From: Haagensen, Brian
Sent: 11 Dec 2017 18:46:12 +0000
To: Haagensen, Brian
Subject: [External_Sender]
Attachments: 9593.pdf

The 13-page attachment has been withheld in its entirety under FOIA exemption 4.

From:	McKenzie, Kieta
To:	R1ORAMAIL RESOURCE; R1DRPMAIL RESOURCE; R1DRSMAIL RESOURCE; Setzer, Thomas; Patel, Jigar; Haagensen, Brian; Rich, Sarah; Hochmuth, Diane; Bowen, Jeremy; RidsNrrPMIndianPoint Resource; RidsNrrDorlLpl1 Resource; ROPreports Resource; Safouri, Christopher; Floyd, Niklas; Furia, Joseph; Masnyk Bailey, Orysia
Subject:	Indian Point - Integrated IR 05000247/2017001 and 05000286/2017001, and ISFSI IR 07200051/2017001
Date:	Thursday, May 11, 2017 11:53:40 AM
Attachments:	IP23 2017.001.FINAL.docx IP23 2017.001.FINAL.pdf

Attachment is publicly available in ADAMS as ML17131A128.

DISTRIBUTION:

Indian Point - Integrated IR 05000247/2017001 and 05000286/2017001, and ISFSI IR 07200051/2017001

ADAMS Accession No. ML17131A128
ADAMS Profile As: Public/Non-Sensitive

Have A Great Day!!

Kieta McKenzie
Administrative Assistant
Reactor Program Administrative Support Team
Region I
Phone: (610) 337-5133

From: Schroeder, Daniel
To: Haagensen, Brian
Subject: RE: FW: 11-10-17 A Message From GMPO John Ferrick Regarding 21 RCP Seal
Date: Monday, November 13, 2017 6:45:11 AM

Thanks.

From: Haagensen, Brian
Sent: Saturday, November 11, 2017 11:22 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>
Cc: Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Subject: Fw: FW: 11-10-17 A Message From GMPO John Ferrick Regarding 21 RCP Seal

The email below is a good summary from the GMPO regarding the 21 RCO seal. FYI

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

Subject: 11-10-17 A Message From GMPO John Ferrick Regarding 21 RCP Seal

11 -10-17 A message for all Indian Point employees

11/10/17 - A Message From GMPO John Ferrick Regarding 21 RCP Seal

All,

As you may have heard, we have been monitoring an abnormal condition on the number 1 seal return flow from 21 Reactor Coolant Pump very closely over the past few days. Although we are already scheduled to replace the seal package in the upcoming 2R23 RFO, there is a potential that we may need to have a forced outage to replace it prior to that. Increased seal leakage is a sign of declining seal performance, and when it reaches certain thresholds, Operations procedures require either a plant shutdown, or if it exceeds 6 gpm, a Reactor Trip followed by securing of the Reactor Coolant Pump. To avoid putting operators in this situation, it's important that we are prepared as a station to pre-emptively plan and execute a forced outage prior to having to trip the plant.

In order to accomplish that, we are doing the following;

- Preparing a forced outage schedule and driving required packages, tagouts and materials to a ready status.
- Identifying required resources to support forced outage execution.
- Engineering is trending RCP data and working with the Fleet and Westinghouse to better predict seal performance
- An ODMI has been approved, providing additional guidance to operators for actions to take to improve seal performance.
- Operating procedures are being reviewed to determine if we can implement Westinghouse (OEM) guidance on when to take shutdown and trip actions. For example, our current procedures require operators to initiate a reactor trip on increasing seal return flow >6gpm. However, the Westinghouse industry guidance for this action is 8 gpm. The IPEC action is only based on instrumentation limitations (Control Room indication reads only up to 6 gpm), so in the past we've been unable to use the full amount recommended by the Industry. In order to improve our margin, we are providing Operations with a temporary indicator capable of reading greater than 8 gpm so we can follow the industry guidance and take the appropriate action at the appropriate time.
- Operations crews have reviewed the procedural actions to take in response to increased seal leakage.

Currently, we believe seal performance is stable, and is capable of lasting several weeks. However, the predictability of these seals is not always certain. So we remain vigilant in our monitoring and aggressive in our preparation to address this. Nuclear Safety is our overriding priority and is central to our decision making process. Thanks for your hard work and dedication to support this important issue. I'll keep you informed as we learn more.

John

From:	Haagensen, Brian
To:	Haagensen, Brian
Subject:	[External_Sender] FW: 21 RCP Maintenance Procedure w/ Pictures
Date:	Friday, December 15, 2017 4:07:45 PM
Attachments:	0-PMP-401-RCS.pdf

This 153-page attachment, Reactor Coolant Pump Seal Package Inspection, is withheld in its entirety under FOIA exemption 4.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9360 (Office)
(b)(6) (cell)
In plant x5347

From: Safouri, Christopher
Sent: Friday, December 15, 2017 2:58 PM
To: Haagensen, Brian
Subject: 21 RCP Maintenance Procedure w/ Pictures

Hey Brian,

Attached is the 21 RCP maintenance procedure with several diagrams showing the RCP.

Thanks,
Chris

From: Haagensen, Brian
To: Haagensen, Brian
Subject: [External_Sender]
Date: Friday, December 15, 2017 9:54:06 AM

Package

(Refer to Figure 10)

eal section consists of three series mechanical seals. They are the No. 1 controlled-leakage, film-riding face seal and the No. 2 and 3 rubbing face seals. These seals are contained within the seal housing.

(b)(4)

(b)(4) REACTOR COOLANT SYSTEM SD 1.0 Rev. 16 40

(b)(4) REACTOR COOLANT

SYSTEM SD 1.0 Rev. 16 41


(b)(4)

(b)(4)

(b)(4)

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9360 (Office)
(b)(6) (cell)
In plant x5347

From:	Haagensen, Brian
To:	Pelton, David; Fuller, Justin; Henrion, Mark; Rossi, Matthew; Schroeder, Daniel; Setzer, Thomas; Siwy, Andrew
Cc:	Safouri, Christopher
Subject:	RE: IP2 Status at 1500 12/2
Date:	Saturday, December 23, 2017 9:49:00 AM

All holding as designed.

Unit 2 entered MODE 1 at 0850 and is preparing to synch to the grid.

From: Pelton, David
Sent: Saturday, December 23, 2017 7:07 AM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>; Fuller, Justin <Justin.Fuller@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>
Cc: Safouri, Christopher <Christopher.Safouri@nrc.gov>
Subject: Re: IP2 Status at 1500 12/2

...terrific...RPV head seals, 21 RCP seal, and RHR weld overlay all holding, I presume?

On: 23 December 2017 01:58, "Haagensen, Brian" <Brian.Haagensen@nrc.gov> wrote:
IP 2 achieved criticality at 0143 this morning. Currently at the POAH and preparing to warm up the secondary plant.

From: Haagensen, Brian
Sent: Friday, December 22, 2017 3:31 PM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>
Cc: Safouri, Christopher <Christopher.Safouri@nrc.gov>
Subject: IP2 Status at 1500 12/2

IP2 remains holding in mode 3 at NOP/NOT pending completion of the mode hold checklist and completion of the 37,000 gallon, 7 hour dilution. The critical path schedule has pulled up by 12 hours from the previous timeline.

Schedule:

12/22
1900 Transition to mode 2
2200 Reactor Critical
2300 POAH

12/23
1000 Synch to the grid

1400 50% power

12/24
0500 100% power
There remains two problems that could delay this schedule:

1. The pressurizer level transmitter LT-459 is reading low. OD in progress – fleet call pending – need to decide if they can justify an expansion of the channel check surveillance criteria from 8% to 14%.
2. Chemistry – at 24 cc/kg H2 in RCS. Need to be above 30 cc/kg for mode 2. Adding H2 to the RCS

I am going to get some rest as it could be a long night. I will be back in this evening for the startup.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Safouri, Christopher
Subject:	Re: IP2 Outage Update
Date:	Sunday, December 17, 2017 2:44:45 PM

Go home...feel better.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Safouri, Christopher
Sent: Sunday, December 17, 2017 2:09:23 PM
To: Haagensen, Brian; Schroeder, Daniel; Setzer, Thomas
Cc: Siwy, Andrew; Henrion, Mark
Subject: IP2 Outage Update

Unit 2
Mode 6
RCS Temp = 119 °F
RCS Press = atm
RCS TTB = 28 min
@ Lowered Inventory just below 68'
Yellow S/D risk -> Core Cooling, RCS Integrity, Containment Closure

Plant Activities:

- I observed via camera feed them landing the Rx head, which was completed @ 1300 12/17. To recap, there are 5 remaining studs that did not pass visual examinations, engineering is working through an evaluation (with review and concurrence by Westinghouse) to determine whether these studs can be credited for structural integrity and re-used. The studs in question are the ones that had boric acid passing past the stud. Additionally, Stud 20 is still stuck in the vessel and attempts to remove it have not been successful. They are going to re-attempt removing it with the head landed; In parallel, they are working through an engineering evaluation leaving Stud 20 in place and tensioning it down but not taking credit for it.
    - One logistical concern is that they only have **one** Unit 2 stud and ten Unit 3 studs available in the Warehouse. They are able to use a Unit 3 stud, but it requires the Unit 3 tensioner which would add about 12 hours to their schedule. The schedule I noted below does not account for this.
- Lifting activities for 21 RCP motor are currently underway, expected to be complete by 0600 12/18. Machining of the shaft and measurements have been verified to be acceptable. The seal package has been assembled successfully.
- Expected to be at Mode 5 @ 0700 12/18
- Expected to exit lowered RCS inventory @ 1000 12/19

If you have any questions, please feel free to reach out to me anytime.

Thanks,
Chris Safouri
Acting Resident Inspector
Indian Point Energy Center
RI/DRP/PB2
Tel: 914-739-9360

From: Haagensen, Brian
Sent: Sunday, December 17, 2017 10:23 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>
Cc: Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Subject: IP2 Status 11/17 at 1100

IP2 is in mode 6 as before. The RCS is drained to 68 ft and RCS temp is 115 F. Both trains of RHR remain in service. Time to boil is 27 minutes.

Risk is green with the exception of core cooling, containment closure and RCS integrity which are yellow.

Entergy was able to clear the Rx vessel flange leakoff line from solidified boric acid and continue preparations to return the RPV head to the vessel. Stud cleaning continues and they are conducting NDE on the studs that were exposed to boric acid. 2 studs were found to be acceptable. 5 more studs remain to be cleaned and inspected. Stud 20 remains inserted in the vessel. They will try to remove stud 20 after the head is landed on the vessel. The OCC schedule had the RPV being lifted at 1100 but this clearly is not happening.

Chris Safouri is on site today and will observe activities.

Brian

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From:	Haagensen, Brian
To:	Henrion, Mark; Rossi, Matthew; Schroeder, Daniel; Setzer, Thomas; Siwy, Andrew; Safouri, Christopher
Cc:	Guzman, Richard
Bcc:	Jackson, Donald
Subject:	RE: Indian Point Status 12/15
Date:	Friday, December 15, 2017 11:25:00 AM

Dan,

IP2 has decided to move forward and remove the RPV head with the errant stud still stuck in the vessel. They will have to be very careful during the lift not to damage the stud as the head is lifted.

I am expecting that IP2 will likely elect to re-land the head with the stud still installed in the vessel (assuming they can't get the stud out with the head removed). Engineering will produce an evaluation of closing the reactor vessel without crediting the stud that could not be removed.

We may need DRS support this weekend to evaluate this engineering mod package, when it is ready.

Brian

From: Haagensen, Brian
Sent: Friday, December 15, 2017 7:52 AM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Subject: Indian Point Status 12/15

Unit 2

Mode 6
RCS Level 68 ft (decreased inventory)
TTB = 22 min

One stud refuses to extract from the vessel. They are trying different penetrating fluids and mechanically agitating it. They have been working on this all night
Options:

1. Continue working on it
2. Apply liquid N2 to cool it causing the metal to contract
3. Restart with the stud in place but not credited – engineering evaluation in progress

The 21 RCP seal will not centralize. Working through this problem with the vendor

The 21 condensate pump impeller was dropped and damaged – evaluation in progress

Unit 3

100%
Green
UIL=0.01 gpm
No emergent or planned work today or over the weekend.

All three residents will provide outage coverage this weekend.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Schroeder, Daniel
Subject:	RE: Indian Point Status 12/15
Date:	Friday, December 15, 2017 8:00:00 AM

They have 3 replacement studs on site.

From: Schroeder, Daniel
Sent: Friday, December 15, 2017 7:57 AM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: RE: Indian Point Status 12/15

I have an EZ out in my trunk!

Dan

From: Haagensen, Brian
Sent: Friday, December 15, 2017 7:52 AM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Subject: Indian Point Status 12/15

Unit 2

Mode 6
RCS Level 68 ft (decreased inventory)
TTB = 22 min

One stud refuses to extract from the vessel. They are trying different penetrating fluids and mechanically agitating it. They have been working on this all night
Options:

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The 21 condensate pump impeller was dropped and damaged – evaluation in progress

Unit 3

100%
Green
UIL=0.01 gpm
No emergent or planned work today or over the weekend.

All three residents will provide outage coverage this weekend.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Schroeder, Daniel
Subject:	Outage schedule contingencies
Date:	Tuesday, December 12, 2017 9:43:00 AM
Attachments:	image001.png

Note: The attached image appears in the text, below.

Dan,

Currently, the Unit 2 outage is scheduled to end on Thursday, 12/21 at 2000. Andrew Siwy has approved leave for 12/20 to 12/27. Chris Safouri has leave scheduled from 12/22 to 12/26. Both have purchased airline tickets and plan to be out of town. I was planning to cover the site alone over the Christmas holidays – but of course this plan was conceived before the plant outage was forced by the increase in the 21 RCP seal leakage.

We need to plan for a contingency that the outage could be extended beyond 12/21. IPEC is having difficulties getting vendors lined up and my expectation is that the outage may slip to the right.

We have the following options to choose from:

1. Rely on just me to cover for the period of time until the outage is over – realizing that I cannot cover 24x7 and there may be gaps while I get some rest.
2. Cancel or defer leaves for the IPRO residents – they will have trouble making alternative arrangements at this late date and the costs for airline tickets will likely escalate
3. Line up additional support from the Region if needed.

I recommend soliciting volunteers for option 3 and if none are found, then go with option 1.

None of these options are optimum – but we need to decide now which way we want to go and get management approval in advance.

Merry Christmas!

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)

From:	Haagensen, Brian
To:	Siwy, Andrew
Subject:	Re: 21 RCP Outage - S/D Update
Date:	Sunday, December 10, 2017 11:50:45 AM

No problems...you are right on top of it! I will be driving back this evening. Next week is going to be busy.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Saturday, December 9, 2017 5:24 PM
To: Safouri, Christopher; Schroeder, Daniel; Haagensen, Brian
Cc: Henrion, Mark; Setzer, Thomas
Subject: Re: 21 RCP Outage - S/D Update

Thanks for the correction Brian. The email was written before I went to the control room (in the hopes that it would be mostly correct afterwards) and I was there two hours longer than expected, after an already 2 hour delayed switch to RHR. Who would've thought they'd be 4 hours behind within the first 12 hours?

From: Siwy, Andrew
Sent: Saturday, December 9, 2017 12:41 PM
To: Safouri, Christopher; Schroeder, Daniel; Haagensen, Brian
Cc: Henrion, Mark; Setzer, Thomas
Subject: RE: 21 RCP Outage - S/D Update

New information in blue

Considering start-up is not scheduled for at least 9 days and they are only performing RCS crud burst the rest of the weekend, the next *expected* update is Monday morning at the 7:30am call.

Summary

- Mode 4, RCS ~300F and ~365 psi
- Scheduled startup (withdrawal control banks), 12/18/17.

OPEN items

- Unexpected cooldown (drop from 547F to ~532F) and letdown isolation (18.9% instead of 18%) [CR-IP2-2017-05068]

- AOPs entered, then exited when plant stabilized
- Leak-by on turbine stop valves and leak-by into DCT

- 24 RCP vibration alarm (15 mils) came in during cooldown [CR-IP2-2017-05067]
  - Vibrations reduced to 13 mils and stabilized
  - Potentially due to cooldown
- 22 RCP lower thrust bearing temperature increased to ~180F [CR-IP2-2017-05066]
  - Emergent Issue Team investigating. FMA to be put together
  - Appears that it may be instrument error due to sharper drop in temp than expected from 180F to 115F
- Reactor vessel head has boron accumulation around the flange surface and at the seams of some of the insulation [CR-IP2-2017-05065]
  - Emergent Issue Team investigating
  - Entry scheduled for afternoon of 12/9/17 to remove insulation.
- Control bank C rod C13 rod bottom light was intermittently on/off post trip [CR-IP2-2017-05064]
  - C13 has been verified to be fully inserted

CLOSED items

-

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From: Safouri, Christopher
Sent: Saturday, December 09, 2017 4:02 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>
Subject: 21 RCP Outage - S/D Update

Hello,

I'd like to provide an update for the shutdown portion of the 21 RCP outage. The S/D was delayed by ~2 hours due to operators going through extensive Just in Time training. The S/D began at 2215 on 12/8 and the operators manually tripped the Rx/Turbine at 0119 on 12/9 in accordance with their plant shutdown procedures, entering Mode 3. The reactor/turbine trip was satisfactory, with all control rods being inserted.

At 0123, shortly after the Rx trip, an unanticipated isolation of letdown took place. This was due to excessive RCS cooldown which caused RCS thermal shrink, causing letdown isolation on low Pressurizer level. The RCS average temperature should have been maintained at ~547 degrees F with the high pressure steam dumps in pressure mode and pressurizer level at 37%; instead the plant data shows that the RCS temperature dropped down to a low of 532 degrees F and pressurizer level of 18.9% (letdown isolates on low pressurizer level at 18%). The cause of the excess RCS cooldown is unknown at this time. Initially, operators believed that a high pressure steam dump valve, PCV-1130, was stuck open due to a valve indication in the control room being lit. However, operators in the field verified that the valve was shut and the light was due to the limit switch not being fully made

up. Engineering and Ops are working through determining the cause of the excess RCS cooldown and issues that followed.

The operators were able to recover and stabilize the plant. They appropriately entered 2-E-0, Reactor Trip or Safety Injection, following the Rx trip and then transitioned into 2-AOP-CVCS-1, Chemical and Volume Control System Malfunctions, in order to recover letdown. From my personal observations, it felt that the CRS did not maintain strong control of the control room in the initial response. During letdown recovery, VCT low level alarm came in at 0131 and VCT level reached 12%. Shortly after, they restored letdown and were able to stabilize the plant.

In regards to 21 RCP seal return flow, it was stable throughout the shutdown at ~4.5gpm with no major fluctuations. Other than what was noted above, there were no major issues with equipment or operator performance while downpowering from 100%.

At this moment, operators are continuing plant cooldown. We will be following up with issues noted above and will provide you an update as we get more information. I am going to head offsite at this time but Andrew will be onsite sometime this morning to observe the licensee swap to RHR cooling at ~0800. If you have any questions, feel free to reach me on my cellphone at (b)(6) or by email.

Thanks,
Chris Safouri
Acting Resident Inspector
Indian Point Energy Center
RI/DRP/PB2
Tel: 914-739-9360

From:	Haagensen, Brian
To:	Fuller, Justin; Haagensen, Brian; Henrion, Mark; Highley, Christopher; McKown, Louis; Rossi, Matthew; Schroeder, Daniel; Setzer, Thomas; Siwy, Andrew; Safouri, Christopher
Subject:	21 RCP Outage Plans for this weekend
Date:	Friday, December 08, 2017 3:50:00 PM

The IP2 21 RCP seal replacement outage will commence at 0000 this evening. The weekend schedule is as follows:

- 12/8 power reduction (2000), reactor trip (0000) and plant stabilization – inspector Chris Safouri
- 12/9 shift to RHR and cooldown to mode 5 (at 0900) on Saturday – inspector Andrew Siwy
- 12/10 crud burst and RCP preparation work (scaffolds, rigging, containment surveys etc) – inspector Andrew Siwy (site presence should not be required)
- 12/11 depressurize RCS and drain down to 68 ft (above the top of the nozzles – maintain seal on S/G U-tubes). All three residents will be at IPEC on Monday

We are also aware of the snowstorm which is predicted to hit this area on Saturday, 12/9. Andrew and I will have all wheel drive cars and should be able to respond during the storm if needed. We are currently under a winter storm advisory and the expectation is for 3-5 inches (here is my impending adverse weather sample!).

Call me if you have any questions.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From: Haagensen, Brian
To: Siwy, Andrew
Subject: Re: Indian Point
Date: Thursday, December 07, 2017 6:38:29 PM

I am not too worried about the responses at the region. We just report the facts and let them decide what needs to be done.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Thursday, December 7, 2017 5:49 PM
To: Haagensen, Brian
Subject: Re: Indian Point

Considering it settled at 4.3, I didn't think it was worth getting everyone amped up

-------- Original Message --------
From: "Haagensen, Brian" <Brian.Haagensen@nrc.gov>
Date: Thu, December 07, 2017 8:36 AM -0500
To: "Siwy, Andrew" <Andrew.Siwy@nrc.gov>, "McKown, Louis" <Louis.McKown@nrc.gov>, "Schroeder, Daniel" <Daniel.Schroeder@nrc.gov>, "Fuller, Justin" <Justin.Fuller@nrc.gov>, "Setzer, Thomas" <Thomas.Setzer@nrc.gov>, "Guzman, Richard" <Richard.Guzman@nrc.gov>
CC: "Henrion, Mark" <Mark.Henrion@nrc.gov>, "Rossi, Matthew" <Matthew.Rossi@nrc.gov>, "Highley, Christopher" <Christopher.Highley@nrc.gov>, "Safouri, Christopher" <Christopher.Safouri@nrc.gov>
Subject: Re: Indian Point

21 RCP seal leakoff increased to 5.08 gpm last night. The sea leakoff was 5.02 gpm at 0400 this morning. The OCC has been staffed for the outage.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Thursday, December 7, 2017 6:50:11 AM
To: McKown, Louis; Schroeder, Daniel; Fuller, Justin; Haagensen, Brian; Setzer, Thomas; Guzman, Richard
Cc: Henrion, Mark; Rossi, Matthew; Highley, Christopher; Safouri, Christopher
Subject: Indian Point

Good morning!

