

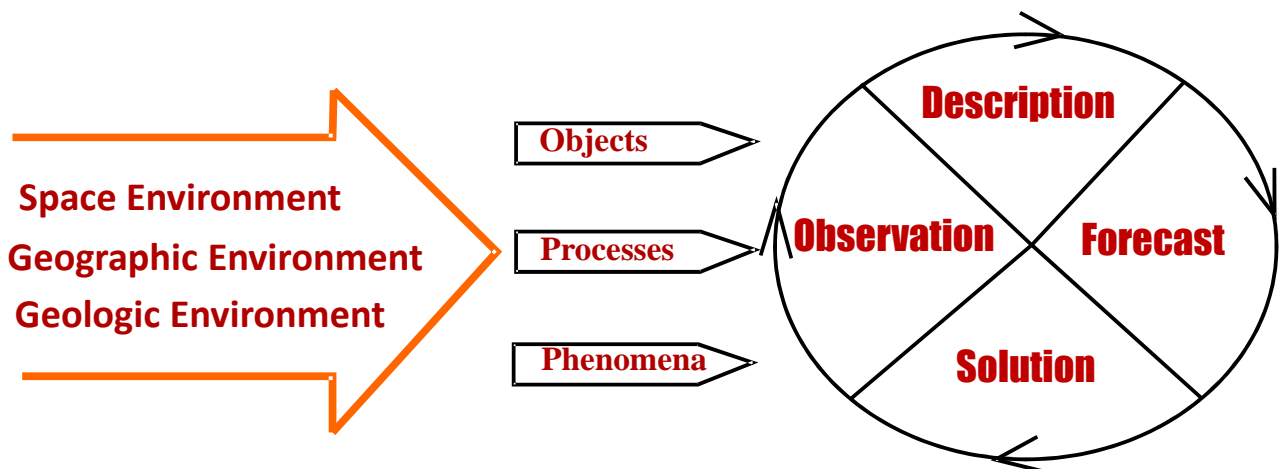
Territorial Monitoring for Nuclear Power Plants Using Geoinformation



XXV International Federation of Surveyors Congress, Kuala Lumpur, Malaysia, 16 - 21 June 2014

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Urgency



Urgency



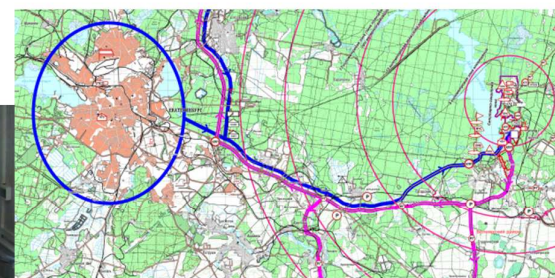
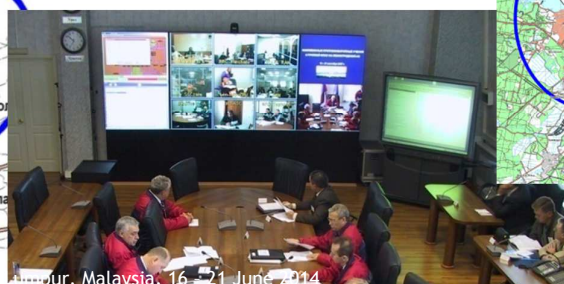
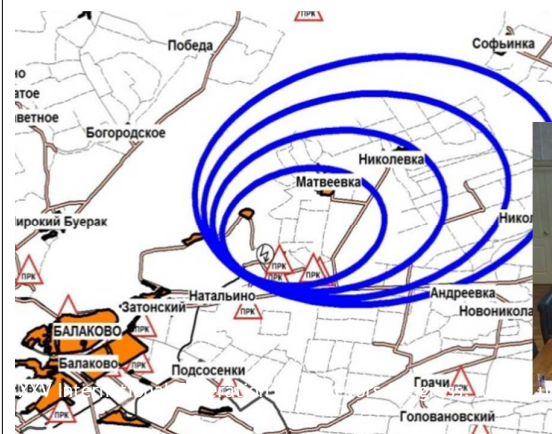
Urgency





Main types:

- timely and dynamically changing monitoring data of spatial objects condition;
- predictive spatial analytical models that describe various scenarios of crisis situations and elimination of their consequences;
- statistical spatial-situational models of crisis management.



