NRC000120
Submitted: March 31, 2012

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
ENTERGY NUCLEAR OPERATIONS, INC.	)	Docket Nos. 50-247/286-LR
	)	
(Indian Point Nuclear Generating Units 2 and 3)	)	

NRC STAFF'S STATEMENT OF POSITION REGARDING RK-TC2

INTRODUCTION

Pursuant to 10 C.F.R. § 2.1207(a) and the Licensing Board Scheduling Order (July 1, 2010) (unpublished), as modified,[1] the Staff of the U.S. Nuclear Regulatory Commission ("Staff") submits its initial written statement of position and written testimony with supporting affidavits on Riverkeeper TC-2, which asserts that deficiencies in Entergy's Aging Management Program ("AMP") for flow accelerated corrosion. Appended to this filing is the "NRC Staff Testimony of Matthew Yoder and Allen Hiser Regarding RK-TC2" and associated Staff Exhibits. For the reasons set forth below and in the testimony filed herewith, the Staff submits that a careful evaluation of RK-TC2 demonstrates that its challenge to the Entergy Nuclear Operations, Inc. ("Entergy" or "Applicant") application for renewal of the Indian Point Nuclear Generating Units 2 and 3 operating licenses cannot be sustained.

[1] Licensing Board Order (Granting NRC Staff's Unopposed Time Extension Motion and Directing Filing of Status Updates) (Feb. 16, 2012) (unpublished); Licensing Board Order (Extension of Time) (Dec. 14, 2011) (unpublished); Licensing Board Order (Granting Entergy's Motion for Clarification of Licensing Board Memorandum and Order Admitting Contention NYS-38/RK-TC-5) (Dec. 6, 2011) (unpublished); Licensing Board Order (Clarification of Procedures for Evidentiary Filings) (Oct. 18,2011) (unpublished); Licensing Board Order (Denying New York's Motion for an Extension of Time) (Oct. 7, 2011) (unpublished); Licensing Board Order (Procedures for Evidentiary Filings) (Oct. 7, 2011) (unpublished); Licensing Board Amended Scheduling Order (June 7, 2011) (unpublished).

BACKGROUND

On April 23, 2007, Entergy filed its license renewal application ("LRA") to renew the operating licenses for Indian Point Nuclear Generating Units 2 and 3 (“IP2” and “IP3”), for an additional period of 20 years.

On November 30, 2007, petitions for leave to intervene were filed by various petitioners, including Riverkeeper.[2] Its Contention TC-2 (Flow Accelerated Corrosion) asserts:

> Entergy's program for management of Flow Accelerated Corrosion (FAC) -- an aging phenomenon with significant safety implications -- fails to comply with 10 C.F.R. § 54.21(a)(3)'s requirement that:
>
> > For each structure and component identified in paragraph (a)(1) of this section, demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.
>
> Entergy also fails to follow the guidance of NUREG-1800, which requires that an aging management program ["AMP"], including a FAC program for life extension, must address each of the following elements:
>
> > (1) Scope
> > (2) Preventative actions
> > (3) Parameters monitored or inspected
> > (4) Detection of aging effects
> > (5) Trending
> > (6) Acceptance criteria
> > (7) Corrective actions
> > (8) Confirmation processes
> > (9) Administrative processes
> > (10) Operating experience
>
> NUREG-1800, § A.1.2.3.
>
> Entergy's program for management of FAC is deficient because it has not demonstrated that components in the Indian Point nuclear power plant that are within the scope of the license

[2] *See* Riverkeeper, Inc.'s Request for Hearing and Petition to Intervene in the License Renewal Proceeding for the Indian Point Nuclear Power Plant (“RK Petition”) filed November 30, 2007 at 15-23. The contention is supported by Riverkeeper's expert Dr. Joram Hopenfeld. *See id*. at 16 & Declaration of Dr. Joram Hopenfeld ("Hopenfeld Declaration") in support of Riverkeeper's Contentions TC-1 and TC-2 (November 28, 2007).

> renewal rule and are vulnerable to FAC will be adequately inspected and maintained during the license renewal term. In particular, Entergy's program for management of FAC is deficient because it relies on the computer code CHECWORKS, without sufficient benchmarking of the IP operating parameters. In addition, Entergy's license renewal application fails to specify the method and frequency of component inspections or criteria for component repair or replacement.