Unit 2
100%, green, 0.05 gpm

- Planned 72-hour LCO, functional 3-month PRZ bistable channels 1-3, all day
- Planned 6-hour LCO, RCS low temperature trip bistables
- Planned 21 RCP outage scheduled to start 12/8/17. 21 RCP seal return flow reported as ~4.3 gpm as of 5am today.

Unit 3
100%, green , 0.02 gpm

- None

Residents at Region I seminar until Thursday afternoon. All available to respond.

From:	Haagensen, Brian
To:	Siwy, Andrew; Fuller, Justin; Guzman, Richard; Henrion, Mark; Highley, Christopher; McKown, Louis; Rossi, Matthew; Schroeder, Daniel; Setzer, Thomas; Elkhiamy, Sarah
Subject:	Re: IP update
Date:	Tuesday, November 07, 2017 5:25:37 PM

I am heading back tonight from CT and will be in office tomorrow morning for the startup.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Tuesday, November 7, 2017 4:25:10 PM
To: Fuller, Justin; Guzman, Richard; Haagensen, Brian; Henrion, Mark; Highley, Christopher; McKown, Louis; Rossi, Matthew; Schroeder, Daniel; Setzer, Thomas; Elkhiamy, Sarah
Subject: RE: IP update

Updated information in blue

-

-

Next update expected: 8am Wednesday (email)

Unit 2:

- 21 RCP seal leakage – Leakage has been hovering around 4 gpm +/- all day. AOP/SOP will drive OPS to 8 hour shutdown at 5gpm and a trip of the pump at 6 gpm. They are working on changing their procedures to allow up to 8gpm, which Westinghouse has set as their limit for seal leakage. They made a containment entry this afternoon to install flow meters on the lines so that they could confirm/refute the control room indication. The results confirmed that the CR indication is accurate. Entergy plans to make a decision Wednesday morning as to if/(when) they will take the unit down to replace/repair the seal. The outage could take approximately 8 days and there has been talk that it could start as soon as this weekend. As always, schedules and preliminary information as always subject to change.

Critical path (loss of exciter field forced outage):

- They have identified 48 potential causes to the unit 3 trip on Friday. Currently, 37 have been eliminated, 11 are still potential. The Failure Modes Analysis (FMA) is a work in progress. The only potential cause that they are not sure of how to refute is the previously identified (previous to trip) failure of the T1 transformer (FMA item 15). They have a strong feeling that they will be able to refute the rest of the potential causes by the end of day shift (6pm). If that is their only remaining potential cause, they will likely assume it is the cause by process of elimination.
- The Post Trip Review is pending the determination of a cause. The residents have previewed the PTR. Considering it is preliminary, a determination cannot be made.
- OSCR convened at 11am this morning and the resident inspector attended. They have conditionally approved the startup, pending additional review of any CRs between that time and a second OSCR (time to be determined). Fleet challenge TBD (likely afternoon or evening today).

- They currently have **startup (close reactor trip breakers) scheduled for 9am Wednesday**. As always, startup schedules are **subject to change**.

Other items of interest:

- ~~Turbine overspeed – The licensee received a report from GE stating that they don't need to take any actions. The overspeed (2195 RPM) was within design limits.~~ **~~This item to be removed from the interest list.~~**
- ~~Letdown isolation – Although letdown isolation came in early, the pressurizer level was within the TS required band.~~ **~~This item to be removed from the interest list.~~**
- ~~CO_2 discharge – The CO_2 system discharged in the vicinity of the MBFPs due to elevated temperatures in the area when relief valve CD-99-1 lifted following a unit trip, the discharge was not due to fire. The MBFP suction relief is not a tech spec component, nor does its function support the function of any safety related SSC. The discharge of CO_2 resulted in a reduction in level of the south CO_2 tank however it remained above the 60% minimum level required for CO_2 tank functionality. Atmospheric sampling on the 5 and 15 foot elevations shortly after the discharge showed the local atmosphere was not oxygen deficient and the area was accessible. Following the discharge, the CO_2 lines were depressurized allowing the CO_2 system to be reset and restored. As left CO_2 tank parameters were approximately 75% level and 300 psi.~~ **~~The residents will follow up with additional questions as provided by DRS, however, the residents do not have any concerns related to this issue which would prevent the licensee from startup.~~**
- ~~Event report – The licensee stated that they will be submitting a revised event report indicating the cause of the turbine trip, which was not 33 SG low level as initially reported.~~ **~~This item to be removed from the interest list.~~**
- Radiation monitor 14 – Although it was reported in the Event Report as having spiked twice during the event, this RM (condenser air ejector) has a history of issues (power supply) and no other RMs exhibited behavior of increased radioactivity during the event. This rad monitor is a backup to RM-27, which did not exhibit any spikes during (after) the event. **This item to be removed from the interest list, pending further questions from the branch.**

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From: Haagensen, Brian
To: McKown, Louis
Subject: RE: IP2 21 RCP Seal Problems
Date: Thursday, November 02, 2017 1:51:00 PM

Lou,

Charging flow to the seal has not changed measurably. They are going to try to measure the combined seal outlet flow (from all 4 seals) to see if it is showing any variations.

They don't have a good way to measure inter-stage D/Ps as this is a Westinghouse unit – old RCP seal packs. They can only measure total D/P across all the seals. Unfortunately, the seal D/P gages are all over ranged for all 4 RCPS – currently reading > 400 psig.

Although the 21 CHP is varying in flow rate, it does not appear this this is the cause. The flow oscillations are not in phase.

What is really bad is that IP2 does not have any alarm for a high condition on the seal outlet flow rate. They have an alarm for low flow but not high flow – which is what we are concerned about. If they do not see the condition on the meter, they will never know it occurred. The display only stores 24 hours of D/P data then the zip disk is over-written.

Brian

From: McKown, Louis
Sent: Thursday, November 02, 2017 9:21 AM
To: Rossi, Matthew <Matthew.Rossi@nrc.gov>
Cc: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: RE: IP2 21 RCP Seal Problems

Good Day,

Just some fun questions if you haven't already asked them.

Has the charging flow to the seal changed? If operators are seeing the standard 8-12 gpm to the seal without noticeable change, then the condition is internal to the seal.

What are the seal stage dp's? Any change in seal return flow should result in some change to stage dp.

If there is a problem with the charging pump, why aren't all four pump motors impacted?

Having in a former life squeezed as much efficiency out of positive displacement pumps as possible, I know that check valve leakage cannot result in improved volumetric displacement. If it did I would have taken advantage of it.

If you have any further questions, comments, or concerns please do not hesitate to contact me at the information provided below.

Very Respectfully,

Lou McKown,
Resident Inspector,
Millstone Power Station
Division of Reactor Projects, Branch 2
Nuclear Regulatory Commission, Region I
860-447-3170/3179 (Desk)
Louis.McKown@NRC.gov

From: Schroeder, Daniel
Sent: Thursday, November 02, 2017 8:41 AM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>; Fuller, Justin <Justin.Fuller@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>
Subject: RE: IP2 21 RCP Seal Problems

Brian,

Thanks. Let's see what happens when they get the charging flow steadied out. Need to inspect if they plan to use control-a-tron for shutdown and scram criteria.

Dan

From: Haagensen, Brian
Sent: Thursday, November 02, 2017 8:31 AM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>
Subject: IP2 21 RCP Seal Problems
Importance: High

Indian Point Unit 2 experienced a seal flow transient on the 21 RCP seal last night. Normal seal flow is around 2.5 gpm. Last night, the 21 RCP seal outlet flow slowly trended up to 3.9 gpm then jumped to 4.9 gpm for ~20 minutes. If it had reached 5 gpm, the ARP requires a reactor shutdown. If it had reached 6 gpm, they manually trip the RCP and take a Rx trip.

The seal flow is now back down to ~3.7 gpm. They are in the process of installing an ultrasonic flow monitor (control-a-tron) on seal return line to verify that it is not an instrument error. However, the nature of the fluctuations is such that it appears to be real. The 21 CHP is oscillating by ~12 gpm in flow output but the oscillations do not appear to in phase.

They have contacted Westinghouse and Engineering is preparing an ODMI. A preliminary analysis by Westinghouse indicates that they can expect the seal to last for 3 more months which does not get them to the outage in March. The 21 RCP seal was scheduled to be replaced during the upcoming refueling outage so it is close to its expected end of life.

They are presently running 0.1 micron seal inlet filters so they can still go to smaller filter mesh sizes. But their experience in the past has shown that 0.05 micron seals plug quickly and the transient induced by shifting seals only degrades the seals more rapidly.

More to follow as information becomes available.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Setzer, Thomas
Cc:	Rich, Sarah; Siwy, Andrew
Subject:	IP3 in AL3 for UIL increase
Date:	Sunday, May 28, 2017 1:46:38 PM
Attachments:	CR Log Entry on UIL 2017 01 01 45.pdf CR Log Entry on UIL 2017 11 46 45.pdf UIL Trend Graph.docx

The 3 pages of attachments have been withheld in their entirety under FOIA exemption 4.

Tom,

It appears that IP3 may have a leak inside containment. The total RCS leak rate has steadily increased from 0.09 gpm to 0.18 gpm over the past week since startup. RCS UIL has increased from 0.01 to 0.10 gpm in the same time period. They are now officially in AL 3 and are taking the required actions.

- Chemistry samples show a slight increase in particulate activity
- They are performing a containment entry to try to identify the source of the leak
- I have attached several files which contain control room log entries and the PEO log trends.
- Informing management
- CR drafted

As you may recall, IP3 experienced a leak on the RPV inner o-ring shortly after startup. They shifted to the outer o-ring and the leakage returned to normal values. In addition, the leak detector thermocouples did not show continued leakage after shifting to the outer o-ring.

We will continue to monitor the trends conditions over the weekend. The leakage is still far away from tech spec limits (1.0 gpm UIL) but the trends have me concerned. This is a problem for next week unless the trends degrade further or unless the containment entry team finds pressure boundary leakage.

Call if you have any questions.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From:	Schroeder, Daniel
To:	Haagensen, Brian; Henrion, Mark; Rossi, Matthew; Setzer, Thomas; Siwy, Andrew; Safouri, Christopher
Subject:	Re: IPEC Status 12/8
Date:	Friday, December 08, 2017 8:54:10 AM

Overtime on Saturday at IP is approved. Please keep me up to date on the outage over the weekend.

Dan

From: Haagensen, Brian
Sent: Friday, December 8, 2017 8:12 AM
To: Henrion, Mark; Rossi, Matthew; Schroeder, Daniel; Setzer, Thomas; Siwy, Andrew; Safouri, Christopher
Subject: RE: IPEC Status 12/8

This morning, the 21 RCP seal leakoff is stable at ~4.5 gpm. The OCC is staffed. The outage will commence at midnight this evening.

We have found that excessive seal return leakoff from the 21 RCP seal caused another forced outage in January 2012. We will be looking into the cause of that excessive leakoff to determine if there are insights that can be gained.

Brian

From: Haagensen, Brian
Sent: Friday, December 08, 2017 7:38 AM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Subject: IPEC Status 12/8

Unit 2
100%
Green
UIL=0.05 gpm

No emergent work

Scheduled activities:

- RPS logic testing channel "A"
- 52/RTA reactor trip breaker 2 Year inspection and PM – 8 hour AOT
- Unit 2 forced (planned) outage commences at 0000 to replace the 21 RCP seal
- Downpower unit from 2000 to 0000

Unit 3
100%
Green
UIL=0.02 gpm

No emergent work

No significant scheduled activities – Friday/Saturday or Sunday

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Schroeder, Daniel; Henrion, Mark; Rossi, Matthew
Cc:	Siwy, Andrew; Safouri, Christopher
Subject:	Follow up Qs to this morning"s call
Date:	Monday, December 04, 2017 10:54:54 AM

1. The 21 RCP seal leakoff varied between 3.2 and 3.8 gpm over the weekend. There were no significant spikes, up or down, observed for this parameter.

2. At 0600 this morning, IP3 noted that the relay flags for the "Auto Volt Reg Trip" and the "Block KLF-1 Trip" were found to be dropped during a back panel walkdown (CR-IP3-2017-5607). There had been no recent anomalies noted in plant operation just prior to discovery.

   The current assessment is that these relay flags likely dropped during the exciter failure on November 3 and the flags were very difficult to observe. They were very dark and did not show much of a visual contrast. The relays had been reset following the trip but the flags had not been noted. They are continuing to investigate but it does not seem to be reflecting of a current condition. I checked the SOE log from the exciter trip and did not see the relay that corresponded to the flags had tripped. However, they did have a generator lockout relay (86BU) trip. This may have cleared the condition prior to the generator phase differential relay being tripped. It is not unusual for flags to drop during a transient without the associated relay tripping. The PTR noted that one point – Y0335D – "Unit online tie breaker OCB A1 Bkr" had tripped but could not identify the source of this event (i.e. what it meant). I also noted that numerous computer points had either been removed from scan or had bad quality tags associated with them. Entergy had noted this issue in another CR.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Schroeder, Daniel
To:	Greives, Jonathan
Subject:	FW: Notes on the Entergy Stakeholders Meeting 11/13
Date:	Monday, November 13, 2017 11:35:00 AM

FYI

From: Haagensen, Brian
Sent: Monday, November 13, 2017 11:23 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>
Cc: Weil, Jenny <Jenny.Weil@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Sheehan, Neil <Neil.Sheehan@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Guzman, Richard <Richard.Guzman@nrc.gov>
Subject: Notes on the Entergy Stakeholders Meeting 11/13

Entergy held their "quarterly" stakeholders meeting today at the Buchanan Town Hall from 0930 to 1030. There were approximately 35 local government officials in attendance.

Presentations:

Tony Vitale (TV) (SVP) gave a presentation on recent plant performance which included:

1. 22 MBFP trip on June 26th and subsequent outage to repair in September
2. U2 and U3 o-ring challenges
3. 21 RCP seal leakoff issues – may have a planned outage coming up
4. U3 main generator exciter trip
5. UAW contract negotiations – coming up next month

Mike Twomey (MT) (VP Corporate – External Affairs) gave a presentation on the following topics:

1. Update on the shutdown settlement agreement
    a. Final supplement EIS from NRC - expected in the next 60 days
    b. SER for License renewal from NRC – expected in the 1st quarter 2018
    c. NYISO deactivation notice process
        i. Filing deemed complete – notice today or tomorrow
        ii. NYISO will produce a grid reliability study within 90 days
        iii. They will likely identify a short term gap of 500-600 MWe with IPEC shutting down
        iv. They will look for the lowest cost, short term solution to filling this gap
        v. "*It is very unlikely that IPEC will operate beyond 2020 and 2021.*"
    d. New AEOF is open in Fishkill – showed photos
    e. Repairs to the discharge canal are completed (This was in response to NYS concerns over the oil leakage last year)
    f. NYS IPEC Closure Task Force
        i. NYS hired a consulting firm for this Task Force
        ii. Entergy is cooperating with the Task Force (as appropriate)
        iii. No decisions have been made regarding the division of the $15 M that Entergy will pay to fund decommissioning studies – not until next year
            1. Both Entergy and NYS have to agree on how these funds will

be divided

iv. Decommissioning planning – Entergy is several years away before announcing firm plans for decommissioning

Qs and As:

Q: Grid reliability was supposed to be a problem when IPEC shutdown – why does Entergy now think that the NYISO report will determine that reliability will not be a problem?
A: (MT) The NYISO study only looks at short term power solutions at the lowest cost. IPEC would require 2 years of 1000 MWe power for each unit. If the gap is only 500 MWe, then IPEC is unlikely to be judged as the low cost provider. It would be less expensive to repower a gas or other fossil fuel to provide only 500 MWe. In addition, the northeast has experiences drops in load demand with solar power coming on line. There are pending transmission upgrades in progress that could provide additional power and there are two gas plants being built in Dover and Orange county that could replace IPEC if NYS stops fighting the extension of the gas pipelines to these areas.

Q: (Bridget Frymire – NYS DPS) Are the replacement o-rings manufactured by the same vendor as the o-rings that failed?
A: (TV) Yes- but they are of a different design that includes more silver content. The silver is the malleable material that deforms to seal the flange surfaces.

Upcoming events at IPEC (TV):

- FoF drill on 11/28
- 2RFO23 in the spring of 2018
- FEMA-evaluated EP Exercise – fall 2018

My Assessment:

Overall, the tone of the room was much less confrontational than in the past. There were very few questions during the presentation and I received no questions at the end. I spoke to several of the local politicians and to Bridget Frymire. Everyone seems to be focused on the outcome of the decommissioning process and loss of tax revenues. They are no longer as concerned about safe, reliable operations as in the past.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Siwy, Andrew; Safouri, Christopher
Cc:	Schroeder, Daniel
Subject:	Fw: FW: 21 RCP Seal Replacement Schedule Challenge
Date:	Thursday, December 07, 2017 10:14:16 AM
Attachments:	21 RCP Seal PO FULL SCHEDULE start 12.08.17c.pdf

This 22-page attachment has been withheld in its entirety under FOIA exemption 4.

I am forwarding the preliminary outage plan for the 21 RCP seal. We will get together tomorrow at 0800 at IPRO and assign the inspection tasks.

Have a safe trip back toNew York.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Walpole, Robert W <rwalpol@entergy.com>
Sent: Wednesday, December 6, 2017 4:20:40 PM
To: Haagensen, Brian
Subject: [External_Sender] FW: 21 RCP Seal Replacement Schedule Challenge

Brian,

Here is the current schedule. We are still going through fleet challenges, looking at which ODMI and other issues we want to bring into this outage.

Bob Walpole

Indian Point Energy Center
Regulatory Assurance Manager

(914) 254-6710 (Work)
(b)(6) (Cell)

From: Lont, Steven
Sent: Wednesday, December 06, 2017 4:09 PM
To: Spagnuolo, Frank M; Gillian, Steven R; Gibbs, Jeffrey L; Stewart, Mark E; DeClemente, Vincent; Primrose, Eugene; Zeoli, Michael A.; Durr Jr, William M; Zandstra, Brian D.; Bouderau, Gregory; Lord, Fausto J; Elam, Terry W; Frink, Lloyd W; Mastronardi, Jeffrey; Bristol, Charles W; Petrillo, Bruce A; Irwin, Steven; Wittich, Walter; Andreozzi, Vincent Joseph; Scalone, Raymond J; Tompkins, Ronald; Andersen, Robert; Catano, John; Bashir, Iqbal M; Seaboldt, Jack; Melvin, John; john.w.melvin@aptim.com; De Donato, Anthony J; dl - IPEC Dept. Managers; Lizzo, Nicholas
Cc: Azznara, Rebecca S
Subject: RE: 21 RCP Seal Replacement Schedule Challenge

Please see attached for the updated schedule. Thanks.

Steven Lont
Lead Outage Scheduler – Unit 2
Entergy - Production Department
Indian Point Energy Center
W: 914-254-7151

-----Original Appointment-----
From: Spagnuolo, Frank M
Sent: Wednesday, December 06, 2017 2:45 PM
To: Spagnuolo, Frank M; Gillian, Steven R; Gibbs, Jeffrey L; Stewart, Mark E; DeClemente, Vincent; Primrose, Eugene; Zeoli, Michael A.; Durr Jr, William M; Zandstra, Brian D.; Bouderau, Gregory; Lord, Fausto J; Elam, Terry W; Frink, Lloyd W; Mastronardi, Jeffrey; Bristol, Charles W; Petrillo, Bruce A; Irwin, Steven; Wittich, Walter; Andreozzi, Vincent Joseph; Scalone, Raymond J; Tompkins, Ronald; Andersen, Robert; Catano, John; Bashir, Iqbal M; Lont, Steven; Seaboldt, Jack; Melvin, John; john.w.melvin@aptim.com; De Donato, Anthony J
Cc: Azznara, Rebecca S
Subject: 21 RCP Seal Replacement Schedule Challenge
When: Thursday, December 07, 2017 11:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).
Where: 53' Conference Room

Meeting to review planned outage schedule based on Friday shutdown

Please forward this invite if necessary

Schedule to follow under separate email

From:	Gray, Mel
To:	Gray, Harold
Cc:	Schoppy, Joseph; Welling, Blake; Yerokun, Jimi
Subject:	FW: Indian Point Unit 2 Update
Date:	Sunday, December 10, 2017 5:05:21 PM

Harold, an item to assist Monday. (You have inspected this in detail more than once. Any insights?)

From: Yerokun, Jimi
Sent: Saturday, December 09, 2017 7:36 PM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>
Cc: Screnci, Diane <Diane.Screnci@nrc.gov>; Sheehan, Neil <Neil.Sheehan@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Greives, Jonathan <Jonathan.Greives@nrc.gov>; Gray, Mel <Mel.Gray@nrc.gov>
Subject: Re: Indian Point Unit 2 Update

Thanks Dan. And the o-ring issues continue, not a good thing. We'll definitely be glad to assist with this.

-------- Original Message --------
From: "Schroeder, Daniel" <Daniel.Schroeder@nrc.gov>
Date: Sat, December 09, 2017 9:13 AM -0500
To: "Lorson, Raymond" <Raymond.Lorson@nrc.gov>, "Pelton, David" <David.Pelton@nrc.gov>, "Welling, Blake" <Blake.Welling@nrc.gov>, "Yerokun, Jimi" <Jimi.Yerokun@nrc.gov>
CC: "Screnci, Diane" <Diane.Screnci@nrc.gov>, "Sheehan, Neil" <Neil.Sheehan@nrc.gov>, "Greives, Jonathan" <Jonathan.Greives@nrc.gov>, "Tifft, Doug" <Doug.Tifft@nrc.gov>, "Safouri, Christopher" <Christopher.Safouri@nrc.gov>, "Siwy, Andrew" <Andrew.Siwy@nrc.gov>, "Haagensen, Brian" <Brian.Haagensen@nrc.gov>
Subject: Indian Point Unit 2 Update

Indian Point Unit 2 shut down at 0119 to start a forced outage to replace the 21 reactor coolant pump seal. An initial containment entry was made by the licensee, and boron accumulation was found on the RPV, indicating leakage past the outer o-ring. THis has been an issue in the past, and the licensee believed that the inner seal was leaking and the outer seal was holding. The licensee is evaluating the current situation. Unit 2 will have a refuel outage in the spring. The unidentified leak rate for Unit 2 has been low, consistently less than 0.1 gpm. The licensee is evaluating the situation. Outage to replace the seal requires draining water level below RPV flange, but removing the head to replace the o-rings would extend the outage.

An update will be provided once the licensee has made a decision, and DRS assistance is requested next week if the licensee decides to leave the current seals in place. Drain down to a level below the RPV flange is scheduled for Monday.