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Fragment of Digital Evacuation Plan from NPP Area

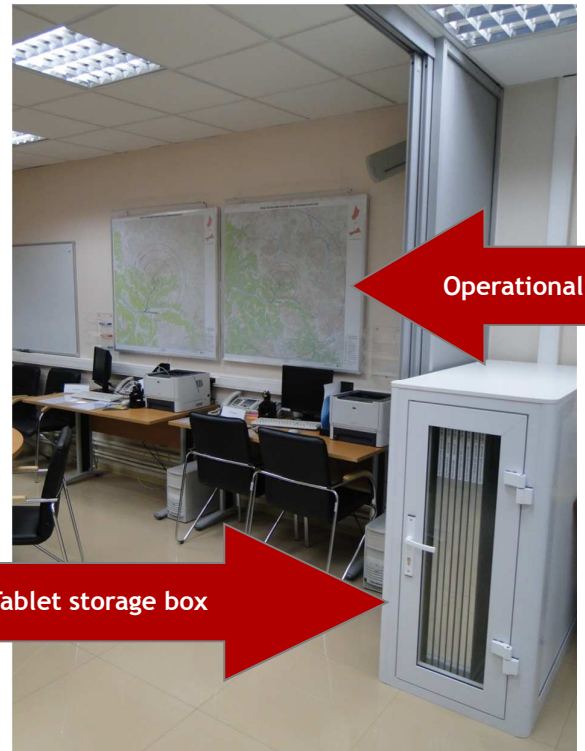
combined representation of thematic symbols and digital topographic map on the territory integrated territory plan;
the fragment of a digital map limited by a 100 kilometer zone around NPP that is used as a topographic substrate. Territories of several regions of the Russia may belong to this zone;
all thematic information without any generalization is plotted in the evacuation plan;
except the main evacuation plan of 1:100,000, the industrial zone of NPP and the residential area near the station are shown in the form of insert maps in a larger scale.



Introduction of Evacuation Plans at the Situation Centre



It is possible to use felt-tip pens and magnets at the tablet



Operational stands

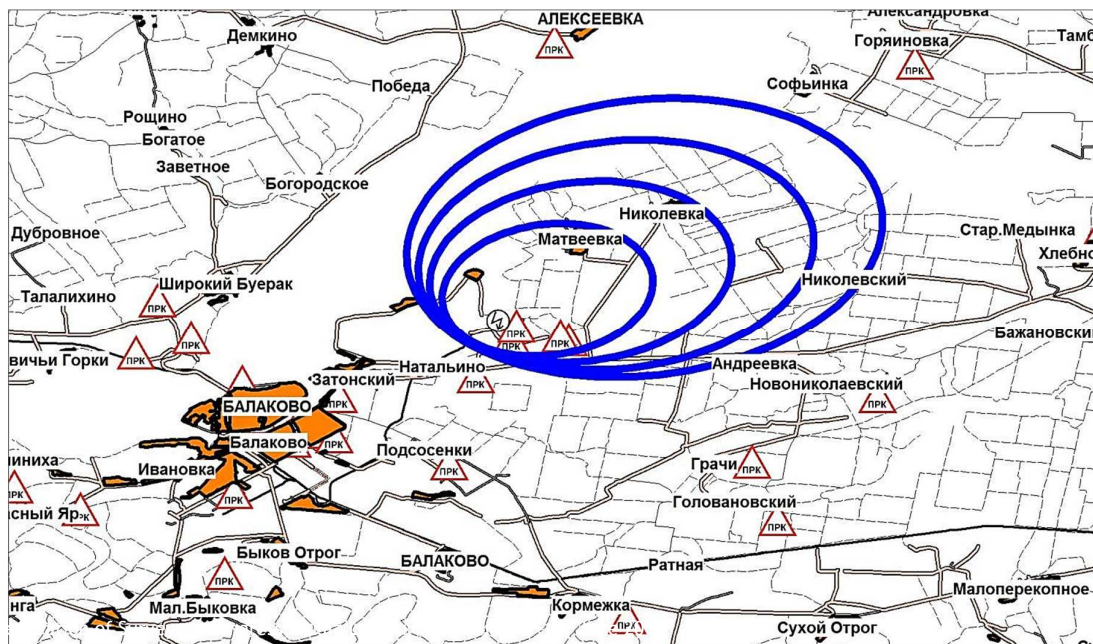
Tablet storage box



Operational stands (CSM)