RK Petition at 15-16.

The Applicant[3] and the Staff[4] opposed the admission of TC-2 on various grounds. Following oral argument on the admissibility of contentions, the Board admitted Riverkeeper TC-2. *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), LBP-08-13, 68 NRC 43, 172-177[5]. The Board admitted TC-2 with two elements:

> (1) Entergy's AMP for components affected by FAC is deficient because it does not provide sufficient details (e.g., inspection method and frequency, criteria for component repair or replacement) to demonstrate that the intended functions of the applicable components will be maintained during the extended period of operation; and (2) Entergy's program relies on the results from CHECWORKS without benchmarking or a track record of performance at IPEC's power uprate levels.

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[3] Answer of Entergy Nuclear Operations, Inc. Opposing Riverkeeper, Inc.'s Request for Hearing and Petition to Intervene (Jan. 22, 2008) ("Entergy Riverkeeper Answer") at 44-60.

[4] NRC Staff's Response to Petitions For Leave to Intervene Filed By (1) Connecticut Attorney General Richard Blumenthal, (2) Connecticut Residents Opposed To Relicensing Of Indian Point, And Nancy Burton, (3) Hudson River Sloop Clearwater, Inc., (4) The State Of New York, (5) Riverkeeper, Inc., (6) The Town Of Cortlandt, And (7) Westchester County ("Staff's Answer"), filed January 22, 2008, at 119-122.

[5] In admitting Riverkeeper TC-2, the Board noted that its decisions were consistent with *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-06-20, 64 NRC 131, 192-96 (ruling on petitions), wherein the intervenor had raised the same challenge regarding the effect of a power uprate on the FAC program. The Staff notes that in *Vermont Yankee*, where Dr. Hopenfeld testified that CHECWORKS was inadequately benchmarked for a 20% increase in power, the Board found that "[b]ased on the overwhelming evidence provided by Dr. Howowitz, coauthor of CHECWORKS, [the Board finds] that CHECWORKS was benchmarked using an extensive database of laboratory testing and actual operating conditions from a multitude of plants operating at the same and higher levels than the uprated value at [Vermont Yankee]." *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-08-25, 68 NRC 763, 889 (Partial Initial Decision), *rev'd in part, aff'd in part, and remanded on other grounds to the Board in* CLI-10-17, 72 NRC 1 (2010). The Board also found 10 to 15 years of benchmarking to be "unreasonable and not defensible." *Id*. Significantly, the Board noted that Dr. Hopenfeld concluded that the FAC Program would not be materially affected if CHECWORKS was not included in the AMP. *Id.* at 877.

Indian Point, LBP-08-13, 68 NRC at 177.

Entergy subsequently filed a motion for summary disposition of this contention on July 26, 2010. Applicant's Motion for Summary Disposition of Riverkeeper Technical Contention 2 (Flow-Accelerated Corrosion) (July 26, 2010) (ADAMS Accession Number ML102140430). Kimberly Green and Matthew Yoder provided affidavits for the Staff supporting the motion. *See* NRC Staff's Answer to Applicant's Motion for Summary Disposition of Riverkeeper Technical Contention 2 (Flow-Accelerated Corrosion) (Aug. 16, 2010) (ADAMS Accession Number ML102290354).

The Board denied the motion finding that genuine issues of material fact existed regarding the adequacy of the Applicant's plan to manage the effects of FAC during the proposed period of extended operation. Memorandum and Order (Ruling on Entergy's Motion for Summary Disposition of Riverkeeper TC-2 (Flow-Accelerated Corrosion)) at 1 (Nov. 4, 2010) (unpublished) (ADAMS Accession No. ML103080994). The Board indicated that it needed to have an opportunity to evaluate and weigh the facts presented to determine if Riverkeeper's claims are true or if Entergy's LRA is sufficient. Id. at 8.

