Ronald B. Clary
General Manager
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SCE&G®
A SCANA COMPANY

February 20, 2009
NND-09-0036

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

ATTN: Document Control Desk

Subject: Virgil C. Summer Nuclear Station (VCSNS) Units 2 and 3 Combined License Application (COLA) - Docket Numbers 52-027 and 52-028 Response to NRC Request for Additional Information (RAI) Letter No. 020

Reference: Letter from Ravindra G. Joshi (NRC) to Alfred M. Paglia (SCE&G), Request for Additional Information Letter No. 020 Related to SRP Section 3.5.1.6 for the Virgil C. Summer Nuclear Station Units 2 and 3 Combined License Application, dated January 22, 2009.

The enclosure to this letter provides the South Carolina Electric & Gas Company (SCE&G) response to the RAI items included in the above referenced letter. The enclosure also identifies any associated changes that will be incorporated in a future revision of the VCSNS Units 2 and 3 COLA.

Should you have any questions, please contact Mr. Al Paglia by telephone at (803) 345-4191, or by email at apaglia@scana.com.

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

Executed on this 20th day of February, 2009.

Sincerely,

Ronald B Clary

Ronald B. Clary
General Manager
New Nuclear Deployment

JMG/RBC/jg

Enclosure

D083
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NRC RAI Letter No. 020 Dated January 22, 2009

SRP Section: 3.5.1.6- Aircraft Hazards

QUESTIONS from Siting and Consequences Branch (RSAC)

NRC RAI Number: 03.05.01.06-1

RG 1.206 provides guidance regarding the information that is needed to ensure potential hazards in the site vicinity are identified and evaluated to meet the siting criteria in 10 CFR 100.20 and 10 CFR 100.21. Section 2.2 describes the site-specific airway hazard evaluation with impact probability determination. Please provide all the data including the site specific effective area estimated and used for the calculation of aircraft crash probability (that would clarify whether flight operations data projected to end of life of plant is used). This is required for performing confirmatory calculations.

VCSNS RESPONSE:

Section 2.2.2.7 of the V.C. Summer Units 2 and 3 FSAR addresses hazards associated with aircraft and airways. While all aviation facilities were screened out from further analysis, one airway presented a potential threat to the site. Based on this, the airway, a low altitude federal airway designated V53 was further analyzed to determine a probability of an aircraft accident that could result in radiological consequences at the site. The analysis was completed utilizing applicable guidance contained in NUREG-0800 and DOE Standard 3014-96 (NUREG-0800 2007, DOE Standard 1996).

The effective area was estimated utilizing the V. C. Summer plot plan (the basis drawing for FSAR Figure 1.1-202) and the DCD general arrangement drawings and included footprint areas from the reactor building (RB), and three auxiliary buildings (AB), A, B and C. To calculate the effective area, methods provided in the DOE Standard 3014-96 were used (DOE Standard 1996). The input values and resultant areas are presented in the attached Table of Effective Areas and Crash Frequencies for V53.

Due to the unavailability of air traffic data for V53 directly from the FAA, annual aircraft data was obtained from the Columbia Metropolitan Airport website for the years 2001 through 2006. This data was then averaged and aircraft frequency for V53 was conservatively estimated by dividing the annual aircraft operations data for Columbia Metropolitan (the airport serviced by V53) by 9, which is the number of airways in and out of Columbia Metropolitan. The fractions of aircraft were assumed to be the same for V53 as they were for the rest of the airport. It was also assumed that flight frequencies would not significantly change for the life of the plant. This seems to be a reasonable assumption given that the FAA projections for flights carried out to 2025 (FAA 2008) are all, with the exception of air taxis, lower than the average values for the 6 years that were used.

Annual Aircraft Operations for Columbia Metropolitan Airport (CAE Website 2007)

	2006	2005	2004	2003	2002	2001	AVERAGE	V53 Operations
Air Carrier	10,890	10,483	10,390	10,274	11,627	15,032	11,449	1,272
Air Taxi	46,423	52,681	53,612	48,392	44,537	41,722	47,895	5,322
GA-Itinerant	26,494	29,045	30,749	31,460	35,612	37,702	31,844	3,538
GA-Local	10,647	12,466	15,120	17,761	18,453	23,052	16,250	1,806
Military Itinerant	2,349	2,022	2,395	2,657	2,743	3,007	2,529	281
Military Local	1,436	1,595	2,197	2,031	3,222	2,989	2,245	249
Total	98,239	108,292	114,463	112,575	116,194	123,504	112,211	12,468

The NUREG-0800 recommended in-flight accident rate of 4×10^{-10} per mile was utilized for all aircraft in the analysis (NUREG-0800 2007). DOE Standard 3014-96 recommended values for cotΦ, skid distances and representative wingspans were used for the calculations as well (DOE Standard 1996). Military aircraft are split into two categories in NUREG-0800, large and small (NUREG-0800 2007). Since the airport only reported values for generic military aircraft with no differentiation, the characteristics for military aircraft were averaged and applied to the values reported. These inputs resulted in the following calculation for general aviation aircraft:

$$P = C \times N \times A/W \text{ (NUREG-0800 2007)}$$

C = in-flight crash rate per mile for aircraft using airway
N = number of flights per year along the airway
A = effective area of plant in square miles
w = width of airway (plus twice the distance from the airway edge to the site when the site is outside the airway) in miles

Refer to Attachment 1 for detailed information inputs for the following formula.

$$\text{General Aviation: } P = 4\times10^{-10} \times 5{,}344 \times 0.029995 / 8.0 = 8.01434\times10^{-9}$$

Air Carrier: 5.70177×10^{-9}
Air Taxi: 1.98491×10^{-8}
Military: 2.86403×10^{-9}

The total calculated crash frequency for all types of flights = $8.01434\times10^{-9} + 5.70177\times10^{-9} + 1.98491\times10^{-8} + 2.86403\times10^{-9} = 3.64293\times10^{-8}$.

