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MAR 16 2011

L-2011-069
10 CFR 50.90

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to NRC Request for Additional Information Regarding Extended Power Uprate License Amendment Request No. 205 and Steam Generator Tube Integrity and Chemical Engineering (CSGB) Issues

References:

(1) M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request No. 205: Extended Power Uprate (EPU)," (TAC Nos. ME4907 and ME4908), Accession No. ML103560169, October 21, 2010.

(2) Email from J. Paige (NRC) to T. Abbatiello (FPL), "Turkey Point EPU - Steam Generator Tube Integrity and Chemical Engineering (CSGB) Request for Additional Information - Round 1," Accession No. ML110460287, February 15, 2011.

By letter L-2010-113 dated October 21, 2010 [Reference 1], Florida Power and Light Company (FPL) requested to amend Renewed Facility Operating Licenses DPR-31 and DPR-41 and revise the Turkey Point Units 3 and 4 Technical Specifications (TS). The proposed amendment will increase each unit's licensed core power level from 2300 megawatts thermal (MWt) to 2644 MWt and revise the Renewed Facility Operating Licenses and TS to support operation at this increased core thermal power level. This represents an approximate increase of 15% and is therefore considered an extended power uprate (EPU).

By email from the U.S. Nuclear Regulatory Commission (NRC) Project Manager (PM) dated February 15, 2011 [Reference 2], additional information regarding Steam Generator Tube Integrity and Chemical Engineering issues was requested by the NRC staff in the Steam Generator Tube Integrity and Chemical Engineering Branch (CSGB) to support their review of the EPU License Amendment Request (LAR). The NRC Request for Additional Information (RAI) consisted of three (3) questions regarding protective coatings and flow accelerated corrosion programs. These three RAI questions and the applicable FPL responses are documented in Attachment 1 to this letter.

In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the State Designee of Florida.

This submittal does not alter the significant hazards consideration or environmental assessment previously submitted by FPL letter L-2010-113 [Reference 1].

This submittal contains no new commitments and no revisions to existing commitments.

Should you have any questions regarding this submittal, please contact Mr. Robert J. Tomonto, Licensing Manager, at (305) 246-7327.

A001
NRR

I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 16, 2011.

Very truly yours,

Michael Kiley
Site Vice President
Turkey Point Nuclear Plant

Attachments

cc: USNRC Regional Administrator, Region II
USNRC Project Manager, Turkey Point Nuclear Plant
USNRC Resident Inspector, Turkey Point Nuclear Plant
Mr. W. A. Passetti, Florida Department of Health

Turkey Point Units 3 and 4

RESPONSE TO NRC RAI REGARDING EPU LAR NO. 205
AND STEAM GENERATOR TUBE INTEGRITY
AND CHEMICAL ENGINEERING ISSUES (CSGB) – ROUND 1

ATTACHMENT 1

This coversheet plus 9 pages

Response to Request for Additional Information

The following information is provided by Florida Power & Light (FPL) in response to the U. S. Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI). This information was requested to support License Amendment Request (LAR) No. 205, Extended Power Uprate (EPU), for Turkey Point Nuclear Plant (PTN) Units 3 and 4 that was submitted to the NRC by FPL letter L-2010-113 on October 21, 2010 [Reference 1].

In an email dated February 15, 2011 [Reference 2], the NRC staff requested additional information regarding FPL's request to implement the Extended Power Uprate. The RAI consisted of three (3) questions from the NRC Steam Generator Tube Integrity and Chemical Engineering Branch (CSGB) regarding protective coatings and flow accelerated corrosion programs. These three RAI questions and the applicable FPL responses are documented below.

CSGB-1.1 By letter dated October 21, 2010, Attachment 4, the licensee provides table 2.1.7-1, which summarizes the current and post extended power uprate (EPU) loss of coolant accident parameters applicable to Service Level I coatings. However, the table does not provide the results of the design basis accident (DBA) testing qualifying the Service Level I coatings. Provide the DBA testing results for the maximum temperature, pressure, pH and irradiation for the coatings used in containment in order for the NRC staff to ensure that the DBA tests bound the proposed EPU conditions.

