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From: Habib, Donald
Sent: Thursday, July 26, 2012 1:14 PM
To: Campbell, Patricia L (GE Power & Water); Hale, Jerry
Subject: RE: Levy Open Items Call
Attachments: 3.7 RG 1.60 FIRS 07 20 12.pdf; 2.5.2.6.3 Horizontal GMRS Final 07 17 12.pdf; 2.5.4.5.4 Backfill Nuclear Island 07 19 12.pdf; 2.5.4.8.4 Liquefaction Cyclic Stress 07 20 12.pdf; 2.5.4.8.7 Liquefaction CEUS 07 19 12.pdf; 2.5.7 New Reference 07 20 12.pdf; Changed Pages from Part 5 LNP_EP_Rev4 draft.pdf; Changed Pages from LNP_FSAR_CHAP13 _Rev5Draft.pdf

Ms Campbell –

During today's public all with Progress Energy Florida, I expect that some of the attached public documents will be addressed. Not all are available in ADAMS, so I am providing them to you directly.

Please contact me if you have any questions.

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From: Campbell, Patricia L (GE Power & Water) [mailto:patriciaL.campbell@ge.com]
Sent: Wednesday, July 25, 2012 2:00 PM
To: Hale, Jerry; Habib, Donald
Subject: Levy Open Items Call

Mr. Hale and Mr. Habib,

Could you please provide the public call-in information for the Levy Open Items call on Thursday 7/26 at 1:30 p.m.?

Someone from the ESBWR DCWG will call in to listen to the public portion.

Thank you,
Patricia Campbell

Patricia L. Campbell
Vice President, Washington Regulatory Affairs
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Hearing Identifier: Levy_County_COL_Public
Email Number: 1159

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Subject: RE: Levy Open Items Call
Sent Date: 7/26/2012 1:13:44 PM
Received Date: 7/26/2012 1:13:00 PM
From: Habib, Donald

Created By: Donald.Habib@nrc.gov

Recipients:
"Campbell, Patricia L (GE Power & Water)" <patriciaL.campbell@ge.com>
Tracking Status: None
"Hale, Jerry" <Jerry.Hale@nrc.gov>
Tracking Status: None

Post Office:

Files	Size	Date & Time
MESSAGE	1248	7/26/2012 1:13:00 PM
3.7 RG 1.60 FIRS 07 20 12.pdf	327706	
2.5.2.6.3 Horizontal GMRS Final 07 17 12.pdf	242654	
2.5.4.5.4 Backfill Nuclear Island 07 19 12.pdf	244382	
2.5.4.8.4 Liquefaction Cyclic Stress 07 20 12.pdf	327838	
2.5.4.8.7 Liquefaction CEUS 07 19 12.pdf	238747	
2.5.7 New Reference 07 20 12.pdf	258730	
Changed Pages from Part 5 LNP_EP_Rev4 draft.pdf	115058	
Changed Pages from LNP_FSAR_CHAP13_Rev5Draft.pdf	728060	

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high frequency range (≥ 25 Hz.) except for the horizontal spectra at node 2078. At this node, the AP1000 HRHF FRS provides sufficient additional margin.

The second SSI analysis was performed using the 2D "Coarse" and "Fine" models for the BE soil profile. The SASSI Direct method was used. The 5 percent damped FRS at the six key nodes were generated. Frequency dependent Bump Factors (≥ 1.0) were calculated from the FRS as the ratio of the 2D Fine model and the 2D Coarse model FRS at the six key nodes.

The third SSI analysis was performed using the 3D 5-layer embedded model for the BE soil profile. The SASSI Direct method was used. The 5 percent damped FRS at the six key nodes were generated. The frequency dependent Bump Factors calculated from the 2D model were applied to the 3D 5-layer model FRS along the frequency spectrum to amplify the 3D 5-layer model FRS. These factored FRS are compared to the AP1000 generic and HRHF (as necessary) FRS envelops at the six key locations in Figures 3.7-220, 3.7-221, 3.7-222, 3.7-223, 3.7-224, and 3.7-225. The HRHF FRS envelope is presented for 3D nodes 2078, 2199, and 2675 to demonstrate that additional margin exists at the three nodes in the high frequency region (20-50 Hz.). As shown in the figures, the LNP site-specific factored FRS are enveloped by the AP1000 generic and HRHF FRS envelopes at each of the six nodes with sufficient margin.

3.7.2.4.1.6 Bearing Pressure and Base Shear

Based on the SSI analysis, the maximum bearing pressure on the RCC bridging mat beneath the NI basemat for the BE, UB, LB and LLB soil profiles is 20.29 ksf. The maximum bearing pressure corresponds to the BE soil profile. The LNP site specific maximum bearing pressure is enveloped by the AP1000 soft rock site maximum bearing pressure of 24 ksf for soft rock sites.

Based on the SSI analysis, the maximum base shear on the RCC bridging mat for the BE, UB, LB and LLB soil cases is 77,600 kips. The maximum base shear corresponds to the BE soil profile. The maximum 77,600 kips base shear yields a base shear to vertical load ratio of 0.12 for the NI. This ratio is enveloped by the AP1000 maximum ratio of 0.55.

3.7.2.4.1.7 Sensitivity Evaluations for Regulatory Guide 1.60 Spectra FIRS

The Regulatory Guide 1.60 Foundation Input Response Spectra (FIRS) is anchored at peak ground accelerations for the scaled site-specific FIRS in Table 2.5.2-236 (0.1g horizontal and 0.0695g vertical). The scaled site-specific FIRS was developed using the updated EPRI SOG methodology and scaled to meet 10 CRF Part 50 Appendix S requirements. Tables 3.7-203 and 3.7-204 present the 5% damped site specific FIRS, the 5% damped Regulatory Guide 1.60 FIRS, and the ratio of the Regulatory Guide FIRS and the site specific FIRS at various frequencies for horizontal and vertical spectra respectively.

Sensitivity evaluations were performed to assess whether the FRS at the six key locations using the Regulatory Guide 1.60 FIRS instead of the scaled site-specific FIRS remains bounded by the Certified Seismic Design Response Spectra (CSDRS) FRS. The sensitivity evaluations were performed using conservative simplified methodology by scaling the entire site specific FRS by the ratio of the Regulatory Guide 1.60 FIRS and the scaled site specific FIRS at the predominant response frequency at the node/direction. The predominant response frequency was determined from the peaks in the site specific FRS at each of the six nodes in the X, Y, and Z directions. The site specific FRS at the six nodes in the X, Y, and Z directions are shown in Figures 3.7-214, 3.7-215, 3.7-216, 3.7-217, 3.7-218, and 3.7-219. For this evaluation the lowest predominant response frequency is used because it will yield a larger scaling factor and is thus conservative. Table 3.7-205 presents the predominant response frequencies at the six key nodes in the X, Y, and Z directions, the ratio of the Regulatory Guide 1.60 FIRS and the scaled site specific FIRS at the predominant response frequency (scaling factor), and the minimum margin for site specific FRS with respect to the CSDRS FRS when the whole site specific FRS is scaled by the scaling factor for the predominant response frequency for the node and direction. Because the scaling factors to develop the Regulatory Guide 1.60 FRS are always smaller than the available margin with respect to the CSDRS FRS, the Regulatory Guide 1.60 FRS will be bounded by the CSDRS FRS. In addition, because the Regulatory Guide 1.60 spectra has only a small frequency content above 20 Hz. and no frequency content above 33 Hz., the Regulatory Guide 1.60 FRS peaks in the high frequency range (>20 Hz.) will be lower that that obtained by the simple scaling used, thus providing additional margin with respect to the CSDRS FRS.

As stated in Subsections 2.5.4.5.4 and 2.5.4.10.1.1, the conceptual design of the RCC bridging mat is based on a bearing pressure of 8.9 kips per square foot [ksf] for static loading and 24.0 ksf for dynamic loading. The static bearing pressure is based on DCD Tier 1 Table 5.0.1. The dynamic bearing pressure is the maximum subgrade pressure at the AP1000 basemat that results from the generic AP1000 analysis for soft rock sites. For the subsurface rock bearing capacity calculations, the RCC self weight was included as an additional bearing pressure load of 5.16 ksf. The buoyancy effects due to the hydrostatic pressure acting at the bottom of the RCC were considered in this analysis. A base shear load of 136,000 kips based on the AP1000 generic analysis was applied at the top of the RCC bridging mat. Because the AP1000 generic analyses are based on the CSDRS (0.3g Regulatory Guide 1.60 spectra enhanced in the high frequency region), the RCC design is conservative for the Regulatory Guide 1.60 FIRS.

3.7.2.8.1 Annex Building

Add the following text to the end of DCD Subsection 3.7.2.8.1.

In DCD Subsection 3.7.2.8.1, the maximum displacement of the roof of the Annex Building is reported as 1.6 inches for response spectra input at the base of the building that envelops the SSI spectra for the six soil profiles and also the CSDRS. The Annex Building foundation (top of mat) is at design grade. Figure 2.5.2-297 shows a comparison of the LNP scaled performance based surface response spectra (PBSRS) at the plant design grade and the CSDRS. The CSDRS envelops the LNP PBSRS by a wide margin. Thus, the LNP Annex Building roof displacement relative to its foundation is expected to be less than the 1.6 inches in the DCD for the CSDRS. The computed probable maximum relative displacement during SSE between the NI and the Annex Building foundation mat is less than 2.5 cm (1 in.) for both the scaled Performance Based Surface Response Spectra (PBSRS) or the Regulatory Guide 1.60 spectra anchored at peak ground acceleration of 0.1g applied at the foundation elevation of the Annex Building as shown in Table 3.7-206. The probable maximum relative displacement calculation included the drilled shaft supported foundation mat displacements including the drilled shaft to drilled shaft interaction effects, additional displacement due to soil column displacement, and the NI displacement at design grade. The square root of the sum of squares (SRSS) method was used to compute the probable maximum relative displacement. Thus, the LNP Annex Building roof displacement during SSE is expected to be less than 2.6 inches. As stated in DCD Subsection 3.7.2.8.1, the minimum clearance between the structural elements of the Annex Building above grade and the nuclear island (NI) is 4 inches. Figure 3.7-226 shows the conceptual design detail for the interface between the Nuclear Island (NI) and the drilled shaft supported foundation mat of the Annex Building. This design detail provides a 5.0 cm (2 in.) gap between the Annex Building foundation and the NI consistent with DCD Subsection 3.8.5.1. The top of the diaphragm wall and controlled low strength material fill between the diaphragm wall and the NI wall is at least 1.5 m (5 ft.) below the bottom of the Annex Building foundation mat as stated in Subsection 2.5.4.5.1. Engineered fill is used from the top of the controlled low strength material fill to the bottom of the Annex Building foundation as stated in Subsection 2.5.4.5.4. This interface is designed to avoid hard contact between the NI and the Annex Building foundation mat resulting from the relative displacement between the NI and the Annex Building foundation mat during the seismic event. Thus, no seismic interaction between the Annex Building and the NI is expected.

3.7.2.8.2 Radwaste Building

Add the following text to the end of DCD Subsection 3.7.2.8.2.

LNP SUP 3.7-5

The computed probable maximum relative displacement between the NI and the Radwaste Building foundation mat is less than 2.5 cm (1 in.) for both the scaled PBSRS or the Regulatory Guide 1.60 spectra anchored at peak ground acceleration of 0.1g applied at the foundation elevation of the Radwaste Building as shown in Table 3.7-206. The probable maximum relative displacement calculation included the drilled shaft supported foundation mat displacements including the drilled shaft to drilled shaft interaction effects, additional

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displacement due to soil column displacement, and the NI displacement at design grade. The SRSS method was used to compute the probable maximum relative displacement. Figure 3.7-226 shows the conceptual design detail for the interface between the Nuclear Island (NI) and the drilled shaft supported foundation mat of the Radwaste Building. This design detail provides a 5.0 cm. (2 in.) gap between the Radwaste Building foundation and the NI consistent with DCD Subsection 3.8.5.1. The top of the diaphragm wall and controlled low strength material fill between the diaphragm wall and the NI wall is at least 1.5 m (5 ft.) below the bottom of the Radwaste Building foundation mat as stated in Subsection 2.5.4.5.1. Engineered fill is used from the top of the controlled low strength material fill to the bottom of the Radwaste Building foundation as stated in Subsection 2.5.4.5.4. This interface is designed to avoid hard contact between the NI and the Radwaste Building foundation mat resulting from the relative displacements during the seismic event. Thus, no seismic interaction between the Radwaste Building foundation mat and the NI is expected.

3.7.2.8.3 Turbine Building

Add the following text to the end of DCD Subsection 3.7.2.8.3.

LNP SUP 3.7-5

The computed probable maximum relative displacement between the NI and the Turbine Building foundation mat is less than 2.5 cm (1 in.) for both the PBSRS or the Regulatory Guide 1.60 spectra anchored at peak ground acceleration of 0.1g applied at the foundation elevation of the Turbine Building as shown in Table 3.7-206. The probable maximum relative displacement calculation included the drilled shaft supported foundation mat displacements including the drilled shaft to drilled shaft interaction effects, additional displacement due to soil column displacement, and the NI displacement at design grade. The SRSS method was used to compute the probable maximum relative displacement. Figure 3.7-226 shows the conceptual design detail for the interface between the Nuclear Island (NI) and the drilled shaft supported foundation mat of the Turbine Building. This design detail provides the 5.0 cm. (2 in.) gap between the Turbine Building foundation and the NI consistent with DCD Subsection 3.8.5.1. The top of the diaphragm wall and controlled low strength material fill between the diaphragm wall and the NI wall is at least 1.5 m (5 ft.) below the bottom of the Turbine Building foundation mat as stated in Subsection 2.5.4.5.1. Engineered fill is used from the top of the controlled low strength material fill to the bottom of the Turbine Building foundation mat as stated in Subsection 2.5.4.5.4. This interface is designed to avoid hard contact between the NI and the Turbine Building foundation mat resulting from the relative displacements during the seismic event. Thus, no seismic interaction between the Turbine Building foundation mat and the NI is expected.

