



# REGULATORY GUIDE

## OFFICE OF NUCLEAR REGULATORY RESEARCH

### REGULATORY GUIDE 1.85

#### MATERIALS CODE CASE ACCEPTABILITY ASME SECTION III DIVISION 1

#### A. INTRODUCTION

Section 50.55a, "Codes and Standards," of 10 CFR Part 50, "Domestic 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,"<sup>1</sup> of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code or equivalent quality standards. Footnote 6 to §50.55a states that the use of specific Code Cases may be authorized by the Commission upon request pursuant to §50.55a(a)(3), 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 ensure 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 that 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.

This regulatory guide contains no information collection activities and, therefore, is not subject to the requirements of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.).

#### B. DISCUSSION

The Boiler and Pressure Vessel Committee of the ASME publishes a document entitled "Code Cases."<sup>1</sup> Generally, the individual Code Cases that make up this

<sup>1</sup>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

Regulatory Guides are issued to describe and make available to the public such information as methods acceptable to the NRC staff for implementing specific parts of the Commission's regulations, techniques used by the staff in evaluating specific problems or postulated accidents, and data needed by the NRC staff in its review of applications for permits and licenses. 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.

This guide was issued after consideration of comments received from the public. 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.

Written comments may be submitted to the Rules Review and Directives Branch, DFIPS, ADM, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

The guides are issued in the following ten broad divisions:

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. Power Reactors                 | 6. Products                       |
| 2. Research and Test Reactors     | 7. Transportation                 |
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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. 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 July 28, 1992, were reviewed for 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 Case usage.

Acceptance or endorsement by the NRC staff applies only to those Code Cases or Code Case revisions with the date of ASME 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. ACCEPTABLE CODE CASES

The Section III ASME Code Cases<sup>2</sup> listed below (by number, date of ASME approval, and title) are acceptable to the NRC staff for application in the construction of components for light-water-cooled nuclear power plants. Their use is acceptable within the limitations stated in the "Inquiry" and "Reply" sections of each individual Code Case, within the limitations of such NRC or other requirements as may exist, and within the additional limitations recommended by the NRC staff given with the individual Code Cases in the listing. 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 ASME approval,<sup>3</sup> and title):

#### (1) Code Cases involving plate:

N-7-1	12-13-82	High Yield Strength Steel,
	02-20-86	Section III, Division 1, Class 1
	02-20-89	Vessels
	02-05-92	

Code Case N-7-1 is acceptable subject to the following condition in addition to those conditions specified in the Code Case: The information required to be developed by Note 1 in the Code Case should be provided in each referencing Safety Analysis Report.

#### (2) Code Cases involving pipe and tubes:

N-20-3	11-30-88	SB-163 Nickel-Chromium-
	12-16-91	Iron Tubing (Alloy 600 and 690) and Nickel-Iron-Chromium Alloy 800 at a Specified Minimum Yield Strength of 40.0 Ksi and Cold Worked Alloy 800 at a yield strength of 47.0 Ksi, Section III, Division 1, Class 1
N-188-1	05-15-78	Use of Welded Ni-Fe-Cr-Mo-
	07-13-81	Cu (Alloy 825) and Ni-Cr-
	07-13-84	Mo-Cb (Alloy 625) Tubing,
	07-13-87	Section III, Division 1, Class 2
	08-14-90	and 3

<sup>2</sup>A numerical listing of the Code Cases appears in the appendix.

<sup>3</sup>When more than one date is given, the earlier date is that on which the Code Case was approved by the ASME, and the later date(s) is that on which the Code Case was reaffirmed by the ASME.

\*Lines indicate substantive changes from Revision 29.

N-294 08-25-80 SB-148 Alloy 952 and 954,  
05-25-83 and SB-62 Alloy 836 Fittings,  
07-30-86 Section III, Division 1, Class 2  
07-30-89  
N-379-1 07-18-85 Bimetallic Tubing Section III,  
07-18-88 Division 1, Class 1  
03-14-91  
N-404 04-05-84 Annealed Alloy UNS N06625  
04-05-87 Over UNS N06600 Bimetallic  
12-11-89 Tubing, Section III, Division  
1, Class 1

Code Case N-404 is acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The outside layer of the bimetallic tubing should be limited to a minimum of 5 percent and to a maximum of 40 percent of the wall thickness. The tolerance on the outside layer of material should not exceed -0.000 to +0.007 inches of the specified design wall thickness.

N-418-1 07-30-86 Use of Seamless Ni-Fe-Cr-  
07-30-89 Mo-Cu Low Carbon (UNS  
N08028 and UNS N08904)  
Tubing, Section III, Division  
1, Classes 2 and 3  
N-439 02-23-87 Use of 20Cr-18Ni-6Mo (Alloy  
12-11-89 UNS S31254) Forgings, Plate,  
Seamless and Welded Pipe,  
and Welded Tube, Class 2  
and 3 Construction, Section  
III, Division 1  
N-441 02-23-87 Use of 20Cr-18Ni-6Mo (Alloy  
12-11-89 UNS S31254) Fittings, Class 2  
and 3 Construction, Section  
III, Division 1  
N-466-1 04-30-90 Modified 9Cr-1Mo Material,  
Section III, Division 1,  
Classes 1, 2, and 3  
N-502 02-05-92 SA-268, Grade 26-3-3 (UNS  
S44660) Section III, Division  
1, Classes 2 and 3

### (3) Codes Cases involving bars and forgings:

1337-11 05-15-78 Special Type 403 Modified  
(N-4-11) 07-13-81 Forgings or Bars, Section III,  
07-13-84 Division 1, Class 1 and CS  
07-13-87  
08-14-90  
N-370-2 12-05-85 Modified SA-705 Grade  
12-05-88 XM-13 Forgings, Section III,  
12-16-91 Division 1

N-469 03-08-89 Martensitic Stainless Steel for  
04-30-92 Class 1, 2, and 3 Compon-  
ents, Section III, Division 1  
N-482 03-05-90 Direct Quenched Stainless  
Bar, ASTM A 479-88b, Sec-  
tion III, Division I

### (4) Code Cases involving general usage:

N-60-4 05-13-91 Material for Core Support  
Structures, Section III, Divi-  
sion 1

Code Case N-60-4 is acceptable subject to the following condition in addition to those conditions specified in the Code Case: 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. The maximum yield strength of strain-hardened austenitic stainless steel should not exceed 90,000 psi in view of the susceptibility of this material to environmental cracking.

N-71-15 12-16-86 Additional Materials for Sub-  
12-16-89 section NF, Classes 1, 2, 3  
and MC Component Supports  
Fabricated by Welding, Sec-  
tion III, Division 1

Code Case N-71-15 is acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service. In the last sentence of paragraph 5.3, reference should be made to paragraph 4.5.2.2, "Alternate Atmosphere Exposure Time Periods Established by Test," of the AWS D.1.1 Code for the evidence presented to and accepted by the Authorized Inspector concerning exposure of electrodes for longer periods of time. Paragraph 16.2.2 is not acceptable as written and should be replaced with the following: When not exempted by 16.2.1, above, the postweld heat treatment

shall be performed in accordance with NF-4622 except that for ASTM A-710 Grade A material, it shall be at least 1000°F (540°C) and shall not exceed 1150°F (620°C) for Class 1 and Class 2 material and 1175°F (640°C) for Class 3 material. The new holding time at temperature for weld thickness (nominal) shall be 30 minutes for 1/2 inch or less, 1 hour per inch for thickness over 1/2 inch to 5 inches, and 5 hours plus 15 minutes for each additional inch over 5 inches. The fracture toughness requirements as listed in this Code Case apply only to piping supports and not to Class 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports shall be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis.