All Service Level I coating systems used at the Turkey Point Plant Units 3 and 4 were tested at conditions more severe than the post EPU loss of coolant accident (LOCA) conditions and the results exhibited acceptable performance while the test temperatures, pressures, and radiation levels bound the LOCA conditions. The DBA testing was done in compliance with ANSI N101.2, and 101.4.

Listed below is each coating system's DBA testing parameters:

Starglaze 2011S with Carboguard 890N as a Topcoat on Concrete

- Test Temperature 307 °F
- Test Pressure 60 psig
- Test Integrated Radiation Dose $1.0*10^9$ rad
- Test Water Chemistry : 2,350 PPM Boron adjusted to pH 9.5 with NaOH.

Two Coats of Carboguard 890N on Concrete

- Test Temperature 310 °F
- Test Pressure 60 psig
- Test Integrated Radiation Dose $2.69*10^8$ rad
- Test Water Chemistry: 3,070-3,780 PPM Boron dissolved in demineralized water.

Two Coats of Carboguard 890N on Steel

- Test Temperature 307 °F
- Test Pressure 60 psig

- Test Integrated Radiation Dose 1.0*10^9 rad
- Test Water Chemistry: 2,350 PPM Boron adjusted to pH 9.5 with NaOH.

Carbozinc 11 on Steel

- Test Temperature 307 °F
- Test Pressure 60 psig
- Test Integrated Radiation Dose 1*10^9 rad
- Test Water Chemistry : 0.28 M Boron adjusted to pH 9.5 with NaOH.

Carboline 195 with Phenoline 305 as a Topcoat on Concrete

- Test Temperature 340 °F
- Test Pressure 70 psig
- Test Integrated Radiation Dose 1*10^9 rad
- Test Water Chemistry: 0.28 M Boron adjusted to pH 9.5 with NaOH.

Carboline 1340 Clear on Concrete

- Test Temperature 340 °F
- Test Pressure 70 psig
- Test Integrated Radiation Dose 1.34*10^9 rad
- Test Water Chemistry Distilled water only

Keeler and Long 6548/7107 with Keeler and Long E-1-7155 as a Topcoat on Steel

- Test Temperature 340 °F
- Test Pressure 70 psig
- Test integrated Radiation Exposure 1*10^9 rad
- Test Water Chemistry: 0.28 M Boron adjusted to pH 9.5 with NaOH.

Phenoline 305 Primer and Finish on Concrete

- Test Temperature 307 °F
- Test Pressure 60 psig
- Test Integrated Radiation Exposure 1*10^9 rad
- Test Water Chemistry: 0.28 M Boron adjusted to pH 9.5 with NaOH.

Carbozinc 11 with Phenoline 305 as a Topcoat on Steel

- Test Temperature 307 °F
- Test Pressure 60 psig
- Test Integrated Radiation Exposure 1*10^9 rad
- Test Water Chemistry: 0.28 M Boron adjusted to pH 9.5 with NaOH.

The change in maximum pH from current DBA conditions to post EPU DBA conditions is 7.2 to approximately 8. Each coating system was tested at a pH level that exceeds the expected post EPU DBA pH level. The exception is pH exposure for Carboline 1340 Clear applied on concrete surfaces which was tested in a water chemistry consisting of demineralized water only. The change in pH level is considered insignificant, as this coating is not susceptible to damage at these pH levels.

CSGB-1.2 Florida Power & Light Company's Service Level I coating specifications failed to provide corrosion control to Turkey Point Nuclear Plant Units 3 and 4 containment liners.

a. Per Licensee Event Report 2010-005-00, corrective actions to prevent coating failure reoccurrence include application of a coating system suitable for immersion service on the liner plate in the lower region of the reactor pit area for both plants. Explain how the coating system used will be qualified for normal and maximum hypothetical accidental conditions, including immersion. Provide the results of the qualification testing performed for the coating system used in this repair.