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3.7.2.8.4 Median Centered Adjacent Building Relative Displacements for 10^{-5} UHRS

TABLE 3.7-203

Ratio of Horizontal RG 1.60 FIRS and Site Specific (SS) FIRS

Frequency (Hz)	Site Specific FIRS (g)	RG 1.60 FIRS (g)	RG 1.60 / SS FIRS Ratio
1.00	0.108	0.147	1.36
1.50	0.156	0.206	1.32
2.00	0.176	0.261	1.48
2.50	0.196	0.313	1.60
3.00	0.214	0.305	1.43
3.50	0.230	0.298	1.30
4.00	0.245	0.293	1.20
5.00	0.273	0.284	1.04
6.00	0.276	0.276	1.00
9.00	0.265	0.261	0.98
10.00	0.263	0.241	0.92
12.00	0.260	0.211	0.81
15.00	0.253	0.179	0.71
20.00	0.231	0.145	0.63
30.00	0.183	0.107	0.59
33.00	0.175	0.100	0.57
100.00	0.100	0.100	1.00

TABLE 3.7-204

Ratio of Vertical RG 1.60 FIRS and Site Specific (SS) FIRS

Frequency (Hz)	Site Specific FIRS (g)	RG 1.60 FIRS (g)	RG 1.60/ SS FIRS Ratio
1.00	0.068	0.071	1.05
2.00	0.104	0.129	1.24
3.00	0.122	0.182	1.49
3.50	0.130	0.207	1.59
4.00	0.139	0.203	1.46
5.00	0.154	0.197	1.28
6.00	0.157	0.192	1.22
7.00	0.157	0.188	1.20
9.00	0.157	0.181	1.15
10.00	0.159	0.168	1.06
15.00	0.170	0.124	0.73
18.00	0.174	0.109	0.63
20.00	0.175	0.101	0.58
33.00	0.144	0.070	0.49
100.00	0.070	0.070	1.00

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LNP SUP 3.7-6

LNP SUP 3.7-3

Table 3.7-205
Predominant Frequencies, Scale Factors for Regulatory Guide 1.60 FIRS, and CSDRS FRS Margin

Node / Direction	Predominant Frequency (Hz.)	Ratio RG 1.60 and Scaled FIRS	Minimum CSDRS FRS Margin
1761-X	3.0	1.43	>1.43
1761-Y	5.5	1.02	>1.02
1761-Z	5.0	1.28	>1.28
2078-X	20.0	0.63	>1.00
2078-Y	12.0	0.81	>1.00
2078-Z	20.0	0.58	>1.00
2199-X	20.0	0.63	>1.00
2199-Y	5.5	1.02	>1.02
2199-Z	20.0	0.58	>1.00
2675-X	30.0	0.59	>1.00
2675-Y	3.0	1.43	>1.43
2675-Z	6.0	1.22	>1.22
2788-X	5.0	1.04	>1.04
2788-Y	5.5	1.02	>1.02
2788-Z	18.0	0.63	>1.00
3329_X	3.5	1.30	>1.30
3329-Y	3.0	1.43	>1.43
3329-Z	7.0	1.20	>1.20

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Table 3.7-206
Probable Maximum Relative Displacements between the Nuclear Island (NI) and Adjacent Buildings

Adjacent Building	Probable Maximum Relative Displacement (in.)	
	Site Specific FIRS	RG 1.60 FIRS
Between NI and Annex Building	0.70	0.59
Between NI and Radwaste Building	0.77	0.64
Between NI and Turbine Building	0.40	0.35

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2.5.2.6.3 Horizontal GMRS

Regulatory Guide 1.208 defines the GMRS as a risk-consistent design response spectrum computed from the site-specific UHRS at a mean annual frequency of exceedance of 10^{-4} by the relationship:

$$GMRS = DF \times UHRS\ (10^{-4}) \qquad \text{Equation 2.5.2-215}$$

Parameter *DF* is the design factor specified by the expression:

$$DF = \text{Maximum}\ (1.0,\ 0.6(A_R)^{0.8}) \qquad \text{Equation 2.5.2-216}$$

In which A_R is the ratio of the UHRS ground motions for annual exceedance frequencies of 10^{-4} and 10^{-5}, specifically:

$$A_R = \frac{UHRS(10^{-5})}{UHRS(10^{-4})} \qquad \text{Equation 2.5.2-217}$$

Regulatory Guide 1.208 also specifies that when the value of A_R exceeds 4.2, the amplitude of the GMRS is to be no less than 0.45 × $SA(0.1H_D)$ that is, 45 percent of the 10^{-5} UHRS. As the 10^{-4} UHRS with CAV is 0, this second criteria is used to define the horizontal GMRS. Figure 2.5.2-294 shows the horizontal GMRS calculated as 0.45 × $SA(0.1H_D)$.

For site-specific evaluations and design (liquefaction evaluations, seismic interaction of the Auxillary Building, Turbine Building, and Radwaste Building with the Nuclear Island, and Soil Structure Interaction analysis of the Nuclear Island), scaled PBSRS and scaled FIRS described in Subsection 2.5.2.6.6 are used. The scale factor of 1.212 was used so that the FIRS has a zero period acceleration of 0.1 g as required by 10 CFR Part 50 Appendix S. To be consistent with the site-specific evaluations and design, the horizontal GMRS was also scaled by the 1.212 factor. The scaled horizontal GMRS is listed in Table 2.5.2-226 along with the 10^{-5} UHRS and is shown on Figure 2.5.2-294. The scaled horizontal GMRS represents the licensing basis for the LNP site.

Deleted: and the design of the RCC bridging mat),

2.5.4.5.4 Properties of Backfill Beneath and Adjacent to Nuclear Island

Based on a design grade elevation of 15.5 m (51 ft.) NAVD88, the elevation of each nuclear island basemat will be 3.4 m (11 ft.) NAVD88. A 15.2 cm (6 in.) mudmat will be located beneath each nuclear island basemat at elevation 3.4 m (11 ft.) NAVD88. Structural fill between the excavation bottom (elevation -7.3 m [-24 ft.] NAVD88) and the nuclear island mudmat (elevation 3.4 m [11 ft.] NAVD88) will consist of an RCC bridging mat, as shown on Figures 2.5.4.5-201B and 2.5.4.5 202B. A waterproofing membrane will be located between the RCC and the mudmat, meeting AP1000 DCD requirements of 0.55 static coefficient of friction between horizontal membrane and concrete. For buildings adjacent to the nuclear islands, the design grade will be raised to elevation 15.5 m (51 ft.) NAVD88 using engineered fill.

The following is the Design Description of the RCC. This RCC fill will serve two purposes: 1) replace the weakly cemented, undifferentiated Tertiary sediments that are present above elevation -7.3 m (-24 ft.) NAVD88, thereby, creating a uniform subsurface with increased bearing capacity; and 2) bridge conservatively postulated karst features.

The RCC bridging mat has been designed to bridge a 3-m (10-ft.) air-filled cavity located immediately beneath the RCC (elevation -7.3 m [-24 ft.] NAVD88) at any plan location for loading conditions identified in Subsection 2.5.4.10.1.1. In addition, a base shear load of 136,000 kips based on the AP1000 generic analysis was applied at the top of the RCC bridging mat. These loads are based on generic AP1000 analyses. The 1-year specified compressive strength (f'_c) of the RCC is 2500 psi. The design of the RCC bridging mat has considered a nominal tensile strength of 250 psi.

Deleted: DCD Tier 1 Table 5.0-1 and Tier 2 Table 2-1

A theoretical rock profile for the North and South Plant Units was developed using LNP site-specific rock properties and layering information. A SAP2000 Finite Element Model (FEM – linearly elastic) of the RCC, nuclear island basemat, and the subsurface rock was created using the design geometry, the rock profile beneath the RCC Bridging Mat, and the total loads applied by the nuclear island.

Also included in the FEM was the presence of theoretical cavities of different sizes and configurations. Three different cases, with cavities located at different depths, were considered:

- Case A: Cavities were located immediately below the grouted limestone, at elevation -99 ft. NAVD88 (75 ft. under the RCC).
- Case B: Cavities were located immediately below the RCC, at elevation -24 ft. NAVD88.
- Case C: Cavities were located at the top of rock layer NAV-3, which is the layer with lower Elastic Modulus for the North Reactor profile, below elevation -149 ft. NAVD88 (125 ft. under the RCC). This case was analyzed only in the North Reactor, where the lower Elastic Modulus layer is somewhat thicker than in the South Reactor profile.

Examples of the locations of these cavities are shown on Figure 2.5.4.5-204.

2.5.4.8.4 Earthquake Induced Cyclic Stress

Earthquake-induced cyclic stresses within soils considered for liquefaction analysis were computed from the site response analyses used to develop the site amplification functions for the PBSRS profiles described in Subsection 2.5.2.5. The site response analyses were performed using 60 randomized soil profiles representing each PBSRS shear wave velocity profile and 30 acceleration time histories representing each deaggregation earthquake (DE) listed in Table 2.5.2-225. In each individual site response analysis effective cyclic shear strains and iterated shear modulus were computed for each layer of the profile. The effective cyclic shear stress for each layer was then taken as the product of the effective cyclic shear strain and the iterated shear modulus. The results of the 180 analyses (60 randomized profiles times three deaggregation earthquakes) were then used to compute a weighted mean effective cyclic shear stress for each layer within each of the three PBSRS soil profiles and for the 10^{-4} and 10^{-5} exceedance level input motions. The weights used were the relative weights assigned to the DEs that are listed in Table 2.5.2-225.

The results of the site response analyses were used to produce peak ground acceleration (PGA) seismic hazard results at the finished graded elevation computed without CAV for the 10^{-4} and 10^{-5} exceedance levels. These values were used to compute a performance based PGA at the finished grade elevation using Equations 2.5.2-215 through 2.5.2-217. The resulting acceleration value is 0.118g. The corresponding PGA at the base of the excavation (-24 ft. NAVD88) is 0.071g. These values along with the site class and the value of F_a based on the International Building Code (2006) are shown in Table 2.5.4.8-201.

The development of the cyclic shear stress complies with the guidance in Regulatory Position 3.3.2 of Regulatory Guide 1.198 because an ensemble of time histories was used that represent the earthquakes contributing to the hazard at the LNP site. The development of the ensemble of time histories is described in Subsection 2.5.2.5.2. The time histories used to represent the DE were taken from NUREG/CR-6728 (Reference 2.5.2-263). The weighted mean magnitude for the earthquake time histories representing the high frequency (HF) 10^{-4} and 10^{-5} DEs are 6.8 and 6.1, respectively. Thus, these time histories also satisfy the acceptance criteria in SRP Section 2.5.2 in that weighted mean magnitudes for the ensembles of time histories exceed magnitude 6. The associated number of equivalent cycles of loading was estimated using the relationship between earthquake magnitude and number of loading cycles provided in Reference 2.5.4.8-203. The m_b magnitudes listed in Table 2.5.2-225 for the HF DEs were converted to moment magnitudes using the relationships given in Subsection 2.5.2.4.2.3 and the resulting average moment magnitude was used to estimate the number of cycles for each DE using Figure 12 in Reference 2.5.4.8-203. The resulting weighted mean values are 9.4 cycles and 6.5 cycles for the HF 10^{-4} and 10^{-5} hazard levels, respectively.

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LNP COL 2.5-9

Table 2.5.4.8-201
Summary of Peak Ground Acceleration Used for Liquefaction Analysis

Structure	Rock Peak Ground Acceleration (g)	Site Class	F_a	a_{max} (g)
North Reactor	0.071	C	1.2	0.118
South Reactor	0.071	C	1.2	0.118

Notes:

Site Class and F_a were estimated based on International Building Code (IBC) (2006).

a_{max} = Horizontal peak acceleration at ground surface for the PBSRS profile with no CAV or scaling
g = gravity acceleration

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2.5.4.8.7 Liquefaction Potential Evaluations for CEUS SSC

The soils under the Nuclear Island will be excavated and backfilled with RCC; therefore, no liquefaction potential exists under the Nuclear Island foundation. For design basis evaluations of liquefaction potential of soils under the adjacent Annex, Turbine and Radwaste Buildings, earthquake-induced cyclic stresses in the soil column were based on ground motions computed for the PBSRS profile using the updated EPRI-SOG model. The associated PGA at the finished grade elevation is 0.118g (Table 2.5.4.8-201) and is based on the surface hazard curves computed without CAV. The PGA at the finished grade elevation computed without CAV using the CEUS SSC model is 0.091g. As the computed equivalent cyclic shear stresses are proportional to the PGA at the finished grade, the equivalent cyclic shear stresses based on the CEUS SSC model would be lower than those computed based on the updated EPRI-SOG model. Therefore, the liquefaction evaluations based on the updated EPRI-SOG LNP ground motions bound those from the CEUS SSC ground motions.

For site specific seismic margins evaluation presented in Subsection 19.55.6.3, liquefaction potential of soils under the adjacent Annex, Turbine and Radwaste Buildings, earthquake-induced cyclic stresses in the soil column, based on ground motions consistent with the updated EPRI-SOG finished grade 10^{-5} UHRS, were used. As shown in Figures 3.7-228 and 3.7-229, 1.67*GMRS and 1.67*PBSRS developed using the CEUS SSC methodology and modified CAV filter are enveloped by the updated EPRI-SOG finished grade 10^{-5} UHRS. Furthermore, the PGA for the 10^{-5} PBSRS profile surface motions computed without CAV using the CEUS SSC model are lower than those computed using the updated EPRI-SOG model. Thus, the High Confidence Low Probability of Failure (HCLPF) capacity for no liquefaction potential of soil under the Annex, Turbine, and Radwaste Buildings exceeds the 1.67*GMRS goal for the plant level HCLPF for the CEUS SSC ground motions.

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Deleted: consistent with the finished grade scaled PBSRS. As shown in Figure 2.5.2-357, the CEUS SSC PBSRS is enveloped by the updated EPRI-SOG scaled PBSRS.

Deleted: To evaluate the High Capacity, Low Probability of Failure (HCLPF)

New Reference added to Subsection 2.5.7

2.5.4.8-203 Seed H.B., Idriss I.M., Makdisi F., & Banerjee N., Representation of Irregular Stress Time Histories by Equivalent Uniform Stress Series in Liquefaction Analyses, Report No EERC 75-29, October, 1975.

d. Report Preparation Director: The Report Preparation Director is located in the EOF and reports to the EOF Director; responsible for initiating notifications to the state and counties of emergency status.

e. Technical Support Coordinator: The Technical Support Coordinator is located in the EOF and reports to the EOF Director; responsible for assisting the TSC Accident Assessment Team in identifying accident mitigation activities and monitoring critical safety system functions.

f. Representatives to the State/County EOCs: The representatives to the State/County EOCs are located at the following:

FL State EOC	State Administrative Building in Tallahassee, FL
Citrus County EOC	Lecanto, FL
Levy County EOC	Bronson, FL
Marion County EOC	Ocala, FL

These representatives act as technical liaisons to facilitate communications and the coordination of information flow between the EC or EOF Director and state/local authorities. They report to the Assistant EOF Director.

g. Emergency News Center (ENC): The ENC Staff is responsible for dissemination of information to the public and the news media under the direction of the Public Information Director.

Outside organizations that support LNP in an emergency include CR3 and other organizations as described in Section A, Assignment of Responsibility (Organizational Control).

6. INTERFACES BETWEEN FUNCTIONAL AREAS

Figure A-1 illustrates the interfaces among functional areas of LNP emergency response activity, Progress Energy corporate support, and the affected state, local, and federal government response organizations.

7. CORPORATE SUPPORT FOR THE PLANT STAFF

Within the overall corporate organization, additional elements exist to directly control and support the operation of LNP. The Plant General Manager and the entire LNP staff are a part of the Nuclear Generation organization. The Plant General Manager reports to the Site Executive, Levy Nuclear Plant, who, in turn, reports to the Senior Vice President – Nuclear Operations Site Group. The Senior Vice President – Nuclear Operations Site Group reports to the Executive

Vice President – Nuclear Generation / Chief Nuclear Officer, who, in turn, reports to the President and Chief Executive Officer – Duke Energy.

The Nuclear Generation organization consists of organizational elements that provide additional administrative and technical support to ensure continued safe plant operation in compliance with operational commitments and applicable licensing requirements and regulations. These elements include Engineering, Support Services, Training, and Nuclear Oversight.

Upon declaration of an Alert, Site Area Emergency, General Emergency, or Unusual Event, if conditions warrant, the EC directs the activation and notification of the on-site and off-site Emergency Response Facilities (ERFs). Progress Energy management, technical, and administrative personnel staff the EOF and other facilities and provide augmented support for the plant staff as shown in Table B-1.

In addition to the minimum required staff, additional personnel report to the EOF to augment the minimum staff. This augmentation would occur within the required time specified in Table B-1.

In the event of an emergency at LNP that requires personnel and other support resources beyond those available within the LNP Emergency Organization, augmentation is available from various off-site organizations. Primary off-site support is available from the Nuclear Generation organization. This support is initiated upon activation of the EOF. Corporate support is also available as described in plant procedures. The following list describes other areas of support within this Plan.

a. Logistics support for emergency personnel is addressed in Section A and Section B of this Plan.

b. Technical support for planning and reentry/recovery operations is addressed in Section M of this Plan.

c. The EOF Director has the ultimate responsibility for directing the corporate emergency response. Corporate support is coordinated between the Emergency Coordinator and the EOF Director. The EOF Director and staff serve as the point of contact among LNP personnel, the corporate emergency response staff, and governmental authorities.

d. The Corporate Communications organization coordinates with governmental authorities and controls the release of information to news media during emergencies. Section G of this Plan discusses the public information function.

P. RESPONSIBILITY FOR THE PLANNING EFFORT: DEVELOPMENT, PERIODIC REVIEW AND DISTRIBUTION OF EMERGENCY PLANS

This section addresses responsibilities associated with planning efforts. For example, Progress Energy implements an organizational structure and processes to ensure that this Plan is periodically reviewed, updated, audited, distributed, and controlled consistent with facility quality assurance and document control requirements. Progress Energy also implements a program to ensure personnel responsible for the emergency planning effort receive training appropriate to their duties and responsibilities.

