

P-413

**DOSE ASSESSMENT OF DELIBERATE ACTIONS INVOLVING
THE USE OF RADIOACTIVE SOURCES**

ROGANI A¹, TABET E¹

(1) Italian National Institute Of Health, Rome, Italy

Presentation preference: Poster
Only

Major scientific thematic
areas: TA8 - Incidents and
Accidents

Recently at the Italian Institute of Health an interactive algorithm (RANA - **R**adiological **A**ssessment of **N**uclear **A**ccidents) has been developed to evaluate the space and time structure of the radiological consequences of an accident at a nuclear plant in Europe. Individual or collective doses from several exposure paths are calculated, either starting from the source term or from air and ground contamination data. The algorithm, formulated in the language of *Mathematica*, can be run on a personal computer.

After 11 September 2001, the risks associated with nuclear terrorism have been the subject of increasing attention. Three categories of risk have been identified: theft of nuclear material, physical attack or sabotage action onto a nuclear facility or use of one or more radioactive sources in a radiological dispersion device. The above mentioned algorithm has been therefore expanded to allow dealing with an arbitrary source term, as could be the case in a sabotage-induced accident, allowing for both somatic (short distance) and stochastic effects evaluation. Along with the previous functions of RANA, a new set of tools allows the user to evaluate also the areas where doses (from several pathways and to all age classes) exceed those at which onset of deterministic effects begin, a variable that plays a major role in emergency planning.

In this paper the radiological risks related to the hypothetical use of radioactive sources in a dispersion device have been evaluated.

By means of the improved version of the model, the doses as a function of the distance from the release point, for those sources that may be of concern for use in a dispersion device, are evaluated, taking into account the relevant exposure paths in the early emergency phase.

For emergency planning purposes the distances within which the absorbed doses (to bone marrow) exceed the threshold values for deterministic effects have been assessed too. A radiological ranking of the most significant accidents related to a few realistic dispersion devices is proposed.