The specified coating repair areas shall be coated per the FPL Protective Coatings for Service Level I applications inside the reactor containment building specification using special process requirements as described below. The repair/replacement coating system specified is Carboguard 890N, a cycloaliphatic amine nuclear grade DBA tested self priming epoxy mastic which is designed for both periodic immersion and severe chemical environments. This is replacing the inorganic zinc primer with an epoxy phenolic topcoat that was previously applied to the containment liner plate walls. Carboguard 890N has been qualified for use for safety related coatings application since mid 1980s with typical exposures that include splash, spill and periodic immersion in borated water. Carboguard 890N has passed stringent testing under the applicable ANSI and ASTM standards which includes chemical immersion testing appropriate for application in a dry containment.

The primary requirements to prevent coating failures in periodic chemical immersion are adhesion and resistance to moisture vapor penetration, temperature, chemicals, and cathodic disbondment. The absorption of chemical ions from water absorption is the driving force that Service Level I periodic immersion coatings must resist. DBA test data provides documentation of the coating's ability to withstand both severe temperature and pressure changes using chemical solution that include boric acid solution in concentration levels that are used in operating plants. The DBA test parameters and results for Service Level I coatings systems are provided in the response to CSGB-1.1.

Additional testing for the repair coating, beyond the required DBA testing, consisted of immersion in Boric Acid for 120 hours and salt fog exposure for 2000 hours. These tests provided excellent results. The boric acid immersion test was performed for one and two coats of Carboguard 890N and each test panel resulted in a 100% performance. After 2000 hours of ASTM B117 salt fog exposure, one coat Carboguard 890N exhibited slight rusting and blistering with a range of 2.5 mm to 3.75 mm scribe undercutting while two coats Carboguard 890N exhibited no effect on the plane areas and a range of 3.5 mm to 4.0 mm scribe undercutting. These additional tests bound the chemical environment that is anticipated in the reactor pit elevation (-15'8"). After cure of the coating system has been completed, both DBA and periodic boric acid chemical immersion testing show excellent results.

Therefore, chemical attack by boric acid is not considered credible per available testing results, both DBA and periodic chemical immersion.

b. As a result of this new operating experience, explain the changes to plant specifications and programs for Service Level I protective coatings; specifically with respect to procurement, storage, removal of existing coatings, surface preparations, application, inspection, applicator's certification, quality assurance documentation, and condition assessments.

PTN identified several programmatic issues as contributors to the event reported in LER 2010-005-00. These included exclusion of the lower reactor cavity pit area in walkdowns conducted by the Appendix J and Containment Coatings Programs. The ASME XI Subsection IWE/IWL Program also did not include this area until 2005. Since 2005, the IWE Program inspections of the lower reactor cavity pit area have been performed once per period. Going forward, improvements to the training and procedures for personnel performing IWE examinations of liner plates will include the following:

- IWE examiners will take additional training in IWE/IWL specific requirements of Class MC components and the metallic liner of Class CC components.
- FPL is conducting a review of industry IWE visual data sheets. The results will be incorporated into enhanced PTN IWE visual data sheets that will be provided for IWE visual examiners before the reactor cavity liner plate inspection that will be conducted during the next refueling outage.
- Specific IWE requirements will be covered in detail in pre-job briefings.

The Appendix J Program Inspection will include the reactor pit area. However, credit can be taken for the IWE inspections of this area during the same refueling outage to address ALARA concerns for multiple entries into a locked high radiation area. Similarly, the Containment Coatings Program will rely on the periodic IWE Program inspections in this area.

In addition, the procedure for the Boric Acid Corrosion Control (BACC) Program has been revised to provide specific guidance for ensuring that leakage of borated water from the upper reactor cavity is identified. It includes the caution that even though such leakage is from a low temperature source and may not lead to significant buildup of boric acid deposits, it can lead to significant corrosive attack over an extended time on components such as the containment liner plate. The reactor pit area is inspected during each refueling outage under the BACC program.