1. TRAINING

Progress Energy develops and implements a process to ensure the Emergency Preparedness Supervisor and support staff are properly trained for effective implementation of the emergency planning effort, consistent with applicable regulatory requirements and guidance, license conditions, other commitments, and accepted good practices. Training is primarily through on-the-job related to Plan preparation, periodic revisions, or drills and exercises. Other training may include formal education, professional seminars, plant-specific training, industry meetings, and other activities and forums that provide for an exchange of pertinent information.

2. RESPONSIBILITY FOR RADIOLOGICAL EMERGENCY RESPONSE TRAINING

The Vice President, Corporate Governance and Operations Support holds the overall authority and responsibility for ensuring that an adequate level of emergency preparedness is maintained. Responsibility for the planning effort is delegated to the Emergency Preparedness Supervisor.

3. EMERGENCY PLANNING COORDINATION

The Emergency Preparedness Supervisor is designated as the Emergency Planning Coordinator, having lead responsibility for emergency planning. This individual is responsible for developing and updating the LNP Emergency Plan and coordination of this Plan with other response organizations. The Progress Energy corporate staff may augment these on-site efforts, as needed, to ensure a comprehensive emergency preparedness effort.

4. PLAN REVIEWS AND UPDATES

The Emergency Planning Coordinator will coordinate the updating of the Emergency Plan, Plant Emergency Procedures (PEPs), and Supporting Agreements, as needed, and will review and certify them to be current on an annual basis. Any revisions to the Plan will be reviewed in accordance with 10 CFR 50.54(q) requirements.

On an annual basis, the Emergency Planning Coordinator reviews the LNP procedures for emergency classification with the state and any affected local organizations. The annual review includes the content of the EALs with the state and county authorities.

5. DISTRIBUTION OF REVISED PLANS

Upon completion of the annual review, the Emergency Planning Coordinator or designee incorporates any necessary changes. Changed pages are marked and dated to highlight the changes.

Following approval of the updated plan by the Site Executive, Levy Nuclear Plant, the LNP document control organization distributes the updated plan to organizations/individuals with responsibility for implementing the plans.

6. SUPPORTING PLANS

Other plans that support this Plan are:

a. The State of Florida Radiological Emergency Management Plan (Annex A to the State of Florida Comprehensive Emergency Management Plan) (Reference O).

b. Appendix VI of the State Plan (Levy Nuclear Plant Site Plan) (Reference O).

c. Citrus County Sheriff's Office Radiological Emergency Preparedness (Rep) Plan For Crystal River and Levy Nuclear Power Plants (Reference EE).

d. Levy County Emergency Management Radiological Emergency Preparedness Plan (Reference FF).

e. Marion County Emergency Management Radiological Emergency Preparedness (REP) Plan For the Levy Nuclear Power Plant (Reference GG).

f. U.S. Nuclear Regulatory Commission, NUREG-0728, NRC Incident Response Plan (Reference Y).

g. National Response Framework (Reference J).

h. NRC Region II Incident Response Plan.

i. Institute of Nuclear Power Operations (INPO) Emergency Response Plan.

j. Citrus Memorial Hospital "Nuclear Accident Plan"

k. Seven Rivers Regional Medical Center "Radioactive Material Contamination Response Plan"

7. IMPLEMENTING PROCEDURES

Appendix 5 of this Plan provides a topical listing of implementing procedures and administrative procedures that support this Plan and includes the section(s) of the Plan to be implemented by each procedure.

Certain emergency plan features recommended by NUREG-0654 (e.g., Evaluation Criterion I.3, which addresses methods and techniques for determining source terms and the magnitude of releases) are procedural in nature and have been appropriately placed in LNP procedures. Changes to the affected portions of these procedures are developed and approved consistent with the requirements of 10 CFR 50.54(q) and the guidance provided in NRC Regulatory Information Summary 2005-02, “Clarifying the Process for Making Emergency Plan Changes (Ref III.A. 28).”

8. TABLE OF CONTENTS AND NUREG-0654 CROSS REFERENCE

This Plan contains a specific table of contents. Additionally, the format for this Emergency Plan directly follows the format of NUREG-0654, Rev. 1.

9. EMERGENCY PLAN AUDITS

Progress Energy’s Nuclear Oversight organization performs, or oversees the performance of, periodic independent audits of the Emergency Preparedness Program consistent with the requirements of 10 CFR 50.54(t). The audits include, at a minimum, the following:

a. The Emergency Plan.

b. Emergency Plan Implementing Procedures and practices.

c. The Emergency Preparedness Training Program.

d. Readiness testing (e.g., drills and exercises).

e. Emergency response facilities, equipment, and supplies.

f. Interfaces with state and local government agencies.

g. Required records and documentation.

Progress Energy’s Nuclear Oversight organization ensures that all audit findings are subject to management controls consistent with the facility’s corrective action program.

Progress Energy establishes and maintains the frequency of the periodic audits based on an assessment of performance as compared to performance indicators; however, the audit frequency may not be less than once every 24 months. In addition, Progress Energy conducts a program audit as soon as

reasonably practicable after a change occurs in personnel, procedures, equipment, or facilities that could potentially adversely affect emergency preparedness, but no longer than 12 months after the change.

Progress Energy's Nuclear Oversight organization documents audit results and improvement recommendations and reports these results to the LNP facility and Progress Energy management. Progress Energy makes those portions of the audits that address the adequacy of interfaces with state and local governments available to the affected governments.

Records Management shall file and maintain the following records for 5 years:

a. The review results and recommended improvements.

b. The answers to the recommended improvements.

c. A description of the corrective actions taken.

10. EMERGENCY TELEPHONE NUMBERS

The Emergency Planning Coordinator, or designee, is responsible for performing a quarterly review of the telephone numbers in emergency response procedures and for ensuring required revisions are completed.

CHAPTER 13

CONDUCT OF OPERATIONS

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CHAPTER 13

CONDUCT OF OPERATIONS

13.1 ORGANIZATIONAL STRUCTURE OF APPLICANT

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

STD DEP 1.1-1

DCD Subsection 13.1.1, Combined License Information, is renumbered in this FSAR section to 13.1.4.

LNP COL 13.1-1

This section describes the organizational positions of a nuclear power station and the interface with it's owner/applicant corporations including their associated functions and responsibilities. The position titles below the executive level used in the text are generic and describe the function of the position.

Table 13.1-201, Generic Position/Site Specific Position Cross Reference, provides a cross-reference to identify the corresponding generic position titles. Changes to the organization described herein are reviewed under the provisions of 10 CFR 50.54 (a) to ensure that any reduction in commitments in the QAPD (as accepted by the NRC) are submitted to and approved by the NRC, prior to implementation.

STD DEP 1.1-1

13.1.1 MANAGEMENT AND TECHNICAL SUPPORT ORGANIZATION

Duke Energy has over 40 years of experience in the design, construction, and operation of nuclear generating stations. The Duke Energy Nuclear Generation organization operates twelve nuclear units at seven sites: Catawba Nuclear Plant Units 1 and 2, McGuire Nuclear Plant Units 1 and 2, Oconee Nuclear Plant Units 1, 2 and 3, Harris Nuclear Plant Unit 1, Brunswick Nuclear Plant Units 1 and 2, H.B. Robinson Nuclear Plant Unit 2, and Crystal River Nuclear Plant Unit 3. The Nuclear Generation organization includes, but is not limited to Nuclear Engineering, Nuclear Operations, Corporate Governance and Operations Support, Nuclear Major Projects, Nuclear Development, and Nuclear Oversight.

13.1.1.1 Design, Construction, and Operating Responsibilities

The Duke Energy Chief Executive Officer has overall responsibility for functions involving design, construction, and operation of Duke Energy's nuclear plants. Line responsibilities for those functions are assigned to the Executive Vice President – Nuclear Generation / Chief Nuclear Officer (CNO) and the Executive Vice President – Energy Supply. The CNO directs the Senior Vice President for each nuclear site group in the operation of his applicable unit(s), the Senior Vice President – Nuclear Engineering, the Vice President – Corporate Governance and Operations Support, the Vice President – Nuclear Major Projects, the Vice President - Nuclear Development, and the Vice President – Nuclear Oversight in

the support of the nuclear fleet. The Executive Vice President – Energy Supply, via an interface agreement with Nuclear Generation .~~The Executive Vice President – Energy Supply~~ directs the Vice President – Project Management and Construction in the design and construction of new nuclear plant generation. The Executive Vice President – Nuclear Generation / Chief Nuclear Officer (CNO) directs Vice President – Nuclear Development in the preparation and integration of the new nuclear plants into the Nuclear Generation operating fleet. The first priority and responsibility of each member of the nuclear staff throughout the life of the plant is nuclear safety. Decision making for station activities is performed in a conservative manner with expectations of this core value regularly communicated to appropriate personnel by management interface, training, and station directives.

Lines of authority, decision making, and communication are clearly and unambiguously established to enable the understanding of the various project members, including contractors, that utility management is in charge and directs the project.

The corporate organization as shown in Figures 13.1-203 and 13AA-201 provide for design, construction, and preoperational activities and oversight of NSSS vendor and Architect/Engineer management and technical support organizations for design, construction, and preoperational activities as discussed in Appendix 13AA.

13.1.1.2 Provisions for Technical Support Functions

Before beginning preoperational testing, the Vice President – Nuclear Development, the Site Executive in charge of LNP, the Vice President – Corporate Governance and Operations Support and the Senior Vice President – Nuclear Engineering establish the organization of managers, functional managers, supervisors, and staff sufficient to perform required functions for support of safe plant operation. These functions include the following:

- Nuclear, mechanical, structural, electrical, thermal-hydraulic, metallurgical and material, and instrumentation and controls engineering.
- Safety review.
- Quality assurance, audit and surveillance.
- Plant chemistry.
- Radiation protection and environmental support.
- Fueling and refueling operations support.
- Training.
- Maintenance support.

- Operations support.
- Fire protection.
- Emergency planning organization.
- Outside contractual assistance.

In the event that station personnel are not qualified to deal with a specific problem, the services of qualified individuals from other functions within the company or an outside consultant are engaged. For example, major contractors, such as the reactor technology vendor or turbine generator manufacturer, provide technical support when equipment modifications or special maintenance problems are considered. Special studies, such as environmental monitoring, may be contracted to qualified consultants. Figure 13.1-201 illustrates the management and technical support organizations supporting operation of the plant. See Section 13.1.1.3.2 for description of responsibilities and authorities of management positions for organizations providing technical support. Table 13.1-201 shows the estimated number of positions required for each function.

Multiple layers of protection are provided to preserve unit integrity including organization. Organizationally, operators and other shift members are assigned to a specific unit. Physical separation of units helps to minimize wrong-unit activities. In addition, station procedures and programs provide operating staff with methods to minimize human error including tagging programs, procedure adherence requirements, and training.

13.1.1.2.1 Nuclear Engineering

The Nuclear Engineering organization consists of system engineering, design engineering, engineering programs, nuclear fuel management, and safety and engineering analysis. This organization is responsible for performing the classical design activities, as well as providing engineering expertise in other areas of new plant sites and license renewal at current plant sites.

Each of the engineering groups has a functional manager who reports to the Senior Vice President – Nuclear Engineering. See Figure 13.1-201.

The Nuclear Engineering organization is responsible for:

- Support of plant operations in the engineering areas of mechanical, structural, electrical, thermal-hydraulic, metallurgy and materials, electronic, instrument and control, and fire protection. Priorities for support activities are established based on input from site management with emphasis on issues affecting safe operation of the plant.
- Engineering programs.
- Major engineering projects for the nuclear fleet

- Support of procurement, chemical and environmental analysis and maintenance activities in the plant as requested by the site management.
- Performance of design engineering of plant modifications.
- Maintaining the design basis by updating the record copy of design documents as necessary to reflect the actual as-built configuration of the plant.
- Accident and transient analyses.
- Human Factors Engineering design process.

Reactor engineering, led by the functional manager in charge of Nuclear Fuel Management and Safety Analysis, provides technical assistance in the areas of core design, core operations, core thermal limits, and core thermal hydraulics.

Engineering work may be contracted to and performed by outside companies in accordance with the Quality Assurance Program Description (QAPD).

Engineering resources are shared between units. A single management organization oversees the engineering work associated with the station units.

13.1.1.2.2 Nuclear Safety Assurance

The Nuclear Oversight organization provides independent oversight of nuclear plant activities, maintains the Quality Assurance Program Manual and administers the nuclear employee concerns program. Review and audit activities are covered in Chapter 17 and the QAPD. The Vice President – Nuclear Oversight reports directly to the Executive Vice President & CNO – Nuclear Generation on all matters related to the independent monitoring and assessing of activities during new nuclear plant construction.

13.1.1.2.3 Quality Assurance

Safety-related activities associated with the operation of the plant are governed by QA direction established in Chapter 17 of the FSAR and the QAPD. The requirements and commitments contained in the QAPD apply to activities associated with structures, systems, and components, which are safety-related and are mandatory and must be implemented, enforced, and adhered to by individuals and organizations. QA requirements are implemented through the use of approved procedures, policies, directives, instructions, or other documents, which provide written guidance for the control of quality related activities and provide for the development of documentation to provide objective evidence of compliance. The QA function includes:

- Maintenance of the QAPD.
- Coordinating the development of audit schedules.

- Audit, surveillance, and evaluation of nuclear division suppliers.

- Support of general quality assurance indoctrination and training for the nuclear station personnel.

The site Nuclear Oversight organization contains the QA and QC organizations and is independent of the station organization. Quality Control (QC) inspection/testing activities to support plant operation, maintenance, and outages are independent of the station organization. QA and QC personnel report to the functional manager in charge of Nuclear Oversight at LNP. The functional manager in charge of Nuclear Oversight at LNP reports directly to the VP – Nuclear Oversight.

Personnel resources of the QA and QC organizations are shared between units. A single management organization oversees the QA and QC organizations for the station units.

13.1.1.2.4 Chemistry

The Corporate Governance & Operations Support organization provides for the standardization and support of the chemistry program at each site. A chemistry program is established to monitor and control the chemistry of various plant systems such that corrosion of components and piping is minimized and radiation from corrosion byproducts is kept to levels that allow operations and maintenance with radiation doses as low as reasonably achievable.

The functional superintendent in charge of Environmental & Chemistry is responsible to the Plant General Manager for maintaining chemistry programs and for monitoring and maintaining the water chemistry of plant systems. The staff of the chemistry department consists of laboratory technicians, support personnel, and supervisors who report to the functional superintendent in charge of Environmental & Chemistry.

Personnel resources of the chemistry organization are shared between units. A single management organization oversees the chemistry group for the station units.

13.1.1.2.5 Radiation Protection

The Corporate Governance & Operations Support organization provides for the standardization and support of the radiation protection programs at each site. A radiation protection (RP) program is established to protect the health and safety of the surrounding public and personnel working at the plant. The RP program is described in Chapter 12 of the FSAR. The program includes:

- Respiratory Protection

- Personnel Dosimetry

- Bioassay
- Survey Instrument Calibration and Maintenance
- Radioactive Source Control
- Effluents and Environmental Monitoring and Assessment
- Radioactive Waste Shipping
- Radiation Work Permits
- Job Coverage
- Radiation Monitoring and Surveys

The RP organization is staffed by Radiation Protection Technicians, support personnel, and supervisors who report to the Functional Superintendent in charge of Radiation Protection. To provide sufficient organizational freedom from operating pressures, the Functional Superintendent in charge of Radiation Protection reports directly to the Plant General Manager.

Personnel resources of the RP organization are shared between units. A single management organization oversees the RP group for the station units.

13.1.1.2.6 Fueling and Refueling Support

The Corporate Governance & Operations Support organization provides for the standardization and support of the refueling programs at each site. The function of fueling and refueling is performed by a combination of personnel from various organizations including operations, maintenance, radiation protection, engineering, and reactor technology vendor or other contractor staff. Initial fueling and refueling operations are a function of the outage organization. The functional manager in charge of Outage & Scheduling is responsible for planning and scheduling outages and for refueling support. The functional manager in charge of Outage & Scheduling reports to the Plant General Manager.

Personnel resources of the outage and scheduling organization are shared between units. A single management organization oversees the outage and scheduling group for the station units.