Dan

From:	Gray, Harold
To:	Kulp, Jeffrey; Mangan, Kevin
Subject:	FW: IP2 Outage Status PM 1630 12/11
Date:	Thursday, December 14, 2017 9:32:51 AM
Attachments:	71111.18 U2 RPV o-ring replacement under EC72951 on 1213.msg FW FW Oversized O-Ring Mod.msg External_Sender FW .msg

These same attachments are also attached to another copy of the 12/13/17 4:51 PM email, so they are not addressed herein.

Jeff, Kevin,

FYI,

H Gray

From: Haagensen, Brian
Sent: Wednesday, December 13, 2017 4:51 PM
To: Gray, Mel <Mel.Gray@nrc.gov>
Cc: Gray, Harold <Harold.Gray@nrc.gov>; Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

Mel,

You asked excellent questions in your previous email – so I just completed a mods sample on the replacement o-ring (attached) and have some concerns.

(b)(5)

(b)(5)

Please help! Thoughts?

Brian

From: Gray, Mel
Sent: Wednesday, December 13, 2017 10:31 AM
To: Gray, Harold <Harold.Gray@nrc.gov>
Cc: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: FW: IP2 Outage Status PM 1630 12/11

Do we know what process Entergy Is applying in installing a larger o-ring (inner and outer?) Is it considered a replacement in kind or a mod? This may dictate the ROP sample applied.

Do we have any questions on the appropriateness of the replacement or process used?

Anyone have safety concerns? (I am not in office this week and may have missed in office discussions on this)

From: Pelton, David
Sent: Tuesday, December 12, 2017 7:35 AM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>; Yerokun, Jimi <Jimi.Yerokun@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

…thanks all.

dave p.

From: Haagensen, Brian
Sent: Tuesday, December 12, 2017 7:25 AM
To: Yerokun, Jimi <Jimi.Yerokun@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Gray,

Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

The schedule continues to change. As of this morning, criticality is again officially scheduled for 12/21. I am certain this will change again.

From: Yerokun, Jimi
Sent: Tuesday, December 12, 2017 7:23 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

Thanks Dan. I'll pass any questions I have to Harold Gray.

Jimi T. Yerokun
610 337-5128/(b)(6) ***(c)***

From: Schroeder, Daniel
Sent: Tuesday, December 12, 2017 6:21 AM
To: Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>; Yerokun, Jimi <Jimi.Yerokun@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: FW: IP2 Outage Status PM 1630 12/11

The decision to replace the RPV o-ring seals has been finalized. The new seals are slightly thicker than the old seals. Revised start-up date pushes back three days to December 23rd.

Dan

From: Haagensen, Brian
Sent: Monday, December 11, 2017 4:52 PM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown,

Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Cc: Guzman, Richard <Richard.Guzman@nrc.gov>; Weil, Jenny <Jenny.Weil@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Sheehan, Neil <Neil.Sheehan@nrc.gov>
Subject: IP2 Outage Status PM 1630 12/11

IP2 has decided NOT to laser scan or depth mic/measure the RPV flange surface defects during this outage (option #2 in the critical decision paper).

Instead, they intend to:

- Drain down the RCS to 68 ft (below the flange but above the S/G tube sheet)
- remove the RPV head,
- clean the flange sealing surfaces,
- replace the leaking o-rings with new, oversized o-rings,
- replace the 21 RCP seals,
- reset the head, refill the RCS and
- proceed to plant restart

The RCS drain down has been delayed until tomorrow on day shift. They plan to remove the equipment access hatch this evening.

Plant conditions are essentially what they were this morning.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Gray, Harold
To:	Kulp, Jeffrey
Subject:	FW: IP3 Reactor Vessel Head O-Ring Update Sunday, September 20, 2015 as of 1400
Date:	Monday, December 11, 2017 2:57:01 PM

From: Gray, Mel
Sent: Monday, September 21, 2015 2:28 PM
To: Scott, Michael <Michael.Scott@nrc.gov>
Cc: Gray, Harold <Harold.Gray@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Suber, Gregory <Gregory.Suber@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Subject: FW: IP3 Reactor Vessel Head O-Ring Update Sunday, September 20, 2015 as of 1400

Thanks Jeff. That was my recollection from our conversation Sunday that they at "dressed' the area.

From: Kulp, Jeffrey
Sent: Monday, September 21, 2015 2:25 PM
To: Gray, Mel <Mel.Gray@nrc.gov>
Subject: RE: IP3 Reactor Vessel Head O-Ring Update Sunday, September 20, 2015 as of 1400

No. It was minor and did not meet the requirements to perform a repair. Westinghouse agreed. The pitting did not extent across the seating surface was the evaluation I was told. This should be addressed in the Critical Decision Document when we receive it.

Jeff

From: Gray, Mel
Sent: Monday, September 21, 2015 9:46 AM
To: Kulp, Jeffrey
Subject: Fw: IP3 Reactor Vessel Head O-Ring Update Sunday, September 20, 2015 as of 1400

Mel Gray
Sent from NRC Blackberry

From: Scott, Michael
Sent: Monday, September 21, 2015 08:32 AM
To: Gray, Mel
Cc: Lorson, Raymond; Suber, Gregory; Colaccino, Joseph
Subject: RE: IP3 Reactor Vessel Head O-Ring Update Sunday, September 20, 2015 as of 1400

Mel:

Did they repair the pitting in the inner seal seating surface?

Thx

Mike

From: Gray, Mel
Sent: Monday, September 21, 2015 8:10 AM
To: Krohn, Paul <Paul.Krohn@nrc.gov>
Cc: Scott, Michael <Michael.Scott@nrc.gov>
Subject: Fw: IP3 Reactor Vessel Head O-Ring Update Sunday, September 20, 2015 as of 1400

Mel Gray
Sent from NRC Blackberry

From: Kulp, Jeffrey
Sent: Sunday, September 20, 2015 02:49 PM
To: Gray, Mel
Cc: Newman, Garrett; Rich, Sarah; Burritt, Arthur; Lorson, Raymond; Gray, Harold; Suber, Gregory
Subject: IP3 Reactor Vessel Head O-Ring Update Sunday, September 20, 2015 as of 1400

- The decision process for repairs is in progress. Based upon my observations and discussions with the licensee, I do not expect to see any required significant repairs.
- Updates since last night.
  - VT1 inspection on Reactor Vessel Head Closure Studs 5 and 6 (correction to previous report where I said 6 and 7) was completed satisfactorily last night (verbal). These were the two studs with the most significant boron deposits. The VT1 Report is being drafted and should be ready for review on Monday 5/21. All removed studs (20) are being cleaned. There 54 total studs.
  - Inner O-ring inspection
    - Found deformation indicating a possible shift in o-ring location during reassembly following last refueling outage. The damage was in the vicinity of studs 7, 8, 9. This coincides with observed boron deposits on the reactor vessel.
    - Found deformation caused by o-ring clip damage in the vicinity of stud 50, which also coincides with observed boron deposits on the reactor vessel.
  - Outer O-ring inspection
    - {verbal report} There was a verbal report of a radial split in the outer o-ring. This would provide a path from the inner ring leakoff area to containment atmosphere.
    - There are deposits of magnetite (corrosion product) on the reactor vessel flange o-ring sealing surfaces and the outer o-ring, extending the full circumference of the o-ring. A sample of the deposit has been taken for analysis.
  - RV-Flange: inspection complete, no damage noted.
  - RV Head Flange, minor pitting in the inner o-ring seating surface in the vicinity of stud 45, no indication of leakage due to this minor pitting.
  - O-ring seal leakoff lines have been shown to be unblocked by passing water through the lines.

- Additional Corrective Actions
  - Change to O-ring installation procedure (3-REF-002-GEN Section 2.10) based upon input from o-ring manufacturer.
    - More personnel to hold o-ring into position while tightening o-ring clips.
    - Use of star pattern vice alternating circular (180 degrees out, North first, then south, then rotate one clip clockwise) pattern to tighten the clip screws.
    - Use of a feeler gage to ensure that o-ring is centered in groove.
- Schedule
  - If decision is that no repairs required, O-ring installation is scheduled for 1600-1900, installation of RV Head onto RV flange from 1900-2200. Installation of studs/washers/nuts should be complete around noon on Monday.

My intention is to leave site and return Monday morning to review the Critical Decision Paper and the completed VT1 inspections on the studs. I will then head to HC for the CDBI.

Jeff

From:	Gray, Harold
To:	Kulp, Jeffrey
Subject:	FW: IPEC U3 O-Ring Leak Overview Drawing
Date:	Monday, December 11, 2017 3:00:53 PM
Attachments:	U3 RVF O-Ring Leakage Indicatio.pdf

The 1-page attachment has been withheld in its entirety under FOIA exemption 4.

From: Pinson, Brandon
Sent: Wednesday, September 09, 2015 10:35 AM
To: Floyd, Niklas <Niklas.Floyd@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>
Cc: Setzer, Thomas <Thomas.Setzer@nrc.gov>; Schussler, Jason <Jason.Schussler@nrc.gov>; Rich, Sarah <Sarah.Rich@nrc.gov>; Newman, Garrett <Garrett.Newman@nrc.gov>
Subject: FW: IPEC U3 O-Ring Leak Overview Drawing

See the attached sketch of where the boron deposits were identified on the flange. Originally they had reported 2 areas of boron deposit, however the drawing shows 3. Engineering indicated that they were initially combining the 2 bottom areas as one. The deposits are to scale so with a RV flange diameter of approximately 15' it looks like the deposits are about 4-5' in length each.

Brandon

From: Lawrence, Benjamin [mailto:blawre2@entergy.com]
Sent: Tuesday, September 08, 2015 3:55 PM
To: Pinson, Brandon <Brandon.Pinson@nrc.gov>; Rich, Sarah <SRich@entergy.com>
Cc: Chan, Tat <TChan@entergy.com>; Wittich, Walter <wwittic@entergy.com>
Subject: [External_Sender] IPEC U3 O-Ring Leak Overview Drawing

Brandon/Sarah,

Attached is the requested diagram depicting where the boric acid accumulation is on the U3 Reactor Vessel Lower Flange. We have no way to tell where along the flange the leak is (until disassembly), but the points of boric acid collection are indicated.

If you have any further questions, we are happy to help.

Thanks,
Benjamin Lawrence
NSSS Engineering, IPEC
(914) 254-7108

From:	Schroeder, Daniel
To:	Pelton, David; Lorson, Raymond
Subject:	FW: Unit 3 susceptibility to flange leakage and detection of the problem
Date:	Wednesday, December 20, 2017 7:57:00 AM

The licensee has the question regarding extent of condition regarding o ring seal leakage and boron wastage of the studs on Unit 3. Brian has received a partial answer from the licensee as stated below. They know that this issue should be addressed in their Corrective Action Process.

From: Haagensen, Brian
Sent: Wednesday, December 20, 2017 7:38 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>
Subject: RE: Unit 3 susceptibility to flange leakage and detection of the problem

I received an email last night from Engineering that essentially restated all of the methods and mechanisms that they have available to detect UIL. They restated my original question and addressed the fact that they had no indications of a leak at present. I responded by asking the original question – what is different between Unit 2 and Unit 3? I expect that they will be revising their answer based on my next round of clarifying questions.

I think the best answer at this point is that Unit 3 proved that it could detect a small leak from the RPV flange last June. The real question is why did they not detect the leak on Unit 2? I have asked them (again) to address the differences between the units. They had addressed this question verbally by stating that the leak measurement systems in Unit 3 are “more sensitive” than Unit 2.

Indian Point Unit 3 flange leakage – Tracking Questions

1. Has a leak rate been determined or estimated? If not, what is preventing this estimation? Is the Unit 3 unidentified leakage rate as low as expected following the outage?

   It should be noted that the leakage from the Reactor Vessel Flange Leakoff system is considered an "identified leakage" and not "unidentified". The preferential and design flow path for leakage past the inner and outer O-ring is into the RCDT which is a closed system and quantifiable. Therefore any leakage is considered "identified". In the unlikely event of outer O-ring any leakage past the metal to metal seal of the Rx head, the leakage would not enter into the RCDT and manifest itself in "un-identified" leakage.

   Since the Unit 3 refueling outage, RCS leak rates for identified and un-identified leakage have been as expected, consistent with online operation, both post outage and during the fuel cycle. Currently, the variation for in-leakage to the RCDT is around 0.01 gpm.

   The RCS leakage rates, both unidentified and identified, are sufficiently low in value such that any slight variation in input parameters (Lpzr, VCT, RCS temp) can significantly alter their calculated value. Therefore, drawing conclusions from trends may not be reliable. For example, comparing a .02 gpm unidentified leak rate on day 1 to a .04 gpm unidentified leak rate on day 2 should not lead to a conclusion that leakage has doubled over that time, nor should it be concluded that it will continue to trend it that way.

   The attached plot shows the trend of the RCDT in-leakage. This plot shows that the rate of influx in June and July are similar.

   As for R-11 and R-12, as can be seen from the attached trends, there has been a slight uptake since 7/19/2015 but no corresponding increase in "un-identified" leakage.

   Based on the above information, no definitive leak rate has been determined.

2. What components are exposed or vulnerable to boric acid wastage from the flange leak? What is the expected wastage rate for these components?

   The reactor vessel flange and closure head in contact with boric acid solution are clad with stainless steel. The preferential pathway for leakage is to the Reactor Coolant Drain Tank (RCDT). However, if leakage is beyond the outer O-ring into the VC atmosphere, the reactor vessel studs could be impacted. Although the studs have plasma bonding, they are still susceptible to boric acid corrosion. The rate of boric acid corrosion is dependent on its concentration and the temperature.

3. What are the containment entry and visual inspection plans and schedule? How will inspections be done and what interference is anticipated? Will inspections be documented?

   Currently, the ODMI specifies weekly VC visual inspections, from the 95' down into the cavity in the area around the flange, which will be documented as part of the special log. Any abnormal indication would be documented in a condition report. Based on containment entry on 07/22/2015, no visible indicators of leakage, and or any signs of dried boron, steam, or water have been seen in the cavity around the vessel.

4. Are containment parameters being tracked or trended, including R-11, R-12 trends, containment temperature and humidity, boric acid particulate, sump level and pump down rate? How is fan coil unit condensate level measured and trended?

   We are tracking the vessel flange leakoff temperature, RCDT level, R11, R12, VC humidity (5 points), RCDT temperature, RCS leak rate, RDCT in-leakage rate, and the VC by visual inspection. The VC inspection is weekly, the RCS leak rate is every 12 hours, and everything else is on 4-hour frequency. FCU condensate level will not be trended since it is a function of vapor containment humidity and the sensitivity is 0.5 GPM for alarm. Additionally, RP is taking weekly VC atmosphere samples to detect activity and to measure gross boron concentration.

   Parameters associated with R-11, R-12, containment humidity are documented in the special log. Containment temperature will not be trended since it is a variable itself and does not lend valuable information (however, this, along with all containment parameters including sump levels and VC pressure, is monitored in the control room and tracked via the normal operator equipment logs). As for boric acid particulate, containment atmosphere will be sampled for presence and trend of boron.

5. Is reactor coolant drain tank pressure of concern as a mask to flange leakage?

   RCDT pressure is a measured parameter that reads on the Waste Disposal Panel next to the level. This specific item isn't being tracked via the special log because it is connected to the Vent Header – it reads Vent Header pressure essentially and is variable with several factors. In lieu of pressure, RCDT temperature is being tracked by the special log.

6. What will be the decision process for trends and changes beyond the ODMI?

   These trends are being monitored and any abnormal indication will be communicated with the site leadership team immediately. This will also happen if any of the trigger point in the ODMI is exceeded.

7. Are there dimensional drawings showing the seal and seal rings and orientation to the vessel bolts?

   The vessel closure head drawing is 234-047 which shows the relative location of the O-ring and studs.

8. Why are the ODMI limits set high relative to the normal RCS leak rate determinations? What is the basis for the ODMI limits?

   The ODMI limits were established based on review of industrial operating experience. Browns Ferry operated a full cycle with double O-ring leakage, without recognition, and a final leakage rate of 1.2 gpm. Additionally, from Westinghouse, Robinson operated with both O-rings leaking for about 5 – 6 months, while Salem operated with both O-rings leaking for about 2 months. The first IP3 ODMI trigger is 0.1 GPM which is well below any required action thresholds and well below the actual measured leakage seen at Browns Ferry. Additionally, any sudden change in RCS leak rate would be detectable by the operator under the normal RCS inventory monitoring. 0-SOP-LEAKRATE-001 provides specific guidance on determining leakage given the current plant condition. Since this leakage is considered “identified leakage”, the ODMI thresholds bound the tech spec operating requirements, the limit for which is 10 gpm. Additional leakage from a different unidentified source would drive the operating team to AOP-LEAK-1, and the 1 gpm limitation would be imposed.

From:	Haagensen, Brian
To:	Schroeder, Daniel; Setzer, Thomas; Henrion, Mark; Rossi, Matthew
Cc:	Modes, Michael; Siwy, Andrew; Safouri, Christopher
Subject:	IPEC Outage Status at 1500 12/18
Date:	Monday, December 18, 2017 4:31:24 PM

The RHR line that is leaking (A-98) will **not have leak injection**. Instead, IP2 intends to install a clamp that will stabilize the line – i.e. will hold the line to prevent it from blowing out. They intend to peen over the leaking weld area (shades of the CH-442?) until they stop the leak. Then, they will weld overlay that area for a permanent repair. **There will be no leak injection performed**.

The degraded stud evaluation was received from Westinghouse today but they do not yet have the final NDE report on the extent of stud damage. They will have to wait until backshift this evening to get the report because the ASME level III does not return to the site until backshift (fatigue rule). Once the NDE report is finalized and accepted, they will compare the extent of damage in the report to the Westinghouse criteria and (hopefully) accept the studs as is.

Mode 4 will be (at the earliest) tomorrow ~~morning~~ afternoon. Then, they will refill and pressurize the RCS. They still to conduct the PMT on the 21 RCP to ensure it is balanced before moving forward toward restarting the plant.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

Siwy, Andrew

From: Haagensen, Brian
Sent: Friday, November 10, 2017 11:18 AM
To: Siwy, Andrew
Subject: Re: IP update

Rich Alexander told me that they have been instructed that they can abort the shutdown at any time that seal leakoff goes below the limit. So it would have to stay above the limit for 8 hours before they would actually shutdown.

I am not sure what happens if leakoff momentarily spikes below the limit during a shutdown and immediately returns above the limit - but I would assume that they would use good judgment and a little divine guidance from Westinghouse.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Friday, November 10, 2017 9:14 AM
To: Haagensen, Brian
Subject: RE: IP update

If they did spike into the shutdown region and started shutting down, wouldn't they be able to abort the shutdown once the spike receded?

-------- Original Message --------
From: "Haagensen, Brian" <Brian.Haagensen@nrc.gov>
Date: Thu, November 09, 2017 8:50 AM -0500
To: "Schroeder, Daniel" <Daniel.Schroeder@nrc.gov>, "Siwy, Andrew" <Andrew.Siwy@nrc.gov>, "Fuller, Justin" <Justin.Fuller@nrc.gov>, "Guzman, Richard" <Richard.Guzman@nrc.gov>, "Henrion, Mark" <Mark.Henrion@nrc.gov>, "Highley, Christopher" <Christopher.Highley@nrc.gov>, "McKown, Louis" <Louis.McKown@nrc.gov>, "Rossi, Matthew" <Matthew.Rossi@nrc.gov>, "Setzer, Thomas" <Thomas.Setzer@nrc.gov>, "Elkhiamy, Sarah" <Sarah.Elkhiamy@nrc.gov>
Subject: RE: IP update

You probably already know all this but here is my assessment of the condition with the 21 RCP at IP2.

Each RCP has 3 seals. Each seal is designed to function if one or more seals fail. Seal return flow is typically 1-2 gpm. The 21 RCP seal return flow is now reading (on average) 3.7 gpm. At 5 gpm, the operators have administrative guidance (2-AOP-RCP) to commence a plant shutdown within 8 hours. If seal return leakoff exceeds 6 gpm, the operators have procedural direction to trip the Rx and the RCP. These admin limits have been expanded to 6 gpm and 8 gpm respectively by Westinghouse. They have installed control-a-tron flow

instruments on the seal return line to verify that the control room installed instrumentation is reading accurately (which it is).

RCP seal return leakoff is into the VCT and is explicitly not considered in the calculation of either identified or unidentified leakage per TS 1.1 LEAKAGE definition. As a result, the only limit on seal return leakoff is what Westinghouse specifies for proper seal functioning. RCP seal leakoff is returned directly to the VCT through the seal water Hx. The concern is that when seal return leakoff gets too high, the sealing function may fail and there may be excessive leakage into containment.

The #3 seal is designed to leak at 100 cc/hr directly into containment through the standpipe, which maintains a small amount of backpressure on the #3 seal. Leakage through the #3 seal is considered as part of the unidentified leakage calculation with a TS limit of 1 gpm. If the #1, #2 and #3 seals all fail, then the water will be expelled through the #3 seal standpipe and a seal LOCA would occur.

As a result, the safety significance of a failed seal is the potential for an unisolable LOCA into containment. But Westinghouse has extensive experience responding to this condition and has been relatively successful in treating the symptoms to extend the life of the seals for a few months beyond what the trend line average projects. Currently, the trend line for average seal leakoff shows the 21 RCP exceeding 5 gpm around 12/24 and exceeding 6 gpm around 2/1/2017. However, the random variations on the seal leakoff are sufficiently high that these admin limits would likely be exceeded significantly prior to the average trend line projections. For example, the average seal leakoff has been 3.7 gpm but this value spiked to 4.9 gpm (for 20 minutes) a few days ago. If a 1 gpm spike were to be imposed on the trend line average, then the 6 gpm shutdown limit could be reached when the average reaches only 5 gpm, requiring an 8-hour reactor shutdown. This condition is projected to occur on **~12/24/2017**. It is little misleading to focus on just the average seal return leakoff value with the significant variations that we presently observe.

We will continue to monitor and trend the data. IPEC will plan for and may elect to execute an outage to replace the seals on the 21 RCP prior to the refueling outage.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(b)(6) (Office)
(Cell)

From: Schroeder, Daniel
Sent: Thursday, November 09, 2017 6:43 AM
To: Siwy, Andrew <Andrew.Siwy@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Fuller, Justin <Justin.Fuller@nrc.gov>; Guzman, Richard <Richard.Guzman@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Elkhiamy, Sarah <Sarah.Elkhiamy@nrc.gov>
Subject: RE: IP update

This procedure change would be a good item to inspect to ensure that they are complying with TSs and their design criteria.

