

2016 and 2017 NRC Standards Forum Topics

Sponsoring Org	Task ID	Research Project	Potential Applications	CHAMPION [Name (SDO)]	Standards Use	Regulatory Use	NRC Rep.	EPRI Product ID*	Predicted Coalition Success	Current activity	Recommendations	Coalition Interest	Other Supporting References
2016 Topics													
EPRI	2014-01	Reactor Coolant Radiological Source Terms for Normal Operation	RCS	ANS	ANS 18.1			3002005404					
EPRI	2015-08	EPZ Size Evaluation	SMRs	ANS		NUREG-0396	NRO	3002008037	✓				
Non-EPRI		Design standards for High Temperature Gas Reactors	HTGRs	Wallace (ANS) Sam Sham (ASME) BPV III SG HTR, BPV III WG HTGR and BPV III WG HTLR	ANS, ASME III	10CFR50 Appx A, 50.55(a) RG 1.87, RG 1.84	A. Cabbage			Division 5 rules cover Class A and Class B metallic pressure boundary components and supports, Class SM metallic core support structures, and Class SN nonmetallic core components for high temperature gas-cooled reactors, liquid metal reactors (sodium, lead or lead/bismuth) and molten salt reactors (with liquid or solid fuel). Code actions to optimize Division 5 rules Various actions are being taken to extend qualified lifetimes of Class A materials to support 60-year design life. New Class A material, Alloy 617, is being added to Division 5 to expand design envelopes. Elastic, perfectly plastic methods are being developed to modernize and simplify Division 5 design analyses. Inelastic analysis methods are being developed for incorporation into Division 5 Appendix HBB-Z. Design rules for integrally clad components with weld overlay on Class A materials are being developed to support molten salt reactor applications. Graphite irradiation data are being incorporated into Division 5 to support use of graphite design rules. Ceramic composite design rules are being incorporated into Division 5.	Incorporate Section III, Division 5 in 10 CFR 50.55A		
Non-EPRI		Design standards for Liquid Metal Reactors (incl SFR)	LMRs	Flanagan (ANS) Sam Sham (ASME) BPV III SG HTR, BPV III WG HTGR and BPV III WG HTLR	ANS, ASME III	10CFR50 Appx A, RG 1.84	A. Cabbage						
EPRI	2010-11	Methodology for Risk Informed Strategies		Kadambi (ANS) Bob Budnitz (ANS) Rick Grantom (ASME)	SME/ANS PRA Standard Parts 1 - 10, Level 2 PRA Standard, Non LWRs PRA Standard	RG 1.200, RG 1.174, RG 1.177, 10CFR50.65, 10CFR50.69, Reactor Oversight Program/Significance Determination Process (ROP/SDP), Low Power/Shutdown Risk Assessment		3002005398, 3002010481		PRA Standards for current and proposed nuclear power plants have been published and are used to support major risk informed applications. PRA Standards cover all nuclear power plant operating modes. Additional risk informed Standards/strategies to improve safety and efficiencies actively being pursued.	Support consensus and regulatory acceptance of proposed risk informed strategies/applications enabled by future Standards publications		

