

2.9. RADIOMETRIC SYSTEM FOR INSPECTION OF LARGE-SCALE VEHICLES AND CARGOS

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This System is based on the principle of radiosopic inspection of large-scale products using electron accelerators as a source of X-ray radiation: a 6 MeV linear accelerator and a 9 MeV betatron.

The method of discrimination of groups of materials with neighboring atomic numbers by using the dual energy method, 4.5 and 9 MeV, is implemented in this System.

To increase the inspection efficiency, 3D imaging of objects by a stereo viewing system is used. In these systems a high-energy photon beam is splitted into two divergent beams within the limits of the directional diagram; there two collimation systems and two detector lines for data acquisition. Then the acquired data are sorted and normalized by using a software to obtain a standard stereopair and are visualized on the monitor of the inspector's workstation.

The System has the following configuration: all the equipment (electron accelerators with the systems forming divergent fan-shaped beams and detection systems) is installed on a traveling frame ensuring its travel along an object inspected with a speed of 0.2 – 0.4 m/s.

All the equipment is installed in a special radiation-shielded building. The entrance and exit of inspected objects into the building are made through a sliding gate; the attending personnel enter through a special labyrinth equipped with the radiation-protection doors. A special room of modular type equipped with all necessary utilities is provided for the attending personnel.

Such a configuration of the system ensures its high operating capacity even when part of the equipment is out of order.