Southern Nuclear Operating Company

ND-19-0152

Enclosure 2

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

Presentation Material:
Functional Arrangement (FA) ITAAC, FA System Package Examples – Closed Meeting (Non - Proprietary)

(Enclosure 2 consist of 26 pages, including this cover page)

ONE TEAM. ONE VISION. ONE GOAL.

Building the future of nuclear power in America

Functional Arrangement (FA) ITAAC

FA System Package Examples
Closed Meeting (Non - Proprietary)

February 14, 2019

Southern Nuclear

Georgia Power

Agenda

- Examples of FA ITAAC and Documentation
- System Safety Functions in Other ITAAC

FA Example #1 -WSS

- ITAAC 2.3.12.01:

Table 2.3.12-1 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
456	2.3.12.01	1. The functional arrangement of the WSS is as described in the Design Description of this Section 2.3.12.	Inspection of the as-built system will be performed.	The as-built WSS conforms with the functional arrangement as described in the Design Description of this Section 2.3.12.

- The “Design Description” in COL Appendix C section 2.3.12 provides a description of what the system does:

“The solid radwaste system (WSS) receives, collects, and stores the solid radioactive wastes received prior to their processing and packaging by mobile equipment for shipment off-site.”

Example #1 -WSS

- The major system components to accomplish this are included in Table 2.3.12-2 (there is no Tier 1 Figure for WSS):

Table 2.3.12-2

Component Name	Tag No.	Component Location
WSS Spent Resin Tank A	WSS-MV-01A	Auxiliary Building
WSS Spent Resin Tank B	WSS-MV-01B	Auxiliary Building

Example #1 -WSS List of Items

- Using guidance from ND-RA-001-012, these Two (2) Items represent the scope of the WSS Walkdown

a,c

Example #1 -WSS Field Sketch

a,c

FA Example #2 -PXS

- ITAAC 2.2.03.01:

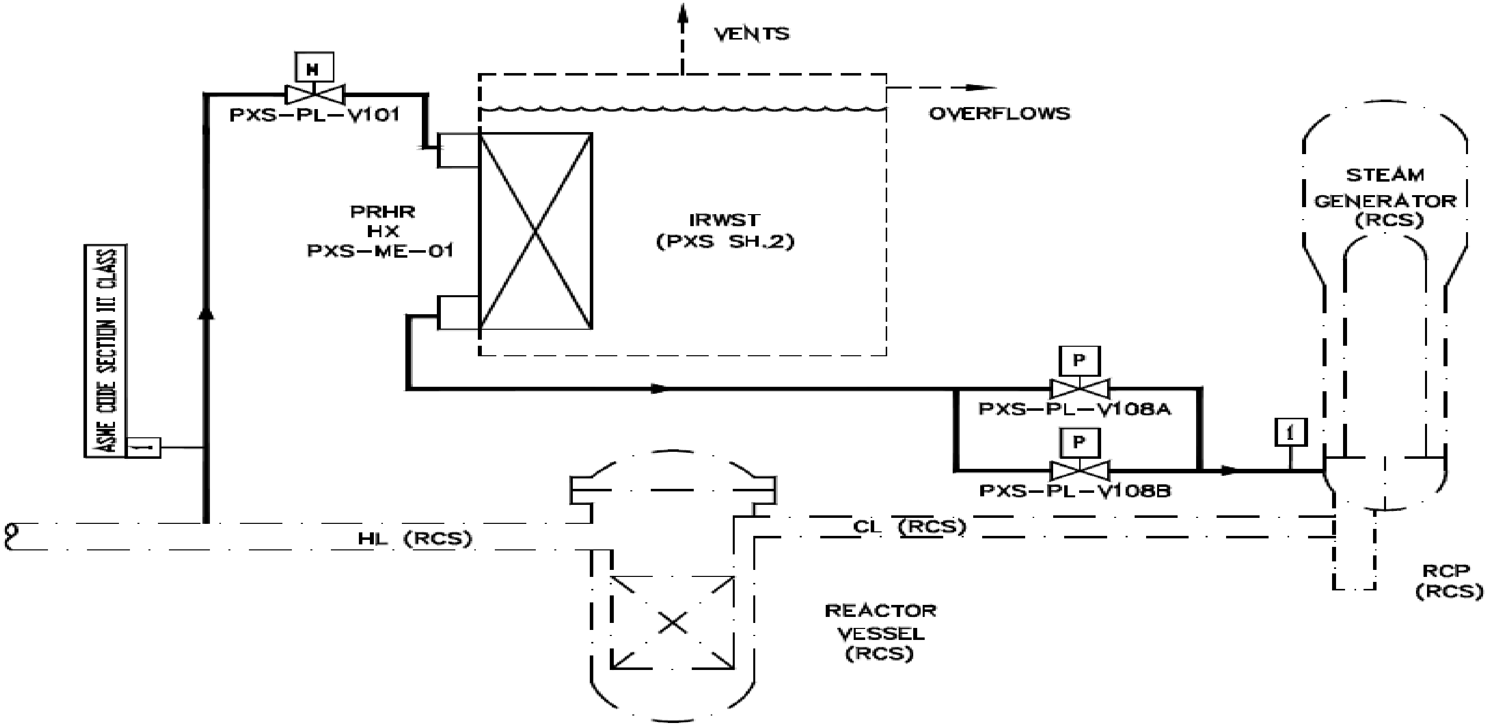
Table 2.2.3-4 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	**ITAAC No.**	**Design Commitment**	**Inspections, Tests, Analyses**	**Acceptance Criteria**
158	2.2.03.01	1. The functional arrangement of the PXS is as described in the Design Description of this Section 2.2.3.	Inspection of the as-built system will be performed.	The as-built PXS conforms with the functional arrangement as described in the Design Description of this Section 2.2.3.

