5.0 SITE PARAMETERS

Assuming the certified design will be referenced for a wide range of sites, it is necessary to specify a set of site parameters enveloping the conditions that could be present at most potential power plant sites in the United States. These parameters are provided in Table 5.0-1. It is intended that any facility that references the certified design will utilize a site where the actual site-specific conditions are within the defined envelope.

In the case of seismic design parameters, deviations from the defined conditions may be justified by site-specific soil-structure interaction analyses. The results may be used to confirm the seismic design adequacy of the certified design using approved methods and acceptance criteria.

Table 5.0-1—Site Parameters for the U.S. EPR Design
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Precipitation	
Parameter	**Value(s)**
Rainfall rate	≤19.4 in/hr
Sum of normal winter precipitation event and extreme frozen winter precipitation event ground load	≤143 psf(1)
Seismology	
Parameter	**Value(s)**
Horizontal SSE Acceleration	0.3g PGA for EUR and 0.21g PGA for HF (CSDRS shapes – See Figure 5.0-1)
Vertical SSE Acceleration	0.3g PGA for EUR and 0.18g PGA for HF (CSDRS shapes – See Figure 5.0-1)
Fault Displacement Potential	No fault displacement is considered for safety-related SSC in U.S. EPR design certification.
Flood Level	
Parameter	**Value(s)**
Maximum flood or tsunami	Maximum flood or tsunami level is no more than 1 ft below grade.
Temperature	
Parameter	**Value(s)**
Design ambient temperature	The 0% exceedance maximum ambient temperature is 115°F Dry Bulb and 80°F Wet Bulb (mean coincident).(2)
	The 0% exceedance minimum ambient temperature is -40°F.(2)
	The 1% exceedance (seasonal basis)(3) maximum ambient temperature is 100°F Dry Bulb and 77°F Wet Bulb (mean coincident).
	The 1% exceedance (seasonal basis) (3) minimum ambient temperature is -10°F.
Wind	
Parameter	**Value(s)**
Maximum Speed (Other than Tornado and Hurricane)	The normal maximum wind speed is 145 mph.
Tornado	
Parameter	**Value(s)**
Maximum Pressure and Rate of Drop	1.2 psi at 0.5 psi/s
Maximum Rotational Speed	184 mph

Table 5.0-1—Site Parameters for the U.S. EPR Design
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Maximum Translational Speed	46 mph
Maximum Wind Speed	230 mph
Radius of Maximum Rotational Speed	150 ft
Missile Spectra	6 in Schedule 40 pipe, 6.625 in diameter x 15 ft long, 287 lb, 34.5 in^2 impact area, impact velocity of 135 fps horizontal and 90 fps vertical.
	Automobile, 16.4 ft x 6.6 ft x 4.3 ft, 4000 lb, 4086.7 in^2 impact area, impact velocity of 135 fps horizontal and 90 fps vertical. (Automobile missile is considered at elevations up to 30.0 ft above grade elevation.)
	Solid steel sphere, 1 in. diameter, 0.147 lb, 0.79 in^2 impact area, impact velocity of 26 fps horizontal and 17 fps vertical.
Hurricane	
Parameter	**Value(s)**
Hurricane (maximum speed)	Maximum hurricane wind speed of 230 mph.
Missile Spectra	6 in Schedule 40 pipe, 6.625 in diameter x 15 ft long, 287 lb, 34.5 in^2 impact area, impact velocity of 176 fps horizontal and 85 fps vertical.
	Automobile, 16.4 ft x 6.6 ft x 4.3 ft 4000 lb, 4086.7 in^2 impact area, impact velocity of 222 fps horizontal and 85 fps vertical. (Automobile missile is considered at elevations up to 30.0 ft above grade elevation).
	Solid steel sphere, 1 in diameter, 0.147 lb 0.79 in^2 impact area, impact velocity of 155 fps horizontal and 85 fps vertical.
Soil	
Parameter	**Value(s)**
Soil properties:	
Minimum angle of internal friction (in situ and backfill)	26.6 degrees(4)
Minimum shear wave velocity	Minimum shear wave velocity (low strain best estimate average value at bottom of basemat) of 1000 feet per second.
Minimum static bearing capacity	Maximum static bearing demand is 23,100, lbs/ft^2 at the bottom of the Seismic Category I structure basemats. The ultimate static bearing capacity divided by 3.0 is greater than or equal to the maximum static bearing demand.

Table 5.0-1—Site Parameters for the U.S. EPR Design
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Minimum dynamic bearing capacity	The maximum dynamic bearing demand (combination of safe shutdown earthquake and static loads) at the corner of any Seismic Category I Structure basemat is: • 38,000 lbs/ft^2 (for soft soil)(5) • 48,000 lbs/ft^2 (for medium soil)(5) • 60,000 lbs/ft^2 (for hard soil)(5) For a site with shear wave velocity between soft and medium soil conditions or between medium and hard soil conditions, the maximum dynamic bearing demand is the larger of the two values. For sites not meeting the soil property requirements, a site-specific analysis is required. The ultimate dynamic bearing capacity divided by 2.0 is greater than or equal to the maximum dynamic bearing demand.
Liquefaction potential	No potential for liquefaction under footprint of Seismic Category I structures from site-specific SSE.
Maximum ground water level	Maximum ground water level is 3.3 ft below grade.
Maximum Settlement (across the basemat)	
Tilt Settlement	1/2 inch in 50 ft in any direction.
Slope Failure Potential	No slope failure potential is considered in the design of safety-related SSC for U.S. EPR design certification.
Atmospheric Dispersion Factors (χ/Q)	
Parameter	**Value(s)**
Meteorological Dispersion (values at Exclusion Area Boundary, and Low Population Zone at appropriate time intervals for short and long term)	Atmospheric dispersion factors – χ/Q (sec/m^3) – Exclusion Area Boundary 0 - 2 hours ≤ 1.00E-03 – Low Population Zone 0 – 2 hours ≤ 1.75E-04 2 – 8 hours ≤ 1.35E-04 8 – 24 hours ≤ 1.00E-04 1 – 4 days ≤ 5.40E-05 4 – 30 days ≤ 2.20E-05

1. The effect of the extreme liquid winter precipitation event on roof loads is negligible due to the lack of parapets.

2. By definition, 0% percent exceedance temperature values exclude peaks of temperatures that last less than two hours. The 0% percent exceedance values are based on conservative estimates of 100 year return period values and historic extreme values, whichever is bounding.

3. For maximum values, data from the summer months of June, July, and August are used. For minimum values, data from the winter months of December, January, and February are used.

4. Minimum angle of internal friction is associated with the soil's ability to develop the minimum coefficient of static friction.

5. The shear wave velocities (strain compatible best estimate average values directly beneath the foundation basemat) of soft, medium, and hard soils are 1000 ft/sec, 1640 ft/sec, and greater than or equal to 6601 ft/sec, respectively.

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