1759-1 05-15-78 Material for Internal Pressure  
(N-131-1) 07-13-81 Retaining Items for Pressure  
12-11-81 Relief Valves, Section III,  
12-05-84 Division 1, Class 1, 2, and 3  
12-05-87  
12-03-90

Code Case 1759-1 is acceptable subject to the following condition in addition to those conditions specified in the Code Case: Applicants using this Case should also use Code Case 1711 for the design of pressure relief valves.

N-205 05-15-78 Use of Ductile Iron SA-395  
07-13-81 for Section III, Division 1,  
07-13-84 Class 3 Construction  
07-13-87  
08-14-90  
N-246-2 05-25-83 SB-169, Alloy C61400, Sec-  
07-30-86 tion III, Division 1, Class 3  
07-30-89  
07-27-92  
N-249-11 05-13-91 Additional Material for Sub-  
section NF, Classes 1, 2, 3,  
and MC Component Supports  
Fabricated Without Welding,  
Section III, Division 1.

Code Case N-249-11 is acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The fracture toughness requirements apply only to piping supports and not to Classes 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports should be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis. The following is to be added to paragraph (e) of the Case: For these cases, it should be demonstrated by the owner that (1) the impact test results for the material meet

Code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

N-265-1 05-19-85 Modified SA-487 Castings,  
05-19-88 Section III, Division 1, Class 1  
N-337-1 07-18-85 Use of ASTM B525-70 Grade  
07-18-88 II, Type II, Sintered Austen-  
03-14-91 itic Stainless Steel for Class 2,  
3, and MC Component Stan-  
dard Supports, Section III,  
Division 1  
N-348-2 08-14-90 Use of SA-574 Socket Head  
Cap Screws, Section III, Divi-  
sion 1

Code Case N-348-2 is acceptable subject to the following condition in addition to those conditions specified in the Code Case: Applicants should justify in their Safety Analysis Reports why use of these socket head cap screws will not result in early failure from stress corrosion cracking.

N-438-3 07-27-92 UNS NO8367 Material, Sec-  
tion III, Division 1, Class 2  
and 3 Construction  
N-440 02-23-87 Use of 20Cr-18Ni-6Mo (Al-  
12-11-89 loy UNS J93254) Castings,  
Class 2 and 3 Construction,  
Section III, Division 1  
N-443-1 03-08-89 High Yield Strength Cr-Mo  
04-30-92 Steel, Class 1 Components,  
Section III, Division 1  
N-459 05-04-88 SA-508 Basic Oxygen-Ladle  
03-14-91 Furnace Process for Code  
Construction, Section III, Divi-  
sion 1  
N-474-1 03-05-90 Design Stress Intensities and  
Yield Strength Values for  
UNS N06690 With a Mini-  
mum Specified Yield Strength  
of 35 ksi, Class 1 Compo-  
nents, Section III, Division 1  
N-475 12-11-89 Materials in Inventory, Sec-  
tion III, Division 1  
N-492 12-03-90 Grade 9 Titanium Alloy, Sec-  
tion III, Division 1, Class 1, 2,  
and 3  
N-497 05-13-91 Use of Fe-Ni-Cr-Mo-N  
(CN-3MN) Cast Materials,  
Section III, Division 1, Class 2  
and 3 Construction

b. Testing-oriented Code Cases:

(1) Code Case involving plates:

(2) Code Case involving bars and forgings:

N-329 12-11-81 Examination of Bar Material,  
12-05-84 Section III, Division 1, Class 1  
12-05-87  
12-03-90

(3) Code Case involving pipe and tubes:

(4) Code Case involving general usage:

N-351 07-16-82 Use of Subsize Charpy  
05-19-85 V-Notch Specimens, Section  
05-19-88 III, Division 1  
03-14-91

N-484-1 12-16-91 Real Time Radioscopic Exam-  
ination of Welds, Class 1  
Components, Section III,  
Division 1

N-501 07-27-92 Alternative Rules to NCA-  
3800, 1990 Addenda Section  
III, Division 1

N-5-1	12-13-82	Nickel Chromium Age Hard-
	12-13-85	enable Alloys (Alloy X750),
		Section III, Division 1,
		Classes 1, 2, 3, MC, and CS
1345-2	03-09-72	Requirements for Nickel-
(N-6)	03-01-79	Molybdenum-Chromium-Iron
		Alloys, Section III
1395-4	01-08-79	SA-508, Class 2 Forgings with
(N-9-4)	07-01-82	Modified Manganese Con-
		tent, Section III
1407-3	07-01-74	Time of Examination for
(N-10)	01-08-79	Classes 1, 2, and 3, Sec-
	01-21-82	tion III Vessels
	09-17-84	
	09-17-87	
1412-4	11-03-75	Modified High Yield Strength
	01-01-77	Steel for Section III, Division
		1, Class 1 Vessels

Code Case 1412-4 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The information required to be developed by Note 1 in the Code Case should be provided in each referencing Safety Analysis Report. The material given in the Inquiry section of the Code Case should be SA-508, Class 4b, instead of SA-508, Class 4.

## 2. ANNULLED CODE CASES

Code Cases that were endorsed by the NRC in a prior version of this guide and were later annulled by action of the ASME should be considered as deleted from the list of acceptable Code Cases as of the date of the ASME action that approved the annulment. Such Code Cases that were annulled on or after July 1, 1974, are listed in the following by number, effective dates,<sup>4</sup> and title.<sup>5</sup>

1141-1	08-31-61	Foreign Produced Steel
	07-23-76	
1332-7	01-08-79	Requirements for Steel Forg-
(N-1-7)	07-01-82	ings, Section III, Division 1
1334-3	04-29-74	Requirements for Corrosion-
(N-2)	01-08-79	Resisting Steel Bars and
	01-01-81	Shapes, Section III
1335-10	08-28-78	Requirements for Bolting
(N-3-10)	08-28-81	Materials, Section III
	09-16-84	

1414-5	08-29-77	High Yield Strength Cr-Mo
(N-11-5)	08-29-80	Steel for Section III, Division
		1, Class 1 Vessels

Code Case 1414-5 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The information required to be developed by Note 1 in the Code Case should be provided in each referencing Safety Analysis Report.

1423-2	03-09-72	Wrought Type 304 and 316
	07-01-77	with Nitrogen Added, Sec-
		tions I, III, VIII, Division 1
		and 2

Code Case 1423-2 was acceptable subject to compliance with the recommendations contained in Regulatory Guides 1.31, "Control of Ferrite Content in Stainless Steel Weld Metal," and 1.44, "Control of the Use of Sensitized Stainless Steel."

1434-1	03-09-72	Postweld Heat Treatment of
	01-01-78	SA-487 Class 8N Steel
		Castings, Section III
1456-2	06-25-73	Substitution of Ultrasonic
(N-15)	03-01-79	Examination for Progressive
		Penetrant or Magnetic Par-
		ticle Examinations of Partial
		Penetration and Oblique
		Nozzle Attachment Welds,
		Section III

<sup>4</sup>Earlier date—date Code Case was approved by ASME; later date—date Code Case was annulled. Where more than two dates appear, the last date is the date that the Code Case was annulled. The middle date (or dates) was the date of reaffirmation of the Code Case.

