
HEALTH PHYSICS & RADIATION SAFETY SERVICES FOR HOSPITALS



Stan A. Huber Consultants, Inc.
Health Physics and Radiation Safety Services

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Preface

The detailed description of consulting services in this manual can be used for several purposes:

- To provide the reader with an organized overview of the major components of a Nuclear Medicine operation.
- To outline the different specific requirements, concerns, and relationships of administration, medical staff, technical and paramedical personnel in striving toward common goals in efficient and quality oriented Nuclear Medicine services.
- To outline the hospital and departmental requirements in their interrelationship with the various regulatory agencies and the public.
- To provide both the hospital and the consultant with a mutually comprehensive understanding and a checklist to tailor a consulting program or project to meet the needs of the individual hospital circumstances.

Radiation Safety Consulting Services

Stan A. Huber Consultants, Inc. has provided radiation safety consulting services to medical clients for over 25 years.

Depending on the size and extent of your facility, a health physics consulting program can be tailored to your needs on either monthly, quarterly, semi-annual, or annual visit frequencies. If special needs arise, visits can also be on call or on any frequency you choose.

The following categories describe typical areas of coverage during our scheduled visits to facilities:

- **Licensure and Regulations**

Nuclear Regulatory Commission, State Health Department, Food and Drug Administration, Department of Transportation, OSHA, and Joint Commission on Accreditation of Hospitals compliance and updating.

- **Record Systems**

Implement or review those records required by the previously mentioned regulatory agencies or recommended for efficient department operations. We can provide you with appropriate forms to best suit your operations for all record keeping requirements.

- **Radiation Safety**

Implement radiation safety survey checks and continuing evaluation of radiation safety controls and methods to meet changing regulatory agency requirements.

- **Quality Control Checks**

Includes controls for instrument validity, radiopharmaceutical integrity, and of imaging or lab studies.

- **Continuing Education**

Includes lectures and audio-visual presentations to your personnel geared to your particular operation.

- **Procedure and Operation Manual**

Includes review and updating of your manuals. We can also assist in the initial development of such manuals.

Radiation Safety Consulting Services (continued)

- **Certified Calibration of Special Instruments**

We are licensed by the Illinois Emergency Management Agency Division of Nuclear Safety to perform certified calibrations of nuclear instruments either on-site at your facility or in our laboratory. We keep back-up records of all certificates in case your originals get misplaced or lost.

- **Facility Changes and Close-Out Surveys**

We can assist in or perform close-out surveys of licensed facilities and handle all regulatory requirements and paperwork.

The foregoing is not intended to limit the service to these categories, but rather to indicate the comprehensiveness and application of this service. All of our consulting visits are of 6 - 8 hours (full day) duration. Special ½ day visit programs are also available on request.

We will provide you with narrative progress reports after each visit to summarize our actions, observations, or recommendations. Visits are always scheduled in advance.

License and Registration

Stan A. Huber Consultants, Inc., Illinois Emergency Management Agency Division of Nuclear Safety Radioactive Materials License Number is IL-01013-01 (Illinois Registration #97117151). We are also listed as "Radiation Experts" in Illinois and other states that have such lists.

Stan A. Huber is licensed by the Texas Board of Health in Medical Nuclear Physics and Medical Health Physics, License Number MP0279.

Radioactive Material Licensing Services

Stan A. Huber Consultants, Inc. can prepare or assist in the preparation of radioactive material licensing documents for your facility (Nuclear Regulatory Commission and State Health Department license, renewal or amendment applications, etc.) Our experience with more than 400 regular clients assures that we are always up to date on current regulations and licensing formats.

Most licensing preparation can be handled by correspondence or telephone or during scheduled consulting visits. More complex licensing actions may require a separate on-site visit and license audit to ascertain correct coverage. A license audit is usually a prerequisite for establishing and maintaining an understandable and efficient control system. The audit steps and purposes are:

- To make certain that the license is organized and complete for present operations. If documents are missing, action will be taken or recommended for their replacement.
- To summarize and restate the license in a manner that is more understandable and useful to the user.
- To list all restrictions and stipulations of the total license in an organized manner and subsequently check department operations and records for compliance.
- To ascertain, by record reviews and interviews that no studies or activities are being performed which are not licensed and that authorized users or radioactive source listings are current and complete.
- To list any necessary amendments to be implemented for present or planned operations.
- To review current methods or handling licensure, such as through Review Committees, for potential recommendations to achieve optimum efficiency and communication among all involved personnel.

A typical license audit will take between 3 and 6 hours to complete. Some licensing actions (such as for use of Xenon-133 radioactive gas) may require additional information, such as airflow and ventilation requirements.

Any necessary renewal or amendment applications are prepared in our office and mailed or delivered to you for review and forwarding to the appropriate regulatory agencies. We also handle any follow-up correspondence necessary until the license is issued.