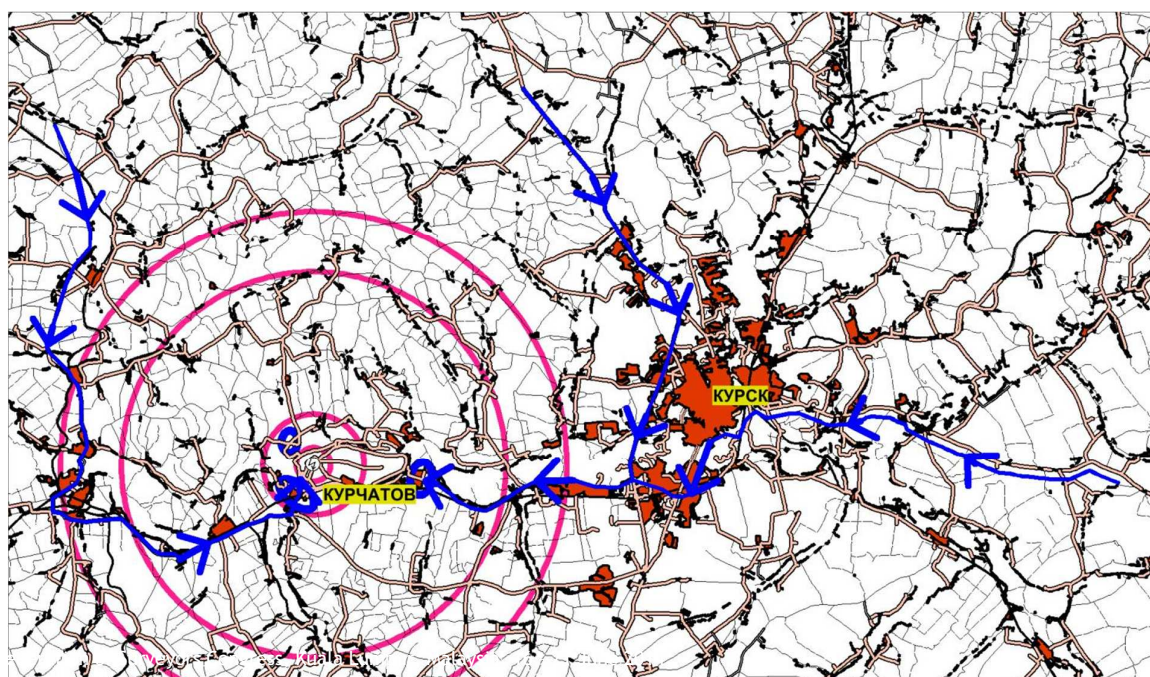
Usage of The digital Plans of NPPs Area

Modelling of radiation contamination depending on the wind speed and its direction



