

THE SWISS EMERGENCY REFERENCE LEVELS AND THEIR  
APPLICATION IN THE CHERNOBYL-CASE

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ABSTRACT

The Swiss radiological emergency response planning system has been adopted by the Federal Commission of Atomic and Chemical Protection (KAC) in the year 1982. The system recognizes four phases of response; the phase of the accident, the preventive phase (predetermined protective actions), the early and the long-term phase of the contamination. The principal exposure pathway for the preventive phase is the whole-body external exposure from the plume (NPP-accidents) and from deposited material (nuclear weapons fallout and NPP-accidents); for the early phase (about the first two days) mainly the external pathway but also the ingestion of contaminated food and water; for the long-term phase the ingestion and with decreasing significance whole-body external.

The system of the external emergency reference levels specifies the action-levels for the predicted external dose (dose equivalent) to initiate immediately predetermined protective actions in predetermined areas. The predicted dose is the dose that would be received by individuals in the population if no protective action were taken. The primary protective actions may be staying in the house or sheltering. They are preventive actions and should be initiated in advance of any irradiation hazard. Evacuation will be carried out after a deposition of radioactive material has occurred and will be based on measuring results.

The reference level for the ingestion defines the projected first-year dose (dose commitment) resulting from the consumption of contaminated food and water below which countermeasures are unlikely to be justified. In the Swiss concept this reference level is the basic standard. Derived levels will be established only in the real case of an accident, considering the special situation of it like amount and concentration of critical nuclides in the different foodstuffs, nourishing behavior of critical population-groups, vegetation-period, possibilities to replace the contaminated food by other one's or to store it, until the activity has decayed, and so on. When it seems likely that a radiation dose will exceed the reference level, countermeasures should be undertaken provided that a substantial reduction of dose is to be achieved. If the projected doses will only be moderately in excess of the reference level, the countermeasures should be such that they do not involve unacceptable risk or loss of income to the community.

During the Chernobyl-contamination parts of this emergency response system had to stand the test, specially the concept for the ingestion pathway. It showed clearly its advantages, e.g. flexibility to react specifically to the given situation, but also the limits. It was nearly impossible to explain to the public, why we didn't have well defined and published activity levels for the food like our neighbouring states.