TOMSK POLYTECHNIC UNIVERSITY

ТОМСКИЙ ПОЛИТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ

# Research and educational inspectorial control complex

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# Summary

In training and education, the complex is used to implement training programs for technical specialists in the field of inspection technologies, as well as to upgrade the skills and retraining of specialists in the field of non-destructive methods of monitoring and radiation safety of devices generating ionization radiation.

# Inspectorial control complex with betatron-type accelerator MIB-9


1 - box with betatron-type accelerator, 2 - collimator, 3 - detector portal,
4 -detectors horizontal ruler, 5 - detectors vertical line, 6 - shelf with testing material,
7 – process control room

# Application

Our project is used to carry out investigations in the field of digital radiography, processing and visualization of control results. It is worth paying attention to the fact of mode realization of obtaining images in several energy ranges (dual energy method). It allows to identify the substances of the verification object by density and atomic number, also it makes possible to detect narcotic and explosive substances.

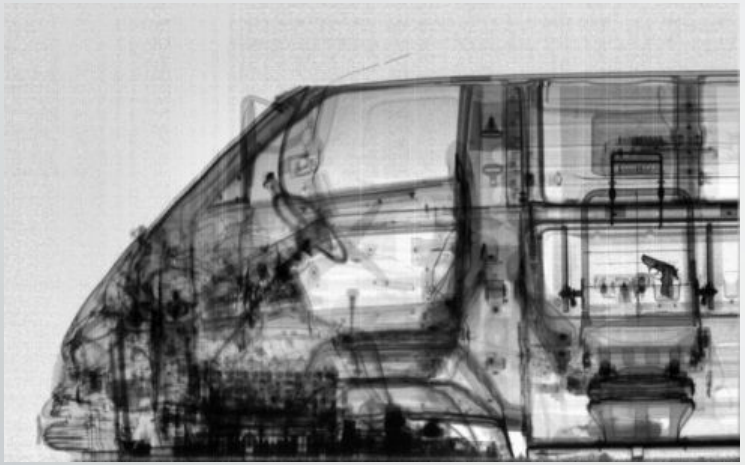
# The main technical characteristics

- The energy of the radiation source is 4-9 MeV.
- 864 detectors.
- The distance from the radiation source to the detector array is 4.2 m.
- The height of the scanned object is up to 2.5 meters.
- The crystal size of the detector is $5 \times 6 \times 50$ $mm^3$.
- 3 mm resolution in the center of the scanned object.

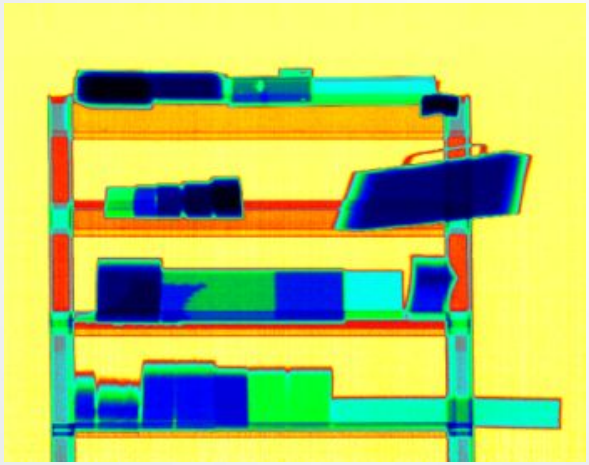
# Advantages

- Radiation burden reduction on control object and on support personnel.
- Ability to use dual energy method, which allows to recognize specific types of substances in the object of control.

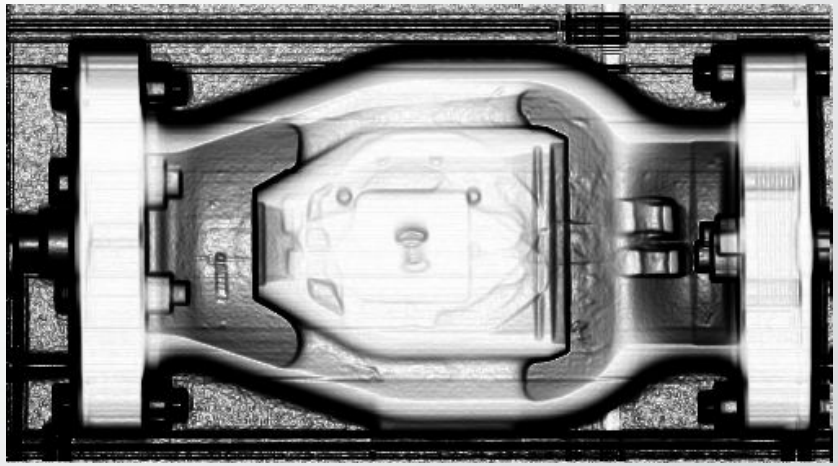
# Obtained images



a



b



c

Obtained images: a) gray scale image, b) by the dual energy method, c) steel flax (Sobel filter)

Thank you for attention!