Usage of The digital Plans of NPPs Area

Generation of reports for evacuation echelons routes



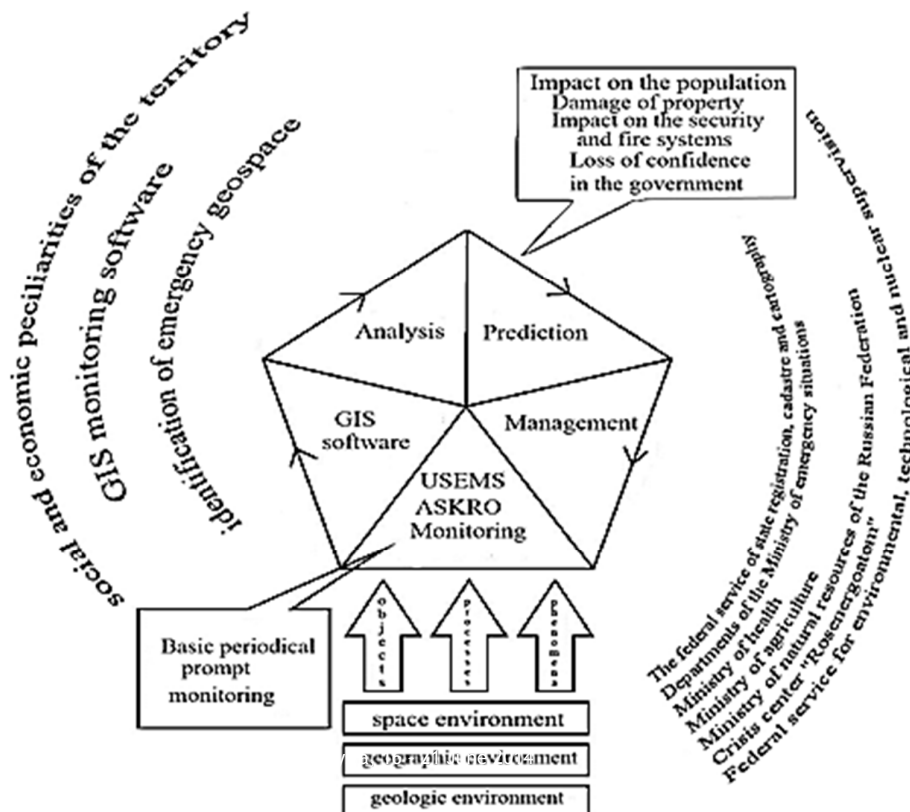
Peculiarities of the geo-information land monitoring:

geo-information basis of land monitoring must contain the systematized complex of the region (territory) data about various groups of spatial objects, processes and phenomena;

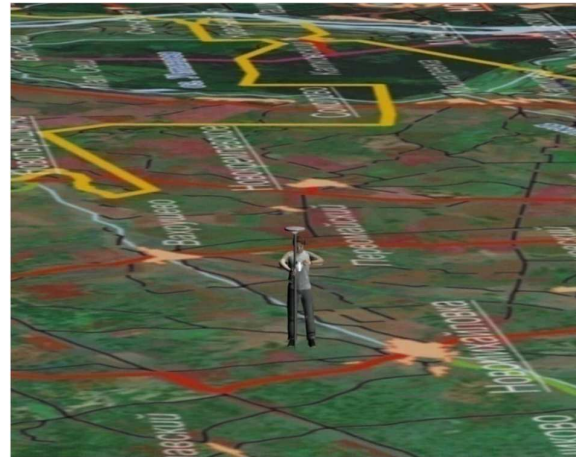
the effectiveness of the monitoring depends on the information exchange comprehensiveness between the land monitoring system and the monitoring systems controlling the condition of such environments as water, air, geological.



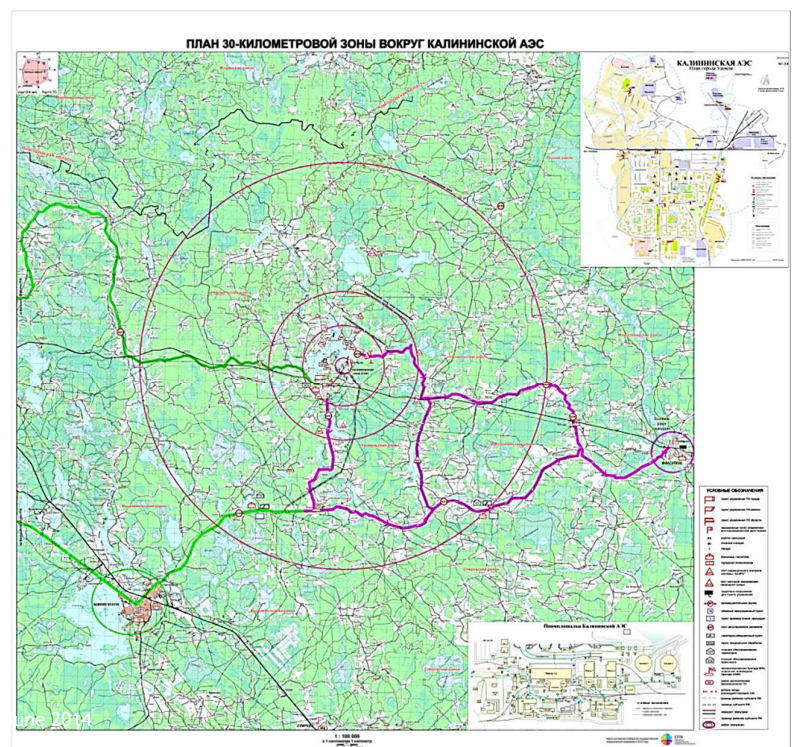
General Scheme of GIS Monitoring in the Area of NPPs



