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

St. Lucie Nuclear Plant, Units 1 and 2
Docket Nos. 50-335 and 50-389

Subject: Third Supplement to License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b"

References:

1. Florida Power & Light Company letter L-2014-242, "Application to Adopt TSTF-505, Revision 1, Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4B," December 5, 2014 (ML14353A016)
2. NRC E-mail "Request for Additional Information - St. Lucie TSTF-505 EICB - MF5372 & MF 5373," March 28, 2016 (ML16089A006)
3. NRC E-mail "Request for Additional Information - St. Lucie TSTF-505 APLA - MF5372 & MF5373," April 13, 2016 (ML16105A456)
4. NRC E-mail "Request for Additional Information - St. Lucie TSTF 505 APLA - MF5372 & MF5373," May 27, 2016 (ML16152A187)
5. Florida Power & Light Company letter L-2016-114, "Response to Request for Additional Information Regarding License Amendment Request to Adopt TSTF-505, 'Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4B'," July 8, 2016 (ML16193A659)
6. Florida Power & Light Company letter L-2016-135, "Second Response to Request for Additional Information Regarding License Amendment Request to Adopt TSTF-505, 'Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4B'," July 22, 2016 (ML16208A061)
7. Florida Power & Light Company letter L-2017-007 "Supplement to License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4b'," February 25, 2017 (ML17058A181)
8. NRC E-mail "Request for Additional Information - St. Lucie RICT LAR - MF5372/5363," October 4, 2017 (ML17277A369)
9. NRC E-mail "Request for Additional Information – St. Lucie RICT LAR I&C – (CACs MF5372/MF5375 EPID L-2014-LLA-0001)," February 1, 2018 (ML18033A014)

10. Florida Power & Light Company letter 2018-006, "Third Response to Request for Additional Information Regarding License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," February 1, 2018 (ML18032A614)
11. Florida Power & Light Company letter L-2018-058, "Fourth Response to Request for Additional Information Regarding License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," March 15, 2018 (ML18074A116)
12. Florida Power & Light Company letter L-2018-111, "Second Supplement to License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," June 7, 2018 (ML18158A228)

In Reference 1, as supplemented by References 5, 6, 7, 10, 11, and 12, Florida Power & Light Company (FPL) submitted a license amendment request (LAR) for St. Lucie Units 1 and 2. The proposed amendment would revise the Technical Specifications (TS) to implement TSTF-505, Revision 1, "Provide Risk-Informed Extended Completion Times RITSTF [Risk Informed TSTF] Initiative 4b."

This letter supplements the LAR by providing additional information regarding PRA open facts and observations (F&O's). Attachment 1 contains a table of open finding level F&Os and the disposition of each F&O with regard to the Risk Informed Completion Time Program. The table identifies four PRA model changes that must occur to support implementation of the Risk Informed Completion Time Program. As a result, Attachments 2 and 3 provide a revised license condition for Unit 1 and Unit 2, respectively, that incorporates these implementation items and supersedes the license condition previously proposed in Reference 10.

The proposed changes submitted in Reference 1 included some editorial and format changes in addition to changes to add risk informed completion times (RICTs). Some of the changes to add RICTs were subsequently withdrawn from TS that also contained editorial changes; however, the withdrawal was not clear regarding whether the editorial changes were also being withdrawn. FPL desires to retain the proposed editorial changes initially submitted in Reference 1. Therefore, Attachments 4 and 5 provide markups of several Unit 1 and Unit 2 TS pages, respectively, containing the editorial changes that FPL desires to retain. The attachments also contain markups of TS that make minor editorial corrections to maintain consistency between the two units' TS. The markup of Unit 1 TS 3.6.1.3, "Containment Air Locks," supersedes the corresponding markup in Reference 7, and the markup of Unit 2 TS 3.8.1, "A. C. Sources," supersedes the corresponding markup in Reference 11.

In Reference 7, FPL proposed adding a RICT to Unit 1 and Unit 2 TS 3.7.1.2, Action a, for an inoperable auxiliary feedwater (AFW) pump. However, TS 3.7.1.2, "Auxiliary Feedwater System," was revised with the issuance of Amendment Nos. 245 and 196 for Unit 1 and 2, respectively, on July 9, 2018, which included the addition of a new Action a for the condition that one AFW pump steam supply is inoperable. FPL proposes to add a RICT to the new Action for an inoperable steam supply. Because the LAR originally proposed a RICT for an inoperable AFW pump, and an inoperable steam supply is a specific cause of an inoperable AFW pump, applying a RICT to an

inoperable AFW steam supply is appropriate and does not involve a loss of function. Attachments 4 and 5 include markups of TS 3.7.1.2 for Unit 1 and Unit 2, respectively, showing the proposed changes. These markups supersede the corresponding markups previously submitted in Reference 7.

This supplement does not alter the conclusions in Reference 1 that the changes do not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with the changes.

No new or revised commitments are included in this letter

Should you have any questions regarding this submittal, please contact Mr. Michael Snyder, Licensing Manager, at (772) 467-7036.

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

Executed on Sept. 18, 2018

Sincerely,

Daniel D. DeBoer

Daniel DeBoer
Site Director
Florida Power & Light Company

Attachments

cc: NRC Regional Administrator, Region II
NRC Senior Resident Inspector
NRC Project Manager
Ms. Cindy Becker, Florida Department of Health

Attachment 1

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
Internal Events PRA Model Findings					
AS-04	AS-A5	RWT rupture is assumed to fail shutdown cooling. This seems overly conservative. Without make-up the level in the RCS would drop, but there is more than enough fluid in the Boric Acid Tanks and the VCT to restore this level. The level does not need to be fully restored to allow shutdown cooling. The level need only be above the hot leg. Estimated Level Drop 2250 psia at 600 F (0.0217 ft^3/lbm) to 100 psia at 300F (0.01766 ft^3/lbm). Given RCS liquid volume of 10,400 ft^3, this means approximately 18,500 gallons are required to restore the PRZ level. Each Boric Acid Tank contains 9700 gallons the VCT contains 4000 gallons. Fully PRZ level is not required full shutdown cooling when core damage is the alternative.	This finding was reviewed and closed with no further action. This scenario was reviewed to be contrary to current plant practices and EOPs. Use of RWT and BAMTs are required when RCS needs makeup due to shrinkage following Rx trip. The reviewer assumes that Ops will continue to SDC, even in case if RWT rupture were to occur during makeup to the point where RCS cooling continues at a rate of 100F/hr, and RCS level drops down to about midloop level. EOP-02, step 4.5 prevent against this behavior by requiring that OP ensure RCS inventory control is maintained, and PZR level is restored between 30% to 35%. SDC will not continue until PZR level is restored. The concerned scenario is perceived as not credible.	This F&O is confusing and needs to be interpreted. The F&O talks about SDC when it is implied that cooldown is being reviewed. Since this is a C-E designed plant, there is a separate pump for HPSI and charging. The source for the charging pump at PSL is the VCT which can be fed from either the boric acid makeup tank or the RWT. So failure of the RWT would not fail charging to makeup during cooldown. However, further review also found gate M1BORATN02 where failure of the RWT would fail emergency boration. The gate M1BORATN02 is an "OR" gate. This gate needs to be changed to "AND" the suction sources. This F&O remains open pending correction of this logic error. <u>Comments</u> The resolution of this F&O in the GDOC should be revised to address the loss of the RWT during plant cooldown.	The current model does not support the finding that RWT is required to establish SDC. Charging pumps take suction from BAMTs and not VCT which is isolated on SIAS (CVCS letdown and VCT are only required during operation). If the RCS level drops, for any reason, CVCS has enough inventory to makeup at a reduced RCS inventory level, even before reaching the level for top of the Hot Leg. SITs will be dumped at 250# in U1 and 600# for U2, which are setpoints above the interlocks for SDC, restoring the full level of RCS and allowing entry into SDC if needed at 235#. The referenced logic correction is made into the current working model which will be revised prior to use for RICT calculations. The model change may have favorable impact on RICT calculations impacting Charging System. ***1. <u>Implementation Item:</u>*** Model revision and associated documentation are an implementation item.
AS-06	AS-A3	Consider adding low pressure feed (using Condensate pumps) to the model for accident sequences involving loss of all	This finding has been resolved and considered closed. Total Loss of MFW/AFW is about 3% of CDF. Adding this credit will	There is no documentation to support the resolution to close without any further actions. The accident sequence notebook	The current working model for Unit 1 was revised to credit Low Pressure Feed to S/Gs. The change favorably impacts RICT calculations associated