13.1.1.2.7 Training and Development

The Corporate Governance & Operations Support organization provides for the standardization and support of the training programs at each site. The site training organization is responsible for providing training programs that are established, maintained, and implemented in accordance with applicable plant administrative directives, regulatory requirements, and company operating policies so that station personnel can meet the performance requirements of their jobs in operations, maintenance, technical support, and emergency response.

The objective of training programs is to provide qualified personnel to operate and maintain the plant in a safe and efficient manner and to provide compliance with the license, technical specifications, and applicable regulations. The training organization's responsibilities encompass operator initial license training, requalification training, and plant staff training, as well as the plant access training (general employee training) and radworker training. The functional manager in charge of Training LNP is independent of the operating line organization to provide for independence from operating pressures. Nuclear plant training programs are described in Section 13.2 of the FSAR.

Personnel resources of the training organization are shared between units. A single management organization oversees the training group for the station units.

13.1.1.2.8 Maintenance Support

The Corporate Governance & Operations Support organization provides for the standardization and support of the maintenance programs at each site. In support of maintenance activities, planners, schedulers, and parts specialists prepare work packages, acquire proper parts, and develop procedures that provide for the successful completion of maintenance tasks. Maintenance tasks are integrated into the station schedule for evaluation of operating or safe shutdown risk elements and to provide for efficient and safe performance. The functional manager in charge of Maintenance reports to the Plant General Manager.

Personnel of the maintenance support organization are shared between units. A single management organization oversees the maintenance group for the station units.

13.1.1.2.9 Operations Support

The Corporate Governance & Operations organization provides for the standardization and support of the operations program at each site. The operations support function is provided under the direction of the functional manager in charge of Operations. Operations support includes the following programs:

- Operations procedures
- Operations surveillances
- Equipment tagging
- Fire protection testing and surveillance
- Radwaste system operation

13.1.1.2.10 Fire Protection

LNP COL 9.5-1 The station is committed to maintaining a Fire Protection Program as described in Section 9.5. The Site Executive in charge of LNP is responsible for the Fire Protection Program. Assigning the responsibilities at that level provides the authority to obtain the resources and assistance necessary to meet Fire Protection Program objectives, resolve conflicts, and delegate appropriate responsibility to fire protection staff. The relationship of the Site Executive in charge of LNP to other staff personnel with fire protection responsibilities is shown on Figure 13.1-201. Fire protection for the facility is organized and administered by the functional supervisor in charge of Fire Protection. The Site Executive in charge of LNP, through the functional supervisor in charge of Fire Protection is responsible for development and implementation of the Fire Protection Program including development of fire protection procedures, site personnel and fire brigade training, and inspections of fire protection systems and functions. The functional lead engineer in charge of the Fire Protection Program reports through the direct line of authority to the Site Executive in charge of LNP. Functional descriptions of position responsibilities are included in appropriate procedures. Station personnel are responsible for adhering to the fire protection/prevention requirements detailed in Section 9.5. The Site Executive in charge of LNP has the lead responsibility for overall site fire protection during construction of new units.

Personnel resources of the fire protection organization are shared between units. A single management organization oversees the fire protection group for the station units.

13.1.1.2.11 Emergency Response Organization

LNP COL 13.1-1 The Corporate Governance & Operations Support organization provides for the standardization and support of the emergency response programs at each site. The emergency response organization is a matrixed organization composed of personnel who have the experience, training, knowledge, and ability necessary to implement actions to protect the public in the case of emergencies. Managers and station personnel assigned positions in the emergency organization are responsible for supporting the emergency preparedness organization and emergency plan as required. The staff members of the emergency planning organization administrate and orchestrate drills and training to maintain qualification of station staff members and develop procedures to guide and direct the emergency organization during an emergency. The functional supervisor in charge of Emergency Preparedness reports to the functional manager in charge of site Support Services. The site emergency plan organization is described in the Emergency Plan.

Resources of the emergency planning group are shared between units. A single management organization oversees the emergency planning group for the station units.

13.1.1.2.12 Outside Contractual Assistance

Contract assistance with vendors and suppliers of services not available from organizations established as part of utility staff is provided by the materials, purchasing, and contracts organization. Personnel in the materials, purchasing, and contracts organization perform the necessary functions to contract vendors of special services to perform tasks for which utility staff does not have the experience or equipment required. The functional manager in charge of Nuclear Generation Supply Chain reports to the Vice President – Supply Chain.

Resources of the materials, purchasing, and contracts organization are shared between units. A single management organization oversees the materials, purchasing, and contracts group for the station units.

13.1.1.3 Organizational Arrangement

13.1.1.3.1 Executive Management Organization

Executive management is ultimately responsible for execution of activities and functions for the nuclear generating plants owned by the utility. Executive management establishes expectations such that a high level of quality, safety, and efficiency is achieved in aspects of plant operations and support activities through an effective management control system and an organization selected and trained to meet the above objectives. A high-level chart of the utility headquarters and engineering organization is illustrated in Figure 13.1-203. Executives and management with direct line of authority for activities associated with operation of the plant are shown in Figure 13.1-201. Responsibilities of those executives and managers are specified below.

13.1.1.3.1.1 President & Chief Executive Officer – Duke Energy

The Duke Energy President & Chief Executive Officer (CEO) has the ultimate responsibility for the safe and reliable operation of each nuclear station owned and/or operated by the utility. The CEO is responsible for the overall direction and management of the corporation, and the execution of the company policies, activities, and affairs. The CEO is responsible for directing Duke Energy's core operational business including the Nuclear Generation and Energy Supply organizations. The CEO is assisted in the direction of nuclear operations by the Executive Vice President – Nuclear Generation / Chief Nuclear Officer and other executive staff in the nuclear division of the corporation. The CEO is assisted in the direction of new nuclear plant development by the Executive Vice President – Nuclear Generation / Chief Nuclear Officer and the Vice President – Nuclear Development in the Nuclear Generation organization.

13.1.1.3.1.2 Executive Vice President – Nuclear Generation / Chief Nuclear Officer

The Executive Vice President – Nuclear Generation / Chief Nuclear Officer (CNO) reports to the CEO – Duke Energy. The CNO is responsible for overall

plant nuclear safety and takes the measures needed to provide acceptable performance of the staff in operating, maintaining, and providing technical support to the nuclear plants. The CNO is responsible for oversight of operations at each of the operating nuclear units in the system. The CNO delegates authority and responsibility for the operation and support of the sites to the Senior Vice Presidents – Nuclear Operations for each site group. The CNO has no ancillary responsibilities that might detract attention from nuclear safety matters.

13.1.1.3.1.3 Executive Vice President – Energy Supply

The Executive Vice President – Energy Supply reports to the Duke Energy CEO. The Executive Vice President – Energy Supply has overall responsibility for the construction of new nuclear generation and maintains oversight of the activities at each new nuclear plant under construction. The Executive Vice President – Energy Supply delegates authority and responsibility for EPC management and the construction of new nuclear units to the Vice President – Project Management & Construction. The licensing, preparation and integration of new nuclear plants into the operating fleet is the responsibility of the Vice President – Nuclear Development. This organizational alignment allows the CNO to focus on the performance of the nuclear operating fleet.

13.1.1.3.1.4 Vice President – Project Management & Construction

The Vice President – Project Management & Construction reports to the Executive Vice President – Energy Supply. The Vice President – Project Management & Construction is directly responsible for the EPC management and construction of a new nuclear plant. This position is supported in this role by the functional managers in charge of EPC contract management and project management. This position serves as the Owner's Project Director interfacing with the EPC contractor Project Director.

13.1.1.3.1.5 Vice President – Nuclear Development

The Vice President – Nuclear Development reports to the Executive Vice President – Nuclear Generation and is directly responsible for the licensing, preparation and integration of the new nuclear plants into the operating fleet. This position responsibility includes the hiring and training of the plant staff, development and implementation of all operational and technical programs, development and implementation of policies, procedures or other infrastructure as necessary to startup and operate the new nuclear plants. This position is supported in this role by the functional managers in charge of Engineering, Licensing, and Operational Readiness.

13.1.1.3.1.6 Vice President – Nuclear Oversight

The Vice President – Nuclear Oversight (VP – NO) reports to the CNO for matters relating to the operating fleet and to the Executive Vice President – Energy Supply via an interface agreement with Nuclear Generation for matters

relating to new nuclear plant construction. The VP – NO is responsible for providing oversight of Nuclear Generation and new nuclear plant construction; administration of the Employee Concerns Program and maintenance of the Quality Assurance Program Manual. Assisting the VP – NO is the functional manager in charge of Corporate Nuclear Oversight and the functional manager in charge of Nuclear Oversight for each nuclear plant site.

13.1.1.3.1.7 Senior Vice President - Nuclear Operations

Each Senior Vice President - Nuclear Operations is responsible for oversight of the management and operation of activities associated with the efficient, safe, and reliable operation of his designated nuclear stations. The Senior Vice President - Nuclear Operations is assisted in these duties by the Site Executive in charge of LNP and the LNP management staff.

13.1.1.3.1.8 Site Executive in charge of LNP

The Site Executive in charge of LNP reports to the Senior Vice President – Nuclear Operations. The Site Executive in charge of LNP is directly responsible for management and direction of activities associated with the efficient, safe, and reliable operation of the nuclear station. The Site Executive in charge of LNP is assisted in management and technical support activities by the functional managers in charge of training, plant operations and support services as shown in Figure 13.1-201.

The Site Executive in charge of LNP is responsible for the site Fire Protection Program through the functional supervisor in charge of Fire Protection. See Subsection 13.1.1.2.10.

13.1.1.3.1.9 Senior Vice President – Nuclear Engineering

The Senior Vice President – Nuclear Engineering reports to the Chief Nuclear Officer (CNO) and is responsible for providing guidance to the site engineering organizations, directing the management of nuclear fuels, and license renewal of current plants. Direction on matters relating to operational analysis, design, systems, engineering programs, and nuclear fuels is accomplished through the functional corporate managers and the functional superintendents of engineering as detailed in Subsections 13.1.1.2.1 and 13.1.1.3.2.1.

13.1.1.3.1.10 Vice President - Nuclear Major Projects

The Vice President - Nuclear Major Projects provides project management, engineering, and vendor oversight for selected large projects at the nuclear sites. Providing oversight for these significant projects provides more focus and continuity for upgrades and eliminates distractions for site management. The Vice President - Nuclear Major Projects reports to the CNO.

13.1.1.3.1.11 Vice President – Corporate Governance & Operations Support

The Vice President – Corporate Governance & Operations Support reports to the CNO. The Vice President – Corporate Governance & Operations Support is responsible for establishing Nuclear Generation fleet operating standards, implementing nuclear security, access authorization and Fitness-For-Duty programs and serving as the company's key nuclear industry interface. The Vice President – Corporate Governance & Operations Support is assisted by the functional managers in charge of Nuclear Protective Services, Regulatory Affairs, Nuclear Fleet Training, Nuclear Fleet Support Services, Organizational Effectiveness and Nuclear Fleet Operations.

13.1.1.3.1.12 Functional Manager in charge of Nuclear Oversight

The functional manager in charge of Nuclear Oversight is responsible for providing independent oversight of the nuclear plant and corporate activities, maintenance of the Quality Assurance Program Manual, and administration of the nuclear employee concerns program. The functional manager in charge of Nuclear Oversight reports to the VP – NO and is assisted in his duties by the functional manager in charge of Corporate Nuclear Oversight and the functional manager in charge of Nuclear Oversight at each plant site.

13.1.1.3.1.13 Functional Manager in charge of Materials Services

The functional manager in charge of Material Services is responsible for providing direction and guidance for the preparation, review, approval, and issuance of procurement requisitions; qualification of suppliers, including supplier QA Program implementation; and receipt and storage of materials, parts, and components, including receipt inspections. The functional manager in charge of Material Services reports to the Vice President – Supply Chain.

13.1.1.3.1.14 Functional Manager in charge of Nuclear Protective Services

The functional manager in charge of Nuclear Protective Services is responsible for providing guidance and direction to the functional manager – Security at each site on the nuclear security, access authorization, and Fitness for Duty programs. The functional manager in charge of Nuclear Protective Services reports to the VP – Corporate Governance & Operations Support.

13.1.1.3.1.15 Functional Manager in charge of Nuclear Information Technology

The functional manager in charge of Nuclear Information Technology provides information technology services, safety-related software services and design, maintenance and configuration control for plant computing systems, structures, and components. This position supports Nuclear Development activities through an interface agreement.

13.1.1.3.2 Site Support Organization

13.1.1.3.2.1 Functional Superintendents in charge of Levy Engineering

The functional superintendents in charge of Levy Engineering functions are the site lead positions for engineering and report to the Sr. VP - Nuclear Engineering through the functional managers for Plant Engineering and Design Engineering. The functional superintendents in charge of Levy Engineering are responsible for engineering activities related to the operation or maintenance of the plant and design change implementation support activities and other functions described in Subsection 13.1.1.2.1. The functional superintendents in charge of Levy Engineering direct functional disciple engineers responsible for LNP plant engineering and design engineering.

A single management organization oversees the engineering support for the station units.

13.1.1.3.2.1.1 Functional Superintendent in charge of Plant Engineering

The functional superintendent in charge of Plant Engineering supervises a technical staff of engineers and other engineering specialists and coordinates their work with that of other groups. Plant engineering staff includes reactor engineering as discussed in Subsection 13.1.1.2.1.

The functional superintendent in charge of Plant Engineering is responsible for providing direction and guidance to system engineers as follows:

- Monitoring the efficiency and proper operation of balance of plant and reactor systems.
- Performance/ISI engineering
- Maintenance rule tracking and trending
- Piping erosion/corrosion
- Inservice testing
- Equipment reliability engineering
- Planning programs for improving equipment performance, reliability, or work practices.
- Conducting operational tests and analyzing the results.
- Providing safety-related software services, including the maintenance, testing, and configuration control of plant digital I&C systems.
- Identification of plant spare parts for cognizant systems.

13.1.1.3.2.1.2 Functional Superintendent in charge of Design Engineering

The functional superintendent in charge of Design Engineering is responsible for:

- Resolution of design issues.
- Materials engineering
- Valve engineering
- Development of design related change packages and plant modifications.
- Implementation of effective project management methods and procedures, including cost controls, for implementation of modifications and construction activities.
- Management of contractors who may perform modification or construction activities.
- Maintaining configuration control program.
- Implementation of the Fire Protection Program.

13.1.1.3.2.2 Functional Manager in charge of Nuclear Oversight LNP

The functional manager in charge of Nuclear Oversight LNP is responsible for overall management of the independent assessment, independent safety review, and quality control programs. In this capacity, the manager shall: manage performance-based assessments activities in a manner that facilitates achievement of world class performance by the line organizations in the area of nuclear safety; identify issues and weaknesses in the area of nuclear performance to plant and senior management; promote self-assessment within the line organization by on-the-job training and example; manage quality control functions to ensure plant activities are conducted in accordance with appropriate regulatory and design commitments; and manage the independent safety review program. The responsibilities of the functional manager in charge of Nuclear Oversight LNP are fulfilled through the functional superintendent in charge of Plant Support Assessment and the QA/QC personnel under the authority of the functional manager in charge of Nuclear Oversight LNP. The functional manager in charge of Nuclear Oversight LNP reports to the Vice President – Nuclear Oversight.

13.1.1.3.2.3 Functional Manager in charge of Support Services

The functional manager in charge of Support Services provides staff functions to the entire plant for licensing activities, document services, cost control and reporting, and management of the operating experience, corrective action, and Emergency Preparedness Programs. The section is responsible for the maintenance of the FSAR and Technical Specifications and serves as the primary contact for the NRC. The functional manager in charge of Support Services is assisted by supervisors and staff within the following units:

- Licensing/Regulatory programs
- Emergency Preparedness
- Self-evaluation/Document Services
- Financial Services

13.1.1.3.2.3.1 Functional Supervisor – Licensing and Regulatory Programs

The responsibility of the Functional Supervisor – Licensing and Regulatory Programs is to provide a coordinated focus for interface with the NRC and technical direction and administrative guidance for the licensing staff for the following activities:

- Developing licensee event reports (LERs) and responding to notices of violations.
- Writing/submitting operating licensee and technical specification amendments and updating the UFSAR.
- Tracking commitments and answering generic letters.
- Analyzing operating experience data and monitoring industry issues.
- Preparing station for special NRC inspections, interfacing with NRC inspectors, and interpreting NRC regulations.
- Maintaining the license basis.