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EPRI	2013-*1	Powder Metallurgy and Hot Isostatic Processing Methods	AM	BPV II TG on Hot Isostatically-Pressed Components 1: Keith Hottle 2: Annemarie Appleton (ASME)	ASTM B834-13 ASME Sec II: A988-11 & A989-11, CC N-834	Appendix 5		3002008035		ASME Section II Part D, Mandatory Appendix 5 has been approved for the 2019 Edition to include HIP powder components as an additional processing option to wrought and cast. The revision includes the requisite controls that need to be in place in the ASME SA/SB specifications/ code case to ensure the quality and integrity of the HIP components. Based on the application of these controls, BPV II's default position will be to assign the previously established wrought allowable stress values to HIP components in the time independent range. ASTM Specifications A988, A989, and B834 are currently being updated to include the requisite controls added to Mandatory Appendix 5.	Adopt the new versions of A988, A989, B834 as SA-988, SA-989, and SB-834. BPV II Task Group to remain in place to address new alloy families as necessary. Acquire data for HIP components in the time-dependent range.		
EPRI	2013-03	PWSCC Initiation Testing for Alloy 690 Weld Metals	Piping system DM welds, Upper head, Lower Head, Pressurizer	Robin Dyle (ASME)	ASME Sec XI CC N-770-1, N-722-1, N-729-1	10 CFR 50.55a(g)(6)(ii)(D), (E), and (F)	Raj Iyengar RES/DE/CIB	3002009412	✓				
EPRI	2013-07	Residual Stress (RS) Guidelines		Charles Kim (ASME)	ASME Section III		Raj Iyengar Mike Benson RES/DE/CIB	3002010464	✓	3 Related records for revisions to BPV III Subsections NB, NC, ND and NG: Record 12-1461 is a Code revision to differentiate between peening for distortion vs peening to introduce compressive residual stresses. Board approved in 8/2017, for inclusion in 2019 Edition. Record 14-764 will clarify existing Code words through a Code revision to require surface stress improvement after weld repairs to the wetted component/item surface. In-process. Record 17-13 will address commitments made during balloting of Record 12-1461.			
EPRI	2014-02	Elimination of Dissimilar Metal Welds (DMWs)	Piping systems	BPV III SG MFE Paul Donavin Steve Hunter Bob Jessee Brian Frew (ASME)				3002008031		The project is currently under development at EPRI and will be presented to ASME when it is ready for action.			

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EPRI	2014-03	ASME Code Acceptance of HDPE	HDPE Piping, Class 3 SR	Tim Adams Matt Brandes Thomas Musto Phil Rush (ASME)	ASME Sec III Appx XXVI; CC N-755-2	50.55(a)	Dave Alley NRR/DE/ENPB Mike Benson RES/DE/CIB	3002005433 ; 3002009545	✓	PE Pipe testing is done There is a Section XI effort on acceptable flaw size ASME Section III Appendix XXVI was published in 2015 to incorporate CC N-755-2 into a mandatory appendix. Additions to 2017 Edition of Appendix XXVI to include alternative materials, acceptance criteria and update the hydro test requirements.	Awaiting 50.55(a) on 2015 Code		
EPRI	2015-03	Environmentally Assisted Fatigue – Long-Term Collaboration and Testing	LTO, Piping systems	Keith Wight Charles Bruny [BPV III WG EE or WG EFEM] (ASME)	ASME III	NUREG-6720, NUREG/CR-6909, RG 1.207	Rob Tregoning RES/DE	3002003922	✓	The EPRI roadmap & gap reports highlighted plant representative 'component feature' and loading tests as a priority. PVP2017-65995 outlines the collaboration ongoing. An EPRI 'RFP' was issued July 2017 and a number of organisations have responded or expressed interest. Awaiting EPRI selection.	Testing enables benchmarking of a variety of methods & quantification of margin.		
EPRI	2015-05	Additive Manufacturing of Net Shape Powder Metallurgy Cans for Valves	AM, PM-HIP	George B. Rawls Jr. (2nd: Keith Hottle and Annemarie Appleton) (ASME)	ASTM B834-13 ASME Sec II: A988-11 & A989-11, CC N-834			3002008035 ; 3002010488		ASME has formed a new BPTCS/BNCS Special Committee on Use of Additive Manufacturing for Pressure Retaining Equipment. Its first meeting was in August. The standards to be considered first are: - AWS D20.1, Standard for Fabrication of Metal Components using Additive Manufacturing - ASTM F3184-16 Standard Specification for Additive Manufacturing Stainless Steel Alloy (UNS S31603) with Powder Bed Fusion			
EPRI	2015-06	Alloy Code Development for Powder Metallurgy	PM-HIP	BPV II TG on Hot Isostatically-Pressed Components 1: Keith Hottle 2: Annemarie Appleton (ASME)	ASTM B834-13 ASME Sec II: A988-11 & A989-11, CC N-834			3002005432 ; 3002010465		Same activity as 2013-*1?			