Disposition and Resolution of Open F&Os					
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		MFW/AFW. Using condensate pumps to feed the SG's is in both EOP 6 'Total Loss of Feed' and EOP-15 'Functional Recovery Procedure'. Operations is directed to use low pressure feed in 1-EOP-06 (Step 8.B.3.1). Crediting low-pressure feed will eliminate those core damage sequences where the MFW pumps are lost, but the condensate pumps are available. If the TBVs are not available, then the hot well make-up control system (or an operation action) must be modeled to incorporate this alternative. Adding LPF could reduce dependency on Once Through Cooling for a number of accident sequences. (See F&O AS-03 also)	require developing new HRA that would counter-affect its benefit and will not significantly change the conclusion. Therefore, credit of low pressure feed is considered with neutral benefit and will not be added to the model at this time.	should include a brief discussion as to why the condensate feed capability was conservatively not credited. This F&O is considered to still be open.	with only small portion scenarios associated with Total Loss of Feed and does not significantly impact overall CDF/LERF scenarios. The current working model will be revised prior to use for RICT calculations. **2. *<u>Implementation Item:</u>*** Model revision and associated documentation are an implementation item.
AS-08	AS-A5	Check Valves 09294 and 09252 are common for both AFW, MFW, and Low Pressure Feed. These CKVs currently appear only in the AFW system. The may be some events (e.g. LOL) where the turbine trips and steam generator pressure rises enough to cause the closure of these check valves. Under these scenarios, the failure of both of these checks would fail all	Data analysis and CCF analysis have been updated numerous times since the development of this F&O. CCF module FMM1SGCVLV was added under gates F1SG1APATH, F1SG1BPATH, F1SG1APATH-<4, and F1SG1BPATH-<4. Added events FCVN109252 under gates F1SG1APATH and F1SG1APATH-<4. Added events FCVN109294 under gates F1SG1BPATH and	Document PSL-1FJR-03-009 was reviewed. There is no documentation of the logic changes made to resolve this F&O in the referenced calculation. It is unclear which check valve CCF combinations are appropriate to consider. The fault tree was reviewed and a CCF module was added to the model in the common cause gates. This F&O is considered to	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		secondary side heat removal. Currently, these CKVs are modeled under FMM1SGCVLV. This event has a failure probability far lower than several three element CKV groups in the AFW system. There does not appear to be a basis for this difference. The failure likelihoods (independent and common cause) of the check valves in the AFW system should be consistent or the basis for the difference is documented. Further, as the random failure of these CKVs could cause a LOFW trip and eliminate all secondary side feed to a single S/G, this is worthy of consideration as an initiating event.	F1SG1BPATH-<4 Implemented in current update (Calc PSL-1FJR-03-009, Rev 0).	still be open.	
AS-12	AS-A5	Currently, shutdown cooling is credited as a long-term cooling method to eliminate the re-circulation requirement on certain ranges of LOCA breaks. A certain amount of water must be above the bottom of the hot leg to avoid drawing vapor into the shutdown cooling system. Some calculation must be done to ensure that the RCS will be above this critical point. This calculation could be quite simple: determine the RCS water level at the point of shutdown	This finding was reviewed and closed with no further action. To enter SDC during the course of mitigating a LOCA, an RCS level of 30% in the Pressurizer is required by EOP-3. Further, once SDC has been entered AOP-03-02 requires OTC to be re-established if RCS level falls below 29 feet 9.5 inches (Top of Hot Leg). Operation of SDC in the above referenced condition is procedurally not allowed and physically not possible. Therefore the question is highly hypothetical and not applicable at PSL.	The response for resolution is inadequate. The LOCA for which SDC is used needs documentation that the RWST is still available for makeup. If the RWST is depleted, then the only other source for water for long term cooling would be the containment sumps. The containment sumps can only supply water via recirculation. The AS notebook should document the basis for the range of LOCA sizes that can credit SDC for long-term cooling. This F&O is considered to still be	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	**Supporting Requirement**	**Description**	**Finding Resolutions Provided to Independent Review For Finding Closure**	**Independent Review Comments**	**Disposition for RICT**
		cooling entry conditions, determine the leakage rate at the point, verify the RCS level will be adequate for the remaining part of the 24 hr mission without re-circulation or RCS make-up. If this is not true, then addition make-up must be modeled through the emergency sump or CVCS.		open, pending incorporation of documentation.	
AS-13	AS-A2	The PORVs are only assumed to lift given total loss of secondary side heat removal or a loss of load with no anticipatory trip. This appears non-conservative. The only loss of load trips considered are TT and loss of off-site power trips. This is based on an informal calculation that shows the RCS pressure exceeds 2300 psia, but stays below the PORV open set point of 2400 psia. This does not consider variations in the time delay between the turbine trip and the reactor trip nor does it consider variations in the PRZ pressure set point. Consideration of these variables may lead the analyst to conclude that the likelihood of a PORV lift during this condition is much larger than analyzed. Further, the portion of the tree (under Gate U1QT99) that models the circuitry associated with the anticipatory trip only	This finding has been resolved and closed by an update to the model/documentation. It is not true that the model considers only the assumed scenario. There are other scenarios that were considered to challenge the PORVs. See logic under gate U1QT03. Input on trips likely to challenge PORVs were received from fuels group and incorporated throughout the model update process.	The PRA model fault tree was reviewed. It was confirmed that several other initiators other than loss of load and loss of offsite power would cause the PORVs to lift. This was determined by reviewing the logic under gate U1QT03 and the ATWS logic (U1P01). However, the use of a single event ('NLCD1TURB') for the anticipatory trip function was not addressed. No documentation for the basis for this event is included in the notebook. Until the anticipatory trip is modeled in more detail or further documentation of the basis for a single event is provided, this F&O is considered to be open.	The current working model is revised to increase fidelity and level of details associated with anticipatory trip function. There is no impact on RICT calculation. The current working model will be revised prior to use for RICT calculations. ***3. <u>Implementation Item:</u>*** Model revision and associated documentation are an implementation item.

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		contains a single basic event. No other support system dependencies appear. For example, does the status of pressurizer spray affect this calculation? Are there support system failures that could cause a loss of load and disable or degrade the anticipatory trip function?			
DA-C14-01	DA-C14	It appears that the treatment of coincident unavailability for inter-systems was considered. However, there was no clear documentation to demonstrate such treatment. Coincident unavailability due to maintenance for different trains of the same system (intra-system) is not allowed by established plant procedures. Therefore, the calculation of coincident unavailabilities for intra-systems as a result of planned and repetitive activities was not calculated. There was no clear documentation on the treatment of coincident unavailability for inter-systems. Discussion with the utility PRA staff indicated that review of the plant operating history was performed to identify potential coincident unavailability for inter-systems. No such unavailabilities were identified. The PRA staff also demonstrated that the PRA	This finding was reviewed and closed with no further action. This SR requires "EXAMINING" coincident unavailability due to maintenance for redundant equipment (both intrasystem and intersystem) that is a result of a planned, repetitive activity based on actual plant experience. The key words here are "PLANNED" and "REPETITIVE". At PSL, there is no coincident unavailability of "PLANNED" and "REPETITIVE" maintenance for redundant equipment (both intrasystem and intersystem) to be allowed, per plant T/S, procedure, guidelines, and instructions.	Table (A-1) in PSL-BFJR-06-008 Rev.5 provides justification for lack of inter-system unavailability. There are some non-staggered tasks which could be done at the same time so it looks like there are some inter-system maintenance which could be done at the same time. Non-staggered tasks are also identified in Table (2) of the same report. However, the resolution should point to the administrative procedures that preclude such coincident unavailability. Further, the discussions referred to in the GDOC Description should be documented somewhere in the actual data notebook. This F&O should remain open.	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
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		model accounts for coincident unavailability for inter-systems by the use of appropriate mutually exclusive logic.			
HR-D1-01	HR-D1	Some inconsistencies have been identified between the documentation, the HRA calculator file and the CAFTA model; one example is AHFL1CSTIV, which is indicated as 2.7E-5 in the summary table 3.0 while appears to have the floor value from ASEP in the HRA calculator file (i.e., 1E-5) (See F&O HR-D1-01). A more conservative value has ben entered in the model, with respect of what the HRA calculator provides.	Resolved per PSL-BFJR-08-003, Rev 1, and PSL-BFJR-17-029 Rev 0.	For pre-initiator HEPs, PSL-BFJR-08-003, Revision 1 was reviewed along with the PSL GDOC draft revision (rev. 1) that provides the updated closure basis for this finding. A spot-check of the Unit 1 and 2 pre-initiator mean values identified in Tables 19 and 20 of document 08-003-Rev.1 were checked against the CAFTA.rr basic events for consistency. All basic event values input to the CAFTA model were found to be consistent. For post-initiator HEPs, PSL-BFJR-15-014, the RR file and the recovery file were reviewed. For these HEPs, there were still inconsistencies. This F&O is considered to still be open. <u>Comments</u> It was noted that there were inconsistencies between the HRA calculator and the PRA notebook for post initiators: LHFPMANUAL AND NHFPMANUALS on both units. These should be corrected.	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
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				At best the documentation process for revising the PSL Model Update Reports is confusing. The revisions of these reports are stand-alone documents and the information is not carried forward in successive revisions. The process of updating the associated PRA documents rather than identifying changes only in the model update document should be improved.	
HR-I2-01	HR-I2	This SR is associated with the documentation of the process used to identify, characterize, and quantify the pre-initiator, post-initiator, and recovery actions considered in the PRA including the inputs, methods and results. Although the overall HRA analysis looks very good, the current documentation for the dependency analysis and treatment of post-initiator HRAs is incomplete. The current documentation only states that all post-initiator HEPs are set to 1.0 and then fed into the HRA calculator to determine the dependency between the HEP events. There is no discussion of how the rest of the process is performed, including how the HRA Recovery File is used to	The latest revision of HRA analysis included use of revised dependency analysis methodology that ensured generation HEP combinations consistent with dependencies between HFEs that are considered in HRA Calculator. The HRA Analysis document included detailed steps taken to generate the revised dependency analysis. Resolved in PSL-BFJR-11-013 Rev 4.	Documents PSL-BFJR-11-013 and PSL-BFJR-17-029 were reviewed. In document PSL-BFJR-11-013, Section 3.2 and Appendix E, the methodology for the dependency analysis is discussed, how the joint HEP floor was applied, and how unanalyzed combinations were identified and treated. In document PSL-BFJR-17-029, section 7.0, the methodology for the dependency analysis is discussed. Since PSL-BFJR-11-013 is not signed this F&O is considered open. When the document is signed and approved the F&O can be closed. Comments The performance of the dependency analysis may not conform to the industry accepted	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
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		"reset" combination events to the appropriate values based on the dependency analysis, no discussion on why the HEP values in the BE file are set to 0.5, no discussion of how the HRA calculators dependency analysis was validated, etc. Additionally, there is no assurance that all HEP combinations have been identified and evaluated - see F&O HR-G6-01 for more detail.		practice (EPRI HRA calculator manual Chapter 17). The values for each HFE should be set at a value as close to 1 as possible (typically 0.99) so that the most HFE combinations possible are capture in the cutsets produced at the truncation level of the model being analyzed. The PSL dependency analysis used 0.5 as the value for HFEs. This would be acceptable if the number of cutsets produced at 0.99 was beyond the capacity of the software but not to reduce the number of to prevent a perceived problem in the software.	
HR-I3-01	HR-I3	There is no discussion on model related uncertainties for pre-initiator HRA calculations. For post-initiator HFE, the EF indicated in Table 9 are then not propagated in the CAFTA file. It is therefore not clear how the uncertainty parameters are treated in the model. A complete uncertainty assessment involves both stochastic uncertainties (included in the HRA calculator)	This finding has been resolved and closed by an update to the model/documentation. Pre-initiator and post-initiator HFE EFs were added to CAFTA RR-file so UNCERT can use them in the uncertainty calculations. Discussion of HRA EF uncertainties is provided in the PSL HRA analysis document. Resolved in PSL-BFJR-11-013 Rev 4.	Documents PSL-BFJR-11-013 and PSL-BFJR-17-029 were reviewed. In document PSL-BFJR-11-013, Section 3.3 the uncertainty analysis is discussed. This provides the basis for the EF section and application and also provides high-level sources of uncertainties and assumptions applied to the HRA. This section was reviewed and provides reasonable development of the EFs that have been applied in the CAFTA .rr file. The CAFTA .rr file	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
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		and epistemic (model) uncertainties. A discussion on the assumptions made in the analysis and their potential for impact on the HEP calculations is required to meet the SR. The inconsistency between the EF discussed in the post-initiator HRA notebook (table 9 in Section 3.3) and the actual CAFTA file does not allow a correct uncertainty analysis. Table 9 states that generic Error Factors are used, but there are no error factors in the BE file, so it is unclear how the error factors are propagated. Also, the Combination events, and the renamed post-initiator single events are not included in the BE file so it is unclear how their error factors are included in the analysis - or if they are even considered.		was spot-checked for application of EFs, which appear to be consistently applied. No issued identified during the review. In addition, the process to document sources of model uncertainty and related assumptions is consistent with SR HR-I3 and HR-D6 for assessment of uncertainty in the HEPs. In document PSL-BFJR-17-029, which is still in draft form, there is no discussion of uncertainty. The assumptions are included as part of the HRA Calculator documentation. The SR requires uncertainty to be addressed. This F&O is considered to still be open.	
IE-C6-01	IE-C6	A screening approach is utilized for some lines based on low frequency but this is not quantified. The SR indicates a frequency expectation for screening. Define the estimate for the lines	This finding was resolved by analysis update document developed by RSC (document RSC 14-05 Rev 0). See also Calc PSL-BFJR-15-014, Rev 2	PSL documents PSL-BFJR-15-014, Rev 2 and RSC 14-05 were reviewed. The RSC document references the original PSL ISLOCA document PSL-BFJR-07-06, which included screening of penetrations based on perceived low frequency. Section	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		screened on low frequency and show that the calculated frequency supports screening.		2.1 of the RSC report says, "The scope of the modeling change was limited to the development of the specific scenarios defined by the existing study. The screening process was not revised and the data utilized is the same as for the existing study." Based on this, previous screening of penetrations has not been superseded and there is no evidence that a quantitative basis has been provided to support the screening as required by the SR. This F&O should remain open.	
IE-C9-01	IE-C9	The fault tree model used for the ISLOCA paths assumes that the status of all valves is known when the plant is brought online and the corresponding exposure time is the refueling interval. However, based on discussions with knowledgeable staff, there is no positive means to know that more than one isolation valve is actually holding. Use of status lights is not definitive since there is a +/-5% margin between light changing and valve seating. The exposure time should be based on a positive flow test which may not occur on	This finding was resolved by analysis update document developed by RSC (document RSC 14-05 Rev 0). See also Calc PSL-BFJR-15-014, Rev 2	PSL document RSC 14-05, "Inter-Systems LOCA Update", was reviewed. The RSC document models appears to adequately account for the status of each isolation valve when estimating the ISLOCA frequency. However, PSL-BFJR-15-014 Rev. 2 does not include evidence that the quantitative screening criteria was addressed in this document. Therefore this F&O is considered to still be open, pending reconciliation of the PRA documentation to reflect the changes made to the model.	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
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		a refueling basis but based on other studies could be as much as the life of the plant.			
QU-02	AS-C3	A lot of results sections in the quantification report are blank with a "later" in place of the table or results.	This finding has been resolved and closed by an update to the model/documentation. The current PRA Update documents included final results and completed analysis. Calc PSL-BFJR-15-014, latest Rev.	The F&O concerned the presence of incomplete sections in the PSL quantification notebook. The F&O cites AS-C3 and DA-E3, which particularly pertain to the documentation of sources of model uncertainty. The current QA notebook (PSL-SNBK-QU, Revision 0) is complete and includes reference to the Uncertainty notebook, which includes discussion of sources of uncertainty. However, the QU notebook documents the results as of 2012. Since that time, subsequent updates have included only a summary set of quantification results in a "PRA update report". The CDF appears to have reduced significantly, for example. There is no justification as to why the previous QU notebook results remain valid. Since an updated QU notebook (including all of the risk results reporting required by the QU	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