- The “Design Description” in COL Appendix C section 2.2.3 provides a description of what service the system is intended to provide:

“The passive core cooling system (PXS) provides emergency core cooling during design basis events. The PXS is as shown in Figure 2.2.3-1 and the component locations of the PXS are as shown in Table 2.2.3-5.”

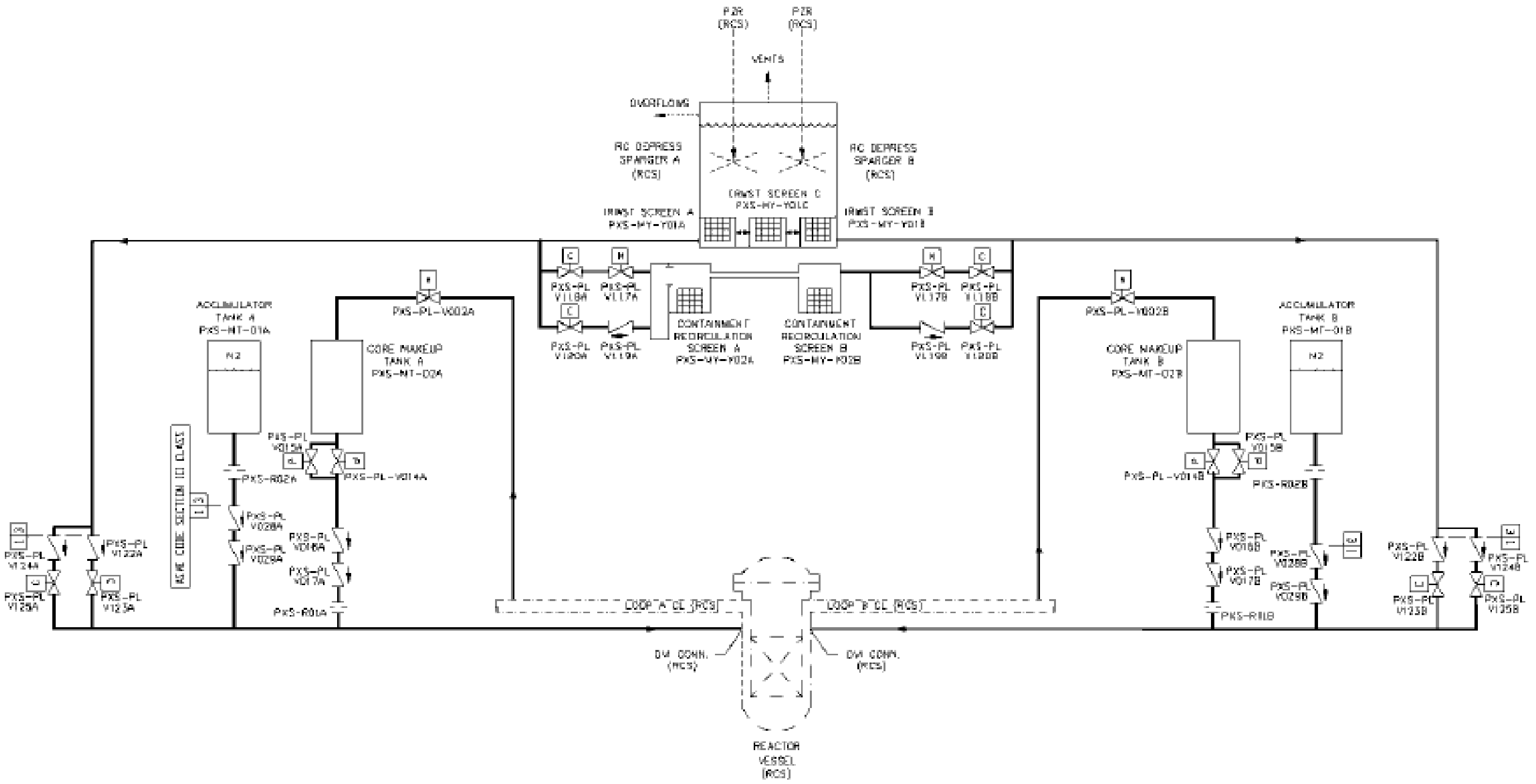
Example #2 -PXS

- The major system components to accomplish this shown in Figure 2.2.3-1 (Sheet 1):



Example #2 -PXS

- The major system components to accomplish this shown in Figure 2.2.3-1 (Sheet 2):



Example #2 -PXS

- The major system components to accomplish this are included in Table 2.2.3-5:

Table 2.2.3-5		
Component Name	**Tag No.**	**Component Location**
Passive Residual Heat Removal Heat Exchanger (PRHR HX)	PXS-ME-01	Containment Building
Accumulator Tank A	PXS-MT-01A	Containment Building
Accumulator Tank B	PXS-MT-01B	Containment Building
Core Makeup Tank (CMT) A	PXS-MT-02A	Containment Building
CMT B	PXS-MT-02B	Containment Building
IRWST	PXS-MT-03	Containment Building
IRWST Screen A	PXS-MY-Y01A	Containment Building
IRWST Screen B	PXS-MY-Y01B	Containment Building
IRWST Screen C	PXS-MY-Y01C	Containment Building
Containment Recirculation Screen A	PXS-MY-Y02A	Containment Building
Containment Recirculation Screen B	PXS-MY-Y02B	Containment Building
pH Adjustment Basket 3A	PXS-MY-Y03A	Containment Building
pH Adjustment Basket 3B	PXS-MY-Y03B	Containment Building
pH Adjustment Basket 4A	PXS-MY-Y04A	Containment Building
pH Adjustment Basket 4B	PXS-MY-Y04B	Containment Building

Example #2 -PXS List of Items

Using guidance from ND-RA-001-012, this LOI is the scope of the PXS Walkdown (Four (4) of 103 Line Items Shown

a,c

Example #2 -PXS Field Sketch (One of Five (5))

a,c

FA Example #3 -DWS

- ITAAC 2.3.14.01:

Table 2.3.14-2
Inspections, Tests, Analyses, and Acceptance Criteria

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
477	2.3.14.01	1. The functional arrangement of the DWS is as described in the Design Description of this Section 2.3.14.	Inspection of the as-built system will be performed.	The as-built DWS conforms with the functional arrangement as described in the Design Description of this Section 2.3.14.