On December 22, 2011, RIverkeeper filed its *Riverkeeper Initial Statement of Position Regarding Contention RK-TC-2 - Flow Accelerated Corrosion* (December 22, 2011) (ADAMS Accession No. ML120040315) ("SOP" or "RK-TC-2 SOP") (Ex. RIV000002). Riverkeeper asserts that Entergy's FAC program is inadequate because the program 1) improperly relies on the CHECWORKS™ computer code, 2) lacks other tools that are meaningfully independent of the CHECWORKS™ computer code, and 3) fails to address safety concerns caused by inadequate aging management by the FAC program. Further, Riverkeeper asserts that 4) the FAC program's reliance on the CHECWORKS™ computer code doesn't meet NRC regulations and guidance, and 5) the FAC program lacks details of the programmatic elements described in the NRC's guidance.

DISCUSSION

I. Regulatory Framework

The regulations in 10 C.F.R. Part 54 set forth the safety standards for license renewal. Underlying the Commission's renewal regulations is the principle that each nuclear power plant has a plant-specific current licensing basis ("CLB")[6] that must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term. *Entergy Nuclear Generation Co. and Entergy Nuclear Operations, Inc.* (Pilgrim Nuclear Power Station), CLI-10-14, 71 NRC 449, 453 (*citing* Final Rule, Nuclear Power Plant License Renewal; Revisions, 60 Fed. Reg. 22,461, 22,464 (May 8, 1995) ("License Renewal Rule")).

Pursuant to 10 C.F.R. § 54.29, the Commission may issue a renewed license if the Commission finds:

> (a) Actions have been identified and have been or will be taken with respect to the matters identified in Paragraphs (a)(1) and (a)(2) of this section, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB, and that any changes made to the plant's CLB in order to comply with this paragraph are in accord with the Act and the Commission's regulations. These matters are:
>
> > (1) managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under § 54.21(a)(1); and
> >
> > (2) time-limited aging analyses that have been identified to require review under § 54.21(c).
>
> (b) Any applicable requirements of Subpart A of 10 CFR Part 51 have been satisfied.
>
> (c) Any matters raised under § 2.335 have been addressed.

10 C.F.R. § 54.29.

[6] The CLB is "the set of NRC requirements (including regulations, orders, technical specifications, and license conditions) applicable to a specific plant, and includes the licensee's written, docketed commitments for ensuring compliance with applicable NRC requirements and the plant-specific design basis." *Pilgrim*, CLI-10-14, 71 NRC at 453-54 (*citing* 10 C.F.R. § 54.3). Both during the original license term and continuing through the renewal term, the NRC continually assesses the both the adequacy of the CLB, as well as the licensee's compliance with its CLB, through the NRC regulatory oversight process, generic and plant-specific reviews, plant inspections, and enforcement actions. *Id.*

The scope of the license renewal process is limited. *Nextera Energy Seabrook, LLC* (Seabrook Station, Unit 1), CLI-12-05, 75 NRC __ (March 8, 2012) (slip op. at 2) (*citing N.J. Envtl. Fed'n v. NRC*, 645 F.3d 220, 224 (3d Cir. 2011)). The safety review—and any associated license renewal adjudicatory proceeding—focuses on the detrimental effects of aging posed by long-term reactor operation. *Id.* Applicants must demonstrate "reasonable assurance" that "the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation." *Id.* at 3.

A. A Commitment to Implement an AMP That Is Consistent With the NRC's Guidance Documents Is Itself an Adequate Demonstration of Reasonable Assurance Under Section 54.29(a)

In reviewing the safety aspect of license renewal applications, the NRC is guided primarily by two documents—the Generic Aging Lessons Learned (GALL) Report[7] and the License Renewal Standard Review Plan ("SRP-LR").[8] *Amergen Energy Company, LLC* (Oyster Creek Nuclear Generating Station), CLI-08-23, 68 NRC 461, 466 (2008).

The SRP-LR assigns review responsibilities among Staff technical organizations and describes methods for identifying those SSCs that are subject to aging effects within the scope of license renewal review. *Id* at 467. The SRP-LR defines ten aging management program elements--1) scope of program, 2) preventive actions, 3) parameters monitored or inspected, 4) detection of aging effects, 5) monitoring and trending, 6) acceptance criteria, 7) corrective actions, 8) confirmation process, 9) administrative controls, and 10) operating experience --

[7] NUREG-1801, Rev. 1, *Generic Aging Lessons Learned (GALL) Report*, (Sept. 2005), Vol. 1 (ADAMS Accession No. ML052770419) & Vol. 2 (ADAMS Accession No. ML052110006) (ex. NYS00146A-C) ("GALL Report Rev. 1"); NUREG-1801, Rev. 2, *Generic Aging Lessons Learned (GALL) Report – Final Report*, (Dec. 2010) (ADAMS Accession No. ML103490041) ("GALL Report Rev. 2") (ex. NYS000147A-D).