Carboguard 890N will be replacing the coating system previously installed in the reactor pit area. Carboguard 890N is the Service Level I coating used for new applications and for repair/replacement activities. This coating has been tested under conditions which are greater than the maximum pre and post EPU DBA conditions as described in the response to CSGB-1.1.

The program will continue to meet its licensing basis requirements as described in the current Service Level I coatings specification. The coatings specification provides the technical requirements for protective coatings work performed inside the reactor containment buildings (RCBs) and covers procurement, storage, removal of degraded coatings, surface preparation, application, inspection, applicator's certification, quality assurance documentation, condition assessment, and other related coatings activities. Adequate assurance that the applicable requirements for procurement, application, inspection, and maintenance is provided by procedures and programmatic controls, approved under the FPL Quality Assurance program.

CSGB-1.3 The flow accelerated corrosion (FAC) monitoring program includes the use of a predictive method to calculate the wall thinning of components susceptible to FAC. In order for the staff to evaluate the accuracy of these predictions, the staff requests a sample list of components for which wall thinning is predicted and measured by ultrasonic testing or other methods. Include the initial wall thickness (nominal), current (measured) wall thickness, and a comparison of the measured wall thickness to the thickness predicted by the model.

A sample list of Feedwater System components has been provided for which wall thinning is predicted and measured by ultrasonic testing (UT), or another approved method. This list includes the initial wall thickness (nominal), current (measured) wall thickness, and the thickness predicted by the CHECWORKS™ FAC model.

Attachment 2 is the Wear Rate Analysis: Combined Summary Report for the Feedwater System Trains A, B, and C piping for this sample list of components. The report identifies the requested thicknesses for various Feedwater System piping segments. As an example, for component name IFA-P-13 (P=piping) the initial wall thickness (nominal) is 0.594 inches, the current (measured) wall thickness is 0.549 inches and the thickness predicted by the CHECWORKS™ FAC model is 0.525 inches.

References

1. M. Kiley (FPL) to U.S. Nuclear Regulatory Commission (L-2010-113), "License Amendment Request No. 205: Extended Power Uprate (EPU)," (TAC Nos. ME4907 and ME4908), Accession No. ML103560169, October 21, 2010.
2. Email from J. Paige (NRC) to T. Abbatiello (NRC), "Turkey Point EPU – Steam Generator Tube Integrity and Chemical Engineering (CGSB) Request for Additional Information - Round 1," Accession No. ML110460287, February 15, 2011.

Company : Florida Power and Light Co.
Plant : Turkey Point
Unit : 3
DB Name: PTN-3_V3

Report Date/Time : 03-Mar-2011 4:49 pm
Analysis Date/Time : 26-Jun-2009 8:32 am

CHECWORKS SFA Version:2.2 SP-1 (build 70)

Wear Rate Analysis: Combined Summary Report

Run Name : FW HEATER 6 TO SG'S
Ending Period : RFO 27
Total Plant Operating Hours: 266988 Duty Factor (Global) : 1.000
WRA Data Option : NFA->ARD->HBD->COMP
Exclude Measure Wear : NO
Line Correction Factor : 1.208