- The "Design Description" in COL Appendix C section 2.3.14 provides a description of what the system does:

"The demineralized water transfer and storage system (DWS) receives water from the demineralized water treatment system (DTS), and provides a reservoir of demineralized water to supply the condensate storage tank and for distribution throughout the plant."

Example #3 -DWS

- ITAAC 2.3.14.01 (Continued):
- The “Design Description” in COL Appendix C section 2.3.14 goes on to provide additional description of what the DWS does:

“Demineralized water is processed in the DWS to remove dissolved oxygen. In addition to supplying water for makeup of systems which require pure water, the demineralized water is used to sluice spent radioactive resins from the ion exchange vessels in the chemical and volume control system (CVS), the spent fuel pool cooling system (SFS), and the liquid radwaste system (WLS) to the solid radwaste system (WSS)”

Example #3 -DWS

- The major system components to accomplish this are included in Table 2.3.14-3 (there is no Tier 1 figure for DWS):

Table 2.3.14-3

Component Name	Tag No.	Component Location
Demineralizer Water Storage Tank Degasification System Package	DWS-MS-01	Annex Building
Condensate Storage Tank Degasification System Package	DWS-MS-02	Turbine Building
Demineralized Water Storage Tank	DWS-MT-01	Yard
Condensate Storage Tank	DWS-MT-02	Yard

- Because there is no Tier 1 figure for DWS and limited components listed on Table 2.3.14-3, four additional components were added per procedure ND-RA-001-012 to address the design description.

Example #3 - DWS List of Items

- Using guidance from ND-RA-001-012, this LOI is the scope of the DWS Walkdown (3 of 20 Line Items shown)

a,c

Example #3 -DWS Field Sketch (One of Five (5))

a,c

System Safety Functions in Other ITAAC

36	2.1.02.08d.v	8.d) The RCS provides automatic depressurization during design basis events.	v) Inspections of the elevation of the ADS stage 4 valve discharge will be conducted. vi) Inspections of the ADS stage 4 valve discharge will be conducted. viii) Inspection of the elevation of each ADS sparger will be conducted.	v) The minimum elevation of the bottom inside surface of the outlet of these valves is greater than plant elevation 110 feet. vi) The discharge of the ADS stage 4 valves is directed into the steam generator compartments. viii) The centerline of the connection of the sparger arms to the sparger hub is $\leq$ 11.5 feet below the IRWST overflow level.

137	2.2.02.07a.iii	7.a) The PCS delivers water from the PCCWST to the outside, top of the containment vessel.	iii) Inspection will be performed to determine the PCCWST standpipes elevations.	iii) The elevations of the standpipes above the tank floor are: – 16.8 ft ± 0.2 ft – 20.3 ft ± 0.2 ft – 24.1 ft ± 0.2 ft
		7.f) The PCS provides a flow path for long-term water makeup from the PCCWST to the spent fuel pool.	ii) Inspection of the PCCWST will be performed.	ii) The volume of the PCCWST is greater than 756,700 gallons.
		8.a) The PCCAWST contains an inventory of cooling water sufficient for PCS containment cooling from hour 72 through day 7.	Inspection of the PCCAWST will be performed.	The volume of the PCCAWST is greater than 780,000 gallons.

