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UNITED STATES NUCLEAR REGULATORY COMMISSION'S  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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658TH MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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THURSDAY

NOVEMBER 1, 2018

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Advisory Committee met at the Nuclear  
Regulatory Commission, Three White Flint North, Rooms  
1C3 & 1C5, 11601 Landsdown Street, at 8:30 a.m.,  
Michael L. Corradini, Chairman, presiding.

COMMITTEE MEMBERS:

- MICHAEL L. CORRADINI, Chairman
- PETER RICCARDELLA, Vice Chairman
- RONALD G. BALLINGER, Member
- CHARLES H. BROWN, JR. Member
- MARGARET SZE-TAI Y. CHU, Member
- VESNA B. DIMITRIJEVIC, Member
- WALTER L. KIRCHNER, Member

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JOSE MARCH-LEUBA, Member

JOY L. REMPE, Member

GORDON R. SKILLMAN, Member

DESIGNATED FEDERAL OFFICIAL:

KENT HOWARD

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AGENDA

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Waterford Steam Electric Station, Unit 3 License

    Renewal Application . . . . . 8

River Bend Nuclear Generating Station, Unit 1

    License Renewal Application . . . . . 31

Adjourn . . . . . 83

## P R O C E E D I N G S

8:29 a.m.

CHAIRMAN CORRADINI: Okay, why don't we get started? The meeting will come to order now. This is the first day of the 658th meeting of the Advisory Committee on Reactor Safeguards.

During today's meeting, the Committee will consider the following, the Waterford Steam Electric Station Unit 3 license renewal application, River Bend Nuclear Generating Station Unit 1 license renewal application, preparation for the meeting with the Commission in December, and preparation of ACRS letter reports.

The ACRS was established by statute and is governed by the Federal Advisory Committee Act, or FACA. As such, this meeting is being conducted in accordance with the provisions of FACA. That means the Committee can only speak through its published letter reports. We hold meetings to gather information to support our deliberations.

Interested parties who wish to provide comments can contact our offices requesting time after the Federal Register notice describing a meeting is published. That said, we also set aside 10 minutes for extemporaneous comments from members of the public

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1 attending or listening to our meetings on the line.  
2 Written comments are also welcome. Today, Mr. Ken  
3 Howard is the designated federal official for the  
4 initial portion of the meeting.

5 The ACRS section of the U.S. NRC public  
6 website provides our charter, bylaws, letter reports,  
7 and full transcripts of all our full and subcommittee  
8 meetings, including all slides presented at those  
9 meetings.

10 We've received no written comments or  
11 requests to make oral statements from members of the  
12 public regarding today's session, and also there will  
13 be a phone bridge line open and on mute. To preclude  
14 interruption of the meeting, it will be on a listen in  
15 only mode during the presentations and Committee  
16 discussions.

17 I also want to remind everybody to please  
18 silence their devices, all your various types of  
19 devices. Make sure we don't have any beeps, or bops,  
20 or rings.

21 Also, this is a temporary room where we  
22 hold our meetings and the audio, I'll just say, is  
23 challenging, so my suggestion is when you turn on the  
24 mic, make sure you have the green light on and you  
25 kind of have to speak into it, otherwise you kind of

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1 drift away for those listening in on the phone line or  
2 the bridge line.

3 A transcript of portions of the meeting is  
4 being kept and it's requested that the speakers use  
5 one of the microphones, identify themselves, and speak  
6 with sufficient clarity and volume so we can be  
7 readily heard.

8 I'll turn the meeting over to Member  
9 Skillman.

10 MEMBER SKILLMAN: Mr. Chairman, thank you.  
11 This is plant week at ACRS. Yesterday, we did alkali-  
12 silica reaction for Seabrook, and today we're  
13 privileged to have the team from Entergy, two teams,  
14 one for Waterford 3 license renewal for 20 years, and  
15 the second meeting will be River Bend team license  
16 renewal for 20 years.

17 So thank you, everybody, and now I'm going  
18 to turn the meeting over to Joe Donoghue as he  
19 introduces the meeting, Joe?

20 MR. DONOGHUE: Good morning. Thank you,  
21 Member Skillman. Thank you, Chairman Corradini and  
22 members of the ACRS full Committee. I'm Joe Donoghue.  
23 I'm the Deputy Director in the Division of Materials  
24 and License Renewal at NRR, and next to me is George  
25 Wilson, the Director.

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1           We sincerely appreciate the opportunity to  
2 brief the Committee on the status review of the  
3 Waterford license renewal application.

4           As you know, the staff presented the  
5 results of their review of the Waterford renewal  
6 application to the ACRS Subcommittee, the License  
7 Renewal Subcommittee on September 20 of this year.  
8 There were no follow ups from the meeting on  
9 Waterford.

10           The license renewal presentations today  
11 will be led by the following staff, Phyllis Clark, and  
12 at the table will be Dr. Allen Hiser, our Senior  
13 Technical Advisor. With me is Eric Oesterle. He's a  
14 Chief of the Projects Branch in our Division, and in  
15 the audience are other staff who conducted the review,  
16 and management as well.

17           We look forward to a productive discussion  
18 today with the full Committee, and as always, we will  
19 address any questions on our reviews that you may  
20 have. We look forward to receiving your  
21 recommendation letter on our review.

22           At this time, I'd like to turn the  
23 presentation over to the Entergy team and their Site  
24 Vice President, Mr. John Dinelli, to introduce his  
25 team and commence their presentation.

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1 MR. DINELLI: Thank you. Good morning.  
2 My name is John Dinelli and I'm the Site Vice  
3 President at the Waterford 3 Steam Electric Station  
4 responsible for the safe and reliable operation of the  
5 facility.

6 This is an important day for Waterford.  
7 We at Entergy have been working for several years to  
8 get ready for the period of extended operation at  
9 Waterford.

10 In today's presentation, you will hear  
11 about major equipment upgrades as well as the  
12 establishment of fleet aging management programs in  
13 support of that effort.

14 We have with us today from Waterford,  
15 Brian Lanka, the Director of Engineering, John  
16 Jarrell, the Senior Manager of Operations, and Garry  
17 Young, Director of License Renewal. We also have  
18 other project and technical personnel in attendance  
19 should their input be necessary.

20 And today's agenda for this presentation  
21 it to describe the Waterford Station, plant status,  
22 and our licensing history. We will also address major  
23 equipment upgrades, both completed and planned, that  
24 will help us prepare for the extended period of  
25 operation. In addition, we will discuss the license

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1 renewal project itself.

2 We want to thank you for the opportunity  
3 today. This is a very important day and a major  
4 milestone for Waterford 3 and for Entergy. Now I'll  
5 turn it over to John Jarrell.

6 MEMBER SKILLMAN: Before you do that,  
7 please, John, let me ask you a question. In the  
8 spirit of shadow of the leader, what shadow do you  
9 cast at your site regarding Appendix B to 10 CFR 50,  
10 your QA program and programs?

11 MR. DINELLI: Mr. Skillman, the QA program  
12 is a vital component to the safe operation of the  
13 facility, so the way I cast my shadow for the  
14 organization is to fully support the QA organization  
15 and all of the functions that they serve.

16 I'll come through my experience that if  
17 you have a healthy adherence to that program and all  
18 aspects of that program, that it will ultimately drive  
19 station performance.

20 So by showing my employees, my directors,  
21 managers, and station employees that adherence to that  
22 and following through with that program is important,  
23 it makes it important to them, and overall makes us a  
24 better operating facility.

25 MEMBER SKILLMAN: Thank you, sir. Thank

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1 you.

2 MR. JARRELL: Okay, good morning. Again,  
3 I want to thank the members of the ACRS for meeting  
4 with us today. My name is John Jarrell. I'm the  
5 Senior Manager of Operations at Waterford 3. I want  
6 to give a little description of the site.

7 First of all, Waterford 3 is located about  
8 25 miles upriver from New Orleans in St. Charles  
9 Parish. We are a combustion engineering design and  
10 EBASCO was our contractor and constructor. We do have  
11 a dry containment.

12 I would like to apologize. We are having  
13 some technical difficulties as you can see.

14 All right, our turbine generator is a  
15 Westinghouse turbine generator. Our ultimate heat  
16 sink is a combination of dry and wet cooling tower  
17 fans which are independent from the Mississippi River.  
18 It is a relatively unique design.

19 Our licensed thermal power limit is 3,716  
20 megawatts thermal and the staff complement is  
21 currently approximately 751 employees.

22 As of this morning, the plant was at 100  
23 percent power. We are in our 18-month refueling  
24 cycle. We are in the rack or oversight process action  
25 matrix column one. Our last refueling outage was

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1 spring of 2017 and we are preparing for an outage  
2 refuel 22 which will occur early 2019.

3 MEMBER SKILLMAN: For the last several  
4 fuel cycles, what has been your approximate capacity  
5 factor?

6 MR. JARRELL: Our capacity factor has been  
7 over 90 percent, so we've had a good operating history  
8 and 90 percent was our capacity factor as of August of  
9 this year.

10 MEMBER SKILLMAN: Thank you.

11 MR. JARRELL: Our licensing history is our  
12 construction permit. We were permitted for  
13 construction in 1974. We received our operating  
14 license on March 16 of 1985 and we went commercial in  
15 September of 1985 as well.

16 We had an eight percent power upgrade in  
17 April of 2005, and we submitted our license renewal  
18 application on March 16 of 2016, and our current  
19 license is set to expire December 18 of 2024.

20 So with that, I'd like to turn it over to  
21 our Engineering Director, Brian Lanka. He'll go over  
22 some major equipment upgrades at the site.

23 MR. LANKA: I'm Brian Lanka. I'm the site  
24 Engineering Director. First, I want to start by  
25 saying Entergy and Waterford are committed through our

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1 nuclear strategy plan to make Waterford 3 reliable for  
2 extended operation. To that means, we have a long  
3 range plan focused on improving plant safety and  
4 equipment performance.

5 The station has completed replacement of  
6 our four active coolant pump motors. We have  
7 proactively added design margin by increasing our  
8 diesel generator fuel capacity. We've increased that  
9 capacity by approximately 35 percent.

10 We have also addressed reliability by  
11 replacing our safety-related static uninterruptible  
12 power supplies, and in January, we'll complete a  
13 modification that will put a swing system in to  
14 further increase reliability.

15 In 2013, the station has replaced both the  
16 reactor head and the steam generator. Both use more  
17 resilient materials. The reactor head eliminated all  
18 LI600 material on the head.

19 The station has also replaced the  
20 traveling screen system to further reduce debris from  
21 entering the condenser and protecting our new steam  
22 generator.

23 This is a picture of our new traveling  
24 screens. These are Geiger screens. They are zero  
25 carryover screens. They actually rotate in a circular

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1 motion versus carryover. These are pictures of our  
2 new steam generators going in in 2013. We replaced  
3 the LI600 tubes with LI690, and this is a picture of  
4 the reactor heads going in. We replaced all of the  
5 top, the coils, and everything on top of the head as  
6 well.

7 Going forward, we had the following -

8 CHAIRMAN CORRADINI: Can I ask a quickie?

9 MR. LANKA: Sure, go ahead.

10 CHAIRMAN CORRADINI: On your, you had gone  
11 through this list, and now I've lost it. You said you  
12 added more capacity for your fuel storage tanks. What  
13 does that change your capacity for running the diesel  
14 generators from and to?

15 MR. LANKA: We added approximately 10,000  
16 gallons, so we had an additional margin -- we're  
17 required to have a seven-day supply because this is  
18 additional margin so we can run more surveillance  
19 without having to go back and fill it up.

20 CHAIRMAN CORRADINI: So seven becomes 14  
21 or seven becomes 10?

22 MR. LANKA: We still use seven. We just  
23 lowered the capacity, but if you look at it the way  
24 you're explaining it, we probably gained a couple of  
25 days.

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1 CHAIRMAN CORRADINI: Okay, thank you.

2 MR. LANKA: Okay, going forward, in  
3 January, we will be retubing our condenser with SEA-  
4 CURE, which is a more resilient material. We'll also  
5 be upgrading our cathodic protection system based on  
6 the new SEA-CORE material.

7 CHAIRMAN CORRADINI: I wasn't at the  
8 meeting, so I apologize if I'm stopping you and this  
9 is old news. What is the material for the condenser?

10 MR. LANKA: SEA-CURE.

11 CHAIRMAN CORRADINI: What is that?

12 MR. LANKA: It's a high-end stainless  
13 steel.

14 CHAIRMAN CORRADINI: High end.

15 MR. LANKA: It's very resilient.

16 CHAIRMAN CORRADINI: Okay, thank you. Is  
17 there any more interesting technology? Is there any  
18 surface treatment to the tubes or is this alloy steel  
19 untreated on the surface?

20 MR. LANKA: It's untreated.

21 CHAIRMAN CORRADINI: Untreated, thank you.

22 MR. LANKA: We are also working to replace  
23 our core protection calculators. This system is part  
24 of our reactor coolant protection system which  
25 actually monitors the core. We have plans to replace

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1 our turbine control system and our safety-related  
2 chillers, and lastly, to improve safety and  
3 reliability, we have several ongoing upgrades of our  
4 motors, fans, and associated motor control centers for  
5 our ultimate heat sink.

6 I'm going to turn it over now to Garry  
7 Young who will go over the license.

8 MR. YOUNG: Okay, thank you. I'm Garry  
9 Young, the Director of License Renewal for the Entergy  
10 nuclear fleet, and I'd like to give you some  
11 background on our license renewal process, including  
12 the approach for the integrated plan assessment and  
13 for preparing the license renewal application.

14 We have a dedicated corporate team working  
15 on license renewal for all of the Entergy nuclear  
16 plants. This team, with almost two decades of  
17 experience with all aspects of aging management and  
18 license renewal, has prepared more than a dozen  
19 license renewal applications over the past several  
20 years.

21 In addition to the corporate team, a plant  
22 team of Waterford experts in design, systems  
23 engineering, and plant programs was established for  
24 this license renewal project. The plant team provided  
25 the needed input, review, and oversight of all the

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1 engineering and environmental reports that were  
2 created.

3 Entergy used the NRC-approved guidance in  
4 NEI 95.10 to prepare the project specific procedures  
5 and guidelines. These procedures have been used on  
6 our previous license renewal projects and are  
7 routinely updated based on lessons learned, industry  
8 operating experience, and changes to NRC guidance.