Radioactive Material Licensing Services (continued)

The NRC licenses only reactor produced (by-product) materials. The Health Department of your state always has jurisdiction over naturally occurring radionuclides and cyclotron produced radionuclides. Agreement States have jurisdiction over all types of radionuclides. For small operations, the NRC and some states also have a permanent registration form for certain procedures. Therefore, the consultant to the Nuclear Medicine Department may be called upon for the following purposes and implementation:

- Advise on jurisdiction and protocols for specific procedures.
- Implement registration or licensure for cyclotron produced nuclides with the State Health Department in those cases where the NRC (or Agreement State in some cases) for small nuclear laboratories where this form of authorization may be sufficient.
- Monitor the files for complete and current maintenance and updating

Radiation Safety Program

All license applications to the NRC or State regulatory agencies must have a Radiation Safety Program specified, and the licensing agency expects that program to be followed as one of the minimum requirements of compliance. Depending on the individual Nuclear Medicine Department and the frequency of scheduled consulting visits, the consultant may serve as Radiation Safety Consultant and/or as a member of the Radiation Safety Committee.

The consultant may be called upon for any or all of the following:

- Evaluate physical facility changes, dose preparation and radiation storage area for their efficiency and continuing adequacy of radiation protection.
- Monitor the maintenance of all provisions listed in the Radiation Safety Program including proper posting of radiation areas and containers, implementation of radionuclide therapy precautions and records and instructions to personnel of proper handling methods for their safety.
- Advise hospital administration and/or the Nuclear Medicine Department of any new or changed requirements and regulations of radiation safety as defined by the Nuclear Regulatory Commission, State Health Department, Department of Transportation, or any other regulatory agency. Also, monitor the total program for complete and continuing compliance with such regulations.
- Implement non-routine instrument checks and calibrations, such as survey meters and dose calibrators, and monitor the total proper performance and maintenance of instrument calibration, quality control and repair records as defined by regulatory agencies.
- Observe personnel handling of radioactive materials and provide recommendations for any improvements that may be made.
- Monitor radioactive disposals, shipment surveys and other provisions as listed in the Standards for Nuclear Medicine Services of JCAHO and the regulations of licensing agencies.
- Monitor personnel film badges for unusual readings and recommend corrective measures as necessary.
- Monitor radiation surveys performed by the technologists to evaluate that the surveys have been properly implemented and recorded. Advise on corrective measures as necessary.
- Perform and/ or check wipe tests of all radiation survey locations that indicate a reading above normal background radiation on the routine radiation survey reports.

Radiation Safety Program (continued)

- Perform leak tests on appropriate sealed sources and/or reference standards.
- Implement written descriptions of radiation safety procedures in any areas where uncertainties may exist or changes occur.
- Advise on new Nuclear Medicine procedures available and implement NRC licensure or State registration as required, after approval of hospital administration or the Radiation Safety Committee and/or private practitioner.

Participate in Radiation Safety Meetings, summarizing the maintenance of radiation protection standards, reporting any safety problems that have been noted, and corrective measures taken, reporting the results of any regulatory agency inspections, and proposing any new radiation handling and safety procedures for committee approval.

Record Systems

Records that are organized, current and properly implemented are the backbone of any Nuclear Medicine Department that has the goals of regulatory compliance, effective management and keeping pace with progress and changes.

The experience of the consultant in continuous contact with many hospitals' record systems, business practices, and the changing regulations, can prove most useful in establishing, organizing and updating overall record systems such as the following:

- License and application files.
- Radiation safety program, radiation surveys, wipe test and leak test records, and related records and reports.
- Correspondence files with NRC, State, JCAHO, and other regulatory agencies.
- Files of JCAHO Standards, NRC, and/or State regulations, NCRP handbooks, OSHA, DOT, etc.
- Facility design and sketches.
- Management files of cost analysis/pricing studies, justification reports, organizational charts, performance audits, feasibility studies, progress reports, budgets, and cost control systems.
- Personnel files of curriculum vitae, job descriptions, and continuing education programs.
- Required records of radioactive material receipt, inventory, utilization and disposal.
- Quality control records of instrumentation, radiopharmaceuticals and patient studies.
- Procedure manual, including not only techniques, premedications list, nursing instructions, etc., but also management descriptions.
- Records of instrument repairs, purchase orders and business papers.
- File of hospital and/or departmental policy manuals and master list of record systems used.
- Instrument calibration records, such as required for survey meters and dose calibrators.

Quality Controls

The consultant can instruct personnel on the performance, interpretation and practical application of quality control checks or implement some of these checks on a scheduled or as needed basis. The consultant can assist in developing organized overall quality control systems with specific schedules for implementation and written descriptions.