<sup>5</sup>Code Cases 1401-1, 1493-1, and 1599, which were listed in the original issue of this guide, were annulled by ASME action prior to July 1, 1974.

1474-1 (N-17)	10-29-71 01-08-79 01-21-82 01-21-85 01-21-88 01-21-91	Integrally Finned Tubes for Section III	1542-1 (N-33)	04-29-74 01-08-79 01-21-82 01-21-85	Type 403 Forgings or Bars for Bolting Material, Section III
1475-1 <sup>6</sup>	03-02-74 07-01-75	Ferritic-Austenitic Stainless Steel Seamless Tubes for Section III, Class 2 and 3 Construction	1557-3 (N-37-3)	01-08-79 07-01-82	Steel Products Refined by Secondary Remelting, Section III and VIII, Division 1 and 2
1498-1 (N-22)	11-06-72 01-08-79 07-01-82	SA-508-Class 2 and 3, Minimum Tempering Tem- perature, Section III	1567	03-03-73 01-01-78	Testing Lots of Carbon and Low Alloy Steel Covered Electrodes, Section III
1515	03-09-72 07-01-77	Ultrasonic Examination of Ring Forgings for Shell Sections, Section III, Class 1 Vessels	1568	03-03-73 01-01-78	Testing Lots of Flux Cored and Fabricated Carbon and Low Alloy Steel Welding Electrodes, Section III
1521-1	04-29-74 01-01-78	Use of H-Grades of SA-240, SA-479, SA-336, and SA- 358, Section III	1571 (N-41)	03-03-73 01-08-79 01-21-82 01-21-85	Additional Material for SA-234 Carbon Steel Fittings, Section III
Code Case 1521-1 was acceptable subject to com- pliance with the recommendations contained in Regulatory Guides 1.31, "Control of Ferrite Con- tent in Stainless Steel Weld Metal," and 1.44, "Control of the Use of Sensitized Stainless Steel."			1578 (N-43)	06-25-73 01-08-79 07-01-82	SB-167 Nickel-Chromium- Iron (Alloy 600) Pipe or Tube, Section III
1527 (N-26)	06-26-72 <sup>7</sup> 01-08-79 01-21-82 01-21-85 01-21-88 01-21-91	Integrally Finned Tubes, Section III	1583	06-25-73 03-21-77	Use of 80-40 Carbon Steel Castings, Section III
1528-3	11-03-75 01-01-78	High Strength Steel SA-508, Class 2 and SA-541, Class 2 Forgings, Section III, Class 1 Components	1587 <sup>6</sup>	08-13-73 12-31-75	SA-508 Class 3 Forgings with 0.4/1.0 Ni for Section III and VIII, Division 2 Construction
Code Case 1528-3 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The information re- quired to be developed by Note 1 in the Code Case should be provided in each referencing Safety Analysis Report.			1590	08-13-73 03-21-77	Chemical Analysis Variations, Section III Construction
1529 <sup>6</sup>	06-29-72 07-01-73	Materials for Instrument Line Fittings, Section III	1602-1	04-29-74 12-31-74	Use of SB-42 Alloy 122, SB-111 Alloys 122, 715 and 706, SB-171 Alloys 715 and 706 and SB-466 Alloys 706 and 715, Section III, Class 2 and 3 Components
1531	08-14-72 03-21-77	Electrical Penetrations, Spe- cial Alloys for Electrical Penetration Seals, Section III	1603	12-17-73 07-01-74	Toughness Tests When Cross- Section Limits Orientation and Location of Specimens
1532	08-14-72 01-01-78	Section III, Class 3 Compo- nents Made of 8 Percent and 9 Percent Nickel Steel	1605	11-05-73 11-20-78 03-17-80	Cr-Ni-Mo-V Bolting Material for Section III, Class 1 Com- ponents
			1608-1	12-17-73 03-21-77	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 Weld- ing Fittings, Section III Class 2 and 3 Components
			1612 (N-56)	12-17-73 07-01-78	Use of Type 308 Stainless Steel Rod and Bar for Section III, Class 1, 2, 3, and CS Construction
			1613	12-17-73 01-01-78	Use of SA-372 Class IV Forg- ings, Section III Construction
			1615	12-17-73 01-01-78	Use of A587-73, Section III, Class 3 Construction

<sup>6</sup>Code Case was annulled on date as indicated, but the annul-  
ment was first so indicated in Revision 12 of this guide.

<sup>7</sup>Corrected date.

[illegible]

1748 (N-125)	03-01-76 07-01-78	Low Carbon Austenitic Stainless Steel Pipe Welded With Filler Metal, Section III, Division 1, Construction	1794 (N-157)	01-14-77 01-07-80 01-07-83	Use of Seamless Al-Br, Alloy CDA 614 Pipe, Section III, Division 1, Class 3
1754 (N-126)	01-14-77 01-07-80 12-13-82 02-20-86 12-07-87 07-01-88	Hard Surfacing by the Spray-Fuse Method, Section III, Class 1, 2, and 3 Construction	1795 (N-158)	01-14-77 07-01-78	Examination of Weld Repairs in Forgings, Section III, Division 1, Class 1, 2, 3, MC and CS
1755-1 (N-127)	01-14-77 01-07-80 02-14-83 02-20-86 02-20-89 02-20-92	Alternative Rules for Examination of Welds in Piping, Section III, Class 1 and 2 Construction	1798	01-14-77 01-01-78	Use of ASTM A352-75, Grades LCA and LCC, Section III, Division 1, Class 1, 2, and 3
1760	04-26-76 01-01-78	Maximum Dimensions for Isolated Pores in Welds—Class 1 Components, Section III, Division 1	1810	03-03-77 03-03-80	Testing Lots of Carbon Steel Solid, Bare Welding Electrode or Wire, Section III, Division 1, Class 1, 2, 3, MC, and CS
1766	04-26-76 07-01-77	Testing Requirements for Welding Materials, Class 1, 2, 3, MC and CS Construction, Section III, Division 1	1819 <sup>9</sup>	03-23-77 01-01-78	Use of Type XM-19 for Construction, Section III, Division 1, Class 1, 2, 3
1767	04-26-76 01-01-77	Examination of Tubular Products Without Filler Metal—Class 1 Construction, Section III, Division 1	1819-1 <sup>10,11</sup> (N-176-1)	03-23-77 03-23-80 08-25-80 08-25-83	Use of Type XM-19 for Construction, Section III, Division 1, Class 1, 2, and 3
1770 (N-139)	08-13-76 01-01-79	Testing of Electroslag Wire and Flux for Class 1, 2, 3, MC, and CS Construction, Section III, Division 1	1820 (N-177)	03-23-77 03-17-80 02-14-83 01-01-84	Alternative Ultrasonic Examination Technique, Section III, Division 1
1772 (N-140)	08-13-76 08-30-79 07-16-82 12-31-85	Use of SA-453 Bolts in Service Below 800°F Without Stress Rupture Tests, Section III, Division 1	N-178	05-25-77 01-01-80	Use of ASTM B271, CDA 954, Alloy 9C for Class 3 Construction, Section III, Division 1
1773	08-13-76 07-01-77	Use of Other Product Forms of Materials for Valves, Section III, Division 1	N-180	07-11-77 07-01-78	Examination of Springs for Class 1 Component Standard Supports, Section III, Division 1
1777	08-13-76 07-01-77	Use of SA-106, Grade C in Class MC Construction, Section III, Division 1	N-181	07-11-77 07-11-80	Steel Castings Refined by the Argon Decarburization Process, Section III, Division 1, Construction
1781 (N-147)	09-10-76 07-01-78	Use of Modified SA-487 Grade CA6NM, Section III, Division 1, Class 1, 2, 3, MC or CS	N-183	07-11-77 01-01-80	Use of Modified SA-182 Grade F22 for Section III, Division 1, Class 1, 2 and 3 Construction
1782 (N-148)	09-10-76 08-30-79 07-16-82 06-30-83	Use of Copper-Nickel Alloy 962 for Castings, Section III, Division 1, Class 3 Construction	N-190	08-29-77 07-01-78	Use of SA-455 for Class 3 Components, Section III, Division 1
1787	09-10-76 01-01-78	Depth of Weld Repairs for Forgings, Section III, Division 1, Class 1, 2, 3, MC and CS Construction	N-204	03-20-78 01-01-81	Use of Modified SA-508, Class 3, and SA-541, Class 3 for Section III, Division 1, Class 1, 2, and 3 Construction
1793 (N-156)	01-14-77 01-07-80 02-14-83 02-14-86	Structural Steel Rolled Shapes, Section III, Division 1, Class 2, 3, and MC			