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				SRs) does not exist for the current PRA, this F&O is considered to still be open. Comments Although the 2012 QU notebook attempts to address all of the QU documentation requirements, some of the required evaluations (e.g., Sections 7.1, "Significant Accident Sequence Review", 7.2, "Importance Measures Review and Comparison", and 7.5, "Non-Significant Accident Sequence Review") are addressed using only summary discussions that don't provide any details as to the methods used, what was reviewed, etc. Additional details should be provided to more fully meet the QU SR documentation requirements.	
QU-04	AS-B5	No uncertainty analysis has been performed on the results from Unit 1 or Unit 2 quantification results.	This finding has been resolved and closed by an update to the model/documentation. Completed uncertainty/sensitivity analysis and related evaluations are included in the current Quantification Notebook document PSL-SNBK-QU Rev 0	The F&O concerns the lack of parametric uncertainty analyses for the PSL quantification results. However, the F&O references AS-B5 and B6, which do not pertain to uncertainty analysis; it is assumed that the SR references are incorrect. The 2012 QU notebook (PSL-SNBK-QU, Revision 0) includes the results of the parametric uncertainty evaluations for CDF	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
				and LERF. Sections 4.2 and 7.9 refer to PSL-SNBK-UNCERT, Revision 0, "UNCERTAINITY NOTEBOOK For ST. LUCIE UNITS 1 & 2" which documents Accident Sequence Analysis Uncertainty, Success Criteria Uncertainty, System Analysis Uncertainty, HRA Uncertainty, Data Analysis Uncertainty, Internal Flooding Uncertainty, Quantification Uncertainty (Documented in Quantification Notebook), LERF Analysis Uncertainty (Documented in Quantification Notebook). However, the subsequent PRA Update notebooks, which document the results of later model revisions, do not include updated uncertainty evaluations. This F&O remains open, pending the creation of a new QU notebook for the current PRA that includes an updated parametric uncertainty evaluation.	
SL-CCF-12	IE-A6	The CCF of ICW traveling screen plugging and the CCF of ICW strainers plugging as contributors to the loss of ICW initiator fault tree are missing from the model and no	This finding has been resolved and closed by an update to the model/documentation. The PSL models were revised to include CCF of ICW traveling screen plugging and the CCF of	Based on review of PSL-BFJR-06-008 (Quantification of Common-Cause Failure Probabilities), CCF of the ICW traveling screen plugging and strainer plugging from	This is a documentation issue. Clarification to be added to existing documents regarding CCF in support system initiating event fault tree is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		explanation for their absence is provided. Common cause contributors to the loss of ICW are judged to be both credible and potentially risk-significant. This judgment is based on the failure of a intake screen reported in LER 84-09, 1011/84 (Unit 1), the fact that these issues are addressed in the plant Off-Nominal Operating Procedure 064030, and that data is available for both of these failures in the NRC CCF database. Given that common cause is likely to be a dominant contributor to the loss of ICW and that the nominal loss of ICW frequency is judged to be very low (~1E-5/rx-yr), the modeling of the loss of ICW initiating event is judged to not meet SR IE-A6 for any CC level on CCF. Basis for Significance: This F&O was assigned a Significance of A due to its potential risk significance. Additional Discussion: This finding applies to both St. Lucie Unit 1 and 2 PRA models	ICW strainers plugging as contributors to the loss of ICW system. They were not considered under IE fault tree to eliminate double-counting. Calc PSL-BFJR-15-014.	environmental impacts has been assessed; however these impacts are included in the loss of ICW mitigative fault tree and are not included in the loss of ICW initiating event fault tree so as to avoid "double counting" of the impact. Because of the suspected double counting issue, the PSL PRA model does not include consideration of CCFs in any of the initiating event fault trees. This appears to be contrary to general industry practice and guidance contained in EPRI TR-1016741, "Support System Initiating Events", and WCAP-16872 "Pilot Implementation of EPRI Guidance for Fault Tree Modeling of Support Systems Initiating Events". This guidance suggests that CCF event combinations associated with operating equipment are assigned a mission time of one year and combinations of CCF events of secondary standby equipment are assigned a mission time as appropriate (e.g., mean time to repair). This finding is considered to remain open pending further explanation and justification for	

