

عنوان مقاله:

DESIGN AND DEVELOPMENT OF A RADIOECOLOGICAL DOMESTIC USER FRIENDLY CODE FOR
CALCULATION OF INDIVIDUAL /COLLECTIVE RADIATION DOSES AND CONCENTRATION DUE TO
RADIONUCLIDES AIRBORN RELEASE DURING THE ACCIDENTAL AND NORMAL OPERATION IN NUCLEAR
INSTALLATION

محل انتشار:

اولین همایش ملی مهندسی قدرت و نیروگاه های هسته ای (سال: 1395)

تعداد صفحات اصل مقاله: 34

نویسندگان:

Ali Haghighi Shad - *PhD Student in Nuclear Eng, Department of Nuclear Eng, Science and Research Branch of
(Islamic Azad University, Tehran, Iran)*

Darush Masti - *Assistant of Prof. Islamic Azad University of Bushehr*

Mitra Athari Allaf - *Assistant of Prof., Department of Nuclear Eng, Science and Research Branch of Islamic Azad
(University, Tehran, Iran)*

(Kamran Sepanloo - *associated prof., General Director of NNSD, Tehran, Iran*

خلاصه مقاله:

A domestic user friendly dynamic radiological dose and model has been developed to estimate radiation doses and stochastic risks due to atmospheric and liquid discharges of radionuclides in the case of a nuclear reactor accident and normal operation. In addition to individual doses from different pathways for different age groups, collective doses and stochastic risks can be calculated by the developed domestic user friendly KIANA Advance Computational Computer Code and model. The current Code can be coupled to any long-range atmospheric dispersion/short term model which can calculate radionuclide concentrations in air and on the ground and in the water surfaces predetermined time intervals or measurement data. A deterministic dose calculation model called as user friendly KIANA Advance Computational Computer Code has been designed and developed for this study in first time in our country. For the dose assessment, all exposure pathways have been implemented as follows: Transfer of radionuclides through food chains and the subsequent internal-exposures of humans due to ingestion of contaminated foodstuffs- Internal exposure due to inhalation of radionuclides during passage of cloud and from re-suspension of deposited radionuclides- External exposure from radionuclides in the passing cloud- External exposure from radionuclides deposited on the ground. Developed code is implemented in Visual Basic. Editable parameters are number of radionuclides, of the whole area modeled, concentration and deposition outputs of an atmospheric dispersion model or measured air concentration and deposition data in days, and time interval of dose calculation in days and in years. Current User Friendly KIANA Advance Computational Computer Code can perform modeling well for unlimited isotopes, 70 years, 13 food stuffs and pasture, 8 animal products, 4 different age groups, i.e. infant, child, teen and adult, maximum and average individuals in terms of food consumption habits, correction coefficients for gamma dose rate and time spent outdoors. The Current user friendly KIANA code can produce individual dose results annually for each isotope and pathway, and the sum for all isotopes and pathways as well, and collective total dose results. The model in Current user friendly KIANA code can also produce monthly activity results in grass and animal

food products, activity concentrations results of agricultural food products at each harvest year after the accident and during normal operation, and total risk results might be calculated as well. External input data files include age depend ...

کلمات کلیدی:

Dynamic software, environmental transfer, radionuclide, nuclear accident, Concentrations Chernobyl, dose, risk, uncertainty, Exposure pathways, user friendly , KIANA Advance Computational Computer Code, long-range transport model, Short-range dispersion models, Gaussian dispersion equations, Dose assessment methodology

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/594961>

