afluoride cylinder material accountability bulk measurements, (Proc. 18th Annual Meeting of the Institute of Nuclear Materials Management, Inc., Washington, DC, June 29-July 1, 1977), *Nucl. Mater. Manage.* VI, No. III, 480-487 (Fall 1977).

Key words: accountability bulk measurements; nuclear material control; Nuclear Regulatory Commission; reference mass standards; uranium hexafluoride.

This paper reports the progress to date in a demonstration of the procedures in ANSI N15.18-1975, "Mass Calibration Techniques for Nuclear Material Control," sponsored and funded by the Nuclear Regulatory Commission (NRC).

The philosophy of mass measurement as a production process, as promulgated in ANSI N15.18-1975, is reviewed. Special emphasis is placed on the use of artifact Reference Mass Standards (RMS) as references for uranium hexafluoride (UF_6) calibration and bulk measurement processes. The history of the creation of the artifact concept and its adoption by ANSI N15.18-1975 and the Nuclear Regulatory Commission is narrated.

The program now under way is specifically described; including descriptions of the RMS, their calibration, and the assignment of uncertainties to them by the National Bureau of Standards (NBS). Instrument tests, in-house standards (IHS), and assignment of values relative to the RMS-NBS values at nuclear facilities which measure UF_6 cylinders are described. Comparisons and the data base are detailed to provide realistic measurement process parameters associated with accountable transfer of UF_6.

The as yet uncompleted part of the demonstration is described, that is, to further close the measurement loop by verification both between and within facilities.

Environmental Studies: Pollution Measurement

SP506. **Proceedings of workshop on asbestos: Definitions and measurement methods.** Proceedings of a Workshop on Asbestos held at the National Bureau of Standards, Gaithersburg, MD, July 18-20, 1977, C. C. Gravatt, P. D. LaFleur, and K. F. J. Heinrich, Eds., *Nat. Bur. Stand. (U.S.), Spec. Publ. 506*, 490 pages (Nov. 1978) SN003-003-01994-1, $6.75.

Key words: amphibole; asbestos; fibers; light microscopy; mineralogical terminology; scanning electron microscopy; serpentine; talc; transmission electron microscopy.

This document contains invited papers which were given at a workshop on "Asbestos: Definitions and Measurement Methods" which was jointly sponsored by the National Bureau of Standards of the U.S. Department of Commerce and the Occupational Safety and Health Administration of the U.S. Department of Labor. The discussion portions of the Workshop also have been included as has written material appropriate to the topics under consideration which was submitted to the editors at a later date. The Workshop covered four major topics: Mineralogical Aspects, the Relationship Between Chemical and Physical Properties and Health Effects, Analytical Methods, and Regulatory Positions and Criteria. Also included in these Proceedings is a summary of each of these topics. These summaries serve to define those factors for which there was general agreement at the Workshop, identify remaining points of controversy, and, in some cases, describe additional research required to resolve remaining problems.

TN963. **Air and water pollution—Annual report, FY 74-76,** W. H. Kirchhoff and E. Myers, *Nat. Bur. Stand. (U.S.), Tech. Note 963*, 387 pages (Oct. 1978) SN003-003-01983-6, $6.00.

Key words: air pollution; measurement; SRM; water pollution.

Water— Evaluation of the accuracy of methods for measuring water velocity and flow in open and closed channels; Development of radioactivity standards; Development of Standard Reference Materials for evaluating the accuracy of instruments and methods for measuring the concentration of pollutants in water and sediments; Measurement evaluation and compilation of physical and chemical properties of known pollutants.

NBSIR 77-1211. **Evaluation of x-ray fluorescence analysis for the determination of arsenic, vanadium, cadmium, lead and mercury in various matrices,** P. A. Pella, R. L. Myklebust, M. M. Darr, and K. F. J. Heinrich, 31 pages (June 1977). Order from NTIS as PB285452, $4.50.

Key words: arsenic; cadmium; detection limits; lead; mercury; vanadium; x-ray fluorescence spectrometry.