[8] NUREG-1801, Rev. 1, *Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants*, (Sept. 2005) (ADAMS Accession No. ML052770566) ("Standard Review Plan" or "SRP-LR Rev. 1") (ex. NYS000195); NUREG-1801, Rev. 2, *Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants*, NUREG-1800, Rev. 2 (Dec. 2010) (ADAMS Accession No. ML103490036) (ex. NYS000161) ("SRP-LR Rev. 2"). Throughout this statement of position, where no revision is provided in the text, the statement provides equally to both revisions of SRP-LR.

which are essential to an effective aging management program. *Id.* & SRP-LR Rev. 2 at A.1-3 through A.1-9.

The GALL Report identifies generic aging management programs that the Staff has determined to be acceptable, based on the experiences and analyses of existing programs at operating plants during the initial license period. *Oyster Creek*, CLI-08-23, 68 NRC at 467. The GALL Report was developed because the Staff discovered through reviews of the first sets of license renewal applications that many of the programs the licensee would rely on to manage aging effects during the renewal period were already in place during the initial license period. *Id.* at 467 n.15. The report describes each aging management program with respect to the ten program elements defined in the SRP-LR. *Id.* at 467.

As the Commission explained in *Oyster Creek*, the SRP-LR provides that a license renewal application may rely on an AMP that is consistent with the GALL Report, or may use a plant-specific AMP. *Oyster Creek*, CLI-08-23, 68 NRC at 467. Using an AMP identified in the GALL Report (i.e. when an applicant ensures and certifies[9] that its programs correspond to those reviewed in the GALL report) constitutes reasonable assurance that the AMP will manage the targeted aging effect during the renewal period. *Id.* Oyster Creek, CLI-08-23, 68 NRC at 467. The Commission has recently re-iterated this principal, stating:

> If the NRC concludes that an aging management program (AMP) is consistent with the GALL Report, then it accepts the applicant's commitment to implement that AMP, finding *the commitment itself to be an adequate demonstration of reasonable assurance under section 54.29(a).*

[9] The Commission has emphasized that it is neither possible nor necessary for the Staff to verify each and every factual assertion in LRAs, but the Commission's regulations require that an LRA be complete and accurate in all material respects, and submitted under oath. *Oyster Creek*, CLI-08-23, 68 NRC at 480-481. Nevertheless, and as demonstrated by the attached testimony, the NRC does not simply take the applicant at its word. When an applicant claims consistency with the GALL Report, the Staff draws its own independent conclusion. *See Vermont Yankee*, CLI-10-17, 72 NRC at 37.

Seabrook, CLI-12-05, 75 NRC at __ (slip op. at 4) (*citing Entergy Nuclear Vermont Yankee, LLC* (Vermont Yankee Nuclear Power Station), CLI-10-17, 72 NRC 1, 36 (2010); *Oyster Creek*, CLI-08-23, 68 NRC at 467-68.) (emphasis added).

B. Burden of Proof

In the Commission's adjudications,

> [t]he ultimate burden of proof on the question of whether the permit or the license should be issued is … upon the applicant. But where … one of the other parties contends that, for a specific reason … the permit or license should be denied, that party has the *burden of going forward* with evidence to buttress that contention. Once [the party] has introduced sufficient evidence to establish a *prima facie* case, the burden then shifts to the applicant who, as part of [its] overall burden of proof, must provide sufficient rebuttal to satisfy the Board that it should reject the contention as a basis for denial of the permit or license.

