A new method for analyzing data from structure shielding experiments was developed. It involves the separate treatment of the direct and skyshine components of the gamma-raydose ratein a structurefrom a source field on the ground outside the structure.

This method was applied to determine the far-field contribution to the infinite-plane dose rate in the structure from measurements made with the finite source field, and to get the dose rate distribution in a structure from an infinite-plane source using measurements made in a scale model of the structure.

The results obtained by the new method were compared with those obtained from the current analysis method in which there is no separation of the measured dose rate in the structure into its components.

Better agreement was found between experimentand theory and between experimental model data and the corresponding experimental full scale data with our new method than with the current method, apparently because the skyshine component of the gamma radiation from a source field is not properly handled by the current analysis method.

Also studied was the effect of the ratio of structure wall height H to structure diameter d on the transmission of in and down radiation thrazgh a basement ceiling into the basement of a 2 ft diameter steel cylinder. For H/d between 0 and 0.25 this transmission was found to increase by about 25 percent, and for H/d between 0.25 and l.0 it increased by an additional 5 to 10 percent.