NRC Report
May 2010

1. Amendment to 10 CFR 50.55a – ASME Code Edition/Addenda

The proposed rule that will incorporate the 2005 through 2008 Addenda is scheduled for publication on Tuesday, May 4th, 2010. Specifically, the proposed rule would incorporate by reference the following ASME Codes and Code Case into 10 CFR 50.55a:

- 2005 Addenda through 2008 Addenda of Section III, Division 1, and Section XI, Division 1, of the B&PV Code
- 2005 Addenda and 2006 Addenda of the *Code for Operation and Maintenance of Nuclear Power Plants*
- Code Case N-770, "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated with UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1"

The proposed rule would also do the following:

- clarify which portions of Section III are approved for use by applicants and licensees
- identify which portions of Section III are NRC requirements, and which portions of Section III are not required to be implemented by 10 CFR 50.55a
- substitute the word "condition(s)" for the words "limitation(s)" "modification(s)" and "provision(s)" throughout 50.55a for consistency
- clarify the time frame for licensees to submit requests for relief based on impracticality for IST and ISI
- allow the use of 1994 Edition of NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications," when using the 2006 Addenda of Section III of the ASME B&PV Code and later editions and addenda
- remove conditions throughout 50.55a that are no longer necessary and renumbering paragraphs as appropriate

Finally, the NRC will also request comments on what the scope of the ASME B&PV Code edition and addenda rulemaking should be; how often the NRC should incorporate Code editions and addenda into 10 CFR 50.55a; and in what ways the NRC should communicate the scope, schedule for publishing the rulemakings in the Federal Register, and status of the 10 CFR 50.55a rulemakings to external users.

2. ASME Code Case Rulemaking/Regulatory Guides

On June 2, 2009, Draft Revision 35 to RG 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III," draft Revision 16 to RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1,"and draft Revision 3 to RG 1.193 "ASME Code Cases Not Approved for Use," were published in the Federal Register (74 FR 26303) for public comment. The guides address Code Cases from Supplement 2 to the 2004 Edition through Supplement 0 to the 2007 Edition (Supplement 0, 2007 Edition also serves as Supplement 12 to the 2004 Edition). The public comment period closed on August 17, 2009. Proposed responses have been drafted for all of the comments, and the draft final regulatory

guides have been reviewed and approved by the program offices. The draft final amendment to 10 CFR 50.55a to incorporate the guides by reference has been developed and is currently being reviewed by the Office of the General Counsel (OGC). In past rulemakings, it was determined that public comments provided an adequate legal and technical basis to include revisions to Code Cases in the final rule, i.e., that a later version of a Code Case should be considered for approval in the final rule. OGC has advised the staff that the federal courts are being stricter relative to renoticing, i.e., all actions being considered for adoption in the final rule, including the NRC's basis for doing so, must be provided in the proposed rule absent very special circumstances. The NRC staff had considered responding favorably to several public comments requesting that later versions of some Code Cases be listed in the final rulemaking. As a result of the recent court rulings, the staff will have to revise the package. The final amendment and regulatory guides are now scheduled to be published in July 2010.

The NRC staff has completed its review of Supplements 1 − 11 to the 2007 Edition. Draft Revision 36 to RG 1.84, draft Revision 17 to RG 1.147, draft Revision 2 to RG 1.192, and draft Revision 4 to RG 1.193 have been reviewed by the cognizant NRC offices. The draft guides will address Supplements 1 – 9 to the 2007 Edition. The goal is to publish these guides for public comment shortly after Revision 35 to RG 1.84, Revision 16 to RG 1.47, and Revision 3 to RG 1.193 have been published as final guides.

The staff is considering addressing the issues raised by Raymond A. West in a petition for rulemaking dated December 14, 2007, and revised on December 19, 2007, in the proposed rulemaking for Revision 17 of Regulatory Guide 1.147.