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
				the current CCF modeling approach to the initiating event fault trees.	
SY-12	AS-A10	It appears that in general key control systems in the St. Lucie Plant are not modeled. In the fault tree the AFW flow control system is demanded 3 times, but the basis for using 3 demands is unclear. No analysis has been done to determine the number of cycle the AFW system will undergo. Further, the common cause MOV demand failure rate does only considers a single demand. The model does not differentiate between an overfill and under fill. Overfills in general could lead to the failure of the turbine driven AFW pumps. Note: If the MOVs are demanded twice, it is doubtful that the failure likelihood would double. But it is also clear the failure likelihood will increase. Given the importance of the AFW	This finding was reviewed and closed with no further action. Per discussions with operations personnel, AFAS would start pumps and open flow valves to provide AFW flow to SGs. Small adjustments to valve position over time would be performed by the operator to maintain desired SG level. There would not be a series of valve open and close cycles. It is judged that the assumed 3 valve cycles would be adequate to capture or bound the total valve failure prob.	Documents PSL-PRA-SNBK-AFW and PLS-BFJR-02-027 were reviewed. Neither document discusses the justification for using 3 demands for the failure calculation. It should be noted that the AFW valves cycle open and close to supply the SG and are not open throttled valves. The basis for the 3x demand on the AFW discharge valves should be explained in the documentation and may not be accurate. Also, the logic that opens and closes these valves is not modeled. This F&O has not been addressed. This F&O is considered to still be open.	Independent Review team reviewed 2002 documents instead of the current PRA documents. AFAS system and AFW system components are developed with greater level of details in the current PRA model. Calculations and Justification of number of demand for these valves and any SSCs are provided as part of the latest periodical data analysis evaluation This is a documentation issue. Clarification to existing finding closure documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		MOVs, any increase to the failure rates can be quite significant.			
SY-15	DA-A4	The implementation of the Alpha Parameter methodology for common cause analysis has resulted in conditions that appear to be an over estimation of the contribution from common cause and results that do not make obvious sense (i.e. cutsets in which the common cause failure of three check valves [three AFW pump discharge check valves] is more likely than the common cause failure of two check valves [two MFW check valves to the steam generators I-V09294 and I-V09252]). The implementation of the methodology includes an assumption in the development of the parameters of staggered testing. This assumption may be non-conservative. The common cause failure of the check valves in the pump recirculation lines	This finding has been resolved and closed by an update to the model/documentation. The latest revision of CCF analysis document clearly describes the application of Alpha-Factor method and applicable data using 2009 INL/NRC database. Calc PSL-BFJR-15-014	Documents PSL-BFJR-06-008 (Quantification of Common-Cause Failure Probabilities) and PSL-BFJR-15-014 (Model Update Document) were reviewed. 06-008 provides a comprehensive discussion on the application and use of the alpha method of common-cause. However, based on inspection of Table 2, some of the 4/4 component CCF probabilities are higher (more likely to occur) than the 3/4 component failure probabilities. In the case of the recently added EER fans failure-to-run CCF, the 3/3 failure probability is slightly higher than the 2/3 failure probability. This was the subject of the finding and was not explained in the referenced CCF document. This F&O should remain open pending further explanation of this CCF alpha	This is a documentation issue. Clarification to existing documents with example is required to close this finding. There is no impact to RICT calculations.

Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		was not considered and justification provided for not including them was not included. Some of the issues may be the result of the use of component specific and generic alpha parameter data.		factor anomaly.	
Internal Flood PRA Model Findings					
IFEV-A7-01	IFEV-A7	The consideration of human-induced floods was not included in the internal flooding evaluation. The consideration of human-induced floods was not included in the internal flooding evaluation. EPRI report 1013141 that provided generic data for flood initiating event frequencies stated that "Human induced causes of flooding that do not involve piping system pressure boundary failure such as overfilling tanks and inappropriate valve operations that release fluid from the system are not included."	This finding was reviewed and closed with no further action. As noted in the main Flooding Analysis document, no condition reports that would reflect such problems, associated with the possibility that plant design and operating practices might affect the likelihood of flooding, were to be found. This possibility was reviewed with experienced plant staff after the peer review that identified one issue "the periodic transfer of waste water from Unit 2 to Unit 1." The document was further revised to address the issue. PSL-BFJR-11-006, Rev 0	PSL-BFJR-11-005 Rev. 0 and PSL-BFJR-11-006 Rev. 0 were reviewed. This F&O is very similar to F&O IE-51. In general, human-induced flooding is not considered in the analysis. Only a single type of human-induced flood (transfer of waste water) was considered credible and this was screened from further consideration. The fact that a human-induced flood has not occurred at PSL to-date is not sufficient rationale to screen such events from consideration. The GDOC does state in the resolution that plant personnel were interviewed and plant procedures were reviewed. The result of this work was that human induced floods could not occur at PSL. Since there is no documentation in the flood notebooks (quantification or	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
				analysis), this F&O is considered to remain open.	
IFPP-B1-01	IFPP-A5	The documentation associated with the plant partitioning is scattered between the initial portion of the document and the walkdown report in Attachment B, which in reality is a discussion of the screening of main structures such as major structures. The walkdown report does not include any explanatory picture and mixes the definition of the area and their screening, without spelling out the generic criteria used for the screening of specific structures. This organization of the information is prone to confusion; moreover, since the area identification and the screening are mixed, some overlook have been noticed. For example, the walkdown notes explicitly mention which bldg. has been walked down and the DG BLDG is not listed among those, still, the screening of the DG BLDG is only discussed in the walkdown report and they are all screened out on the basis that there is no service water	This finding was reviewed and closed with no further action. No flood zones or flood sources located within the reactor auxiliary building were screened out. The flooding analysis document was further revised to address flooding originating in the other buildings or areas even if this is not truly "internal" flooding. These do not result in additional scenarios that need be quantified as no previously unaddressed reactor scram need ensue after such an event. This SR explicitly requires discussing other than spray/submergence failure modes. PSL-BFJR-11-005	PSL-BFJR-11-005 Rev. 0 and PSL-BFJR-11-006 Rev. 0 were reviewed. The flooding analysis report (PSL-BFJR-11-005) now includes some additional discussion of other plant buildings (such as the EDG buildings, CCW building, etc.). The discussions in Section 4.4 of the notebook address the "other buildings" concerns noted in this F&O. However, section 5.3 of PSL-BFJR-11-005 states: "applied—all flooding scenarios excepting those originating in small diameter domestic water lines and drain lines were considered." This is a screening criteria but it is too general to be acceptable. The pipe size (i.e. 1" or smaller) should be specified. Also, the screening criteria in general are used but do not appear to be consistently applied. This F&O is considered to still be open. <u>Comments</u> Table 6 lists the flood zones that are considered in each unit for analysis. However, the Unit 1 condensate pump pit is listed as a	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		(DG are air cooled); there is nevertheless no mention of the potential spray effects of Fire Protection system on a single DG (FP lines have been noticed during the walkdown that may have the potential to spray on the DG cabinet). While the screening of the DG BLD may still be possible (FP lines may be dry since there are large FP valves immediately outside of the DG building that may be deluge valve, or the DG AOT may be sufficient to recover from a spray event on the DG cabinet), the presence of a flood source that has the potential for impacting PRA equipment needs to be addressed. The screening out of the Turbine Building is another example of screening process inconsistent with the screening criteria provided in the standard. While it is true that the TB BDLG is open, a rupture in the condenser expansion joints will induce an initiating event and for this reason the area cannot be screened out for flood considerations. The flood		flood area, but the Unit 2 pump pit is not. Section 4.4.1 implies that all turbine building floods are neglected. The documentation should be checked to ensure the turbine building zones are accurately listed.	

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		scenario generated by a rupture of the condenser expansion joint may be screened for other reasons (e.g., it may be folded into an already existing IE category with identical plant effect but higher IEF), still a discussion of the reasoning and of the screening criteria needs to be provided. Finally, section 4.1.1 points to the walkdown notes but incorrectly indicating Attachment C rather than Attachment B.			
IFQU-A1-02	IFQU-A1	Some inconsistencies in the mapping between the flood events and the basic events associated with impacted equipment has been identified. According to table 20, the top cutsets have to do with ATWS induced by a spray event on the reactor trip switchgear. Spray on the reactor trip switchgear would result in loss of power, which would result in the trip itself. Therefore, even though the reactor trip switchgears are actually impacted by the spray event, the flood initiator needs not to be mapped with the basic event associated with the	This finding was reviewed and closed with no further action. Mapping between impacted components and associated basic events was reviewed to ensure that the flood induce failure is consistent with the failure mode modeled in the PRA model. Changes to the mapping tables were implemented to address the concerns of this F&O. The one inconsistency related to the spray event affecting the trip switchgear has been corrected. The scenario referenced in the second part of the review comment does not involve a spray in rooms	The results presented in the flooding quantification notebook were reviewed. The Unit 1 results no longer show a flood-induced ATWS as a dominant contributor; however, failures of both trains of batteries (due to a potential spray event, as well as a flood event) continue to dominate. While the flood event may be credible, a spray event that fails both trains of DC seems conservative. For Unit 2, flood-induced ATWS remains a contributor, so it is not clear if the Unit 2 models were updated, or if this is the result in unit differences. This F&O is	This is a documentation issue. Clarification to existing documents is required to close this finding. Although there are differences between the units, mapping in Unit 2 will be verified to be consistent with mapping in Unit 1. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	**Supporting Requirement**	**Description**	**Finding Resolutions Provided to Independent Review For Finding Closure**	**Independent Review Comments**	**Disposition for RICT**
		switchgear because their failure is in the direction of the success. Another example of suspect inconsistency in the mapping is observed from the review of the main CDF contributors. A spray from room 1RAB43-59/58 is not expected to impact both trains since the originating room only hosts 1 train of batteries	1RAB43-58 and -59 but rather a flood emanating from the battery rooms to the neighboring switchgear rooms through the connecting doors and submerging various electrical components inside. Since the analysis does not credit isolation of the break, the flooding will persist over the number of hours. The mapping reflects the equipment disabled by the accumulating water not only in the battery rooms but also in the neighboring electrical rooms, affecting both electrical trains. Flooding Analysis PSL-BFJR-11-006.	considered to still be open, pending confirmation that the flooding results have been checked for consistency with the as-built plant.	
IFSO-A4-01	IFSO-A4	No evidence was provided to indicate that human-induced mechanisms were considered to determine their impact as potential sources of flooding. The flooding notebook indicated that the EPRI guideline, as documented in report 1019194, was used in performing the flooding analysis. The EPRI Guidance identified the flooding mechanism that would result in a release. No evidence could be found on the treatment of human-induced flooding. It	This finding was reviewed and closed with no further action. As noted in the main Flooding Analysis document PSL-BFJR-11-005, Rev 0, no condition reports that would reflect such problems, associated with the possibility that plant design and operation practices might affect the likelihood of flooding, were to be found. This possibility was reviewed with experienced plant staff after the peer review who identified one issue "the periodic transfer of waste water from Unit 2 to Unit 1."	PSL Internal Flooding PRA document PSL-BFJR-11-05 was reviewed. The report and PSL F&O GDOC acknowledged that a CR review was performed (CR review identified no human-induced events) and discussions held with plant personnel. The potential for waste water flooding was mentioned in the scenario for the rupture of the waste management system in the waste holdup tank rooms. Although there is some mention of human-induced interaction, the report	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		appears that only pipe failures were considered as flooding mechanism.	The document was further revised to address the issue.	lacks detail and evidence of a thorough review of the PSL plant-specific events data (and applicability of generic data), needed to identify significant potential human-induced flooding mechanisms. IFSO-A4 requires the identification of flooding mechanisms that would result in a release for each potential source of flooding including item (b), human-induced mechanisms that could lead to overfilling tanks, diversion of flow-through openings created to perform maintenance; inadvertent actuation of fire-suppression system. It is judged that this limited consideration of induced flooding does not meet the intent of SR IFSO-A4. Therefore, this F&O remains open.	