The Functional Supervisor – Licensing and Regulatory Programs reports directly to the functional manager in charge of Support Services.

13.1.1.3.2.3.2 Functional Supervisor – Self Evaluation and Document Services

The Functional Supervisor – Self Evaluation and Document Services is responsible for:

- Establishing processes and procedures to facilitate identification.
- Correction of conditions adverse to quality.
- Implementation of corrective actions to preclude repetition.

The Functional Supervisor – Self Evaluation and Document Services reports to the functional manager in charge of Support Services.

13.1.1.3.2.3.3 Functional Supervisor – Emergency Preparedness

The Functional Supervisor – Emergency Preparedness is responsible for:

- Coordinating and implementing the plant emergency response plan with state and local emergency plans.
- Developing, planning, and executing emergency drills and exercises.
- Emergency action level development.
- NRC reporting associated with 10 CFR 50.54(q).

The Functional Supervisor – Emergency Preparedness reports to the functional manager in charge of Support Services.

13.1.1.3.2.3.4 Functional Supervisor – Financial Services

The Functional Supervisor – Financial Services is responsible for assisting plant management with:

- Budget development, cost control, and budgeting status.
- Business Plan development and status reporting.
- Project analysis and cost control support.
- Financial Performance Analysis and reporting.

The Functional Supervisor – Financial Services reports to the functional manager in charge of Support Services.

13.1.1.3.2.4 Functional Manager in charge of Training LNP

LNP COL 18.10-1 The functional manager in charge of Training LNP is responsible for training programs required for the safe and proper operation and maintenance of the plant including:

- Operations training programs
- Plant staff training programs
- Plant access training
- Emergency plan training
- Radiation worker training

The functional manager in charge of Training LNP may seek assistance from other departments within the company or outside specialists such as educators and manufacturers. The functional manager in charge of Training LNP

supervises a staff of training supervisors who coordinate the development, preparation, and presentation of training programs for nuclear plant personnel. The functional manager in charge of Training LNP reports to the Site Executive in charge of LNP.

13.1.1.3.2.4.1 Functional Superintendent – Operations Training

The responsibilities of the Functional Superintendent – Operations Training for LNP include:

- Coordinating and supervising the development and administration of the licensed operator training program.
- Verifying proper content and conduct of the licensed operator training program.
- Maintaining the licensed operator training program in compliance with the latest revision of applicable regulations or codes.
- Implementing necessary training that reflects changes to plant design and procedures.

The Functional Superintendent – Operations Training reports to the functional manager in charge of Training LNP.

A single management organization oversees the LNP operations training programs for the station units.

13.1.1.3.2.4.2 Functional Supervisor – Technical Training

The responsibilities of the Functional Supervisor – Technical Training for LNP include:

- Coordinating and supervising the development and administration of the maintenance, chemistry, radiation protection, engineering support, and general employee training programs.
- Verifying proper content and conduct of the technical training programs.
- Maintaining the technical training program in compliance with the latest revision of applicable regulations or codes.
- Implementing necessary training that reflects changes to plant design and procedures.

The Functional Supervisor – Technical Training reports to the functional manager in charge of Training LNP.

A single management organization oversees the LNP technical training programs.

LNP COL 13.1-1

13.1.1.3.2.5 Functional Superintendent in charge of Materials and Contract Services

The functional superintendent in charge of Materials and Contract Services is responsible for providing sufficient and proper materials to support the material needs of the plant and performing related activities including:

- Procedure development
- Materials storage
- Supply system database maintenance
- Meeting QA and internal audit requirements.
- Site purchasing

The functional superintendent in charge of Materials and Contract Services reports directly to the corporate functional manager in charge of Nuclear Generation Supply Chain and indirectly to the Plant General Manager.

13.1.1.3.2.6 Functional Manager in charge of Security

The functional manager in charge of Security is responsible for:

- Implementation and enforcement of security directives, procedures, and instructions received from appropriate authorities.
- Day-to-day supervision of the security guard force.
- Administration of the security program.

The functional manager in charge of Security reports directly to the functional corporate manager in charge of Protective Services and indirectly to the Site Executive in charge of LNP.

13.1.1.3.2.7 Functional Superintendent in charge of Nuclear Information Technology

The functional superintendent in charge of Nuclear Information Technology provides site support for safety-related software services including the design, maintenance, and configuration control of plant computing structures, systems, or components.

The functional superintendent in charge of Nuclear Information Technology reports directly to the functional manager in charge of Nuclear Information Technology and indirectly to the functional manager in charge of Support Services.

13.1.1.4 Qualifications of Technical Support Personnel

LNP COL 18.6-1 The qualifications of managers and supervisors of the technical support organization meet the qualification requirements in education and experience for those described in ANSI/ANS-3.1-1993 (Reference 201) as endorsed and amended by Regulatory Guide 1.8. The qualification and experience requirements of headquarters staff is established in accordance with current corporate nuclear policy and procedure manuals.

13.1.2 OPERATING ORGANIZATION

LNP COL 13.1-1

13.1.2.1 Plant Organization

The plant management, technical support, and plant operating organizations are shown in Figure 13.1-201. The on-shift operating organization is presented in Figure 13.1-202, which shows those positions requiring NRC licenses. Additional personnel are required to augment normal staff during outages.

Nuclear plant employees are responsible for reporting problems with plant equipment and facilities. They are required to identify and document equipment problems in accordance with the QA Program. QA Program requirements as they apply to the operating organization are described in Chapter 17 and the QAPD. Administrative procedures or standing orders include:

- Establishment of a QA Program for the operational phase.
- Preparation of procedures necessary to carry out an effective QA Program. See Section 13.5 for description of the station procedure program.
- A program for review and audit of activities affecting plant safety. See Section 17.5 and the QAPD for description of station review and audit programs.
- Programs and procedures for rules of practice as described in Section 5.2 of N18.7-1976/ANS-3.2 (Reference 203).

Managers and supervisors within the plant operating organization are responsible for establishing goals and expectations for their organization and to reinforce behaviors that promote radiation protection. Specifically, managers and supervisors are responsible for the following, as applicable to their position within the plant organization:

- Interface directly with radiation protection staff to integrate radiation protection measures into plant procedures and design documents and into the planning, scheduling, conduct, and assessment of operations and

work.

- Notify radiation protection personnel promptly when radiation protection problems occur or are identified, take corrective actions, and resolve deficiencies associated with operations, procedures, systems, equipment, and work practices.
- Ensure department personnel receive training on radiation protection and periodic retraining, in accordance with 10 CFR Part 19 so that they are properly instructed and briefed for entry into restricted areas.
- Periodically observe and correct, as necessary, radiation worker practices.
- Support radiation protection management in implementing the Radiation Protection Program.
- Maintain exposures to site personnel ALARA.

13.1.2.1.1 Site Executive in charge of LNP

The Site Executive in charge of LNP is the senior management representative on-site. The Site Executive in charge of LNP role and responsibilities are described in Subsection 13.1.1.3.1.8.

13.1.2.1.2 Plant General Manager

The Plant General Manager (PGM) is responsible for overall safe operation of the plant and has control over those on-site activities necessary for safe operation and maintenance of the plant including the following:

- Operations
- Maintenance and modification
- Chemistry and radiochemistry
- Outage management

Additionally, the Plant General Manager has overall responsibility for occupational and public radiation safety. Radiation protection responsibilities of the Plant General Manager are consistent with the guidance in Regulatory Guide 8.8 and Regulatory Guide 8.10 including the following:

- Provide management radiation protection policy throughout the plant organization.
- Provide an overall commitment to radiation protection by the plant organization.

- Interact with and support the Superintendent – Radiation Protection on implementation of the Radiation Protection Program.
- Support identification and implementation of cost-effective modifications to plant equipment, facilities, procedures and processes to improve radiation protection controls and reduce exposures.
- Establish plant goals and objectives for radiation protection.
- Maintain exposures to site personnel ALARA.
- Support timely identification, analysis and resolution of radiation protection problems (e.g., through the plant corrective action program).
- Provide training to site personnel on radiation protection in accordance with 10 CFR Part 19.
- Establish an ALARA Committee with delegated authority from the Plant General Manager that includes, at a minimum, the managers in charge of operations, maintenance, engineering, and radiation protection to help provide for effective implementation of line organization responsibilities for maintaining worker doses ALARA.

In the absence of the Plant General Manager – LNP, the on-site individual designated by the Plant General Manager shall be "in charge" for the duration of the absence. This will normally be the scheduled Duty Manager. The succession of authority includes the authority to issue standing or special orders as required.

As described in Subsection 13.1.2.1.3.4, the Nuclear Shift Manager is the Plant General Manager's direct representative for the conduct of operations. This delegation of authority includes the authority to issue standing or special orders as required.

13.1.2.1.2.1 Manager – Maintenance

Maintenance of the plant is performed by the maintenance department mechanical, electrical, and instrumentation and control disciplines. Planning, scheduling, and work package preparation are performed by maintenance support. The functions of this department are to perform preventive and corrective maintenance, equipment testing, and implement modifications as necessary.

The Manager – Maintenance is responsible for the performance of preventive and corrective maintenance and modification activities required to support operations, including compliance with applicable standards, codes, specifications, and procedures. The Manager – Maintenance reports to the Plant General Manager and provides direction and guidance to the maintenance discipline functional managers and maintenance support staff.

13.1.2.1.2.2 Maintenance Superintendents

The superintendent of each maintenance discipline (mechanical, electrical, instrumentation and control, and support) is responsible for maintenance activities within their discipline including plant modifications. They provide guidance in maintenance planning and craft supervision. They establish the necessary manpower levels and equipment requirements to perform both routine and emergency type maintenance activities, seeking the services of others in performing work beyond the capabilities of the plant maintenance group. Each discipline superintendent is responsible for liaison with other plant staff organizations to facilitate safe operation of the station. These superintendents report to the Manager – Maintenance.

13.1.2.1.2.3 Maintenance Supervisors

The maintenance supervisors (mechanical, electrical, and instrumentation and control) supervise maintenance activities, assist in the planning of future maintenance efforts, and guide the efforts of the craft within their discipline. The maintenance discipline supervisors report to the appropriate maintenance discipline superintendent.

13.1.2.1.2.4 Maintenance Mechanics, Electricians, and Instrumentation and Control Technicians

The discipline craft perform electrical and mechanical maintenance, I&C and support tasks as assigned by the discipline supervisors. They trouble shoot, inspect, repair, maintain, and modify plant equipment and perform technical specification surveillances on equipment for which they have cognizance. They perform these tasks in accordance with approved procedures and work packages.

13.1.2.1.2.5 Manager – Outage and Scheduling

The Manager – Outage and Scheduling is responsible for:

- Planning and scheduling refueling, maintenance, and forced outages.
- Providing direction and guidance to staff members in establishing outage activities.
- Minimizing shutdown risk during outages with proper planning and preparation.
- Directing activities during outages to provide safe, efficient, and effective outages.
- Planning and scheduling online work activities, monitoring the online work process and risk management.

The Manager – Outage and Scheduling is assisted by the Supervisor – Outage Management and the Supervisor – Online Scheduling. The Manager – Outage and Scheduling reports to the Plant General Manager. See Subsection 13.1.1.2.6.

13.1.2.1.2.6 Superintendent – Radiation Protection

The Superintendent – Radiation Protection has the direct responsibility for providing adequate protection of the health and safety of personnel working at the plant and members of the public during activities covered within the scope and extent of the license. Radiation protection responsibilities of the Superintendent – Radiation Protection are consistent with the guidance in Regulatory Guide 8.8 and Regulatory Guide 8.10. They include:

- Manage the radiation protection organization.
- Establish, implement, and enforce the Radiation Protection Program.
- Provide radiation protection input to facility design and work planning.
- Track and analyze trends in radiation work performance and take necessary actions to correct adverse trends.
- Support the plant Emergency Preparedness Program and assign emergency duties and responsibilities within the radiation protection organization.
- Delegate authority to appropriate radiation protection staff to stop work or order an area evacuated (in accordance with approved procedures) when, in his or her judgment, the radiation conditions warrant such an action and such actions are consistent with plant safety.

The Superintendent – Radiation Protection reports to the Plant General Manager and is assisted by the Supervisors – Radiation Protection.

13.1.2.1.2.7 Supervisors – Radiation Protection

The Supervisors – Radiation Protection are responsible for carrying out the day-to-day operations and programs of the radiation protection department as listed in Subsection 13.1.1.2.5.

Supervisors – Radiation Protection report to the Superintendent – Radiation Protection.

13.1.2.1.2.8 Radiation Protection Technicians

Radiation protection technicians (RPTs) directly carry out responsibilities defined in the Radiation Protection Program and procedures. In accordance with Technical Specifications an RPT is on-site whenever there is fuel in the vessel. See Table 13.1-202.

The following are some of the duties and responsibilities of the RPTs:

- As delegated authority by the Superintendent – Radiation Protection, stop work or order an area evacuated (in accordance with approved procedures) when, in his or her judgment, the radiation conditions warrant such an action and such actions are consistent with plant safety.
- Provide coverage and monitor radiation conditions for jobs potentially involving significant radiation exposure.
- Conduct surveys, assess radiation conditions, and establish radiation protection requirements for access to and work within restricted, radiation, high radiation, very high radiation, airborne radioactivity areas, and areas containing radioactive materials.
- Provide control over the receipt, storage, movement, use, and shipment of licensed radioactive materials.
- Review work packages, proposed design modifications, and operations and maintenance procedures to facilitate integration of adequate radiation protection controls and dose-reduction measures.
- Review and oversee implementation of plans for the use of process or other engineering controls to limit the concentrations of radioactive materials in the air.
- Provide personnel monitoring and bioassay services.
- Maintain, prescribe, and oversee the use of respiratory protection equipment.
- Perform assigned emergency response duties.

13.1.2.1.2.9 Superintendent – Environmental & Chemistry

The Superintendent – Environmental & Chemistry is responsible for development, implementation, and direction and coordination of the chemistry, radiochemistry, and nonradiological environmental monitoring programs. This area includes overall operation of the hot lab, cold lab, emergency off-site facility lab, and nonradiological environmental monitoring. The Superintendent – Environmental & Chemistry is responsible for the development, administration, and implementation of procedures and programs, which provide for effective compliance with environmental regulations. The Superintendent – Environmental & Chemistry reports to the Plant General Manager and directly supervises the chemistry supervisors and chemistry technicians as assigned.

13.1.2.1.3 Operations Department

Operations activities are conducted with safety of the public, personnel, and equipment as the overriding priority. The operations department is responsible for:

- Operation of station equipment.
- Monitoring and surveillance of safety and non-safety related equipment.
- Fuel loading.
- Providing the nucleus of emergency and fire-fighting teams.

The operations department maintains sufficient licensed Senior Reactor Operators (SROs) and Reactor Operators (ROs) to staff the control room continuously using a crew rotation system. The operations department is under the authority of the Manager – Operations, who through the Manager – Shift Operations directs the day-to-day operation of the plant.

Specific duties, functions, and responsibilities of key shift members are discussed in Subsections 13.1.2.1.3.4 through 13.1.2.1.3.8 and in plant administrative procedures and the technical specifications. The minimum shift manning requirements are shown in Table 13.1-202.

Some resources of the operations organization are shared between units. Administrative and support personnel perform their duties on either unit. To operate, or supervise the operation of more than one unit, an operator must hold an appropriate, current license (Senior Reactor Operator [SRO] or Reactor Operator [RO]) for each unit. A single management organization oversees the operations group for LNP 1 and 2. See Table 13.1-201 for estimated number of staff in the operations department for single or multiple unit sites.

The operations support section is staffed with sufficient personnel to provide support activities for the operating shifts and overall operations department. The following is an overview of the operations organization.

