING OF CODE CASES

1361-2	1541-1	1623
1461-1	1552	1625
1470-2	1553	1633
1471-1	1555	1635-1
1477-1	1569	1636-1
1494-1	1573	1651
1506	1574	
1508	1580-1	
1516-1	1581	
1533	1588	
1535-2	1606	
1536	1607	
1539	1614	
1540-1	1620	