Formalized lineament analysis as a basis for seismic monitoring of platform areas (by the example of Kursk NPP)

Ivanchenko G.N., Kishkina S.B.

Institute of geosphere dynamics of Rusian academy of siences, Moscow, Russia

e-mail: ivanchenko@idg.chph.ras.ru

On the basis of modern ideas about the mechanics of earthquakes, seismic monitoring should be directed not only to a general study of the controlled area but mainly to the areas of the most probable zones of seismic events: to fault zones. What forms one of the areas of work: the development of methods for assessing the geodynamic conditions of the region where the monitoring object is located. In terms of platform areas, this is a very hard task. We use automated methods for lineament analysis and selection of digital image processing parameters for solving problems describing the modern geodynamic setting of the area. With this treatment, the dependence on the expert's subjective view is significantly reduced. At the same time, the individuality of the expert assessment doesn't disappeare but is formalized to a large extent, which, in turn, leads to greater stability of the results. It is from this stage that all work on seismic monitoring of NPP sites, conducted by IDG RAS, begins.

As an example, the analysis of modern and neotectonic geodynamic processes in the area of the Kursk NPP-2 site is considered. The complex approach including the analysis of results of visual and automated interpretation of space images in combination with a stratigraphic method of an estimation of Neogene-Quaternary vertical deformations is applied. It is shown that the geodynamic situation of the studied area is typical for stable platform areas with a tendency to slow slightly differentiated uplift under conditions of regional compression, not exceeding the limits of strength of the main fault zones of the region. This situation does not imply any significant local seismicity, which is confirmed by the results of seismological observations.