40-7102

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November 28, 1995

Mr. Gary C. Comfort, Jr.
Licensing Section 2
Division of Fuel Cycle Safety and Safeguards, NMSS
U. S. Nuclear Regulatory Commission
Washington, D. C. 2055-0001

RE: Radiation Safety Procedures - Newfield Facility

Dear Mr. Comfort:

Enclosed herewith, please find a copy of the following Radiation Safety Procedures (RSPs) being supplied to the Nuclear Regulatory Commission staff (NRC) to assist in evaluating Shieldalloy Metallurgical Corporation's (SMC) revised license renewal application submitted to the NRC on September 15, 1995. You will note that these procedures are not part of the renewal application and are not intended to become license conditions in and of themselves, but are provided to allow NRC to fully understand the scope and extent of the license renewal application. These procedures are currently in draft form and will not be finalized until the renewed license is issued by NRC. However, we do not anticipate that they will be substantially different than they are now. Per your request, you will be provided initial copies of the finalized procedures and updates annually thereafter.

You will be aware that there are three procedures listed in the Radiation Protection Program Plan that are not included in this package. One of these procedures, RSP 013, "Control of Radioactive Waste" has been deleted because SMC does not generate any radioactive waste. The Radiation Protection Program Plan will be revised to reflect this change. The other two procedures, RSP 014 "Receipt, Handling, and Identification of Radioactive Materials" and RSP 015 "Packaging and Transportation of Radioactive Materials" will be finalized after training of the personnel involved has taken place in mid December. Both of these RSPs will be transmitted to the NRC when the training has been completed.

NMSS

Please let me know if you need additional information or if there are any questions regarding these procedures.

Very Truly Yours,

C. Scott Eves
Vice President, Environmental Services

Enclosures:
RSP002: Definitions
RSP004: Radiation Protection Records
RSP005: ALARA Program
RSP006: Training and Qualifications of Radiation Protection Personnel
RSP007: Training in Radiation Protection
RSP008: Instrumentation and Surveillance
RSP009: Contamination Control
RSP010: Exposure Control
RSP011: Radiological Areas and Posting
RSP012: Control of Work
RSP016: Emergency Response and Notifications
RSP017: Stop Work Authority

cc: w/o enclosures
HNS
KRP
JPV
Carol Berger

SMC	DEFINITIONS - NEWFIELD	Procedure No: RSP-002	Page: 1 of 17
		Revision No. 000	Date: September 8, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Chair, RSC):	

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CONTROLLED COPY NO. : _____

1 PURPOSE

This procedure provides definitions of terms used in the Shieldalloy Metallurgical Corporation (SMC) Radiation Protection Program Plan and in Radiation Safety Procedures. Its purpose is to ensure consistent implementation through a common understanding of applicable terms.

2 SCOPE

The definitions contained in this Radiation Safety Procedure apply to activities and procedures performed in support of the SMC Radiation Protection Program Plan.

3 REFERENCES

3.1 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.2 Title 49, Code of Federal Regulations, "Transportation"

3.3 Title 10, Code of Federal Regulations, "Nuclear Regulatory Commission"

3.4 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan".

4 DEFINITIONS

4.1 A_1 and A_2 Quantities - The maximum quantity of radioactive material permitted in a Type A package. The A_2 quantity is used when the physical form has not been certified as a special form by the DOT. These quantities are listed by individual isotopes in the DOT regulations, 49 CFR 173.435.

4.2 Absorbed Dose - The energy imparted by ionizing radiation per unit mass of irradiated material. The units of absorbed dose are the rad and the gray (Gy).

4.3 Activity - Disintegration rate of a radioactive material stated in dps, becquerels, μCi, nCi, pCi, or other acceptable units.

4.4 Airborne Radioactive Material - Radioactive material dispersed in the air in the form of dusts, fumes, particulates, mists, vapors or gases.

4.5 Airborne Radioactivity Area - A room, enclosure, or area in which airborne radioactive materials, composed wholly or partly of licensed materials, exist in concentrations in excess of the DAC specified in 10 CFR 20.1001-20.2401 or, to such a degree that an individual present in the area could incur an exposure of 12 DAC-hours in a week.