13.1.2.1.3.1 Manager – Operations

The Manager – Operations has overall responsibility for the day-to-day operation of the plant. The Manager – Operations reports to the Plant General Manager and is assisted by the Manager – Shift Operations for each unit and the Superintendent – Operations Support. The Manager – Operations or the Manager – Shift Operations for each unit is SRO licensed.

13.1.2.1.3.2 Manager – Shift Operations

The Manager – Shift Operations, under the direction of the Manager – Operations is responsible for:

- Shift plant operations in accordance with the operating license, technical

specifications, and written procedures.

- Providing supervision of operating shift personnel for operational shift activities including those of emergency and firefighting teams.

- Coordinating with the Nuclear Shift Manager(s) and other plant staff sections.

- Verifying that nuclear plant operating records and logs are properly prepared, reviewed, evaluated, and turned over to the Superintendent – Operations Support.

The Manager – Shift Operations is assisted in these areas by the Nuclear Shift Managers who direct the operating shift personnel. The Manager – Shift Operations reports to the Manager – Operations.

13.1.2.1.3.3 Superintendent – Operations Support

The Superintendent – Operations Support, under the direction of the Manager – Operations, is responsible for:

- Directing and guiding plant operations support activities in accordance with the operating license, technical specifications, and written procedures.

- Providing supervision of operating support personnel, for operations support activities, and coordination of support activities.

- Providing for nuclear plant operating records and logs to be turned over to the nuclear records group for maintenance as quality assurance records.

- Coordinating operations related to Fire Protection Program activities with the Supervisor – Fire Protection.

The Superintendent – Operations Support is assisted by the work management, operations procedures and other support personnel.

13.1.2.1.3.4 Nuclear Shift Manager

The Nuclear Shift Manager (NSM) is a licensed SRO responsible for the control room command function, and is the Plant General Manager's direct management representative for the conduct of operations. As such, the NSM has the responsibility and authority to direct the activities and personnel on-site as required to:

- Protect the health and safety of the public, the environment, and personnel on the plant site.

- Protect the physical security of the plant.

- Prevent damage to site equipment and structures.

- Comply with the operating license.

The NSM retains this responsibility and authority until formally relieved of operating responsibilities by a licensed SRO. Additional responsibilities of the NSM include:

- Directing nuclear plant employees to report to the plant for response to potential and real emergencies.

- Seeking the advice and guidance of the shift technical advisor and others in executing the duties of the NSM whenever in doubt as to the proper course of action.

- Promptly informing responsible supervisors of significant actions affecting their responsibilities.

- Participating in operator training, retraining, and requalification activities from the standpoint of providing guidance, direction, and instruction to shift personnel.

The NSM is assisted in carrying out the above duties by the Unit Senior Control Operators in charge on shift and the operating shift personnel. The NSM reports to the Manager – Shift Operations.

13.1.2.1.3.5 Unit Senior Control Operator

The Unit Senior Control Operator (USCO) is a licensed SRO. The primary function of the USCO is to administratively support the NSM such that the "command function" is not overburdened with administrative duties and to supervise the licensed and non-licensed operators in carrying out the activities directed by NSM. Other duties include:

- Being aware of maintenance and testing performed during the shift.

- Shutting down the reactor if conditions warrant this action.

- Informing the NSM and other station management in a timely manner of conditions which may affect public safety, plant personnel safety, plant capacity or reliability, or cause a hazard to equipment.

- Initiating immediate corrective action as directed by the NSM in any upset situation until assistance, if required, arrives.

- Participating in operator training, retraining, and requalification activities from the standpoint of providing guidance, direction, and instruction to shift personnel.

The Unit Senior Control Operator reports directly to the NSM.

13.1.2.1.3.6 Unit Control Operator

The Unit Control Operators (UCO) are licensed Reactor Operators and report to the Unit Senior Control Operator. They are responsible for routine plant operations and performance of major evolutions at the direction of the Unit Senior Control Operator. The UCO duties include:

- Monitoring control room instrumentation.
- Responding to plant or equipment abnormalities in accordance with approved plant procedures.
- Directing the activities of non-licensed operators.
- Documenting operational activities, plant events, and plant data in shift logs.
- Initiating plant shutdowns or scrams or other compensatory actions when observation of plant conditions indicates a nuclear safety hazard exists or when approved procedures so direct.

Whenever there is fuel in the reactor vessel, at least one UCO is in the control room monitoring the status of the unit at the main control panel. The UCO assigned to the main control panel is designated the "operator at the controls" and conducts monitoring and operating activities in accordance with the guidance set forth in Regulatory Guide 1.114, which is further described in Subsection 13.1.2.1.4, Conduct of Operations.

13.1.2.1.3.7 Non-Licensed Operator

The non-licensed operators perform routine duties outside the control room as necessary for continuous, safe plant operation including:

- Assisting in plant startup, shutdown, surveillance, and emergency response by manually or remotely changing equipment operating conditions, placing equipment in service, or securing equipment from service at the direction of the reactor operator.
- Performing assigned tasks in procedures and checklists such as valve manipulations for plant startup or data sheets on routine equipment checks, and making accurate entries according to the applicable procedure, data sheet, or checklist.
- Assisting in training of new employees and for improvement and upgrading of their own performance by participating in the applicable sections of the training program.

Non-licensed operators include building operators and auxiliary operators as shown in Figure 13.1-202.

13.1.2.1.3.8 Shift Technical Advisor

The station is committed to meeting NUREG-0737 TMI Action Plan item I.A.1.1 for Shift Technical Advisors. The Shift Technical Advisor (STA) reports directly to the NSM and provides advanced technical assistance to the operating shift complement during normal and abnormal operating conditions. The STA's responsibilities are detailed in plant administrative procedures as required by TMI Action Plan I.A.1.1 and NUREG 0737 Appendix C. These responsibilities include:

- Activities to monitor core power distribution and critical parameters.
- Activities to assist the operating shift with technical expertise during normal and emergency conditions.
- Evaluation of technical specifications, special reports, and procedural issues.

The STA is to primarily contribute to maximizing safety of operations by independently observing plant status and advising shift supervision of conditions that could compromise plant safety. During transients or accident situations, the STA independently assesses plant conditions and provides technical assistance and advice to mitigate the incident and minimize the effect on personnel, the environment, and plant equipment.

A licensed Senior Reactor Operator (SRO) on shift who meets the qualifications for the combined SRO/STA position specified for Option 1 of Generic Letter 86-04 (Reference 202) may also serve as the STA. If this option is used for a shift, then the separate STA position may be eliminated for that shift.

13.1.2.1.3.9 Supervisor – Fire Protection

LNP COL 9.5-1

Within the LNP Engineering and Support Unit, the Supervisor – Fire Protection is in charge of fire protection and the fire protection staff. Fire Protection Program implementation and maintenance are the responsibilities of the Lead Engineer – Fire Protection Program. The Supervisor – Fire Protection is responsible for:

- Fire Protection Program requirements, including consideration of potential hazards associated with postulated fires, knowledge of building layout, and system design.
- Post-fire shutdown capability.
- Design, maintenance, surveillance, and quality assurance of fire protection features (e.g., detection systems, suppression systems, barriers, dampers, doors, penetration seals, and fire brigade equipment).

- Fire prevention activities (administrative controls and training).
- Fire brigade organization and training.
- Pre-fire planning including review and updating of pre-fire plans at least every two years.

The Supervisor – Fire Protection reports to the Site Executive – LNP, who has ultimate responsibility for fire protection of the plant. The Supervisor – Fire Protection also reports to the functional superintendent in charge of Design Engineering. Additionally, the Supervisor – Fire Protection works with the Superintendent – Operations Support to coordinate activities and program requirements with the operations department. The Lead Engineer – Fire Protection Program meets the educational and experience/knowledge requirements of Regulatory Guide 1.189, Revision 1, Section C.1.6.1.a. The engineer in charge of fire protection is trained and experienced in nuclear plant safety or has available personnel who are trained and experienced in nuclear plant safety.

LNP COL 13.1-1

13.1.2.1.3.10 Radwaste Operations Lead

The Radwaste Operations Lead is responsible for development, implementation, direction, and coordination of the radwaste activities. The Radwaste Operations Lead reports to the Manager – Shift Operations.

The Radwaste Operations Lead supervises radwaste operators assigned to the radwaste area.

13.1.2.1.4 Conduct of Operations

Station operations are controlled and/or coordinated through the control room. Maintenance activities, surveillances, and removal from/return to service of structures, systems, and components affecting the operation of the plant may not commence without the approval of senior control room personnel. The rules of practice for control room activities, as described by administrative procedures, which are based on Regulatory Guide 1.114, address the following:

- Position/placement of operator at the controls workstation and the expected area of the control room where the majority of the time of the USCO and UCO should be spent.
- Definition and outline of “surveillance area” and requirement for continuous surveillance by the operator at the controls.
- Relief requirements for UCO at the controls and the USCO.

In accordance with 10 CFR 50.54:

- Reactivity controls may be manipulated only by licensed Reactor Operators and licensed Senior Reactor Operators except as allowed for training under 10 CFR Part 55.

- Apparatus and mechanisms other than controls which may affect reactivity or power level of the reactor shall be operated only with the consent of the operator at the controls or the USCO.

- During operation of the facility in modes other than cold shutdown or refueling, a license Senior Reactor Operator shall be in the control room and a licensed Reactor Operator or Senior Reactor Operator shall be present at the controls.

13.1.2.1.5 Operating Shift Crews

Plant administrative procedures implement the required shift staffing. These procedures establish crews with sufficient qualified plant personnel to staff the operational shifts and be readily available in the event of an abnormal or emergency situation. The objective is to operate the plant with the required staff and to develop work schedules that minimize overtime for plant staff members who perform safety-related functions. Work hour limitations and shift staffing requirements defined by TMI Action Plan I.A.1.3 are retained in station procedures. When overtime is necessary the provisions in the technical specifications and the plant administrative procedures apply. Shift crew staffing plans may be modified during refueling outages to accommodate safe and efficient completion of outage work in accordance with the proceduralized work hour limitations.

The minimum composition of the operating shift crew is contingent upon the unit operating status. Position titles, license requirements and minimum shift manning for various modes of operation are contained in Technical Specifications, administrative procedures, and Table 13.1-202. Routine shift operations staffing is illustrated in Figure 13.1-202.

13.1.2.1.6 Fire Brigade

The station is designed and the fire brigade organized to be self-sufficient with respect to fire fighting activities. The fire brigade is organized to deal with fires and related emergencies that could occur. It consists of a fire brigade leader and a sufficient number of team members to be consistent with the equipment that must be put in service during a fire emergency. A sufficient number of trained and physically qualified fire brigade members are available on-site during each shift. The fire brigade consists of at least five members on each shift. Members of the fire brigade are knowledgeable of building layout and system design. The assigned fire brigade members for any shift does not include the NSM nor any other members of the minimum shift operating crew necessary for safe shutdown of the unit. It does not include any other personnel required for other essential functions during a fire emergency. Fire brigade members for a shift are

designated in accordance with established procedures at the beginning of the shift.

13.1.3 QUALIFICATION REQUIREMENTS OF NUCLEAR PLANT PERSONNEL

13.1.3.1 Minimum Qualification Requirements

LNP COL 18.6-1
LNP COL 13.1-1

Qualifications of managers, supervisors, operators, and technicians of the operating organization meet the qualification requirements in education and experience for those described in ANSI/ANS-3.1-1993 (Reference 201), as endorsed and amended by Regulatory Guide 1.8, except for cold license operators as discussed in NEI 06-13A.

13.1.3.2 Qualification Documentation

Resumes and/or other documentation of qualification and experience of initial appointees to appropriate management and supervisory positions are available for NRC review after position vacancies are filled.

STD DEP 1.1-1

13.1.4 COMBINED LICENSE INFORMATION ITEM

LNP COL 13.1-1

This COL item is addressed in Subsections 13.1.1 through 13.1.3.

Add the following information after renumbered DCD Subsection 13.1.4:

13.1.5 REFERENCES

201. American Nuclear Society, “American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plant,” ANSI/ ANS -3.1-1993.

202. U.S. Nuclear Regulatory Commission, “Generic Letter 86-04, Policy Letter, Engineering Expertise on Shift.”

203. American Nuclear Society, “American National Standard for Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants,” N18.7-1976/ANS-3.2.

Table 13.1-201 (Sheet 1 of 7)
Generic Position/Site-Specific Position Cross Reference

Nuclear Function	Function Position – ANSI/ANS-3.1-1993 Section Reference	Nuclear Plant Position (Site-Specific)	Expected Positions Single Unit	Expected Additional Positions 2nd Unit
Executive Management	Chief Executive Officer	Chief Executive Officer (CEO)	-	-
	Chief Nuclear Officer	Chief Nuclear Officer	-	-
	Executive, Nuclear Operations	Senior Vice President – Nuclear Operations	-	-
	Executive, Nuclear Generation and Development	Vice President - Nuclear Plant Development	1	-
Nuclear Support	Executive, Operations Support	VP-Corporate Governance & Operations Support	-	-
Plant Management	Executive	Site Executive – LNP	1	-
	Plant Manager 4.2.1	Plant General Manager	1	-
Engineering	Executive	Senior Vice President – Nuclear Engineering	-	-
	Manager 4.2.4	Functional Manager in charge of Levy Engineering	2	-
System Engineering	Functional Manager 4.3.9	Functional Superintendent in charge of Plant Engineering	1	-
	System Engineer	System Engineer	24	12

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Table 13.1-201 (Sheet 2 of 7)
Generic Position/Site-Specific Position Cross Reference

Nuclear Function	Function Position – ANSI/ANS-3.1-1993 Section Reference		Nuclear Plant Position (Site-Specific)	Expected Positions Single Unit	Expected Additional Positions 2nd Unit
Design Engineering	Functional Manager	4.3.9	Functional Superintendent in charge of Design Engineering	1	-
	Design Engineer		Design Engineer	12	0
Engineering Programs	Functional Manager	4.3.9	Functional Superintendent in charge of Levy Engineering	0	-
	Programs Engineer		Programs Engineer	12	6
Reactor Engineering	Functional Manager	4.3.9	Functional Supervisor in charge of Reactor Engineering	1	-
	Reactor Engineer		Reactor Engineering	3	1
Maintenance	Manager	4.2.3	Manager – Maintenance	1	-
Instrumentation and Control	Functional Manager	4.3.4	Superintendent – Instrumentation and Control / Electrical	1	-
	Supervisor	4.4.7	Supervisor – Instrumentation and Control Maintenance	3	1
	Technician	4.5.3.3	Instrumentation and Control Technician	22	12
Mechanical	Functional Manager	4.3.6	Superintendent – Mechanical Maintenance	2	-

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Table 13.1-201 (Sheet 3 of 7)
Generic Position/Site-Specific Position Cross Reference

Nuclear Function	Function Position – ANSI/ANS-3.1-1993 Section Reference		Nuclear Plant Position (Site-Specific)	Expected Positions Single Unit	Expected Additional Positions 2nd Unit
	Supervisor	4.4.9	Supervisor – Mechanical	2	1
	Technician	4.5.7.2	Mechanic	22	8
Electrical	Functional Manager	4.3.5	Superintendent – Instrumentation and Control / Electrical	1	-
	Supervisor	4.4.8	Supervisor – Electrical Maintenance	2	1
	Technician	4.5.7.1	Electrician	14	6
Support	Functional Manager	4.3	Superintendent – Programs, Projects & Facility Services	1	-
Operations	Manager	4.2.2	Manager – Operations	1	-
Operations, Plant	Functional Manager	4.3.8	Manager – Shift Operations	1	1
Operations, Admin	Functional Manager	4.3.8	Superintendent – Operations Support	1	-
Operations, (On-shift)	Functional Manager	4.4.1	Nuclear Shift Manager	5	5
	Supervisor	4.4.2	Unit Senior Control Operator	5	5
	Licensed Operator	4.5.1	Unit Control Operator	10	10
	Non-Licensed Operator	4.5.2	Non-Licensed Operator	30	15

Table 13.1-201 (Sheet 4 of 7)
Generic Position/Site-Specific Position Cross Reference