===> Grouped by Line: FW: CLASS CHG-SGA 817 4,651 1, Sorted by: Flow Order

Component Name		Geom Code	Average Wear Rate (mils/yr)	Current Wear Rate (mils/yr)	Thickness (in) Init.	Prd.[1]	Thoop	Tcrit	Comp Predict [1] Time to Tcrit (hrs)	Inspected	Total Lifetime Wear (mils) Prd.[2]	Meas.	In-Service Comp Wear (mils) Prd.[2]	Meas.	In-Service Comp Tmeas (in)[4]	Method [3]	Time (hrs)[4]	Time (hrs) Last Inspected
IFA-T-10	96.XXX (D/S)	15	3.751	1.844	0.594	0.527	0.492	0.520	32181	Yes	85.8	83.0	85.8	83.0	0.555	MT	125882	125882
IFA-P-11	102.551	65	2.501	1.229	0.594	0.518	0.492	0.520	-14066	No	0.0	0.0	0.0	0.0	0.594		150	0
IFA-E-12	95.561	2	4.627	2.274	0.594	0.526	0.492	0.520	23811	Yes	105.8	111.0	105.8	111.0	0.561	MT	125882	125882
IFA-P-13	95.XXX	52	3.126	1.537	0.594	0.525	0.492	0.520	31469	Yes	71.5	81.0	71.5	81.0	0.549	MT	125882	125882
IFA-T-14	103.540	15	3.751	1.844	0.594	0.533	0.492	0.492	192506	Yes	99.3	113.0	99.3	113.0	0.561	MT	125882	185461
IFA-T-14	103.540 (D/S)	15	3.751	1.844	0.594	0.536	0.492	0.520	74934	Yes	99.3	64.0	99.3	64.0	0.564	MT	125882	185461
IFA-P-15	95.XXX	65	2.501	1.229	0.594	0.542	0.492	0.520	168660	Yes	57.2	57.0	57.2	57.0	0.561	MT	125882	126882
IFA-P-15A	XX.INA	9	1.847	0.968	0.594	0.538	0.492	0.520	162672	No	0.0	0.0	0.0	0.0	0.594		0	0
IFA-E-16	94.565	1	4.126	2.028	0.594	0.529	0.492	0.520	41435	Yes	90.0	90.0	90.0	80.0	0.565	MT	114972	114972
IFA-P-17	013.529	51	2.751	1.352	0.594	0.521	0.492	0.492	185832	Yes	71.5	69.0	71.5	69.0	0.533	GW	173998	173998
IFA-E-18	043.531	1	4.130	2.028	0.594	0.518	0.492	0.492	112246	Yes	111.9	126.0	111.9	125.0	0.532	GW	198186	198186
IFA-P-19	92.561	51	2.751	1.352	0.594	0.534	0.492	0.520	92311	Yes	56.8	37.0	56.8	37.0	0.561	MT	103992	103992
IFA-P-19A	92.576	9	1.846	0.968	0.594	0.558	0.492	0.520	344076	Yes	37.9	59.0	37.9	69.0	0.576	MT	103992	103992
IFA-E-20	92.614	2	4.627	2.274	0.594	0.569	0.492	0.520	188121	Yes	95.5	112.0	95.5	112.0	0.614	MT	103992	103992
IFA-P-21	076.536	52	3.126	1.537	0.594	0.501	0.492	0.492	53514	Yes	87.8	63.0	87.8	63.0	0.512	GW	198186	219983
IFA-E-22	102.526	2	4.627	2.274	0.594	0.512	0.492	0.520	-34622	Yes	95.5	87.0	95.5	87.0	0.557	MT	103992	103992
IFA-E-24	92.590	2	4.625	2.274	0.594	0.545	0.492	0.520	95681	Yes	95.5	93.0	95.5	93.0	0.590	MT	103992	103992
IFA-P-25	014.536	52	3.126	1.537	0.594	0.522	0.492	0.492	171063	Yes	81.2	137.0	81.2	137.0	0.536	MT	173998	173998
IFA-E-26	92.573	2	4.627	2.274	0.594	0.528	0.492	0.520	30202	Yes	95.5	131.0	95.5	131.0	0.573	MT	103992	103992
IFA-P-27	92.556	52	3.126	1.537	0.594	0.525	0.492	0.520	31743	Yes	64.5	71.0	64.5	71.0	0.556	MT	103992	103992
IFA-X-28	074.502 (D/S)	18	2.729	1.341	0.750	0.690	0.633	0.638	337861	Yes	76.7	104.0	76.7	104.0	0.699	GW	198186	219983
IFA-X-28	074.502	18	3.501	1.721	0.594	0.568	0.492	0.492	387398	Yes	99.4	132.8	99.4	132.9	0.580	GW	198186	219983
IFA-N-29		30	3.642	1.789	0.750	0.639	0.633	0.656	-98232	No	0.0	0.0	0.0	0.0	0.750		0	0