Dose Calibrator

- Accuracy, precision and linearity calibration certification
- Geometrical variation determinations
- Assay records of standards and precalibrated sources
- Scale range linearity checks
- Background, zero control and volume/activity control checks on some instruments
- Environmental controls

Survey Meters

- Calibration, at least annually, and after repair
- Standardization (operational) records
- Battery checks
- Zero control (ionization meters)
- Environmental controls

Well Counters

- Standardized records
- Calibration routines and records
- Resolution percent records
- Pulse height analysis (spectrum checks)
- Linearity checks
- Background checks
- Environmental controls

Single Probe Uptake and Dual, Triple Probe Function Systems

- Standardization records
- Calibration routines and records
- Resolution percent records
- Pulse height analysis checks
- Linearity checks
- Background or zero checks
- Balancing routines (dual and triple probes)
- Environmental controls

Pocket Dosimeters

- Leakage checks
- Calibration checks
- Charger battery checks
- Environmental controls

Radiation Training Services

Stan A. Huber Consultants, Inc. presents a variety of training seminars to aid management in the tasks of implementing their radiation safety program. We schedule our *Seminar on Radiation Safety and Management* approximately every 4 months at locations throughout the U.S. Seminar topics include:

- ◆ **Types of Radiation**
 - Basic Radioactivity and Radiation Theory
 - Radiation Quantities; Math Review
- ◆ **Nuclear Regulatory Commission and Agreement State Regulations**
 - 10 CFR Part 20
 - Regulations Review
 - Inspections by Regulatory Agencies
 - Inspection Reports and Your Follow-Up
- ◆ **Licensing of Radioactive Materials**
 - General or Specific Licenses
 - Who Needs a License
- ◆ **Radiation Biology**
- ◆ **DOT Regulations & Transportation**
- ◆ **Effective Radiation Safety Programs**
 - Personnel Training and Continuing Education
 - Record Systems & Record Retention Requirements
 - Operations Manuals
 - Personnel Monitoring (film badge requirements)
 - Leak Testing of Sealed Sources
 - Calibration of Instruments
 - Radioactive Materials Area Posting
 - Facility Description and Survey Requirements
- ◆ **Emergency Response to Radiation Incidents**
 - Contamination Incidents
 - Damaged or Lost Sources
 - Personnel Exposures and Reporting Requirements
- ◆ **Termination & Expansion or Reduction of Radioactive Materials Program**
 - Termination of Licenses
 - Close-out or Decommissioning of Facilities
 - Disposal of Radioactive Sources

Training for Results Our training methods combine lecture, hands-on sessions, and workshops. All of our health physics consultants are available on a one-on-one basis to address specific concerns, such as individual license reviews or questions, throughout the seminars. We also encourage all personnel who attend any of our courses to call us at any time with questions (at no charge, of course). We can also assist in the preparation for radiation accident cases or conducting simulated drills.

Customized training is, of course, arranged according to your schedule and needs. Training can be done in one, two, or five day sessions, depending on the specific needs and levels of radiation training needed (such as, for authorized users, management, key radiation safety personnel, support workers, etc.). For over 25 years, Stan A. Huber Consultants, Inc. has specialized in providing radiation safety training services for hospitals, universities, research labs, and a wide variety of manufacturing and industrial facilities that use radioactive materials.

Radiation Training Services (continued)

We can offer your facility an effective way to oversee your radioactive material program through the use of formal training seminars, on-site customized personnel training or audio-visual presentations. Please call us for information about what type of training can best accomplish your goals depending on the extent of your radioactive materials program and special license considerations.

For a list of upcoming seminar dates and topics, and all of our training options, please call **1-800-383-0468** or visit the training section at www.sahci.com.

Continuing Education

Continuing education systems are essential to any individual who wishes to maintain his or her competence in any endeavor. In the health field, continuing education is vital, not only to the morale and confidence of the individual, but also to the benefit of the patient being served.

The consultant can present training sessions and audio-visual presentations to the technical and medical personnel, nursing staff, ancillary personnel and administration, designed for their specific interests and circumstances. He/She can document this training for regulatory inspections and personnel records.

Nuclear Calibration Services

Survey Meters - Dose Calibrators

Pocket Dosimeter - Monitors and Alarms

Airflow Ventilation Checks

*Calibrations performed **on-site** at your facility or
Performed in our lab - 5 day Turn-around time*

- We have regular routes throughout the Midwestern United States and can often perform these calibrations ON-SITE at your facility, whenever a minimum of three instruments can be calibrated at any one time, or during regularly scheduled consulting visits. Specific dates for these calibration visits are arranged with you in advance.
- Instruments can be sent to our lab for calibrations. We will perform the calibrations within five (5) days of receipt of the instruments and return them to you along with a calibration certificate. This certificate needs to be kept on file for your records and regulatory agency inspections. We keep back-up records of all certificates, in the event that your originals are misplaced.

According to your facility's radioactive material license conditions, instruments need to be calibrated on specific frequencies. We can send reminders to you when calibrations are due to be performed, on request.

All of our radioactive sources and standards are NIST (NBS) traceable, and our calibration methods and procedures conform to Nuclear Regulatory Commission and State Health Department regulations.

Our Illinois Emergency Management Agency Division of Nuclear Safety license Number is IL-01013-01 with nationwide reciprocity recognition.