9 The site specific aging management review  
10 results for Waterford were compared to the GALL  
11 Report, which is NUREG-1801, Revision 2, as part of  
12 the license renewal application development, and I'll  
13 talk more about the comparison of the programs with  
14 the GALL Report on a later slide. The LRA was  
15 submitted to the NRC in March of 2016.

16 The NRC review process culminated in the  
17 Waterford safety evaluation report which was issued in  
18 August of 2018 with no open items and no confirmatory  
19 items. We appreciate the extensive and thorough work  
20 of the NRC staff in reaching this important milestone  
21 in the license renewal application review process.  
22 Next slide.

23 This slide summarizes the aging management  
24 programs credited for license renewal. We have 41  
25 aging management programs that include 12 new programs

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1 and 29 existing programs, most of which are or will be  
2 consistent with the GALL Report with a handful of  
3 exceptions as shown on this slide.

4 Some examples of the 12 new programs are  
5 the buried and underground piping and tanks inspection  
6 program, the non-EQ cables and connections, aging  
7 management programs, and one-time inspection programs.

8 Some aspects of these new programs have  
9 been implemented, but they are considered new programs  
10 because a significant number of changes must be made  
11 or have only recently been made to make them  
12 consistent with the program descriptions in the GALL  
13 Report.

14 For example, the Waterford buried piping  
15 program was initiated in response to the 2009 NEI  
16 initiative, but significant changes are necessary to  
17 incorporate the latest NRC guidance which includes the  
18 interim staff guidance issued in 2015.

19 For clarity in describing the program,  
20 Entergy classified it as a new program that would be  
21 consistent with the program description in the most  
22 recent NRC guidance.

23 In addition, most of these new programs  
24 have already been implemented at other Entergy nuclear  
25 units. This allows us to ensure that implementation

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1 of the Waterford aging management programs reaps the  
2 benefits of lessons learned, from the Entergy  
3 operating experience review program, and the  
4 corrective action program.

5 28 of the existing programs have been  
6 compared to the GALL programs, and only a few  
7 exceptions have been taken. These exceptions include  
8 such things as revised inspection intervals based on  
9 the Waterford refueling outage schedules and  
10 referencing NRC regulatory guides and industry  
11 standards that are later revisions than those  
12 referenced in the GALL Report which was published in  
13 2010.

14 And finally, we have one existing plant  
15 specific program which is the period surveillance and  
16 preventive maintenance program. This program includes  
17 a variety of aging management activities that could  
18 not readily fit within the scope of the GALL Report  
19 programs. Next slide.

20 On the topic of commitment management and  
21 controlling the commitments that we've made for  
22 license renewal, Entergy has a fleet program that  
23 covers management of commitments for all our nuclear  
24 plants.

25 We have successfully used this commitment

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1 management program for our previous license renewal  
2 projects, including projects for plants that have  
3 implemented license renewal commitments and are  
4 successfully operating in the period of extended  
5 operation.

6 For each Waterford license renewal  
7 commitment, the commitment management program  
8 identifies the actions needed to implement the  
9 commitments and identifies the owner responsible for  
10 implementation.

11 Assignments will include actions such as  
12 creation of implementing procedures for new aging  
13 management programs and incorporating enhancements to  
14 existing aging management programs. So this completes  
15 my portion of the presentation. Thank you.

16 MEMBER MARCH-LEUBA: Can I ask you a  
17 question? You may not be the right person. Are you,  
18 any of you familiar with the term alkali-silica  
19 reaction, concrete aging mechanism? Does it affect  
20 your plant?

21 MR. YOUNG: No, we did look into that  
22 because that is an industry issue of importance, but  
23 we found that there was no indication of ASR at  
24 Waterford.

25 MEMBER MARCH-LEUBA: Thank you.

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1 MR. DINELLI: Thank you. So I just want  
2 to thank the Committee once again and assure the  
3 Committee that Entergy is committed to the long term  
4 operation and continuous improvement of our facility.

5 We will manage the effects of our aging,  
6 evaluate time limited aging analysis under the  
7 evaluations governed by 10 CFR 54, and we meet the  
8 provisions for issuance of a license renewal.

9 So once again, I want to thank you for  
10 this opportunity on this important day, and I look  
11 forward to any further discussions.

12 MEMBER SKILLMAN: John, thank you.  
13 Colleagues, any questions for the Entergy Waterford 3  
14 team? Okay, team change out? Joe, back to you.

15 MR. DONOGHUE: Thank you, Chairman  
16 Corradini. In my opening remarks, I introduced  
17 Phyllis Clark as the project manager, and Allen Hiser  
18 is our senior technical advisor involved in license  
19 renewal, and Lois James who is the project manager  
20 assisting in this project. Go ahead.

21 MS. CLARK: Good morning, Chairman  
22 Corradini and the members of the ACRS.

23 MEMBER SKILLMAN: You may have to get  
24 closer to the mic.

25 MS. CLARK: Okay, thanks, okay. My name

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1 is Phyllis Clark and I'm the project manager for the  
2 license renewal safety review for the Waterford Steam  
3 Electric Station Unit 3, or I'll refer to it as  
4 Waterford.

5 We are here today to discuss the staff's  
6 review of the Waterford license renewal application as  
7 documented in the safety evaluation report, SER, which  
8 was issued August 17, 2018.

9 Joining me here at the table is Allen  
10 Hiser, Senior Technical Advisor for License Renewal,  
11 aging management, and Ms. Lois James, Senior Safety  
12 Project Manager from the Division of Material and  
13 License Renewal, DMLR.

14 Seated in the audience and joining by  
15 phone are members of the technical staff who  
16 participated in the review of the license renewal  
17 application and conducted onsite audits and  
18 inspection. Next slide.

19 I will begin the presentation with a  
20 general overview of the staff's review and then  
21 present the staff's conclusions. Next slide.

22 On March 23, 2016, Entergy Operations,  
23 Inc. submitted a license renewal application or LRA  
24 for Waterford which has a combustion engineering  
25 pressurized water reactor, PWR, nuclear steam electric

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1 steam supply system with licensed thermal power of  
2 3,716 megawatts thermal. The staff conducted two  
3 onsite audits and one inspection at the site.

4 During the scoping and screening  
5 methodology audit, the audit team reviewed the  
6 applicant's scoping and screening methodology,  
7 selected examples of component material and  
8 environmental combinations, the corrective action  
9 program, administrative and confirmatory action  
10 process as described in the LRA, and the training of  
11 personnel who participated in the development of the  
12 LRA. The results of the audit are documented in the  
13 report dated November 10, 2016.

14 During the aging management program  
15 audits, the audit team examined the applicant's aging  
16 management program of AMPs, related documentation, and  
17 operating experience to verify the applicant's claim  
18 of consistency with corresponding AMPs in the generic  
19 aging lessons learned report or GALL Report. The  
20 staff reviewed the initial 41 AMPs and documented the  
21 results in the report dated May 9, 2017.

22 Region IV conducted a 71.02 inspection in  
23 January and February of 2017 and documented the  
24 results in a report dated March 31, 2017.

25 Based on the inspection results, the

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1 Region IV team had reasonable assurance that Entergy's  
2 program in place or planned as described in their  
3 commitment table will manage the aging effects and  
4 ensure the intended safety functions of safety,  
5 structure, and components within the scope of the  
6 rule. Next slide.

7 The Waterford final SER was issued on  
8 August 17, 2018. During the staff's in-depth  
9 technical review of the LRA, 119 RAIs were issued, 25  
10 of which were follow-up RAIs. The final SER will be  
11 published as a NUREG report following the issuance of  
12 the renewed license.

13 The ACRS Subcommittee was held on  
14 September 20, 2018 and there were no follow-up items  
15 for the staff. Next slide.

16 MEMBER REMPE: I have a question. I did  
17 not participate in the Subcommittee either, but I'm  
18 just curious about the number of RAIs. Is this  
19 typical? Is it going down as we go through more of  
20 these plants and license renewal or how does this  
21 compare to other -

22 MS. JAMES: Hello, my name is Lois James.  
23 If I may, this is a low number. I worked on two other  
24 plants that we had over 300, 360, 380, so the 119 is  
25 relatively low for my recollection of history.

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1                   MEMBER REMPE: In your opinion, is that  
2 because this is a great licensee or is that because  
3 everyone's understanding the process and the  
4 expectations of the process?

5                   MS. JAMES: I think at this point, it  
6 would be understanding the process. We only have  
7 about three or four left, I think, maybe five, and so  
8 one of the things our management has been stressing is  
9 that they need to look at old RAIs or previously  
10 issued RAIs and make sure those get addressed, and I  
11 think in general for license renewal, we're finding  
12 that.

13                   MEMBER REMPE: Great, thank you.

14                   MR. OESTERLE: This is Eric Oesterle,  
15 Chief of the License Renewal Projects Branch. So to  
16 add to what Lois had mentioned, yes, the understanding  
17 of the process is getting better, and one of the  
18 things that the staff has been doing is communicating  
19 expectations to applicants ahead of time that they  
20 should be looking at RAIs that staff has issued on  
21 previous applications.

22                   And applicants have done that, and so  
23 they've already answered questions then ahead of time  
24 that we asked before, and so the number of questions  
25 that we end up having to ask, you know, has

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1 continuously trended downwards. And also as you'll  
2 see in the next presentation on River Bend, we came in  
3 around the same level of RAIs as on Waterford.

4 MEMBER SKILLMAN: I would like to make a  
5 comment here. I've been looking at these for seven  
6 years. I believe that the individuals who have been  
7 preparing the license renewal applications have worked  
8 hard to make sure that the initial submittal is  
9 strong, accurate, and thorough.

10 And as Garry Young said when he introduced  
11 himself, he's done about 12 of these, so I think  
12 there's some credit to be given to Garry and the crew  
13 that did this. They're getting better at this  
14 process.

15 But it also may point to the degree to  
16 which the plant owners have protected the material  
17 condition of the plant, and from my experience, that's  
18 critical. This plant is not falling down around  
19 peoples' heads and shoulders.

20 This is a plant that's in good condition  
21 because people have been taking care of it, but those  
22 two need to go side by side in order to get to a very  
23 low number of RAIs, and credit to the staff for having  
24 a thick magnifying glass and being able to say, "This  
25 is a low number." That's not by accident. It took an

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1 awful lot of effort.

2 MR. OESTERLE: Yeah, we definitely agree  
3 with your remarks, and we'll add that what we heard at  
4 the Subcommittee meeting on September 20 was from the  
5 regional inspector that the plant was in good material  
6 condition.

7 MS. CLARK: In the next few slides, I'll  
8 present the results of the staff's review as described  
9 in the SER. SER Section 2 describes the scoping of  
10 the system structures and components or SSCs and  
11 screening of structures and components to identify  
12 those subject to an aging management review of AMR.

13 The staff reviewed the applicant's scoping  
14 and screening methodology, procedures, quality control  
15 applicable to the LAR development, and training of its  
16 personnel.

17 The staff also reviewed the various  
18 summaries of the safety-related SSCs, non-safety SSCs  
19 affecting safety functions, and the SSCs relied upon  
20 to perform functions applicable to Waterford in  
21 compliance with the Commission regulation for fire  
22 protection, environmental qualifications, station  
23 blackout, pressurized thermal shock, and anticipated  
24 transience without a scram.

25 Based on the review of the results from

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1 the scoping and screening audit and additional  
2 information provided by the applicant, the staff  
3 concludes that the applicant's scoping and screening  
4 methodology and implementation were consistent with  
5 the standard review plan and the requirements of 10  
6 CFR Part 54.

7 SER Section 3 and its subsections cover  
8 the staff's review of the applicant's programs  
9 managing aging in accordance with 10 CFR 54.21A3.  
10 Sections 3.1 through 3.6 include the AMR items in each  
11 of the general system areas within the scope of  
12 license renewal. For a given AMR item, the staff  
13 reviewed the item to determine whether it is  
14 consistent with the GALL Report.

15 For AMR items not consistent with the GALL  
16 Report, the staff reviewed the applicant's evaluation  
17 to determine whether the applicant has demonstrated  
18 that there is reasonable assurance that the effects of  
19 aging will be adequately managed so that the intended  
20 functions will be maintained consistent with the  
21 current licensing basis for the period of extended  
22 operation. Next slide.

23 The LAR described a total of 41 AMPs, 12  
24 new, 29 existing, and one plant specific. This slide  
25 identifies the applicant's disposition of these AMPs

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1 in the left column and the staff's disposition in the  
2 right column. The AMPs were evaluated by the staff's  
3 consistency with the GALL Report.

4 During the staff's review, the applicant  
5 changed the disposition of three AMPs based on NRC  
6 requests for additional information. These AMPs are  
7 in-service inspection changed from consistent in the  
8 original LRA to consistent with enhancements.

9 Reactor vessel surveillance changed from  
10 consistent in the original LRA to consistent with  
11 enhancements and exceptions. Steam generator  
12 integrity changed from consistent in the original LRA  
13 to consistent with enhancements.

14 SER Section 4 identifies time limiting  
15 aging analysis to TLAAs. Section 4.1 documents the  
16 staff's evaluation of the applicant's identification  
17 of applicable TLAAs.

18 The staff evaluated the applicant's basis  
19 for identifying those plant specific or generic  
20 analyses that need to be identified as TLAAs and  
21 determined that the applicant has provided an adequate  
22 list of TLAAs as required by 10 CFR 54.21C1.

23 Sections 4.2 through 4.7 document the  
24 staff's review of the applicable Waterford TLAAs for  
25 the areas shown on this slide. Based on its review

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1 and the information provided by the applicant, the  
2 staff concludes that either one, the analysis is valid  
3 for the period of extended operation, two, the  
4 analysis has been projected to the end of the period  
5 of extended operation, or three, the effects of aging  
6 on the intended functions will be adequately managed  
7 for the period of extended operation as required by 10  
8 CFR 21.C1 Subparagraphs I, ii, and iii respectively.

9 The staff finds that the requirements of  
10 10 CFR 54.29A have been met for the license renewal of  
11 Waterford. This concludes the staff's presentation.  
12 We're available for any further questions from the  
13 full Committee.

14 MEMBER SKILLMAN: Phyllis, thank you.

15 MS. CLARK: Thanks.

16 MEMBER SKILLMAN: Colleagues, any  
17 questions for the staff in the matter of Waterford 3,  
18 please?

19 MEMBER BALLINGER: Well, I have a  
20 question, but it's for Entergy. We had an  
21 unanticipated transient over here and the question is  
22 does Entergy have other experience with SEA-CURE  
23 tubing for condensers? Yeah, what experience does  
24 Entergy have with SEA-CURE for tubing material for  
25 condensers?