3. Risk-Informed Activities

On December 1, 2009, Westinghouse submitted a revised Pressurized Water Reactor Owners Group (PWROG) plan to the NRC for implementation of WCAP- 16168-NP-A, Revision 2, "Risk-Informed Extension of the Reactor Vessel In-Service Inspection Interval" Agencywide Documents Accession and Management System [ADAMS] No. ML093370133). The implementation plan was revised as a result of three recent changes in inspection requirements: 1) MRP-139 and ASME Section XI Code Case N-770 - Inspection and Mitigation of Alloy 82/182 Reactor Vessel Nozzle Welds, 2) MRP-227 - Inspection and Evaluation Guidelines for PWR Reactor Vessel Internals, and 3) 10 CFR 50.61a- Alternate Pressurized Thermal Shock Rule.

4. Generic Activities on Material Degradation/PWR Alloy 600/182/82 PWSCC

In 2006 ASME started the development of a Code Case for inspection of Alloy 82/182 butt welds. Code Case N-770 has been completed, and the NRC has incorporated it with conditions in the soon to be published proposed amendment to 10 CFR 50.55a. The NRC staff previously provided comments on the Code Case related to these proposed conditions to the cognizant ASME committees.

The NRC staff continues to monitor and evaluate operating experience to ensure that the current inspection schedules are adequate.

The staff is in the process of preparing a Regulatory Issue Summary (RIS) on the regulatory requirements for application of weld overlays and other mitigation techniques in piping systems

approved for leak-before-break. The staff held a public meeting to obtain stakeholder input on February 26, 2010. The staff will make their response to the public comments from this meeting available when the RIS is issued. The staff expects to issue this RIS by the end of June 2010.

5. New Reactor Licensing Activities

The New Reactor Licensing public web-site [http://nrr10.nrc.gov/NRO/new-rx-status/index.cfm] has a list of expected new nuclear power plant applications, and an estimated schedule by fiscal year for new reactor licensing applications.

New Reactor Licensing Status

As of April 15, 2010, the status of new reactors licensing under 10 CFR Part 52 is as follows:

Design Certification

NRC has issued four design certifications to date (ABWR, System 80+, AP600, and AP1000). These are certified in 10 CFR Part 52, Appendices A, B, C, and D, respectively. The NRC is currently reviewing four design certifications:

- General Electric-Hitachi's ESBWR (first passive BWR)
- AREVA's EPR (evolutionary pressurized-water reactor)
- Mitsubishi Heavy Industries' US-APWR (advanced pressurized water reactor)
- AP1000 Revision 17 (first amended design certification)

Early Site Permits (ESP)

NRC has issued four ESPs to date (Clinton, Grand Gulf, North Anna and Vogtle). The NRC's issuance of the Vogtle ESP on August 26, 2009 is the first to be based on a specific technology (AP1000) and the first to include a limited-work authorization (LWA). The NRC received an application for an ESP for the Victoria County Station submitted by Exelon on March 25, 2010. This is the first ESP application for a greenfield site with no specific technology established at this time.

Combined License (COL) Applications

NRC is currently reviewing 17 COL applications (27 new reactor units):

- 1 ABWR — South Texas Project 3 and 4
- 7 AP1000 — Bellefonte 3 and 4, William S. Lee Station 1 and 2, Shearon Harris 2 and 3, Vogtle 3 and 4, V.C. Summer 2 and 3, Levy County 1 and 2, and Turkey Point 6 and 7
- 5 ESBWR — North Anna 3 and Grand Gulf 3*, River Bend 3*, Victoria County 1 and 2*, Fermi 3
- 3 EPR — Calvert Cliffs 3, Nine Mile Point 3*, Bell Bend

- 1 US-APWR Comanche Peak Units 3 and 4

* NRC staff review suspended at request of applicant.

Advanced Reactors Program

NRC has established an advanced reactors program in the Office of New Reactors. Currently there are no applications under review, but several applications are expected to be submitted in the next three years including:

- High Temperature Gas-Cooled Reactors:
  - Next Generation Nuclear Plant (DOE) – Design Certification application expected FY 2013
- Small and Medium-size LWRs:
  - NuScale – Design Certification application expected FY 2012
  - mPower (B&W)– Design Certification application expected Q1 CY 2012
  - Toshiba 4S – Design Approval application expected FY 2012
  - IRIS (Westinghouse) – Design Certification application expected Q3 2013

NRO Vendor Inspection

The NRO vendor inspection program is described in Inspection Manual chapter (IMC) 2507, "Construction Inspection Program, Vendor Inspection." This IMC will be implemented by various Inspection Procedures (IPs) including:

IP 43002: Routine Inspections of Nuclear Vendors;
IP 43003: Reactive Inspections of Nuclear Vendors;
IP 43004: Inspection of Commercial-Grade Dedication Programs;
IP 43005: NRC Oversight of Third Party Organizations Implementing Quality Assurance Requirements; and
IP 36100: Inspection of 10 CFR Parts 21 and 50.55(e) Programs for Reporting Defects and Noncompliance.