<sup>9</sup>This Code Case was reaffirmed as Case 1819-1. See regulatory position 2 for the effective dates.

<sup>10</sup>Case 1819 (N-176) was annulled December 31, 1977. However, it was later reaffirmed to continue providing rules pertaining to external pressure charts.

<sup>11</sup>Code Case N-176-1: The 3-23-80 is an annulment date. This Case was allowed to expire on 3-23-80 because of an administrative error. It was reinstated on 8-25-80 with no technical changes. It is, therefore, considered to be in effect during that lapse in time. The 8-25-83 is the mandatory annulment date. The Case did not appear in Revisions 18-21 of this guide because of the ASME administrative error.



N-206	03-20-78 03-16-81 06-30-83	Use of ASTM B151-75 Copper-Nickel Alloy 706 Rod and Bar for Section III, Division 1, Class 3 Construc- tion
N-207-1	03-19-79 01-21-82 01-21-85	Use of Modified SA-479 Type XM-19 for Section III, Division 1, Class 1, 2, 3, or CS Construction
N-223	11-30-78 11-20-81	Requirements for Stainless Steel Precipitation Hardening, Section III, Division 1, Class MC
N-224-1	05-11-81 04-05-84 04-05-87 04-05-90	Use of ASTM A500 Grade B and ASTM A501 Structural Tubing for Welded Attach- ments for Section III, Class 2, 3, and MC
N-225	11-20-78 01-01-81	Certification and Identifica- tion of Material for Compo- nent Supports, Section III, Division 1
N-227	07-09-79 07-09-82	Examination of Repair Welds, Section III, Class 2 and 3 Tanks
N-242-1	04-10-80 05-06-83 06-30-84	Materials Certification, Sec- tion III, Division 1, Classes 1, 2, 3, MC, and CS Construc- tion

Code Case N-242-1 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: Applicants should identify in their Safety Analysis Reports the components and supports for which the Code Case is being applied and should specify the respective paragraphs of the Code Case.

N-245	07-09-79 07-16-82 07-17-85	Use of ASTM B61-76 and B62-76 Copper Alloy Castings for Section III, Division 1, Class 3 Construction
N-246	07-09-79 09-07-82	Use of SB-169, Alloy CA 614, Section III, Division 1, Class 3
N-248	08-30-79 07-01-80	Alternative Reference Radio- graphs, Section III, Division 1, Classes 1, 2, 3, MC, and CS Construction
N-259	01-07-80 02-14-83 01-01-84	Ni-Cu-Al Bolting Material SB 164 Modified, Section III, Division 1, Class 3

N-265 <sup>12</sup>	01-07-80 09-01-83 12-31-84 05-19-85	Modified SA-487 Castings, Section III, Division 1, Class 1
N-267	01-07-80 07-01-81	Double-Wall Radiography, Section III, Division 1, Class 1 and 2
N-274	03-17-80 09-07-82 06-30-86	Alternative Rules for Exami- nation of Weld Repairs for Section III, Division 1 Con- struction

Code Case N-274 was acceptable subject to the following condition<sup>13</sup> in addition to those conditions specified in the Code Case. Paragraph 6 should be expanded as follows: The ultrasonic examination procedures shall be proven by actual demonstration, to the satisfaction of the Authorized Nuclear Inspector, that the procedures are capable of detecting unacceptable cracks according to Section XI requirements.

N-277	03-17-80 09-17-80	Use of Type XM-19 Austen- itic Stainless Steel for Sec- tion III, Division 1, Class MC Construction
N-295	01-15-81 12-11-81 06-30-82	NCA-1140, Materials, Sec- tion III, Division 1
N-296	11-17-80 12-01-83	Welding Material, Section III, Division 1 Construction
N-298	11-17-80 12-01-83	Examination of Component Supports, Section III, Division 1, Class 1, 2, 3, and MC
N-299-1	07-18-85 02-23-87	Use of Nickel-Chromium- Molybdenum-Columbium Al- loy 625 Forgings, Section III, Division 1, Class 2 and Class 3 Components
N-310-1	08-14-81 07-01-82	Certification of Bolting Mate- rials, Section III, Division 1, Class 1, 2, 3, MC and CS

<sup>12</sup>Code Case N-265 was allowed to expire on 1-7-83 because of an administrative error. It was reinstated on 9-1-83 with no technical changes. The Case is, therefore, considered in effect during that period of time. Again, Code Case N-265 was allowed to expire on 12-31-84 (mandatory annulment date). It was reinstated as N-265-1 on 5-19-85. Because of the circumstances and because there were no changes in the Code Case, the NRC considers that this Case was in effect during the period of 12-31-84 through 5-19-85.

<sup>13</sup>The reason for the conditional acceptance of paragraph 6 is to make certain that there is a qualified ultrasonic testing procedure capable of detecting small flaws and differentiating the small flaws from geometric reflectors. This paragraph does not in any way alter the acceptance criteria as specified in paragraph 3.

Code Case N-310-1 was acceptable subject to the following conditions in addition to those conditions specified in the Code Case: Each applicant who applies the Code Case should indicate in the referencing Safety Analysis Report (1) in what way the bolting does not meet NCA-3800 (or NA-3700), (2) where the bolting will be used in the plant, and (3) how it will be shown that the bolting material properties required by the Equipment Support Design Specification are present in the actual bolting material.

N-317	07-13-81	ASTM A276 Bar Section III, Division 1
N-321-1	12-05-85 12-05-88	Use of Modified SA-249, Grade TP 304, Section III, Division 1, Class 1
N-342	04-02-82 04-02-85	Use of SA-249 and SA-312 Type 317 Stainless Steel, Section III, Division 1, Classes 1, 2, and 3
N-348	09-09-82 09-07-85 <sup>14</sup>	Use of SA-574 Socket Head Cap Screws, Section III, Division 1

Code Case N-348 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: Applicants should justify in their Safety Analysis Reports why use of these socket head cap screws will not result in early failure from stress corrosion cracking.