System Safety Functions in Other ITAAC

176	2.2.03.08b.02	8.b) The PXS provides core decay heat removal during design basis events.	2. Inspection of the elevation of the PRHR HX will be conducted.	2. The elevation of the centerline of the HX's upper channel head is greater than the HL centerline by at least 26.3 ft.
183	2.2.03.08c.iv.01	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	iv) Inspections of the elevation of the following pipe lines will be conducted: 1. IRWST injection lines; IRWST connection to DVI nozzles v) Inspections of the elevation of the following tanks will be conducted: 2. IRWST	iv) The maximum elevation of the top inside surface of these lines is less than the elevation of: 1. IRWST bottom inside surface v) The elevation of the bottom inside tank surface is higher than the direct vessel injection nozzle centerline by the following: 2. IRWST ≥ 3.4 ft
184	2.2.03.08c.iv.02	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	iv) Inspections of the elevation of the following pipe lines will be conducted: 2. Containment recirculation lines; containment to IRWST lines	iv) The maximum elevation of the top inside surface of these lines is less than the elevation of: 2. IRWST bottom inside surface

System Safety Functions in Other ITAAC

185	2.2.03.08c.iv.03	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	iv) Inspections of the elevation of the following pipe lines will be conducted: 3. CMT discharge lines to DVI connection	iv) The maximum elevation of the top inside surface of these lines is less than the elevation of: 3. CMT bottom inside surface
186	2.2.03.08c.iv.04	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	iv) Inspections of the elevation of the following pipe lines will be conducted: 4. PRHR HX outlet line to SG connection	iv) The maximum elevation of the top inside surface of these lines is less than the elevation of: 4. PRHR HX lower channel head top inside surface
187	2.2.03.08c.v.01	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	v) Inspections of the elevation of the following tanks will be conducted: 1. CMTs	v) The elevation of the bottom inside tank surface is higher than the direct vessel injection nozzle centerline by the following: 1. CMTs $\geq$ 7.5 ft

System Safety Functions in Other ITAAC

192	2.2.03.08c.vii	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	vii) Inspection of the as-built components will be conducted for the plate located above the containment recirculation screens.	vii) The plate located above the containment recirculation screens is no more than 1 ft, 3 in above the top of the face of the screens and extends at least 8 ft, 3 in perpendicular to the front and at least 7 ft to the side of the face of the screens.
193	2.2.03.08c.viii	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	viii) Inspections of the IRWST and containment recirculation screens will be conducted. The inspections will include measurements of the pockets and the number of pockets used in each screen. The pocket frontal face area is based on a width times a height. The width is the distance between pocket centerlines for pockets located beside each other. The height is the distance between pocket centerlines for pockets located above each other. The pocket screen area is the total area of perforated plate inside each pocket; this area will be determined by inspection of the screen manufacturing drawings.	viii) The screens utilize pockets with a frontal face area of $\geq$ 6.2 in^2 and a screen surface area $\geq$ 140 in^2 per pocket. IRWST Screens A and B each have a sufficient number of pockets to provide a frontal face area $\geq$ 25 ft^2, a screen surface area $\geq$ 575 ft^2, and a screen mesh size of $\leq$ 0.0625 inch. IRWST Screen C has a sufficient number of pockets to provide a frontal face area $\geq$ 50 ft^2, a screen surface area $\geq$ 1150 ft^2, and a screen mesh size $\leq$ 0.0625 inch. Each containment recirculation screen has a sufficient number of pockets to provide a frontal face area $\geq$ 105 ft^2, a screen surface area $\geq$ 2500 ft^2, and a screen mesh size $\leq$ 0.0625 inch. A debris curb exists in front of the containment recirculation screens which is $\geq$ 2 ft above the loop compartment floor. The bottoms of the IRWST screens are located $\geq$ 6 in above the bottom of the IRWST.