FY 10 Vendor Inspection Plans

- Commercial grade dedication organizations
- Manufacturing for valves (all new reactor Design Centers)
- Forgings suppliers for AP1000, EPR
- Manufacturing for steam generator tubes EPR and AP1000
- STP ABWR reactor vessel fabrication in Japan
- STP ABWR mechanical component fabrication in Japan
- AP1000 Modular Construction Facilities

Vendor Inspection Reports completed, issued and planned inspections

- Dubose National Energy Services, Clinton, NC, December 2009 – (Part 21 only) issued
- Shaw Power Group, Charlotte, NC, March 2010 – completed
- Sulzer Pumps, March, 2010, Chattanooga TN – completed
- South Texas Project Units 3&4 (ABWR Design Certification amendment) Bay City, Texas - completed
- Westinghouse (Seismic Structural Code), Cranberry Woods, PA - scheduled May 10 - 12, 2010
- Sandvik, Sandviken Sweden, Areva EPR SG tubes, scheduled - May 31- June 4, 2010

Vendor Inspections continue to identify findings related to commercial grade dedication activities and inadequate Part 21 programs for evaluating and reporting of defects that could cause a substantial safety hazard.

Previously issued NRC inspection and trip reports can be located at

http://www.nrc.gov/reactors/new-licensing/quality-assurance.html

Multinational Design Evaluation Programme (MDEP) Codes and Standards Working Group

MDEP is a multinational initiative to develop innovative approaches to leverage the resources and knowledge of mature, experienced national regulatory authorities who will be tasked with the regulatory design review of new reactor plant designs. One of the issue-specific working groups established under the MDEP organization is the Codes and Standards Working Group (CSWG) whose goal is to achieve harmonization of Code requirements for pressure-boundary components.

Harmonizing pressure-boundary Codes used by member countries would ensure a consistent level of quality and safety in the design of pressure-boundary components such as the reactor vessel, piping, pumps, and valves and allow components manufactured in other countries to be used in member countries with a relatively minor review and reconciliation of Code differences. Such an approach would simplify the licensing of nuclear power plants and reduce the burden on the regulatory authorities on an international scale significantly.

The MDEP/CSWG has been working with standards development organizations (SDOs) from several countries (i.e., U.S., Japan, Korea, France, Canada and, recently, the Russian Federation) for the past 2 years to compare each countries' pressure-boundary Code requirements for Class 1 vessels, piping, pumps and valves to the requirements of the ASME Boiler and Pressure Vessel Code, Section III. Similarities and differences are being documented in a database table. The Code-comparison effort is the first step to achieve harmonization of pressure-boundary codes and standards. The Code-comparisons are essentially complete for Class 1 vessels, piping, pumps and valves for Korea, Japan, and France with Canada following shortly thereafter. Russia recently initiated a comparison of its pressure-boundary code for Class 1 vessels, piping, pumps

and valves. The SDOs from Japan, France, Canada, Russia and the U.S. met at the OECD Nuclear Energy Agency's offices on April 8-9, 2010 to discuss with the MDEP/CSWG their results and significant findings from its Code comparisons. The MDEP/CSWG presented to the SDOs its conceptual plan to harmonize pressure-boundary codes and standards on an international level. The MDEP/CSWG plans to issue a letter to each of the SDOs requesting support to harmonize pressure-boundary codes and standards and to consider how further divergence of code requirements can be prevented. The next MDEP/CSWG meeting is tentatively planned to be held in Vancouver, Canada in November 2010 in conjunction with the ASME Boiler Code meeting.