N-348-1	09-07-85 <sup>14</sup> 02-20-86 02-20-89	Use of SA-574 Socket Head Cap Screws, Section III, Division 1
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Code Case N-348-1 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: Applicants should justify in their Safety Analysis Reports why use of these socket head cap screws will not result in early failure from stress corrosion cracking.

N-352-1	07-18-85 06-30-86	Use of SA-638 Grade 660 Forgings and Bars Below 700°F Without Stress Rupture Tests, Section III, Division 1
N-353	07-16-82 05-19-85 09-05-88	Marking of SA-354 Grade BD Bolting, Section III, Division 1
N-367	02-14-83 02-19-86 02-19-89	SA-372 Type V, Grade 1, Class B, Section III, Division 1

<sup>14</sup>Code Case N-348 was annulled on 9-7-85. It was reinstated as N-348-1 on 2-20-86. Because of the circumstances and because there were no changes in the Code Case, the NRC considers that the Code Case was in effect during the period 9-7-85 through 2-20-86.

N-371-1	07-18-85 07-18-88	12CR-1W-1Mo-1/4V Martensitic Stainless Steel Valve Internals, Section III, Division 1
N-372	02-14-83 12-31-83	SB-163 Ni-Fe-Cr-Mo-Cu Alloy 825 (UNS N08825) Tubing, Section III, Division 1
N-378	10-28-83 10-28-86 <sup>15</sup>	Examination of Piping Support Material, Section III, Division 1, Class 1
N-388	07-25-83 07-30-86 02-23-87	Component Support Bolting, Section III, Division 1, Classes 2, 3, and MC
N-398	02-20-84 02-20-87	Reporting of Charpy-V Notch Test Results, Section III, Division 1

Code Case N-398 is acceptable subject to the following condition in addition to those conditions specified in the Code Case: The Code Case is not acceptable to steam generator or reactor coolant pump supports. Applicants wishing to use this Code Case should indicate in the Safety Analysis Report the component supports to which the case is applied for review on a case-by-case basis.

N-470	03-08-89 03-08-92	Class MC Material Requirements [NE-2121(c)], Section III, Division 1
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### 3. REVISED CODE CASES

Code Cases that were endorsed by the NRC in a prior version of this guide and were superseded by revised Code Cases on or after July 1, 1974, should be considered as not endorsed as of the date of the ASME 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, effective dates,<sup>16</sup> and title.<sup>17</sup>

1332-6	03-09-72 01-08-79	Requirements for Steel Forgings, Section III and VIII, Division 2
1335-9	04-29-74 08-28-78	Requirements for Bolting Materials
1337-9	04-29-74 04-28-75	Special Type 403 Modified Forgings or Bars, Section III
1337-10	04-28-75 05-15-78	Special Type 403 Modified Forgings or Bars, Section III

<sup>15</sup>The annulment date of 12-31-84 that was listed in Revisions 24 and 25 was in error. The annulment date should be 10-28-86.

<sup>16</sup>Earlier date—date Code Case was approved by ASME; later date—date revision of Code Case was approved by ASME.

<sup>17</sup>Code Cases 1334-2, 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.

1344-5 (N-5)	04-29-74 01-08-79 01-21-82 12-13-82	Nickel-Chromium, Hardenable Alloys (Alloy X750), Section III	Age-
1358-5 (N-7)	11-03-75 01-08-79 01-21-82 12-13-82	High Yield Strength Steel, Section III, Division 1, Class 1 Vessels	

Code Case 1358-5 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The information required to be developed by Note 1 in the Code Case should be provided in each referencing Safety Analysis Report.

1395-3	11-06-72 01-08-79	SA-508, Class 2 Forgings with Modified Manganese Con- tent, Section III or Section VIII, Division 2
1407-2	06-26-72 07-01-74	Time of Examination for Class 1, 2, and 3, Section III Vessels
1414-3	11-03-75 03-01-76	High Yield Strength Cr-Mo Steel for Section III, Division 1, Class 1 Vessels

Code Case 1414-3 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The information required to be developed by Note 1 in the Code Case should be provided in each referencing Safety Analysis Report.

1414-4	03-01-76 08-09-77	High Yield Strength Cr-Mo Steel for Section III, Division 1, Class 1 Vessels
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Code Case 1414-4 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The information required to be developed by Note 1 in the Code Case should be provided in each referencing Safety Analysis Report.

1484-1	04-29-74 11-04-74	SB-163 Nickel-Chromium- Iron Tubing (Alloy 600) at a Specified Minimum Yield Strength of 40.0 Ksi, Section III, Class 1
1484-2	11-04-74 08-13-76	SB-163 Nickel-Chromium- Iron Tubing (Alloy 600 and 690) at a Specified Minimum Yield Strength of 40.0 Ksi, Section III, Class 1

1484-3 (N-20)	08-13-76 08-30-79 07-16-82 05-19-85 09-05-85	SB-163 Nickel-Chromium- Iron Tubing (Alloy 600 and 690) and Nickel-Iron- Chromium Alloy 800 at a Specified Minimum Yield Strength of 40.0 Ksi, Section III, Division 1, Class 1
N-20-1	09-05-85 12-07-87	SB-163 Nickel-Chromium- Iron Tubing (Alloy 600 and 690) and Nickel-Iron- Chromium Alloy 800 at a Specified Minimum Yield Strength of 40.0 Ksi, Section III, Division 1, Class 1
N-20-2	12-07-87 11-30-88	SB-163 Nickel-Chromium- Iron Tubing (Alloy 600 and 690) and Nickel-Iron- Chromium Alloy 800 at a Specified Minimum Yield Strength of 40.0 Ksi, and Cold Worked Alloy 800 at a Yield Strength of 47.0 Ksi, Section III, Division 1, Class 1
1492 <sup>18</sup>	10-29-71 03-03-75	Post Weld Heat Treatment, Section I, III and VIII, Division 1 and 2
1557-2	12-17-73 01-08-79	Steel Products Refined by Secondary Remelting
1618	03-02-74 03-03-75	Material for Core Support Structures—Section III, Sub- section NG

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

a. 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.

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

1618-1	03-03-75 03-01-76	Material for Core Support Structures Section III, Sub- section NG
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Code Case 1618-1 was acceptable subject to the following condition in addition to those specified in the Code Case: 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.

1618-2 (N-60)	03-01-76 01-08-79 01-21-82 05-25-83	Material for Core Support Structures—Section III, Divi- sion 1, Subsection NG
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<sup>18</sup>Code Case 1492 is no longer listed by ASME as a Section III Code Case and is therefore deleted from the acceptable listing.

Code Case 1618-2 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: 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.

N-60-1    05-25-83    Material for Core Support  
             09-17-84    Structures, Section III,  
                         Division 1

Code Case N-60-1 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: 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.

N-60-2    09-17-84    Material for Core Support  
             09-05-85    Structures, Section III, Division 1

Code Case N-60-2 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: 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. For SA-479 material, the maximum yield strength should not exceed 90,000 psi in view of the susceptibility of this material to environmental cracking.

