

Fontenay-aux-Roses, January 9th, 2013

Director General

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GEN ENERGIJA		
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Mr. Martin NOVŠAK

Director-General

GEN energija, d.o.o.

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Slovenija

Objet : Contract "GG&S NPP KRŠKO II"

Dear Sir,

On the 26-27th of June 2012 a Consortium meeting was held in Ljubljana so as to resolve issues concerning conclusions of the report related to the detailed investigations carried out on the "Krško II" sites envisaged for the implantation of a new nuclear power plant. In accordance with the decisions taken at this meeting the present letter is to inform you of IRSN's position related to the recent findings on the Libna fault, located at only a few hundred meters from these sites.

As requested by contractual obligations attached to the implementation of the Geotechnical, Geological and Seismological (GG&S), Krško II project, the Consortium was to establish whether the geological conditions at the proposed "Krško II" sites were suitable for the future development of a nuclear power generating facility. In particular, the Consortium had to identify the potential for surface rupture associated to the possible presence of capable faults within 5 km of the future power plant location. I recall that, in accordance with the contract and associated technical specifications, the Consortium evaluations had to be performed with reference to relevant recommendations issued by the International Atomic Energy Agency (IAEA), Western European Nuclear Regulators Association (WENRA) and United States Nuclear Regulatory Commission (US-NRC). Extracts of these recommendations are attached in appendix.

In the first phase of the project, the Consortium identified faults within the 5 km radius of the two Krško II sites (e.g. Orlica, Artice, Stara Vas and Libna faults), the capability of which had to be assessed. In this respect, the Libna fault, outcropping at a short distance from the Krško II sites, was more thoroughly investigated by trenching. The findings of these investigations led the Consortium to agree on the capability of this fault. However, the Consortium failed to reach consensus on the conclusions to be drawn from this finding with regard to site suitability, and on its implications for the continuation of the siting process.

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IRSN's opinion on this matter is that this new and serious finding does not allow concluding in a favorable manner as regards the suitability of the Krško II sites for the implantation of a new nuclear power plant. Acknowledging the fact that the feasibility of designing a reactor against fault surface displacement is questionable, and consistent with IAEA and NRC recommendations, IRSN believes that GEN should consider revising its strategy for the Krško II project and further examine the possibility to search for an alternative site.

Should GEN nevertheless decide to pursue investigations on the Krško II sites, possibly making use of probabilistic fault displacement hazard analysis (PFDHA) for assessing site suitability, it should be recalled that the evaluation of permanent ground displacement phenomena is a highly challenging issue given the poor international experience currently available and the lack of recognized methods and tools. There is therefore in our view a major risk that this strategy fails in the end at demonstrating that the new power plant will meet current national and international safety standards. Thus, IRSN considers that the use of PFDHA is more appropriate in the process of upgrading safety demonstration of existing nuclear facilities than for supporting the licensing of new plants.

Concerning this last point, particular attention must be given to the fact that the Libna capable fault lies in the vicinity of the existing Krško I plant site. IRSN considers that it is of utmost importance that the possible implications on the safety of the existing plant of this fault capability, as well as its potential structural relationship to nearby faults, be addressed without delay. I understood that GEN felt concerned about this issue and was willing indeed to inform Krško I plant operator (Nuklearna Elektrarna Krško - NEK)) as well as the Slovenian Nuclear Safety Administration (NSA) about this finding. I would be very grateful if you could confirm that this has been actually done, since I do envisage drawing NSA's attention on this issue, considering the potential safety implications it may have at national and international level.

IRSN remains of course at your disposal to discuss further this matter, at your convenience.

Sincerely,


Jacques REBUSARD

IAEA and NRC Regulations

IAEA - NS-R-3 - Site Evaluation for Nuclear Installations - Safety Requirements

“Surface Faulting

3.5. The potential for surface faulting (i.e. the fault capability) shall be assessed for the site. The methods to be used and the investigations to be made shall be sufficiently detailed that a reasonable decision can be reached using the definition of fault capability given in paragraph 3.6.

3.6. A fault shall be considered capable if, on the basis of geological, geophysical, geodetic or seismological data, one or more of the following conditions applies:

(a) It shows evidence of past movement or movements (significant deformations and/or dislocations) of a recurring nature within such a period that it is reasonable to infer that further movements at or near the surface could occur. In highly active areas, where both earthquake data and geological data consistently reveal short earthquake recurrence intervals, periods of the order of tens of thousands of years may be appropriate for the assessment of capable faults. In less active areas, it is likely that much longer periods may be required.

(b) A structural relationship with a known capable fault has been demonstrated such that movement of the one may cause movement of the other at or near the surface.

(c) The maximum potential earthquake associated with a seismogenic structure is sufficiently large and at such a depth that it is reasonable to infer that, in the geodynamic setting of the site, movement at or near the surface could occur.

3.7. Where reliable evidence shows the existence of a capable fault that has the potential to affect the safety of the nuclear installation, an alternative site shall be considered.”

US NRC - Regulatory Guide 4.7 - General Site Suitability Criteria for Nuclear Power Stations

“1. GEOLOGY AND SEISMOLOGY

Preferred sites are those with a minimal likelihood of surface or near-surface deformation and a minimal likelihood of earthquakes on faults in the site vicinity (within a radius of 8 km (5 miles)). Because of the uncertainties and difficulties in mitigating the effects of permanent ground displacement phenomena such as surface faulting or folding, fault creep, subsidence or collapse, the NRC staff considers it prudent to select an alternative site when the potential for permanent ground displacement exists at the site.”

US NRC - NUREG-800 (2.5.3 - Revision 4 - Surface faulting) - II - ACCEPTANCE CRITERIA

Acceptance criteria for Surface faulting are based on meeting the requirements of the Cf10 CFR 100.23, "Geologic and Seismic Siting Criteria," as it relates to determining the potential for surface tectonic and non-tectonic deformations at and in the region surrounding the site.

"Standard Review Plan Acceptance Criteria

8. Potential for Surface Tectonic Deformation at the Site Location.

To meet requirements of GDC 2 in Appendix A of 10 CFR Part 50, 10 CFR 52.17, and 10 CFR 100.23 for this area of review, information must be presented by the applicant in this subsection if field investigations reveal that surface or near-surface tectonic deformation along a known capable tectonic structure (i.e., a known capable tectonic feature related to a fault or blind fault) must be taken into account at the site location.

It is important to note that no commercial nuclear power plant has ever been constructed on a known capable tectonic deformation feature, and it is questionable whether it may be feasible to design for surface or near-surface tectonic displacements with any degree of confidence that safety-related plant features would remain intact and functional if displacements were to occur. Consequently, it is NRC policy to recommend that any site determined, based on results of detailed fault investigations, to lie on a surface or near-surface tectonic structure capable of displacement be prudently re-located to an alternate site by the applicant. If it becomes feasible in the future to design for surface or near-surface faulting with confidence that safety-related plant features would remain intact and functional should displacements occur, it would be necessary for an applicant to present the design basis for faulting and all supporting data in a high degree of detail."

External copies:

Mr. J.C. Guillaneau (BRGM) - Consortium Leader

Mr. M. Komac (GeoZs) - Consortium Member

Mr. B. Petkovsek (ZAG) - Consortium Member