Multinational Design Evaluation Program (MDEP) Vendor Inspection Cooperation Working Group (VICWG) activities:

NRC staff continues involvement for international cooperation of vendor oversight through the MDEP and through interactions with other international regulatory bodies. The staff has met with the Japan Nuclear Energy Safety Organization (JNES), the Japan Nuclear and Industrial Safety Agency (NISA), the French Nuclear Safety Authority (ASN), the Korean Institute of Nuclear Safety (KINS), the Chinese regulator (NNSA) and the regulator from Great Britain.

On October 14-15, 2009, NRO CQVP and CQVB staff participated in the meeting of the MDEP Vendor Inspection Cooperation Working Group (VICWG) at NRC offices in Rockville MD. There are currently 10 member countries participating: Canada, China, France, Finland, Japan, the Russian Federation, South Korea, the U.K., South Africa; and the U.S. During this meeting, discussions were held regarding the results of the survey to document the quality assurance requirements being implemented in the member countries. The overall conclusion was that many of the member countries programs are similar to what the US licensee's are implementing. Members all thought that it would be beneficial to perform a comparison between the quality standards NQA-1-2008, ISO 9001 and IAEA-GSR-3.

The MDEP VICWG members continue to allow opportunities for NRC staff participation and observation of vendor inspections conducted by regulatory authorities from other countries and for opportunities where participation and observation of NRC vendor inspections by representatives of regulatory authorities from other countries is possible. VICWG objectives include: explore international regulators' vendor oversight requirements and programs; apply lessons learned; exchange vendor inspection insights; and identify areas where international cooperation can yield tangible benefits.

On April 19-23, 2010, NRO staff observed the British Regulator perform an engineering procurement inspection of AREVA design activities in Paris, France.

On May 10-12, 2010, NRO staff will staff will be participating at the next meeting of the VICWG in Paris, France. Discussion will include lessons learned on MDEP vendor inspections conducted to date, a general discussion of vendor inspection activities, and a discussion on common quality assurance criteria for member counties.

NRC Regulatory Guide (RG) 1.28 Revision 4 Update

In October 2007, ASME requested NRC Endorsement of the NQA-1-2008 Edition. NRC Draft Guide DG-1215 for proposed Revision 4 of Regulatory Guide 1.28 was posted on the NRC website for public comment in July 2009 and includes endorsement of NQA-1-2008 edition and 2009-1a addenda. The NRC has completed its review of 33 public comments received from stakeholders.

It is expected that Revision 4 to RG 1.28 will be issued in May 2010.

The ASME Section III Subgroup on General Requirements (SG-GR) will continue revision activities related to referencing the NQA-1-2008 Edition and the 2009-1a addenda in ASME Section III, Subsection NCA 4000. It is expected that this activity will coincide with the NRC endorsement of the later edition of the NQA-1 standard in RG 1.28 Revision 4.

2nd NRC Workshop on Vendor Oversight for New Reactor Construction

The Nuclear Regulatory Commission will hold its 2nd Workshop on Vendor Oversight for New Reactor Construction on June 17 in New Orleans, LA, to share insights and lessons learned for companies supplying components and services for new reactor construction.

The purpose of this workshop is to bring together NRC staff, regulated utilities, vendors of nuclear components, and other interested stakeholders to discuss recent issues. This one-day NRC workshop is being held upon completion of the periodic Nuclear Procurement Issues Committee (NUPIC) meeting to maximize industry and vendor participation. Vendor inspection topics at this workshop will include both the NRC's and industry's perspectives on vendor oversight for new reactors; the ASME nuclear survey process; the NRC enforcement policy as it applies to vendors; counterfeit, fraudulent, and suspect items; safety culture; and vendor perspectives on third party inspections, audits, and surveys. In addition to presentations by the NRC staff, there will be presentations by NUPIC, NEI, EPRI, ASME, and two nuclear vendors.

The workshop runs from 8 a.m. to 5 p.m. on June 17 at the New Orleans Marriott, 555 Canal Street, New Orleans. Those interested in attending the workshop are encouraged to pre-register by June 1 by visiting this NRC Web page:

http://www.nrc.gov/reactors/new-reactors/oversight/quality-assurance/vendor-oversight/registration.html.

