GAPS MEASUREMENTS IN WWR-M CORE

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Reactor safety operation essentially depends on the heat conditions of the fuel elements.

The gaps between the fuel elements play a main part in this problem. In the fuel assemblies the gaps between elements are kept up installed tolerance limits due to spacing details and may be checked at the stage of assembly. The gaps between external fuel elements of neighbouring fuel assemblies, between external fuel elements of fuel assemblies and beryllium reflector, control-rods channels, ampoules, booms for measurements of the reactor lattice bowing and etc, are defined by the states of the reactor lattices, the reflector, the compression zone mechanism, the precision of the ampoules, cnannels and safety regulating rods making and their eccentricity, deformation by fixing their in the active core, that is set of many factors. Therefore the knowledge about the modern state of these gaps in active core and consideration of their values in thermophysical calculations present an actual engineering problem.

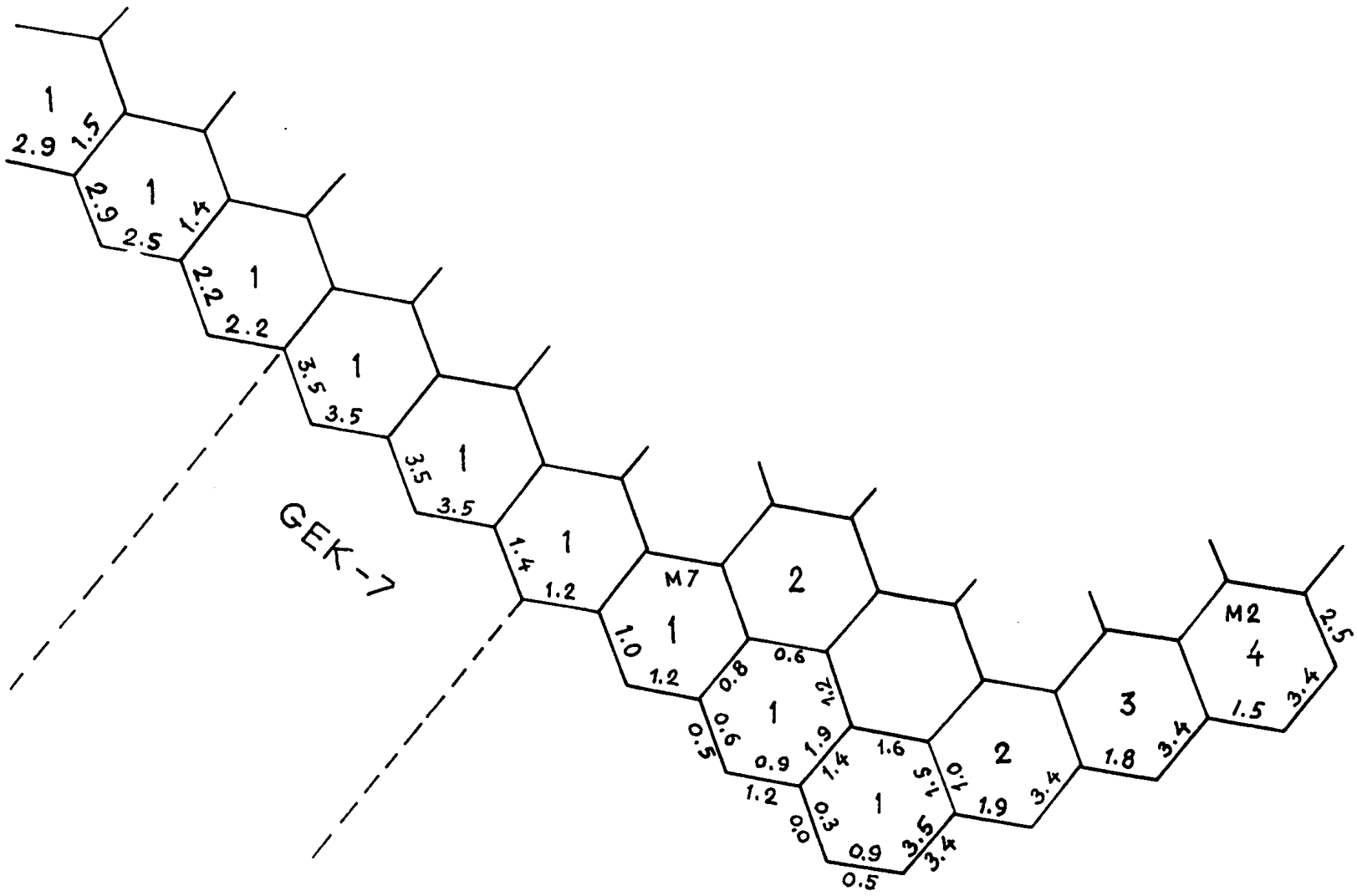

Fig.1. The south-west border part of the active cove

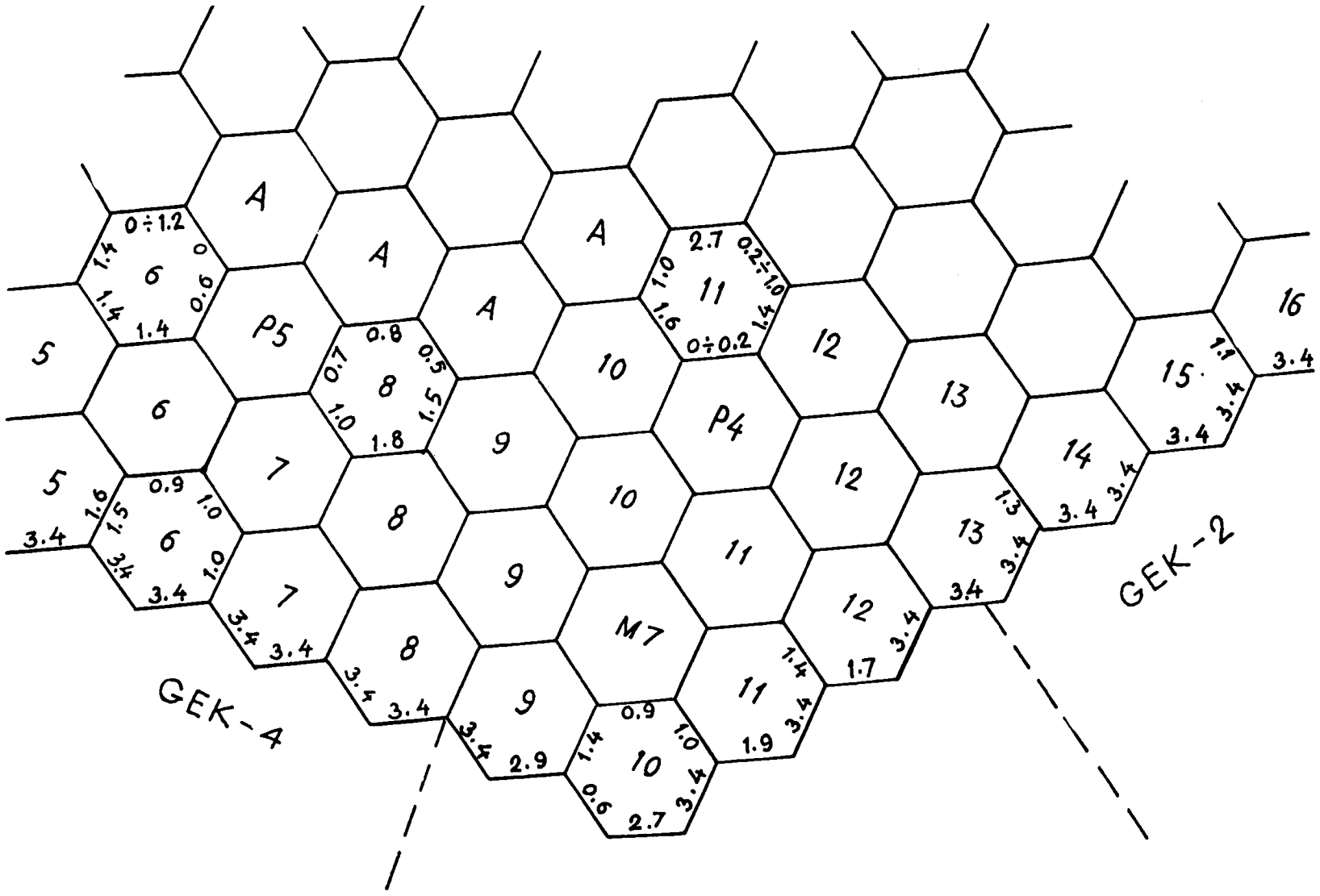

Fig. 2. The south border part of active cove

For the measurements of the gaps the special instrument was created which imitates model hexahedral fuel element increased by long tube. Inside of this tube in the sleeve guides the stock can be freely moved up and down. The lower part of this stock is connected with the inclining strip. Moved vertically inclined strip drives crosshead, which moves horisontaly in the special sleeves.

Crosshead is connected with the probe which is putted out through the hole in the model of the fuel element to the next side of the device.

One can judge the value of the gap by the movement of the stock. This device is equiped with the automatic design for the distant control of the moving stock and the measurements of the gaps. The results of the gap measurements in the south-west and south part of the WWR-M active core are presented in fig.1 and fig.2.

Double values correspond to the two-fold measurements of the gap in the same place at different time. Leading values presented the average values from the three measurements, which is roud off 0.1 *mm*, the results of the measurements were as a rule equalled or distinguished negligible, so that the measurement error was not beyond the scope of calibration accuracy (± 0.1 *mm*).

The carried out measurement showed essential defection on the value of gaps in the certain cells of the active core from nominal value — 2.25 *mm* near the reflector and 0.75 — near the rods, the ampoules, the boomes are correlated with the results of temperature measurements in the WWR-M core.

This deviations must be taken into account for the reactor work prediction.

The deviation of the gaps values from the nominal ones are compensated by the choice of necessary margin coefficient for the allowable reactor power from the maximum calculated one.

For fuel elements dangerous contact removing it is necessary to equip them with the spacing fins.