Disposition and Resolution of Open F&Os					
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IFSO-A6-01	IFSO-A6	Confirmatory walkdown to assess the accuracy of the information associated with the source identification and scenario definition were not performed. One walkdown was performed before the identification of the flood source began but flood sources have not been confirmed during a dedicated confirmatory walkdown. Some potential inconsistencies between the isometric drawings used for the identification of the flood sources and actual configuration has been observed during the peer review walkdown. For example Appendix A indicates more than 138' of CC piping in the U2 Battery room A (2RAB43-35) but no CC piping has been observed in the room during the walkdown. On the other hand, demin water lines to the emergency eyewash have been observed during the peer review walkdown in the battery room, which are not listed in the Appendix A datasheet. 2RAB43-36 also does not show DW lines although it is	This finding has been resolved and closed by an update to the model/documentation. Confirmatory partial-walkdowns were performed after development of this F&O and pipe isometric drawings were re-reviewed for accuracy. The walkdown revealed that the CCW piping segments inside the vital battery rooms at el. 43' are hidden within a pipe chase near the ceiling and therefore not visible. As a result, the analysis has been corrected by deleting the CCW piping from the list of potential flood sources in the battery rooms. Any water from postulated breaks inside the chase was assumed to divert from the battery rooms to the adjoining rooms. However, the water supply pipe to the shower station was added as a potential flood source in each battery room. The spreadsheet calculating rupture frequencies was updated with the above corrections which also corrected the input to FRANX. Finally, the datasheets were reviewed and updated as well. PSL-BFJR-11-005. Rev 0 and PSL-BFJR-11-006, Rev 0.	The GDOC response for this F&O indicates that new walkdowns were performed and flood source and scenario calculations were updated to reflect the new/corrected information. The flooding notebook indicates that some of the original battery room sources were deleted (see for example, sections 4.2.1.9 and 4.2.1.12). The discussion of the sources and scenarios for the Unit 2 ECCS rooms also appears to be complete. The Appendix A flooding spreadsheet appears to be consistent with the notebook text. However, there is no specific documentation concerning the walkdowns performed to support the flooding analysis. Appendix B is referred to as providing the walkdown notes, but it states that there are no walkdown notes available. Although the performance of a walkdown(s) is mentioned in the base document and in the GDOC response, there are no specific walkdown notes available in Attachment B, as these have been transformed into the flood area summaries. This F&O is considered to remain open,	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		expected that eyewash station are also present and they are indeed shown in the architectural drawing). In 2RAB43-36, the batteries are mentioned to be potentially vulnerable to spray from fire protection but no fire protection is listed as potential source in the room. Appendix A shows multiple examples of datasheet being incomplete even for critical rooms such as the ECCS rooms (see for example 2RAB-10-16B) that would challenge the selection of impacted equipment.		pending addition of information pertaining to the initial and subsequent walkdowns.	
Fire PRA Model Findings					
CS-A3-01	CS-A3	4kV power and 125VDC control cables required to support the operation of the Containment Spray Pump were not identified. Fire PRA Plant Response model and other Fire PRA support tasks are adversely affected. Perform a comparison of the components identified on the MSO (multiple spurious operation) list against the Fire PRA components for which new cable selection was performed (i.e., components not previously	Reviewed component failure modes to ensure that components for which operation is credited include required power cables. PSL-BFJR-16-039	PSL-BFJR-16-039, PSL Fire PRA Component and PSL-BFJR-16-039, PSL Fire PRA Component and Cable Selection, was reviewed. No list of components added based on the MSO expert panel was available. As such, no review of the cable selection performed for these components could be done. Comments Appendix D incorrectly states reference 16 is the MSO expert panel report.	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		identified on the Appendix R safe shutdown equipment list). Verify that the cable selection for the common components supports all credited operations. Fire PRA Plant Response model and other Fire PRA support tasks are adversely affected.			
CS-B1-01	CS-B1	No evaluation was performed to verify that the new components and cables associated with the Fire PRA is bounded by the existing overcurrent coordination analysis. The evaluation was not completed at this time.	A detailed review of the coordination analysis was performed including those power supplies associated with Fire PRA components.	PSL-BFJR-16-039, Task 2 Component and Cable Selection, was reviewed. Section 3.0, Cable Selection, contains the following text, "A review of power supplies for active components was performed and required power supplies were also added to the FPRA component / cable data." No mention of coordination could be found in the report. The review of breaker coordination needs to be added or referenced in the report for traceability. This F&O remains open pending inclusion of documentation of the coordination study.	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.
ES-D1-01	ES-D1	PI-03-003 provides instruction for circuit analysis to include review of interlocks, instrumentation, and support system dependencies. Cable routing database was reviewed and confirmed that interlocks,	SSD and FPRA documentation revised to provide enhanced documentation of component selection and cable selection. One set of SSD instrumentation will	PSL-BFJR-16-039, PSL Fire PRA Component and Cable Selection, was reviewed. Section 3 of the report states, "A review of power supplies for active components was performed and required power supplies were also added	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		instrumentation, and support system cables were included in equipment effects. However, demonstration of a review of power supplies, etc. was not readily apparent in the Component Selection report. The development of the Fire PRA equipment list inherently considers the entire component and its supporting equipment; however, it is important to document this information to support peer reviews and applications. It is suggested that document the review to show the interlocks, power supplies, etc. are included (or referenced) in the development of the Component Selection section. The equipment selection report states that SSEL equipment required to place the plant in hot standby, the PRA end state, are included in the analysis while equipment only associated with taking the plant to cold shutdown were excluded from analysis. No information is provided to facilitate the assignment of	remains available to meet SSD systems for an area wide fire. The correlation between SSD instrumentation and operator actions provided in the HRA report confirms that for each HFE Appendix R instrumentation is available to support the cue for the action. Guidance provided in SSD procedures will identify the instruments available post fire and focus operator cues on these instruments. Since the instrumentation availability is defined on a fire area wide fire basis it will provide a conservative basis for instrumentation available for an individual scenario within the fire area. Incorporated additional discussion in HRA report, Section 3. i. As part of the task of replacing the screening HEP values with detailed FPRA HEPs, FPRA-specific HEPs are being added to the quantification fault tree including instrumentation cues. The required cues were correlated to SSD analysis instrumentation which is identified as available instrumentation in the post-fire shutdown procedures. This	to the FPRA component/cable data. The circuit analysis performed for the original safe shutdown analysis as well as for the FPRA components included the identification of cables associated with interlocks and instrumentation permissives, the failure of which could impact the safe shutdown/FPRA component." This portion of the F&O is addressed. Appendix B of the report describes the review of Safe Shutdown equipment for individual disposition for applicability in the FPRA. One criteria for inclusion in the FPRA is the equipment's function is related to reaching the safe and stable end state of hot shutdown, not cold standby. As such, the equipment which is included in the list is needed to reach said safe and stable end state. This portion of the F&O is also met. However, no connection to a fire-related reactor trip or any discussion related to how fire impacts propagate through the logic model could be found other than the following statement,	