System Safety Functions in Other ITAAC

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
197	2.2.03.08c.xii	8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	xii) Inspections will be conducted of the CMT level sensors (PXS-11A/B/D/C, -12A/B/C/D, - 13A/B/C/D, -14A/B/C/D) upper level tap lines.	xii) Each upper level tap line has a downward slope of ≥ 2.4 degrees from the centerline of the connection to the CMT to the centerline of the connection to the standpipe.
200	2.2.03.08d	8.d) The PXS provides pH adjustment of water flooding the containment following design basis accidents.	Inspections of the pH adjustment baskets will be conducted.	pH adjustment baskets exist, with a total calculated volume ≥ 560 ft^3. The pH baskets are located below plant elevation 107 ft, 2 in.
202	2.2.03.09a.ii	9.a) The PXS provides a function to cool the outside of the reactor vessel during a severe accident.	ii) Inspections of the as-built reactor vessel insulation will be performed.	ii) The combined total flow area of the water inlets is not less than 6 ft^2. The combined total flow area of the steam outlet(s) is not less than 12 ft^2. A report exists and concludes that the minimum flow area between the vessel insulation and reactor vessel for the flow path that vents steam is not less than 12 ft^2 considering the maximum deflection of the vessel insulation with a static pressure of 12.95 ft of water.

System Safety Functions in Other ITAAC

330	2.3.04.04.i	4. The FPS provides for manual fire fighting capability in plant areas containing safety-related equipment.	i) Inspection of the passive containment cooling system (PCS) storage tank will be performed.	i) The volume of the PCS tank above the standpipe feeding the FPS and below the overflow is at least 18,000 gal.
		6. The FPS provides nonsafety-related containment spray for severe accident management.	Inspection of the containment spray headers will be performed.	The FPS has spray headers and nozzles as follows: At least 44 nozzles at plant elevation of at least 260 feet, and 24 nozzles at plant elevation of at least 275 feet.
		7. The FPS provides two fire water storage tanks, each capable of holding at least 100 percent of the water supply necessary for FPS use.	Inspection of each fire water storage tank will be performed.	The volume of water dedicated to FPS use provided in each fire water storage tank is at least 396,000 gallons.

System Safety Functions in Other ITAAC

375	2.3.06.09b.ii	9.b) The RNS provides heat removal from the reactor coolant during shutdown operations.	ii) Testing will be performed to confirm that the RNS can provide flow through the RNS heat exchangers when the pump suction is aligned to the RCS hot leg and the discharge is aligned to both PXS DVI lines with the RCS at atmospheric pressure.	ii) Each RNS pump provides at least 1400 gpm net flow to the RCS when the hot leg water level is at an elevation 15.5 inches ± 2 inches above the bottom of the hot leg.
			iii) Inspection will be performed of the reactor coolant loop piping.	iii) The RCS cold legs piping centerline is 17.5 inches ± 2 inches above the hot legs piping centerline.
			iv) Inspection will be performed of the RNS pump suction piping.	iv) The RNS pump suction piping from the hot leg to the pump suction piping low point does not form a local high point (defined as an upward slope with a vertical rise greater than 3 inches).
			v) Inspection will be performed of the RNS pump suction nozzle connection to the RCS hot leg.	v) The RNS suction line connection to the RCS is constructed from 20-inch Schedule 140 pipe.
		9.c) The RNS provides low pressure makeup flow from the cask loading pit to the RCS for scenarios following actuation of the ADS.	Testing will be performed to confirm that the RNS can provide low pressure makeup flow from the cask loading pit to the RCS when the pump suction is aligned to the cask loading pit and the discharge is aligned to both PXS DVI lines with RCS at atmospheric pressure.	Each RNS pump provides at least 1100 gpm net flow to the RCS when the water level above the bottom of the cask loading pit is 1 foot ± 6 inches.
426	2.3.09.03.iv	3. The VLS provides the nonsafety-related function to control the containment hydrogen concentration for beyond design basis accidents.	iv) An inspection will be performed of the as-built IRWST vents that are located in the roof of the IRWST along the side of the IRWST next to the containment shell.	iv) The discharge from each of these IRWST vents is oriented generally away from the containment shell.

Questions