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Radiological protection principles concerning the release for general use of reusable equipment and installations from uranium mining

Recommendation of the German Commission on Radiological Protection

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Strahlenschutzgrundsätze für die Freigabe von wiederverwendbaren Geräten und Einrichtungen aus dem Bereich des Uranerzbergbaus zur allgemeinen Nutzung

Empfehlung der Strahlenschutzkommission

In the event of any doubts about the meaning, the German original as published shall prevail.

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1 Scope

Contaminated equipment (e.g. vehicles and tools) as well as operational installations (e.g. machines and containers) which are to be used later on outside the uranium production facilities arise with the decommissioning of or remedial actions in the uranium production facilities in Saxony and Thuringia.

The following recommendation applies to the release, for general use of such equipment and installations, if the contamination was caused by waste rock material or uranium ore. In the case of contaminations by tailings or uranium concentrate it must be checked on a case by case basis whether and on which additional conditions a release is possible.

2 General principles

Uranium mining in the above-mentioned Federal States has led to a contamination of different environmental media and industrial installations with uranium and its daughter products.

If such reusable equipment or installations are planned to be directly handed over to a third party for further use, the release is orientated on a value of 0.05 Bq/cm^2 referred to the strongly adhering contamination of large surfaces. It must be assumed that the loosely adhering contamination can be removed by cleaning.

In order to assess this value for the release of large amounts of contaminated equipment or installations, generally all significant exposure pathways must be assessed. The following parameters are to be checked:

- external exposure to gamma radiation,
- the further spreading of the contamination and the hereby caused exposure by inhalation or ingestion of dust contaminated with long-lived alpha emitters.

Assuming conditions as realistic as possible but sufficiently conservative, the result of the dose assessments is that when using equipment and installations contaminated with waste rock material the relevant exposure pathway is the exposure by inhalation of uranium-bearing dusts. These can be released from the surface, e.g. in decomposition works (rebuilding, repair works etc.). Assuming a surface contamination of 0.05 Bq/cm^2 (such a contamination can be recognized on a plain surface as visible soiling), effective dose equivalent values not exceeding some 10 µSv are to be expected when such works are performed once.

In the case of a contamination with waste rock material or uranium ore, the contamination of plain surfaces above 0.05 Bq/cm^2 is connected with a visible soiling (e.g. by dust). This can be removed by a thorough cleaning.

3 Release criteria

Equipment or installations contaminated with waste rock material or uranium ore are to be cleaned such that a soiling cannot be recognized any more. In doing this, especially points

which are difficult to reach (e.g. openings) must be considered. After such a cleaning a release is possible, even without measuring the surface contamination afterwards, as it cannot be expected under these conditions that the value of 0.05 Bq/cm^2 is exceeded on a large surface.