Nuclear Function	Function Position – ANSI/ANS-3.1-1993 Section Reference		Nuclear Plant Position (Site-Specific)	Expected Positions Single Unit	Expected Additional Positions 2nd Unit
	Shift Technical Supervisor	4.6.2	Shift Technical Advisor	5	5
Operations – Radwaste	Supervisor	4.4	Lead – Radwaste Operations	1	-
Fire Protection	Supervisor	4.4	Lead Engineer – Fire Protection Program	1	-
Radiation Protection	Functional Manager	4.5.3.2	Superintendent – Radiation Protection	1	-
	Supervisor		Supervisor – Radiation Protection	3	2
	Technician		Radiation Protection Technician	18	9
	ALARA specialist		ALARA Specialist	3	1
	Decon Technician		Decon Technician	6	2
Chemistry	Functional Manager	4.3.2	Superintendent – Environmental & Chemistry	1	-
	Supervisor	4.4.5	Supervisor–Environmental & Chemistry	2	1
	Technician	4.5.3.1	Chemistry Technician	18	9
Nuclear Safety Assurance	Manager	4.2	Functional Manager in charge of Nuclear Oversight LNP	1	-

Table 13.1-201 (Sheet 5 of 7)
Generic Position/Site-Specific Position Cross Reference

Nuclear Function	Function Position – ANSI/ANS-3.1-1993 Section Reference		Nuclear Plant Position (Site-Specific)	Expected Positions Single Unit	Expected Additional Positions 2nd Unit
Licensing	Functional Manager	4.3	Functional Manager in charge of Licensing	-	-
	Supervisor		Supervisor – Licensing & Regulatory Programs	1	-
	Licensing Engineer		Licensing Engineer	4	-
Corrective Action	Functional Manager	4.3	Supervisor – Self Evaluation	1	-
	Corrective Action Specialist		Corrective Action Specialist	2	2
Emergency Preparedness	Functional Manager	4.3	Supervisor–Emergency Preparedness	1	-
	EP Planner		EP Specialist	3	1
Training	Functional Manager	4.3.1	Functional Manager in charge of Training LNP	1	-
			Superintendent – Operations Training	1	-
	Supervisor Ops Trng	4.4.4	Supervisor – Operations Training	2	-
	Ops Training Instructor		Ops. Training Instructor	9	9
	Supervisor Tech. Staff/ Maint Trng		Supervisor – Technical Training	1	1

Table 13.1-201 (Sheet 6 of 7)
Generic Position/Site-Specific Position Cross Reference

Nuclear Function	Function Position – ANSI/ANS-3.1-1993 Section Reference		Nuclear Plant Position (Site-Specific)	Expected Positions Single Unit	Expected Additional Positions 2nd Unit
	Tech Staff/Maint. Instructors		Technical Training Instructor	8	4
Purchasing and Contracts	Functional Manager	4.3	Superintendent – Materials & Contracts Services	1	-
Security	Functional Manager	4.3	Functional Manager in charge of Security	1	-
Planning and Scheduling	Functional Manager	4.3	Supervisor – Planning and Procedures	1	-
	Functional Manager	4.3	Manager – Outage & Scheduling	1	-
	Supervisor	4.4	Supervisor – Online Scheduling	1	-
			Supervisor – Outage Management	1	-
Quality Assurance	Functional Manager	4.3.7	Functional Manager in charge of Nuclear Oversight	1	-
	Supervisor	4.4.13	Superintendent – Plant Assessment	1	-
	QA Auditor		QA Auditors	6	2

Table 13.1-201 (Sheet 7 of 7)
Generic Position/Site-Specific Position Cross Reference

Nuclear Function	Function Position – ANSI/ANS-3.1-1993 Section Reference		Nuclear Plant Position (Site-Specific)	Expected Positions Single Unit	Expected Additional Positions 2nd Unit
	Supervisor	4.4.13	Supervisor – QC	1	-
	QC Inspector	4.4.11	QC Technicians	2	1
Startup testing	Supervisor	4.4.12	Manager –Plant Test & Operations	1	-
			Startup Manager	1	-
	Startup Test Engineer		Startup Test Engineer	6	-
	Supervisor		Manager – Plant Test & Operations Support	1	-
	Preop. Test Engineer		Preop Test Engineer	20	-

STD DEP 1.1-1

DCD Section 13.7 is redistributed to include DCD Section 13.7 references 7, 8, and 10 with COLA FSAR Subsection 13.5.4 and DCD Section 13.7 references 2, 3, and 4 with COLA FSAR Subsection 13.6.2.

Add the following new section after DCD Section 13.6.

13.7 FITNESS FOR DUTY

STD SUP 13.7-1

The Fitness for Duty Program (FFD) is implemented and maintained in multiple and progressive phases dependent on the activities, duties, or access afforded to certain individuals at the construction site. In general, two different FFD programs will be implemented: a construction FFD program and an operations FFD program. The construction and operations phase programs are illustrated in Table 13.4-201.

The construction FFD program is consistent with NEI 06-06 (Reference 201). NEI 06-06 applies to persons constructing or directing the construction of safety- and security-related structures, systems, or components performed onsite where the new reactor will be installed and operated. Management and oversight personnel, as further described in NEI 06-06, and security personnel prior to the receipt of special nuclear material in the form of fuel assemblies (with certain exceptions) will be subject to the operations FFD program that meets the requirements of 10 CFR Part 26, Subparts A through H, N, and O. At the establishment of a protected area, all persons who are granted unescorted access will meet the requirements of an operations FFD program. Prior to issuance of a Combined License, the construction FFD program at a new reactor construction site for those subject to Subpart K will be reviewed and revised as necessary should substantial revisions occur to either NEI 06-06 following NRC endorsement or the requirements of 10 CFR Part 26.

LNP SUP 13.7-1

The following site-specific information is provided:

- The construction site area is defined in the Physical Security Plan and will be under the control of Shaw Stone & Webster (Shaw). The 10 CFR Part 26 requirements will be implemented for the construction site area based on the descriptions provided in Table 13.4-201.

- Construction Workers & First Line Supervisors (Shaw employees and subcontractors) are covered by the Duke-approved Shaw FFD Program (elements Subpart K).

- Duke employees and Duke subcontractor's construction management and oversight personnel are covered by a Duke Operations FFD Program and Shaw's employees and Shaw's subcontractors, construction management, and oversight personnel will be covered by the Duke-approved Shaw FFD Program (elements Subpart A - H, N and 0).

- Duke security personnel are covered by a Duke Operations FFD Program and Shaw's security personnel are covered by the Duke-approved Shaw

FFD Program (elements Subpart A - H, N and 0). This coverage is applicable from the start of construction activities to the earlier of (1) the receipt of SNM in the form of fuel assemblies, or (2) the establishment of a Protected Area, or (3) the 10 CFR 52.103(g) finding.

- Duke FFD Program personnel are covered by a Duke Operations FFD Program and Shaw's FFD Program personnel will be covered by the Duke-approved Shaw FFD Program (elements Subpart A - H, N and 0, and C per licensee's discretion).
- Duke security personnel protecting fuel assemblies are covered by a Duke Operations FFD Program (elements Subpart A - I, N and 0).
- Personnel required to physically report to the Technical Support Center (TSC) or Emergency Operations Facility (EOF) when that requirement is in effect are covered by a Duke Operations FFD Program.

STD SUP 13.7-1 The operations phase FFD program is consistent with the applicable subparts of 10 CFR Part 26 (elements Subpart A – I, N, and O, except for individuals listed in §26.4(b), who are not subject to §§ 26.205 – 209).

13.7.1 REFERENCES

201. Nuclear Energy Institute "Fitness for Duty Program Guidance for New Nuclear Power Plant Construction Sites," NEI 06-06, Revision 5, August 2009 (ML092430016).

Add the following new appendix at the end of DCD Chapter 13.

LNP COL 13.1-1

APPENDIX 13AA CONSTRUCTION-RELATED ORGANIZATION

The information in this appendix is included for future designation as historical information. Paragraphs are numbered to be subsequent to Subsection 13.1.1.1.

13AA.1.1.1.1 Design and Construction Activities

The Westinghouse Electric Company (WEC) was selected to design, fabricate, deliver, and install the AP1000 advanced light water pressurized water reactors (PWR) and to provide technical direction for installation and startup of this equipment. DCD Subsection 1.4.1 provides detailed information regarding WEC past experience in design, development, and manufacturing of nuclear power facilities. Operating experience from design, construction, and operation of earlier WEC PWRs is applied in the design, construction, and operation of the AP1000 as described in numerous locations throughout the DCD (e.g., DCD Subsections 3.6.4.4, 3.9.4.2.1, 4.2.3.1.3).

A construction architect engineer (AE) provides the construction of the plant and additional design engineering for selected site specific portions of the plant. The AE is selected based on experience and proven technical capability in nuclear construction projects or projects of similar scope and complexity.

Other design and construction activities are generally contracted to qualified suppliers of such services. Implementation or delegation of design and construction responsibilities is described in the subsections below. Quality assurance aspects of these activities are described in Chapter 17.

13AA.1.1.1.1.1 Principal Site-Related Engineering Work

The principal site engineering activities accomplished towards the construction and operation of the plant are:

a. Meteorology

Information concerning local (site) meteorological parameters is developed and applied by station and contract personnel to assess the impact of the station on local meteorological conditions. An on-site meteorological measurements program is employed by station personnel to produce data for the purpose of making atmospheric dispersion estimates for postulated accidental and expected routine airborne releases of effluents. A maintenance program is established for surveillance, calibration, and repair of instruments. More information regarding the study and meteorological program is found in Section 2.3.

b. Geology

Information relating to site and regional geotechnical conditions is developed and evaluated by utility and contract personnel to determine if geologic conditions could present a challenge to safety of the plant. Items of interest include geologic structure, seismicity, geological history, and ground water conditions. During construction, foundations within the power block area are mapped or visually inspected and photographed. Section 2.5 provides details of these investigations.

c. Seismology

Information relating to seismological conditions is developed and evaluated by utility and contract personnel to determine if the site location and area surrounding the site is appropriate from a safety standpoint for the construction and operation of a nuclear power plant. Information regarding tectonics, seismicity, correlation of seismicity with tectonic structure, characterization of seismic sources, and ground motion are assessed to estimate the potential for strong earthquake ground motions or surface deformation at the site. Section 2.5 provides details of these investigations.

d. Hydrology

Information relating to hydrological conditions at the plant site and the surrounding area is developed and evaluated by utility and contract personnel. The study includes hydrologic characteristics of streams, lakes, shore regions, the regional and local groundwater environments, and existing or proposed water control structures that could influence flood control and plant safety. Section 2.4 includes more detailed information regarding this subject.

e. Demography

Information relating to local and surrounding area population distribution is developed and evaluated by utility and contract personnel. The data is used to determine if requirements are met for establishment of exclusion area, low population zone, and population center distance. Section 2.1 includes more detailed information regarding population around the plant site.

f. Environmental Effects

Monitoring programs are developed to enable the collection of data necessary to determine possible impact on the environment due to construction, startup, and operational activities and to establish a baseline from which to evaluate future environmental monitoring.

13AA.1.1.1.1.2 Design of Plant and Ancillary Systems

Responsibility for design and construction of systems outside the power block such as circulating water, service water, switchyard, and secondary fire protection systems are delegated to qualified contractors.

13AA.1.1.1.1.3 Review and Approval of Plant Design Features

Design engineering review and approval is performed in accordance with the reactor technology vendor QA Program and Section 17.1. The reactor technology vendor is responsible for design control of the power block. Verification is performed by competent individuals or groups other than those who performed the original design. Design issues arising during construction are addressed and implemented with notification and communication of changes to the functional manager in charge of Nuclear Engineering for review. As systems are tested and approved for turnover and operation, control of design is turned over to plant staff. The functional manager in charge of Nuclear Engineering, along with functional managers and staff, assumes responsibility for review and approval of modifications, additions, or deletions in plant design features, as well as control of design documentation, in accordance with the Operational QA Program. Design control becomes the responsibility of the functional manager in charge of Nuclear Engineering prior to loading fuel. During construction, startup, and operation, changes to human-system interfaces of control room design are approved using a human factors engineering evaluation addressed within Chapter 18. See Organization Charts, Figures 13.1-201 and 13AA-201 for reporting relationships.

13AA.1.1.1.1.4 Site Layout With Respect to Environmental Effects and Security Provisions

Site layout was considered when determining the expected environmental effects from construction.

The Physical Security Plan is designed with provisions that meet the applicable NRC regulations. Site layout was considered when developing the Security Plan.

13AA.1.1.1.1.5 Development of Safety Analysis Reports

Information regarding the development of the Final Safety Analysis Report is found in Chapter 1.

13AA.1.1.1.1.6 Review and Approval of Material and Component Specifications

Safety-related material and component specifications of structures, systems, and components designed by the reactor technology vendor are reviewed and approved in accordance with the reactor technology vendor quality assurance program and Section 17.1. Review and approval of items not designed by the reactor vendor are controlled for review and approval by Section 17.5 and the Quality Assurance Program Description.

13AA.1.1.1.1.7 Procurement of Materials and Equipment

Procurement of materials during construction phase is the responsibility of the reactor technology vendor and constructor. The process is controlled by the construction QA Programs of these organizations. Oversight of the inspection and receipt of materials process is the responsibility of the manager in charge of quality assurance.

13AA.1.1.1.1.8 Management and Review of Construction Activities

Overall management and responsibility for construction activities is assigned to the VP – Project Management & Construction. The Project Director of the engineering, procurement, and construction (EPC) contractor is accountable to the VP – Project Management & Construction for construction activities. See Organization Chart Figure 13AA-201. Monitoring and review of construction activities by utility personnel is a continuous process at the plant site. Contractor performance is monitored to provide objective data to utility management in order to identify problems early and develop solutions. Monitoring of construction activities verifies that the contractors are in compliance with contractual obligations for quality, schedule, and cost. Monitoring and review of construction activities is divided functionally across the various disciplines of the utility construction staff (e.g., electrical, mechanical, instrument and control) and tracked by schedule based on system and major plant components/areas.

After each system is turned over to plant staff, the construction organization relinquishes responsibility for that system. At that time they will be responsible for completion of construction activities as directed by plant staff and available to provide support for preoperational and start-up testing as necessary.
To ensure equipment operability and reliability, plant maintenance programs such as preventive and corrective maintenance are developed and made effective during pre-operation/startup phase with approved administrative procedures under the direction of the managers in charge of maintenance, engineering and work control.

Periodic assessment involving both the construction and operations organizations continues to identify SSCs that could reasonably be expected to be impacted by scheduled construction activities. Appropriate administrative and managerial controls are then established as necessary. Specific hazards,

impacted SSCs, and managerial and administrative controls are reviewed on a recurring basis and, if necessary, controls are revised/developed and implemented and maintained current as work progresses on site. For example, prior to construction activities that involve the use of large construction equipment such as cranes, managerial and administrative controls are in place to prevent adverse impacts on any operating unit(s) overhead power lines, switchyard, security boundary, etc., by providing the necessary restrictions on the use of large construction equipment.

13AA.1.1.1.2 Preoperational Activities

The VP – Nuclear Development reports to the Executive Vice President – Nuclear Generation / CNO. The VP – Nuclear Development, with the aid of the functional manager in charge of Operational Readiness, (see Figure 13AA-201) are responsible for the activities required to transition the unit from the construction phase to the operational phase. These activities include turnover of systems from construction, preoperational testing, schedule management, procedure development for tests, fuel load, integrated startup testing, and turnover of systems to plant staff.

13AA.1.1.1.2.1 Development of Human Factors Engineering Design Objectives and Design Phase Review of Proposed Control Room Layouts

Human factors engineering (HFE) design objectives are initially developed by the reactor technology vendor in accordance with Chapter 18 of the FSAR and the Design Control Document (DCD). As a collaborative team, personnel from the reactor technology vendor design staff and personnel, including, licensed operators, engineers, and instrumentation and control technicians from owner and other organizations in the nuclear industry assess the design of the control room and man-machine interfaces to attain safe and efficient operation of the plant. See Section 18.2 for additional details of HFE program management.