Limits of detection for arsenic, vanadium, cadmium, lead and mercury have been determined with a wavelength-dispersive or energy-dispersive x-ray spectrometer, or with both, in various matrices consisting of cupric oxide, ferric oxide, lead oxide, coal and fly ash. Limits of detection for mercury in coal have already been determined and reported in NBSIR 75-675 and are included as an addendum to this report.

NBSIR 78-1428. **Survey of the occurrence of mercury, lead, and cadmium in the Washington, D.C. area,** E. P. Scheide, J. J. Filliben, and J. K. Taylor, 98 pages (Sept. 1977). Order from NTIS as PB281725, $6.00.

Key words: cadmium; computer techniques for environmental data; environmental data; environmental surveys; mercury; toxic materials.

This report describes the development of a plan to comprehensively survey the occurrence of potentially toxic substances in a defined geographical area and its application to the determination of the concentration levels of mercury, lead, and cadmium in various aspects of the environment in the Washington, D.C. area. It describes the basic philosophy of such a survey, the development of a sampling plan, and the identification of analytical methods adequate to obtain the required measurements. Methods of data reduction using the NBS computer are also described. The data are presented in tables and unique computer-generated plots which show the overall concentration profiles and spots of elevated concentration levels. No significantly hazardous conditions were found to exist. The approach followed and the data reduction techniques developed should be useful to surveys of these elements in other areas and also for surveys of ubiquitous hazardous materials in general.

NBSIR 78-1466. **Evaluation of new portable x-ray fluorescent lead analyzers for measuring lead in paint,** A. P. Cramp and H. W. Berger, 59 pages (May 1978). Order from NTIS as PB282254, $5.25.

Key words: accuracy; calibration; evaluation; lead; paint; poisoning; portable; precision; radiation; references; substrates; x-ray fluorescent.

Portable x-ray fluorescent lead analyzers offer the most cost-effective and adaptable means for the nondestructive detection and measurement of lead in paint in housing. However, commercially available portable lead analyzers have had poor accuracy and precision below lead levels of about 3.0 milligrams of lead per square centimeter of surface area. This is particularly serious because the current operational criteria for lead paint hazard abatement, 1.5 or 2.0 mg/cm of lead maximum (used in many communities) is in this range. They have also per-

sources for the irradiation of objects or materials. It establishes the criteria to be used in the proper design, fabrication, installation, use, and maintenance of these irradiators which will ensure a high degree of radiation safety at all times. The requirements of the standard are grouped as 1) general considerations, 2) manufacturer's responsibility, and 3) owner's responsibility. Included in the first group are general radiation protection criteria, sealed source performance requirements, and radiation survey needs. Among the manufacturer's responsibilities are criteria for maximum external radiation levels, integrity of shielding, and controls and indicators. The requirements for users include safety-related servicing, administrative procedures, operator qualifications, and routine safety tests.

FIPS PUB 54. **Computer output microform (COM) formats and reduction ratios, 16 mm and 105 mm,** T. C. Bagg, Standards Coordinator, *Nat. Bur. Stand.* (*U.S.*), *Fed. Info. Process. Stand. Publ.* (*FIPS PUB*) *54*, 15 pages (July 15, 1978).

Key words: COM formats and reduction ratios; communications; computer output microform; computer system hardware; computers; data processing; data processing equipment; information systems; microfiche; microfilm; standards.

This FIPS PUB specifies the image arrangement, size, and reduction ratios for 16 mm and 105 mm microforms generated by Computer Output Microfilmers. It is limited to systems using business-oriented fonts similar to line printer output. This standard covers microform formats and reduction ratios for Computer Output Microforms using business-oriented fonts.

FIPS PUB 55, Vols. 1 and 2. **Codes for named populated places and related entities of the States of the United States,** H. E. McEwen, Standards Coordinator, *Nat. Bur. Stand.* (*U.S*), *Fed. Info. Process. Stand. Publ.* (*FIPS PUB*) *55*, Vol. 1, 980 pages; Vol. 2, 986 pages (June 1, 1978).

Key words: cities; data file; data processing; demography; geographic areas; geographic coding; geography; information systems; named places; standard location codes; towns.