References:

(NUREG-0800 2007) NUREG-0800, Draft Rev. 3, Standard Review Plan, Section 3.5.1.6 Aircraft Hazards, U.S. Nuclear Regulatory Commission, April 2007.

(DOE Standard 1996) Accident Analysis for Aircraft Crash into Hazardous Facilities, DOE Standard, DOE-STD-3014-96, U.S. Department of Energy, October 1996.

(CAE Website 2007) Columbia Metropolitan Airport (CAE), available online at: http://www.columbiaairport.com/, last accessed: October 12, 2007.

(FAA 2008) APO Terminal Area Forecast Detail Report, for Columbia Metropolitan Airport (CAE); U. S. Federal Aviation Administration, December 2008.

This response is PLANT SPECIFIC.

ASSOCIATED VCSNS COLA REVISIONS:

No COLA changes have been identified as a result of this response.

ASSOCIATED ATTACHMENTS:

Attachment 1 - Table of Effective Areas and Crash Frequencies for V53.

Table of Effective Areas and Crash Frequencies for V53

AP1000	Footprint (ft)	Bldg W (ft)	Bldg L (ft)	Bldg Diagonal, R (ft)	Bldg. H (ft)	Wing Span (ft)	Skid Dist. (ft)	CotΦ	Eff. Fly-In Area, Af (ft2)	Eff. Skid Area, As (ft2)	Total Eff. Area (ft2)	Total Eff. Area (mi2)	Aircraft Operation from 2001 to 2006	Crash Freq. (100% flights)
Gen. Aviation														
Reactor Bldg	16,483.00	128.39	128.39	181.57	228.75	50	60	8.2	459,920.1	13,893.9	473,814.0	0.016996		
Aux Bldg A	5,933.00	77.03	77.03	108.93	80.75	50	60	8.2	116,615.8	9,535.9	126,151.7	0.004525		
Aux Bldg B	5,578.00	74.69	74.69	105.62	80.75	50	60	8.2	113,904.2	9,337.3	123,241.5	0.004421		
Aux Bldg C	4,408.00	66.39	66.39	93.89	80.75	50	60	8.2	104,381.8	8,633.6	113,015.4	0.004054		
										Total:	836,222.6	0.029995	5,344	8.01434E-09
Air Carrier														
Reactor Bldg	16,483.00	128.39	128.39	181.5654	228.75	98	1440	10.2	686,572.4	402,574.2	1,089,146.6	0.039068		
Aux Bldg A	5,933.00	77.03	77.03	108.9312	80.75	98	1440	10.2	187,047.1	297,980.9	485,028.0	0.017398		
Aux Bldg B	5,578.00	74.69	74.69	105.622	80.75	98	1440	10.2	183,642.2	293,215.6	476,857.8	0.017105		
Aux Bldg C	4,408.00	66.39	66.39	93.89356	80.75	98	1440	10.2	171,662.7	276,326.7	447,989.4	0.016069		
										Total:	2,499,021.9	0.08964	1,272	5.70177E-09
Air Taxi														
Reactor Bldg	16,483.00	128.39	128.39	181.73	228.75	59	1440	10.2	588,868.9	346,651.2	935,520.1	0.033557		
Aux Bldg A	5,933.00	77.03	77.03	110	80.75	59	1440	10.2	151,494.3	243,360.0	394,854.3	0.014163		
Aux Bldg B	5,578.00	74.69	74.69	104	80.75	59	1440	10.2	146,161.8	234,720.0	380,881.8	0.013662		
Aux Bldg C	4,408.00	66.39	66.39	99.5	80.75	59	1440	10.2	140,184.1	228,240.0	368,424.1	0.013215		
										Total:	2,079,680.4	0.074598	5,322	1.98491E-08
Military														
Reactor Bldg	16,483.00	128.39	128.39	181.73	228.75	223	780	10.4	1,019,788.1	315,689.4	1,335,477.5	0.047904		
Aux Bldg A	5,933.00	77.03	77.03	110	80.75	223	780	10.4	309,642.0	259,740.0	569,382.0	0.020424		
Aux Bldg B	5,578.00	74.69	74.69	104	80.75	223	780	10.4	304,113.6	255,060.0	559,173.6	0.020058		
Aux Bldg C	4,408.00	66.39	66.39	99.5	80.75	223	780	10.4	295,002.0	251,550.0	546,552.0	0.019605		
										Total:	3,010,585.1	0.10799	530	2.86403E-09

Total	3.64293E-08