Dan

From: Siwy, Andrew
Sent: Wednesday, November 08, 2017 9:59 PM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>; Fuller, Justin <Justin.Fuller@nrc.gov>; Guzman, Richard

<Richard.Guzman@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Elkhiamy, Sarah <Sarah.Elkhiamy@nrc.gov>
Subject: RE: IP update

Sorry for the extra email, almost forgot…

They decided to raise their procedure limit for RCP seal leakage to 8 gpm and monitor while planning for a forced outage. Of course, they hope to last until the refueling outage. But no plans in the foreseeable future to have a Unit 2 outage.

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From: Siwy, Andrew
Sent: Wednesday, November 08, 2017 9:51 PM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>; Fuller, Justin <Justin.Fuller@nrc.gov>; Guzman, Richard <Richard.Guzman@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Elkhiamy, Sarah <Sarah.Elkhiamy@nrc.gov>
Subject: RE: IP update

Updated information in blue

Reactor critical: 20:53 11/8/17
Sync: 0600-0700 (estimate)
Raise to 20%: 0700 (estimate)

Next update expected: 7:30am Thursday (branch call)

Unit 2:

- 21 RCP seal leakage – Leakage has been hovering around 4 gpm +/-. AOP/SOP will drive OPS to 8 hour shutdown at 5gpm and a trip of the pump at 6 gpm. They are working on changing their procedures to allow up to 8gpm, which Westinghouse has set as their limit for seal leakage. They expect this to be complete Wednesday 11/8. They made a containment entry Tuesday afternoon to install flow meters on the lines so that they could confirm/refute the control room indication. The results confirmed that the CR indication is accurate. Entergy plans to make a decision ???Thursday??? as to if/(when) they will take the unit down to replace/repair the seal. The outage could take approximately 10 days and there has been talk that it could start as soon as this weekend. There has been additional talk that raising the limit to 8 gpm may get them to the end of the year or beginning of next year. As always, schedules and preliminary information as always subject to change.

Critical path (loss of exciter field forced outage):

- They have identified 48 potential causes to the unit 3 trip on Friday. Currently, 47 have been eliminated, 1 potential. The only potential cause that they are not sure of how to refute is the previously identified (previous to trip) failure of the T1 transformer (FMA item 14). If that is their only remaining potential cause, they will likely assume it is the cause by process of elimination.
- The Post Trip Review is pending the determination of a cause. The residents have previewed the PTR. Considering it is preliminary, a determination cannot be made.
- OSCR convened at 11am Tuesday and the resident inspector attended. They have conditionally approved the startup, pending additional review of any CRs between that time and a second OSCR (time to be determined). Fleet challenge 7:15am Wednesday.
- Critical Decision Paper– by Thursday

- ODMI revision– by Thursday
- Fleet challenge call – by Thursday

Other items of interest:

- ~~Turbine overspeed – The licensee received a report from GE stating that they don't need to take any actions. The overspeed (2195 RPM) was within design limits.~~ **~~This item to be removed from the interest list.~~**
- ~~Letdown isolation – Although letdown isolation came in early, the pressurizer level was within the TS required band.~~ **~~This item to be removed from the interest list.~~**
- ~~CO_2 discharge – The CO_2 system discharged in the vicinity of the MBFPs due to elevated temperatures in the area when relief valve CD-99-1 lifted following a unit trip, the discharge was not due to fire. The MBFP suction relief is not a tech spec component, nor does its function support the function of any safety related SSC. The discharge of CO_2 resulted in a reduction in level of the south CO_2 tank however it remained above the 60% minimum level required for CO_2 tank functionality. Atmospheric sampling on the 5 and 15 foot elevations shortly after the discharge showed the local atmosphere was not oxygen deficient and the area was accessible. Following the discharge, the CO_2 lines were depressurized allowing the CO_2 system to be reset and restored. As left CO_2 tank parameters were approximately 75% level and 300 psi.~~ **~~The residents will follow up with additional questions as provided by DRS, however, the residents do not have any concerns related to this issue which would prevent the licensee from startup.~~**
- ~~Event report – The licensee stated that they will be submitting a revised event report indicating the cause of the turbine trip, which was not 33 SG low level as initially reported.~~ **~~This item to be removed from the interest list.~~**
- ~~Radiation monitor 14 – Although it was reported in the Event Report as having spiked twice during the event, this RM (condenser air ejector) has a history of issues (power supply) and no other RMs exhibited behavior of increased radioactivity during the event. This rad monitor is a backup to RM-27, which did not exhibit any spikes during (after) the event. Licensee has written two CRs to address this issue. Additional information provided by licensee and reviewed by residents.~~ **~~This item to be removed from the interest list.~~**

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

Siwy, Andrew

From: Haagensen, Brian <bhaag90@entergy.com>
Sent: Wednesday, November 08, 2017 9:54 AM
To: Siwy, Andrew
Subject: [External_Sender] FW: 21 RCP No. 1 Seal Return Flow Projections
Attachments: IP2 RCP Seal Return Trend with Projections.pdf; ATT00001.htm

The 1-page attachment has been withheld in its entirety under FOIA exemption 4.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9360 (Office)
(b)(6) (cell)
In plant x5347

From: Alexander, Richard
Sent: Wednesday, November 08, 2017 9:45 AM
To: Haagensen, Brian
Subject: FW: 21 RCP No. 1 Seal Return Flow Projections

From: Wittich, Walter
Sent: Wednesday, November 08, 2017 6:23 AM
To: Alexander, Richard
Subject: Fwd: 21 RCP No. 1 Seal Return Flow Projections

Walter Wittich

Begin forwarded message:

> **From:** "Chan, Tat" <TChan@entergy.com>
> **Date:** November 7, 2017 at 15:47:45 EST
> **To:** "Wright, Richard" <rwrig95@entergy.com>
> **Cc:** "D'Antono, James" <jdanto1@entergy.com>, "Gioggia, Richard" <rgioggi@entergy.com>, "Kenney, Eric T" <ekenney@entergy.com>, "Laverde, Charles" <CLaverd@entergy.com>, "LoPiccolo, Angela Marie." <alopicc@entergy.com>, "Miu, Jarvis" <jmiu@entergy.com>, "Van Loan, Shannon Elizabeth" <svanloa@entergy.com>, "dl - IPEC Engrg. DMs/SMs" <dl-IPECEngrg.DMsSMs@entergy.com>
> **Subject: 21 RCP No. 1 Seal Return Flow Projections**
>
> Rich,
>
> As requested. Assume the projection holds true, it is anticipated that No. 1 seal return will reach 6 GPM on or about 2/5/2018. Additionally, data from the ultrasonic flow meter and from logs and plant computer are tabulated below.

		Seal Return Flow		98' PAB	Seal Return Temp		Seal Injection Flow	Thermal E D/P
Time	RCP	CCR	VC (UT)	Common Return Flow	VC	CCR	CCR	PI
1351	22	1.95	1.9	8	99 F	142 F	7.3	40
1356	23	1.84	2	8	110 F	150 F	8	103
1400	24	1.66	1.5	8.1	110 F	151 F	7.2	102
1405	21	3.86	3.9	8.3	122.5 F	139 F	7.3	28

Data indicate close correlation between the installed Rotameter (normal RCP No. Seal Return) and the ultrasonic flow meter installed on 11/7/2017. However, the ultrasonic flow meter installed on the 98' is indicating approximately 1 GPM less than the total indicated by the individual ultrasonic / rotameter. These data support the use of alternate indication (e.g. ultrasonic in the PAB bias by 1 GPM). Additionally, further monitoring can be achieved with the thermal barrier differential pressure. Based on estimate, a 6 GPM No. 1 seal return flow would equate to a thermal barrier differential pressure of approximately 4" of water (1.3 GPM through the thermal barrier). Currently, Westinghouse guidance under Technical Bulletin ESBU-TB-93-01 Revision 1, allow an orderly shutdown if the No. 1 seal exceed 6 GPM and upto 8 GPM

Tat

Siwy, Andrew

From: Siwy, Andrew
Sent: Tuesday, November 07, 2017 5:53 AM
To: Rossi, Matthew; Haagensen, Brian
Subject: RE: FW: FMA IP3 Exciter

Don't hesitate to send an update to the branch if you think the branch should know. I only put that the next "expected " update would be the morning call so that you wouldn't feel pressed and that they wouldn't press.

-------- Original Message --------
From: "Rossi, Matthew" <Matthew.Rossi@nrc.gov>
Date: Mon, November 06, 2017 10:15 PM -0500
To: "Haagensen, Brian" <Brian.Haagensen@nrc.gov>, "Siwy, Andrew" <Andrew.Siwy@nrc.gov>
Subject: RE: FW: FMA IP3 Exciter

Brian & Andrew,

As of the 2100 meeting, they have identified shorted diodes on the power supply for one of the thyristor cards. It is possible this is one of the contributing causes, but they will not know until they have completed the survey of all causes. They are planning on completing 5 of the remaining evaluations during night shift tonight, and expect to be covering the remainder tomorrow during day shift. Included in these is a direct evaluation of the exciter, which they were unable to perform today due to not having qualified staff for confined space entry.

As such, the region can be updated in the AM as Andrew suggests.

As for Unit 2, they are currently evaluating and discussing the potential for a forced outage due to the 21 RCP seal leakoff issues. I don't think we need to spin up the region on this yet. They have proposed several solutions that may get them to 2R23 instead.

1) Smaller and slower dilutions by procedure.
2) Increasing the temperature of incoming flow to minimize any delta T.
3) Modifying AOP-RCP-1 to allow for leakoff flow up to 8 gpm. The current control room indication max scale goes to 6 gpm, and they have talked to Westinghouse, who has stated the seals are ok at 8 gpm. The installation of the UT flowmeters on all the RCPs would allow them to have higher range in their indication. They are doing a GSI-191 eval on the flowmeters, as well.

In other work, they are planning to do maintenance on the 21 EDG on 11/8 at 0400. I would expect they will push this out if U3 is not back by then, but they are planning as if U3 will be critical sometime tomorrow night.

The 31 CCW pump PMT is supposed to kick off at 2300. I will be observing, and will not be in during the day tomorrow, Tuesday, 11/7. I will be reachable by cell at any time, and will likely come in in the afternoon/evening.

Regards,
Matt

From: Haagensen, Brian
Sent: Monday, November 06, 2017 2:18 PM
To: Siwy, Andrew <Andrew.Siwy@nrc.gov>
Cc: Rossi, Matthew <Matthew.Rossi@nrc.gov>
Subject: Re: FW: FMA IP3 Exciter

Andrew,

Please keep me informed of the progress toward restarting the plant so I can plan my return to the site. If the exciter is repaired, the schedule will proceed very quickly.

(b)(6)

(b)(6) I also have a social function that I would like to attend on Tuesday evening. I would expect to drive back Wednesday morning if the plant does not restart before Wednesday at noon.

But if the plant is going to restart before Wednesday at 1200, then I need to plan for that contingency. I will definitely be back in time for the restart.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Monday, November 6, 2017 12:40 PM
To: Haagensen, Brian
Cc: Rossi, Matthew
Subject: RE: FW: FMA IP3 Exciter

They hope to have troubleshooting complete by 1600 today. The schedule has a built in 24-hour window for repair and a built in 12-hour window for testing. They are scheduled to evaluate 6 causes today, which will leave 11 causes left to be evaluated.

During the OPS focus meeting this morning, the SVP stated that if they don't find a smoking gun, they need to have an ODMI in place.

We have no concerns at this time.

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From: Haagensen, Brian
Sent: Monday, November 06, 2017 12:28 PM
To: Siwy, Andrew <Andrew.Siwy@nrc.gov>
Cc: Rossi, Matthew <Matthew.Rossi@nrc.gov>
Subject: Re: FW: FMA IP3 Exciter

Andrew, Matt,

Does Entergy have a projection for when they would complete the troubleshooting phase?

What is your assessment of their progress so far?

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Monday, November 6, 2017 11:53 AM
To: Schroeder, Daniel; Henrion, Mark; Setzer, Thomas
Cc: Haagensen, Brian; Rossi, Matthew
Subject: FW: FW: FMA IP3 Exciter

Work in progress.

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From: Siwy, Andrew [mailto:asiwy90@entergy.com]
Sent: Monday, November 06, 2017 11:52 AM
To: Siwy, Andrew <Andrew.Siwy@nrc.gov>
Subject: [External_Sender] FW: FMA IP3 Exciter

Andrew Siwy, P.E.
U.S. NRC Resident Inspector
Indian Point | ☎:914.739.9360

From: McCaffrey, Thomas S
Sent: Monday, November 06, 2017 9:27 AM
To: Siwy, Andrew
Subject: FMA IP3 Exciter

Siwy, Andrew

From: Haagensen, Brian
Sent: Saturday, December 09, 2017 10:56 AM
To: Siwy, Andrew; Safouri, Christopher
Subject: Fw: Indian Point Unit 2 Update

Andrew, Chris,

I am now back in my house in CT. They are expecting 6 inches of snow in southeastern CT.

Below is an email that I sent to Dan - FYI.

From: Haagensen, Brian
Sent: Saturday, December 9, 2017 10:53 AM
To: Schroeder, Daniel
Subject: Re: Indian Point Unit 2 Update

Dan,

I decided to drive back to my house in CT in order to arrive before the snow got too bad. Connecticut is expecting 6 inches. I will be monitoring the situation using the Entergy Remote network from my house but will rely on Andrew as the man on site today with Chris as his backup. I will go back tomorrow after the snow has fallen and I clean off the driveway.

The boric acid leakage may not be from the o-ring flange surface. The leakage appears to be coming from somewhere in the insulation above the flange. This looks a bit like a situation that I experienced at Millstone when a greylock fitting on a CET developed a leak. Entergy won't know where the leakage is coming from until they pull the head insulation. In the past, the o-ring leakage leaked out horizontally without traveling in the vertical direction. BA could always go vertically but it may also be leakage from a fitting that is higher in the head and dribbling down through the insulation.

Approximately two weeks ago, we noted that the gross leak rate had trended up from ~0.1 gpm to 0.2 gpm over a period of about a week. They attributed this to a change in CVCVs leak rate but that seems a bit dubious in my opinion because of the nature of the trend. Changes in CVCS leakrate are generally step changes rather than slow increases. There was no indication of BA leakage through the outer o-ring telltale drain line (sometimes, this line gets plugged up) nor was there any increase in the identified leak rate which would show a leak through the drain line into the PDT.

So we should standby by and wait for more information before concluding that this was a RPV o-rinig leak.

Brian

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Schroeder, Daniel
Sent: Saturday, December 9, 2017 9:12 AM
To: Lorson, Raymond; Pelton, David; Welling, Blake; Yerokun, Jimi
Cc: Screnci, Diane; Sheehan, Neil; Greives, Jonathan; Tifft, Doug; Safouri, Christopher; Siwy, Andrew; Haagensen, Brian
Subject: Indian Point Unit 2 Update

Indian Point Unit 2 shut down at 0119 to start a forced outage to replace the 21 reactor coolant pump seal. An initial containment entry was made by the licensee, and boron accumulation was found on the RPV, indicating leakage past the outer o-ring. THis has been an issue in the past, and the licensee believed that the inner seal was leaking and the outer seal was holding. The licensee is evaluating the current situation. Unit 2 will have a refuel outage in the spring. The unidentified leak rate for Unit 2 has been low, consistently less than 0.1 gpm. The licensee is evaluating the situation. Outage to replace the seal requires draining water level below RPV flange, but removing the head to replace the o-rings would extend the outage.

An update will be provided once the licensee has made a decision, and DRS assistance is requested next week if the licensee decides to leave the current seals in place. Drain down to a level below the RPV flange is scheduled for Monday.

Dan

Siwy, Andrew

From: Haagensen, Brian
Sent: Wednesday, November 15, 2017 7:27 AM
To: Schroeder, Daniel; Setzer, Thomas; Henrion, Mark; Rossi, Matthew
Cc: Sheehan, Neil; Tifft, Doug; Siwy, Andrew; Safouri, Christopher; Guzman, Richard
Subject: FYI: Background info on IPEC O-rings

Dan,

There seems to be continued interest in the press and among some stakeholders regarding the reactor pressure vessel (RPV) o-rings at IPEC. Some of the stories appear to attribute the design change in 2003 as the start of O-ring leakage. I thought I would pass on some additional background insights. FYI

The design change in 2003 was not a cause of the leakage. Prior to the design change in 2003, they had experienced numerous O-ring leaks since original construction. We actually mapped the history of O-ring leaks on a timeline back to 1990. The design change in 2003 actually worked and the leaks stopped for several years. The O-ring leakage started back up after ~5 years and the extent and frequency of the leaks has been getting steadily worse with time. We believe that there are small defects in the RPV flange surfaces that cause these leaks. The flange defects were noted visually during the last outage but Westinghouse assessed them as not being significant – i.e. the O-rings would crush and should seal any defects.

Following the last refueling outage, IPEC convinced themselves that it was water sloshing around inside the RPV during water level changes that disrupted the O-rings and prevented them from fully seating. We did not buy into this explanation but could not get IPEC to do anything more than change the RHR / RPV fill procedure to prevent water from impacting the O-rings after the O-rings had been set. This was an example of correlation is not causation. We were not too surprised when the O-rings leaked coming out of the last refueling outage nor that the inner O-ring leaked after the subsequent outage to repair the O-rings.

We expect the problem will likely be solved if they conduct the laser mapping of the RPV flange surfaces, repair any defects identified and use the larger O-ring to seal the flange surfaces. These corrective actions are scheduled on Unit 2 in the spring of 2018. I would expect they will do the same on Unit 3 during the refueling outage in 2019.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

Siwy, Andrew

From: Haagensen, Brian
Sent: Saturday, November 04, 2017 7:04 PM
To: Pelton, David; Lorson, Raymond; Schroeder, Daniel
Cc: Siwy, Andrew; Rossi, Matthew
Subject: RE: Boric acid leakage discovered on the Unit 3 RPV head

Engineering has assessed these BA deposits and they believe that they are not indicative of an active leak through the RPV outer o-ring. They think the deposits may have originated from reactor reassembly in June.

From: Haagensen, Brian
Sent: Saturday, November 04, 2017 6:22 PM
To: Pelton, David <David.Pelton@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>
Cc: Siwy, Andrew <Andrew.Siwy@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>
Subject: Boric acid leakage discovered on the Unit 3 RPV head
Importance: High

Entergy identified small amounts boric acid deposits on the outer o-ring flange area on the reactor vessel head in the same axial location as last time. The amount of boric acid deposits are approximately the same as in June when they shutdown.

RCS UIL has been very low on Unit 3 since the O-ring outage July. The monthly average leak rate has been improving:

0.075 gpm – July
0.043 gpm – August
0.031 gpm – September
0.02 gpm – October

You may want to forward this information to the SLOs and PAOs in case someone calls them to ask the question. Entergy just got this information and it is being assessed by Engineering.

Status email to follow after the OCC Status update at 1830-1900.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

Siwy, Andrew

From: Haagensen, Brian
Sent: Saturday, November 04, 2017 1:15 PM
To: Pelton, David
Cc: Tifft, Doug; Screnci, Diane; Sheehan, Neil; Guzman, Richard; Fuller, Justin; Haagensen, Brian; Henrion, Mark; Highley, Christopher; McKown, Louis; Rossi, Matthew; Schroeder, Daniel; Setzer, Thomas; Siwy, Andrew
Subject: Restart efforts are delayed

IP3 remains stable in Mode 3 on the condenser steam dumps at NOT/NOP. They are conducting a containment entry to walkdown systems inside the VC and especially to look for evidence of o-ring leakage.

My assessment is that Indian Point Unit 3 is several days away from restarting the plant. The issues list continues to grow as discovery identifies more problems from the trip. The OCC has not yet put a restart schedule together. They are discussing the possibility of cooling the plant down to mode 4 to effect some repairs.

They are having significant problems getting craft resources to come in over the weekend to repair the items on the issues list. Management is escalating the issue "to the highest level" to the Union.

Last night, the SM evaluated the need to declare a NOUE (EAL HU3.1) because of the CO2 discharge into the turbine building. He ultimately decided it was not required because the "asphyxiant gas did not adversely affect normal operations," but he looked hard at declaring the event. We should ask DRS EP to review this decision.

The Post Trip review report is not yet completed. Apparently, Engineering did not get support from the other departments (maintenance, OPS, planning, I&C, electrical etc.) to conduct the PTR and the FMA analysis for the cause of the trip.

Current Issues List:

1. Determine and repair the cause of the main generator trip - mode 2 hold
2. MS-116-2 steam leak at flange (this is a manual steam heater valve on the main turbine) – leak injection (Team Inc.) or shut MSIVs and weld repair bonnet flange
3. Air leak on TCV-1104 (FCU SW outlet valve) – repair leak
4. Engineering assessment of main turbine overspeed – mode 2 hold
5. RCS letdown isolated prematurely (4% high in PZR level)
6. 31 CCW pump needs to be replaced (was in progress at time of the trip) – mode 2 hold or mode change with risk assessment – scheduled to be completed by Monday
7. 33 RCP vibrations are high
8. 32 RCP has a bad vibration probe
9. 34 inverter auto-transferred to alternate AC source because of a failed 34 feedwater heater cascade valve – mode 2 hold
10. 32 MBFP suction relief lifted – repair or accept as is with engineering evaluation – mode 1 hold
11. 33 isophase heat exchanger leak – plug tube or replace heat exchanger – mode 2 hold
12. Can't add chemicals to 33 SG because of leak on CF-134 – repair leak

At their present pace, restart will be sometime in the middle of next week. This will be a race between the reduction in decay heat and being able to maintain the RCS on the condenser steam dumps. When decay heat gets too low, they will have to shut the MSIVs and break vacuum in the condenser to prevent cooling down the RCS. Recovery will take much longer.

I completed my plant walkdowns and did not find any additional significant issues.

Next email update at 1900 this evening.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

Siwy, Andrew

From: Haagensen, Brian
Sent: Friday, December 15, 2017 3:58 PM
To: Schroeder, Daniel; Setzer, Thomas; Henrion, Mark; Rossi, Matthew
Cc: Siwy, Andrew; Safouri, Christopher
Subject: Outage status 12/15 at 1530

Dan,

The 21 RCP shaft will be milled to remove the degraded material and restore shaft roundness. They are bringing a milling machine in from New Jersey this evening. Current plans are to have the milling completed by noon on Saturday, and realign the shaft and install the seal by 2400 Saturday evening.