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1 MR. LANKA: This is Brian Lanka. Entergy,  
2 to my knowledge, has not installed SEA-CURE yet. We  
3 have installed titanium Fitzpatrick when we did own  
4 them, but we have reached out to the industry, and  
5 other utilities are using SEA-CURE.

6 MEMBER BALLINGER: Thank you.

7 MEMBER SKILLMAN: Colleagues, any other  
8 question or questions for the staff in the matter of  
9 Waterford 3?

10 MEMBER MARCH-LEUBA: Well, since nobody is  
11 asking the question, do you evaluate ASR for Waterford  
12 or ask any questions about it?

13 DR. HISER: I would expect that we looked  
14 through the operating experience at Waterford, and we  
15 did walk downs during the AMPs audit, and obviously  
16 there were no indications of ASR identified.

17 MEMBER MARCH-LEUBA: Thank you.

18 MEMBER SKILLMAN: So with that, Allen, and  
19 Phyllis, and Lois, thank you very much. And Mr.  
20 Chairman, we're back to you.

21 CHAIRMAN CORRADINI: Okay, so here's what  
22 we're going to do. We have the challenges of the  
23 room, so we have to stick with the published schedule,  
24 which means we cannot take up River Bend until 10:30  
25 when it is scheduled. We're going to essentially go

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1 off the record and we're going to look at the draft  
2 letter report for Waterford now.

3 (Whereupon, the above-entitled matter went  
4 off the record at 9:03 a.m. and resumed at 10:44 a.m.)

5 CHAIRMAN CORRADINI: Okay, why don't we  
6 come back into session? We're going to now take on  
7 our second subject which is the River Bend Station  
8 license renewal, so I'll turn it back over to Member  
9 Skillman. Dick, do you want to take it over?

10 MEMBER SKILLMAN: Yes, ladies and  
11 gentlemen, thank you. We are picking up the second  
12 license renewal application discussion. In this  
13 discussion, we will hear from leaders from the River  
14 Bend Station owned and operated by Entergy South. And  
15 without further ado, I'm going to turn the microphone  
16 over to Joe Donoghue from the NRC staff for the  
17 remainder of this session, Joe?

18 MR. DONOGHUE: Thank you, Member Skillman,  
19 and thank you, Chairman Corradini, and members of the  
20 ACRS full Committee.

21 I'm Joe Donoghue. I'm the Deputy Director  
22 of the Division of Materials and License Renewal in  
23 the Office of Nuclear Reaction Regulations. We  
24 sincerely appreciate the opportunity to brief the ACRS  
25 full Committee on the River Bend license renewal

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1 review that we've done.

2 As you know, the staff presented the  
3 results of their review on the River Bend application  
4 to the ACRS License Renewal Subcommittee on September  
5 20 of this year. There were two follow-up items from  
6 that meeting and the staff is prepared to discuss them  
7 today.

8 The license renewal presentation today  
9 from the staff will be led by Emmanuel Sayoc, and we  
10 have other staff who will be participating in that  
11 participation, Dr. Allen Hiser, our Senior Technical  
12 Advisor for License Renewal.

13 Also here is Eric Oesterle, Chief of the  
14 Project Branch in our Division, and in the audience  
15 and on the phone, we have other technical staff and  
16 management to support the presentation.

17 We look forward to a productive discussion  
18 today with the full Committee, and as always, we'll  
19 address any questions on our review that you may have,  
20 and we look forward to receiving your recommendation  
21 letter to support issuing the renewed license.

22 I'd like to turn the presentation over to  
23 the Entergy team and their Site Vice President, Bill  
24 Maguire, to introduce his team and commence their  
25 presentation.

1 MR. MAGUIRE: Thank you, Mr. Donoghue.  
2 Good morning, Mr. Chairman and members of the ACRS.  
3 My name is Bill Maguire. I'm the Site Vice President  
4 at River Bend Station. We very much appreciate the  
5 opportunity to present -

6 PARTICIPANT: I just think you got to get  
7 close to it.

8 MR. MAGUIRE: Okay, I'll move the  
9 microphone up. Is this better? Great, thank you.  
10 Good morning. My name is Bill Maguire. I am the Site  
11 Vice President at River Bend Station. We very much  
12 appreciate the opportunity to review our license  
13 renewal application with the Committee.

14 We have dedicated significant resources at  
15 Entergy in the application presentation and  
16 preparation, and we believe it got a very thorough  
17 review by the staff, a very rigorous and detailed  
18 review.

19 For this morning's discussion, we have  
20 with us Mr. James Henderson. He's our Engineering  
21 Director. He'll be talking about some of the plant  
22 upgrades that we've done to ensure long-term reliable  
23 operation of the station, Mr. Tim Schenk, our  
24 Regulatory Assurance Manager, he'll go over the  
25 background of the station, and Mr. Garry Young, our

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1 Fleet Director for License Renewal.

2 Again, we thank you for this opportunity  
3 today, and we welcome your questions and look forward  
4 to discussion, and I'll turn over the presentation to  
5 Mr. Tim Schenk.

6 MEMBER SKILLMAN: Before you do, Bill,  
7 thank you for being here. Please speak to us on the  
8 same topic that I asked the VP from Waterford 3, and  
9 that is you are the exec at this site. You do cast a  
10 shadow as the leader, and what is your vision of the  
11 shadow that you cast relative to Appendix B to 10 CFR  
12 10, your QA program?

13 MR. MAGUIRE: Well, thank you, Mr.  
14 Skillman. I have a strong passion for our nuclear  
15 independent oversight organization. That's how we  
16 meet the Appendix B regulation, as well as our  
17 commitment to a robust corrective action program.

18 Our nuclear oversight manager is a strong  
19 leader with multi-site, multi-discipline experience.  
20 He has reporting to him a robust organization that  
21 represents all of the disciplines at the station,  
22 engineering, operations, maintenance, technical team.

23 I have a responsibility to provide to him  
24 a few members of the teams that are rotate  
25 assignments, so we pick high quality personnel. For

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1 example, we currently have a current senior reactor  
2 operator license holder to rotate to the team to  
3 ensure we get a good technical, rigorous review of our  
4 control room operations, our field operations.

5 We also have a robust corrective action  
6 program as I mentioned. As of this morning, we've  
7 generated over 5,830 condition reports here to date,  
8 so we have a very low threshold for problem  
9 identification.

10 We also have in our Entergy management  
11 model an articulated value for safety, and the tool  
12 that we use to implement safety is what we call the  
13 PDC model or prevention, detection, correction model,  
14 and certainly we correct a number of issues at the  
15 station through the corrective action program, but the  
16 model is biased toward prevention and detection  
17 activity.

18 So our operators are performing rounds,  
19 our engineers are doing system health reports, all  
20 intended to be out in the detection and prevention  
21 mode so that our plant runs safely and reliably.

22 MEMBER SKILLMAN: Thank you, please  
23 proceed.

24 MR. SCHENK: Thank you, Bill. This is Tim  
25 Schenk. I'm the Regulatory Assurance Manager at River

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1 Bend Station. River Bend is located in Louisiana,  
2 West Feliciana Parish, approximately 24 miles north,  
3 northwest of Baton Rouge.

4 It's a General Electric and Triple S  
5 design. Stone and Webster was the constructor. We're  
6 boiling water reactors six type. We have a General  
7 Electric mark three containment and a GE turbine  
8 generator.

9 Our ultimate heat sink is an independent  
10 wet cooling tower. We have a closed circulating water  
11 system with mechanical draft cooling towers, and we're  
12 licensed to 3,091 megawatts thermal and our  
13 approximate staff is 820 at this time.

14 Currently, our plant status is actually 75  
15 percent power as of 0600 this morning. We had a  
16 planned control rod pattern adjustment overnight and  
17 we'll be ascending in power throughout the day today.

18 We're on a 24-month operating cycle in our  
19 reactor oversight process. We're a column one plant.  
20 Our last refueling outage was in the spring of 2017.  
21 That was refueling outage number 19. Our next  
22 refueling outage is scheduled for the spring of 2019  
23 and that will be refueling outage number 20.

24 MEMBER SKILLMAN: Tim, what is your  
25 capacity factor, please?

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1 MR. SCHENK: Our capacity factor for this  
2 cycle is 84.5 percent.

3 MEMBER SKILLMAN: Are you experiencing  
4 some equipment problems that are pushing you back from  
5 90, 92, 94 percent?

6 MR. SCHENK: The biggest impact in our  
7 capacity factor this cycle was a planned outage that  
8 we took in January of 2018 to address fuel leaks.

9 MEMBER SKILLMAN: Yes, sir, thank you.

10 MEMBER MARCH-LEUBA: I was going to ask  
11 about that. What fuel do you use? Who is your fuel  
12 vendor, GE?

13 MR. SCHENK: GNF.

14 MEMBER MARCH-LEUBA: GNF, you use GNF too?

15 MR. SCHENK: Yes.

16 MEMBER MARCH-LEUBA: And you were having  
17 leakage problems?

18 MR. SCHENK: Yes, sir, we have experienced  
19 fuel leaks through this cycle.

20 MEMBER MARCH-LEUBA: Okay, thank you.

21 MEMBER SKILLMAN: Thank you. Please  
22 continue.

23 MR. SCHENK: Some of the River Bend  
24 licensing history, we received our construction permit  
25 in 1977 and our operating license was in 1985, and we

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1 commenced commercial operation in 1986. We were  
2 operating initially at 2,894 megawatts thermal.

3 We received our first power up rate in the  
4 year 2000 and went to 3,039 megawatts thermal, and  
5 then we did another power up rate in 2003 for thermal  
6 power optimization and that's where we're currently  
7 at, 3,091 megawatts thermal.

8 Our license renewal application was  
9 submitted in May of 2017 and our current operating  
10 license will expire in August of 2025.

11 MEMBER REMPE: Do you have any plans for  
12 other upgrades or MELLA+ separation or anything like  
13 that?

14 MR. SCHENK: No, ma'am.

15 MEMBER REMPE: Why not?

16 MR. MAGUIRE: I can answer that. So while  
17 the plant has the reactor capacity to add additional  
18 megawatts from the plant, we would have to provide  
19 additional balance of plant support to give that  
20 margin, and right now, the economics would support us  
21 using other forms of generation rather than adding  
22 capacity to our existing plant.

23 MEMBER REMPE: Thank you.

24 MR. SCHENK: All right, with that, I'd  
25 like to turn it over to our Engineering Director,

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1 James Henderson.

2 MR. HENDERSON: Good morning. My name is  
3 James Henderson. I am the Engineering Director at  
4 River Bend Station. I want to go over a couple of  
5 items. The first will be our major equipment upgrades  
6 for the facility, and then we'll go over our planned  
7 upgrades going forward.

8 The first thing that Entergy has done is  
9 done a very good job of making sure we have major  
10 investments looking at the long-term health and  
11 reliability of the station, not just from an equipment  
12 liability perspective, but also a safe and reliable  
13 operation of the facility.

14 The first item is an upgrade to our  
15 digital electro hydraulic control system. We'll have  
16 a picture further on in the slide presentation and  
17 we'll discuss further that upgrade that was performed.  
18 We also have an upgrade for our control building  
19 chilled water controls.

20 Those digital controls help with our  
21 operators interface as well as diagnostics for  
22 understanding and ability to troubleshoot and really  
23 get in front of one of our safety-related chilled  
24 water systems.

25 We've also done recoat for underground

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1 circulating water piping. That coupled with quality  
2 soil as well as our cathodic protection system really  
3 helped improve the overall health for our circ water  
4 system, and also the further bullets look at our  
5 modernization of the plant, so -

6 MEMBER SKILLMAN: Excuse me, sir. Let me  
7 ask this question and I'm curious from a personal  
8 perspective. Is the mud or the dirt in which that  
9 circ water piping prehistoric Mississippi mud that  
10 attacks the piping?

11 And I ask that because I spent many years  
12 in the Susquehanna River basin fighting this very  
13 issue, so I'm wondering if it's the nature of the  
14 water, or the nature of the dirt, or the combination.  
15 Could you speak a little bit to it, please?

16 MR. HENDERSON: Yes, I could. Actually  
17 it's the quality of the soil itself that's actually  
18 helpful for our protection of that underground piping.  
19 Unlike the Susquehanna plant that you mentioned, the  
20 soil is actually one of our key barriers to maintain  
21 the quality and structural integrity of the  
22 underground piping.

23 So we've seen from that soil, in not only  
24 the coating that we've done, vast improvements as far  
25 as our corrosion programs.

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1 MEMBER SKILLMAN: Did you add different  
2 soil to protect the pipe?

3 MR. HENDERSON: No, we did not. It's the  
4 same soil.

5 MEMBER SKILLMAN: Okay, thank you.

6 MEMBER RICCARDELLA: Have you had leakage  
7 issues?

8 MR. HENDERSON: We have not, and we do  
9 underground inspections whenever we have any  
10 opportunity to go in, not only just with our normal  
11 requirements as a part of our program, and all of  
12 those inspections have been satisfactory.

13 MEMBER SKILLMAN: Please proceed. Thank  
14 you.

15 MR. HENDERSON: The next slide in our  
16 presentation shows a representation of our digital  
17 electro hydraulic control system. Those upgrades  
18 eliminated on the order of 90 single point  
19 vulnerabilities from the facility.

20 It also gave the interface for the  
21 operations team to be able to not only perform  
22 testing, but better diagnostic for the generation of  
23 the plant and ensure that we don't have challenges  
24 there.

25 The next slide shows our four e-volt load

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1 center breakers. This is just another example of  
2 modernization to the plant. This dealt with a lot of  
3 obsolescence that we had with some of our breakers in  
4 the facility. Those have been changed and this has  
5 improved overall reliability as well as our safety-  
6 related power performance.

7 The next slide is carbon steel piping  
8 replacement. The system that's depicted here is our  
9 reactor water cleanup system. We've gone in and  
10 replaced carbon piping with new carbon piping as well  
11 as chromoly.

12 That's helped improve the overall  
13 reliability of our reactor water cleanup system as  
14 well as a fact perspective, really helping the  
15 reliability of the system.

16 The next slide goes through our major  
17 equipment upgrades that are planned, the first being  
18 our turbine building chiller replacements. Those will  
19 complete in 2019. This is really to help with  
20 generation as well as reliability for the station.  
21 Our turbine chillers not only supply our turbine  
22 building, but they also supply our main steam tunnel  
23 associated with our reactor vessel.

