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Automated Image Acquisition System for the Verification of Copper Brass Seal Images

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This paper describes a system for the verification of copper brass seals realized by JRC according to DG ENER requirements.

DG ENER processes about 20,000 metal seals per year. The verification of metal seals consists in visually checking the identity of a removed seal. The identity of a copper brass seal is defined by a random stain pattern realized by the seal producer together with random scratches engraved when the seals are initialized ('seal production'). In order to verify that the seal returned from the field is the expected one its pattern is compared with an image taken during seal production. Formerly, seal initialization and verification were very heavy tasks as seal pictures were acquired with a camera one by one both in the initialization and verification stages. During the initialization the Nuclear Safeguards technicians had to place one by one new seals under a camera and acquire the related reference images. During the verification, the technician had to take used seals and place them one by one under a camera to take new pictures. The new images were presented to the technicians without any preprocessing and the technicians had to recognize the seal.

The new station described in this paper has an automated image acquisition system allowing to easily process seals in batches of 100 seals. To simplify the verification, a software automatically centers and rotates the newly acquired seal image in order to perfectly overlap with the reference image acquired during the production phase. The new system significantly speeds up seal production and helps particularly with the demanding task of seal verification. As a large part of the seals is dealt with by a joint EURATOM-IAEA team, the IAEA directly profits from this development. The new tool has been in routine use since mid 2013.

Country or International Organization

European Commission - joint Research Centre

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