- Density measurements to distinguish between different grades of oil.
- Control of level in coal pulverizing.
- Measurement of metal thickness and deposits.
- Control of slurry density in reclaiming lime in paper mills.
- Measurement of coverage and film thickness of printing ink and paint.
- Measurement of thickness of raw leather.

Radiography

Radiography is a process of visualizing the internal structure of solid materials by exposing them to a source of penetrating radiation and recording the shadow image on film. An internal void decreases the amount of material through which the radiation penetrates and thus increases the intensity of radiation reaching the film at a position corresponding to the location of the void. The resulting darkened area of the film indicates the outline of the defect and its thickness, according to the degree of darkening. (Figure 6.)

Both X-ray generators and radioisotopes are commonly used as radiation sources for industrial radiography. X-ray machines are usually used in fixed installations in which workpieces can be conveniently moved to the inspection station. Radioisotopes are commonly used to inspect large fixed structures or complex shapes when the source can be easily positioned to achieve the optimum exposure geometry. In maintenance work or in such applications as pipeline construction, where inspection must be done in the field, radioisotope sources have the advantages of being portable and free from the need for an external power supply. The major users of radioisotope radiography are the metal products industries and the commercial testing laboratories that serve the producers and users of castings and weldments. Although a variety of gamma-emitting isotopes have been used as radiographic sources in research programs and specialized applications, the great majority of industrial radiographers employ either cobalt-60 for thick sections or iridium-192 for thin sections. Well over 1,000 companies and more than 7,000 individuals are engaged in industrial radiography.

A typical large company using radiography is a manufacturer of boilers for both nuclear and conventional steam generators and of large, high-pressure chemical reactors. A typical unit is 15 feet in diameter and 75 feet long, with more than 500 feet of welded seams up to 8 inches thick. Every inch of the welds is radiographed because