Modifications to the certified design of the control room or man-machine interface described in the Design Control Document are reviewed per engineering and site support procedures, as required by Section 18.2, to evaluate the impact to plant safety. The Functional Superintendent – Design Engineering is responsible for the human factors engineering (HFE) design process and for the design commitment to HFE during construction and throughout the life of the plant as noted in Subsection 13.1.1.2.1. The HFE Program is established in accordance with the description and commitments in Chapter 18.

13AA.1.1.1.2.2 Preoperational and Startup Testing

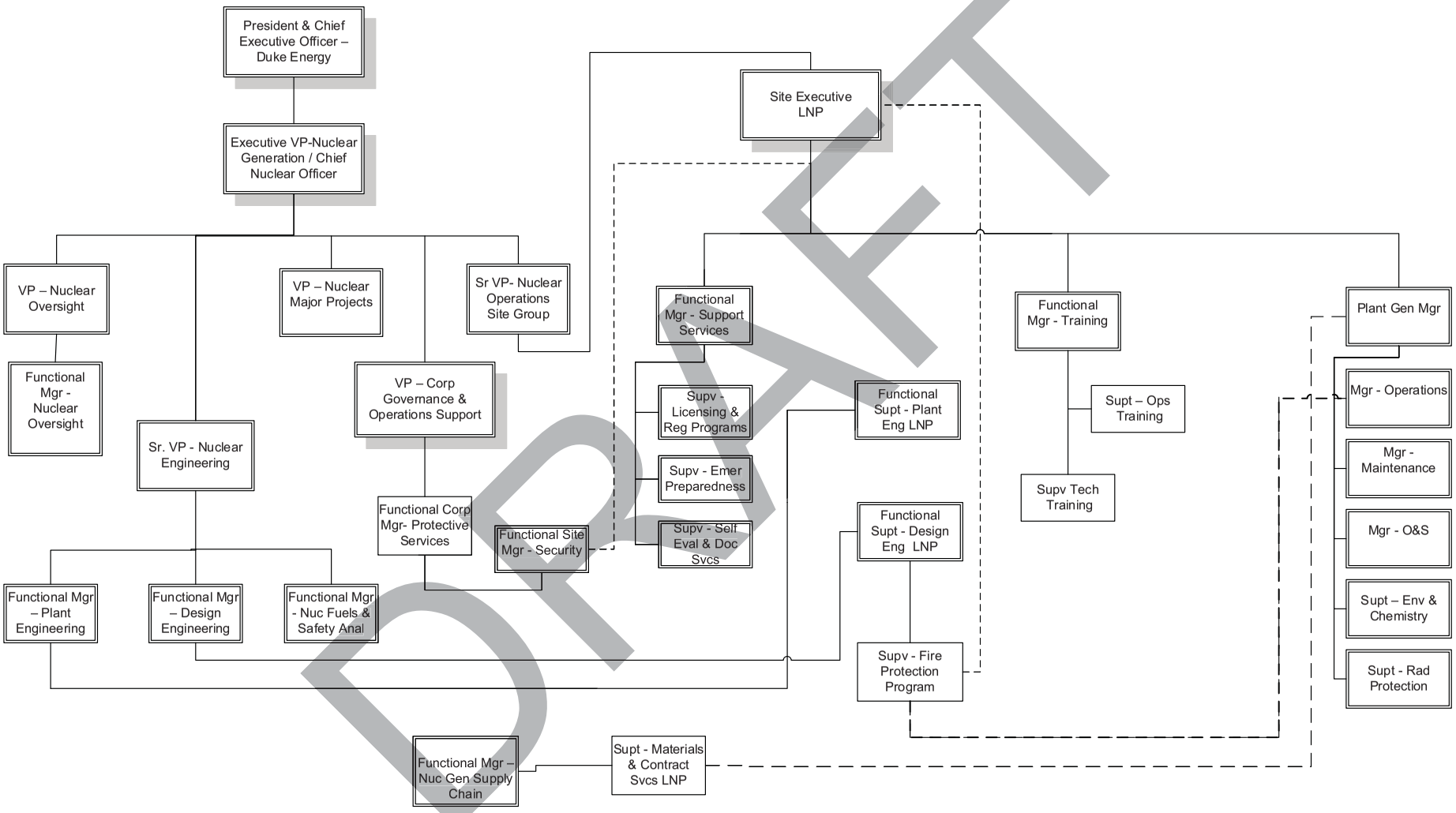
Preoperational and startup testing is conducted by the plant test and operations (PT&O) organization. The PT&O organization, functions, and responsibilities are addressed in Section 14.2. Sufficient numbers of personnel are assigned to perform preoperational and startup testing to facilitate safe and efficient implementation of the testing program. Plant-specific training provides instruction on the administrative controls of the test program. To improve operational experience, operations and technical staff are used as support in conducting the test program and in reviewing test results.

See Figure 13AA-201 for organization chart for preoperational and startup testing.

13AA.1.1.1.2.3 Development and Implementation of Staff Recruiting and Training Programs

Staffing plans are developed based on operating plant experience with input from the reactor technology vendor for safe operation of the plant as determined by HFE. See Section 18.6. These plans are developed under the direction and guidance of the VP – Nuclear Development and the Site Executive in charge of LNP. Staffing plans are completed and manager level positions are filled prior to start of preoperational testing. Personnel selected to be licensed Reactor Operators and Senior Reactor Operators along with other staff necessary to support the safe operation of the plant are hired with sufficient time available to complete appropriate training programs, and to become qualified, and licensed, if required, prior to fuel being loaded in the reactor vessel. See Figure 13AA-202 for an estimated timeline of hiring requirements for operator and technical staff relative to fuel load.

Because of the dynamic nature of the staffing plans and changes that occur over time, it is expected that specific numbers of personnel on-site will change; however, Table 13.1-201 includes the initial estimated number of staff for selected positions and the estimated number of additional positions required for a second unit. Recruiting of personnel to fill positions is the shared responsibility of the manager in charge of human resources and the various heads of departments. The training program is described in Section 13.2.



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Plant Management Organization

FIGURE 13.1-201

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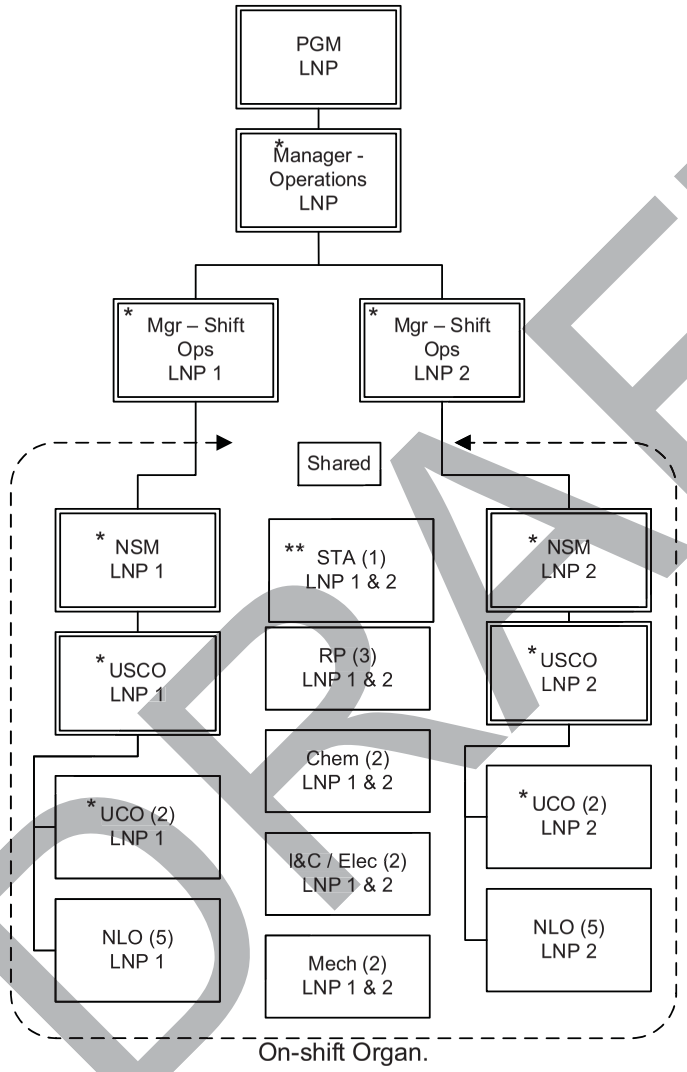

On-shift Organ.

* licensed staff
NSM & USCO - licensed Senior Reactor Operator
UCO - licensed Reactor Operator
** may be met by onshift combined SRO/STA
NLO - non-licensed operator

Shift Manning - 5 shifts (minimum)
(No.) - indicates number of positions per shift

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Shift Operations Organization

FIGURE 13.1-202

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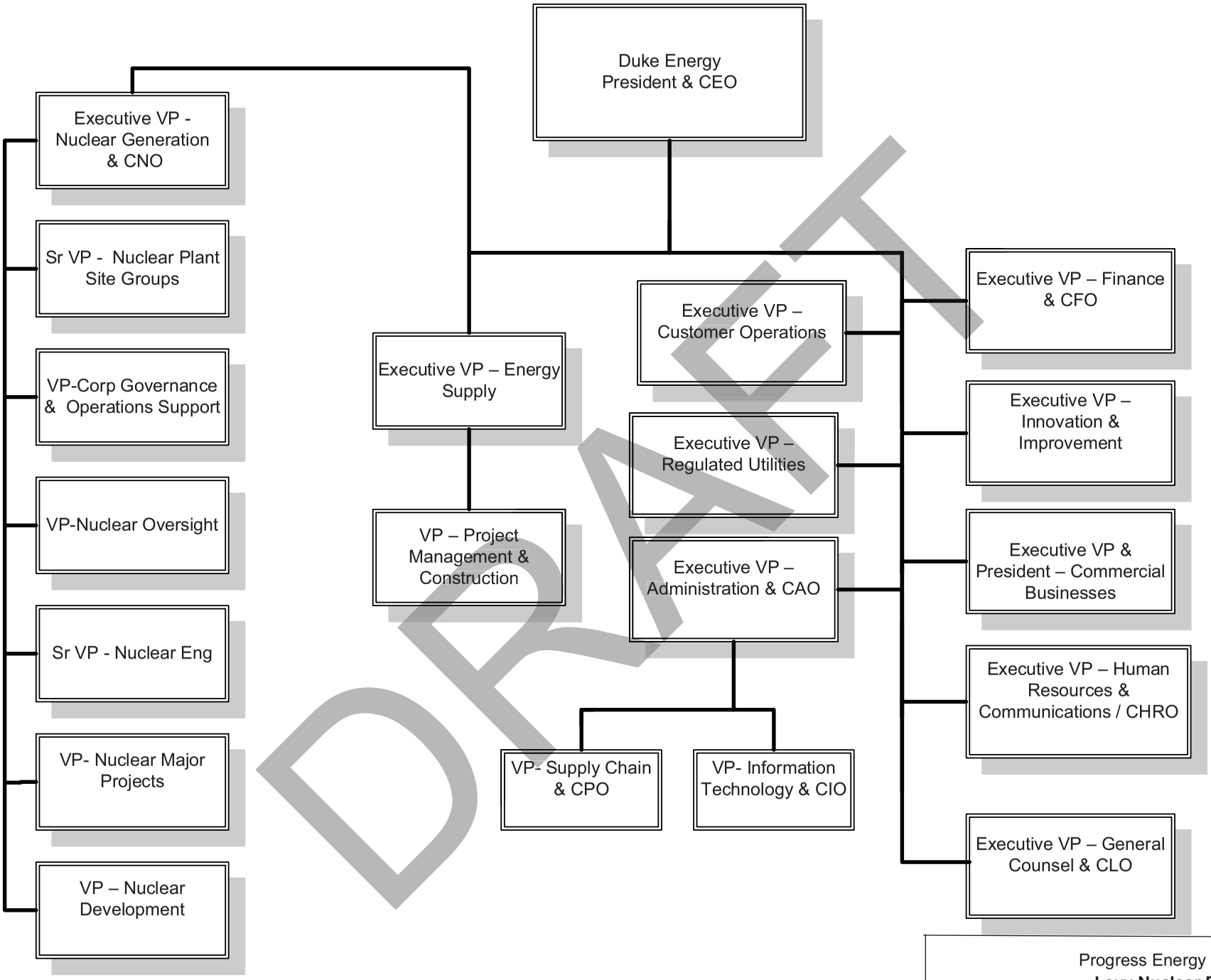

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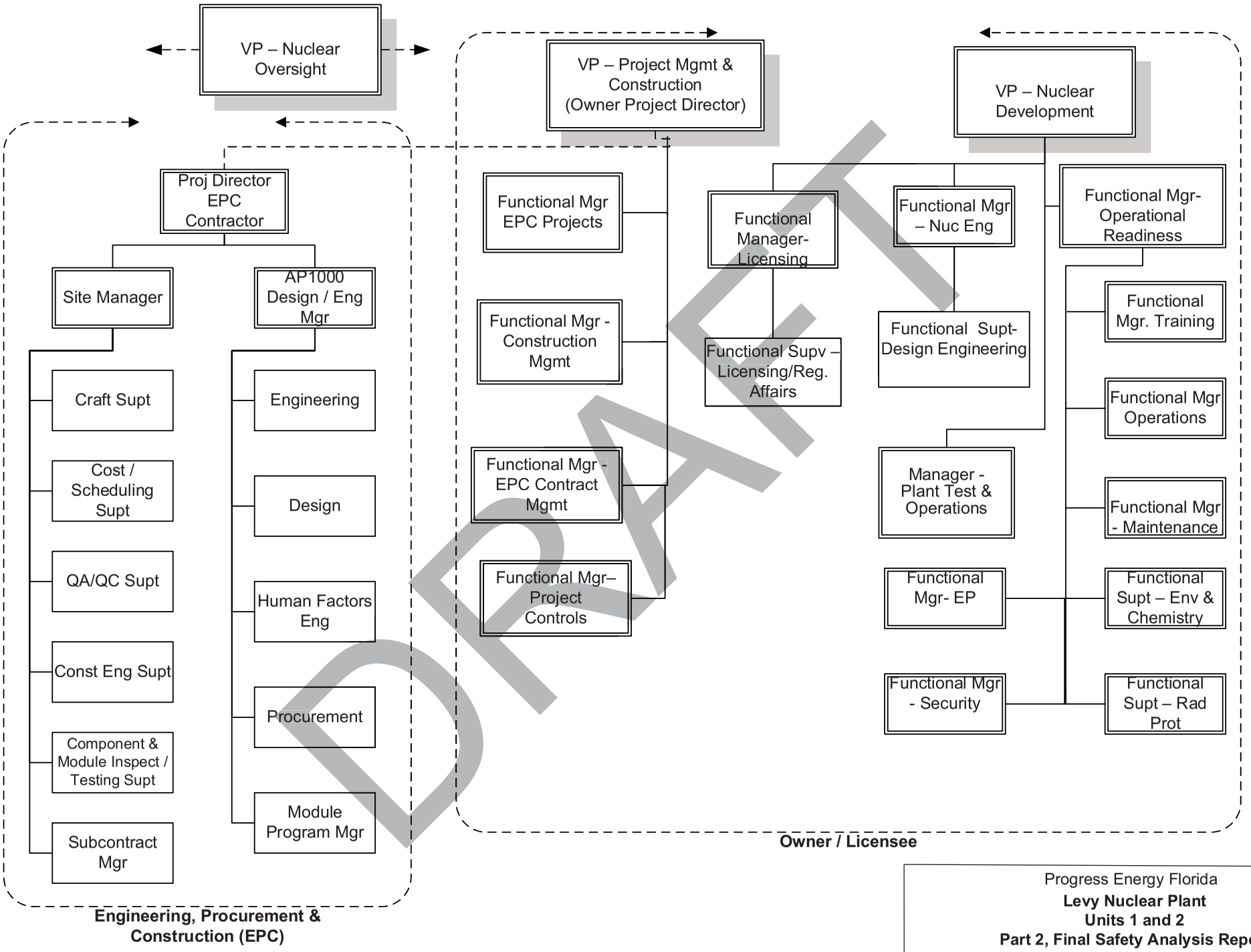
Corporate and Engineering Organization

FIGURE 13.1-203



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Construction Management Organization
FIGURE 13AA-201

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