

● Health Physics Support and Assistance to The Department of Energy

Pacific Northwest Laboratory functions as the lead laboratory providing health physics support and assistance to the Division of Operational and Environmental Safety, Department of Energy (DOE), on special studies principally associated with the analysis of impact of standards, regulations, and engineering and administrative actions on occupational and environmental exposure. Support and assistance are also provided for other specific tasks or special studies identified by DOE as priorities. The designation of lead laboratory in health physics, with an agreement and budget in place, provides the Division with the additional expertise necessary to respond to the many questions and situations that arise during the operation of their numerous nuclear energy research, development, and demonstration facilities.

HEALTH PHYSICS SUPPORT AND ASSISTANCE TO THE DEPARTMENT OF ENERGY

L. G. Faust, J. M. Selby

Characterization of Internal Dosimetry Practices

R. J. Traub, K. R. Heid, J. C. Mann

The purpose of this task is to characterize current practices in internal dosimetry at DOE facilities and evaluate those practices with respect to consistency among DOE Contractors. This task is multifaceted in that all aspects of an internal dosimetry program are addressed. Items considered include, but are not necessarily limited to, record systems and ease of information retrieval; ease of integrating internal dose and external dose; modeling systems employed, including ability to modify models depending on excretion data, and verification of computer codes utilized; bioassay procedures, including quality control; and ability to relate air concentration data to individual workers and bioassay data. This task will also identify collective and individual strengths and weaknesses in the assessment of internal dose by DOE contractors. Furthermore, it will serve as a basis by which these practices can be improved. This past year a draft questionnaire has been written and should be distributed early next fiscal year.

This task has also supported work that has demonstrated the feasibility of uranium analysis in solution by laser fluorescence excitation at uranium concentrations of one part per billion. This is less than the background concentration of uranium in urine samples. Improvements in laser stability may increase the sensitivity to allow measurements at one part per trillion. This would allow the dilution of the sample by at least 1000-fold prior to analyses and should therefore ensure the dilution of interfering substances to insignificant levels.

Technical Evaluation of the Capability of Present Instrumentation to Meet the Draft ANSI Standard on Performance Specifications for Radiation Protection Survey Instrumentation

J. L. Kenoyer, K. L. Swinth, R. L. Kathren

The objectives of this project are to evaluate the applicability and practicability of the proposed ANSI standard "Performance Specifications for Health Physics Instrumentation;" to determine the degree of conformance to the proposed standard of selected currently available commercial instruments; to develop a formal test and evaluation protocol and specific procedures; and to lay the ground work for establishing a permanent testing and certification laboratory.

Early in the fiscal year, existing standards and guides were reviewed to determine what criteria are currently used with instrumentation. In addition, a survey of commercially available instruments was performed to determine information on types of instruments available and the specifications claimed by the manufacturers. Direct contact with instrument users provided information regarding instrument preference and desired capability. Based on the above information and statistical criteria, procurement of representative instrumentation was initiated. An estimated 50 instruments will be procured by loan or purchase for test and evaluation.

Instrument test and evaluation procedures are being developed that follow the existing, proposed, or draft standards and guides. Drafts of the required test procedures have been prepared, and several of the procedures have been tested. A manual giving detailed operational and administrative guidance will result.

Testing of the instrumentation will include tests to evaluate each of the performance specifications in the ANSI standards ap-