Creation of the network of active base stations to organize high-precision satellite positioning system, to increase the accuracy of geodetic measurements and to control the NPP technological facilities;



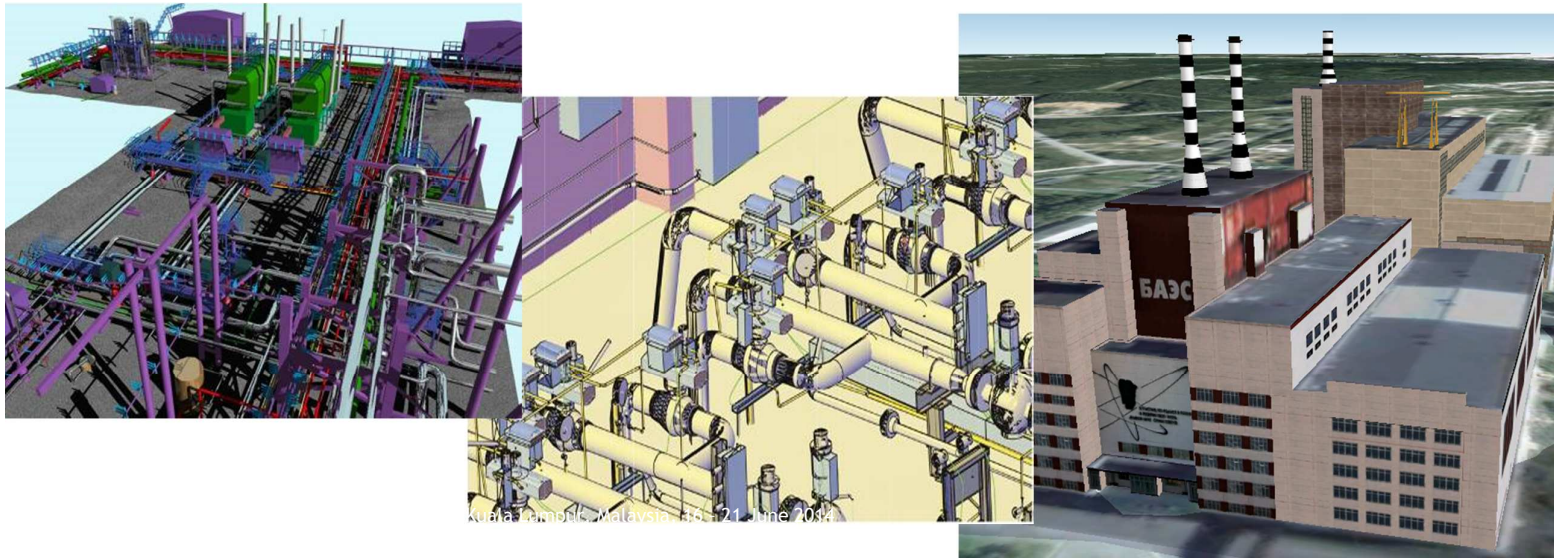
Creation of the unified GIS basis in the area of NPP, including large-scale digital plans of NPP industrial site and the residential area near the station (1:100 - 1:1 000); digital maps of a sanitary protection zone (1:10,000); digital maps of 30 km monitoring zone (1:100, 000); digital maps of 100 km evacuation zone (1:200,000);