4.6 ALARA (acronym for "as low as is reasonably achievable") - Making every reasonable effort to maintain exposures to radiation as far below the regulatory dose limits as is practical consistent with the purpose for which the licensed activity is undertaken, and taking into account the state of technology, the economics of improvements in relation to state of technology, the economics of improvements in relation to benefits to the public health and safety, and in relation to the utilization of licensed materials in the public interest.

4.7 Alpha decay - Spontaneous emission of an alpha particle from the nucleus of an atom.

4.8 Alpha particle - A positively charged particle ejected spontaneously from the nuclei of some radioactive elements. It is identical to a helium nucleus that has a mass number of four (4) and an electrostatic charge of +2.

4.9 Alternate Radiation Safety Officer (ARSO) - An individual who is qualified to serve as RSO in the absence of the RSO. An individual assigned to the position of ARSO shall perform work under the direct supervision of the RSO until such time as the ARSO meets the qualifications of the RSO.

4.10 Annual Limit on Intake (ALI) - The derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by Reference Man that would result in a committed effective dose equivalent of 5,000 millirems or a committed dose equivalent of 50,000 millirems to any individual organ or tissue. ALI values are given in Table 1, Columns 1 and 2 of Appendix B, 10 CFR 20.1001-2401.

4.11 Approval - An act of endorsing or adding positive authorization or both.

4.12 Attenuation - The process by which a beam of radiation is reduced in intensity when passing through some material. It is the combination of absorption and scattering processes and leads to a decrease in flux density of the beam when projected through matter.

4.13 Authorized User - Employees who supervise the use of radioactive material and who supervise individuals who work with radioactive material. Authorized users are qualified, by training and experience, to assure radioactive material is used for its intended purpose in a manner that protects health and minimizes danger to life or property. Training and qualifications of authorized users is contained in RSP-006, "Training and Qualifications of Radiation Protection Personnel".

4.14 Becquerel - A unit, in the International System of Units (SI), of measurement of radioactivity equal to one disintegration per second.

4.15 Beta decay - Spontaneous emission of a beta particle from the nucleus of an atom.

4.16 Beta particle - A charged particle emitted from a nucleus during radioactive decay, with a very small mass. A negatively charged beta particle is identical to an electron. A positively charged beta particle is called a positron.

4.17 Bioassay - Measurement of amount or concentration of radioactivity in the body or in material excreted or removed from the body for purposes of estimating the quantity of radioactive material in the body.

4.18 Breathing Zone - That region adjacent to a worker's mouth and nostrils from which air is drawing into the lungs while performing his/her assigned work. Air sampled from this region represents the air the worker breaths while at work, whether standing, sitting, or moving.

4.19 Background Radiation - The ambient radiation field to which we are exposed daily, originating from cosmic rays, naturally-occurring radionuclides (^{40}K, etc.) and human endeavors (fallout, fuel cycle, etc.). This radiation field is variable, and causes a survey meter to respond in the absence of radioactive materials.

4.20 Calibration - Determining the response of an instrument relative to a series of reference values over the range of the instrument; or the strength of a source of radiation relative to a reference standard.

4.21 Committed Dose Equivalent - The time integral, over 50 years, of the dose equivalent rate in an organ or a tissue following intake of a radionuclide:

$$H_{50} = \int_{t=0}^{t=50} H(t)\ dt$$

where t = 0 is the time of intake and H(t) is the dose equivalent rate in an organ or a tissue at time t.

4.22 Committed Effective Dose Equivalent - The sum of the committed dose equivalents to individual tissues resulting from an intake of a radionuclide multiplied by the appropriate weighting factors (w_T):

$$CEDE = \sum w_T H_T \leq H_{wb}$$

where w_T = the weighting factor representing the ratio of the stochastic risk resulting from irradiation of tissue (T) to the total risk when the whole body is irradiated uniformly; and H_T is the dose equivalent received by tissue (T).

4.23 Contaminated Waste - Any waste generated which is contaminated by licensable radioactive materials.

4.24 Contamination - The deposition of radioactive material on accessible surfaces of structures, objects, equipment, or personnel. Contamination may be either "fixed" (e.g., not removable by rubbing with a dry smear) or "removable". Total Contamination refers to fixed plus removable contamination.

4.25 Contamination Area or Zone - Any area which contains removable or total (fixed plus removable) activity in excess of site-specific release criteria.

4.26 Controlled Area - The fenced area within the Newfield site boundaries, access to which can be limited by SMC for any reason. A controlled area is one in which exposure of personnel to radiation or radioactive material is controlled under the supervision of an individual who is knowledgeable of radiation safety practices.