Disposition and Resolution of Open F&Os					
Finding Number	**Supporting Requirement**	**Description**	**Finding Resolutions Provided to Independent Review For Finding Closure**	**Independent Review Comments**	**Disposition for RICT**
		individual SSEL instrumentation to specific plant states, which complicates review against this SR. Expand Component and Cable Selection tables to allow SSEL components to be associated with specific plant states. Components are linked to fault tree Basic Events, but suggest document all potential fire induced sequences are confirmed to be associated with a reactor trip initiating event in the fault tree. Improve component selection report to address items identified in this F&O.	imposes a failure of the HEP in any scenario where all associated cues are lost due to fire damage. The treatment of cues is consistent with NUREG-1921, specifically discussion regarding failure of cues due to fire in accordance with NUREG-1921 section 4.5.5. ii. The fire specific HEPs have also been correlated to the SSA instrumentation. The cues for these HEPs have also been incorporated into the fire PRA fault tree. iii. The development of the fire specific HEPs included the review of post fire shutdown procedures. Revisions to these procedures to ensure that operators are focused on non-fire impacted cues and to update the required actions in a manner	"Disposition codes were only assigned to basic events that are under the FPRA top gate." No mention of any logic added to the fault tree to allow FPRA quantification to capture the impact of fire related initiating events could be found. Since this does not fully meet the intent of SR ES-D1, this F&O remains open.	
FSS-A1-01	FSS-A1	PSL did not postulate hydrogen (H2) fires other than the turbine generator H2 fires. PSL used the basis that their H2 piping contains excess flow check valves. However, this will not prevent H2 fires. It's likely that plants experiencing H2 fires that contributed to the "potentially challenging" fire frequency also	Hydrogen for VCT tank isolated from other equipment components. AFW steam driven pump oil fire addressed in AFW C pump fire. Located in outdoor area thus limiting impact of this fire. i. The hydrogen system at St. Lucie provides hydrogen to the chemistry lab and the volume control tank in the reactor auxiliary building.	PSL-BFJR-16-042, PSL Fire PRA Scenario Development, was reviewed. Sections 6.6.2 through 6.7.2 describes the treatment for various types of hydrogen fires. Section 8.5, Scenario Nomenclature, states that scenario names including "H2" are scenarios associated with hydrogen fires. A number of	PSL Fire PRA model requires the addition of fire scenarios associated with the documented Bin 34 Turbine Generator Fire Ignition Frequency. These scenarios are for a hydrogen fire associated with the turbine generator. Since the turbine generator is in an open environment, the risk impact of this scenario is minimal.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		had excess flow check valves. Recommend either postulating H2 fires or developing a stronger technical justification for their exclusion. PSL did not appear consider all pump lube oil fire scenarios (e.g., AFW pumps, Charging Pumps, HPSI pumps, LPSI pumps, MFW pumps, etc.). These scenarios often involve significant quantities of oil causing widespread damage in the fire compartment. They can also contribute to multi-compartment fire risk. Note that some lube oil scenarios appear to have been considered by PSL. Specifically, MFW and turbine lube oil fires were postulated. In speaking with the analysts, they indicated that other pumps tend not to have large quantities of lube oil and that source-target data for oil scenarios was often collected during walkdowns. However, there was little documentation of this, and very few oil scenarios were quantified in FRANC. PSL did not postulate H2 fires	These systems are provided with pressure monitoring, guard piping and excess flow check valves which preclude the release of a significant quantity of hydrogen which could cause a challenging fire. The design basis for these lines in the event of a complete line break is for the hydrogen concentration to be limited to no more than 2% hydrogen (Unit 1 UFSAR Appendix 9.5A Section 3.15.2 and Unit 2 UFSAR Appendix 9.5A Section 3.15.1). This is a safety factor of 2 to the flammable limit for hydrogen in air. Therefore, based on these design features no specific scenarios associated with a miscellaneous hydrogen fire are postulated. ii. The current Fire PRA does not exclude any flammable liquid fire scenarios for fixed fire sources that may contain combustible liquids. A review of the fire scenarios for pumps containing significant quantities of oil identified existing scenarios for the Circulating Water Pumps, Main Feedwater Pumps, Heater Drain Pumps and Condensate pumps. A comparison between Unit 1 and Unit 2	scenarios were identified with the "H2" designation in the report and the FRANX model. PSL-BFJR-16-040, PSL Fire PRA Task 1 & 6 Plant Partitioning and FIF, was reviewed to determine where the fire frequency for bin 34, Turbine Generator Hydrogen, was accounted for. This frequency was documented in fire zones 1-23 & 2-47(8) the LP Heater Area for Units 1 & 2 respectively; however no fire scenario with this ignition frequency applied could be found in the scenario report or FRANX model. Sections 6.5 & 6.6.3 of the scenario development report describes the treatment of oil spill fires. Fire ignition frequency for Bin 35, Turbine Generator Oil, is documented in two fire zones, 1-13 & 2-11 the Turbine Lube Oil Reservoir for Units 1 and 2 respectively, but no scenarios in those fire zones have a Bin 35 contribution to their fire ignition frequency. In addition, only the RCP fires were identified in the report. The documentation of the oil fires in the PRA model is not	***4. Implementation Item:*** Model revision and associated documentation are an implementation item.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		and oil fires as specified by NUREG/CR-6850, and minimal basis for this deviation was provided. These fires can be risk significant due to the potential for widespread damage in the fire compartment.	identified several missing scenarios for Unit 2 which were walked down and added to the Fire PRA. Diesel generator fire scenarios are base scenarios which include the impact of a fire given that all targets in the room are impacted. Main, Auxiliary and Startup Transformer scenarios are included in the current Fire PRA, as is a turbine generator related fire. Ref ML14135A395 PSL L-2014-109	evident. This F&O is considered open due to the identified issues with both hydrogen and oil fires.	
FSS-H1-01	FSS-H1	In several cases, PSL implemented methods beyond those available in beyond industry accepted guidance documents (e.g., NUREG/CR-6850 and its supplements). For example, PSL created their own multipliers / severity factors for fires that cause damage beyond the ignition source by reviewing the EPRI Fire Events Database. A second example is that PSL modeled transient fires using the motor fire heat release rate distribution, which is much smaller than the transient fire distribution. A third example is	Beyond 6850 methods, panel factor approach, has been eliminated from the PSL Fire PRA. The use of the 69 kW HRR for transient fires has been limited to those fire zones in which "zero transients" are allowed in order to account for the potential violation of the administrative controls. i. The St. Lucie Fire PRA model implements two types of scenario manual suppression factors for an ignition source: time to target damage and time to hot gas layer (HGL). The time to target damage evaluates the direct heat flux	PSL-BFJR-16-042, PSL Fire PRA Scenario Development, was reviewed. The report no longer has a reference to the use of un-reviewed methods in the fire PRA model. Section 7.1 describes the treatment of transient HRRs. The use of 69kW transient fires was eliminated and replaced with the accepted 317kW fires from NUREG/CR 6850. Only fire zones in which "zero transient" combustible controls are in place use a 69kW heat release rate for transient fires. Section 8.1 describes the application of severity factors based on	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		not applying the "Location Factor" to account for wall/corner effects on flame height and plume temperature distribution. While these methods seem appropriate, documentation of the technical bases for these methods was generally lacking. Methods beyond industry accepted guidance (e.g., NUREG/CR-6850 and its supplements) should have documented technical bases of similar quality and magnitude to those provided in NUREG/CR-6850. Also, PSL should be aware that methods beyond industry accepted guidance documents may be viewed critically by the NRC. While these methods seem appropriate, the level of documentation provided did not allow detailed review by the peer reviewers. In addition, methods beyond industry accepted guidance (e.g., NUREG/CR-6850 and its supplements) should have documented technical bases of similar quality	incident on a target due to the fire. The time to HGL evaluates the volume temperature effects due to the fire. The LAR-submitted model used the approach that these two analyses were independent of each other and therefore one was not conditioned on. the other. The updated approach, generated to support the RAI responses considers the two analyses as dependent. Since the time to target damage in most cases is less than the time to HGL, the time to HGL is conditioned on the time to target damage. For example, consider a time to target damage of 5 minutes and a time to HGL of 30 minutes, in the context of the event tree in Figure 1. The first node, event MSI, represents the time to target damage. Using the manual nonsuppression (MS) distribution from NUREG/CR-6850, Supplement 1, Chapter 14 with a lambda value of 0.102 (electrical fires), the MSI probability is 0.602. The second node, event MS2, represents the time to HGL and is conditioned on the first node. In order to condition MS2 on MS 1,	NUREG-6850. The use of panel factors was eliminated and wall/corner factors were applied as appropriate. Section 7.5 states that the use of location factors has not been applied to increase heat release rates used in the model, and this section needs to be updated to reflect the adjustment factors used in the final PRA model. This F&O is considered to remain open, pending revision of the section 7.5 discussion.	

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
		and magnitude to those provided in NUREG/CR-6850.	the time credited for MS 1 is subtracted from the time available for MS2. In this example that would leave 25 minutes available for MS2, which, using NUREG/CR-6850, Supplement 1, Chapter 14, has an MS value of 0.079. Figure 1 in L-2014-109 (pg. 52) shows the resulting fire scenario MS values for the three respective fire scenarios applying the node MSI and MS2 values. The HGL fire scenario gets a 0.0474 MS value, which corresponds to a 30-minute non-suppression probability. The minimum manual non-suppression probability used is 0.001. ii. Reliability and unavailability of automatic detection systems were assumed in the LAR submitted model to be incorporated in the manual non-suppression probabilities specified in NUREG/CR-6850, Appendix P, as revised in NUREG/CR-6850, Supplement 1. Reliability of automatic suppression systems was based on values specified in NUREG/CR-6850, while availability was not considered to impact the reliability data given that plant		

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
			procedures specify compensatory actions to be implemented when the systems are not available. In order to address the concern that the information inherent in the NUREG/CR-6850 data may not be bounding, the model has been updated to incorporate this additional failure potential. The scenario development event tree incorporates an additional node, before any suppression (manual or automatic) is credited. The event tree detection failure path includes a 15-minute time delay before manual suppression is allowed to be credited (using SDP guidance for detection time for locations without detection systems). Figure 1 in L-2014-109 (pg. 53)shows an event tree without consideration of detection failure. Figure 2 in L-2014-109 (pg. 53) shows the Updated approach which incorporates detection failure. Note that the MS1/MS 15 and MS2/MS_15 values are bounded to a maximum value of 1. This results in zero ignition frequency being applied to the success branch for instances where the time to target damage or time to hot gas layer is less than 15 minutes. NUREG/CR-		

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
			6850 Appendix P suggests a bounding failure probability for smoke detection based on the Halon suppression failure probability. The data used to develop the Halon suppression failure probability included detection failure (smoke detection), so the detection failure probability by itself is bounded by the Halon failure probability. NUREG/CR-6850 Appendix P does not specify guidance on thermal detection failure probability, therefore the use of the associated suppression system failure probability is applied to the corresponding detection system. The failure probability specified in NUREG/CR-6850 Appendix P for deluge or pre-action sprinkler systems is conservatively applied as the failure probability for thermal detectors associated with actuation of a preaction system. iii. no credit for an NSP is used in the analysis of HEAF or oil fire HGL impact (all HEAF and oil fire scenarios will be assumed to result in a hot gas layer in the associated fire zone). Ref ML14135A395 PSL L-2014-109 (pg. 51-53)		