Ventilation airflow checks (for use of Xenon-133 studies) can be performed during our regularly scheduled visits as part of a consulting program.

Leak Testing of Radioactive Sources

Stan A. Huber Consultants, Inc. performs certified leak testing of radioactive sealed sources and reference standards.

Ordering Information and Procedures

- Tests can be ordered by phone or email. We then send you our leak test kits for the number of sources that require leak testing. You perform the simple test according to the instructions in the kit and mail the kit back to us. Within five days of our receipt of the kit, the test is assayed and results are reported to you by mail. Should our results indicate that a source is leaking, we will immediately contact you by telephone.
- If we visit your facility for consulting or instrument calibration, we can perform the leak test services during that time. The tests are assayed in our lab, and results are reported to you within 10 days of our visit.

Along with the certificate for each test performed, we will send you an equal number of new kits for you to keep on hand for the next time the tests are due. We can also send reminders when your sources are due to be tested, if you so desire.

When ordering kits, please specify if any Iodine-125 sources are to be leak tested. These sources require that, along with the surface contamination test, an additional airborne contamination test also be performed.

Our office keeps back-up copies of all leak test certificates in the event that your originals are misplaced.

Our methods and procedures are registered with the Illinois Emergency Management Agency Division of Nuclear Safety under license number IL-01013-01 with nationwide reciprocity recognition.

24-Hour Emergency Response Services to Radiation Accidents

Stan A. Huber Consultants, Inc. can respond to radiation incidents around the clock. This immediate response allows management to handle the incident in a correct manner according to regulatory requirements.

Should you need emergency response because of a radiation incident during off-duty hours, help is only a phone call away. We ask that you call our regular toll-free number. Should you not be able to reach us immediately, you may call our emergency number at **(815) 485-7866**. One of our health physics personnel will then return your call. This on-site assistance response is only limited to travel time and distance.

Site Visit Objectives are:

- Secure the radioactive source and keep personnel exposures to a minimum.
- Address any personnel exposure concerns and follow-up actions needed.
- Meet with management and keep them informed of all actions.
- Contact the radiation source manufacturer for handling instructions, if applicable.
- Perform leak testing of sealed sources or tests of any tests of any areas that could have been contaminated, to determine radiation source integrity, or additional precautions which may be indicated.
- Discuss procedures that will aid in future operations to avoid recurrence of incidents.

All of our actions and recommendations are detailed in a narrative report to management after the site visit.

Our specific license allows us to retrieve and prepare radioactive sources for return to the manufacturer or for disposal, and to take, possess and analyze samples.

Close-Out Radiation Survey Projects

Termination of radioactive materials licenses, or close-out of existing licensed facilities require that a close-out radiation survey be performed to ascertain that the areas are free of radioactive contamination and can be released for unrestricted use. Any areas found to be contaminated require decontamination. All survey results must be submitted to the Nuclear Regulatory Commission or State Health Department, or retained for future inspection by those agencies.

Close-out of facilities require that the following steps be taken:

- Perform a site visit to the building or area to be closed out.
- Review all existing radioactive material license documents to verify what type of radioactive materials had been used or stored in the facility. In older facilities that have not been used for years or have been vacant for a long time, it is often difficult to find licensing documents. In those cases, it may be possible to interview previous authorized users or personnel.
- If radioactive materials are to be disposed (possibly through a radioactive waste broker), a conference between management, the waste removal firm, and the decontamination personnel should be held and an estimated schedule of removal and decontamination should be established.
- Once the extent of the close-out and decommissioning project has been established, definite time schedules can be set up, giving projected starting and ending for each phase, number of personnel needed for each phase, etc.
- Our health physics personnel can coordinate the total project and act as liaison between waste removal personnel, management, and regulatory agencies.
- Waste removal should be estimated according to the type of waste to be removed in each area, cubic footage of waste, barrels and supplies needed, and any special equipment that may need to be obtained or rented for waste removal.
- If blueprints are available of the facility to be decommissioned, these can be used to prepare "blow-ups" of each room showing numbered grid patterns, which will be used to record survey and wipe test readings obtained.
- Health physics personnel will check and decontaminate (if needed) each area, after radioactive was has been removed.
- Wipe test results are analyzed in our mobile lab or in our office, and results relayed to on-site health physics personnel for further decontamination or suspect areas, if necessary.

Close-Out Radiation Survey Projects (continued)

We will communicate our progress and results to management through daily or other periodic reports, showing the areas being worked on; number of personnel used each day, and special problems or results.

- Once clean-up has been completed, we will prepare a close-out summary report to management, and any detailed reports necessary for regulatory agencies. Should those agencies desire to make a site visit, we will also participate in these meetings and inspections to explain our findings.

We will prepare any documents for regulatory agencies (NRC and/or State Health Departments) requesting license termination or facility close-out, and handle any follow-up meetings or correspondence necessary for licensing termination or relocation actions.

References and previous decontamination/decommissioning projects are enclosed herein.