24 MEMBER SKILLMAN: Jim, would you go back  
25 a slide, please? For the reactor water cleanup piping

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1 that was replaced, was this piping degradation  
2 identified in your flow accelerated corrosion program?

3 MR. HENDERSON: Yes, it was.

4 MEMBER SKILLMAN: Oh, it was?

5 MR. HENDERSON: Yes, it was.

6 MEMBER SKILLMAN: And is this a 40-year  
7 replacement that you are providing?

8 MR. HENDERSON: The replacement time  
9 frame, I do not have that.

10 MEMBER SKILLMAN: No, no, how long is this  
11 new piping going to be good for?

12 MR. HENDERSON: It will last for the 40  
13 years.

14 MEMBER SKILLMAN: And does this pipe and  
15 its attachments remain in your FAC program?

16 MR. HENDERSON: Yes, they do.

17 MEMBER SKILLMAN: Okay, thank you.

18 MEMBER BROWN: Could you go back another  
19 slide? Right there, are those -- excuse me, I've got  
20 to learn to do this too. Are those breakers digital  
21 controls?

22 MR. HENDERSON: They are not. They have  
23 indications as far as diagnostics for breaker amperage  
24 and those things, but they are specifically at the  
25 bucket of the breaker. They do not communicate with

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1 the main control room or any other areas.

2 MEMBER BROWN: Okay, no internet  
3 connections or anything like that?

4 MR. HENDERSON: That's correct.

5 MEMBER BROWN: Okay, that's fine. I might  
6 have asked that earlier, but I forgot.

7 MR. HENDERSON: No worries.

8 MEMBER BROWN: Thank you.

9 MR. HENDERSON: The next item we'll talk  
10 about is the spent fuel pool neutron absorber upgrade.  
11 There's a slide going forward for a picture of that.  
12 We also have condenser upgrades that will be taking  
13 place in 2021. Similar to Waterford 3, we'll be going  
14 with the secure piping for our retube.

15 We also have service water cooling heat  
16 exchanger refurb, our Fancy Point switchgear  
17 upgrades. That's our offsite power source that comes  
18 to the facility really making sure we have the  
19 reliability and redundancy of offsite power coming to  
20 the facility. That's an upgrade scheduled.

21 We also will be discussing the feedwater  
22 strainer. I have a picture in the slide show for it  
23 and that's related to the fuel failures that we've  
24 seen that have been predominantly caused by foreign  
25 material, and also our feedwater level control system

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1 upgrades to a digital system which will eliminate  
2 several of the single point vulnerabilities and  
3 obsolescence concerns with our feedwater level control  
4 system.

5 The next slide depicts our neutron  
6 absorber prototype inserts. Currently we have 60 of  
7 these inserts installed. They will help improve  
8 neutron absorption in our spent fuel pool.

9 We've done the analysis for both seismic  
10 as well as thermal impacts of having those inserts  
11 into the core. Our plan is to in 2020, have an  
12 engineering change that allows to take credit for  
13 those as a part of our licensing basis.

14 MEMBER SKILLMAN: Jim, you said into the  
15 core. I think what you meant is in the spent fuel  
16 pool.

17 MR. HENDERSON: Spent fuel pool, that's  
18 correct.

19 MEMBER SKILLMAN: Okay, thank you.

20 MEMBER REMPE: What material is that?

21 MR. HENDERSON: It's boron aluminum.

22 MEMBER RICCARDELLA: And is that going to  
23 allow you to load more fuel in the condenser packing?

24 MR. HENDERSON: It will, and the intent  
25 will be with the installation that we begin now, when

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1 we get to 2020 with all of the analysis, we'll be able  
2 to see what kind of additional capacity we'll have  
3 based upon the inserts that we have in the spent fuel  
4 pool.

5 MEMBER BALLINGER: You had boraflex before  
6 that?

7 MR. HENDERSON: Yes, we did. We have the  
8 boraflex inserts.

9 All right, our next slide depicts  
10 strainers that will be installed in our feedwater  
11 system. This is one of two strainers that will go in  
12 the last point in our feedwater injection into the  
13 vessel. We've had foreign material intrusion impacts  
14 to our fuel. We have addressed the sources of those  
15 foreign material.

16 This will be a preventive measure to allow  
17 another means of collecting foreign material prior to  
18 it getting into the vessel so that we don't have,  
19 going forward, fuel failures at our facility. This  
20 depiction is actually not the one that we're  
21 installing, but this is just a representation of what  
22 we'll have.

23 MEMBER MARCH-LEUBA: And you're planning  
24 to install this during the next outage?

25 MR. HENDERSON: Yes.

1                   MEMBER MARCH-LEUBA: This was not part of  
2 these reviews operating, I mean, on the scheduled  
3 outages you had last cycle, right?

4                   MR. HENDERSON: That's correct. This will  
5 be in our next refueling outage in the spring of 2019.

6                   And the final upgrade that I will discuss  
7 is our feedwater level control. This will be a  
8 digital upgrade. We have taken actions to bridge and  
9 alleviate some of the concerns with our analog system  
10 that we've had for feedwater level control. This will  
11 improve with the SPV elimination as well as operator  
12 interface, the ability to control reactor water level.

13                   Some of the things that we're doing at the  
14 station one is looking at OE from the industry as far  
15 as impacts not only from a cyber security perspective  
16 for installation of the system, but also the  
17 effectiveness of the level control going forward, so  
18 this is an item that we have on target for the station  
19 as well.

20                   With that, I'll turn over the presentation  
21 to Garry Young.

22                   MR. YOUNG: Okay, thank you. I'm Garry  
23 Young, Director of License Renewal for the Entergy  
24 nuclear fleet and I'd like to give you some background  
25 on our license renewal process, including the approach

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1 for the integrated plan assessment and for preparing  
2 the license renewal application.

3 We have a dedicated corporate team working  
4 on license renewal for all of the Entergy nuclear  
5 plants, and this team with almost two decades of  
6 experience with all aspects of aging management and  
7 license renewal has prepared more than a dozen license  
8 renewal applications over the past several years.

9 In addition to the corporate team, a plant  
10 team of River Bend experts in design, systems  
11 engineering, and plant programs was established for  
12 this license renewal project. The plant team provided  
13 needed input, review, and oversight of all the  
14 engineering and environmental reports that were  
15 created.

16 Entergy used the NRC-approved guidance in  
17 NEI 95.10 to prepare the project specific procedures  
18 and guidelines. These procedures have been used on  
19 our previous license renewal projects and are  
20 routinely updated based on lessons learned, industry  
21 operating experience, and changes to NRC guidance.

22 The site specific aging management review  
23 results for River Bend were compared to the GALL  
24 Report, NUREG-1801, Revision 2, as part of the  
25 application development, and I'll talk more about the

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1 comparison of aging management programs with the GALL  
2 Report on a later slide.

3 The license renewal application was  
4 submitted to the NRC in May of 2017 and the NRC used  
5 a new review process for the River Bend application  
6 that included some efficiency improvements based on  
7 lessons learned from previous NRC reviews.

8 This has proven to be a successful effort  
9 by the NRC staff and has resulted in a planned 18-  
10 month review schedule rather than the typical 22-month  
11 review schedule. Okay, next slide.

12 The NRC review process culminated in the  
13 River Bend safety evaluation report which was issued  
14 in August of 2018 with no open items and no  
15 confirmatory items. We appreciate the extensive and  
16 thorough work of the NRC staff in reaching this  
17 important milestone in the license renewal application  
18 review process. Okay, next slide.

19 This slide summarizes the aging management  
20 programs credited for license renewal. We have 43  
21 aging management programs that include 12 new programs  
22 and 30 existing programs that are or will be  
23 consistent with the GALL Report programs with a  
24 handful of exceptions that are shown on this slide.

25 Some examples of the 12 new programs are

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1 the buried and underground piping and tanks inspection  
2 program, the non-EQ cables and connections aging  
3 management programs, and one-time inspection programs.

4 Some aspects of these new programs have  
5 been implemented, but they are considered new programs  
6 because a significant number of changes must be made  
7 or have only recently been made to make them  
8 consistent with the program descriptions in the GALL  
9 Report.

10 For example, the River Bend buried piping  
11 program was initiated in response to a 2009 NEI  
12 initiative, but significant changes are necessary to  
13 incorporate the latest NRC guidance which includes  
14 interim staff guidance issued in 2015.

15 For clarity in describing the program,  
16 Entergy classified it as a new program that would be  
17 consistent with the program description in the most  
18 recent NRC guidance.

19 MEMBER MARCH-LEUBA: What is the plant  
20 specific program, the last bullet?

21 MR. YOUNG: That's the period surveillance  
22 and preventive maintenance program.

23 MEMBER MARCH-LEUBA: That's not in other  
24 plants?

25 MR. YOUNG: Entergy has that in all of our

1 plants. It's an existing program and we use it when  
2 we have some, for example, some preventive maintenance  
3 activities that we can credit for aging management  
4 such as inspections during some period frequency for  
5 maintenance.

6 MEMBER MARCH-LEUBA: Yeah, but there's  
7 nothing special about River Bend. All Entergy plants  
8 have that?

9 MR. YOUNG: All of the Entergy plants have  
10 it, yes.

11 MEMBER MARCH-LEUBA: Okay, I just was  
12 reading something wrong in that bullet.

13 MR. YOUNG: Okay, the 30 existing programs  
14 have been compared to the GALL programs, and only a  
15 few exceptions have been taken. These exceptions  
16 include such things as revised inspection intervals  
17 based on the River Bend refueling outage schedules and  
18 referencing NRC regulatory guides and industry  
19 standards that are later revisions than those  
20 referenced in the GALL Report which was published in  
21 2010.

22 And then the last one is the plant  
23 specific program which is the period surveillance and  
24 preventive maintenance program. Okay, next slide.

25 On the topic of commitment management and

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1 controlling the commitments that we've made for  
2 license renewal, Entergy has a fleet program that  
3 covers management of commitments for all our nuclear  
4 plants.

5 We have successfully used this commitment  
6 management program for our previous license renewal  
7 projects, including projects for plants that have  
8 implemented license renewal commitments and are  
9 successfully operating in the period of extended  
10 operation.

11 For each River Bend license renewal  
12 commitment, the commitment management program  
13 identifies the actions needed to implement the  
14 commitments and identifies the owner responsible for  
15 implementation.

16 Assignments will include actions such as  
17 creation of implementing procedures for new aging  
18 management programs and incorporating enhancements to  
19 existing aging management programs, and this completes  
20 my portion of the presentation and I'll turn it back  
21 over to Bill.

22 MR. MAGUIRE: Thank you, Garry. In  
23 summary, Entergy is committed to the long-term safe  
24 and reliable operation of the River Bend facility.  
25 Entergy will manage the effects of aging in accordance

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1 with 10 CFR 54. Entergy has evaluated time limited  
2 aging analysis that require evaluation under 10 CFR 54  
3 and we have met the provisions of 10 CFR 54 for  
4 issuance of a renewed license. That concludes our  
5 remarks pending your questions.

6 MEMBER SKILLMAN: Bill, thank you.  
7 Colleagues, any questions, please, for the River Bend  
8 management team?

9 MEMBER KIRCHNER: Could you go back to,  
10 you mentioned issues with fuel leakage and then you  
11 showed us a picture of a strainer, feedwater strainer.  
12 What was the program or analysis that you did? Did  
13 you see debris or crud on the fuel that was the cause  
14 of the leakage and that led you to this planned step  
15 to install a feedwater strainer or can you give us  
16 some more detail on that issue, please?

17 MR. HENDERSON: Yes, so we've done  
18 analysis for the fuel that has been removed from the  
19 core with indications of fuel failure, and all of the  
20 indications show or are indicative of foreign material  
21 and debris.

22 The actions that I discussed earlier about  
23 pinpointing the specific causes of those were very  
24 foreign material potential systems that got into the  
25 vessel, including our feedwater system and our

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1 feedwater sparger probe, so those all have direct feed  
2 into the vessel to cause a foreign material concern,  
3 so that's where we narrowed down and pinpoints to go  
4 address and correct.

5 The whole purpose of the strainer itself  
6 was more of a prevention perspective to give us an  
7 additional robust barrier between getting items  
8 through our feedwater system into the vessel and cause  
9 a potential fuel failure.

10 MEMBER BALLINGER: Was this foreign  
11 material from the system or from maintenance which  
12 introduced the foreign material into the system?

13 MR. HENDERSON: It was -- the first of it  
14 was due to a failure of one of our feedwater  
15 regulating valves.

16 MEMBER BALLINGER: Okay.

17 MR. HENDERSON: There was a Variseal  
18 within that that failed and went in. The other item  
19 was because of a conductivity probe that had broken  
20 off and their operating experience about conductivity  
21 probes breaking. That conductivity probe made its way  
22 into our feedwater sparger and made a hole into the  
23 sparger.

24 MEMBER BALLINGER: So these are from  
25 systems? They're not from like a wire brush or

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1 something?

2 MR. HENDERSON: No, that's correct. It is  
3 not from maintenance practices.

4 MR. MAGUIRE: And this measure would not  
5 have prevented the feed reg valve from failing or the  
6 probe from failing, but it would have prevented those  
7 components from getting into the reactor vessel and  
8 causing fuel defects.

9 MEMBER KIRCHNER: So if I could follow up,  
10 so the fuel failure was induced by this debris getting  
11 caught in the fuel at a grid spacer or some place?

12 MR. MAGUIRE: Yes, sir.

13 MEMBER KIRCHNER: Or was it blocking the  
14 channel, the flow into the bundle?

15 MR. MAGUIRE: It's at the grid spacer.  
16 It's debris induced threading of the cladding of the  
17 fuel that's causing the defects.

18 MEMBER KIRCHNER: So it wasn't a dry out  
19 problem per se. It was more of an inter-middle  
20 interaction kind of problem?

21 MR. MAGUIRE: You are correct.

22 MEMBER KIRCHNER: Did the first grid  
23 spacer pick up the debris?

24 MR. MAGUIRE: We have -

25 MEMBER KIRCHNER: Was it in the bottom of

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1 the cooler?

2 MR. MAGUIRE: The GNF comes with a fuel  
3 defender, and the fuel defender provides a tortuous  
4 path at the bottom of the fuel bundle so that if you  
5 did have some debris entering the reactor core, the  
6 probability of it getting inside the channel is low.

7 If it were to get past the defender, it  
8 could get stuck at any number of the spacers along the  
9 longitudinal length of the fuel bundle, and we have  
10 seen defects at different heights in the fuel bundle,  
11 typically at a spacer grid.

