



**REVIEW AND
COMMENTS**

**BRGM CONSORTIUM
REPORT**

**PALEOSEISMOLOGICAL
TRENCHES ON THE
LIBNA HILL
KRŠKO II**

REVISION 2

Engineering & Construction Management
Hydro • Nuclear • Fossil

Tunnel Engineering

Geotechnical Engineering

Seismic & Structural Engineering

Hydrological & Hydraulic Engineering

Environmental Engineering & Permitting

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PROJECT NO. 11-4546
25 JUNE 2012

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REVIEW AND COMMENTS

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INTRODUCTORY REMARKS

As per the request of Gen Energija, we have reviewed the subject Report as made available to us at the end of May 2012. We have already reviewed an earlier version of this Report, and consequently, we are reasonably familiar with its content and the investigations and studies leading up to this Revision 1.

COMMENTS

We question the overall conclusions in of the Report because of the major uncertainties explicitly stated regarding site suitability or seismic design basis for new Nuclear Power Plants (NPPs) proposed at the Krško East and West Sites.

Quote No. 1:

ESR and OSL dates were obtained for the terrestrial Plioquaternary series during the course of this project that are surprisingly low (210.000 to 130.000 B.P.) for Globoko formation compared to the estimate of 1 - 2 million years before this project. At this stage, we cannot apply these age dates into the regional geological model (also outside Krško basin) so we decided to wait with further application until they are proven by independent analyses.

This quote clearly indicates that no conclusion can be reached on the basis of these age dates and that additional work is required regarding the age dates.

Quote No. 2 – Again regarding the age dating:

The results are not consistent with understanding (including published works) of the age of the Plioquaternary sediments as it was interpreted prior to this project. There are evidences that do not converge with Globoko formation being as young as shown by the current absolute age, but all are non-conclusive:

Quote No. 3 – Again regarding the age dating:

An extensive and multi-method campaign of datings is required to conclude as there is no known single absolute dating method that would guarantee reliable age dating of the deformed sediments in trench on Libna and consequently the age of deformation.

Quotes No. 2 and 3 clearly indicate that no conclusion can be reached on the basis of these age dates and that additional work is required regarding the age dates.

Quote No. 4 – Regarding the Libna Hill Feature, the Report states the following:

At the end of this report (section 5) the Consortium proposes further actions for clarification of activity and geometry of the Libna fault.

This Quote indicates that more work is recommended regarding the Libna Hill Feature before any defendable conclusions can be stated.

Quote No. 5 – Regarding the artifact found in one of the Trenches, the Report states the following:

Another impacting difference in potential interpretation is related to the genesis of the whole (or a part of the) silt unit (called here the Plioquaternary silt) as colluvial and to the position of the silex artefact within this silt. According to interpretation of D. Pantosti (Annex 1), the silt may be colluvial thus the silex artefact (200.000 to 2.500 BC) may have been deposited within the colluvium (synchronous with deposition) and thus predates the deformation along the fault. This interpretation is not well demonstrated as to begin with, the silt is definitely of fluvial origin (except possibly the upper 10-20 cm). There are other possible interpretations of the artifact position such as infiltration into a crack that has not been opened coseismically, or the one suggested by the archeological expert that the artefact could have been pushed downward into the silt by bioturbation (see Appendix 2) or by other means (for discussion on artifact position see section 3.2.4).

The level of uncertainty implied in this quote does not allow for a firm conclusion as regards dating of offsets in the Trenches using the artifact.

Quote No. 6 – Concerning the capability of the Libna Hill Feature:

The map locates the inferred capable fault inside the Sava plain into app. 200 m wide band, with its axis at only 250 meters and 500 meters (approximately) east of the eastern and western site fences, respectively. The capable fault then is not exactly crossing the eastern site project. Following the NRC regulation, we recommend investigating thoroughly especially nature and amount of displacement (kinematics, slip per event and cumulated slip), slip rate, estimation of recurrence interval and elapsed time since last event. Considering the strike-slip kinematics of the fault, we are aware that some of these tasks will be difficult to investigate and the results may not be conclusive, especially the data dealing with fault displacement and the age of the sediments.

Quote No. 7 Again regarding the Libna Hill Feature:

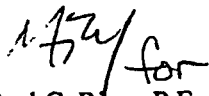
As previously mentioned with we recommend investigating the site vicinity for the capable fault issue even if conclusive results cannot be guaranteed beforehand.

Quotes No. 6 and 7 are requesting additional investigation as no conclusion can be reached in the context of the currently available data and information.

CONCLUSION

The above direct Quotes from the Report do not allow for a defensible position regarding site suitability and there is no technical basis for drawing conclusions regarding this matter. Any conclusions or statements alluding to site suitability should be stricken from the Report as they are pre-mature and without sound technical supporting data.

Respectfully submitted,
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PCR/sdr/pj