Principles of Geo-solutions for NPPs maintenance



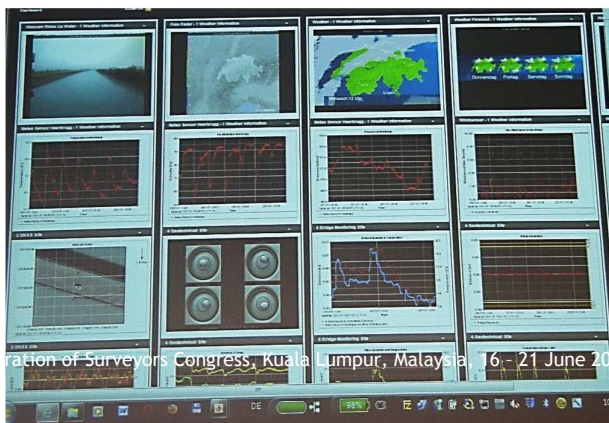
Development of 3D models of technological objects and the machinery at NPPs that are digitally integrated into unified GIS based on a given territory;



Principles of Geo-solutions for NPPs maintenance



Development of a complex monitoring system of the area near NPP, including geodetic monitoring system, hydro-meteorological observations, automated system of radiation control, the environmental control system. Information, received from various sensors, must be referenced and integrated into the unified GIS basis of a given territory;



Principles of Geo-solutions for NPPs maintenance



Development of the mobile navigation software to solve the problems of emergency response, navigation, mapping the NPP territory, the increase of geodetic measurements accuracy;



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Principles of Geo-solutions for NPPs maintenance

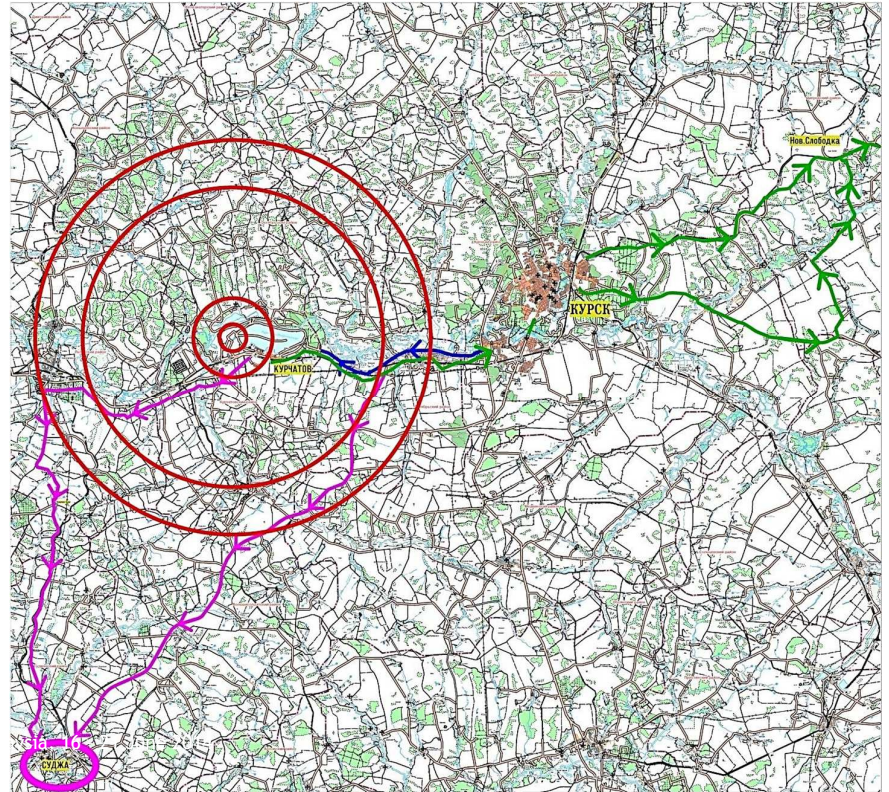


Introduction of the GIS and development of automated workstations (AW) in the departments of NPP office, situation center, Municipal Bodies administration of NPP area, Civil Defense and Emergencies divisions;