12 MEMBER KIRCHNER: Thank you.

13 MEMBER RICCARDELLA: You mentioned  
14 feedwater sparger damage. Did this require  
15 replacement of the sparger or just repair?

16 MR. HENDERSON: During our next refueling  
17 outage, we have a clam shell, for lack of better  
18 terms, that we're going to put over the sparger itself  
19 which will repair the sparger and the hole that we  
20 have indications of an issue with.

21 MEMBER MARCH-LEUBA: Just curious because  
22 we have time, how do you know it was broken? I mean,  
23 you saw it on the last refueling outage?

24 MR. HENDERSON: We actually were doing in  
25 core inspections and had a camera that was panning

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1 over the area, and we identified the -

2 MEMBER MARCH-LEUBA: During refueling, it  
3 was visual?

4 MR. HENDERSON: That's correct.

5 MEMBER RICCARDELLA: Was it the little  
6 sparger nozzle, the little elbows, one of those or the  
7 main pipe, sparger piping?

8 MR. HENDERSON: Yeah, if you can imagine  
9 the actual sparger elbow, right on the side of the  
10 elbow was where the hole had -

11 MEMBER REMPE: Okay, thank you.

12 MEMBER SKILLMAN: Colleagues, any further  
13 questions for the River Bend executive team? Hearing  
14 none, Joe, change out time. Entergy team, thank you.

15 MR. DONOGHUE: Chairman Corradini and  
16 Committee, we're just about ready with our staff  
17 presentation. As I said before, Emmanuel Sayoc, the  
18 project manager who led this, will lead the  
19 presentation. Allen Hiser, who you saw earlier today,  
20 he's our senior technical advisor for license renewal,  
21 and Angela Wu is a project manager that helped with  
22 this review. Take it away.

23 MEMBER SKILLMAN: So, Angela, Emmanuel,  
24 Allen, let's go. Thank you very much for being here  
25 and let's go.

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1 MR. SAYOC: Good morning, Chairman  
2 Corradini and members of the ACRS. My name is  
3 Emmanuel Sayoc and I am the license renewal project  
4 manager for the River Bend Station Unit 1 safety  
5 review.

6 We are here today to discuss the staff's  
7 review of the River Bend license renewal application  
8 or LRA as discussed in the safety evaluation report  
9 issued on August 16, 2018. Joining me here at the  
10 table are Dr. Allen Hiser, senior technical advisor,  
11 and Ms. Angela Wu, project manager from the Division  
12 of Materials and License Renewal.

13 Seated in the audience are members of the  
14 technical staff who participated in the review of the  
15 license renewal application and conducted the onsite  
16 audits and inspections. Next slide.

17 I will begin the presentation with a  
18 general overview of the staff's review. Next, I will  
19 touch upon follow-up items from the ACRS Subcommittee  
20 meeting of September 20, 2018. As there were no open  
21 items or confirmatory items in the SER, I will proceed  
22 to the staff's review, follow-up items, and  
23 conclusions. Next slide.

24 On May 25, 2017, Entergy Louisiana, LLC  
25 and Entergy Operations, Inc., collectively referred to

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1 as Entergy or the applicant, submitted an application  
2 for renewal of River Bend operating license for an  
3 additional 20 years.

4 Consistent with prior license renewal  
5 reviews, the staff conducted the three standard audits  
6 as shown in the slide, the operating experience audit,  
7 the scoping and screening methodology audit, and the  
8 aging management audit.

9 These audits were performed from NRC  
10 headquarters, and the regional 71.02 inspection as  
11 well as portions of the AMP audit were performed  
12 onsite at River Bend.

13 During the operating experience audit, the  
14 team conducted an independent search of plant  
15 operating experience information to determine whether  
16 the applicant's LRA aging management program can  
17 adequately manage the associated aging effects. The  
18 operating experience audits were documented in a  
19 report dated January 18, 2018.

20 During the scoping and screening  
21 methodology audit, the team reviewed the applicant's  
22 administrative controls governing the scoping and  
23 screening methodology and the technical basis for  
24 selecting scoping and screening results. The scoping  
25 and screening methodology audits were documented in a

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1 report dated January 8, 2018.

2 During the AMP audits, the team examined  
3 applicant's aging management programs and related  
4 documentation to verify that the applicant's programs  
5 are consistent with those described in the GALL Report  
6 and with plant conditions and operating experience.  
7 The staff documented the results in a report dated  
8 January 29, 2018.

9 Region IV conducted a 71.02 inspection in  
10 February and March 2018 and documented their results  
11 in a report dated May 7, 2018.

12 Based on the inspection results, the  
13 Region IV team had reasonable assurance that the  
14 Entergy programs in place or planned as described in  
15 their commitment table will manage the aging effects  
16 and ensure the intended safety function of systems,  
17 structures, and components within the scope of the  
18 rule. Next slide, please.

19 The River Bend final SER was issued on  
20 August 16, 2018. With the staff's in-depth technical  
21 review of the LRA, a total of 119 RAIs were issued, 15  
22 of which were follow-up RAIs. The final SER will be  
23 issued with the renewed license and published as a  
24 NUREG report.

25 The ACRS License Renewal Subcommittee

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1 meeting was held on September 20, 2018. There were  
2 two follow-up items from that meeting which I will  
3 discuss later in the presentation. Next slide,  
4 please.

5 In the next few slides, I will present the  
6 results of the staff's review of the LAR as described  
7 in the SER. SER Section 2 described the scoping of  
8 SSCs and the screening of structures and components to  
9 identify those subject to AMR.

10 The staff reviewed the applicant's scoping  
11 and screening methodology, procedures, quality  
12 controls applicable to the LAR development, and  
13 training of its project personnel.

14 The staff also reviewed the various  
15 summaries of safety-related systems, structures, and  
16 components or SSCs, non-safety SSCs affecting safety  
17 functions, and SSCs relied upon to perform functions  
18 applicable to River Bend in compliance with the  
19 Commission's regulations for fire protection,  
20 environmental qualification, station blackout, and  
21 anticipated transience without scram.

22 Based on the review results from the  
23 scoping and screening audit and additional information  
24 provided by the applicant, the staff concludes that  
25 the applicant's scoping and screening methodology and

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1 implementation were consistent with the standard  
2 review plan and the requirements of 10 CFR Part 54.  
3 Next slide, please.

4 SER Chapter 3 and its subsections cover  
5 the staff's review of the applicant's programs for  
6 managing aging in accordance with 10 CFR 54.21A3.

7 Sections 3.1 through 3.6 include AMR items  
8 in each of the general system areas within the scope  
9 of license renewal. For a given AMR item, the staff  
10 reviewed the item to determine whether it is  
11 consistent with the GALL Report.

12 For the AMR items not consistent with the  
13 GALL Report, the staff reviewed the applicant's  
14 evaluation to determine whether the applicant has  
15 demonstrated reasonable assurance that the effects of  
16 aging will be adequately managed so that the intended  
17 functions will be maintained consistent with the  
18 current licensing basis for the period of extended  
19 operation. Next slide, please.

20 The LRA described a total of 43 aging  
21 management programs, 11 new, 31 existing, and one  
22 plant specific. This slide identifies the applicant's  
23 disposition of AMPs in the left column and the staff's  
24 disposition of AMPs on the right column.

25 One plant specific AMP was provided. All

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1 with the exception of the plant specific AMP were  
2 evaluated by the staff for consistency with the GALL  
3 Report Rev 2.

4 Overall, the staff concluded that 22 AMPs  
5 were consistent with the GALL Report. These included  
6 12 new programs, 10 existing programs. In addition,  
7 13 programs were consistent with enhancements, two  
8 consistent with exceptions, and five were consistent  
9 with enhancements and exceptions. Next slide, please.

10 SER Section 4 identifies time-limited  
11 aging analysis or TLAAs. Section 4.1 documents the  
12 staff's evaluation of the applicant's identification  
13 of applicable TLAAs.

14 The staff evaluated the applicant's basis  
15 for identifying those plant specific or generic  
16 analyses that need to be identified as TLAAs and  
17 determined that the applicant has provided an accurate  
18 list of TLAAs as required by 10 CFR 54.21C1.

19 Sections 4.2 through 4.7 document the  
20 staff's review of applicable TLAAs as shown. Based on  
21 its review and the information provided by the  
22 applicant, the staff concludes that either one, the  
23 analysis remain valid for the period of extended  
24 operation, two, the analysis has been projected to the  
25 end of the period of extended operation, or three, the

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1 effects of aging on the intended functions will be  
2 adequately managed for the period of extended  
3 operation as required by 10 CFR 54.21C1 Subparagraphs  
4 I, ii, and iii respectively. Next slide.

5 I will now discuss the two follow-up items  
6 from the Subcommittee meeting. With regards to the  
7 ACRS request for clarification on SER Section  
8 2.1.4.2.1, the staff verified that the plant drain  
9 system was the only non-safety SSC providing support  
10 for safety functions under 10 CFR 54.4A1.

11 LRA Section 2.1.1.2.1, function failures  
12 for non-safety related SSCs states that the systems  
13 and structures required to support a safety function  
14 are classified as safety related and have been  
15 included in the scope of license renewal in accordance  
16 with 10 CFR 54.4A1.

17 As a result, only one safety-related SSC  
18 supporting a safety function was identified. That is  
19 the plant drain system which supports maintaining  
20 suppression pool inventory for use following a loss of  
21 coolant accident and was therefore included within the  
22 scope of license renewal in accordance with 10 CFR  
23 54.4A2.

24 As verified by the staff, the plant drain  
25 system is the only non-safety system credited in the

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1 LRA for supporting a safety function and it's not just  
2 an example. Next slide, please.

3 The second follow-up item was related to  
4 the EDG crankcase vent lines. At the September 20  
5 ACRS Subcommittee meeting, a concern was raised  
6 regarding applicant's response to RAI 2.3.3.16-1.

7 The staff agreed that further  
8 clarification of the applicant's RAI response was  
9 warranted and the applicant agreed to supplement their  
10 original RAI response to provide that clarification.

11 A supplemental response has been submitted  
12 and the staff has completed its review and found it  
13 acceptable. The staff has also updated the relevant  
14 section of its SER and provided that to the ACRS.

15 In its supplemental RAI response, the  
16 applicant clarified that with respect to the  
17 application of the scoping criteria of 10 CFR 54.4A1,  
18 the purpose of the vent pipe for Division I and II  
19 emergency diesel engine is to vent the gases from the  
20 diesel generator to the outdoors.

21 Upon loss of the vent pipe pressure  
22 boundary, the gases would exhaust into the room, but  
23 the diesel would continue to perform its function.  
24 When the diesel is in operation, the room ventilation  
25 system is in service venting the room.

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1           Therefore, the loss of pressure boundary  
2 of this vent pipe has no impact on the diesel or  
3 personnel and it has no safety function. The function  
4 of venting the crankcase to the outdoors is not  
5 necessary for the diesel to operate under emergency  
6 conditions.

7           The applicant also clarified that the  
8 Division III diesel engine removes the crankcase gases  
9 via the engine and its exhaust line. In addition,  
10 periodic surveillance testing confirms adequate  
11 control of crankcase gases for Division I, II, and III  
12 diesel engines.

13           With respect to the application of scoping  
14 criteria of 10 CFR 54.4A2, non-safety related SSCs  
15 whose failure could impact SSCs proving safety  
16 function, the applicant clarified that for the  
17 Division I and II emergency diesel engines, the non-  
18 safety related engine vent lines are not subject to  
19 aging management review under 54.4A2 because the vent  
20 lines contain no liquids that would impact other  
21 components in the room from leakage or spray.

22           The vent lines are installed with seismic  
23 supports that are subject to aging management review  
24 and included in the structures monitoring program.  
25 Therefore, the vent lines cannot fall or impose an

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1 unanalyzed load on the connection to the safety-  
2 related diesel engine that would render it unable to  
3 perform its intended safety function under both normal  
4 and seismic conditions.

5 The staff found these clarifications to  
6 provide sufficient justification as to why the  
7 Division I and II emergency diesel engine vent lines  
8 are not within the scope of license renewal per the  
9 criteria of 10 CFR 54.4A.

10 The staff updated the relaxant section of  
11 the SER to include this clarification, has provided  
12 that update to the ACRS, and considers this issue  
13 fully resolved. Next slide, please.

14 In conclusion, on the basis of its safety  
15 review, the staff finds that the requirements of 10  
16 CFR 54.29A are met for the license renewal of River  
17 Bend Station Unit 1. This concludes my presentation.  
18 Now, if there are any questions, the staff would like  
19 to take them at this time.

20 MEMBER SKILLMAN: Thank you, Manny.  
21 Colleagues, any questions for the staff that conducted  
22 the review here for River Bend?

23 MEMBER MARCH-LEUBA: I should have asked  
24 the applicant the same question. Any concrete aging,  
25 ASR concrete aging issues identified?

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1 MR. SAYOC: Yes, I have Brian Wittick  
2 here, the Chief of the Structural Branch to further  
3 elaborate.

4 MR. WITTICK: Yes, my name is Brian  
5 Wittick. I'm the Branch Chief of the Structural  
6 Engineering Branch that did the review. Similar to  
7 Waterford, in reviewing their application, given the  
8 amount of work we were doing on ASR at the time, we  
9 were particularly sensitive to that particular effect,  
10 and so we did a careful review of the operating  
11 experience and corrective action program to verify  
12 whether or not there was any indications of ASR for  
13 River Bend. There were none.

14 And while we were onsite for other audit  
15 activities, Angie Buford, who briefed you yesterday,  
16 did walk downs in the plant and specifically did look  
17 for any indications of ASR and found none.

18 MEMBER MARCH-LEUBA: Yeah, that's what I  
19 was going to say, that just looking at the licensee  
20 reports, maybe you wouldn't find anything. What you  
21 need is a walk down through all the concrete  
22 structures with somebody with a trained eye, and it  
23 doesn't need to be the staff. It has to be the  
24 licensee, the one that's looking for those clear  
25 indications.

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1 MR. WITTICK: Correct.

2 MEMBER MARCH-LEUBA: And it doesn't cost  
3 that much money. You just need to have a trained eye.

4 MEMBER REMPE: So when you looked for  
5 indications, you not only looked for cracks, but you  
6 also looked for any unexplained building movement,  
7 right?

8 MR. WITTICK: Well, I'm not the structural  
9 expert, but when she did her sampling inspections, she  
10 said she specifically looked for any indications of  
11 ASR and found none.

