# Probabilistic Seismic Hazard Analysis (PSHA) and Soil-Structure Interaction (SSI) Analysis

## Zaporozye Nuclear Power Plant, Ukraine

<table>
<thead>
<tr>
<th>Year Completed</th>
<th>Professional Services</th>
<th>Project Construction</th>
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<tbody>
<tr>
<td>9/2013 – 8/2014</td>
<td>N/A</td>
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### Client’s Information

<table>
<thead>
<tr>
<th>Client – Point of Contact Name</th>
<th>Client – Point of Contact Email</th>
<th>Client – Point of Contact Telephone Number</th>
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<tbody>
<tr>
<td>UNIX CZ s.r.o. Gleb Serebrjakov</td>
<td><a href="mailto:Gleb.serebrjakov@gmail.com">Gleb.serebrjakov@gmail.com</a></td>
<td>+380 63 143-11-11</td>
</tr>
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**RIZZO Associates** performed a PSHA and a SSI analysis in accordance to the guidelines and recommendations outlined by the International Atomic Energy Agency (IAEA) Specific Safety Guide (SSG)-9, other Ukrainian and European Codes and U.S. Nuclear Regulatory Commission (NRC) standards.

Zaporozye Nuclear Power Plant (ZNPP) is owned by ZNPP Energoatom and is located in Southeastern Ukraine near the city of Enerhodar, on the banks of the Kakhovka water reservoir on the Dnieper River. It is the largest nuclear power plant in Europe and the fifth largest in the world. It has six (6) 1000-Megawatt (MW) light water reactor units (VVER-1000) for a total power output of 6,000 MW; Unit 1 was commissioned in 1985 and Unit 6 in 1996. The Plant is operated by the National Nuclear Energy Generating Company Energoatom (NNEGCE). NNEGCE is currently performing a seismic reevaluation of several Nuclear Plants in Ukraine, including ZNPP, in order to comply with IAEA Guidelines.

### Main Service Provided:

RIZZO personnel performed a PSHA at the ZNPP Site according to recommendations of IAEA SSG-9 on PSHA procedures. As part of the PSHA, potential seismic sources were defined, including rate of earthquake occurrence and maximum magnitude; ground motion prediction equations were selected, and the corresponding probabilistic calculations that appropriately account for uncertainties in input parameters were performed. The PSHA will be used to generate design response spectra which can be compared to the existing Operating Basis Earthquake (OBE) and Safe Shutdown Earthquake (SSE) for the Site.

RIZZO carried out an assessment of site response using available data to obtain the Peak Ground Acceleration (PGA) at soil surface. Subsequently, a Soil Structure Interaction (SSI) analysis was performed to obtain the response spectra and accelerograms at the foundation level of the buildings and structures of Units 1 and 2. Finally, results from probabilistic analyses were compared with the results from previous investigations (deterministic analyses).

**RIZZO Contract Value:** $1,000,000  
**RIZZO Project Number:** 13-5040