4.27 Controlled Copy - A facsimile of a master copy.

4.28 Corrective Action - Measures taken to rectify conditions adverse to quality and, where necessary, to preclude repetition.

4.29 Critique - A meeting of management and involved/concerned personnel to analyze an event to determine what happened, why it happened, and how to minimize or prevent recurrence.

4.30 Curie - The basic unit used to describe the intensity of radioactivity in a sample of material. The curie is equal to 37 billion disintegrations per second, which is approximately the rate of decay of one (1) gram of radium.

4.31 DAC-hours - A unit of internal radiation exposure. For purposes of workplace control, the secondary occupational dose limit is 2,000 DAC-hours.

4.32 Daughter Products - Isotopes that are formed by the radioactive decay of some other isotope. In the case of Thorium-232, for example, there are 10 successive daughter products, ending in a stable isotope of lead.

4.33 Decay - the decrease in the amount of any radioactive material with the passage of time, due to the spontaneous emission from the atomic nuclei of either alpha or beta particles, often accompanied by gamma radiation.

4.34 Decontamination - The reduction or removal of contaminating radioactive material from a structure, area, object, or person.

4.35 Deep Dose Equivalent (H_d) - The dose equivalent from external whole body exposure at a tissue depth of one (1) centimeter.

4.36 Derived Air Concentration (DAC) - The concentration of a given radionuclide in air which, if breathed by Reference Man for a working year of 2,000 hours under conditions of light work (inhalation rate of 1.2 m^3 per hour) results in an intake of one Annual Limit on Intake (ALI). DAC values are given in Table 1, Column 3 of Appendix B, 10CFR 20.1001-2401.

4.37 Direct Bioassay - In vivo measurements to estimate the quantity of radioactive material in the human body using instrumentation that detects radiation emitted from within the body.

4.38 Dose - A generic term that means absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or total effective dose equivalent, as defined elsewhere in this RSP.

4.39 Dosimeter - A portable instrument or device for measuring and registering the total accumulated exposure to ionizing radiation.

4.40 Draft Copy - A facsimile of a master or controlled document and so designated.

4.41 Dry Combustible Waste - Combustible, dry solids including plastic bags, absorbent paper and protective equipment used to prevent the spread of contamination.

4.42 Escorted personnel - Individuals (e.g., visitors, contractors) who have not received training in radiation protection. These individuals are under the direct supervision of a trained employee while they are within the controlled area.

4.43 Extremity - The arms below the elbow and the legs below the knee. It includes the hands, fingers, feet and toes.

4.44 Eye Dose Equivalent (H_e) - The dose equivalent to the lens of the eye from external whole body exposure at a tissue depth of one (0.3) centimeter.

4.45 Flammable Liquids - Any liquid having a flash point below 100 degrees fahrenheit (°F) or 37.8 degrees centigrade (°C). This includes materials like, acetone, alcohols, hexane and ethers. Other flammable liquids are listed in the DOT regulations (49 CFR 172).

4.46 Flammable solids - Any solid material, other than an explosive, which under conditions normally incident to transportation, is liable to cause fires through friction, retained heat and when ignited, burns vigorously as to create a serious transportation hazard. This includes materials like, charcoal, phosphorous, lithium metal and magnesium metal. Other flammable solids are listed in DOT regulations, 49 CFR 172.101.

4.47 Gamma Ray - High energy, short wavelength electromagnetic radiation (a packet of energy) emitted from the nucleus. Gamma radiation frequently accompanies alpha and beta emissions and always accompanies fission.

4.48 General Employee - Any employee, visitor, or contractor who is permitted unescorted access to the controlled area.

4.49 Halflife, Biological (T_b) - The time in which half the quantity of a material in a compartment, in an organ, or in the whole body is eliminated by biological processes.

4.50 Halflife, Effective (T_e) - The time taken for the activity of a radioactive material in a compartment, in an organ or in the whole body to be reduced to half its value by a combination of biological elimination and radioactive decay:

$$\frac{1}{T_e} = \frac{1}{T_b} + \frac{1}{T_R}$$

where T_e = the effective half time; T_b = the biological half time; and T_R = the radiological or physical half time.

4.51 Halflife, Physical (T_R) - The time taken for the activity of a radionuclide to lose half its value by radioactive decay.

