

IONIZING RADIATION

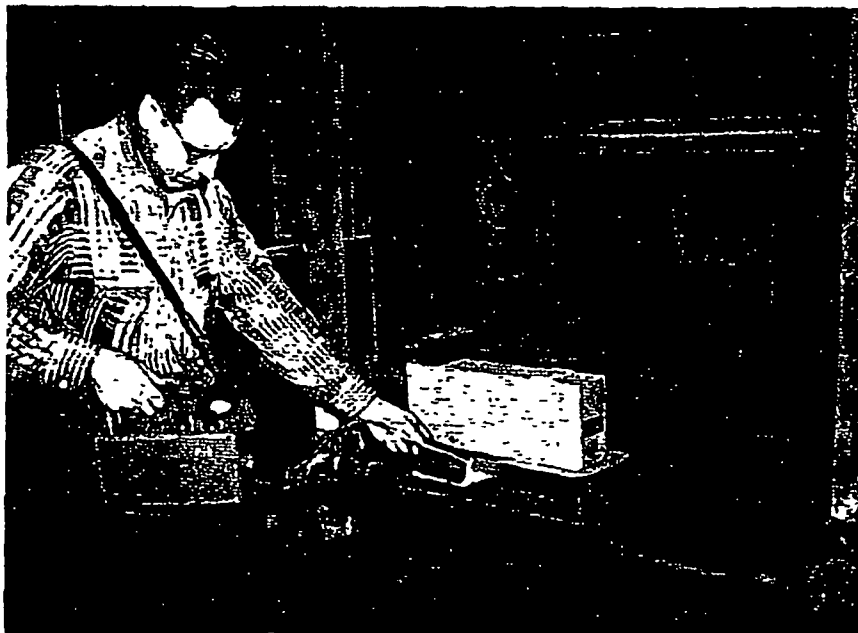


Fig 42-6 Radiation level near beta ray gauge used to measure thickness of steel strip is checked with a Geiger counter

Courtesy Armco Steel Corp

mation One example is the employment of radioactive sources to effect quantitative or dimensional control of industrial materials (for example, to measure fluid-flow rates, and thicknesses of semifinished or finished products)

Sealed sources Sealed sources are available that have widely varying amounts of radioactivity. A high intensity source may require so much shielding that it will not be portable. Shielding, control devices, and procedures should be designed by someone experienced in such work. Keeping external exposures to personnel under control should be easily accomplished with the aid of alarms, strict control of access, and thorough monitoring (Fig. 42-6). (See NBS Handbook 73, *Protection Against Radiation from Sealed Gamma Sources* (1960), and also Handbook 66, *Safe Design and Use of*

Industrial Beta-Ray Sources (1958))

At the other extreme, if the source is of trivial size, it should present no more difficult problem than that of keeping track of its presence.

Sources of intermediate size are more troublesome. They are portable and in some cases may require so little shielding that they can easily be moved by hand. The person operating a portable source must be depended upon to follow the necessary precautions, including the use of film badges and dosimeters to measure his own exposure, and to operate the source so that other persons are not accidentally irradiated (see NBS Handbook No 66 *Safe Design and Use of Industrial Beta-Ray Sources*, and NSC Industrial Data Sheet 461 *Beta-Ray Sealed Sources*).

Some sealed sources are subject to break-