Included are standard codes for named populated cities, towns, villages, whether incorporated or unincorporated, important military and naval installations, townships, Indian reservations, named places that form parts of other places, places important for transportation, industrial, or commercial purposes, i.e., unpopulated railroad points, airports, and shopping centers.

The standard code is seven characters in length, the first two of which identify the State. The last five numeric characters identify the place within the State and provide an alphabetic ordering of the place numbers. In addition to the place name and its code, the list also provides the name and code for the county (or counties) in which the place is located, the ZIP code of the servicing post office (or offices), cross-references to former or alternate names, an inclusion code, a class designator code, and a cross-reference to the Worldwide Geographic Location Codes issued by the General Services Administration.

FIPS PUB 56. *Guideline* **for managing multivendor plug-compatible ADP systems,** J. M. Bakshi, *Nat. Bur. Stand.* (*U.S.*), *Fed. Info. Process. Stand. Publ.* (*FIPS PUB*) *56*, 18 pages (1978).

Key words: ADP systems; multivendor systems; plug-compatible systems; procurement regulations; standards.

To an increasing extent, Federal automatic data processing (ADP) systems are being configured with components obtained from multiple sources and ADP managers are being provided with services from multiple suppliers. This multivendor environment has led to both increased competition in the marketplace and substantial procurement savings by the Federal Government. This document is intended for the Federal ADP manager who is responsible for the planning, acquisition, and operation of multivendor ADP systems—particularly multivendor plug-compatible ADP systems. Its main purpose is to facilitate the planning and operation of multivendor systems by providing guidance based upon actual Federal agency experiences with problems in such installations and recommend ways through which they may be resolved.

FIPS PUB 57. *Guidelines* **for the measurement of interactive computer service response time and turnaround time,** M. D. Abrams, *Nat. Bur. Stand.* (*U.S.*), *Fed. Info. Process. Stand. Publ.* (*FIPS PUB*) *57*, 25 pages (1978).

Key words: evaluation; interactive; measurement; response time; selection; service; turnaround time.

These guidelines are primarily directed to the person who will be writing specifications for or conducting evaluation and selection of interactive computer network services. Response time and turnaround time are defined. Measurement methodologies are described, and recommendations are made concerning their applicability. The methodologies include accounting logs, stopwatches, communications monitors, live users at terminals, ASR terminals, intelligent terminals, internal measurement drivers, and remote terminal emulators.

NBSIR 78-1490. **Standards referenced in the National Building Code,** J. M. Hicks, Jr., Suppl. to NBSIR 76-1140, 43 pages (July 1978). Order from NTIS as PB284819, $4.50.

Key words: building codes; building regulations; building regulatory systems; model building codes; standards.

This report is a supplement to NBSIR 76-1140, "Standards Referenced in Selected Building Codes," published by the U.S. Department of Commerce, National Bureau of Standards, and is intended to provide a base for assisting the building community in updating, utilizing and maintaining the standards referenced in the 1976 edition of the National Building Code promulgated by the American Insurance Association. In addition to identifying each standard referenced in the code, this publication lists the current date of the standard, its title, the date of the code and the locations within the code where the standard is referenced.

NBSIR 78-1503. **State adopted building regulations for the construction of manufactured buildings—An analysis,** P. W. Cooke and R. M. Eisenhard, 215 pages (July 1978). Order from NTIS as PB284685, $9.25.

Key words: building regulation; construction; enforcement; inspection; legislation; manufactured building; rules and regulations; standards.

This report summarizes the status and characteristics of State adopted building regulatory programs specific to the construction of manufactured buildings. Included are tabularized data and summary information relative to: technical codes upon which regulations are based; extent to which established technical provisions contained in recognized national model codes have been amended by certain States; differences from a regulatory standpoint between each States treatment of manufactured building construction and conventional construction; occupancy classifications and type of compliance assurance activities covered by each States' program; definitions for "manufactured building" and related terms as defined in State regulations.

17761. Pontius, P. E., Doher, L. W., **The joint ANSI-INMM 8.1—Nuclear Regulatory Commission study of uranium hex-**