12 MEMBER REMPE: Thank you.

13 MEMBER KIRCHNER: Emmanuel, I wanted to go  
14 back to the fuel question that I raised. So how does  
15 this fit into your review? Obviously there was an  
16 issue that the applicant has taken what appear to be  
17 some appropriate corrective actions to address it.  
18 How does that impact -- How does this fit into your  
19 review, an issue like that where you have an operating  
20 plant and they're seeking an extension or a renewal?

21 We were corrected earlier that plant  
22 equipment upgrades aren't the same as committed  
23 upgrades, but it seems like the applicant has  
24 identified the strainer as one means to prevent  
25 foreign objects from getting into the fuel, into the

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1 core. So how does this -- how do you address that  
2 issue as part of this license renewal process?

3 MR. SAYOC: I appreciate the question. As  
4 far as the fuel issue and the strainers, that's not  
5 within the scope of license renewal. That's a Part 50  
6 operating within their scope. Does anybody else want  
7 to elaborate from the staff?

8 DR. HISER: Yeah, so really this is not a  
9 part of our review. We are focused on passive, long-  
10 lived systems, structures, and components, and the  
11 fuel does not fit within that.

12 MEMBER KIRCHNER: I understand that. So  
13 it's under the existing license under 10 CFR 50, but  
14 when an issue -- maybe this is a more generic  
15 question, not specific just to this plant, but when  
16 you have an issue like that that's of concern, how  
17 does that factor into your LRA review?

18 DR. HISER: If it's a, if it's operating  
19 experience related to an item that's within the scope  
20 of license renewal, then we would consider whether  
21 that operating experience is consistent with the  
22 boundaries of the appropriate GALL aging management  
23 program, and if it exceeds the boundaries, then the  
24 plant normally would implement some enhancement to  
25 their program to adequately manage that aging effect

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1 in the future.

2 For example, they may do more extensive  
3 inspections. Instead of visual examination, they may  
4 do ultrasonic. They may do inspections more  
5 frequently than the GALL AMP would indicate.

6 MEMBER KIRCHNER: My concern is that this  
7 falls kind of betwixt and between. It appears that  
8 the applicant has a plan in place to address it, but  
9 it is an aging effect if indeed parts or pieces get  
10 into the primary system and then find their way into  
11 the core.

12 Those parts are displaced because of  
13 aging, or corrosion, or migration, whatever. How do  
14 you -- you know, I understand you have these AMPs and  
15 all of the GALL Report, but, I mean, this is a real  
16 issue obviously for the existing license, but it also  
17 suggests that there may be aging effects that impact  
18 the license -

19 MEMBER SKILLMAN: I'd like to weigh in on  
20 this. Well, let me chime in. I loaded eight lead  
21 test assemblies one time. We thought we had found the  
22 magic path through the swamp of fuel. All eight of  
23 them fell apart. We had parts and pieces all over  
24 TMI-1.

25 It was not an aging issue. It was a

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1 design issue, the fuel, and we worked our way through  
2 that very painfully as a team, worked our way through  
3 that. So when a probe fails or a device fails, it's  
4 not necessarily an aging issue. It can be simply a  
5 mechanical failure.

6 So I think to try to couple the events  
7 that triggered the installation of the feedwater  
8 filter with AMP probably isn't cricket. From time to  
9 time, the plants get older, things happen, or you  
10 install a new device and the device doesn't function  
11 the way it was advertised and you deal with it.

12 So I'm adverse to connecting what has  
13 happened to the fuel at River Bend, if you will, to  
14 either a failed AMP or lack of clairvoyance on the  
15 plant staff. That fires some emotion in me that -

16 MEMBER KIRCHNER: That's not where I was  
17 going with this. I'm just interested in exploring  
18 this interface. You have something that has happened  
19 due to aging of the plant. Either a component wears  
20 out prematurely -- I mean, it wasn't an expected  
21 failure, I don't think.

22 MEMBER SKILLMAN: Okay.

23 MEMBER KIRCHNER: So the plant is  
24 operating. It's aging. Things will break. I  
25 understand that. I was just concerned that this kind

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1 of falls in a gap, an interesting gap. The fuel did  
2 not fail because of the defect in the fuel design. It  
3 was caused by something in the plant that had aged or  
4 failed, and it's just an interesting -- I'm just  
5 checking to see how this gets factored into the  
6 license renewal.

7 MR. DONOGHUE: So Member Kirchner, this is  
8 Joe Donoghue. I'm going to use a different example to  
9 tell you our thought process, but before I get there,  
10 what our expectation is is something like this gets  
11 factored into the plant's programs to evaluate and  
12 determine the cause. I can let them speak to that in  
13 any detail, but leading to another example, the  
14 Anchor/Darling valve problem.

15 When that occurred, one of the things that  
16 we did working with the Division of Engineering was to  
17 try to fully understand the cause of that to see if it  
18 was an aging-related mechanism, to see if it needed to  
19 be part of our license renewal, a normal, regular  
20 license renewal protocol, and we determined not.

21 And I'll tell you that, you know, this is  
22 an -- you're right. It's worth -- we have to look at  
23 these and think about them, and pull the string on  
24 what the cause is and see if it's an aging-related  
25 one.

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1           And there's a list of other issues, and  
2           I'll be as -- I'll illustrate it this way. In  
3           George's office, the Director who is here, when there  
4           are material-related issues that occur, he's got them  
5           listed on his white board in his office, and for this  
6           reason, we evaluate them.

7           We work closely with the Division of  
8           Engineering. And if we determine, if it's determined  
9           that it's an aging-related mechanism for a passive  
10          component, we then have to consider how it's going to  
11          be dealt with in a normal review protocol. Allen, do  
12          you have more?

13          DR. HISER: The only other thing I would  
14          say is passive long-lived, it's within the scope of  
15          license renewal, and if it's not within the scope of  
16          license renewal, it is not a part of our review, but  
17          that does not obviate the plant needing to make  
18          effective corrective actions to remediate a situation,  
19          identify root cause, and things like that. That is  
20          still -- that's a Part 50 process that is incumbent on  
21          the plant.

22          MEMBER KIRCHNER: I know it's under the  
23          existing license. I appreciate that, but let me ask  
24          you, does the aging management program for reactor  
25          vessels, internals, and coolant system, would that

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1 pick this up going forward?

2 MR. MEDOFF: Hello, this is Jim Medoff of  
3 the staff. I was the staff reviewer for the  
4 applicant's reactor vessel internals program. We did  
5 come across one example of a situation exactly what  
6 you're talking about which was mentioned earlier in  
7 the presentation, which was the hole in the feedwater  
8 sparger.

9 As we've said, that is a Part 50 issue,  
10 but we did assess whether it could potentially impact  
11 the aging management programs. We did do our  
12 appropriate due diligence. We turned it over to the  
13 Division of Operating Reactor Licensing and with the  
14 Region. We had several calls with the applicants on  
15 the operating experience to determine whether there  
16 would be any impacts on aging.

17 For instance, if you had a part that was  
18 generated as a loose part, could it vibrate against  
19 the reactor vessel or any of the internals and cause  
20 them to wear away, which would be an aging effect, so  
21 we did evaluate that. So it's not like we ignored  
22 this.

23 We do evaluate specifically those effects  
24 and our conclusion is after talking with the licensee,  
25 hearing what the licensee had to say with us over the

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1 phone, and in phone calls with counterparts that were  
2 involved from the Division of Engineering and with the  
3 regional office, we concluded there were no impacts,  
4 that even though it was Part 50 driven event, that  
5 could cause like an aging effect later on in one of  
6 the components that was scoped in for renewal and  
7 screening in for an aging management review.

8 In regards to the fuel assemblies, those  
9 are never scoped for renewal. Those are -- they may  
10 be scoped in for renewal, but they're never subject to  
11 an aging management review because they're passive and  
12 long lived. So operating experience involved with  
13 those types of things would never come away. We  
14 always leave it as a Part 50 issue.

15 MEMBER BALLINGER: So what you're saying  
16 is this is a River Bend specific issue, not a BWR  
17 generic issue? There's no other experience out in the  
18 fleet where similar debris production has occurred?

19 MR. MEDOFF: No, I'm not saying that. I'm  
20 saying because the fuel assemblies, they may be scoped  
21 in for renewal, and they're not subject to AMR because  
22 they're replaced on a specified time frame set by  
23 their core offload, so experience like that would  
24 never been considered for its impacts on aging because  
25 they're not subject to AMR.

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1                   MEMBER BALLINGER: Yeah, I'm not talking  
2 about the fuel. I'm talking about the structure. So  
3 have there been other similar cases where these  
4 components have produced debris which ended up in the  
5 vessel?

6                   DR. HISER: I'm not aware of any. There  
7 may be, but they have not -

8                   MEMBER BALLINGER: But that would -

9                   DR. HISER: They would be on a plant  
10 specific basis. If the plant had a history of doing  
11 that, then again, through the Part 50 original  
12 operating license context, then they would take  
13 appropriate measures to ensure that that doesn't  
14 happen, that -

15                   MEMBER BALLINGER: Okay, but I'm talking  
16 about other plants as well. In other words, in other  
17 BWRs, you're saying that this is a unique -- these  
18 debris production devices were unique to this plant  
19 and not to some other, and not likely to occur in  
20 other similar plants?

21                   DR. HISER: I don't know that I would say  
22 either one of those. I'm not aware of other plants  
23 that had these kinds of filters, and maybe River Bend  
24 could comment on that, and there may be other plants  
25 that have had issues with this.

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1 MEMBER BALLINGER: Okay.

2 MEMBER MARCH-LEUBA: All BWRs have leakage  
3 at one time in their lives. I mean, this is a common  
4 thing. It's not specific to River Bend.

5 MR. HENDERSON: This is James Henderson,  
6 Engineering Director for River Bend. When we did look  
7 at the conductivity probe failure that had the hole in  
8 the sparger that caused some of the debris to get into  
9 the vessel, there was Dresden that had a similar OE  
10 where a conductivity probe had broken and caused an  
11 issue in their feedwater spargers as well, so there is  
12 industry operating experience for that.

13 MEMBER MARCH-LEUBA: Yeah, but you did  
14 take positive steps by buying the GNF fuel with the  
15 filter at the bottom because you know that fuels pass  
16 in your system, and we found out there were not  
17 sufficient enough, but you put in the additional  
18 filter which is even better?

19 MR. HENDERSON: That's correct.

20 MEMBER MARCH-LEUBA: And the only thing I  
21 can blame you for is during the license renewal,  
22 you're trying to take credit for that filter when it  
23 doesn't really belong there. That filter wasn't  
24 really used for operating concerns. It has nothing to  
25 do with the license renewal. You were just so proud

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1 of it that you wanted to show us the picture, but it  
2 didn't belong in this presentation.

3 MR. HENDERSON: The intent of the  
4 inclusion in the presentation was just to show the  
5 upgrades that we have planned for the station.

6 MEMBER MARCH-LEUBA: Yeah, so we're  
7 confused because you put it in there when it really  
8 doesn't belong.

9 MR. HENDERSON: I understand.

10 MEMBER KIRCHNER: Okay, thank you.

11 MEMBER SKILLMAN: Colleagues, any other  
12 questions for the NRC staff, please?

13 MEMBER DIMITRIJEVIC: I have a question on  
14 this follow up on the vent for the diesel generator  
15 room. Is there any other electrical equipment there  
16 like, you know, intermediate basks or controls? Is  
17 there any, other than the diesel generator, is there  
18 any other electrical equipment in that room, and if  
19 yes, was then the room heat up calculation performed  
20 to show that that can operate without the vent?

21 MR. SAYOC: Yes, I appreciate the  
22 question. This is regarding the second follow up,  
23 right, the emergency diesel generator grid lines?

24 MEMBER DIMITRIJEVIC: Right, right.

25 MR. SAYOC: Okay, I'd like to call upon

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1 Mr. Dave Nold to elaborate on the follow-up item.  
2 Thank you, David.

3 MR. NOLD: This is David Nold with the  
4 Containment and Ventilation Systems Branch. With  
5 respect to other equipment, safety-related equipment  
6 in the area of the vent lines, is that what you're  
7 talking about?

8 According, well, all I had to do was rely  
9 on the answer of the supplemental response, was the  
10 fact that these pipes do not leak. They do not  
11 contain fluid. There's no potential impact there.

12 MEMBER DIMITRIJEVIC: My concern was about  
13 other electrical equipment in this diesel generator  
14 room, like a bank which the diesel generator connects  
15 to and goes to the emergency switch or the controls  
16 for the diesel generator. Is there any other  
17 electrical equipment which can be sensitive to  
18 temperature? That's my concern.

19 MR. NOLD: Temperature.

20 MEMBER DIMITRIJEVIC: Yes.

21 MR. HENDERSON: This is James Henderson  
22 with River Bend Station, Engineering Director. For  
23 the emergency diesel generator room, there are no  
24 other switch gears that are in the room. It is only  
25 the diesel generator. There's a control room that is

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1 next to the room. It's separated by a fire-rated  
2 door, but that room only has auxiliaries that support  
3 the diesel generator function.

4 MEMBER DIMITRIJEVIC: And which  
5 auxiliaries are in that room?

6 MR. HENDERSON: It's related to -- there's  
7 an equipment room, the air compressors associated with  
8 the diesel, some of the jacket water pumps. Those  
9 power supplies come within that diesel generator room.  
10 It's not a cross-divisional, other power supplies or  
11 electrical buses there.

12 MEMBER DIMITRIJEVIC: And none of this  
13 equipment is sensitive to the temperature heat up in  
14 the room?

15 MR. HENDERSON: That's correct.

16 MEMBER DIMITRIJEVIC: All right, so is  
17 this the case in other applications? Did you always  
18 see the venting to the diesel generator room is out of  
19 the scope? We just had Waterford this morning, so, I  
20 mean, I was just wondering. Did they also exclude it?

21 MR. NOLD: When I first got feedback on  
22 this issue, I did do a search of other license  
23 renewal, the SEs. I couldn't find anything that this  
24 ever has been surfaced before this question, so it is  
25 unique as far as I know.

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1 MEMBER DIMITRIJEVIC: All right.

2 MEMBER SKILLMAN: Colleagues, any other  
3 questions for the staff? Hearing none, Manny, thank  
4 you, and Mike, back to you.