Special Projects

Decontamination – Decommissioning Emergency Response and Norm Projects

<u>Client Name</u>	Job Description
Enginex, Lake Forest, IL	Thorium Monitoring Projects throughout Chicago, Illinois for ComEd, Chicago Dept. of Water. Includes soil sampling and analysis for Thorium contamination, particulate air monitoring, packaging of contaminated soils, and soil screening surveys.
Specialty Minerals, River Rouge, MI	Health Physics Survey of manufacturing facility
Michael Reese Hospital Chicago, IL	Close-out survey of Michael Reese Hospital, termination of license, waste disposal
Lakeshore East Development 221 N. Columbus Drive USEPA Superfund Site Chicago, IL	Site Radiation Safety Officer throughout planning stages, site characterization, clean-up and packaging, and continued construction radiation monitoring of 25 acre parcel of land with Th-230/232 impacted soils. Duties include radiation surveys, soil sampling, air monitoring, awareness and health physics training, personnel dosimetry, and regulatory compliance. Worked with excavation contractors to safely identify, excavate, and package impacted soils.
DuSable Park Chicago, IL	Performed surveys of potentially Thorium contaminated soils and performed air monitoring and radiation screening during excavation process. Assisted in packaging and shipping radioactive waste for disposal.
Former Kraft Building (Parcel K and 21) USEPA Superfund Site Chicago, IL	Site Radiation Safety Officer throughout planning stages, site characterization, clean-up and packaging, and continued construction radiation monitoring of parcel with Th-230/232 impacted soils. Duties include radiation surveys, soil sampling, air monitoring, awareness and health physics training, personnel dosimetry, and regulatory compliance. Worked with excavation contractors to safely identify, excavate, and package impacted soils
GeoSyntec Consultants 160 E. Illinois Street Project Chicago, IL	Designed and implemented air monitoring program for Thorium contamination during demolition of existing building. Performed site characterization prior to demolition. Provided continuing radiation monitoring support throughout demolition and construction of new building.
MidAmerican Energy Co. Muscatine, IA	Emergency response to gauge shutter malfunction and exposure concerns. Coordinated with State and local regulation agencies.
B.P. Refinery Whiting, IN	Emergency response to Cs-137 gauge incident, taking radiation readings and participate in NRC inspection and communication follow up meetings with contractor personnel.
Mead/Westvaco Richmond, VA	Identification, retrieval and disposal of radioactive gauge found damaged in scrap yard.
L & L Supply Company Carmi, IL	Performed Site Characterization and cleanup of site contaminated with Ra-226/228 pipe scale (TENORM). After submittal of Final Status Survey Report the property was released for unrestricted use by the IEMA-Department of Nuclear Safety.

Decontamination – Decommissioning Emergency Response and Norm Projects (Cont.)

341 East Ohio Street Site Chicago, IL USEPA Superfund Site Chicago, IL	Assisted in designing and implementing Site Characterization. Worked with general contractor to develop Work Plan and Quality Assurance Project Plan for EPA approval. Acted as Site Radiation Safety Officer throughout clean-up process. Performed all required radiation monitoring.
Lindsay Light II Site North Columbus Drive USEPA Superfund Site Chicago, IL	Site Radiation Safety Officer – supervised all health physics aspects of Th-230/232 clean-up. For specific duties please see Lakeshore East project above.
Beverly Gravel Co. Elgin, IL	Large-scale decontamination project at a gravel pit involving cleanup and remediation of Th-230/232 impacted soil.
Keystone Steel & Wire Co. Peoria, IL	Decontamination of steel and wire plant involving surveying and clean-up of complete facility, using a total of 20 health physics personnel and a clean-up crew of over 100. Coordinated with the IEMA- Department of Nuclear Safety.
Procter & Gamble Cincinnati, OH	Assisted in cleanup of laboratories contaminated with H-3 and C-14. Packaged waste and performed surveys required to release area for unrestricted use.
Case Property Brookhaven, MS	Decontamination of NORM on private property due to oil pipe decaling processing. Surveys and remediation of over 25 acres of land over a 2-1/2 year time period.
Alliant Techsystems Wilmington, IL	Site characterization of part of ammunition facility. Developed radiation safety plan and supervised removals of depleted uranium (D.U.) contaminated sand pile with unexploded ordnance contractor (UXO) and packaged/transported D.U. for transfer and disposal.
Border Steel Mill El Paso, TX	Decontamination of Cs-137 contaminated steel mill involving personnel training, surveying, waste packaging and clean up of facility.
General Instruments (CP Claire, Inc.) Chicago, IL	Survey of large manufacturing facility (approx. 100,000 sq. ft.). Decontamination of Cs-137 and Ni-63 from several furnaces and ovens, floors, equipment, etc. and resurvey. Coordinated with IEMA-Department of Nuclear Safety. Later, Stan Huber also surveyed the General Instruments, Inc. facility in Guadalajara, Mexico.
Mead Paper Co. Escanaba, MI	Nuclear Gauge removal, packaging, and disposal services.
Spectrulite Consortium Madison, IL	Health Physics Radiation Safety Services for Decontamination - Decommissioning and waste disposal of Th-232 Magnesium casting dross.
Inland Environmental Skokie, IL	Radiation survey and analysis of plots of land in the western suburbs of Chicago, IL.
U.S. Steel Gary Works Gary, IN	Emergency responses involving nuclear gauges.
B.P. Whiting, IN	Emergency response, leak testing and survey of radioactive gauges (fire at facility). Emergency response involving radioactive contamination found during hazardous waste project.