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EPRI	2016-06	Advanced Manufacturing Program	AM, PM-HIP	George B. Rawls Jr. (2nd: Keith Hottle and Annemarie Appleton) (ASME)	ASME Section II, III, and IX					BPTCS/BNCS Special Committee on Use of Additive Manufacturing for Pressure Equipment was appointed and approved to proceed with the following charter at the June 7, 2014 BPTCS Meeting. To develop a technical baseline to support development of a proposed BPTCS standard or guideline addressing the pressure integrity governing the construction of pressure retaining equipment by additive manufacturing processes. Construction, as used in this Charter, is limited to materials, design, fabrication, examination, inspection, and testing. First meeting of the Committee was held during Boiler Code Week in Minneapolis, MN on Wednesday, August 9, 2017.	Current work performed under Record 17-601 to include hot isostatically pressed powder into Section II, App. 5 is being reviewed - AM Committee will develop a white paper on what changes/expansions are needed to Section II, App. 5 for controls to powder bed fusion AM materials. Material grade 316 will be used as a test case Control of Fabrication for AM Processes AWS is developing Standard D20.1/D20.1M:201X Specification for Fabrication of Metal Components using Additive Manufacturing - expects approval of the standard in 2019. AWS D20.1 draft is a thorough document in terms of process control and material control. The current plan is to apply AWS D20.1 for control of fabrication similar to the approach Section IX currently uses. The committee will compare essential variables in AWS D20.1 for laser fusion and electron beam AM processes currently being used. Design of AM Components A combination of analysis and testing will be required to address AM pressure equipment. The design by analysis rules in Section VIII Div. 2 are the most appropriate requirements to evaluate the complex shapes for additive manufacturing. The committee will prepare a white paper for design requirements for AM using Section VII, Div. 2, Part 5 as a basis for the analysis section and Section VIII Div. 1, UG-101 and Section X, App. 8 for qualification by testing.		
EPRI	2012-06	High Strength Reinforced Rebar	Reinforced concrete structures	Javeed Munshi Namho Lee (ASME w/ACI)	ACI 318, ACI 349	RG 1.35.1, RG 1.69, RG 1.136, RG 1.142, RG 1.143, RG 1.199	Dogan Seber RES/DE/SGSEB	3002005440; 3002007535; 3002010486	✓	BPV III-2 is currently working on a code revision to allow the use of ASTM 615 Grades 75 and 80 and ASTM A706 Grade 80 reinforcement for containment structure construction. Currently out for approval by the SG. Once approved it will proceed to BPV III Standards Committee and ACI TAC.	TBD		
EPRI	2014-06	Thick Section Component Welding		BPV III SG MFE Paul Donavin Steve Hunter Bob Jessee Brian Frew (ASME)				3002005438; 3002009557					
EPRI	2014-08	Advanced Battery Evaluation for 1E Service Qualification	LTO	IEEE	IEEE 535	RG 1.158, RG 1.206, RG 1.212	Lilianan Ramadan RES/DE/ICEEB	3002007408					
EPRI	2015-02	Technology for SMR Staff Optimization	SMRs	IEEE	IEEE	10CFR50 Appx B		3002007071					
EPRI	2015-09	Seismic High Frequency Loadings	Seismic analyses for structures and equipment anchoring	IEEE	IEEE 344	NUREG-0800	Dogan Seber RES/DE/SGSEB	3002009429	✓			Bechtel (S. Malushte)	
EPRI	2009-07	Next Generation Attenuation Model for the Central and Eastern US	Seismic analyses			10CFR50 GI-199		1021097	✓				
EPRI	2010-13	Seasonal/Annual Cooling Tower Impacts (SACTI) Model Update	Cooling towers					3002006350					