N-60-3    09-05-85    Material for Core Support  
             07-27-88    Structures, Section III, Division 1  
             05-13-91

Code Case N-60-3 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: 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. For SA-479 material, the maximum yield strength should not exceed 90,000 psi in view of the susceptibility of this material to environmental cracking.

1626    03-02-74    Normalized and Tempered  
          01-08-79    1-1/4 Cr Low Alloy Steel  
                         Forgings, Section 1, Section  
                         III, and Section VIII, Division  
                         1 and 2  
1634    07-01-74    Use of SB-359 for Section III,  
          08-12-74    Class 3 Construction  
1634-1    08-12-74    Use of SB-359 for Section III,  
          08-13-76    Class 3 Construction  
1644    08-12-74    Additional Materials for Com-  
          04-28-75    ponent Supports—Section III,  
                         Subsection NF, Class 1, 2,  
                         3, and MC Construction

Code Case 1644 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength of the component support material should not exceed 170 Ksi.

1644-1    04-28-75    Additional Materials for Com-  
          06-30-75    ponent Support—Section III,  
                         Subsection NF, Class 1, 2, 3,  
                         and MC Construction

Code Case 1644-1 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength of the component support material should not exceed 170 Ksi.

1644-2    06-30-75    Additional Materials for Com-  
          11-03-75    ponent Supports—Section III,  
                         Subsection NF, Class 1, 2,  
                         3 and MC Construction

Code Case 1644-2 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength of the component support material should not exceed 170 Ksi.

1644-3    11-03-75    Additional Materials for Com-  
          03-01-76    ponent Supports—Section III,  
                         Subsection NF, Class 1, 2,  
                         3 and MC Construction

Code Case 1644-3 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength of the component support material should not exceed 170 Ksi.

1644-4    03-01-76    Additional Materials for Com-  
          08-13-76    ponent Supports and Alter-  
                         nate Design Requirements for  
                         Bolted Joints, Section III,  
                         Division 1, Subsection NF,  
                         Class 1, 2, 3 and MC Con-  
                         struction

Code Case 1644-4 was acceptable subject to the following conditions in addition to those specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by

virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

- 1644-5      08-13-76    Additional Materials for Com-  
                 03-03-77    ponent Supports and Alter-  
                      nate Design Requirements for  
                      Bolted Joints, Section III,  
                      Division 1, Subsection NF,  
                      Class 1, 2, 3 and MC Con-  
                      struction

Code Case 1644-5 was acceptable subject to the following conditions in addition to those specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

- 1644-6      03-03-77    Additional Materials for Com-  
                 11-21-77    ponent Supports and Alter-  
                      nate Design Requirements for  
                      Bolted Joints, Section III, Di-  
                      vision 1, Subsection NF, Class  
                      1, 2, 3 and MC Construction

Code Case 1644-6 was acceptable subject to the following conditions in addition to those specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment

is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

- 1644-7      11-21-77    Additional Materials for Com-  
(N-71-7)    05-15-78    ponent Supports, Section III,  
                      Division 1, Subsection NF,  
                      Class 1, 2, 3 and MC Compo-  
                      nent Supports

Code Case 1644-7 was acceptable subject to the following conditions in addition to those specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

- 1644-8      05-15-78    Additional Materials for Com-  
(N-71-8)    01-07-80    ponent Supports, Section III,  
                      Division 1, Subsection NF,  
                      Class 1, 2, 3 and MC Compo-  
                      nent Supports

Code Case 1644-8 was acceptable subject to the following conditions in addition to those specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

- 1644-9 01-07-80 Additional Materials for Com-  
(N-71-9) 05-11-81 ponent Supports Fabricated  
by Welding, Section III, Divi-  
sion 1, Subsection NF,  
Class 1, 2, 3, and MC Com-  
ponent Supports

Code Case 1644-9 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: In the last sentence of paragraph 5.3, reference should be made to paragraph 4.5.2.2, "Alternate Atmosphere Exposure Time Periods Established by Test," of the AWS D.1.1 Code for the evidence presented to and accepted by the Authorized Inspector concerning exposure of electrodes for longer periods of time.

- N-71-10 05-11-81 Additional Materials for Com-  
06-17-82 ponent Supports Fabricated  
by Welding, Section III, Divi-  
sion 1, Subsection NF, Class  
1, 2, 3, and MC Component  
Supports

Code Case N-71-10 was acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service. In the last sentence of paragraph 5.3, reference should be made to paragraph 4.5.2.2, "Alternate Atmosphere Exposure Time Periods Established by Test," of the AWS D.1.1 Code for the evidence presented to and accepted by the Authorized Inspector concerning exposure of electrodes for longer periods of time.

- N-71-11 06-17-82 Additional Materials for Com-  
02-14-83 ponent Supports Fabricated  
by Welding, Section III, Divi-  
sion 1, Subsection NF, Class  
1, 2, 3, and MC Component  
Supports

Code Case N-71-11 was acceptable subject to the following conditions in addition to those condi-

tions specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service. In the last sentence of paragraph 5.3, reference should be made to paragraph 4.5.2.2, "Alternate Atmosphere Exposure Time Periods Established by Test," of the AWS D.1.1 Code for the evidence presented to and accepted by the Authorized Inspector concerning exposure of electrodes for longer periods of time.

- N-71-12 02-14-83 Additional Materials for Com-  
02-20-84 ponent Supports Fabricated  
by Welding, Section III, Divi-  
sion 1, Class 1, 2, 3, and MC

Code Case N-71-12 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service. In the last sentence of paragraph 5.3, reference should be made to paragraph 4.5.2.2, "Alternate Atmosphere Exposure Time Periods Established by Test," of the AWS D.1.1 Code for the evidence presented to and accepted by the Authorized Inspector concerning exposure of electrodes for longer periods of time. The

provisions of paragraph 4.3 are not acceptable on a generic basis. Paragraph 16.2.2 is not acceptable as written and should be replaced with the following: When not exempted by 16.2.1, above, the postweld heat treatment shall be performed in accordance with NF-4622 except that for ASTM A-710 Grade A material it shall be at least 1000°F (540°C) and shall not exceed 1150°F (620°C) for Class 1 and Class 2 material and 1175°F (640°C) for Class 3 material. The new holding time at temperature for weld thickness (nominal) shall be 30 minutes for 1/2 inch or less, 1 hour per inch for thickness over 1/2 inch to 5 inches, and 5 hours plus 15 minutes for each additional inch over 5 inches.

N-71-13    02-20-84    Additional Materials for Sub-  
                  12-05-85    section NF, Classes 1, 2, 3  
                                  and MC Component Supports  
                                  Fabricated by Welding, Sec-  
                                  tion III, Division 1

Code Case N-71-13 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service. In the last sentence of paragraph 5.3, reference should be made to paragraph 4.5.2.2, "Alternate Atmosphere Exposure Time Periods Established by Test," of the AWS D.1.1 Code for the evidence presented to and accepted by the Authorized Inspector concerning exposure of electrodes for longer periods of time. Paragraph 16.2.2 is not acceptable as written and should be replaced with the following: When not exempted by 16.2.1 above, the postweld heat treatment shall be performed in accordance with NF-4622 except that for ASTM A-710 Grade A material, it shall be at least 1000°F (540°C) and shall not exceed 1150°F (620°C) for Class 1 and Class 2 material and 1175°F (640°C) for Class 3 material. The new holding time at temperature for weld thickness (nominal) shall be 30 minutes for 1/2

inch or less, 1 hour per inch for thickness over 1/2 inch to 5 inches, and 5 hours plus 15 minutes for each additional inch over 5 inches. The fracture toughness requirements as listed in this Code Case apply only to piping supports and not to Class 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports shall be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis.