5 CHAIRMAN CORRADINI: Okay, what we're  
6 going to do is take a break for lunch and come back at  
7 1:00. We're off the record after this discussion  
8 because we'll be going through our draft slides to  
9 report to the Commission for our December meeting. So  
10 we'll be back here, the Committee will be back here at  
11 1:00.

12 For those on River Bend that want to see  
13 and be present for the letter making session, that  
14 will probably be something around 2:00 to 2:15.  
15 You're more than welcome to stay and listen to us  
16 prepare slides for the Commission, but I sense that  
17 you might have other profitable things to do.

18 MEMBER REMPE: Mike, just to make sure  
19 that we're in compliance -

20 CHAIRMAN CORRADINI: We're in compliance.  
21 I checked.

22 MEMBER REMPE: Did you adjust -

23 CHAIRMAN CORRADINI: Yes.

24 MEMBER REMPE: Okay.

25 MEMBER MARCH-LEUBA: And we're off the

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1 record for the rest of the week, so he can go home?

2 CHAIRMAN CORRADINI: I just said that.

3 Yeah, he's off. We're off the record.

4 (Whereupon, the above-entitled matter went  
5 off the record at 11:49 a.m.)

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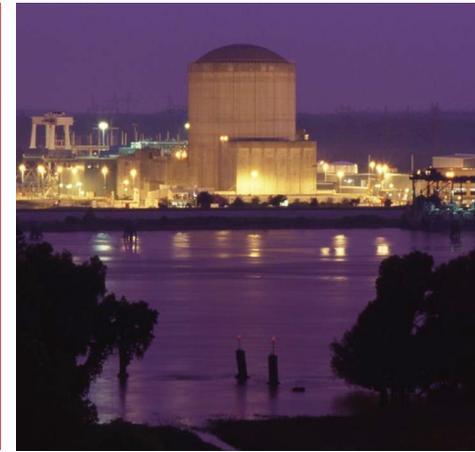
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# Waterford 3 License Renewal



# Entergy Presenters

| Name         | Title                            |
|--------------|----------------------------------|
| John Dinelli | Site Vice President, Waterford 3 |
| Brian Lanka  | Director, Engineering            |
| John Jarrell | Sr. Manager, Operations          |
| Garry Young  | Director, License Renewal        |

# Agenda

- Background
  - Site Description
  - Plant Status
  - Licensing History
  - Major Equipment Upgrades
- License Renewal Project
  - License Renewal Application
  - Aging Management Programs and Commitments
- Conclusion



# Waterford 3 Site Description

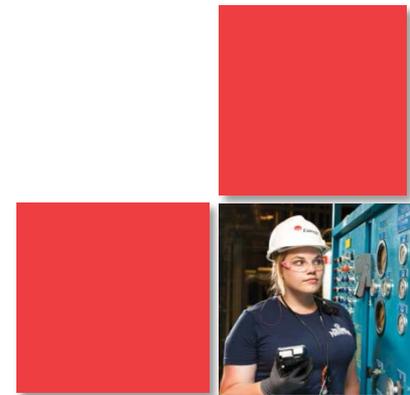
- Located on Mississippi River 25 miles upriver from New Orleans in St. Charles Parish
- Combustion Engineering NSSS
- EBASCO (AE and constructor)
- Dry containment

# Waterford 3 Site Description

- Westinghouse turbine generator
- Ultimate heat sink is combination dry & wet cooling towers independent from river
- Licensed thermal power is 3716 MWT
- Staff complement is approximately 751

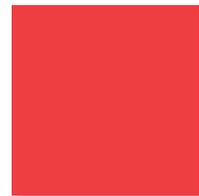
# Waterford 3 Plant Status

- Plant Status
  - 100% power
  - Refueling cycle – 18 months
  - ROP action matrix Column 1
- Last Refueling Outage
  - RF21 (Spring 2017)
- Next Refueling Outage
  - RF22 (Early 2019)



# Waterford 3 Licensing History

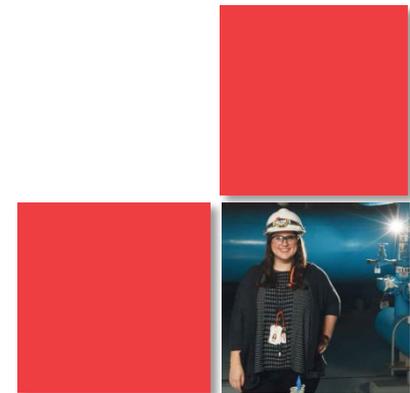
|                              |                    |
|------------------------------|--------------------|
| Construction Permit          | November 14, 1974  |
| Operating License            | March 16, 1985     |
| Commercial Operation         | September 24, 1985 |
| 8% Power Uprate              | April 15, 2005     |
| LRA Submitted                | March 16, 2016     |
| Operating License Expiration | December 18, 2024  |



# Major Equipment Upgrades

## Completed

- Replaced reactor coolant pump motors
- Added emergency diesel generator fuel storage tanks
- Upgraded static uninterruptable power supplies
- Replaced intake structure traveling screens
- Replaced steam generators
- Replaced reactor vessel head
- Replaced refueling machine



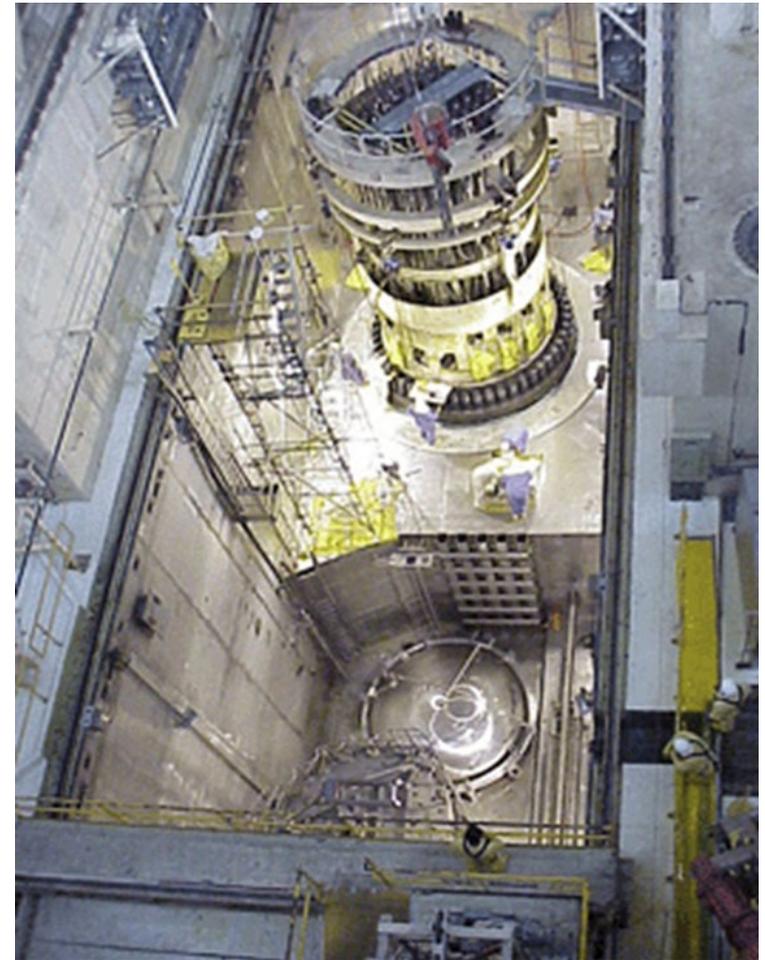
# Photos – New Traveling Screens



# Photos – New Steam Generators



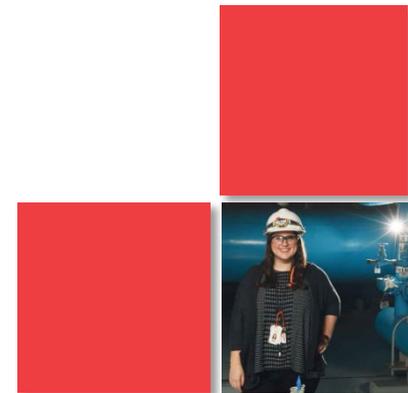
# Photos – New Reactor Head



# Major Equipment Upgrades

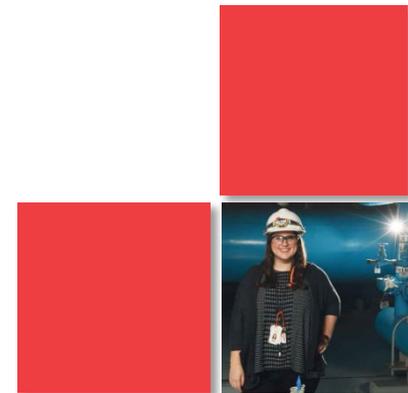
## Planned

- Retube main condensers
- Replace core protection calculators
- Upgrade turbine controls
- Replace essential chillers
- Ultimate heat sink (UHS) improvements
- Replace UHS motor control center



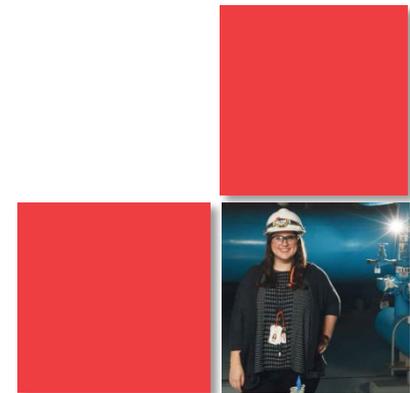
# Waterford 3 License Renewal Project

- Experienced, multi-discipline Entergy team (corporate and site personnel) prepared the license renewal application (LRA)
- Incorporated lessons learned from previous applications
- Used NEI 95-10 guidance
  - Scoping and screening process
  - Aging management reviews
  - LRA format and content
- Used Revision 2 of NUREG-1801



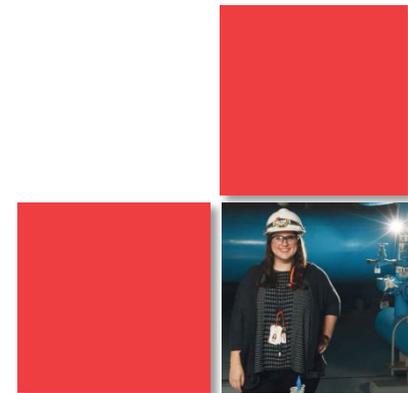
# Safety Evaluation Report

- SER issued August 17, 2018
  - No open items
  - No confirmatory items



# Aging Management Programs

- **41 Aging Management Programs**
  - 12 new programs
    - 10 consistent
    - 2 consistent with exceptions
  - 28 existing programs
    - 6 consistent
    - 19 consistent with enhancements
    - 3 consistent with exceptions and enhancements
  - 1 existing plant-specific program with enhancements



# Program Commitment Implementation

- Regulatory commitments in the commitment management system to track enhancements to existing programs and implementation of new programs
- Entergy has significant experience with license renewal commitment implementation
- Similar new AMPs and AMP enhancements have been successfully implemented at other Entergy plants



# Conclusion

- Entergy is committed to the long-term operation and continuous improvement of our facilities
- Entergy will manage the effects of aging in accordance with 10 CFR 54.21(a)(1)
- Entergy has evaluated time-limited aging analyses that require evaluation under 10 CFR 54.21(c)
- Entergy has met the provisions of 10 CFR 54 for issuance of a renewed license



# **Advisory Committee on Reactor Safeguards**

## **Waterford Steam Electric Station, Unit 3 Safety Evaluation Report (SER)**

November 1, 2018

Phyllis Clark, Project Manager  
Office of Nuclear Reactor Regulation

# Presentation Outline

- **Overview of Waterford license renewal review**
- **SER Section 2, Scoping and Screening Review**
- **SER Section 3, Aging Management Review**
- **SER Section 4, Time-Limited Aging Analyses**
- **Conclusion**

# License Renewal Review: Audits and Inspections

| <b>Audit / Inspection</b>                                     | <b>Dates</b>                   | <b>Location</b> |
|---|--------------------------------|-----------------|
| Scoping & Screening Methodology Audit                         | June 13 – 16, 2016             | Onsite          |
| Aging Management Program (AMP) Audits                         | July 11 – July 29, 2016        | Onsite          |
| Region IV 71002<br>Inspection: Scoping and Screening and AMPs | January 30 – February 16, 2017 | Onsite          |

# **SER Overview**

- **Final SER issued August 17, 2018**
- **Waterford SER contains no open items**
- **119 RAIs issued**
  - **25 of which were follow-up RAIs**
- **ACRS License Renewal Subcommittee meeting held September 20, 2018**

## **SER Section 2**

- **Structures and Components Subject to Aging Management Review (AMR)**
  - Section 2.1, Scoping and Screening Methodology
  - Section 2.2, Plant Level Scoping Results
  - Sections 2.3, 2.4, 2.5, Scoping and Screening Results

# SER Section 3

- **Aging Management Review (AMR) Results**
  - Section 3.0, Use of the Generic Aging Lessons Learned Report
  - Section 3.1, Reactor Vessel, Internals, and Reactor Coolant System
  - Section 3.2, Engineered Safety Features Systems
  - Section 3.3, Auxiliary Systems
  - Section 3.4, Steam and Power Conversion Systems
  - Section 3.5, Structures and Component Supports
  - Section 3.6, Electrical and Instrumentation and Controls Components

# SER Section 3

## 3.0.3 - Aging Management Programs (AMPs)

### Applicant's Original Disposition of AMPs

- 12 new programs
  - 10 consistent
  - 2 consistent with exceptions
- 29 existing programs
  - 9 consistent
  - 17 consistent with enhancements
  - 2 consistent with enhancements and exceptions
  - 1 plant specific

### Final Disposition of AMPs in SER

- 12 new programs
  - 10 consistent
  - 2 consistent with exceptions
- 29 existing programs
  - 6 consistent
  - 19 consistent with enhancements
  - 3 consistent with enhancements and exceptions
  - 1 plant specific

# SER Section 4

- **Time-Limited Aging Analyses (TLAAs)**
  - 4.1, Identification of TLAAs
  - 4.2, Reactor Vessel Neutron Embrittlement
  - 4.3, Metal Fatigue
  - 4.4, Environmental Qualification of Electric Equipment
  - 4.5, Concrete Containment Tendon Prestress
  - 4.6, Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analysis
  - 4.7, Other Plant-Specific TLAAs

# Conclusion

- On the basis of its review, the staff finds that the requirements of 10 CFR 54.29(a) have been met for the license renewal of Waterford Steam Electric Station, Unit 3.