Component Name		Geom Code	Average Wear Rate (mils/yr)	Current Wear Rate (mils/yr)	Thickness (in) Init.	Prd.[1]	Thoop	Tcrit	Comp Predict [1] Time to Tcrit (hrs)	Inspected	Total Lifetime Wear (mils) Prd.[2]	Meas.	In-Service Comp Wear (mils) Prd.[2]	Meas.	In-Service Comp Tmeas, (in)[4]	Method [3]	Time (hrs)[4]	Time (hrs) Last Inspected
IFA-P-9	073.540	54	4.001	1.967	0.594	0.526	0.492	0.520	26169	Yes	112.4	80.0	112.4	80.0	0.556	MT	125882	219983
IFA-T-10	96.XXX	15	3.761	1.844	0.594	0.524	0.492	0.520	17930	Yes	85.8	80.0	85.8	80.0	0.552	MT	125882	125882

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IFB-T-10	102.562 (D/S)	15	3.755	1.844	0.594	0.546	0.492	0.520	123645	Yes	95.2	45.0	95.2	45.0	0.565	GW	161087	161087
IFB-P-11	062.557	65	2.503	1.229	0.594	0.555	0.492	0.492	446802	Yes	69.0	47.0	69.0	47.0	0.562	GW	208248	209248
IFB-E-12	98.642	2	4.631	2.274	0.594	0.453	0.492	0.520	-203156	No	0.0	0.0	0.0	0.0	0.594		0	0
IFB-P-13	062.556	52	3.129	1.537	0.594	0.547	0.492	0.492	312841	Yes	86.2	62.0	86.2	62.0	0.556	GW	208248	209248
IFB-T-14	062.558	15	3.765	1.844	0.594	0.547	0.492	0.492	281637	Yes	103.5	65.0	103.6	65.0	0.558	GW	208248	209248
IFB-T-14	062.558 (D/S)	15	3.755	1.844	0.594	0.551	0.492	0.520	148715	Yes	103.5	61.0	103.5	61.0	0.562	GW	208248	209248
IFB-P-15	00.-T14	65	2.503	1.229	0.594	0.518	0.492	0.520	-15001	No	0.0	0.0	0.0	0.0	0.594		0	0
IFB-E-16	92.648	1	4.126	2.028	0.594	0.608	0.492	0.520	378953	Yes	85.2	45.0	85.2	45.0	0.649	MT	103992	103992
IFB-E-17	92.646	3	4.376	2.151	0.594	0.603	0.492	0.520	339161	Yes	90.4	75.0	90.4	75.0	0.646	MT	103992	103992
IFB-P-18	03.INAC	53	3.129	1.537	0.594	0.499	0.492	0.520	-130219	No	0.0	0.0	0.0	0.0	0.594		0	0
IFB-P-18A	03.555	9	1.847	0.966	0.594	0.538	0.492	0.492	414263	Yes	48.8	61.0	48.8	61.0	0.594		0	185461
IFB-E-19	95.578	2	2.438	2.274	0.594	0.543	0.492	0.520	89039	Yes	10.2	123.0	10.2	123.0	0.578	MT	125982	125682
IFB-P-20	95.INA	52	1.847	1.537	0.594	0.563	0.492	0.520	248792	No	0.0	0.0	0.0	0.0	0.594		104218	0
IFB-E-21	92.621	2	2.440	2.274	0.594	0.576	0.492	0.520	216082	Yes	0.0	118.0	0.0	118.0	0.621	MT	103992	103992
IFB-P-22	074.553	52	1.649	1.537	0.594	0.527	0.492	0.492	201057	Yes	23.3	57.0	23.3	67.0	0.551	MT	125982	219983
IFB-E-23	92.619	2	4.627	2.274	0.594	0.574	0.492	0.520	207379	Yes	95.5	77.0	95.5	77.0	0.619	MT	103992	103992
IFB-P-24	014.531	52	1.649	1.537	0.594	0.507	0.492	0.492	87048	Yes	16.7	117.0	16.7	117.0	0.531	MT	125982	173998
IFB-E-25	94.619	2	4.627	2.274	0.594	0.579	0.492	0.520	226300	Yes	101.0	96.0	101.0	96.0	0.619	MT	114972	114972
IFB-P-26	012.555	52	3.126	1.537	0.594	0.523	0.492	0.520	176649	Yes	81.2	69.0	81.2	69.0	0.550	MT	114972	173998
IFB-X-27	064.509	18	1.945	1.721	0.594	0.543	0.492	0.492	258483	Yes	24.1	187.0	24.1	187.0	0.553	GW	208248	209248
IFB-X-27	064.509 (D/S)	18	1.439	1.341	0.750	0.687	0.633	0.633	352898	Yes	14.5	109.0	14.5	109.0	0.695	GW	208248	173998
IFB-N-28		30	3.642	1.789	0.750	0.639	0.633	0.656	-96232	No	0.0	0.0	0.0	0.0	0.750		0	0
IFB-P-9	92.557	54	4.001	1.967	0.594	0.518	0.492	0.520	-9006	Yes	82.6	41.0	82.6	41.0	0.557	MT	103992	103992
IFB-T-10	102.562	15	3.755	1.844	0.594	0.546	0.492	0.520	123645	Yes	95.2	42.0	95.2	42.0	0.565	GW	161087	161087

