

N3424. EVALUATION OF THE KEY FACTORS ANALYSIS TECHNIQUE AS AN ALARA TOOL

Key Factors Analysis (KFA) is a suite of statistical procedures and computer techniques developed by the consultants to determine the "Key Factors" that are associated with an observed result. Unlike more standard database analysis procedures, the focus is not on group means but on high-end values. The technique presents the distributions of ranked dependent-variables in tree structures. Although the details of applying the method are proprietary, standard statistical techniques are employed to evaluate the significance of findings.

KFA has been utilized successfully in a number of applications, such as identifying the specific factors that result in elevated radiation doses to aboriginal populations (Health Canada project), the analysis of the social and political influences that raise public and government concern into EMF (Toronto Hydro project), and the resolution of a quality control problem in the production of a commercial food product that had a negative impact on shelf-life.

Based on this prior work, the Atomic Energy Control Board and the Canadian nuclear regulatory agency sponsored a study to evaluate the effectiveness of KFA as an ALARA tool from a regulator's perspective and also from that of a nuclear facility operator. The Eagle Point Uranium Mine, situated in northern Saskatchewan, was selected as the test case nuclear facility. The significant findings on the patterns and sources of occupational doses to the mine underground workers included:

- the identification of the highest exposed work groups associated with particular mine areas; and
- the categorizing of a limited number of areas in which significant collective doses were accumulated - particularly work places that have not been correlated to occupancy factors.

A review of the findings by John Takala, Health Physicist for Eagle Point, confirmed that KFA provided reasonable findings as well as new insight for ALARA strategies at the mine. Accordingly, as a result of the study, KFA has been demonstrated to be an effective ALARA analysis tool. The methodology could be employed by either regulatory authorities to ensure that audits are focused on the highest priority areas or by nuclear facility operators to identify the most cost-effective ALARA dose minimization strategies.

For additional information, contact Murray Walsh at SAIC Canada (613) 563-7242.