AmerGen Energy Company, LLC (Oyster Creek Nuclear Generating Station), CLI-09-7, 69 NRC 235, 269 (quoting *Louisiana Power and Light Co.* (Waterford Steam Electric Station, Unit 3), ALAB-732, 17 NRC 1076, 1093 (1983), quoting *Consumers Power Co.* (Midland Plant, Units 1 and 2), ALAB-123, 6 AEC 331, 345 (1973) (emphasis in original))

II. Staff Position on Contention RK-TC2

The NRC Staff testimony of Matthew G. Yoder and Dr. Allen L. Hiser, Jr. concerning RK-TC2 presents the Staff's position that the concerns raised in RK-TC2 lack merit. Test. at A7-A8 (ex. NRC000121). The Staff's witnesses explain how the FAC Program described in Entergy's license renewal application meets the regulatory criteria described in 10 C.F.R. Part 54 and is consistent with the Staff guidance. *Id.* at A8. The details available on the FAC Program, as described in Riverkeeper's exhibits, are sufficient to demonstrate that the effects of FAC will be managed during the period of extended operation. *Id.*

A. Staff Witnesses

In the attached testimony of Mr. Matthew Yoder and Dr. Allen Hiser the two highly-qualified witnesses explain why the information in the LRA on aging management of FAC

provides an adequate demonstration of reasonable assurance under section 10 C.F.R. 54.29(a), and that the additional information requested through Contention RK-TC-2 is not necessary.

Mr. Yoder is a Senior Chemical Engineer in the Steam Generator Tube Integrity and Chemical Engineering Branch of the Division of Engineering, and his responsibilities include the technical, safety, and regulatory compliance reviews of a variety of chemistry and chemical engineering topics, including flow accelerated corrosion programs for applicants for license renewal, as well as to how FAC is affected by power uprates. substantial experience in the nuclear power industry regulation including pressurized water reactors (“PWRs”) as well as boiling water reactors (“BWRs”). *See* Yoder Statement of Professional Qualifications (ex. NRC000122). In the area of power uprates, he has performed technical, safety, and regulatory review of license amendment requests ("LAR") to increase authorized power levels for multiple sites, and his uprate reviews have included careful consideration of the impact of the requested changes on flow accelerated corrosion programs, including inspection frequencies, component replacements, changes in corrosion rate, and modeling in CHECWORKS.

Dr. Allen Hiser, Jr. has 22 years of an experienced at the NRC and also has been a participant in American Society of Mechanical Engineers (ASME) Working Groups on Flaw Evaluation and Pipe Flaw Evaluation dating back in the early 1980s. *See* Hiser Professional Qualifications (ex.NRC000103). His responsibilities include providing technical advice and assistance to the Division of License Renewal on a variety of technical, regulatory and policy issues related to aging management of nuclear power plant systems, structures, and components. His responsibilities include serving as a lead technical expert for aging management evaluation and assisting other NRC staff as they implement their review of license renewal applications. Dr. Hiser holds Bachelor of Science and Master of Science degrees in Mechanical Engineering from the University of Maryland at College Park, and a Ph.D. in Materials Science and Engineering from Johns Hopkins University.

B. Summary of Staff Position: The LRA is Adequate to Support a Request for a Renewed License Under 10 C.F.R. §§ 54.21(a)(1) and 54.29

The Staff's witnesses explain that the current FAC Program for IP2 and IP3 is acceptable to be used as the FAC program for license renewal. Test. at A56 (ex. NRC000102). On the basis of its audit and review of the applicant's Flow-Accelerated Corrosion Program, the staff finds that all program elements are consistent with the GALL Report. *Id.* The applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, as required by 10CFR 54.21(a)(3). *Id.*

The NRC has been addressing the concern, and the industry has been responding, for several decades. *See Id*. at A13. Through Generic Letters and Bulletins, the agency has required substantial information from licensees on what the licensee do to address flow accelerated corrosion. *Id.* In late 1988, the NRC requested information to assess implementation of erosion/corrosion monitoring programs, and to ensure that adequate guidance was provided for corrective actions and other activities regarding repair and replacement of degraded piping and components; in general, all licensees had developed and implemented erosion/corrosion monitoring programs. *Id.* at A14. Later in 1989, the NRC requested information about long term erosion/corrosion monitoring programs and assurances that procedures or administrative controls were in place, but explicitly did NOT require detailed information. *Id.* at A17.

For license renewal, the Staff verified the responses to this information requests. Id. at A18.

The Staff's witnesses observe that, Riverkeeper did not discuss the findings associated with the generic requests, even though Riverkeeper itself drew attention to the requests by submitting related exhibits (i.e. NRC Bulletin 87-01 (RIV00007). *Id.* at A19.