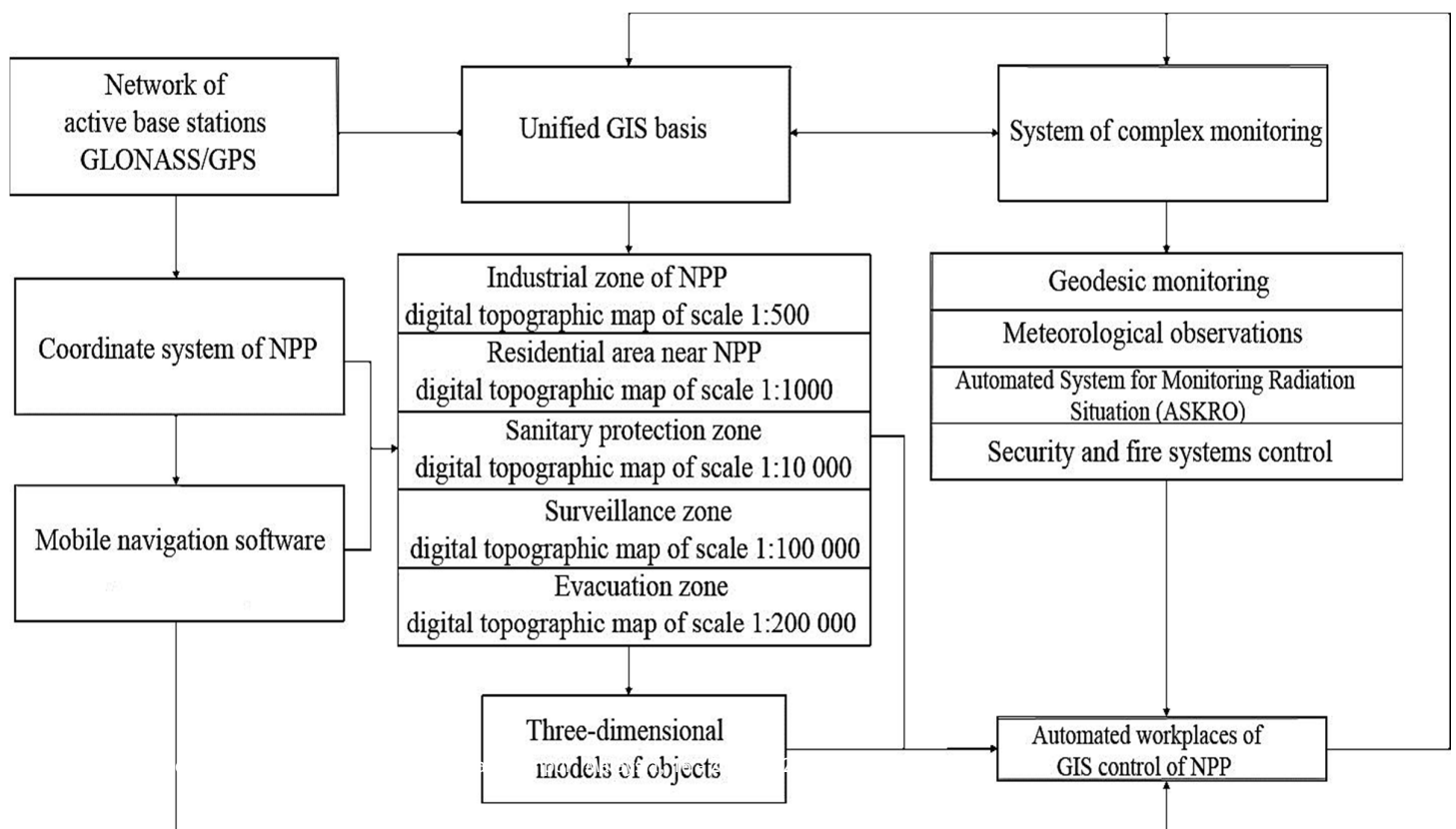


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- Computer simulation modelling of probable emergencies scenarios of natural and technogenic character



Scheme of Basic Principles of Geo-solutions





Thank you!

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