Additional workshop information is available on the NRC Web site here: http://www.nrc.gov/reactors/new-reactors/oversight/quality-assurance/vendor-oversight.html.

6. LICENSE RENEWAL ACTIVITIES

There are several on-going activities in license renewal. Current status of applications and approvals is:

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- 59 units approved (Beaver Valley on November 5 and Susquehanna on November 24)
- 13 applications (19 units) under review
    - 2 (2 units) awaiting final approval (Pilgrim and Vermont Yankee)
    - 2 (4 units) completed ACRS full committee (Indian Point 2 & 3, Prairie Island 1 & 2)
    - 0 (0 units) completed ACRS subcommittee
    - 7 (10 units) awaiting ACRS subcommittee (Cooper 5/10, Duane Arnold 6/10, Crystal River 6/10, Kewaunee 7/10, Palo Verde 9/10, Hope Creek 11/10 and Salem 12/10)
    - 2 (3 units) applications received (Diablo Canyon 1 & 2 and Columbia)
- 6 applications with scheduled application dates through 2011
    - April-June 2010 – Seabrook
    - August 2010 – Davis-Besse
    - October-December 2010 – South Texas Project 1 & 2
    - July 2011 – Grand Gulf
    - September 2011 – Limerick 1 & 2
    - October 2011 – Callaway
    - Others staggered out to 2017

Four plants have entered the operating period beyond 40 years:

- Oyster Creek – April 9, 2009
- Nine Mile Point Unit 1 – August 22, 2009
- Ginna – September 19, 2009
- Dresden – December 22, 2009

Upcoming plants in 2010 are H.B. Robinson, Monticello, and Point Beach Unit 1.

Revision of Generic Aging Lessons Learned (GALL) Report (NUREG-1801)

NRC has an on-going internal activity to develop an update of the GALL report and the License Renewal Standard Review Plan (SRP). This revision is comprehensive in nature, including consideration of aging management programs (AMPs), aging management review (AMR) line items from the GALL tables, and the SRP. Sources of information for the proposed revisions are:

- Interim Staff Guidance documents
- Comments from the industry (Nuclear Energy Institute)
- Plant operating experience (generic communications, etc.)
- Lessons learned and precedents from LRA reviews
- The NRR RES Proactive Materials Degradation Assessment (PMDA).

NRC staff will modify the GALL Report to address concerns raised by ASME about use of Section XI Code Editions, Relief Requests, and Code Cases for license renewal, consistent with the summary of the NRC-ASME teleconference held on August 10 (see (Agencywide

Documents Access and Management System (ADAMS) Accession No. ML092440512, available on the NRC web site [http://www.nrc.gov]).

The tentative schedule is:

- December 2009 COMPLETE – draft portions of documents were made available on the web
- April 2010 – draft GALL and SRP available for public comment and public workshop (see item number 9 below)
- December 2010 – final revised GALL and SRP issued

Status and schedule can be tracked at:

http://www.nrc.gov/reactors/operating/licensing/renewal/guidance/updated-guidance.html

Technical Issues

Recent reviews and plant operating experience have identified issues in the following areas:

- Neutron Absorbers
  - Information Notice 2009-26, "Degradation of Neutron-Absorbing Materials in the Spent Fuel Pool," issued on October 28.
  - Draft Interim Staff Guidance (ISG) for Boral and other neutron absorber materials was issued for public comment on December 1 (LR-ISG-2009-01, "Staff Guidance Regarding Plant-Specific Aging Management Review and Aging Management Program for Neutron-Absorbing Material In Spent Fuel Pools"). Final ISG will be issued soon.
- Buried Piping
  - Recent operating experience, including tritium releases. NRC has initiated on-going interactions with NEI, EPRI, INPO and NACE.
- Socket Welds
  - Consideration of the need for non-visual examinations to ensure integrity of these welds.
  - Industry reviewing/evaluating operating experience
- Metal Fatigue
  - Additional information routinely requested for NRC reviews (dissolved oxygen, cycle counting, etc.). RIS 08-030 describes need to use six stress components instead of one to assure conservative fatigue calculations. The Office of Nuclear Regulatory Research is considering additional work in the area of environmental fatigue and has initiated discussions with EPRI.
- Containment Liner
  - Corrosion identified at several plants.
  - An item was introduced on the agenda of Section XI, Subsection IWL to assess the need to identify early detection methods for containment liner plate degradation/corrosion. Discussion of this issue is continuing in working group meetings.
  - NRC has initiated an activity to review operating experience and assess likelihood of corrosion occurrence.