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
			Unreviewed Analysis Methods were eliminated (panel factors methodology was eliminated, wall and corner factors were applied where appropriate) or revised (revised use of 69 kW HRR for transient fires to limit its use to locations specific locations) by application of the guidance provided in the June 21, 2012 Joseph Giitter to Biff Bradley memo. The items addressed in this memo and their disposition with respect to the PSL Fire PRA is addressed below: 1. Frequencies for Cable Fires Initiated by Welding and Cutting - not used 2. Clarification for Transient Fires - methodology applied is consistent with the approach accepted by the methods review panel and the NRC. See RAI PRA 4 for further details. 3. Alignment Factor for Pump Oil Fires - not used 4. Electrical Cabinet Fire Treatment Refinement Details - eliminated from Fire PRA supporting PSL LAR submittal as stated in PSL NFPA 805 LAR Section V.2 and in RAI		

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
			PRA 01.m. 5. EPRI 1022993 - "Evaluation of Peak Heat Release Rates (HRRs) in Electrical Cabinet Fires" - not used No other methods used in support of the PSL Fire PRA are considered deviations from accepted methods and approaches. Ref ML14135A395 PSL L-2014-109 (pg. 57/58)		
HRA-A4-01	HRA-A4	A review of modeled actions is planned to be performed once draft procedures are generated from the Fire PRA. However, at present no such review has been performed except for a limited board walkthrough documented in Appendix C of the Human Failure Evaluation report.	The use of the screening approach for adjusting FPIE model HEPs and the use of screening HEPs is sufficient to support this application. PSL-BFJR-16-041	PSL-BFJR-16-041, PSL Fire PRA Human Failure Evaluation Report, was reviewed. The report has not been updated since the original peer review comment was made. To satisfy capability category II of the ASME/ANS standard, a walkthrough with operators on the procedures that were generated for the fire recovery actions is required. No fire response procedure review/talk through with plant operations and training personnel was conducted. Also, no mention of screening values is provided in the report. This F&O is considered to remain open.	Each operator action is developed based on analysis of the existing procedures. For the Fire PRA model, new operator actions were developed for fire responses based on the existing plant operating procedures, things like local control of the AFW valves or aligning the fire protection pump to provide a means to refill the CST. Each of these actions was developed based on operator interviews and feedback on the key action steps. The issue that exists is that the documentation of the operator interviews in not complete in the HRA calculator database or in PSL-BFJR-16-041. This F&O was left open to ensure that the documentation is added to the database and/or the

Disposition and Resolution of Open F&Os					
Finding Number	Supporting Requirement	Description	Finding Resolutions Provided to Independent Review For Finding Closure	Independent Review Comments	Disposition for RICT
					GDOC. This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.
PRM-C1-01	PRM-C1	Overall PRM documentation is sparse and doesn't provide the information addressed in the SRs associated with the HLRs described in the Category I, II and III criteria of PRM-C1. In addition, the development of changes made in Tables D1 and D3 are not described (PRM-B9). Recommend a separate PRM report that documents in a structured and consistent way the requirements described in the PRM SRs	Added discussion in Component/Cable report Section 5.0. PSL-BFJR-16-039	PSL-BFJR-16-039, PSL Fire PRA Component and Cable Selection, was reviewed. Insufficient information was added to section 5.0 to describe the plant response model, or assumptions made. No discussion of initiating events, accident sequence changes, system model changes, LERF impacts, or any new operator actions was found. In addition, there is limited documentation of the changes to the CAFTA model. This F&O is considered to remain open.	This is a documentation issue. Clarification to existing documents is required to close this finding. There is no impact to RICT calculations.

Attachment 2

St. Lucie Unit 1 - Markup of the Operating License

INSERT J

J. FPL is authorized to implement the Risk Informed Completion Time Program as approved in License Amendment No. XXX subject to the following conditions:

1. FPL will complete the following prior to implementation of the Risk Informed Completion Time Program:

   a. The items listed in the table of implementation items in the enclosure to FPL letter L-2018-006, "Third Response to Request for Additional Information Regarding License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk Informed Extended Completion Times - RITSTF Initiative 4b'," February 1, 2018, and

   b. The four implementation items listed in Attachment 1 to FPL letter L-2018-150, "Third Supplement to License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," September 18, 2018.

2. The risk assessment approach and methods, shall be acceptable to the NRC, be based on the as-built, as-operated, and maintained plant, and reflect the operating experience of the plant as specified in RG 1.200. Methods to assess the risk from extending the completion times must be PRA methods accepted as part of this license amendment, or other methods approved by the NRC for generic use. If the licensee wishes to change its methods, and the change is outside the bounds of this license condition, the licensee will seek prior NRC approval via a license amendment.

6. Training on integrated fire response strategy
7. Spent fuel pool mitigation measures

(c) Actions to minimize release to include consideration of:
1. Water spray scrubbing
2. Dose to onsite responders

H. Control Room Habitability

Upon implementation of Amendment No. 205, adopting TSTF-448, Revision 3, the determination of control room envelope (CRE) unfiltered air inleakage as required by SR 4.7.7.1.e, in accordance with TS 6.8.4.m, the assessment of CRE habitability as required by Specification 6.8.4.m.c. (ii), and the measurement of CRE pressure as required by Specification 6.8.4.m.d, shall be considered met. Following implementation:

(a) The first performance of SR 4.7.7.1.e, in accordance with Specification 6.8.4.m.c(i), shall be within the specified Frequency of 6 years, plus the 18-month allowance of SR 4.0.2, as measured from September 2003, the date of the most recent successful tracer gas test, as stated in FPL letters to NRC dated December 9, 2003, and October 29, 2004, in response to Generic Letter 2003-01.

(b) The first performance of the periodic assessment of CRE habitability, Specification 6.8.4.m.c(ii), shall be within 3 years, plus the 9-month allowance of SR 4.0.2, as measured from September 2003, the date of the most recent successful tracer gas test, as stated in FPL letters to NRC dated December 9, 2003, and October 29, 2004, in response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.

(c) The first performance of the periodic measurement of CRE pressure, Specification 6.8.4.c.d, shall be within 36 months in a staggered test basis, plus the 138 days allowed by SR 4.0.2, as measured from June 30, 2006, which is the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

I. RODEX2 Safety Analyses

RODEX2 has been specifically approved for use for St. Lucie Unit 1 licensing basis analyses. Upon NRC's approval of a generic supplement to the RODEX2 code and associated methods that accounts for thermal conductivity degradation (TCD), FPL will within six months:

(a) Demonstrate that St. Lucie Unit 1 safety analyses remain conservatively bounded in licensing basis analyses when compared to the NRC-approved generic supplement to the RODEX2 methodology, or

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(b) Provide a schedule for the re-analysis using the NRC-approved generic supplement to the RODEX2 methodology for any of the affected licensing basis analyses.

Attachment 3

St. Lucie Unit 2 - Markup of the Operating License

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O. FPL is authorized to implement the Risk Informed Completion Time Program as approved in License Amendment No. XXX subject to the following conditions:

1. FPL will complete the following prior to implementation of the Risk Informed Completion Time Program:

   a. The items listed in the table of implementation items in the enclosure to FPL letter L-2018-006, "Third Response to Request for Additional Information Regarding License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk Informed Extended Completion Times - RITSTF Initiative 4b'," February 1, 2018, and

   b. The four implementation items listed in Attachment 1 to FPL letter L-2018-150, "Third Supplement to License Amendment Request to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," September 18, 2018.

2. The risk assessment approach and methods, shall be acceptable to the NRC, be based on the as-built, as-operated, and maintained plant, and reflect the operating experience of the plant as specified in RG 1.200. Methods to assess the risk from extending the completion times must be PRA methods accepted as part of this license amendment, or other methods approved by the NRC for generic use. If the licensee wishes to change its methods, and the change is outside the bounds of this license condition, the licensee will seek prior NRC approval via a license amendment.

NRC dated December 9, 2003, and October 29, 2004, in response to Generic Letter 2003-01, or within the next 9 months if the time period since the most recent successful tracer gas test is greater than 3 years.

(c) The first performance of the periodic measurement of CRE pressure, Specification 6.15.d, shall be within 36 months in a staggered test basis, plus the 138 days allowed by SR 4.0.2, as measured from November 13, 2006, which is the date of the most recent successful pressure measurement test, or within 138 days if not performed previously.

N. FATES3B Safety Analyses (Westinghouse Fuel Only)

FATES3B has been specifically approved for use for St. Lucie Unit 2 licensing basis analyses based on FPL maintaining the more restrictive operational/design radial power fall-off curve limits as specified in Attachment 4 to FPL Letter L-2012-121, dated March 31, 2012 as compared to the FATES3B analysis radial power fall-off curve limits. The radial power fall-off curve limits shall be verified each cycle as part of the Reload Safety Analysis Checklist (RSAC) process.

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4. This renewed license is effective as of the date of issuance, and shall expire at midnight April 6, 2043.

FOR THE NUCLEAR REGULATORY COMMISSION

Original signed by

J. E. Dyer, Director

Office of Nuclear Reactor Regulation

Attachments:
1. Appendix A, Technical Specifications
2. Appendix B, Environmental Protection Plan
3. Appendix C, Antitrust Conditions
4. Appendix D, Antitrust Conditions

Date of Issuance: October 2, 2003

Attachment 4

St. Lucie Unit 1 - Markup of the Technical Specifications

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

SAFETY INJECTION TANKS (SIT~~)~~ S

LIMITING CONDITION FOR OPERATION

3.5.1 Each reactor coolant system safety injection tank shall be OPERABLE with:

a. The isolation valve open,

b. Between 1090 and 1170 cubic feet of borated water,

c. A minimum boron concentration of 1900 ppm, and

d. A nitrogen cover-pressure of between 230 and 280 psig.

APPLICABILITY: MODES 1, 2 and 3~~*~~ with pressurizer pressure ≥ 1750 psia.

