

Action levels and guidelines for Swedish Armed Forces operations in radioactively contaminated environments

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NSFS, Reykjavik, 24 august 2011



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Regarding action levels and guidelines for radioactive contamination on skin, clothing and equipment:

1. Which guidelines and action levels apply today?
2. Where do they come from?
3. What do they mean?
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5. Summary



1. Action levels of today

- NATO ATP 3.8.1.

- Contamination levels below which Radiation Exposure State (RES) dose limits will not be exceeded

Example: RES Category 1A (<5mSv), 3 month mission:

- Clothing and equipment:

- High-toxicity alpha emitters 0.5 Bq/cm²
- Beta and low-toxicity alpha emitters 5 Bq/cm²

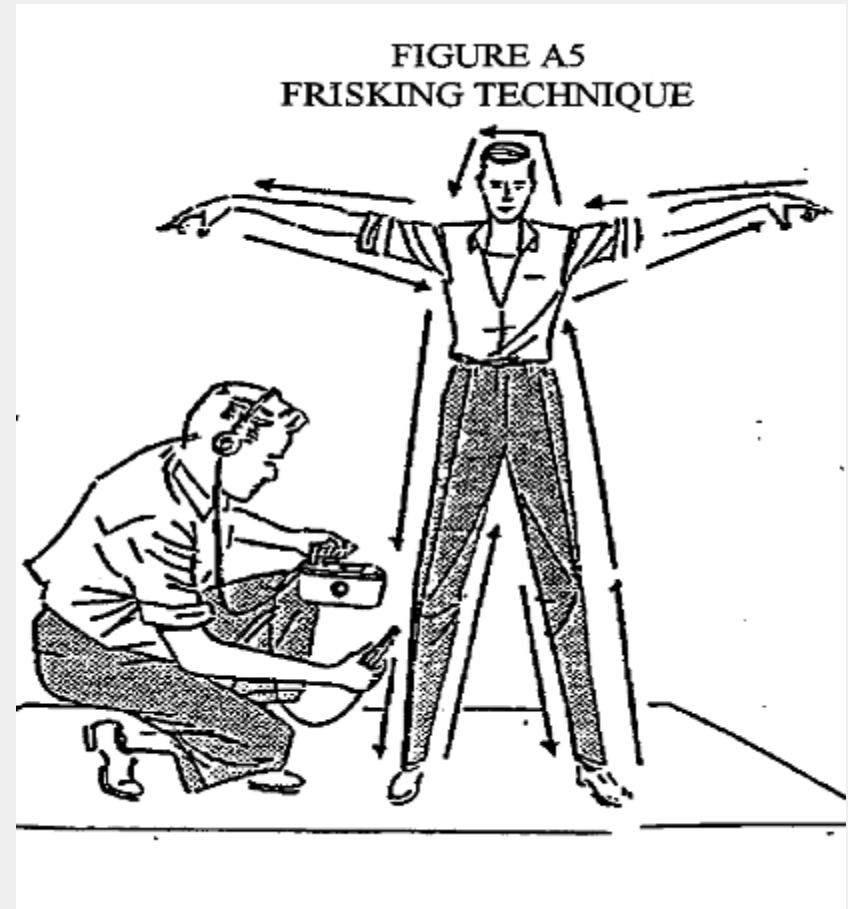
- Skin

- Beta 10 Bq/cm²



1. Action levels of today – cont.

- IAEA Tecdoc 1092
 - Personal Contamination Monitoring
- Skin and clothing OIL
- Beta and less toxic alpha emitters 4 Bq/cm^2
 - More toxic alpha emitters 0.4 Bq/cm^2



2. Origin of today's action levels

- ATP 3.8.1
 - The action level for beta on skin corresponds to a skin dose “equal to or less than 1% of the ICRP’s 30cGy (300mSv) skin dose reference level for professional radiation workers”.
 - Suggestions by L. Schöntzler, presented at the third meeting of NATO LG.7 Working group 2 on Low Level Radiation in Military Operations, Brussels 3-6 Sept. 1996.
- IAEA Tecdoc 1092
 - Generic procedures for monitoring in a nuclear or radiological emergency
 - Reference: *IAEA Technical Reports Series no. 120, 1970*



2. Origin of today's action levels – cont.

- IAEA Technical Reports Series No. 120
 - “...methods of monitoring the working environment...”
 - Derived Working Limits for inhalation, external irradiation and ingestion
 - “...the worst conditions likely to be encountered must be assumed...”
 - Limiting conditions: Ingestion
 - Assumption:
a person can ingest all activity from 10 cm² of skin every day (365 days/year).
 - The maximum intake should not exceed one tenth of relevant ALI
 - This results in action levels 0.4 and 4 Bq/cm² for alpha (Ra-226) and beta (Pb-210), respectively.



3. Implications of today's action levels

- Suggested action levels are, if applied to an emergency situation or any other event of limited duration, very low and will only correspond to trivial doses.
- In fact – action levels suggested in Tecdoc 1092 are equal to clearance levels suggested by e.g. EU and IAEA



3. Implications of today's action – cont.

- Some complicating factors:
 - Suggested action levels are often mistaken for limits
 - ATP 3.8.1. is somewhat difficult interpret



4. Further work

- FOI is working together with the Swedish Armed Forces and the Swedish Radiation Safety Authority towards issuing advice on how to interpret existing documents and action levels.
- Parallel to this work, experiments have been performed to evaluate the performance of the Swedish Armed Force's alpha and beta measurement probes (poster presentation S8-P5).

5. Summary

- Action levels in i.e. IAEA Tecdoc 1092 and ATP-3.8.1 appears to be
 - based on obsolete data
 - not adapted to emergency scenarios or other situations of limited duration
 - equal to clearance levels

