EARTHQUAKE HAZARD STUDY

for the Corning Shizuoka Plant and surrounding area, Kakegawa-shi, Japan

PROJECT DESCRIPTION

Japan is home to two Corning plant sites. The Kakegawa-shi Plant is located on the southeastern coast of Japan, southwest of the city of Shizoka, Japan. The Sakai City plant is located on the southeastern coast of Japan, south of Osaka, on Osaka Bay. The sites lies within an active tectonic environment with multiple potential seismic source zones. Due to the presence of these zones, there is a high possibility of site shaking within the near futur Shaking has the ability to cause damage to not just the plant, but to the critical facilities in the surrounding areas as well. A study was conducted in order to understand the earthquake hazards that is present in the areas.

SOLUTION

Earth Consultants International conducted an extensive search and review of literature and had multiple consultations with Japanese colleagues. Afte collecting the literature, we created/ modified a database of the active faults within a 100 km radius of the site. These faults are either crust subduction zone faults with a high probability of movement within the next 30 years. We combined the source contributions for all faults in probabilistic seismic hazard analysis using EZ-FRISK subscription software. Finally, we developed a 5% damped site specific probabilistic acceleration response spectra, to define the level of ground shaking anticipated to occur at the site with a specific recurrence interval (return period), based on the ASCE-41 manual.

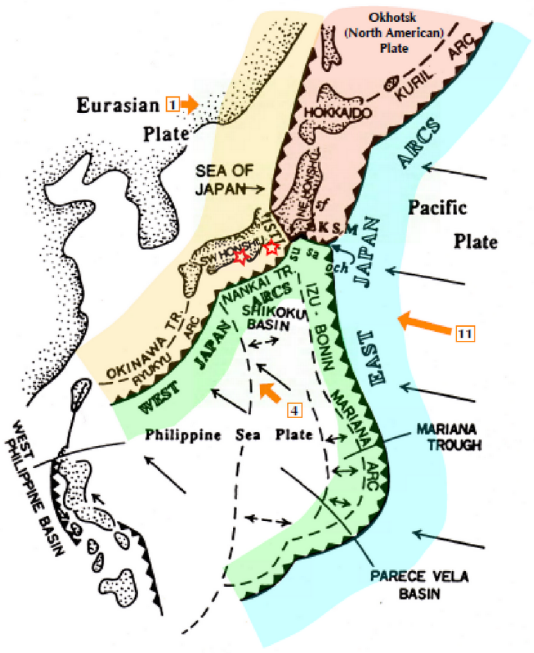

Figure 1 (above): Dashed lines mark volcanic arcs; colors differentiate plate boundaries. Orange arrows indicate plate motion direction in cm/yr. Abbreviations:ISTL. Itoigawa-Shizuoka Tectonic Line; SA, Sagami Trough; SU, Suruga Trough; SF, South Fossa Magna triple junction. Red Stars indicates site locations.

RESULTS

Through our efforts we identified several sources that could produce shaking at the two sites.

-a major earthquake generated from the northeastern section of the Nankai Subduction Zone.

-crustal faulting along the Itoigawa-Shizuoka Tectonic Line

-earthquakes generated from fragmentation of the Philippine Sea Plate offshore to the south of the site

-surface deformation caused by a splay of the Uemachi fault system

Subduction Scenarios	Fault Type	Length (km)	Max EQ (Mw)
Nankai #2 (segment A+B)	Subduction Interface	345	8.3
Nankai #3 (segment C+D)	Subduction Interface	230	8.4
Nankai #4 (segment C+D+E)	Subduction Interface	315	8.4
Nankai #1 (all segments)	Subduction Interface	600	8.6
Sagami Trough	Subduction Interface	250	8.0
Nankai Slab	Subduction Intraslab	500	8.0
Izu-Bonin	Subduction Interface	300	8.2
Izu-Bonin Slab	Subduction Intraslab	300	7.8

Maximum Size of Subduction Zone Earthquakes Modeled in this Study

Fault Name	Fault Type	Length (km)	Slip per event (m)	Slip Rate (m/kyr)	Magnitude (Mw)	Approximate Recurrence Interval (kyrs)	Long-Term Occurrence Probability (maximum) (in 30 years)
Nakago Fault	SS	50	1.5	0.1	6.5-7.0	15	0.2%
Itoigawa Shizuoka Tectonic Line	R,SS	140-150	16-17	14.0	8.0	1.0	NA
Middle	R,SS	47	6.3	9.1	7.5-8.0	0.7	4%
South	R	38	4.1	3.5	7.3	1.2	3%
North	R,SS	65	6.4	3.7	7.5-8.0	2.0	2%
Fujikawa Kako Fault Zone	R	58	13	8-9	8.0+-0.5	1.5-1.9	NA
Iriyamase	R	30	10	7.0	7.5	1.4	2.0%
Shibakawa	R	28	3.3	1.8	7.4	1.8	1.0%
Ina Valley Fault	R	>80	4-6	2-3	8.0	3.5	0.9%
Kamigamo Fault	SS	12	1.4	0.1	6.9-7.0	14	0.2%
Fukozu Fault	R	15	2.4	NA	6.8	NA	NA

Major Onshore Seismic Sources Within 100 km of the Kakegawa-shi Plant Site

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