The head is now sitting on the stand. They will either:

1. Install the o-ring and reinstall the head without removing stud 20 (the stuck stud) – with an EC to justify operating with one stud not credited for strength, or
2. Reinstall the head without the o-ring and try again to remove the stud this evening.

The final answer (to the head path - above) will depend on the progress on the path forward for the 21 RCP seal job.

The 21 condensate pump repairs are still being evaluated – they were able to establish condensate system isolation so they will be assessing the extent of damage to the impeller and support from the drop.

Currently, IPRO will continue to monitor the progress over the weekend (Andrew on Saturday, Chris on Sunday – I will come in as needed)

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Siwy, Andrew
To:	Gray, Harold
Cc:	Haagensen, Brian
Subject:	O-ring
Date:	Monday, December 11, 2017 1:29:03 PM
Attachments:	IMG_0860.JPG IMG_0858.JPG

The 2 photograph attachments have been withheld under FOIA exemption 4.

Pre-installation. 0860 picture shows two O-rings (inner and outer) being removed from the transportation device in containment. 0858 picture shows an up-close shot of the O-rings at the spacing in the protective sheath of the outer O-ring.

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From:	Haagensen, Brian
To:	Schroeder, Daniel; Setzer, Thomas; Henrion, Mark; Rossi, Matthew
Cc:	Siwy, Andrew; Safouri, Christopher
Subject:	Outage status 12/15 at 1530
Date:	Friday, December 15, 2017 3:58:01 PM

Dan,

The 21 RCP shaft will be milled to remove the degraded material and restore shaft roundness. They are bringing a milling machine in from New Jersey this evening. Current plans are to have the milling completed by noon on Saturday, and realign the shaft and install the seal by 2400 Saturday evening.

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Currently, IPRO will continue to monitor the progress over the weekend (Andrew on Saturday, Chris on Sunday – I will come in as needed)

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Gray, Mel; Gray, Harold
Cc:	Schroeder, Daniel
Subject:	RE: IP2 Outage Status PM 1630 12/11
Date:	Wednesday, December 13, 2017 11:38:31 AM

Mel, Harold,

The replacement o-ring repair is being completed as an equivalent change (EC). As a result, they did not complete a recent 50.59/PADs assessment for this installation. The EC has numerous references to Westinghouse letters and a calc that purportedly demonstrates equivalency. It is also a good summary of the past history of the leaking o-ring saga at IPEC.

I will be reviewing this EC under a 71111.18 sample today.

I can send you a copy of the EC topical notes for your review if desired. It is a good summary of the issues.

Brian

From: Haagensen, Brian
Sent: Wednesday, December 13, 2017 10:49 AM
To: Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>
Cc: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

Mel,

Both the inner and outer o-rings will be oversized in comparison to the o-rings that were previously installed. The previously installed o-rings were of the "Helicoflex" design which was adopted back in 1995 by both units.

This activity is considered to be a permanent modification. NYPA completed a 50.59 evaluation on this change back in 1995 (9593.pfd - attached) when they first shifted to the Helicoflex design. Part of this old 50.59 evaluation was also to accept an oversized o-ring design. I sent these documents to Harold Gray yesterday for his review. They are attached to this email.

The IP2 reactor design is identical to the IP3 design. In fact, they are using the o-rings that were ordered for the IP3 refueling outage in the IP2 head. They ordered two complete sets of identical o-rings last summer expecting the use them during the upcoming refueling outages on both units.

I would expect them to update the MOD/PADs evaluation for the installation of this o-ring into Unit 2. The original 50.59 evaluation (circa 1995) was focused primarily on shifting to the Helicoflex design and the analysis of the oversized design was very cursory. We will review the new mods package when it is available.

Based on my review of the 50.59 evaluation from 1995, I don't have any immediate safety

concerns at this time. Please let me know if Harold has any other insights.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From: Gray, Mel
Sent: Wednesday, December 13, 2017 10:31 AM
To: Gray, Harold <Harold.Gray@nrc.gov>
Cc: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: FW: IP2 Outage Status PM 1630 12/11

Do we know what process Entergy Is applying in installing a larger o-ring (inner and outer?) Is it considered a replacement in kind or a mod? This may dictate the ROP sample applied.

Do we have any questions on the appropriateness of the replacement or process used?

Anyone have safety concerns? (I am not in office this week and may have missed in office discussions on this)

From: Pelton, David
Sent: Tuesday, December 12, 2017 7:35 AM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>; Yerokun, Jimi <Jimi.Yerokun@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

…thanks all.

dave p.

From: Haagensen, Brian
Sent: Tuesday, December 12, 2017 7:25 AM
To: Yerokun, Jimi <Jimi.Yerokun@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

The schedule continues to change. As of this morning, criticality is again officially scheduled for 12/21. I am certain this will change again.

From: Yerokun, Jimi
Sent: Tuesday, December 12, 2017 7:23 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

Thanks Dan. I'll pass any questions I have to Harold Gray.

Jimi T. Yerokun
610 337-5128/ (b)(6) ***(c)***

From: Schroeder, Daniel
Sent: Tuesday, December 12, 2017 6:21 AM
To: Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>; Yerokun, Jimi <Jimi.Yerokun@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: FW: IP2 Outage Status PM 1630 12/11

The decision to replace the RPV o-ring seals has been finalized. The new seals are slightly thicker than the old seals. Revised start-up date pushes back three days to December 23rd.

Dan

From: Haagensen, Brian
Sent: Monday, December 11, 2017 4:52 PM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Cc: Guzman, Richard <Richard.Guzman@nrc.gov>; Weil, Jenny <Jenny.Weil@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Sheehan, Neil <Neil.Sheehan@nrc.gov>
Subject: IP2 Outage Status PM 1630 12/11

IP2 has decided NOT to laser scan or depth mic/measure the RPV flange surface defects during this outage (option #2 in the critical decision paper).

Instead, they intend to:

- Drain down the RCS to 68 ft (below the flange but above the S/G tube sheet)
- remove the RPV head,
- clean the flange sealing surfaces,
- replace the leaking o-rings with new, oversized o-rings,
- replace the 21 RCP seals,
- reset the head, refill the RCS and
- proceed to plant restart

The RCS drain down has been delayed until tomorrow on day shift. They plan to remove the equipment access hatch this evening.

Plant conditions are essentially what they were this morning.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Dentel, Glenn
To:	Bickett, Carey
Subject:	RE: Recap from 0800 Meeting and other items...
Date:	Monday, December 11, 2017 9:34:00 AM

Nice summary.

Glenn Dentel
Branch Chief responsible for oversight of Fire Protection, Cyber Security, Program, and Electrical Inspections
610-337-5233 (w)

From: Bickett, Carey
Sent: Monday, December 11, 2017 9:18 AM
To: Dipaolo, Eugene <Eugene.DiPaolo@nrc.gov>; Young, Keith <Keith.Young@nrc.gov>; Werkheiser, David <David.Werkheiser@nrc.gov>; Dentel, Glenn <Glenn.Dentel@nrc.gov>; Kern, David <David.Kern@nrc.gov>; Patel, Jigar <Jigar.Patel1@nrc.gov>; Rady, Jeff <Jeff.Rady@nrc.gov>; Hobbs, Clinton <Clinton.Hobbs@nrc.gov>; Elkhiamy, Sarah <Sarah.Elkhiamy@nrc.gov>; Dumont, Louis <Louis.Dumont@nrc.gov>
Subject: Recap from 0800 Meeting and other items...

Good morning!

Plant Items

- IP2 – Currently in Mode 5 to support work on the RCP seal. The station is also considering replacement of both vessel head O-rings due to leakage (decision to be made today; this will extend the forced outage 2 – 3 days).
- Limerick 1 – high jacket water temperature on the D12 EDG (last week) was due to an improperly set temperature controller (was supposed to be set at around 130F, but was found at about 200F). The station replaced the associated solenoid valve and recalibrated the controller. Site is in the process of investigating the reason for the improper setting. Based on information received to date, the branch does not suspect tampering.

People Items

- The inspection manning for the remainder of the Pilgrim CAL follow-up inspections should be issued today.
- Dan Dorman is now in HQ and Dave Lew is now the acting RA. Dan Collins is the acting DRA. Ray Lorson and Dave Pelton are transitioning January 2.

Action Items

- The End-of-Cycle guidance memo was issued December 8. Our next big action item is to ensure inspections are entered into RPS through December 31, 2019 (due 1/04/2018). I will attend the expectations meeting tomorrow.

Other Items

- Early close-out on time for this pay period: Keith requested all time be in no later than 1100 on Thursday 12/21.
- I have to leave today at 1000 for a personal appointment. You can reach me this

afternoon by email or cell phone (484-947-4132) if needed. Dave Werkheiser has graciously agreed to be the in-office POC while I'm gone.

- I don't plan on having a branch meeting tomorrow unless someone needs to discuss something with the group.

Regards,

Carey Bickett
Senior Reactor Inspector
carey.bickett@nrc.gov
610.337.5317

From:	Haagensen, Brian
To:	Schroeder, Daniel
Subject:	RE: Unit 3 susceptibility to flange leakage and detection of the problem
Date:	Wednesday, December 20, 2017 7:37:34 AM

I received an email last night from Engineering that essentially restated all of the methods and mechanisms that they have available to detect UIL. They restated my original question and addressed the fact that they had no indications of a leak at present. I responded by asking the original question – what is different between Unit 2 and Unit 3? I can forward this email to you if you want to read it. I expect that they will be revising their answer based on my next round of clarifying questions.

I think the best answer at this point is that Unit 3 proved that it could detect a small leak from the RPV flange last June. The real question is why did they not detect the leak on Unit 2? I have asked them (again) to address the differences between the units. They had addressed this question verbally by stating that the leak measurement systems in Unit 3 are "more sensitive" than Unit 2 but this point was never written in the email.

We shall see what today brings.

From: Schroeder, Daniel
Sent: Wednesday, December 20, 2017 7:09 AM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: RE: Unit 3 susceptibility to flange leakage and detection of the problem

Brian,

I think that their answer for extent of condition regarding o ring leakage needs to include periodic containment tours at power to look for boron coming through the insulation,

What about chemistry samples of the sump that would determine which type of leak is present?

Have there been leaks on U3 outer o ring in the past that have been detected by their outer o ring leak monitoring system? What is the answer to this question for U2? Past performance may be indicative of future performance.

Dan

From: Haagensen, Brian
Sent: Tuesday, December 19, 2017 4:31 PM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>
Subject: Unit 3 susceptibility to flange leakage and detection of the problem

Dan,

I have the verbal answers to the Region's questions regarding the extent of condition on Unit 3 from Tat Chan (Engineering Supervisor).

Q: Could Entergy detect a small flange leak through the outer o-ring on Unit 3 (in light of the fact that this was not detected on Unit 2)?

ANS: There are two distinct differences between Unit 2 and Unit 3 that ensure Unit 3 can detect this leak whereas Unit 2 did not.

1. The Unit 3 sump is smaller and other physical differences in leak measuring systems ensure that Unit 3 can detect unidentified leakage with greater sensitivity. There is currently no indication of a leak into containment from this sump (UIL=0 gpm this morning). Unit 2 has lesser sensitivity for detecting UIL. (I asked them to quantify this relative sensitivities).
2. The Unit 2 containment had a small secondary system leak into containment that was masking the increase in RCS leakage. (This is true (and we knew it) but I am not sure that this matters.)

Comment:

(b)(5)

Q: If a leak on Unit 3 was undetected, how long could the leakage last before the studs reached an unacceptable level of degradation?

ANS: Entergy cannot answer this question because there are too many variables. However, if Unit 3 can detect an increase in UIL, then this should not be an issue.

Comment:

(b)(5)

I do not want to perturb the Engineering Organization further at this time by demanding they answer this question now - as they are over-stretched trying to get Unit 2 back on line and I am concerned that if we disrupt their attention from the restart, we may get a bigger problem. Unless you have an immediate safety concern on Unit 3, I recommend we wait for the official answer to come back in writing.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Safouri, Christopher; Schroeder, Daniel; Setzer, Thomas; Henrion, Mark
Cc:	Siwy, Andrew; Fuller, Justin; McKown, Louis; Highley, Christopher; Rossi, Matthew; Guzman, Richard
Subject:	RE: Indian Point Status 12/20
Date:	Wednesday, December 20, 2017 11:36:22 AM

Update – Unit 2 remains in mode 5 while tightening up various minor leaks on the 21 RCP seal injection line. Mode 4 is currently estimated for 1700 this evening. I expect is will be later.

From: Safouri, Christopher
Sent: Wednesday, December 20, 2017 7:46 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>
Cc: Haagensen, Brian <Brian.Haagensen@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Fuller, Justin <Justin.Fuller@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Guzman, Richard <Richard.Guzman@nrc.gov>
Subject: Indian Point Status 12/20

Hello PB2,

Unit 2
Mode 5
RCS Temp = 165 °F
RCS Press = 340 psig
S/D Risk = Yellow for Core Cooling until they run the RCPs and couple the S/G's for heat removal

Early this morning, they drew a Steam bubble in the Pressurizer at 0036 12/20 to prepare for RCP starts.

Next major activities:

- *0600 – Run all RCPs for 10 minutes – verify <5% change in pressurizer level
- 0700 – Depressurize RCS for venting
- 1100 – Start 21 RCP, perform PMT/vibrations
- 1200 – Enter Mode 4
- 1400 – Apply PTO of 21 RHR HX
- 2300 – A-98 21 RHR HX repair

*They are investigating water leakage coming from the 21 RCP, once that is resolved they will proceed with the schedule. Therefore, the times noted above will slide to the right.

For milestones, they are aiming for:

- 12/20 1200 – Mode 4
- 12/21 0100 – Mode 3
- 12/23 0900 – Generator Sync
- 12/24 0700 – 100% power

Unit 3
100%, Green, 0.01 gpm
No SLCOs

Thank you,
Chris Safouri
Acting Resident Inspector
Indian Point Energy Center
RI/DRP/PB2
Tel: 914-739-9360

From:	Haagensen, Brian
To:	Siwy, Andrew; McKown, Louis; Schroeder, Daniel; Fuller, Justin; Setzer, Thomas; Guzman, Richard; Tifft, Doug; Sheehan, Neil
Cc:	Henrion, Mark; Rossi, Matthew; Highley, Christopher; Safouri, Christopher
Subject:	Re: Indian Point Unit 2 seal outage may start next week
Date:	Wednesday, December 06, 2017 12:45:13 PM

The IP2 outage will commence at midnight on Friday, 12/8 to Saturday, 12/9.. The residents will cover the outage and should not need any support from the region.

There go make plans for the Army/Navy game Party...

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Haagensen, Brian
Sent: Wednesday, December 6, 2017 8:35:02 AM
To: Siwy, Andrew; McKown, Louis; Schroeder, Daniel; Fuller, Justin; Setzer, Thomas; Guzman, Richard; Tifft, Doug; Sheehan, Neil
Cc: Henrion, Mark; Rossi, Matthew; Highley, Christopher; Safouri, Christopher
Subject: Re: Indian Point Unit 2 seal outage may start next week

Last night, the 21 RCP seal leakoff spiked to 5.2 gpm from ~3.5 gpm. Seal leak off is now 4.9 gpm. IPEC is currently considering moving the seal outage up from January 4th to Monday, December 11th. The final decision regarding when to start the outage will be made today. The goal is to complete the outage prior to the holiday period. They are verifying parts availability and resource readiness.

The outage will require cooling the plant to mode 5 and draining the RCS to just above the outlet nozzle level. They will have very short time-to-boil with a hot core in the vessel and decreased inventory, likely around 30 minutes. They are planning an outage time of 13 days.

They will make the final decision on the outage start date today. I will let you know.

This information is subject to FERC restrictions for release to the public.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)

(b)(6)
(cell)
(home)

From: Siwy, Andrew
Sent: Wednesday, December 6, 2017 6:50:16 AM
To: McKown, Louis; Schroeder, Daniel; Fuller, Justin; Haagensen, Brian; Setzer, Thomas; Guzman, Richard
Cc: Henrion, Mark; Rossi, Matthew; Highley, Christopher; Safouri, Christopher
Subject: Indian Point

Good morning!

Unit 2
100%, green, 0.06 gpm

- Planned 72-hour LCO, functional CCR vent area rad monitor, night shift
- Planned 6-hour LCO, RCS low temperature trip bistables

Unit 3
100%, green , 0.02 gpm

- Planned 6-hour LCO, 3-month functional SG level analog, day shift
- Planned 6-hour LCO, 3-month functional VC pressure analog channels 2, 3, and 4, day shift
- Planned 72-hour LCO, 3-month functional U/V and U/F analog, day shift
- Planned 72 hour LCO, 3-month test of SI valves, night shift
- Planned 72 hour LCO, 3-month functional 33 SWP, after midnight

Residents at Region I seminar until Thursday afternoon. All available to respond.

From:	Haagensen, Brian
To:	Siwy, Andrew; McKown, Louis; Schroeder, Daniel; Fuller, Justin; Setzer, Thomas; Guzman, Richard
Cc:	Henrion, Mark; Rossi, Matthew; Highley, Christopher; Safouri, Christopher
Subject:	Re: Indian Point
Date:	Thursday, December 07, 2017 8:36:40 AM

21 RCP seal leakoff increased to 5.08 gpm last night. The sea leakoff was 5.02 gpm at 0400 this morning. The OCC has been staffed for the outage.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Thursday, December 7, 2017 6:50:11 AM
To: McKown, Louis; Schroeder, Daniel; Fuller, Justin; Haagensen, Brian; Setzer, Thomas; Guzman, Richard
Cc: Henrion, Mark; Rossi, Matthew; Highley, Christopher; Safouri, Christopher
Subject: Indian Point

Good morning!

Unit 2
100%, green, 0.05 gpm

- Planned 72-hour LCO, functional 3-month PRZ bistable channels 1-3, all day
- Planned 6-hour LCO, RCS low temperature trip bistables
- Planned 21 RCP outage scheduled to start 12/8/17. 21 RCP seal return flow reported as ~4.3 gpm as of 5am today.

Unit 3
100%, green , 0.02 gpm

- None

Residents at Region I seminar until Thursday afternoon. All available to respond.

From:	Pelton, David
To:	Haagensen, Brian; Fuller, Justin; Henrion, Mark; Highley, Christopher; McKown, Louis; Rossi, Matthew; Schroeder, Daniel; Setzer, Thomas; Siwy, Andrew; Safouri, Christopher
Subject:	Re: IP2 Synch to the grid 1149 12/23
Date:	Saturday, December 23, 2017 2:34:19 PM

...my thanks to PB2 for monitoring the IP restart...now go enjoy the Holidays with friends and family!

dave p.

On: 23 December 2017 12:05, "Haagensen, Brian" <Brian.Haagensen@nrc.gov> wrote:

IP2 was synchronized to the grid at 1149 today. **The outage is over.** The operators are now in the process of raising power.

Schedule:

12/23 1400 – 50% power
12/24 0500 – 100% power

They had minor difficulty with the turbine governor. Turbine speed would not increase above 1759 rpm from the control room. They called in the "Generator Whisperer" and he was able to raise turbine speed to 1800 rpm by taking local control and carefully bumping the governor above the sticking point. The Generex exciter also gave them some problems but they worked through the excitation issue.

I will be heading back to my house in Connecticut but will continue to monitor the startup from my Entergy Remote account and will be the primary (and only) responder until Chris Safouri gets back on 12/27.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Schroeder, Daniel
To:	Safouri, Christopher
Subject:	Re: IP2 Outage Update
Date:	Sunday, December 17, 2017 8:10:36 PM

Great update.

-------- Original Message --------
From: "Safouri, Christopher" <Christopher.Safouri@nrc.gov>
Date: Sun, December 17, 2017 2:09 PM -0500
To: "Haagensen, Brian" <Brian.Haagensen@nrc.gov>, "Schroeder, Daniel" <Daniel.Schroeder@nrc.gov>, "Setzer, Thomas" <Thomas.Setzer@nrc.gov>
CC: "Siwy, Andrew" <Andrew.Siwy@nrc.gov>, "Henrion, Mark" <Mark.Henrion@nrc.gov>
Subject: IP2 Outage Update

Unit 2
Mode 6
RCS Temp = 119 °F
RCS Press = atm
RCS TTB = 28 min
@ Lowered Inventory just below 68'
Yellow S/D risk -> Core Cooling, RCS Integrity, Containment Closure

Plant Activities:

- I observed via camera feed them landing the Rx head, which was completed @ 1300 12/17. To recap, there are 5 remaining studs that did not pass visual examinations, engineering is working through an evaluation (with review and concurrence by Westinghouse) to determine whether these studs can be credited for structural integrity and re-used. The studs in question are the ones that had boric acid passing past the stud. Additionally, Stud 20 is still stuck in the vessel and attempts to remove it have not been successful. They are going to re-attempt removing it with the head landed; In parallel, they are working through an engineering evaluation leaving Stud 20 in place and tensioning it down but not taking credit for it.
    - One logistical concern is that they only have **one** Unit 2 stud and ten Unit 3 studs available in the Warehouse. They are able to use a Unit 3 stud, but it requires the Unit 3 tensioner which would add about 12 hours to their schedule. The schedule I noted below does not account for this.
- Lifting activities for 21 RCP motor are currently underway, expected to be complete by 0600 12/18. Machining of the shaft and measurements have been verified to be acceptable. The seal package has been assembled successfully.
- Expected to be at Mode 5 @ 0700 12/18
- Expected to exit lowered RCS inventory @ 1000 12/19

If you have any questions, please feel free to reach out to me anytime.

Thanks,
Chris Safouri
Acting Resident Inspector
Indian Point Energy Center

RI/DRP/PB2
Tel: 914-739-9360

From: Haagensen, Brian
Sent: Sunday, December 17, 2017 10:23 AM
To: Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>
Cc: Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Subject: IP2 Status 11/17 at 1100

IP2 is in mode 6 as before. The RCS is drained to 68 ft and RCS temp is 115 F. Both trains of RHR remain in service. Time to boil is 27 minutes.

Risk is green with the exception of core cooling, containment closure and RCS integrity which are yellow.

Entergy was able to clear the Rx vessel flange leakoff line from solidified boric acid and continue preparations to return the RPV head to the vessel. Stud cleaning continues and they are conducting NDE on the studs that were exposed to boric acid. 2 studs were found to be acceptable. 5 more studs remain to be cleaned and inspected. Stud 20 remains inserted in the vessel. They will try to remove stud 20 after the head is landed on the vessel. The OCC schedule had the RPV being lifted at 1100 but this clearly is not happening.

