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## A new type of $^{75}\text{Se}$ gamma radiography design with enhanced inherent safety

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The use of  $\gamma$ -rays for industrial flaw detection is one of the important means of non-destructive testing technology. However, due to the inherent safety of the traditional gamma radiography that cannot accurately identify the location of the radioactive source, the interlock system between the shielded exposure device and the guide tube has some inherent flaws in use, etc. Gamma radiography industry becomes the most risky industry in Nuclear Technology Application, because flaws can easily cause radioactive sources decontrolled and cause radiation accidents.

In order to enhance the inherent safety of gamma radiography, A new type of  $^{75}\text{Se}$  gamma radiography, which includes mechanical identification of the pigtail, a new interlock system between the shielded exposure device and the guide tube, the self-locking mechanism of the quick connector of the guide tube, dovetail type directional shutter, miniature motor remote control, satellite positioning system, etc. is newly designed. The new type of  $^{75}\text{Se}$  gamma radiography has the following advantages:

1. Compared with similar equipment, the weight is reduced by more than two kilograms.
2. The supervised areas can be greatly reduced (from the original radius of more than 200 meters to less than 10 meters) with appropriate shield.
3. The personal dose of the operator and the radiation levels on the site can be reduced by more than ten times at least.

This new type device has made some breakthroughs in safety supervision, radiation protection, accident prevention, and operational safety, and truly enhanced the inherent safety of gamma radiography.

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