ACTION:

a. With one SIT inoperable due to boron concentration not within limits, or due to an inability to verify the required water volume or nitrogen cover-pressure, restore the inoperable SIT to OPERABLE status with 72 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With one SIT inoperable due to reasons other than those stated in ACTION-a, restore the inoperable SIT to OPERABLE status within 24 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.1 Each safety injection tank shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

1. Verifying that the borated water volume and nitrogen cover-pressure in the tanks are within their limits, and

2. Verifying that each safety injection tank isolation valve is open.

~~* With pressurizer pressure ≥ 1750 psia.~~

CONTAINMENT SYSTEMS

CONTAINMENT AIR LOCKS

LIMITING CONDITION FOR OPERATION

3.6.1.3 Each containment air lock shall be OPERABLE with:

a. Both doors closed except when the air lock is being used for normal transit entry and exit through the containment, then at least one air lock door shall be closed, and

b. An overall air lock leakage rate in accordance with the Containment Leakage Rate Testing Program.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one containment air lock door inoperable~~*~~:

1. Maintain at least the OPERABLE air lock door closed and either restore the inoperable air lock door to OPERABLE status within 24 hours or lock the OPERABLE air lock door closed.

2. Operation may then continue until performance of the next required overall air lock leakage test provided that the OPERABLE air lock door is verified to be closed at least once per 31 days.

in the affected air lock(s) and

3. Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

one or both

lock(s)

b. With ~~the~~ containment air l~~ock~~ inoperable, except as the result of an inoperable air lock door, maintain at least one air lock door closed~~;~~ restore the inoperable air lock to OPERABLE status within 24 hours ~~or~~ be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

(s)

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; otherwise

SURVEILLANCE REQUIREMENTS

4.6.1.3 Each containment air lock shall be demonstrated OPERABLE:

~~*~~

NOTE

If the inner air lock door is inoperable, passage through the OPERABLE outer air lock door is permitted to effect repairs to the inoperable inner air lock door. No more than one air lock door shall be open at any time.

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

a. Two motor driven feedwater pumps, and

b. One feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2 and 3.

ACTION:

a. With one auxiliary feedwater pump steam supply inoperable, restore the inoperable auxiliary feedwater pump steam supply to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

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b. With one auxiliary feedwater pump inoperable, restore the auxiliary feedwater pump to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With one auxiliary feedwater pump steam supply inoperable and one motor-driven auxiliary feedwater pump inoperable, either restore the inoperable auxiliary feedwater pump steam supply OR restore the inoperable motor-driven auxiliary feedwater pump to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

d. With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

NOTE
LCO 3.0.3 and all other LCO Actions requiring MODE changes are suspended until one AFW pump is restored to OPERABLE status.

e. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status.

f. LCO 3.0.4.b is not applicable.

SURVEILLANCE REQUIREMENTS

4.7.1.2 Each auxiliary feedwater pump shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

Attachment 5

St. Lucie Unit 2 - Markup of the Technical Specifications

REACTOR COOLANT SYSTEM

OPERATING

LIMITING CONDITION FOR OPERATION

3.4.2.2 All pressurizer code safety valves shall be OPERABLE with a lift setting of ≥ 2410.3 psig and ≤ 2560.3 psig.*

APPLICABILITY: MODES 1, 2, 3, and 4 with all RCS cold leg temperatures > 230°F.

ACTION:

a. With one pressurizer code safety valve inoperable, either restore the inoperable valve to OPERABLE status within 15 minutes or be in HOT STANDBY within 6 hours and in HOT SHUTDOWN within the next 6 hours.

b. With two or more pressurizer code safety valves inoperable, be in HOT STANDBY within 6 hours and in HOT SHUTDOWN with all RCS cold leg temperatures at ≤ 230°F within the next 6 hours.

SURVEILLANCE REQUIREMENTS

4.4.2.2 Verify each pressurizer code safety valve is OPERABLE in accordance with the INSERVICE TESTING PROGRAM. Following testing, as-left lift settings shall be within +/- 1% of 2500 psia.

NOTE

The lift setting pressure shall correspond to ambient conditions of the valve at nominal operating temperature and pressure.

3/4.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3/4.5.1 SAFETY INJECTION TANKS (SIT~~)~~ S

LIMITING CONDITION FOR OPERATION

3.5.1 Each Reactor Coolant System safety injection tank shall be OPERABLE with:

a. The isolation valve open,

b. A contained borated water volume of between 1420 and 1556 cubic feet,

c. A boron concentration of between 1900 and 2200 ppm of boron, and

d. A nitrogen cover-pressure of between 500 and 650 psig.

APPLICABILITY: MODES 1, 2 and 3~~*~~ with pressurizer pressure ≥ 1750 psia.

ACTION:

a. With one SIT inoperable due to boron concentration not within limits, or due to an inability to verify the required water volume or nitrogen cover-pressure, restore the inoperable SIT to OPERABLE status with 72 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

b. With one SIT inoperable due to reasons other than those stated in ACTION-a, restore the inoperable SIT to OPERABLE status within 24 hours; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

SURVEILLANCE REQUIREMENTS

4.5.1.1 Each safety injection tank shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

1. Verifying that the borated water volume and nitrogen cover-pressure in the tanks are within their limits, and

2. Verifying that each safety injection tank isolation valve is open.

NOTE

~~*~~ ~~With pressurizer pressure greater than or equal to 1750 psia.~~ When in MODE 3 with pressurizer pressure ~~is~~ less than 1750 psia, at least three safety injection tanks shall be OPERABLE, each with a minimum pressure of 235 psig and a maximum pressure of 650 psig and a contained water volume of between 1250 and 1556 cubic feet with a boron concentration of between 1900 and 2200 ppm of boron. With all four safety injection tanks OPERABLE, each tank shall have a minimum pressure of 235 psig and a maximum pressure of 650 psig and a contained water volume of between 833 and 1556 cubic feet with a boron concentration of between 1900 and 2200 ppm of boron.

CONTAINMENT SYSTEMS

CONTAINMENT VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.1.7 Each containment purge supply and exhaust isolation valve shall be OPERABLE and:

a. Each 48-inch containment purge supply and exhaust isolation valve shall be sealed closed.

b. The 8-inch containment purge supply and exhaust isolation valves may be open for purging and/or venting as required for safety related purposes such as:

1. Maintaining containment pressure within the limits of Specification 3.6.1.4.

2. Reducing containment atmosphere airborne radioactivity and/or improving air quality to an acceptable level for containment access.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With a 48-inch containment purge supply and/or exhaust isolation valve(s) open or not sealed closed, close and/or seal close the open valve(s) or isolate the penetration(s) within 4 hours, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With an 8-inch containment purge supply and/or exhaust isolation valve(s) open for reasons other than those stated in Specification 3.6.1.7.b, close the open 8-inch valve(s) or isolate the penetration(s) within 4 hours, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With a containment purge supply and/or exhaust isolation valve(s) having a measured leakage rate exceeding the limits of Surveillance Requirements 4.6.1.7.3 and/or 4.6.1.7.4, within 24 hours either restore the inoperable valve(s) to OPERABLE status or isolate the affected penetration flow path by use of at least one closed and de-activated automatic valve with resilient seals or blind flange, verify the affected penetration flowpath is isolated, and perform Surveillance Requirement 4.6.1.7.3 or 4.6.1.7.4 for resilient seated valves closed to isolate the penetration flowpath, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

1. Closed and de-activated automatic valve(s) with resilient seals used to isolate the penetration flowpath(s) shall be tested in accordance with either Surveillance Requirement 4.6.1.7.3 for 48-inch valves at least once per 6 months or Surveillance Requirement 4.6.1.7.4 for 8-inch valves at least once per 92 days.

following isolation

2. Verify the affected penetration flowpath is isolated once per 31 days for isolation devices outside containment and prior to entering MODE 4 from MODE 5 for isolation devices inside containment if not performed within the previous 92 days.

NOTE

Verification of isolation devices by administrative means is acceptable when they are located in high radiation areas or they are locked, sealed, or otherwise secured by administrative means.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and

b. Two separate and independent diesel generators, each with:

1. Two separate engine-mounted fuel tanks containing a minimum volume of 238 gallons of fuel each,

2. A separate fuel storage system containing a minimum volume of 42,500 gallons of fuel, and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one offsite circuit of 3.8.1.1.a inoperable, except as provided in Action f. below, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite circuit to OPERABLE status within 72 hours ~~or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.~~ INSERT 1

b. With one diesel generator of 3.8.1.1.b inoperable, demonstrate the OPERABILITY of the A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.~~2a.4~~ 2.a within 8 hours, unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*; restore the diesel generator to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

*

NOTE

If the absence of any common-cause failure cannot be confirmed, ~~this test~~ Surveillance Requirement 4.8.1.1.2.a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

ELECTRICAL POWER SYSTEMS

ACTION: (Continued)

c. With one offsite A.C. circuit and one diesel generator inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the ~~OPERABILITY~~ of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.~~1~~.2a.4 within 8 hours, unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 ACTION Statement a or b, as appropriate, with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable A.C. power source. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

INSERT 1

2.a

NOTE

If the absence of any common-cause failure cannot be confirmed, ~~this test~~ Surveillance Requirement 4.8.1.1.2.a.4 shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

PLANT SYSTEMS

AUXILIARY FEEDWATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.1.2 At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:

a. Two feedwater pumps, each capable of being powered from separate OPERABLE emergency busses, and

b. One feedwater pump capable of being powered from an OPERABLE steam supply system.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

a. With one auxiliary feedwater pump steam supply inoperable, restore the inoperable auxiliary feedwater pump steam supply to OPERABLE status within 7 days ~~or~~ be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

INSERT 1

b. With one auxiliary feedwater pump inoperable, restore the auxiliary feedwater pump to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

c. With one auxiliary feedwater pump steam supply inoperable and one motor-driven auxiliary feedwater pump inoperable, either restore the inoperable auxiliary feedwater pump steam supply OR restore the inoperable motor-driven auxiliary feedwater pump to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

d. With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

NOTE
LCO 3.0.3 and all other LCO Actions requiring MODE changes are suspended until one AFW pump is restored to OPERABLE status.

e. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status.

f. LCO 3.0.4.b is not applicable.

SURVEILLANCE REQUIREMENTS

4.7.1.2 Each auxiliary feedwater pump shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

1. Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.