Chris Safouri is on site today and will observe activities.

Brian

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From:	Floyd, Niklas
To:	Rich, Sarah; Burritt, Arthur
Cc:	Setzer, Thomas; Newman, Garrett; Pinson, Brandon; Stewart, Scott; Gray, Mel; Trapp, James; Pickett, Douglas
Subject:	Review of ODMI Regarding IP3 Reactor Vessel Head Flange O-ring Leak
Date:	Friday, July 17, 2015 4:08:00 PM

ALL,

I have performed a review of the Operational Decision Making Issue (ODMI) document regarding the IP3 reactor vessel flange (RVF) O-ring leakage. The ODMI provides a summary of the issue, operating experience, monitoring, trigger points, and actions if trigger points are exceeded. I do not have a safety concern based on the monitoring plan being implemented. However, I do have several comments and observations provided below that Entergy should address.

Background
IP3 noted leak-by on the RVF inner O-ring on 3/23/2015 while coming out of their spring refueling outage. Operations followed the recommended actions to isolate the inner O-ring and put the redundant outer O-ring into service. On 7/14/2015, IP3 operations observed an increase in RVF leak-off temperature, which would be indicative of leakage past the outer O-ring. A containment entry was performed and verified the temperatures on the leak-off line. Entergy then performed an ODMI to evaluate continued plant operation with this leakage.

Licensee Actions
Entergy plans to perform specific 4-hour monitoring consisting of flange leak-off temperature, RCDT level, containment radiation monitors, containment humidity/temp, and sump levels. There is also weekly monitoring consisting of containment boron concentration via air samples. The main trigger points are #4 (identified RCS leak rate increases to 2GPM), which would begin preparations for a forced outage, and trigger point #5 (identified RCS leak rate increases to 10GPM or Unidentified RCS leak rate increases to 1GPM), which represents the TS limits and would require a shutdown.

Observations
(b)(5)

Please feel free to ask any questions. I will be at Nine Mile Point next week, but I am available by email or the resident office telephone.

Niklas Floyd
Reactor Inspector
Division of Reactor Safety
USNRC Region I

(610) 337-5282

From: Rich, Sarah
Sent: Friday, July 17, 2015 12:42 PM
To: Burritt, Arthur; Floyd, Niklas
Cc: Setzer, Thomas; Newman, Garrett; Pinson, Brandon; Stewart, Scott
Subject: RE: IP3 Reactor Vessel Head Flange O-ring Leak ODMI

All,
I asked two Unit 3 SROs for their interpretation of trigger point 1 "R-11/R-12 indications increase towards the alarm setpoint." Both stated that they would consider the trigger point met if there was an increasing trend on either of the rad monitors, even if the alarm setpoint was not reached.

I also asked about unidentified leakage monitoring, since that is not included as a trigger point in the ODMI. They calculate gross leakage (unidentified plus identified) using a mass balance approach, so that would show leakage coming out of the flange. They calculate the identified leakage (which includes RCDT as identified) and subtract it from the gross leakage to determine unidentified. Their action levels for unidentified leakage are similar to ours, and the operators I spoke with stated that RCS leakage would show up in the unidentified leakage number long before it would show up on the radiation monitors. Their actions for action level three leakage (greater than 3 std dev above the mean) include a containment entry to identify the source of the leakage.

Sarah

PS: Larry Coyle, the site VP, is in the hospital but doing well after a motorcycle accident.

From: Rich, Sarah
Sent: Friday, July 17, 2015 10:57 AM
To: Burritt, Arthur; Floyd, Niklas
Cc: Setzer, Thomas; Newman, Garrett; Pinson, Brandon; Stewart, Scott
Subject: IP3 Reactor Vessel Head Flange O-ring Leak ODMI

All,
I have attached the operational decision-making issue (ODMI) document on the reactor vessel head flange o-ring leakage. It was approved this morning.
Sarah

Rossi, Matthew

From: Rossi, Matthew
Sent: Monday, November 06, 2017 10:16 PM
To: Haagensen, Brian; Siwy, Andrew
Subject: RE: FW: FMA IP3 Exciter

Brian & Andrew,

As of the 2100 meeting, they have identified shorted diodes on the power supply for one of the thyristor cards. It is possible this is one of the contributing causes, but they will not know until they have completed the survey of all causes. They are planning on completing 5 of the remaining evaluations during night shift tonight, and expect to be covering the remainder tomorrow during day shift. Included in these is a direct evaluation of the exciter, which they were unable to perform today due to not having qualified staff for confined space entry.

As such, the region can be updated in the AM as Andrew suggests.

As for Unit 2, they are currently evaluating and discussing the potential for a forced outage due to the 21 RCP seal leakoff issues. I don't think we need to spin up the region on this yet. They have proposed several solutions that may get them to 2R23 instead.

1) Smaller and slower dilutions by procedure.
2) Increasing the temperature of incoming flow to minimize any delta T.
3) Modifying AOP-RCP-1 to allow for leakoff flow up to 8 gpm. The current control room indication max scale goes to 6 gpm, and they have talked to Westinghouse, who has stated the seals are ok at 8 gpm. The installation of the UT flowmeters on all the RCPs would allow them to have higher range in their indication. They are doing a GSI-191 eval on the flowmeters, as well.

In other work, they are planning to do maintenance on the 21 EDG on 11/8 at 0400. I would expect they will push this out if U3 is not back by then, but they are planning as if U3 will be critical sometime tomorrow night.

The 31 CCW pump PMT is supposed to kick off at 2300. I will be observing, and will not be in during the day tomorrow, Tuesday, 11/7. I will be reachable by cell at any time, and will likely come in in the afternoon/evening.

Regards,
Matt

From: Haagensen, Brian
Sent: Monday, November 06, 2017 2:18 PM
To: Siwy, Andrew <Andrew.Siwy@nrc.gov>
Cc: Rossi, Matthew <Matthew.Rossi@nrc.gov>
Subject: Re: FW: FMA IP3 Exciter

Andrew,

Please keep me informed of the progress toward restarting the plant so I can plan my return to the site. If the exciter is repaired, the schedule will proceed very quickly.

If they are not ready to restart before Wednesday at 1200, (b)(6)

(b)(6)

that I would like to attend on Tuesday evening. I would expect to drive back Wednesday morning if the plant does not restart before Wednesday at noon.

But if the plant is going to restart before Wednesday at 1200, then I need to plan for that contingency. I will definitely be back in time for the restart.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Monday, November 6, 2017 12:40 PM
To: Haagensen, Brian
Cc: Rossi, Matthew
Subject: RE: FW: FMA IP3 Exciter

They hope to have troubleshooting complete by 1600 today. The schedule has a built in 24-hour window for repair and a built in 12-hour window for testing. They are scheduled to evaluate 6 causes today, which will leave 11 causes left to be evaluated.

During the OPS focus meeting this morning, the SVP stated that if they don't find a smoking gun, they need to have an ODMI in place.

We have no concerns at this time.

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From: Haagensen, Brian
Sent: Monday, November 06, 2017 12:28 PM
To: Siwy, Andrew <Andrew.Siwy@nrc.gov>
Cc: Rossi, Matthew <Matthew.Rossi@nrc.gov>
Subject: Re: FW: FMA IP3 Exciter

Andrew, Matt,

Does Entergy have a projection for when they would complete the troubleshooting phase?

What is your assessment of their progress so far?

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9630/1 (office)
(b)(6) (cell)
(home)

From: Siwy, Andrew
Sent: Monday, November 6, 2017 11:53 AM
To: Schroeder, Daniel; Henrion, Mark; Setzer, Thomas
Cc: Haagensen, Brian; Rossi, Matthew
Subject: FW: FW: FMA IP3 Exciter

Work in progress.

Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From: Siwy, Andrew [mailto:asiwy90@entergy.com]
Sent: Monday, November 06, 2017 11:52 AM
To: Siwy, Andrew <Andrew.Siwy@nrc.gov>
Subject: [External_Sender] FW: FMA IP3 Exciter

Andrew Siwy, P.E.
U.S. NRC Resident Inspector
Indian Point | ☎:914.739.9360

From: McCaffrey, Thomas S
Sent: Monday, November 06, 2017 9:27 AM
To: Siwy, Andrew
Subject: FMA IP3 Exciter

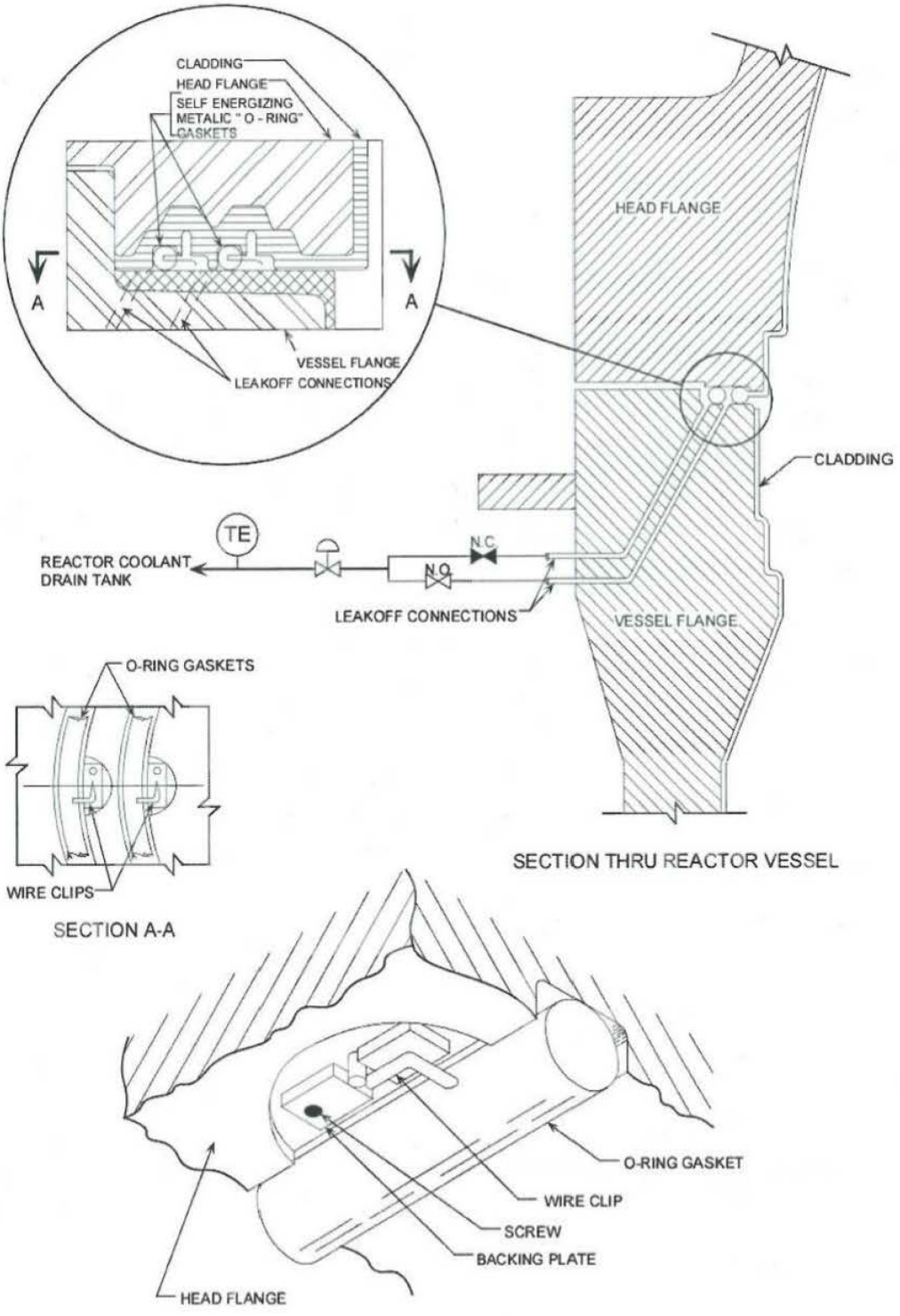


Figure 3.1-7 Reactor Vessel Seal

Welling, Blake

From: Welling, Blake
Sent: Tuesday, December 12, 2017 7:23 AM
To: Gray, Mel; Gray, Harold; Kulp, Jeffrey
Cc: Yerokun, Jimi
Subject: RE: IP2 Outage Status PM 1630 12/11

Harold/Mel,

It seems like we should reach out to Dan, if we have not done so already, to see if he is still looking for DRS support.

Do we have OpE on the use of oversized O-rings at IP or elsewhere?

Thanks,
Blake

From: Schroeder, Daniel
Sent: Tuesday, December 12, 2017 6:21 AM
To: Gray, Mel <Mel.Gray@nrc.gov>; Gray, Harold <Harold.Gray@nrc.gov>; Kulp, Jeffrey <Jeffrey.Kulp@nrc.gov>
Cc: Greives, Jonathan <Jonathan.Greives@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Screnci, Diane <Diane.Screnci@nrc.gov>; Pelton, David <David.Pelton@nrc.gov>; Lorson, Raymond <Raymond.Lorson@nrc.gov>; Welling, Blake <Blake.Welling@nrc.gov>; Yerokun, Jimi <Jimi.Yerokun@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: FW: IP2 Outage Status PM 1630 12/11

The decision to replace the RPV o-ring seals has been finalized. The new seals are slightly thicker than the old seals. Revised start-up date pushes back three days to December 23rd.

Dan

From: Haagensen, Brian
Sent: Monday, December 11, 2017 4:52 PM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Cc: Guzman, Richard <Richard.Guzman@nrc.gov>; Weil, Jenny <Jenny.Weil@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Sheehan, Neil <Neil.Sheehan@nrc.gov>
Subject: IP2 Outage Status PM 1630 12/11

IP2 has decided NOT to laser scan or depth mic/measure the RPV flange surface defects during this outage (option #2 in the critical decision paper).

Instead, they intend to:

- Drain down the RCS to 68 ft (below the flange but above the S/G tube sheet)
- remove the RPV head,
- clean the flange sealing surfaces,
- replace the leaking o-rings with new, oversized o-rings,
- replace the 21 RCP seals,
- reset the head, refill the RCS and

- proceed to plant restart

The RCS drain down has been delayed until tomorrow on day shift. They plan to remove the equipment access hatch this evening.

Plant conditions are essentially what they were this morning.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

Please note that the remaining 13 pages of this record have been withheld in their entirety under FOIA exemption 4.

Below is a list of **30** CR's created in the last 24 hours. (12/19/2017 3:24:15 AM to 12/20/2017 3:24:15 AM) For IPEC Unit 2 and 3, Ordered by Unit and Time entered. Please refer to PCRS application for detailed information.

(b)(4)

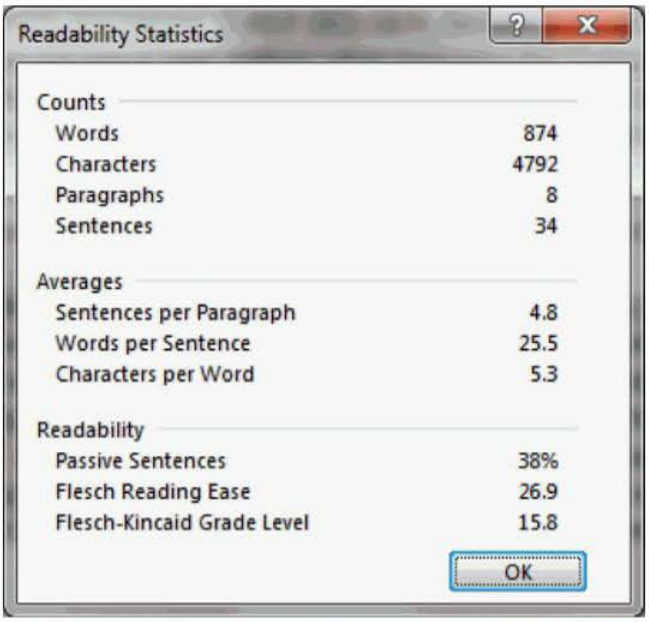
From: Haagensen, Brian
Sent: 11 Dec 2017 15:47:21 +0000
To: Haagensen, Brian
Subject: [External_Sender]
Attachments: crs109.pdf

The 12-page Condition Report has been withheld in its entirety under FOIA exemption 4.

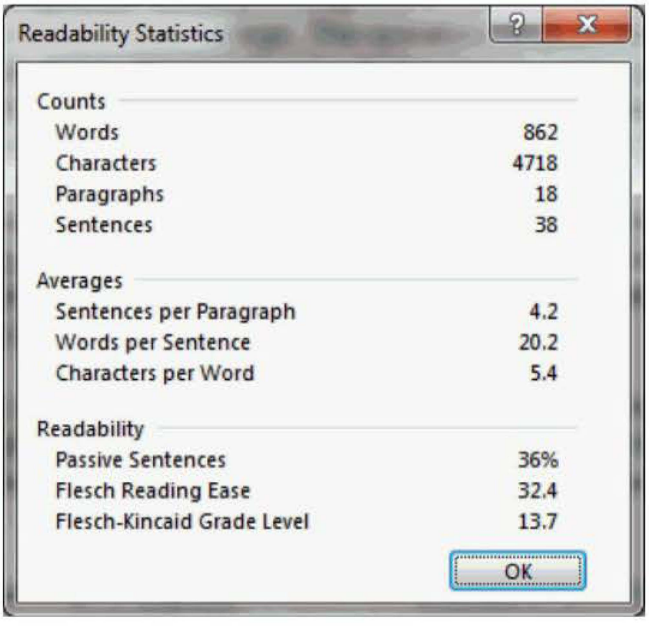
From:	Siwy, Andrew
To:	Haagensen, Brian; Rossi, Matthew
Subject:	RE: Request for comment/review on 4OA.2 O-Ring PI&R sample
Date:	Thursday, October 19, 2017 2:26:33 PM
Attachments:	image001.png image002.png 2017-003 O-ring PI&R write-up Comments by SIWY.docx

Note: The two image attachments appear in the body of the top email. The 4-page redlined draft attachment is withheld in its entirety under FOIA exemption 5.

ORIGINAL



REVISED



Andrew Siwy, P.E.
Resident Inspector | Indian Point
Region I | ☎:914.739.9360

From: Haagensen, Brian
Sent: Thursday, October 19, 2017 11:17 AM

To: Siwy, Andrew <Andrew.Siwy@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>
Subject: Request for comment/review on 4OA.2 O-Ring PI&R sample

I have substantially re-written Sarah's O-ring PI&R inspection observations. Please review and send me your edits/comments.

a. Findings and Observations

(b)(5)

(b)(5)

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

a. Findings and Observations

(b)(5)

(b)(5)

(b)(5)

From:	Haagensen, Brian
To:	Haagensen, Brian
Subject:	[External_Sender] FW: Unit 3 Vessel O-ring Leakage Evaluation
Date:	Wednesday, December 20, 2017 7:41:55 AM
Attachments:	Historical data with O-ring leakage at Unit 3 in 2017.pdf Unit 3 VC Radiation Monitor R11 and R12 Trend since June to December 2017.pdf Unit 3 VC Sample Result from June to December 2017.pdf Unit 3 VC Sump In-leakage comparison between last July to December 2016 and 2017.pdf

The 4 attachments, comprising 8 pages, have been withheld in their entirety under FOIA exemption 4.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
914-739-9360 (Office)
(b)(6) (cell)
In plant x5347

From: Chan, Tat
Sent: Tuesday, December 19, 2017 6:20 PM
To: Haagensen, Brian; Walpole, Robert W
Cc: Andreozzi, Vincent Joseph; Kaczmarek, Adam; Gioggia, Richard
Subject: Unit 3 Vessel O-ring Leakage Evaluation

Brian,

The following has been entered in CA-00003 on CR-IP2-2017-05095

Based on the current information at Unit 3, there is no indication of an external leak associated with the reactor vessel outer O-ring. The specific detail and associated explanation are as follows:

1. All leakage within the Vapor Containment (VC) including the RCS would eventually be condensed by the Containment Fan Cooler Units and drain to the VC sump. In-leakage to the sump is monitored by the VC sump pump system. This system automatically pumps out approximately 120 gallon between the actuation points and alarms in the control room, "VC Sump Pump Running". As such, a historical (similar period in 2016) where we did not an external vessel O-ring leak and confirmed by observation in 3R19. This is compared to the recent historical value after the last O-ring replacement in June 2017. The comparison indicates that the in-flux rate to the VC sump is around 0.01 GPM or less. This is within the nominal fluctuation. Additionally, a review of the VC sump pump out during May and June of 2017, where there was an active leak, VC sump pump out frequency is almost daily as compared to the nominal frequency of approximately once weekly. This support the current assessment of a tight RCS at Unit 3 based on amount of influx to the VC sump. These data is attached.
2. Out leakage from the RCS can also be captured by the installed radiation monitors (R-11 particulate / R12 gas). A review of trend since the O-ring outage has been stable and recently showed a downward trend. This support the current assessment of a tight RCS at Unit 3 based on indication from the installed radiation monitors. However, keep in mind

that magnitude and detectability is a function of the RCS condition. See attached for trend information.

3. Out leakage of RCS can also show up in short live fission products. In this case, Xe-133 with a half-life of approximately 5.2 days could be a good indicator. Based on the periodic sample of the VC atmosphere since September 2017, Xe-133 has been less than detectable. This support the current assessment of a tight RCS at Unit 3. VC sample result is attached.

As for the amount of erosion / wastage of the closure head stud(s), this would be a function of the leakage rate and impingement. With all things being equal, the amount of impingement should be negligible if the leakoff line is not obstructed where the leakoff line is routed to the Reactor Coolant Drain Tank (RCDT) normally maintained less than 2 psig. This in-leakage is captured in the weekly RCS inventory determination.

In summary, based on the available indications that would support an RCS external leakage from the vessel outer O-ring within the containment building discussed above, it is reasonable to conclude currently, the overall integrity of the vessel outer O-ring is intact.

From:	Haagensen, Brian
To:	Gray, Harold
Subject:	FW: IP2 Outage Status PM 1630 12/11
Date:	Tuesday, December 12, 2017 3:39:00 PM

Harold,

Sorry – I should have included you/DRS on this email. Please send to DRS folks as needed.