N-71-14    12-05-85    Additional Materials for Sub-  
                  12-16-86    section NF, Classes 1, 2, 3  
                                  and MC Component Supports  
                                  Fabricated by Welding, Sec-  
                                  tion III, Division 1

Code Case N-71-14 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: The maximum measured ultimate tensile strength (UTS) of the component support material should not exceed 170 Ksi in view of the susceptibility of high-strength materials to brittleness and stress corrosion cracking. Certain applications may exist where a UTS value of up to 190 Ksi could be considered acceptable for a material and, under this condition, the Design Specification should specify impact testing for the material. For these cases, it should be demonstrated by the applicant that (1) the impact test results for the material meet code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service. In the last sentence of paragraph 5.3, reference should be made to paragraph 4.5.2.2, "Alternate Atmosphere Exposure Time Periods Established by Test," of the AWS D.1.1 Code for the evidence presented to and accepted by the Authorized Inspector concerning exposure of electrodes for longer periods of time. Paragraph 16.2.2 is not acceptable as written and should be replaced with the following: When not exempted by 16.2.1, above, the postweld heat treatment shall be performed in accordance with NF-4622 except that for ASTM A-710 Grade A material, it shall be at least 1000°F (540°C) and shall not exceed 1150°F (620°C) for Class 1 and Class 2 material and 1175°F (640°C) for Class 3 material. The new holding time at temperature for weld thickness (nominal) shall be 30 minutes for 1/2 inch or less, 1 hour per inch for thickness over 1/2 inch to 5 inches, and 5 hours plus 15 minutes for each additional inch over 5 inches. The fracture toughness requirements as listed in this Code Case apply only to piping supports and not to Class 1, 2,

and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports shall be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis.

1682	01-29-75 08-11-75	Alternate Rules for Material Manufacturers and Suppliers, Section III, Subarticle NA-3700
1714	08-11-75 07-11-77	Postweld Heat Treatment of P-1 Material, Section III, Class MC
1714-1 (N-102-1)	07-11-77 08-28-78	Postweld Heat Treatment of P-1 Material, Section III, Class MC
1722	11-03-75 01-08-79	Vacuum, Carbon Deoxidized SA-508 Forgings, Section III, Division 1, and VIII, Division 1 and 2
1741	12-22-75 01-14-77	Interim Rules for the Required Number of Impact Tests for Rolled Shapes, Section III, Division 1, Subsection NF, Component Supports
1755	04-26-76 01-14-77	Alternative Rules for Examination of Welds in Piping, Class 1 and 2 Construction, Section III, Division 1
1759	08-13-76 05-15-78	Material for Internal Pressure Retaining Items for Pressure Relief Valves, Section III, Division 1, Class 1, 2, and 3

Code Case 1759 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: Applicants using this Case should also use Code Case 1711 for the design of pressure relief valves.

N-188	08-29-77 05-15-78	Use of Welded Ni-Fe-Cr-Mo-Cu (Alloy 825) and Ni-Cr-Mo-Cb (Alloy 625) Tubing, Section III, Division 1, Class 3
N-207	03-20-78 03-19-79	Use of Modified SA-479 Type XM-19 for Section III, Division 1, Class 1, 2 or 3 Construction
N-224	11-20-78 05-11-81	Use of ASTM A500 Grade B and ASTM A501 Structural Tubing for Welded Attachments for Section III, Class 2 and 3 Construction
N-242	04-12-79 04-10-80	Materials Certification, Section III, Division 1, Classes 1, 2, 3, MC, and CS Construction

Code Case N-242 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: Applicants should identify the components and supports requiring the use of paragraphs 1.0 through 4.0 of the Code Case in their Safety Analysis Reports.

N-246-1	09-07-82 05-25-83	SB-169, Alloy C 61400, Section III, Division 1, Class 3
N-249	01-07-80 05-11-81	Additional Materials for Component Supports Fabricated Without Welding, Section III, Division 1, Subsection NF, Class 1, 2, 3, and MC Component Supports

Code Case N-249 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: Footnote 2 of the Code Case should apply to all materials listed in Tables 1, 2, 3, 4, and 5 of the Code Case and should be so indicated on line 5 of the "Reply."

N-249-1	05-11-81 06-17-82	Additional Materials for Component Supports Fabricated Without Welding, Section III, Division 1, Subsection NF, Class 1, 2, 3, and MC Component Supports
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Code Case N-249-1 was acceptable subject to the following condition in addition to those conditions specified in the Code Case: Paragraph 7 of the "Reply" should reference the requirements of NF-2600 instead of NF-2800. This is a typographical error in that NF-2800 does not exist.

N-249-2	06-17-82 02-14-83	Additional Materials for Subsection NF Class 1, 2, 3, and MC Component Supports Fabricated Without Welding, Section III, Division 1
N-249-3	02-14-83 02-20-84	Additional Materials for Subsection NF Class 1, 2, 3, and MC Component Supports Fabricated Without Welding, Section III, Division 1
N-249-4	02-20-84 09-17-84	Additional Material for Subsection NF, Classes 1, 2, 3, and MC Component Supports Fabricated Without Welding, Section III, Division 1

The fracture toughness requirements as listed in Code Case N-249-4 apply only to piping supports and not to Classes 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports should be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis.



N-249-5 09-17-84 Additional Material for Sub-  
04-08-85 section NF, Classes 1, 2, 3,  
and MC Component Supports  
Fabricated Without Welding,  
Section III, Division 1

The fracture toughness requirements as listed in Code Case N-249-5 apply only to piping supports and not to Classes 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports should be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis.

N-249-6 04-08-85 Additional Material for Sub-  
09-05-85 section NF, Classes 1, 2, 3,  
and MC Component Supports  
Fabricated Without Welding,  
Section III, Division 1

Code Case N-249-6 was acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The fracture toughness requirements apply only to piping supports and not to Classes 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports should be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis. The following is to be added to paragraph (5) of the Case: For these cases, it should be demonstrated by the owner that (1) the impact test results for the material meet Code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

N-249-7 09-05-85 Additional Material for Sub-  
12-05-85 section NF, Classes 1, 2, 3,  
and MC Component Supports  
Fabricated Without Welding,  
Section III, Division 1

Code Case N-249-7 was acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The fracture toughness requirements apply only to piping supports and not to Classes 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports should be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis. The following is to be added to paragraph (5) of the Case: For these cases, it should be demonstrated by the owner that (1) the impact test results for the material meet

Code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

N-249-8 12-05-85 Additional Material for Sub-  
12-16-86 section NF, Classes 1, 2, 3,  
and MC Component Supports  
Fabricated Without Welding,  
Section III, Division 1

Code Case N-249-8 was acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The fracture toughness requirements apply only to piping supports and not to Classes 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports should be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis. The following is to be added to paragraph (5) of the Case: For these cases, it should be demonstrated by the owner that (1) the impact test results for the material meet Code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

N-249-9 12-16-86 Additional Material for Sub-  
05-06-89 section NF, Classes 1, 2, 3,  
and MC Component Supports  
Fabricated Without Welding,  
Section III, Division 1

Code Case N-249-9 was acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The fracture toughness requirements apply only to piping supports and not to Classes 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports should be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis. The following is to be added to paragraph (5) of the Case: For these cases, it should be demonstrated by the owner that (1) the impact test results for the material meet Code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly

stresses, and it does not experience frequent sustained loads in service.

