Design of Elevated Temperature Class 1 Components in Section III, Division 1, of the ASME Boiler and Pressure Vessel Code
Criteria of the ASME Boiler and Pressure Vessel Code for Design by Analysis in Sections III and VIII, Division 2
Regulatory guide 1.85 Containment Performance of Prototypical Reactor Containments Subjected to Severe Accident Conditions
ASME Boiler and Pressure Vessel Code
Regulatory Guide 1.84 Current Work in Support of Section III Division 3 of the ASME Boiler and Pressure Vessel Code
Commentary on Article CC-3000 Design

This paper provides commentary on a new division under Section III of the ASME Boiler and Pressure Vessel (BPV) Code. This new Division 5 has an issuance date of November 1, 2011 and is part of the 2011 Addenda to the 2010 Edition of the BPV Code. The new Division covers the rules for the design, fabrication, inspection and testing of components for high temperature nuclear reactors. Information is provided on the scope and need for Division 5, the structure of Division 5, where the rules originated, the various changes made in finalizing Division 5, and the future near-term and long-term expectations for Division 5 development. Portions of this paper were based on Chapter 17 of the Companion Guide to the ASME Boiler & Pressure Vessel Code, Fourth Edition, © ASME, 2012, Reference.

Pressure vessels are found everywhere -- from basement boilers to gasoline tankers -- and their usefulness is surpassed only by the hazardous consequences if they are not properly constructed and maintained. This essential reference guides mechanical engineers and technicians through the maze of the continually updated International Boiler and Pressure Vessel Codes that govern safety, design, fabrication, and inspection. * 30% new information including coverage of the recent ASME B31.3 code

This Bulletin reports the evaluation of application of the ASME-NUPACK (Section III, Div. 3 of the ASME Boiler and Pressure Vessel Code) Design Rules to the actual design of radioactive nuclear material transportation containments. The Report applies to the ASME-NUPACK rules to the design of a commercial nuclear reactor fuel shipping containment and generates a detailed example problem, compares the ASME-NUPACK design rules to current practice for the design of smaller nuclear material shipping containments, summarizes the difficulties encountered in the
for an intermediate heat exchanger for the very high temperature reactor. To evaluate the behavior of this material in the expected service conditions, strain controlled cyclic tests that include long hold times up to 240 minutes at maximum tensile strain were conducted at 850°C. In terms of the total number of cycles to failure, the fatigue resistance decreased when a hold time was added at peak tensile strain. Increases in the tensile hold duration degraded the creep fatigue resistance, at least to the investigated strain controlled hold time of up to 60 minutes at the 0.3% strain range and 240 minutes at the 1.0% strain range. The creep fatigue deformation mode is considered relative to the lack of saturation, or continually decreasing number of cycles to failure with increasing hold times. Additionally, preliminary values from the 850°C creep fatigue data are calculated for the creep fatigue damage diagram and have higher values of creep damage than those from tests at 950°C. Addresses containment design practices and compares the 2 different material types (steel and concrete). Various failure modes are evaluated and computed in previous containment designs. Margin in steel and concrete containment was compared by designing and analyzing a set of surrogate containment. The containment chosen encompass the primary types of containment shapes and construction materials. For compatibility, each containment has an identical internal volume and design pressure and temperature. These containments are designed according to all applicable code requirements for nuclear reactor containment structures. The Code of Federal Regulations Title 10 contains the codified Federal laws and regulations that are in effect as of the date of the publication pertaining to energy, including: nuclear energy, testing, and waste; oil, natural gas, wind power and hydropower; climate change, energy conservation, alternative fuels, and energy site safety and security. Includes energy sales regulations, power and transmission rates. The design and fabrication criteria recommended by the US Department of Energy (DOE) for high-level radioactive materials containment vessels used in packaging is found in Section III, Division 1, Subsection NB of the ASME Boiler and Pressure Vessel Code. This Code provides material, design, fabrication, examination, and testing specifications for nuclear power plant components. However, many of the requirements listed in the Code are not applicable to containment vessels made from austenitic stainless steel with austenitic or ferritic steel bolting. Most packaging designers, engineers, and
fabricators are intimidated by the sheer volume of requirements contained in the Code; consequently, the Code is not always followed and many requirements that do apply are often overlooked during preparation of the Safety Analysis Report for Packaging (SARP) that constitutes the basis to evaluate the packaging for certification. This is Volume 1 of the fully revised second edition. Organized to provide the technical professional with ready access to practical solutions, this revised, three-volume, 2,100-page second edition brings to life essential ASME Codes with authoritative commentary, examples, explanatory text, tables, graphics, references, and annotated bibliographic notes. This new edition has been fully updated to the current 2004 Code, except where specifically noted in the text. Gaining insights from the 78 contributors with professional expertise in the full range of pressure vessel and piping technologies, you find answers to your questions concerning the twelve sections of the ASME Boiler and Pressure Vessel Code, as well as the B31.1 and B31.3 Piping Codes. In addition, you find useful examinations of special topics including rules for accreditation and certification; perspective on cyclic, impact, and dynamic loads; functionality and operability criteria; fluids; pipe vibration; stress intensification factors, stress indices, and flexibility factors; code design and evaluation for cyclic loading; and bolted-flange joints and connections. The Code of Federal Regulations is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government. Copyright code: 0661aa50cc05dc56737b01e6cb12ff