Brian

From: Haagensen, Brian
Sent: Monday, December 11, 2017 4:52 PM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Cc: Guzman, Richard <Richard.Guzman@nrc.gov>; Weil, Jenny <Jenny.Weil@nrc.gov>; Tifft, Doug (Doug.Tifft@nrc.gov) <Doug.Tifft@nrc.gov>; Sheehan, Neil <Neil.Sheehan@nrc.gov>
Subject: IP2 Outage Status PM 1630 12/11

IP2 has decided NOT to laser scan or depth mic/measure the RPV flange surface defects during this outage (option #2 in the critical decision paper).

Instead, they intend to:

- Drain down the RCS to 68 ft (below the flange but above the S/G tube sheet)
- remove the RPV head,
- clean the flange sealing surfaces,
- replace the leaking o-rings with new, oversized o-rings,
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The RCS drain down has been delayed until tomorrow on day shift. They plan to remove the equipment access hatch this evening.

Plant conditions are essentially what they were this morning.

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Weil, Jenny
Subject:	RE: IP2 Outage Status PM 1630 12/11
Date:	Tuesday, December 12, 2017 7:57:00 AM
Attachments:	O-ring.msg

The o-rings come in sets – one inner + one outer. They have two sets of the current design – which will not be used. They ordered two additional sets of oversized o-rings – one for unit 3 and one for unit 2. The Unit 2 rings are arriving on site tomorrow or Thursday. I have attached two photos of what they look like.

Brian

From: Weil, Jenny
Sent: Tuesday, December 12, 2017 7:35 AM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

Interesting - thank you! One last question - the extra o-rings that they have stockpiled are all outer ones? Or do they keep both on hand?

-------- Original Message --------
From: "Haagensen, Brian" <Brian.Haagensen@nrc.gov>
Date: Tue, December 12, 2017 7:09 AM -0500
To: "Weil, Jenny" <Jenny.Weil@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

Jenny,

No dumb questions here!

The o-rings are not readily available at Home Depot ☺ - Westinghouse fabricates them when ordered. They already have the over-sized o-ring needed for this outage. They had already ordered an over-sized o-ring for the Unit 3 outage and it will fit unit 2. The lead time to get them fabricated is fairly short. No special equipment involved.

They also keep two sets of o-rings for each unit on site for contingencies just this one. One set is stored inside containment, one set is in the warehouse. These sets are not oversized so they needed to order another set.

Brian

From: Weil, Jenny
Sent: Monday, December 11, 2017 5:33 PM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Cc: Tifft, Doug <Doug.Tifft@nrc.gov>; Greives, Jonathan <Jonathan.Greives@nrc.gov>
Subject: RE: IP2 Outage Status PM 1630 12/11

Thanks Brian – this may be a dumb question, but are o-rings something Entergy can get off

the shelf? It's not a long-lead item custom made for the reactor? And no special equipment (say, from Europe) required for the swap out?

From: Haagensen, Brian
Sent: Monday, December 11, 2017 4:52 PM
To: Fuller, Justin <Justin.Fuller@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Henrion, Mark <Mark.Henrion@nrc.gov>; Highley, Christopher <Christopher.Highley@nrc.gov>; McKown, Louis <Louis.McKown@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>; Schroeder, Daniel <Daniel.Schroeder@nrc.gov>; Setzer, Thomas <Thomas.Setzer@nrc.gov>; Siwy, Andrew <Andrew.Siwy@nrc.gov>; Safouri, Christopher <Christopher.Safouri@nrc.gov>
Cc: Guzman, Richard <Richard.Guzman@nrc.gov>; Weil, Jenny <Jenny.Weil@nrc.gov>; Tifft, Doug <Doug.Tifft@nrc.gov>; Sheehan, Neil <Neil.Sheehan@nrc.gov>
Subject: IP2 Outage Status PM 1630 12/11

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Instead, they intend to:

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Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From:	Haagensen, Brian
To:	Gray, Harold
Subject:	RE: U2 RPV Seal flange O ring drain line configuration
Date:	Monday, December 11, 2017 4:11:00 PM
Attachments:	External_Sender FW .msg

Note: The attached email, with its 4 attachments, have already been addressed (see BHaagensen's 12/11/17 4:09:23 email)

Harold,

See the last page of the attached pdf file in the attached email for the drawing – 19641.pdf. Also have good descriptions of the o-rings.

Brian

From: Gray, Harold
Sent: Monday, December 11, 2017 4:04 PM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: U2 RPV Seal flange O ring drain line configuration

Brian,

Do you have or can you get a drawing that shows the U2 RPV Seal flange inner and outer O ring drain line configuration?

I had one for U3 but it was deleted.

Thanks,

H Gray

From:	Haagensen, Brian
To:	Brian Haagensen
Subject:	Emailing: IPShutdown.11-6-2017.pdf
Date:	Wednesday, November 08, 2017 7:41:00 AM
Attachments:	IPShutdown.11-6-2017.pdf

Indian Point reactor shuts down unexpectedly, NRC investigating

Thomas C. Zambito, tzambito@lohud.com Published 1:32 p.m. ET Nov. 6, 2017

(Photo: Peter Carr/The Journal News)

One of Indian Point's two nuclear reactors shut down unexpectedly Friday night and remains without power while workers try to assess what went wrong.

Indian Point officials notified the Nuclear Regulatory Commission around 8:30 p.m. Friday that Unit 3 automatically shut down after a loss of power in a generator.

An NRC investigator arrived at the site shortly afterward to observe shutdown efforts.

SHUTDOWN: Indian Point 2 reactor back online after shutdown (/story/news/2017/10/31/indian-point-leaks/818614001/)

INDIAN POINT: Faulty bolts discovered at Indian Point nuclear power plant (/story/news/local/indian-point/2016/03/29/indian-point-nuclear-power-plant-faulty-bolts-colsure/82408462/)

LEAKS: Nuclear Regulatory Commission says Indian Point must resolve leak issue in reactors (/story/news/2017/10/31/indian-point-leaks/818614001/)

"No immediate safety concerns were identified," said NRC spokesman Neil Sheehan. "NRC staff will continue to follow any repair activities at the plant, as well as planning for restart of the unit."

This aerial view of the Indian Point nuclear power station, located in Buchanan, N.Y. and taken from about 1000 feet above the ground, looks east from the Hudson River. Photo by Spencer Ainsley *(Photo: Spencer Ainsley)*

Jerry Nappi, a spokesman for Indian Point owner Entergy, said that the shutdown went safely and that no radiation was released.

"All equipment operated as expected following the shutdown," Nappi said. "Engineers are troubleshooting an issue with the electrical generator system to

determine the exact cause of the shutdown."

It is unclear when Unit 3 will be up and running. The plant's second reactor, Unit 2, remains at 100 percent power.

The NRC's latest inspection report for Indian Point, released last week, (/story/news/2017/10/31/indian-point-leaks/818614001/)identified a recurring issue with O-rings used to seal off the plant's reactors.

The NRC says the O-ring issue has been the cause of eight water leaks since 2003 and urged Entergy to do more to prevent leaks in the future.

"Corrective actions to address the causal factors over the years have not been completely effective at preventing recurrence of the issue," the NRC report says.

The O-rings secure the lid of the reactor to the body of the reactor vessel, where nuclear fission occurs. The most recent leak occurred in June during a scheduled maintenance of Unit 3.

The NRC said that when the leaks have occurred, Entergy has been quick to shut down the plant and make repairs. But, the report noted, the company needs to evaluate its installation procedure for the O-rings to prevent leaks of water determined to be slightly radioactive.

WASTE: Nuclear waste stranded at Indian Point (/story/news/investigations/2017/10/11/nuclear-waste-indian-point/713534001/)

CRISIS: Nuclear plant shutdowns a crisis for small towns across the USA (/story/news/investigations/2017/07/12/nuclear-plant-shutdowns/403656001/)

Each of the leaks have been contained inside the reactor building and have not been released into the environment, the NRC says.

Indian Point is slated to shut down in 2021.

From:	Haagensen, Brian
To:	Siwy, Andrew
Cc:	Diane Hochmuth (Diane.Hochmuth@nrc.gov)
Subject:	Creative writing assignment
Date:	Monday, October 23, 2017 5:32:00 PM
Attachments:	Greives comments on quarterly report.pdf

Note: The 12-page draft report (with handwritten comments) is withheld in its entirety under FOIA exemption 5.

Andrew,

Please revise the o-ring sample section in the quarterly report to address Jon's concerns. I will review what you have written when I return on Wednesday with the goal to publish the quarterly report by Friday.

(b)(5)

Please complete the revisions on the linked file below, not in the report file (contrary to our usual practice of only making changes directly to the report file).

G:\Sites\IP\Documents\Inspection Reports\2017\2017-003\Annual PIR Sample on o-ring leaks.docx

Diane will be working in the report and I don't want any version conflicts at this late hour.

Brian

From: Haagensen, Brian
Sent: Monday, October 23, 2017 5:17 PM
To: Diane Hochmuth (Diane.Hochmuth@nrc.gov) <Diane.Hochmuth@nrc.gov>
Cc: Siwy, Andrew <Andrew.Siwy@nrc.gov>; Rossi, Matthew <Matthew.Rossi@nrc.gov>
Subject: Quarterly Report for final review

Diane,

I will be out of the office tomorrow (Tuesday). (b)(6)

The quarterly report is (almost) ready for your final review. Andrew changed the TOC and now there is an errant code that should be fixed. Please read it over for editorial problems, abbreviations and the other formatting issues that you check so well.

We removed the closure of two LERs from the last section.

23. LER U3 2017-002-00: Manual Isolation of the CVCS letdown to stop a valve leak resulted in an exceedance of TS 3.4.9 condition A Limit for Pressurizer Level	Andrew S	3	LER							4
17. LER U2 2017-001-00: Manual Rx Trip on June 26	Matt R	2	LER	9/5	07 Sep	v	v	8	4.0	3

- The LER U3 2017-002-00 for the excessive leakage was not completed by Andrew and will be closed next quarter. The following item has been deleted from the report:

  ~~"05000286/2017-002-00 LER Manual Isolation of Chemical and Volume Control System Normal Letdown to Stop a Valve Leak Resulted in an Exceedance of Technical Specification 3.4.9 Condition A Limit for Pressurizer Level (Section 4OA3)"~~

- The LER U2 2017-001-00 for the Manual Reactor Trip was determined to have a performance deficiency (at our pre-exit meeting last Friday) and will be closed to a new finding next quarter. This sample will have to be backed out of RRPS for this quarter.

I have modified the inspection sample plan to reflect these changes. Please remove from RRPS as appropriate.

(b)(5)

I believe I have reconciled all other comments from Andrew and Jon.

Please do your magic but do not send it to Jon until I see it one more time. Feel free to work directly with Jon if you need to better understand his comments (which are attached to this email).

Brian C. Haagensen
Senior Resident Inspector
Indian Point Energy Center
(914) 739-9360 (Office)
(b)(6) (Cell)

From: Haagensen, Brian
Sent: Wednesday, June 21, 2017 7:51 AM
To: Setzer, Thomas; Henrion, Mark; Greives, Jonathan
Subject: RPV O-ring leak CR

From: Haagensen, Brian [mailto:bhaag90@entergy.com]
Sent: Wednesday, June 21, 2017 7:50 AM
To: Haagensen, Brian <Brian.Haagensen@nrc.gov>
Subject: [External_Sender] Emailing: CR Detail

PCRS Condition Summary CR-IP3-2017-3389

PCRS WebLink

This report contains only summary information. Please consult PCRS application for full detail.

(b)(4)

Close Window

ENERGY SYSTEMS BUSINESS UNIT

Westinghouse Technical Bulletin

An advisory notice of a recent technical development pertaining to the installation or operation of Westinghouse-supplied Nuclear Plant equipment. Recipients should evaluate the information and recommendation, and initiate action where appropriate.

P.O. BOX 355, Pittsburgh, PA 15230

Subject	REVISED PROCEDURES FOR RCP SHUTDOWN WITH NO. 1 SEAL LEAKAGE OUTSIDE OPERATING LIMITS			Number	ESBU-TB-93-01-R1
System(s)	REACTOR COOLANT SYSTEM			Date	10/10/95
Affected Plants	ALL WESTINGHOUSE REACTOR COOLANT PUMPS WITH CONTROLLED LEAKAGE SEALS (See Attachment B)			S.O.(s)	125
References	EMD PRODUCT UPDATE S-013	Affects Safety Related Equipment	Yes ☒ No ☐	Sheet	1 of 14

This is Revision 1 to NSD-TB-93-01-R0 and is issued to:

1) Add the No. 1 seal operating range from WEMD Product Update S-009
2) Add Condition 5 for low No. 1 seal leak rate and increasing temperature
3) Define the elapsed time after the RCP has been tripped to isolate No. 1 seal leakoff. Revision 0 specified that the RCP had to come to a complete stop which is typically not measurable at plants.
4) Add a Notice concerning manual overide of CCW isolation
5) Add a Notice that use of the orderly shutdown in Condition 2 requires the ability to monitor total No. 1 seal flow up to 8.0 gpm
6) Correct the list of applicable plants

BACKGROUND

Years of Westinghouse RCP operating experience has demonstrated that complete failure of the No. 1 seal is a rare occurrence. A complete failure is defined as excessive No. 1 seal leakage in conjunction with pump bearing/seal inlet and/or No. 1 leakoff temperatures approaching or exceeding the maximum limits. Prior to issuing Rev. 0 of this technical bulletin, operating procedures for failed No. 1 seals directed that the No. 1 seal leakoff be isolated within 5 minutes and RCP shutdown within 30 minutes. These operating procedures are specified in the RCP instruction books or addenda to the books.

Additional Information, if Required, may be Obtained from the Originator. Telephone 412-963-5040 or (WIN) 298-5040.

Originator

T. W. Dunn

T. W. Dunn, RCP, Motor and Seal Engineering

R. F. Pfeifer

R. F. Pfeifer, Manager, RCP, Motor and Seal Engineering

Approval

J. M. Hall

J. M. Hall

OPBA Business Integration

After a review of current operating procedures and actual operating experiences with high and low leaking No. 1 seals, it was concluded that distinct procedures could specify steps for both emergency and orderly shutdowns. The two situations that follow have been incorporated into the revised procedures in this technical bulletin. As used within this bulletin, the term "emergency" refers to a condition that is related only to RCP operation and in no way pertains to emergency conditions for plant operation as defined in a plant Final Safety Analysis Report (FSAR).

1) A damaged No. 1 seal may produce debris or leak at a high enough rate to exceed the injection rate and introduce unfiltered, high temperature reactor coolant into the seals. In the presence of debris, the ability of the No. 2 seal to survive and function as a backup for the No. 1 seal is more favorable under static conditions. Thus, it is preferred to have pump shutdown precede No. 1 seal leakoff isolation.

2) High No. 1 seal leakage (>6.0 gpm) or low No. 1 seal leakage (<0.8 gpm) can occur while no other RCP parameter limits are approached or violated. In these cases, pump shutdowns within several hours are within the capabilities of the RCPs and are more conducive to orderly plant shutdowns.

The following new procedures are provided to address each of five conditions that indicate No. 1 seal flow outside of the operating limits (0.8-6.0 gpm) that are defined in Attachment C. Conditions 1-3 address high No. 1 seal leakage and Conditions 4 and 5 address low No. 1 seal leakage. Each condition and the respective procedure is specified below and summarized in Attachment A.

DEFINITIONS

1.	No. 1 seal leakoff indication:	Flowmeter readout of No. 1 seal leak rate
2.	No. 2 seal leakoff indication:	Flowmeter readout or estimate of No. 2 seal leak rate
3.	Total No. 1 Seal Flow:	Sum of No. 1 and No. 2 seal leakoff indications
4.	Immediate Shutdown:	RCP shutdown and isolation of No. 1 seal leakoff within 5 minutes of a high or low No. 1 seal leakoff flow indication per Conditions 1, 3, or 5 (No. 1 seal leakoff isolation needs to occur promptly after the RCP has stopped for Conditions 1, 3, and 5. RCP coastdown time is normally less than

2 minutes after tripping the pump. Actual coastdown time is dependent on the plant and number of RCPs operating. Assuming 3 minutes for coastdown, the No. 1 seal leakoff is isolated between 3 and 5 minutes after tripping the RCP.

5. Orderly Shutdown: RCP shutdown within 8 hours or low No. 1 seal leakoff flow indication per Conditions 2 or 4.

NOTICES

NOTICE 1: A manual plant trip must precede an "Emergency" or 'Orderly" RCP shutdown. This will prevent an automatic plant trip on a "low flow" signal which represents an unnecessary challenge to installed safety systems.

NOTICE 2: The ability to monitor total No. 1 seal flow (No. 1 seal leakoff plus No. 2 seal leakoff) up to at least 8.0 gpm is required to proceed with an orderly shutdown for high No. 1 seal flows described in Condition 2.

NOTICE 3: A No. 1 seal leak rate that exceeds the seal injection flow rate may cause local boiling in the thermal barrier heat exchanger of the affected RCP. This may be detected outside the RCP and activate automatic isolation of component cooling water (CCW). The number of RCP heat exchangers automatically isolated is dependent on the plant specific CCW system design which may include local isolation valves at each RCP or a common containment isolation valve for all RCPs.

Failure to override CCW isolation for this high No. 1 seal leak rate condition could result in extensive damage to the RCP and seal components. Manual override of automatic CCW isolation should be performed to avoid potential damage to the RCP. However, for those plants that are not equipped with local isolation valves but have a common containment isolation valve for all RCP heat exchangers, plant safety considerations have precedence over manual override of CCW containment isolation.

Each plant needs to evaluate their specific CCW system design and address plant safety requirements to determine if manual override of automatic CCW isolation may be incorporated into operating procedures for high No.1 seal leak rate conditions.

PROCEDURES

The following procedures supersede those in the RCP instruction books or addenda to the books relative to RCP emergency operation and shutdown procedures for high or low No. 1 seal leak rates. Apply the Conditions 1 through 5 procedures that follow.

Also, the Condition 1 shutdown procedure supersedes the RCP emergency operation and shutdown procedure for No. 2 and No. 3 seals in WEMD Product Update S-013, Revision 0, and in the RCP instruction books or addenda to the books. The No. 2 and No. 3 seal leak rate limits that are specified in WEMD Product Update S-013 are unchanged.

If no alternative Westinghouse direction has been provided to address a specific RCP seal performance condition at a plant, the following are the recommended shutdown procedures for No. 1 seal leak rates outside the operating limits (0.8-6.0 gpm).

Condition 1: a) No. 1 seal leakoff indication > 6.0 gpm
and/or
Total No. 1 seal flow > 6.0 gpm

b) Increasing pump bearing/seal inlet temperature
and/or
Increasing No. 1 seal leakoff temperature

Procedure: 1) Shut down the RCP immediately after a manual plant trip.

2) Isolate the No. 1 seal leakoff between 3 minutes and 5 minutes after the RCP is tripped.

3) Monitor component cooling water (CCW) to ensure adequate flow and manually override automatic isolation if permitted by plant procedures (see Notice 3).

4) Do not restart the pump until the cause of the seal malfunction has been determined and corrected.

Condition 2: a) No. 1 seal leakoff indication > 6.0 gpm
and/or
Total No. 1 seal flow > 6.0 gpm and <8.0 gpm

b) Pump bearing/seal inlet temperature is not increasing.

c) No. 1 seal leakoff temperature (if equipped) is not increasing.

Procedure: Notice 2 applies for the following orderly shutdown. Otherwise, proceed with an immediate shutdown in accordance with the Condition 3 procedure.

1) Prepare for an orderly pump shutdown to take effect within 8 hours of exceeding 6.0 gpm No. 1 seal flow. Ensure that seal injection flow rate is 9 gpm or greater to the affected RCP.

2) Continue to monitor the No. 1 seal for further degradation during the orderly shutdown. If the total No. 1 seal flow exceeds 8.0 gpm or temperatures begin to increase, proceed with immediate shutdown in accordance with the Condition 3 procedure. Otherwise, proceed with the orderly shutdown.

3) Secure the pump within 8 hours of exceeding a No. 1 seal leakoff indication or total No. 1 seal flow of 6.0 gpm.

4) Monitor component cooling water (CCW) to ensure adequate flow and manually override automatic isolation it permitted by plant procedures (see Notice 3).

5) Three minutes or longer after the RCP is tripped, No. 1 seal leakoff may be isolated at the discretion of plant operators to mitigate inventory loss and to assure that seal injection flow exceeds total No. 1 seal flow on the affected pump.

6) Do not restart the pump until the cause of the seal malfunction has been determined and corrected.

Condition 3: a) Total No. 1 seal flow $\geq$ 8.0 gpm

Procedure: 1) Shut down the RCP immediately after a manual plant trip.

2) Isolate the No. 1 seal leakoff between 3 minutes and 5 minutes after the RCP is tripped.

3) Monitor component cooling water (CCW) to ensure adequate flow and manually override automatic isolation if permitted by plant procedures (see Notice 3).

4) Do not restart the pump until the cause of the seal malfunction has been determined and corrected.

Condition 4: a) No. 1 seal leakoff indication < 0.8 gpm

b) Zero (or negligible) No. 2 seal leak rate such that total No. 1 seal flow < 0.8 gpm.

c) Pump bearing/seal inlet temperature and No. 1 seal leakoff temperature (if equipped) are stable (i.e., not continuously increasing) and within limits.

Procedure: 1) Prepare for an orderly pump shutdown to take effect within 8 hours of violating the minimum 0.8 gpm No. 1 seal leak rate limit.

2) Continue to monitor the No. 1 seal for further degradation during the orderly shutdown. If the low No. 1 seal leakage reverses to high leakage (> 6.0 gpm) or temperatures start to increase, proceed with immediate shutdown in accordance with the Condition 1 procedure. Otherwise, proceed with the orderly shutdown.

3) Secure the pump within 8 hours of violating the minimum 0.8 gpm No. 1 seal leak rate limit.

4) Do not restart the pump until the cause of the seal malfunction has been determined and corrected.

Condition 5: a) No. 1 seal leakoff indication < 0.8 gpm

b) Zero (or negligible) No. 2 seal leak rate such that total No. 1 seal flow < 0.8 gpm.

c) Increasing pump bearing/seal inlet temperature
and/or
Increasing No. 1 seal leakoff temperature

Procedure:

1) Shut down the RCP immediately after a manual plant trip.

2) Isolate the No. 1 seal leakoff between 3 minutes and 5 minutes after the RCP is tripped.

3) Do not restart the pump until the cause of the seal malfunction has been determined and corrected.