- Concrete Containment
  - Delamination at tendon thickness location identified at one plant. Conditions not identified at a similar plant.
- Medium Voltage Cables
  - Cables in submerged environment not qualified for continuous submergence.

7. Buried Piping

Recent leaks from buried piping at nuclear power plants have caused the NRC to undertake a focused look at how underground piping is designed, maintained, and inspected to ensure structural integrity and to prevent leaks that could harm the environment. These leaks generated significant stakeholder interest, including inquiries from several congressmen. On December 2, 2009, the NRC staff responded to the Chairman's memorandum dated September 3, 2009, ADAMS No. ML092460648, tasking the staff to describe the activities currently underway or planned addressing the issue of leaks from buried piping. The response is SECY-09-0174, "Staff Progress in Evaluation of Buried Piping at Nuclear Reactor Facilities," and can be found at http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2009/.

A new Code Case N-XXX is under development to address underground piping systems. The staff has identified several areas that are not yet addressed, or require significant additional detail. The staff has provided its comments to Section III.

With regard to Code Case N-755 regarding the use of high density polyethylene piping for underground systems, the staff has identified issues to Section III related to design life, joining, and non-destructive examination that will need to be addressed for the staff to endorse the Code Case.

8. Crystal River Unit 3 (CR-3) Containment Delamination

During the October 2009 refueling outage, while cutting a 25 ft by 27 ft opening for the steam generator replacement (SGR) project, the licensee discovered a delamination of the concrete about 9 inches from the outer surface of the 42-inch thick wall of its post-tensioned concrete containment. The delaminated condition is not an immediate safety concern, since the plant is shutdown. The NRC Region-II dispatched a Special Inspection Team (SIT) to evaluate the CR-3 containment.

The licensee's ongoing investigation of the issue includes four major areas: (i) condition assessment to determine the extent of condition; (ii) root cause analysis; (iii) design basis analysis; and (iv) repair analysis and design of repair implementation. The repair construction is being implemented in 5 phases: (1) implement crack arrest cuts; (2) detension additional tendons; (3) remove delaminated concrete; (4) place reinforcement and concrete; and (5) retension tendons and post-repair testing.

The licensee determined that the delaminated condition is limited to the area between two buttresses from above the equipment hatch to about 10 ft below the ring girder, which includes the SGR construction opening. After analyzing repair alternatives, the licensee decided to remove and replace the concrete in the delaminated area. The licensee is performing a root cause analysis and a design basis analysis (using a solid finite element model) to evaluate the

impact of the delamination on the containment design basis. The technical root cause analysis and the design basis analysis are expected to be completed during the second half of May 2010.

The licensee has indicated that it intends to perform appropriate post-repair pressure testing of the containment to demonstrate structural and leak-tight integrity prior to returning to service. The NRC is proactively addressing this issue to ensure that the integrity of the containment is restored within its design basis. The successful determination of the root cause(s) analysis is essential to determining any generic implications of the issue.

9. License Renewal Workshop

A license renewal workshop will be held on Wednesday, May 26, 2010, and Thursday, May 27, 2010, from 9:00 a.m. – 4:30 p.m. each day, and Friday May 28, 2010, from 8:30 a.m. – noon, on the updated license renewal guidance documents. The meeting will be held at the U.S. Nuclear Regulatory Commission (NRC) headquarters, Two White Flint North, 11545 Rockville Pike, ACRS Conference Room (T-2B3), Rockville, MD 20852. The purpose of the license renewal workshop is to provide information to stakeholders regarding the updated license renewal guidance documents and receive input and comments from stakeholders on the documents. The meeting notices can be found in ADAMS at ML101130356. The schedule, background information, and preliminary drafts of the guidance documents will be available at http://www.nrc.gov/reactors/operating/licensing/renewal/guidance/updated-guidance.html on the NRC's Website. The contact for the meeting is Robert Gramm, NRR, 301-415-1010.