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EPRI	2012-01	Water Chemistry Guidelines for Advanced Light Water Reactors			EPRI Guidelines			1021090; 1021091; 1023002; 1024499; 1024502; 1026540; 3002002922; 3002004709; 3002004710; 3002007516; 3002008028; 3002008039; 3002004709; 3002004710; 3002004711					
EPRI	2012-15	New Steam Generator Thermal-Hydraulics Code (Triton)	SGs					3002005513; 3002005515					
EPRI	2015-01	Real Time NDE for Welding	Piping systems					300201468					
EPRI	2015-04	Demonstration of Self-Consolidating Concrete (SCC) and SCC Structural Members	Reinforced concrete structures	Javeed Munshi BPV III, Division 2 (ASME)	ACI 301 (potentially)	RG 1.107	Jose Pires RES/DE	3002007567				Bechtel (S. Malushte)	http://www.google.com/patents/WO2016187482A1?cl=en
EPRI	2015-07	Pre-filming Steam Generator Tubing Evaluation	SGs		EPRI Specification			3002008033; 3002009412					
EPRI	2015-10	Mass Concrete Modeling & Temperature Control	Reinforced concrete structure of material defined as mass concrete	ASME/ Javeed Munshi (BPV III-2) , Joshua Zhang (BPV III-2)	ACI 301					Research on NPP Basemat Modeling (Structural modeling of NI basemat mass concrete) considering the primary loads (static load, seismic load), and secondary loads (thermal / temperature load during operation etc.) has been conducted by SNERDI, it related more to structural design-analysis rather than material design and applications. A related research paper has published in ICONE-25 Proceedings entitled "NUCLEAR ISLAND BASEMAT MODELING FOR GENERATION III NUCLEAR POWER PLANT DESIGN IN CHINA", Paper NO.: ICONE-25 Paper 66346.	TBD		
EPRI	2015-11	Moisture Tolerant Coatings for Decreasing Open Top Construction Time	Reinforced concrete member requiring coatings					3002010463					
EPRI	2015-12	PIM Archive and Lessons Learned											
EPRI	2015-13	SMR Aerosol Project				RG 1.183		3002010491					
EPRI	2016-01	Cyber Security During Construction	Cyber security		NEI-08-09	RG 5.71		3002010470					
EPRI	2016-02	PM-HIP Manufacturing Demonstration of ALWR and SMR Components	PM-HIP					3002010500					
EPRI	2016-03	Augmented Reality (AR) Scoping Study for New Plant Applications						3002010467					

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Non-EPRI		ASME Code Case N-860 Examination Requirements and Acceptance Standards for Spent Nuclear Fuel Storage and Transportation Containment Systems		Ken Hunter (ASME)						Work under development by the Task Group on ISI of Spent Nuclear Fuel Storage and Transportation Containment Systems (BPV XI) EPRI guidance has been considered Inspection flowchart to support the code case has been through several comment cycles and expected to be approved by the end of this year.	Draft code case will be finalized upon approval of inspection flowchart.		

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2017 Topics													
EPRI	2017-04	A Vertical Response Motion Computation in SSI Analysis of Embedded Structures	Seismic analyses for structures and equipment anchoring			NUREG 0800		tbd				Bechtel (S. Malushte)	Bechtel is involved in this EPRI project
EPRI	2017-06	Ground Motion Kappa Parameter Assessment	Seismic analyses for structures and equipment anchoring			NUREG 0800		tbd					
EPRI		Investigation of New Residual Stress Mitigation Techniques	Piping systems	ASME	ASME Section III, IX, and XI			tbd					
EPRI	2017-03	Central and Eastern US Seismic Source Characterization for Nuclear Facilities	Seismic analysis			NUREG 0800		3002005288					
EPRI		Innovative Manufacturing Process for Nuclear Power Plant Components via Powder Metallurgy and Hot Isostatic Processing Methods: Manufacture of a Steam Separator Inlet Swirler	Components	ASME	BPV II, III			3002005403					
EPRI		Program on Technology Innovation: Innovative Manufacturing Process for Nuclear Power Plant Components Through Powder Metallurgy-Hot Isostatic Processing	Components	ASME	BPV II, III			3002008030					
EPRI		Advanced Nuclear Technology: Risk-Informed In-Service Inspection/Risk-Informed Break Exclusion Region Results for First Site	Piping and components	ASME	BPV XI, RA			3002003119					
EPRI		High-Density Polyethylene Flaw Development, Sample Fabrication, and Performance Demonstration	Piping systems	ASME	BPV III,VI			3002008761					
EPRI		Advanced Nuclear Technology: The Long-Term Oxidative Resistance of Butt Fusion Joints in High-Density Polyethylene Piping	Piping systems	ASME	BPV III,VI			3002003120					
EPRI		Applicability of High-Density Polyethylene in Nuclear Piping Systems with Internal Radionuclides	Piping systems	ASME	BPV III,VI			3002000524					
non-EPRI		Verification and Validation	New Reactor Designs	ASME	V&V 30								