N-249-10 05-06-89 Additional Material for Sub-  
05-13-91 section NF, Classes 1, 2, 3,  
and MC Component Supports  
Fabricated Without Welding,  
Section III, Division 1

Code Case N-249-10 was acceptable subject to the following conditions in addition to those conditions specified in the Code Case: The fracture toughness requirements apply only to piping supports and not to Classes 1, 2, and 3 component supports. The fracture toughness of Classes 1, 2, and 3 component supports should be characterized in accordance with paragraph 5.3.4 of the USNRC Standard Review Plan (NUREG-0800) or on a case-by-case basis. The following is to be added to paragraph (5) of the Case: For these cases, it should be demonstrated by the owner that (1) the impact test results for the material meet Code requirements and (2) the material is not subject to stress corrosion cracking by virtue of the fact that (a) a corrosive environment is not present and (b) the component that contains the material has essentially no residual stresses or assembly stresses, and it does not experience frequent sustained loads in service.

N-265<sup>19</sup> 01-07-80 Modified SA-487 Castings,  
09-01-83 Section III, Division 1, Class 1  
12-31-84  
05-19-85

N-299 11-17-80 Use of Nickel-Chromium-  
11-28-83 Molybdenum-Columbium Al-  
07-18-85 loy 625 Forgings, Section III,  
Division 1, Class 2 and Class 3  
Components

N-321 07-13-81 Use of Modified SA-249,  
07-13-84 Type 304 for Section III,  
12-05-85 Division 1, Class 1 Construc-  
tion

N-337 04-02-82 Use of ASTM B525-70 Grade  
05-19-85 II, Type II, Sintered Austen-  
07-18-85 itic Stainless Steel for Class 2,  
3, and MC Component Stan-  
dard Supports, Section III,  
Division 1

N-352	07-16-82	Use of SA-638 Grade 660
	05-19-85	Forgings and Bars Below
	07-18-85	700°F Without Stress Rupture
		Tests, Section III, Division 1
N-370	02-14-83	Modified SA-705 Grade
	07-18-85	XM-13 Forgings, Section III,
		Division 1
N-370-1	07-18-85	Modified SA-705 Grade
	12-05-85	XM-13 Forgings, Section III,
		Division 1
N-371	02-14-83	12 Cr-1W-1Mo-1/4V Marten-
	07-18-85	sitic Stainless Steel Valve In-
		ternals, Section III, Division 1
N-379	04-04-83	Bimetallic Tubing Section III,
	07-18-85	Division 1, Class 1
N-418	12-05-84	Use of Seamless Ni-Fe-Cr-
	07-30-86	Mo-Cu Low Carbon (UNS
		N08028 and UNS N08904)
		Tubing, Section III, Division
		1, Classes 2 and 3
N-438	02-23-87	Fe-24.5Ni-21Cr-6.5 Mo-0.2N
	03-08-89	(Alloy UNS N08367) Seam-
		less and Welded Pipe, Tube,
		Plate, Bar, Fittings, and For-
		gings, Class 2 and 3 Construc-
		tion, Section III, Division 1
N-438-1	03-08-89	Fe-24.5Ni-21Cr-6.5Mo-0.2N
	03-05-90	(Alloy UNS N08367) Seam-
		less and Welded Pipe, Tube,
		Plate, Bar, Fittings, and For-
		gings, Class 2 and 3 Construc-
		tion, Section III, Division 1
N-438-2	03-05-90	UNS N08367 Material, Sec-
	07-27-92	tion III, Division 1, Class 2 and
		3 Construction
N-443	05-07-87	High Yield Strength Cr-Mo
	03-08-89	Steel, Class 1 Components,
		Section III, Division 1
N-466	03-08-89	Modified 9Cr-1Mo Material
	04-30-90	Section III, Division 1,
		Classes 1, 2, and 3
N-474	05-06-89	Design Stress Intensities and
	03-05-90	Yield Strength Values for Al-
		loy 690 With a Minimum
		Yield Strength of 35 ksi, Class
		1 Components, Section III,
		Division 1

#### 4. UNACCEPTABLE CODE CASES

Code Cases for Class 1 components that are not on the approved list of this guide (paragraph C.1) or other regulatory guides, or for which authorization by the Commission has not been granted, are not acceptable for Class 1 components.

Code Cases for other classes of components that are not on the approved list of this guide (paragraph

<sup>19</sup>Code Case N-265 was allowed to expire on 1-7-83 because of an administrative error. It was reinstated on 9-1-83 with no technical changes. The Case is, therefore, considered in effect during that period of time. Again, Code Case N-265 was allowed to expire on 12-31-84 (mandatory annulment date). It was reinstated as N-265-1 on 5-19-85. Because of the circumstances and because there were no changes in the Code Case, the NRC considers that this Case was in effect during the period of 12-31-84 through 5-19-85.

C.1) or other regulatory guides should be considered not acceptable on a generic basis.

#### D. IMPLEMENTATION

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

1. Except for those Code Cases that have been annulled by action of the ASME, the NRC staff has found the Code Cases listed in this regulatory guide under regulatory position C.1 acceptable for appropriate use. Other Code Cases may be considered for use in accordance with footnote 6 of the Codes and Standards rule, §50.55a of 10 CFR Part 50.

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

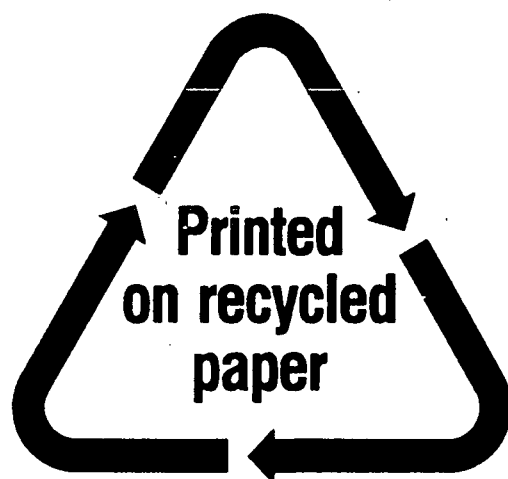
3. Components ordered to a Code Case that was previously approved for use need not be changed because the Code Case has been subsequently annulled.

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.

#### APPENDIX

##### NUMERICAL LISTING OF CODE CASES

N-4-11 (1337-11)	N-404
N-7-1	N-418-1
N-20-3	N-438-3
N-60-4	N-439
N-71-15	N-440
N-131-1 (1759-1)	N-441
N-188-1	N-443-1
N-205	N-459
N-246-2	N-466-1
N-249-11	N-469
N-265-1	N-474-1
N-294	N-475
N-329	N-482
N-337-1	N-484-1
N-348-3	N-492
N-351	N-497
N-370-2	N-501
N-379-1	N-502



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