Decontamination – Decommissioning Emergency Response and Norm Projects (Cont.)

Browning Ferris Industries Springfield, MO	Emergency response and decontamination of Radium found in landfill and waste packaging.
Johnson City Medical Center Johnson City, TN	Emergency response and decontamination of P-32 incident at hospital nuclear laboratory.
Austeel Lemont Co., Inc. Lemont, IL	Decontamination of steel plant involving the surveying, waste packaging and cleanup of facility in coordination with Wastren Remediation.
Raytheon/Fleet Environmental Boston, MA	Decontamination of Thorium contaminated facility and equipment. Included packaging of waste and arranging disposal. Coordinated with Nuclear Regulatory Commission.
Southern Zinc Co. Atlanta, GA	Decontamination of Depleted Uranium contamination in a scrap milling process. Coordinated with Georgia Radiological Health Dept.
Butler University Indianapolis, IN	Decontamination and decommissioning of university laboratory facility. Waste packaging and disposal consulting.
Bristol-Meyers Squibb Evansville, IN.	Survey of lab area, decontamination and/or removal of fixtures, floors and walls.
Louisiana Pacific Corporation Alpena, MI	Radioactive gauge removal project
Pittsburg & Midwest Coal Mining Company Raton, NM	Radioactive gauge removal, packaging and return to the manufacturer
Crosfield Catalysts Chicago, IL	Radioactive gauge removal services

COMPLIANCE AUDITS AND CONSULTING SERVICES

Stan A. Huber Consultants, Inc. (SAHCI) has completed several radiation safety and management compliance audits, procedure manual preparation, and license reviews. Some of our clients include:

- StoraEnso North America, Wisconsin Rapids, WI
- Corning, Inc., Greenville, OH
- University of Health Sciences, Kansas City, MO
- Marshall University School of Medicine, Huntington, WV
- Emory University, Atlanta, GA
- Minerals Technology, Easton, PA
- Kay-Ray/Sensall, Mt. Prospect, IL
- Firestone Fibre & Textile, Hopewell, VA
- Dept. of Defense, Naval Surface Weapons Center, Crane, IN
- MediPhysics, Arlington Hts., IL
- BEBIG, Inc., Elgin, IL
- City of Indianapolis, Indianapolis, IN
- Hammes Company, Brookfield, WI

RADIATION SAFETY TRAINING PROJECTS

The following corporations have contracted with Stan A. Huber Consultants, Inc. (SAHCI) to do on-site radiation safety training for their manufacturing and management personnel. This included five day, 40 hour training; two day training; one day training; and refresher training.

Escanaba Paper Company, Escanaba, MI
Aventine Renewable Energy, Pekin, IL
Corn Products International, Argo, IL
U.S. Steel, Gary, IN
BASF Corporation, Joliet, IL
Beckman-Coulter, Inc., Indianapolis, IN
Sugen, Inc., South San Francisco, CA
St. Lawrence Cement Co., Hagerstown, MD
Indiana Dept. of Transportation, Indianapolis, IN
Packard Instruments, Downers Grove, IL
Baxter Healthcare, Irving, CA
Bio-Imaging Research, Lincolnshire, IL
Molecular Dynamics, Sunnyvale, CA

Occupational Training Services, Alsip, IL
Mobil Oil, Joliet, IL
Helene Curtis, Chicago, IL
Celtrix Pharmaceuticals, Inc., Santa Clara, CA
Johnson Controls, Battle Creek, MI
Sterigenics International, Several US Locations
Indiana State Dept. of Health, Indianapolis, IN
CINERGY Westwood Gen. Station, Tremont, PA
INDEV Gauging Systems, Burr Ridge, IL
Applied Extrusion Technologies, Terre Haute, IN
CMI International, Tulsa, OK
Cementos Progreso, Guatemala, Central America

Radiation Safety Officer Services and Management Support

Stan A. Huber Consultants, Inc. (SAHCI) has provided Temporary Radiation Safety Officer and Management Support services to several facilities. Among our clients are:

<u><i>Client Name</i></u>	<u><i>Job Description</i></u>
ArcelorMittal USA East Chicago, IN	Radiation Safety Officer and health physics services for major steel mill operation.
LyondellBasell – Equistar Chemicals. Morris, IL	Radiation Safety Officer and health physics services for a large chemical company.
Alliance Imaging, Inc. Chicago, IL	Radiation Safety Officer (WI) for mobile PET operation.
LaPorte Hospital LaPorte, IN	Radiation Safety Officer services for large medical facility.
Millipore St. Charles, MO	Radiation Safety Officer for research laboratory.
Midwest PET Cedar Rapids, IA	Temporary Radiation Safety Officer for mobile PET operation.
Perkin Elmer Life Sciences, Torrance, CA	Temporary Radiation Safety Officer and Alternate Radiation Safety Officer for liquid scintillation equipment manufacturing facility.
Perkin Elmer Life Sciences (formerly Packard Instrument Co.) Downers Grove, IL	Temporary RSO for corporate facility of a liquid scintillation equipment manufacturer. SAHCI has served as RSO on two separate occasions for several months during search for and orientation of a permanent RSO.
Chicago Specialties Chicago, IL	Temporary RSO for to oversee disposition of materials and close-out of facility.
Michael Reese Medical Center Chicago, IL	Temporary RSO for several months for a Broad Scope Medical Licensee, Radiation Oncology Center and research labs.
Wisconsin Electric Power Co. Milwaukee, WI	Temporary Radiation Protection Officer for Fossil Operation Plants on a temporary basis during search for a permanent Radiation Protection Officer.
Cognis Corporation (Henkel Corp.) Kankakee, IL	Temporary RSO for several months for a large chemical company. An initial audit of Henkel Corp.'s radiation safety program was performed upon SAHCI assuming the RSO responsibilities, to ensure Henkel Corp. was in compliance with all Illinois Emergency Management Agency Division of Nuclear Safety regulations and license conditions.
CITGO Petroleum Corp. Lemont, IL	Temporary RSO for several months for large oil refinery in suburban Chicago, IL.

**Jackson County
Schneck Memorial Hospital
Seymour, IN**

Temporary Radiation Safety Officer for several months for Medical Center during search for permanent Radiation Safety Officer.

Supporting Information

Glenn A. Huber, CHP, President

Glenn Huber joined Stan A. Huber Consultants, Inc. in 1994 and has been president of the company since 1999. The firm now serves over 450 medical and industrial client facilities. Glenn holds a Master of Health Physics Degree from the Illinois Institute of Technology in Chicago, IL, and a Bachelor of Science Degree in Marketing from the University of Illinois in Champaign, IL. He received certification from the American Board of Health Physics in 2002.

James C. Hatten, Senior Health Physics Consultant

Jim Hatten joined SAHCI as a Health Physics Consultant in 2000. He holds a Bachelor of Arts Degree in Business Administration from McKendree College in Lebanon, IL. He has completed 20 years of military service with the U.S. Army. He has over 13 years of Health Physics experience including being an instructor for the Army Health Physics Specialist Course.

Jason A. Behling, Health Physics Consultant

Jason Behling joined SAHCI as a Health Physics Consultant in 2006. He holds a Bachelor of Science Degree in Health Physics from Purdue University, West Lafayette, IN.

Erica L. Krueger, Health Physics Consultant

Erica Krueger is the most recent addition to the Stan A. Huber Consultants, Inc. staff having joined the company as a Health Physics Consultant in October 2008. She holds a Bachelor of Science Degree in Health Physics from Purdue University, West Lafayette, IN.

Joel M. Ahrweiler, Lab Services and Instrument Calibrations

Joel Ahrweiler joined Stan A. Huber Consultants, Inc. in 1993. His training includes “Calibration of Radiation Survey Instruments” presented by Consultec Scientific, Inc., Knoxville, TN in 1994 and “Calibration and Repair of Ludlum Measurements Instruments”, Ludlum Measurements, Sweetwater, TX. He received extensive training in radioactive materials decontamination and decommissioning of facilities.

Our staff provides radiation safety and health physics services to medical and industrial clients throughout the U.S. This includes such responsibilities as regulatory compliance audits, records management, nuclear instrument calibrations, leak (wipe) testing of sealed sources and standards, personnel training, and Nuclear Regulatory Commission and Agreement State radioactive material licensing. In addition to presenting our Seminar on Radiation Safety and Management, our consultants lecture at various radiation safety seminars, which range from one to five days in length, at large industrial facilities throughout the United States.

Sample Consulting Report

Dear Ms./Mr.:

This is the summary report of my visit to your facility on December 21, 2004.

Radiation Safety Committee

I participated in the Radiation Safety Committee meeting for the fourth quarter of 2004. The minutes from this meeting are attached to this report.

Licensing

You indicated that your facility has not received its renewed radioactive materials license. You may continue to operate under your present license until the renewal is received.