The Staff's witnesses explain briefly the history of CHECWORKS™ and the NRC's acceptance of the tool. Test. at A20 (ex. NRC000102). CHECWORKS™ is a computer code used to predict component degradation in the systems conducive to FAC using plant-specific data and information, including characteristics of the materials, along with the plant's hydrodynamic, and operating conditions. CHECWORKS™ models the effects of alloy composition, fluid pH level, control amine, hydrazine concentration, dissolved oxygen, fluid velocity, component geometry, upstream influences, fluid temperature, and steam quality to predict the FAC rate. *Id.* CHECWORKS™ is an empirical model, meaning that the CHECWORKS™ model for wear rate predictions was developed using measured data from many plants and from controlled laboratory experiments. *Id.* CHECWORKS™ was "benchmarked" by comparison of the CHECWORKS™ model's predicted susceptible locations with actual wear data obtained from nuclear power plants and additional laboratory data. *Id.* This comparison showed that the CHECWORKS™ model accurately predicts FAC behavior. *Id.*

The Staff's witnesses explain the process for using CHECWORKS™ at a nuclear plant to identify the most susceptible components for inspection and to calculate wear rates to predict when the components will reach the minimum allowable wall thickness. *Id.* at A23. After initial measurements of the component baseline wall thickness, follow-up inspections throughout the life of the plant are used to confirm and update the predictions. *Id.* Plants using CHECWORKS™ input plant specific operating parameters to enable component susceptibility rankings for the plant. *Id.* Data from physical inspections of components are entered into CHECWORKS™ to determine the actual wear rate and to calibrate the predictive models in the code. *Id.* The future predicted wear rates and thickness values are based on the calibrated models that have been adjusted to reflect the actual wear from the inspection data. *Id.* In other words, wear rates and wear rate predictions are based on calibration of CHECWORKS™ using actual physical inspection data from components. *Id.*

The Staff's witnesses explain what can be done when plant operating conditions change. Specifically, a "line correction factor" may be applied to "calibrate" CHECWORKS™ as part of self-benchmarking at a plant. *Id.* at A24. This results in improved performance and more accurate wear predictions. Id. at A25.

C. The Staff Disagrees with Riverkeeper's Claims

Riverkeeper asserts that Entergy's FAC program is inadequate because the program 1) improperly relies on the CHECWORKS™ computer code, 2) lacks other tools that are meaningfully independent of the CHECWORKS™ computer code, and 3) fails to address safety concerns caused by inadequate aging management by the FAC program. *Id.* at A7. Further, Riverkeeper asserts that 4) the FAC program's reliance on the CHECWORKS™ computer code doesn't meet NRC regulations and guidance, and 5) the FAC program lacks details of the programmatic elements described in the NRC's guidance. *Id.* The Staff's witness explain how, based upon their review of the totality of Riverkeeper's arguments and exhibits, they see Riverkeeper's argument as fundamentally a claim that CHECWORKS™ cannot be relied upon for adequate aging management under a renewed license and, by extension the current license. *Id.* at A8. The Staff's witnesses disagree with all of Riverkeeper's claims. *Id.* at A8.

Regarding the lack of details, the Staff's witnesses discuss how Riverkeeper itself supplied a significant of detailed information, including Entergy's controlling procedure for its FAC program (*EN-DC-315, Rev. 3, Flow Accelerated Corrosion Program* (March 1, 2010) (ADAMS Accession No. ML11356A024) (Ex. RIV000015)), copies of historic NRC generic communications on FAC (e.g., Ex. RIV000007 (NRC Bulletin 87-01, *Thinning Pipe Walls in Nuclear Plants* (July 9, 1987) (ADAMS Accession No. ML11356A020) ("NRC Bulletin 87-01")), and industry's current guidance (e.g., Ex. RIV000012 (*Electric Power Research Institute (EPRI), Recommendations for an Effective Flow-Accelerated Corrosion Program, NSAC-202L-R3*) (ADAMS Accession No. ML11356A015) ("NSAC-202L-R3")). Test. at A9.