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IFC-T-10	062.532 (D/S)	15	3.755	1.844	0.594	0.545	0.492	0.520	120213	Yes	103.5	70.0	103.5	70.0	0.556	GW	208248	208248
IFC-P-11	97.-T10	65	2.503	1.229	0.594	0.518	0.492	0.520	-15001	No	0.0	0.0	0.0	0.0	0.594		0	0
IFC-E-12	97.601	2	4.631	2.274	0.594	0.453	0.492	0.520	-203156	No	0.0	0.0	0.0	0.0	0.594		0	0
IFC-P-13	97.-T14	52	3.129	1.537	0.594	0.499	0.492	0.520	-130219	No	0.0	0.0	0.0	0.0	0.594		0	0
IFC-T-14	073.546	15	3.755	1.844	0.594	0.480	0.492	0.492	-67128	Yes	105.6	1.0	105.6	1.0	0.594		0	219983
IFC-T-14	073.546 (D/S)	15	3.755	1.844	0.594	0.480	0.492	0.520	-170652	No	0.0	0.0	0.0	0.0	0.594		0	0
IFC-P-15	97.-T14	65	2.503	1.229	0.594	0.518	0.492	0.520	-15001	No	0.0	0.0	0.0	0.0	0.594		0	0

Component Name		Geom Code	Average Wear Rate (mils/yr)	Current Wear Rate (mils/yr)	Thickness (in) Init.	Thickness (in) Prd.[1]	Thickness (in) Thoop	Thickness (in) Tcrit	Comp Predict [1] Time to Tcrit (hrs)	Inspected	Total Lifetime Wear (mils) Prd.[2]	Total Lifetime Wear (mils) Meas.	In-Service Comp Wear (mils) Prd.[2]	In-Service Comp Wear (mils) Meas.	In-Service Comp Tmeas (in)[4]	Method [3]	Time (hrs)[4]	Time (hrs) Last Inspected
IFC-P-15A	03.564	9	1.847	0.966	0.594	0.538	0.492	0.492	414263	Yes	48.8	50.0	48.8	50.0	0.594		0	186461
IFC-E-16	032.542	1	4.126	2.028	0.594	0.509	0.492	0.492	74904	Yes	109.3	128.0	109.3	128.0	0.545	MT	114972	186461
IFC-E-17	093.529	3	4.381	2.151	0.594	0.550	0.492	0.520	123358	Yes	125.7	120.0	125.7	120.0	0.593	MT	103992	232122
IFC-P-18	093.563	53	3.129	1.537	0.594	0.529	0.492	0.520	54546	Yes	89.8	46.0	89.8	46.0	0.560	MT	103992	232122
IFC-P-18A	043.535	9	1.846	0.966	0.594	0.529	0.492	0.492	331883	Yes	49.8	89.0	49.8	89.0	0.535	GW	198186	198186
IFC-E-19	942.596	1	4.126	2.028	0.594	0.560	0.492	0.520	175310	Yes	90.0	178.0	90.0	178.0	0.596	MT	114972	114972
IFC-P-20	104.543	51	2.751	1.352	0.594	0.531	0.492	0.492	250439	Yes	74.5	70.0	74.5	70.0	0.540	GW	198186	198186
IFC-P-20A	103.540	9	1.846	0.966	0.594	0.534	0.492	0.492	378844	Yes	48.7	60.0	48.7	60.0	0.549	MT	125882	185461