Radiation Safety and Record Systems

1. I reviewed the film badge exposure reports for the third quarter of 2004. These reports indicated that all individuals received exposures of less than 10% of the dose limits except forwho received 230 mRem deep dose. ... indicated she left her film badge on a lead apron in one of the procedure rooms. Also, I noted that the reports for the Clinic were missing for March and September of 2004. ... contacted Landauer and they advised that these badges were never received. We completed estimated exposures for these individuals and they will be forwarded to Landauer, so there is no lapse in exposure reporting.
2. The daily personnel and area radiation surveys performed around the various areas of the Nuclear Medicine Department indicate that there was one incident of contamination during the past quarter. This spill occurred on October 25, 2004 in the treadmill room. Documentation of this event is on file in the Nuclear Medicine Department. This documentation confirms the area to have been properly cleaned.
3. The miscellaneous accountability records for radioactive materials received, used, returned, and disposed by the technologists were reviewed. These records verify that the radioactive materials are being handled safely by all individuals in the Nuclear Medicine Department.
4. The fourth quarter 2004 physical inventory of sealed sources and reference standards was completed on December 15, 2004. This inventory verified that all of these sources are present and in their proper location. The inventory is due to be completed again in March 2005.
5. I completed the quarterly quality assurance review of instrumentation. This review verified that the instruments and camera systems have been operating properly. This documentation should be reviewed and signed by Dr. .. before being filed in the Nuclear

Medicine Department.

6. You indicated that a close-out survey was performed in the old long-term storage area on November 15, 2004. Documentation of these events are on file in the Nuclear Medicine Department.
7. There have been no misadministrations or recordable events since our previous visit.
8. During the previous quarter there were two procedures completed which were applicable to the Quality Management Program and one procedure was in progress on the date of my visit. There were no deviations from this program.

Leak Tests

I completed the semi-annual leak testing of sealed sources and reference standards. The certificates from these leak tests are attached to this report.

Facilities

I completed the semi-annual airflow check of the ventilation system. This check verified that a negative air pressure exists in the department. The airflow certificate is attached to this report.

Instrumentation

1. The daily constancy checks performed on the dose calibrator verify that this instrument is operating properly. These checks were complete and up to date.
2. The results of the third and fourth quarter 2004 linearity checks performed on the dose calibrator verified that this instrument is operating in a linear fashion over the range of use down to 10 μCi . These checks were completed on September 15 and December 18, 2004. The next check of this instrument should be completed in March 2005.
3. I completed the annual calibration of the dose calibrator. The results of this calibration verify that this instrument is operating properly. Please have Dr. ... review and sign this certificate before it is filed in the Nuclear Medicine Department.
4. The annual calibration of the survey instruments was completed during this visit. These calibrations verify that all of the instruments are operating properly.

Thank you for the opportunity of serving you. Our next visit is scheduled for March 21, 2005.

Sincerely,
Stan A. Huber Consultants Inc.

Nuclear Consultant

Sample Radiation Safety Committee Meeting Minutes

Date: December 21, 2004

Members Present:

Adjunct Members:

Guest

Member: Nuclear Consultant, Stan A. Huber Consultants, Inc.

Members

Absent:

Adjunct Member

Absent: None

Previous Minutes:

The minutes from the September 15, 2004 Radiation Safety Committee meeting were reviewed and approved.

Old Business:

.... informed us that he has contacted the physicians in surgery and indicated that they may discontinue the use of film badges in the operating room. This will be reviewed further at the next meeting.

New Business:

1. The consultant provided the following report to the Radiation Safety Committee:
 - A. The film badge exposure reports for the third quarter of 2004. These report indicated that all individuals received exposures less than 10% of the dose limits except for... who received 230 mRem deep dose. ... stated she left her film badge on a lead apron in one of the procedure rooms.
 - B. The daily personnel and area radiation surveys, along with the supplemental wipe tests indicated that there was one spill in the Nuclear Medicine Department. This spill occurred on October 25, 2004 and was properly decontaminated and documented.
 - C. The miscellaneous accountability records indicate that the radioactive materials are handled safely from receipt to disposal.
 - D. The quarterly inventory of sealed sources and reference standards was completed on December 15, 2004 by This inventory verified that all of the sealed

radioactive materials are present and in their proper location.

- E. The quarterly quality assurance review of the instrumentation verified that these instruments are operating properly.
 - F. There have been no misadministrations or recordable events during the past quarter.
 - G. During the past quarter there were two procedures completed which were applicable to the Quality Management Program and there was one procedure in progress as of the time of this meeting. There were no deviations from this program.
 - H. The consultant completed the annual audit of all the procedures performed applicable to the Quality Management Program. There were a total of seven (7) procedures performed. No deviations from the program were found.
 - I. The semi-annual leak tests performed on the sealed sources and reference standards was completed by the consultant.
 - J. The semi-annual ventilation check of the airflow system was completed and verified that a negative air pressure exists in the Nuclear Medicine Department.
 - K. The quality control checks performed on the dose calibrator and survey instruments verify that these instruments are operating properly.
2. Dr. indicated that the State of ... still requires an amendment to be filed when adding an authorized user. The NRC has adopted a change to their regulations, which only requires the licensee to notify the NRC when adding an authorized user who is Board Certified or listed on another radioactive material license. The State of ...has not yet adopted this regulation.

Respectfully submitted,

Radiation Safety Officer

/jjz