ATTACHMENT A

Condition	No. 1 Leakoff Indication	No. 2 Leakoff Indication	Total No. 1 Seal Flow	Pump Bearing/Seal Inlet and/or No. 1 Leakoff Temp	RCP Shutdown
1	> 6.0 gpm		> 6.0 gpm	Increasing	Immediate (within 5 minutes)
2	> 6.0 gpm		> 6.0 gpm and < 8.0 gpm	Stable	Orderly (within 8 hours)
3			> 8.0 gpm	Stable or increasing	Immediate (within 5 minutes)
4	< 0.8 gpm	Zero (or negligible)	< 0.8 gpm	Stable	Orderly (within 8 hours)
5	< 0.8 gpm	Zero (or negligible)	< 0.8 gpm	Increasing	Immediate (within 5 minutes)

Notes:

1. Total No. 1 seal flow = No. 1 leakoff plus No. 2 leakoff indications
2. For Conditions 1, 3, and 5, a manual plant trip must precede the RCP shutdown.

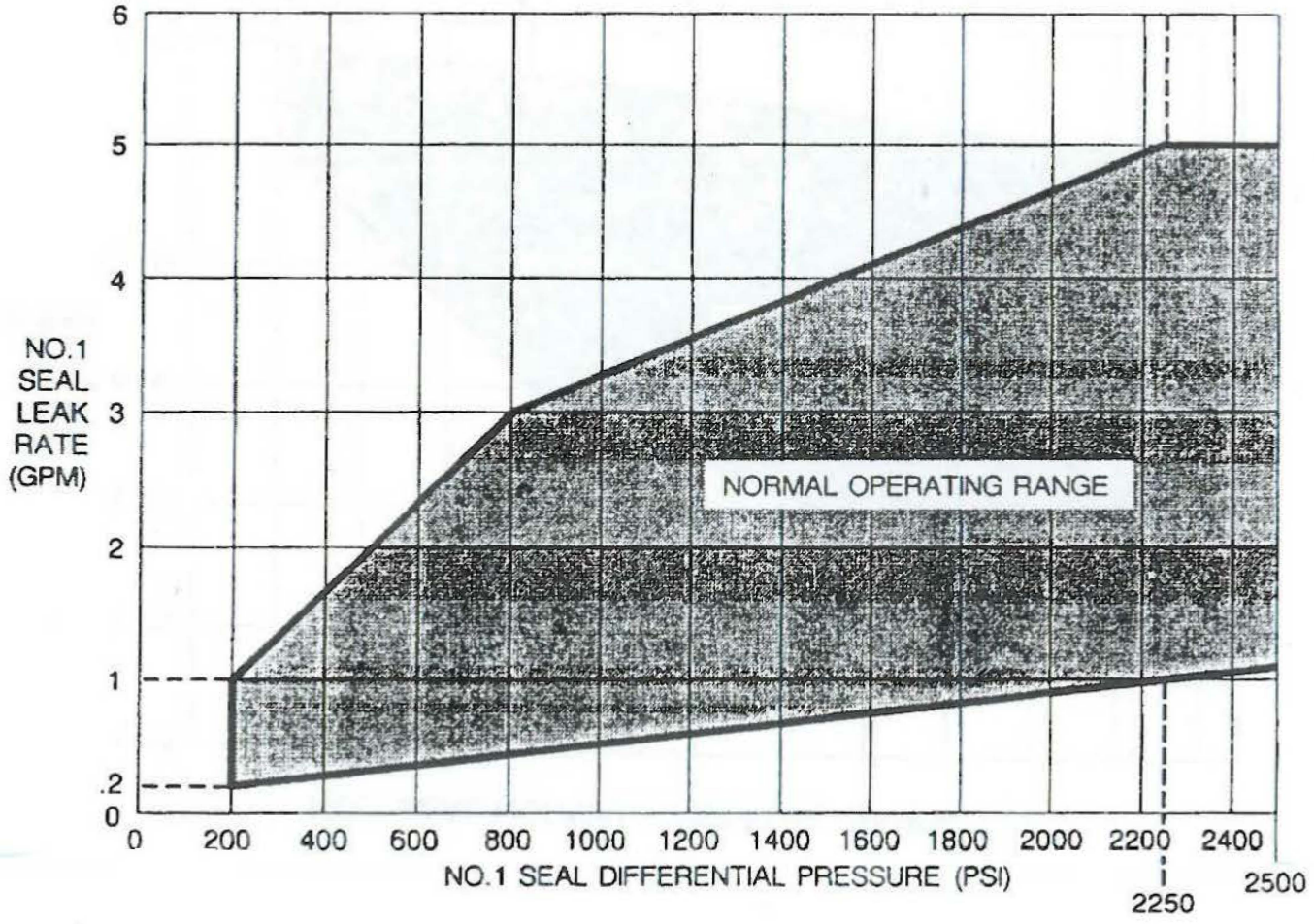
ATTACHMENT B

PLANT	SPIN
Almaraz Nos. 1 & 2	ARZ/ASZ
Angra No. 1	ANG
Asco No. 1 & 2	FEY/FFY
Beaver Valley No. 1	DLW
Beaver Valley No. 2	DMW
Beznau Nos. 1 & 2	NOK/NBK
Braidwood Nos. 1 & 2	CCE/CDE
Byron Nos. 1 & 2	CAE/CBE
Jose Cabrera (Zorita)	UEM
Callaway	SCP
Catawba Nos. 1 & 2	DCP/DDP
Comanche Peak Nos. 1 & 2	TBX/TCX
Cook Nos. 1 & 2	AEP/AMP
Diablo Canyon Nos. 1 & 2	PGE/PEG
Farley Nos. 1 & 2	ALA/APR
Genkai No. 1	GENP
Genkai No. 3	QGN
Ginna	RGE
Haddam Neck	CYW
Harris No. 1	CQL
Ikata No. 1	MSPN
Indian Point No. 2	IPP
Indian Point No. 3	INT
Kewaunee	WPS
Kori No. 1	KOR
Kori No. 2	KPR
Kori Nos. 3 & 4	KGA/KHB
Krsko	KRK
Maanshan Nos. 1 & 2	TWP/TXP
McGuire Nos. 1 & 2	DAP/DBP
Mihama No. 1	KEP
Mihama No. 2	MEP
Mihama No. 3	MRC
Millstone No. 3	NEU
Napot Point	PLA
North Anna Nos. 1 & 2	VRA/VGB
Oconee No. 1	BOCO1

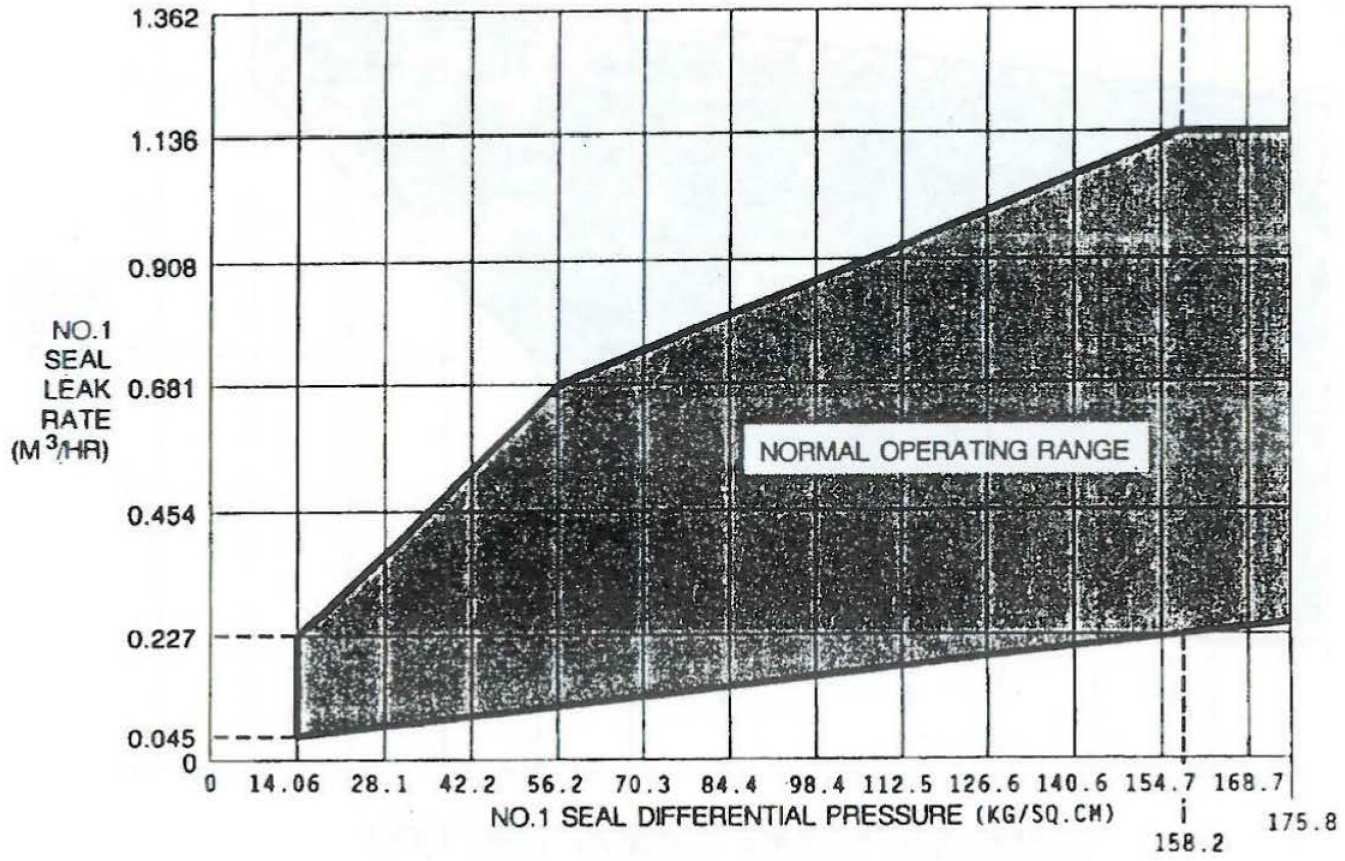
ATTACHMENT B (continued)

PLANT	SPIN
Ohi Nos. 1 & 2	OHI/OKB
Ohi Nos. 3 & 4	KON
Point Beach Nos. 1 & 2	WEP/WIS
Prairie Island Nos. 1 & 2	NSP/NRP
Ringhals No. 2	SSP
Ringhals No. 3	STP
Ringhals No. 4	SUP
Robinson No. 2	CPL
Salem Nos. 1 & 2	PSE/PNJ
San Onofre No. 1	SCE
Seabrook No. 1	NAH
Sequoyah Nos. 1 & 2	TVA/TEN
Sizewell B	SWB
South Texas Nos.1 & 2	TGX/THX
V. C. Summer	CGE
Surry Nos. 1 & 2	VPA/VIR
Takahama No. 1	TAK
Takahama No. 2	TMP
Takahama Nos. 3 & 4	MIT
Three Mile Island No. 1	B3MI1
Trojan	POR
Turkey Point Nos.3 & 4	FPL/FLA
Vandellos No. 2	EAS
Vogtle Nos. 1 & 2	GAE/GBE
Watts Bar Nos. 1 & 2	WAT/WBT
Wolf Creek	SAP
YongGwang Nos. 1 & 2	KSR/KTR
Zion Nos. 1 & 2	CWE/COM

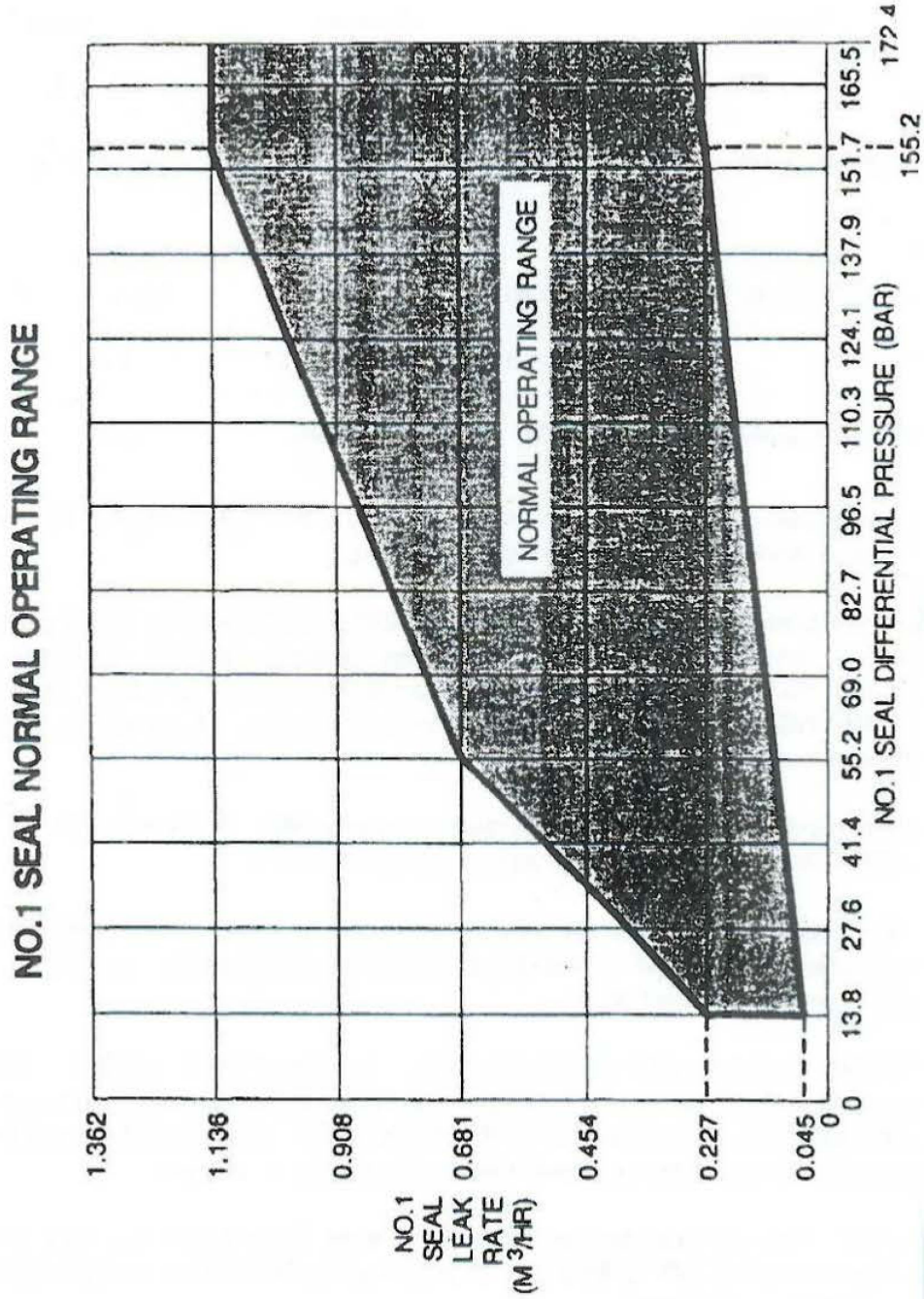
NO.1 SEAL NORMAL OPERATING RANGE



NO.1 SEAL NORMAL OPERATING RANGE



ATTACHMENT C



ATTACHMENT C
NO. 1 SEAL LEAK RATE OPERATING VALUES

Startup	Minimum	Notes
Flow (gpm)	0.2	a, b, c
Differential Pressure (psid)	200	b, d

Continuous Operation	Normal	Minimum	Maximum	Notes
Flow (gpm)	1.0-5.0	0.8	6.0	c, e , f
Differential Pressure (psid)	2250	2150	2300	

a) Apply the operating and troubleshooting guidelines in the RCP Instruction Manual for leak rates below the minimum startup requirement.

b) Minimum startup requirements are 0.2 gpm at 200 psid differential pressure across the No. 1 seal. For startups at differential pressures greater than 200 psid, the minimum No. 1 seal leak rate requirements are defined in the NO. 1 SEAL NORMAL OPERATING RANGE (e.g., at 1000 psi differential pressure, do not start the RCP with less than 0.5 gpm).

c) Alarm setpoints should indicate leak rates outside the NO. 1 SEAL NORMAL OPERATING RANGE for startup and continuous operation.

d) A No. 1 seal differential pressure of 200 psid or greater must be maintained during all periods of RCP operation, including pump bumps during venting, and pump coastdowns after pump bumps.

e) If the No. 1 seal leak rates are outside the normal range (1.0-5.0 gpm) but within the operating limits (0.8-6.0 gpm), continue pump operation. Ensure that seal injection flow exceeds No. 1 seal leak rate for the affected RCP. Closely monitor pump and seal parameters and contact Westinghouse for further instructions.

f) For No. 1 seal leak rates outside the operating limits, follow the procedures in this technical bulletin (NSD-TB-93-01) for shutdown of the RCP in the absence of other Westinghouse guidelines.

Power Reactor Event # 52829

Site: INDIAN POINT **Notification Date / Time:** 06/26/2017 18:39 (EDT)
Unit: 2 **Region:** 1 **State :** NY **Event Date / Time:** 06/26/2017 (EDT)
Reactor Type: [2] W-4-LP,[3] W-4-LP **Last Modification:** 06/26/2017
Containment Type: DRY AMB DRY AMB

NRC Notified by: MICHAEL MCCARTHY **Notifications:** RAY POWELL R1DO
HQ Ops Officer: VINCE KLCO
Emergency Class: NON EMERGENCY
10 CFR Section:
50.72(b)(2)(iv)(B) RPS ACTUATION - CRITICAL
50.72(b)(2)(xi) OFFSITE NOTIFICATION
50.72(b)(3)(iv)(A) VALID SPECIF SYS ACTUATION

Unit	Scram Code	RX Crit	Init Power	Initial RX Mode	Curr Power	Current RX Mode
2	A/R	Yes	93	Power Operation	0	Hot Standby

MANUAL REACTOR TRIP DUE TO LOSS OF MAIN FEEDPUMP

"On June 26, 2017, at 1531 [EDT], Indian Point Unit 2 inserted a manual reactor trip prior to Steam Generator levels reaching the automatic reactor trip setpoint. Steam Generator water level perturbation resulted from a loss of 22 Main Boiler Feed Pump. All Control Rods verified inserted. The Auxiliary Feedwater System started as designed and supplied feedwater to the Steam Generators. Heat removal is via the Main Condenser through the High Pressure Steam Dumps. Offsite power is being supplied through the normal 138kV feeder 95332. The cause of the 22 Main Boiler Feed Pump loss is currently under investigation. Entergy is issuing a press release/news release on this issue."

Unit 2 is stable and in Mode 3. There was no impact on Unit 3.

The licensee notified the State of New York and the NRC Resident Inspector.

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Power Reactor Event # 52801

Site: INDIAN POINT **Notification Date / Time:** 06/11/2017 14:35 (EDT)
Unit: 3 **Region:** 1 **State :** NY **Event Date / Time:** 06/11/2017 09:11 (EDT)
Reactor Type: [2] W-4-LP,[3] W-4-LP **Last Modification:** 06/11/2017
Containment Type: DRY AMB DRY AMB

NRC Notified by: CLIFTON GATES **Notifications:** BLAKE WELLING R1DO
HQ Ops Officer: JEFF ROTTON
Emergency Class: NON EMERGENCY
10 CFR Section:
50.72(b)(3)(v)(A) POT UNABLE TO SAFE SD

Unit	Scram Code	RX Crit	Init Power	Initial RX Mode	Curr Power	Current RX Mode
3	N	Yes	100	Power Operation	100	Power Operation

EXCESSIVE BONNET LEAKAGE FROM CHEMICAL VOLUME CONTROL SYSTEM VALVE

"At Indian Point Energy Center [IPEC], Unit 3 normal letdown was isolated due to a significant body/bonnet leak on the inlet valve to Reactor Coolant Filter. Shift team took action to isolate letdown and stop the leak. The Abnormal Operating Procedure (AOP) was entered, normal letdown was isolated per procedure, and excess letdown was placed in service to balance inventory at 61 percent Pressurizer Level. This was above the Technical Specification [3.4.9] level of 54.3 percent which was exceeded at 0911 [EDT], putting the unit in a 6-hour shutdown action statement. The valve body/bonnet was torqued, successfully eliminating the leakage. Pressurizer Level was restored to the normal control band and the AOP was exited at 1136. The SM [Shift Manager] estimated the leakage at 18 gallons per minute when leak was active. No EAL [Emergency Action Level] thresholds were exceeded. This occurrence is considered a safety system functional failure per 10 CFR 50.72(b)(3)(v)(A), requiring an 8-hour NRC report. Both IPEC units are stable at full power."

The licensee has notified the NRC Resident Inspector and the New York State Public Service Commission.

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From: Giantelli, Joseph
Sent: 27 Jun 2014 08:09:00 -0400
To: Mathew, Roy;Issa, Alfred
Subject: FYI - LER - DAVIS-BESSE: REACTOR TRIP DUE TO REACTOR COOLANT PUMP MOTOR FAULTY ELECTRICAL CONNECTION

LER 3462013001R00 - DAVIS-BESSE: REACTOR TRIP DUE TO REACTOR COOLANT PUMP MOTOR FAULTY ELECTRICAL CONNECTION (EN 49159)

On June 29, 2013, with Davis-Besse operating at approximately 100 percent power, the Reactor Coolant Pump (RCP) Motor 1-2 tripped due to actuation of a differential trip relay in the motor source breaker. This resulted in a reactor trip from the Reactor Protection System on Flux/Delta-Flux/Flow. Licensees determined the cause of the RCP motor trip to be a failure in the current transformer (CT) circuit. A screw on the RCP Motor 1-2 CT terminal block had a stress/fatigue related failure which caused the wire to detach in the CT circuitry causing an open circuit and actuation of the differential trip. The investigation also found degraded wiring in the CT circuit because it was touching the high voltage buss bar insulation in the RCP motor termination box and experienced degradation caused by corona discharge. The CT wiring and terminal block including all screws were replaced. The screws were replaced with a different type of material. Procurement documents will be revised to ensure replacement hardware is of appropriate quality to meet ANSI standards. The CT wiring, terminal blocks and screws in all four RCPs will be inspected during the next scheduled outage. Forward to TRG Lead for Electrical Power Systems (Roy Mathew) and NRO (Al Issa); assigned to Joe Giantelli

Joe Giantelli
Operating Experience Branch
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joseph.giantelli@nrc.gov

If you want to go quickly go alone.
If you want to go far go together.