IFC-E-21	002.568	1	4.130	2.029	0.594	0.553	0.492	0.520	142970	Yes	104.7	107.0	104.7	107.0	0.574	GW	161087	161087
IFC-P-22	105.556	51	2.751	1.352	0.594	0.527	0.492	0.492	224528	Yes	74.5	109.0	74.5	109.0	0.536	GW	198186	198186
IFC-E-23	92.630	2	4.627	2.274	0.594	0.585	0.492	0.520	249747	Yes	95.6	92.0	95.6	92.0	0.630	MT	103992	103992
IFC-P-24	044.534	52	3.126	1.537	0.594	0.559	0.492	0.492	384141	Yes	84.6	82.0	84.6	82.0	0.570	GW	198186	198186
IFC-E-25	94.610	2	3.141	2.274	0.594	0.570	0.492	0.520	193635	Yes	38.0	60.0	38.0	60.0	0.610	MT	114972	114972
IFC-E-26	94.601	4	3.141	2.274	0.594	0.561	0.492	0.520	168970	Yes	38.0	85.0	38.0	85.0	0.601	MT	114972	114972
IFC-E-27	922.564	4	3.141	2.274	0.594	0.519	0.492	0.520	-4463	Yes	32.5	101.0	32.5	101.0	0.564	MT	103992	103992
IFC-P-28	922.554	54	2.717	1.967	0.594	0.515	0.492	0.520	-24093	Yes	28.1	62.0	28.1	62.0	0.554	MT	103992	103992
IFC-X-29	105.497 (D/S)	18	2.729	1.341	0.750	0.673	0.633	0.633	259824	Yes	70.9	176.0	70.9	176.0	0.685	GW	173998	173998
IFC-X-29	105.497	18	3.501	1.721	0.594	0.479	0.492	0.492	-73869	Yes	91.0	129.0	91.0	129.0	0.495	GW	173998	173998
IFC-N-30		30	3.642	1.789	0.750	0.639	0.633	0.658	-98232	No	0.0	0.0	0.0	0.0	0.760		0	0
IFC-P-9	922.538	54	4.001	1.967	0.594	0.499	0.492	0.520	-107865	Yes	82.6	73.0	82.6	73.0	0.538	MT	103992	103992
IFC-T-10	062.532	15	3.755	1.844	0.594	0.537	0.492	0.492	214033	Yes	103.5	89.0	103.5	89.0	0.548	GW	208248	208248

Notes:

[1] Predictions are based on last Tmeas to analysis ending period.
[2] Predictions are for the time of last known meas. wear. Can be P-to-P value depending on meas. wear method.
[3] GW = Tmeas is minimum thickness from Band, Blanket or Area Method of greatest wear.
MT = Tmeas is component minimum thickness.
PW = Tmeas is Tinit - predicted wear.
US = Tmeas is user specified.
[4] If no Tmeas has been determined from measured data, then Tmeas = Tinit and Time = current component installation time.
Tmeas is used to determine Predicted Thickness and Component Predicted Time to Tcrit.