Riverkeeper also supplied a technical report called *Recommendations for an Effective Flow-Accelerated Corrosion Program (NSAC-202L-R3)* which further demonstrates the acceptance of CHECKWORKS. Test. at A28. The report describes eight separate tasks for creating an effective FAC program: 1) identifying susceptible systems, 2) performing FAC analysis (using a predictive methodology such as CHECWORKS™); 3) selecting and scheduling components for inspection; 4) performing inspections; 5) evaluating inspection data; 6) evaluating worn components; 7) repairing and replacing components; and 8) determination of the safety factor. Test. at A28.

Regarding if CHECKWORKS meets NRC Renewal requirements, the Staff's witnesses explain the NRC's GALL Report, Rev. 1, Aging Management Program ("AMP") XI.M17, "Flow-Accelerated Corrosion," provides guidance on the elements of an acceptable program to manage the effects of FAC during the period of extended operation, and that the GALL Report calls for implementation of EPRI guidelines in the NSAC-202L as part of an acceptable aging management program. Test. at A30. The Staff's witnesses testify that the NRC has long accepted use of CHECWORKS™ and its predecessor CHEC as important tools to manage FAC. Test. at A31.

Despite the acceptance of CHECWORKS™ described above, Riverkeeper claims it is unproven at Indian Point. On this point, Riverkeeper's argument is without merit. Riverkeeper is well aware that its own report describes how CHECWORKS™ has been implemented at Indian Point since at least 2000 for Unit 2 and 2001 for Unit 3, including under the power uprate conditions of Unit 2 since 2004 and Unit 3 since 2005. Test at A32.

The Staff's witnesses describe how Entergy uses a robust corporate procedure for its FAC program. Test. at A35-A40. The Staff's witnesses explain how the procedure was found to be acceptable by another Board in *Vermont Yankee* and how the facts are applicable here. Test. at A41.

Further, the Staff's witnesses explain how Riverkeeper ignores the substantial information available on Entergy's FAC program. Test. at A43.

The Staff's witnesses explain how the NRC already approved the uprated power levels at Indian Point, and those uprates allowed for use of ,CHECWORKS™. Test. at A49-50. Riverkeeper's claim that CHECWORKS™ cannot be used fails to recognize that CHECWORKS™ is part of the CLB already, and Riverkeeper does not identify any factor unique to license renewal that would preclude using CHECWORKS™.

The Staff's witnesses also describe how Staff reviewed CHECWORKS™ modeling with respect to how power uprate conditions were incorporated, to ensure that the CLB FAC Program will be sufficient for the period of extended operation. Thus, the Staff explains that Dr. Hopenfeld's claims that CHECWORKS™ cannot be used because of the power uprates lack merit. Test. at A57-58.

Regarding the clam that Entergy relies too much on the code, the Staff's witnesses explain that Entergy does not "overrely" on CHECWORKS™. Test. at A70. Instead it is one of multiple criteria in determining which in-scope piping component locations will be inspected at the next outage. *Id.* Entergy's procedure further state that many factors are used, including on CHECWORKS results, industry/station/utility experience, required re-inspections, the non-modeled program piping AND engineering judgment. *Id.*

Last, the Staff's witnesses discuss how Riverkeeper's discussion of the safety implications of using a poor FAC program are illogical and inapplicable. Test. at A71. In addition, the NRC's ongoing reactor oversight verifies that the licensee implements its aging management activities consistent with its CLB.

CONCLUSION

For the reasons stated above, the Staff's position is that the LRA is adequate with respect to FAC. Accordingly, RK-TC-2 should be resolved in favor of the Applicant.

Respectfully submitted,

/ signed electronically by/

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Dated at Rockville, Maryland
this 31th day of March 2012

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
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ENTERGY NUCLEAR OPERATIONS, INC.	)	Docket Nos. 50-247/286-LR
	)	
(Indian Point Nuclear Generating Units 2 and 3)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing (1) "NRC STAFF'S INITIAL STATEMENT OF POSITION REGARDING CONTENTION RK-TC2" (Ex. NRC000120), (2) "NRC STAFF TESTIMONY OF MATTHEW G. YODER AND ALLEN L. HISER CONCERNING RIVERKEEPER TECHNICAL CONTENTION RK-TC-2 (FLOW ACCELERATED CORROSION)" (Ex. NRC000121), and (3) NRC STAFF EXHIBITS NRC000122 THROUGH NRC000131 in the above-captioned proceeding have been served on the following by Electronic Information Exchange this 31st day of March, 2012.

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