# River Bend Station License Renewal



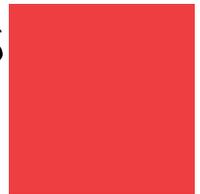
# Entergy Presenters

| Name            | Title                           |
|-----------------|---------------------------------|
| Bill Maguire    | Site Vice President             |
| James Henderson | Director, Engineering           |
| Tim Schenk      | Manager, Regulatory Assurance   |
| Garry Young     | Director, Fleet License Renewal |

# Agenda



- Background
  - Site Description
  - Plant Status
  - Licensing History
  - Major Equipment Upgrades
- License Renewal Project
  - License Renewal Application (LRA)
  - Aging Management Programs and Commitments
- Conclusion



# RBS Site Description

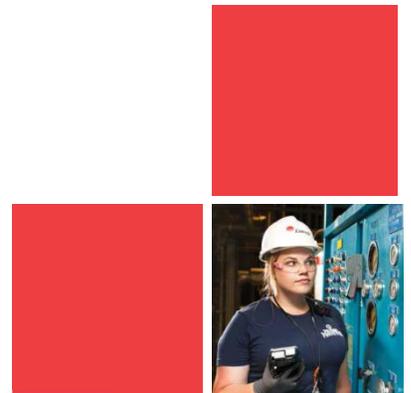
- Located in West Feliciana Parish, Louisiana, approximately 24 miles north-northwest of Baton Rouge, Louisiana
- General Electric NSSS – Stone & Webster (constructor)
- BWR-6, GE Mark III containment
- GE turbine generator

# RBS Site Description

- Ultimate heat sink is independent wet cooling tower
- Closed circulating water system with mechanical draft cooling towers
- Licensed thermal power - 3091 MWt
- Staff complement - approximately 820

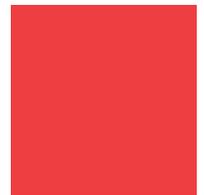
# RBS Plant Status

- Plant Status
  - 100% power
  - 24-month cycle
  - ROP action matrix Column 1
- Last Refueling Outage
  - RF19 (Spring 2017)
- Next Refueling Outage
  - RF20 (Spring 2019)



# RBS Licensing History

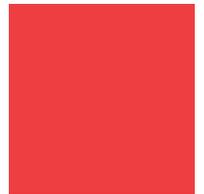
|  |                   |
|--|-------------------|
| Construction Permit  | March 25, 1977    |
| Operating License  | November 20, 1985 |
| Commercial Operation   | June 16, 1986     |
| 5% Power Uprate  | November 2000     |
| Power Uprate License Amendment (1.7% Thermal Power Optimization) | January 31, 2003  |
| LRA Submitted  | May 25, 2017      |
| Operating License Expiration                                     | August 29, 2025   |



# Major Equipment Upgrades

## Completed

- Upgraded digital EHC turbine controls
- Upgraded control building chiller controls
- Recoated underground circulating water piping
- Replaced inverters
- Replaced carbon steel piping
- Upgraded normal service water cooling tower
- Replaced 4th point feedwater heaters
- Upgraded 480 V load center breakers



# Photos – Digital EHC



Human Machine Interface for EHC on the H13-P680 Panel

# Photos – 480 V Loadcenter Breakers



# Photos – Carbon Steel Piping Replacement

Carbon Steel Piping Replacement in RF-18 and RF-19



# Major Equipment Upgrades

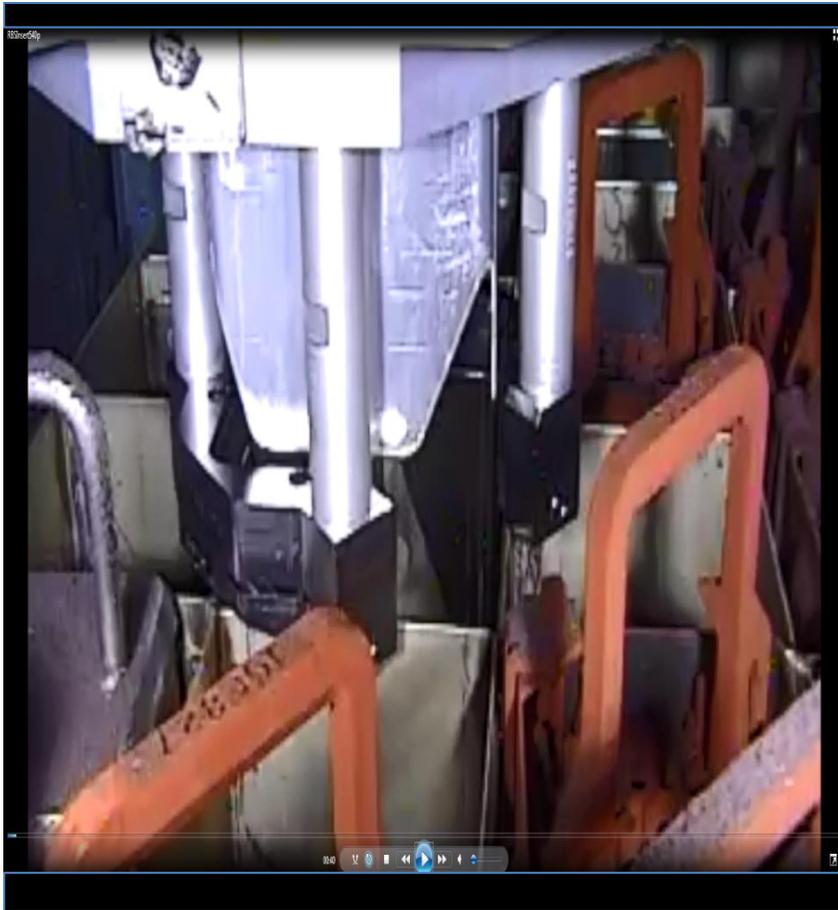
## Planned

- Turbine building chiller replacements
- Spent fuel pool neutron absorber upgrade
- Condenser upgrades
- Service water cooling heat exchanger refurbishment
- Fancy Point switchyard upgrades
- Recirculation pump power cable replacement
- Feedwater strainer
- Feedwater level control



# Photos – Neutron Absorber Prototype Inserts

Start of absorber insertion



Full insertion. Ready to retract tool



# Photos – Feedwater Strainer



# Photos – Feedwater Level Controls

## Past

- RBS has had multiple issues with the FWLC system in the past contributing to reactor SCRAMS
- System is currently the GE original analog control system with reverse engineered Baily control cards.



## Present

- SIPD 3166 has been presented to upgrade the FWLC system to DCS control system, such as Ovation.
- This Mod is proposed to be installed RF21



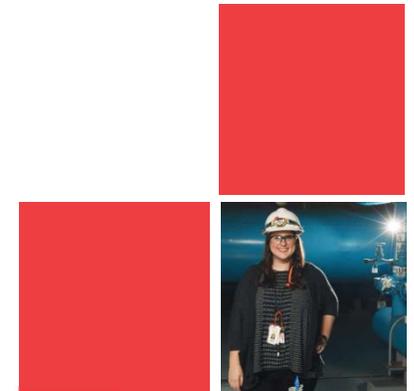
## Future

- Will increase the reliability of the feedwater system, leading to few SCRAMS or down-powers.
- Automatic Feedwater control over the complete range of normal power operation (1 – 100 percent) and optionally during plant heat up/cooldown
- Ability and spare capacity to expand and upgrade plant controls to the ovation platform as needed.
- Long Term Benefits:
  - Improves Reliability
  - Increases Defense in Depth
  - Addresses Obsolescence and spares issues
  - Eliminates several Single Point Vulnerabilities
  - Improves Data Collection



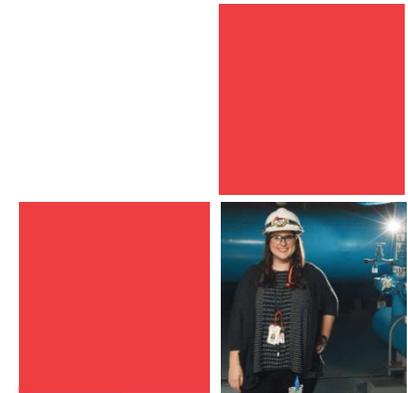
# RBS License Renewal Project

- Experienced, multi-discipline Entergy team (corporate and site personnel) prepared the license renewal application (LRA)
- Incorporated lessons learned from previous applications
- Used NEI 95-10 guidance
  - Scoping and screening process
  - Aging management review
  - LRA format and content
- Used Revision 2 of NUREG-1801
- 18-month NRC review schedule



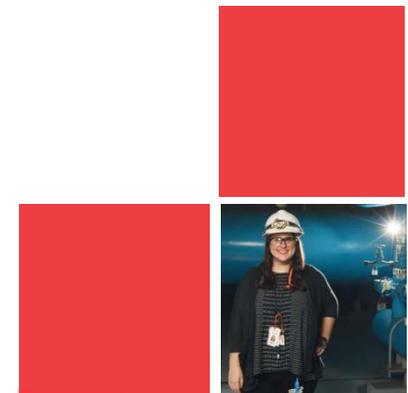
# Safety Evaluation Report

- SER issued August 2018
  - No open items
  - No confirmatory items



## Aging Management Programs and Regulatory Commitments

- 43 Aging Management Programs
  - 12 new programs
    - 12 consistent without exception
  - 30 existing programs
    - 10 consistent without exception
    - 13 consistent with enhancements
    - 2 consistent with exceptions
    - 5 consistent with exceptions and enhancements
  - 1 existing plant-specific program with enhancements



# Program Commitment Implementation

- Regulatory commitments in the commitment management system track enhancements to existing programs and implementation of new programs
- Entergy has significant experience with license renewal commitment implementation
- Similar new AMPs and AMP enhancements have been successfully implemented at other Entergy plants



# Conclusion

- Entergy is committed to the long-term operation and continuous improvement of our facilities.
- Entergy will manage the effects of aging in accordance with 10 CFR 54.21(a)(1)
- Entergy has evaluated time-limited aging analyses that require evaluation under 10 CFR 54.21(c)
- Entergy has met provisions of 10 CFR 54 for issuance of a renewed license.



**Advisory Committee on Reactor Safeguards**  
**Full Committee**

**River Bend Nuclear Generating Station**  
**Safety Evaluation Report (SER)**

November 1, 2018

Emmanuel Sayoc, Project Manager  
Office of Nuclear Reactor Regulation

# Presentation Outline

- **Overview of River Bend license renewal review**
- **Follow-Up Items from Sub-committee Meeting**
- **Conclusion**

# License Renewal Review: Audits and Inspections

| <b>Audit / Inspection</b>                                | <b>Dates</b>   | <b>Location</b>  |
|--|--|------------------|
| Operating Experience Audit                               | October 2 – 13, 2017                                   | Rockville        |
| Scoping & Screening Methodology Audit                    | October 24 – 26, 2017                                  | Onsite           |
| Aging Management Program (AMP) Audits                    | October 16 – November 8, 2017<br>November 6 – 10, 2017 | NRC HQ<br>Onsite |
| Region IV 71002 Inspection: Scoping, Screening, and AMPs | February 26 – March 2, 2018<br>March 19 – 23, 2018     | Onsite           |

# SER Overview

- Final SER issued August 16, 2018
  - No open items or confirmatory items
  - Total of 119 RAIs issued
    - 15 follow-up RAIs
- ACRS License Renewal  
Subcommittee meeting held  
September 20, 2018

# SER Section 2

- **Structures and Components Subject to Aging Management Review (AMR)**
  - Section 2.1: Scoping and Screening Methodology
  - Section 2.2: Plant-Level Scoping Results
  - Sections 2.3, 2.4, 2.5: Scoping and Screening Results

# SER Section 3

- **Aging Management Review (AMR) Results**
  - Section 3.1: Aging Management of Reactor Vessel, Internals, and Reactor Coolant System
  - Section 3.2: Aging Management of Engineered Safety Features
  - Section 3.3: Aging Management of Auxiliary Systems
  - Section 3.4: Aging Management of Steam and Power Conversion Systems
  - Section 3.5: Aging Management of Containments, Structures and Component Supports
  - Section 3.6: Aging Management of Electrical Commodity Group

# SER Section 3

## 3.0.3 - Aging Management Programs (AMPs)

### Applicant's Disposition of AMPs

- 11 new programs
  - All consistent
- 31 existing programs
  - 12 consistent
  - 13 consistent with enhancements
  - 2 consistent with exceptions
  - 4 consistent with enhancements and exceptions
- 1 plant-specific existing program

### Final Disposition of AMPs in SER

- 12 new programs
  - All consistent
- 30 existing programs
  - 10 consistent
  - 13 consistent with enhancements
  - 2 consistent with exceptions
  - 5 consistent with enhancements and exceptions
- 1 plant-specific existing program

# SER Section 4

- **Time-Limited Aging Analyses (TLAAs)**
  - 4.1: Identification of TLAAs
  - 4.2: Reactor Vessel Neutron Embrittlement Analyses
  - 4.3: Metal Fatigue Analyses
  - 4.4: Environmental Qualification of Electric Equipment
  - 4.5: Concrete Containment Tendon Prestress Analyses
  - 4.6: Containment Liner Plate, Metal Containment, and Penetrations Fatigue Analyses
  - 4.7: Other Plant-Specific TLAAs

# Non-Safety SSC Supporting Safety SSC Function

- Follow-up Item:
  - In SER Section 2.1.4.2.1 is the plant drains system the only system under category - Nonsafety-Related Systems, Structures, or Components (SSCs) Providing Functional Support for Safety Related SSC Functions, or was it an example?
- Response:
  - The plant drains system was the only SSC falling under said category.

## **RAI 2.3.3.16-1: EDG Crankcase Vent Lines Not Subject to AMR**

- **Follow-up Item:**

- ACRS identified concern re: RAI response regarding the Division I & II Emergency Diesel Engine (EDG) vent lines being not necessary for the diesels to operate under emergency conditions.
- Information provided in initial RAI response did not clearly provide technical justification as to why the vent lines did not have either 54.4(a)(1) or (a)(2) function.

- **Resolution:**

- Applicant provided additional clarification via an RAI supplement dated October 9, 2018.
- The RAI supplement included sufficient clarification for the staff to concur that the subject EDG vent lines do not meet the criteria of 54.4(a)(1) or (a)(2) for inclusion within the scope of license renewal.

# Conclusion

On the basis of its review, the staff finds that the requirements of 10 CFR 54.29(a) have been met for the license renewal of River Bend Station, Unit 1.