4.52 Health Physics - The science concerned with recognition, evaluation and control of health hazards from ionizing and nonionizing radiation.

4.53 High Radiation Area - Any area, accessible to individuals, in which there exists radiation at levels that could expose a major portion of the body to more than 100 millirem in one hour measured at 30 cm from the source or surface that the radiation penetrates.

4.54 Incident/Event - Potential conditions or real occurrences which are described in the appendices to this procedure. Incidents may include power failures, minor spills of radioactive materials, or radioactive contamination that present no significant hazard to personnel, etc. Emergency situations may include fires, acute illness or personnel injuries involving a contamination hazard, major spills, accidents resulting in personnel exposure to radioactive dusts, mists, fumes, organic vapors or gases.

4.55 Indirect Bioassay - Estimate of the amount of radioactive material in the human body based on measurements of radioactive material in excreta or in other biological materials from the body, and on a biological model for movement of the material in body tissues and organs.

4.56 Inner Container - A container or some other package that surrounds the compound being transported. The inner container provides the first level of containment in order to minimize the likelihood of a spill.

4.57 Intake - Amount of radioactive material entering the body through the nose, mouth, or skin.

4.58 Internal Dosimetry - Specification, analysis, and interpretation of bioassay measurements that result in an estimate of internal dose equivalent or dose commitment.

4.59 International Air Transport Association (IATA) - Association of commercial airline companies which publish regulations addressing the conveyance of goods and passengers via air.

4.60 Ionizing Radiation - Any radiation capabile of displaing electrons from atoms or molecules, thereby producing ions. Examples are alpha, beta, gamma, x-rays, neutrons, and ultraviolet light.

4.61 Isotope - One of two or more atoms with the same number of protons but different numbers of neutrons in their nuclei. Carbon-12, carbon-13 and carbon-14 are isotopes of the element carbon. Isotopes have very nearly the same chemical properties, but often different physical properties.

4.62 Labels - Shipping labels prescribed by the DOT to provide a warning of the hazard of the material contained within the package and information about the safe segregation of shipping packages. Labels are affixed to the exterior of the package.

4.63 License - A radioactive materials license issued by the USNRC in accordance with the regulations adopted by the USNRC.

4.64 Limited Quantity - A maximum quantity of a hazardous material listed by the DOT, for which there are specific exceptions from marking, labeling and packaging. The quantity of radioactive material that is exempted from these requirements is listed in 49 CFR 173.421.

4.65 Low Specific Activity (LSA) - A concentration of radioactive material that is not likely to result in a significant radiation exposure if the integrity of the shipping package is breached. The following guidelines are used to establish the criteria.

4.65.1 Material in which the radioactivity is essentially uniformly distributed and in which the average concentration of the compound, excluding the weight of the shipping package, does not exceed:

4.65.1.1 0.0001 millicurie per gram (mCi/gm) for isotopes in which the A_2 quantity is not more than 0.05 Curies (Ci); or

4.65.1.2 0.005 mCi/gm for isotopes in which the A_2 quantity is not more than 1 Ci; or

4.65.1.3 0.3 mCi/gm for isotopes in which the A_2 quantity is not more than 1 Ci.

4.65.1.4 Uranium or thorium ores and their chemical concentrates (concentrations in excess of 2,000 pCi/g).

4.65.1.5 Tritium Oxide in aqueous solutions in which the concentration does not exceed 5 mCi per milliliter (5 mCi/ml).

4.65.2 Objects of nonradioactive material externally contaminated with radioactive material that is not readily dispersed and the surface contamination, averaged over a square meter does not exceed:

4.65.2.1 0.01 mCi per 100 square centimeters (cm^2) (2.22×10^7 dpm per 100 cm^2) for isotopes in which the A_2 quantity is not more than 0.05 Curies; or

4.65.2.2 0.1 mCi/100 cm^2 (2.22×10^7 dpm/100 cm^2) for isotopes in which the A_2 quantity is greater than 0.05 Ci.

4.66 Markings - Information printed or durably affixed to the exterior of the shipping package.

4.67 Master (Original) - A procedure or record on whic the original approval (via signatures) have been affixed or authorized.

4.68 May - The word may is used to denote permission.

4.69 Milliroentgen per hour (mR/hr) - A unit of gamma exposure rate. One mR/hr shall be equivalent to 1000 μR/hr.

4.70 Minor change - Refers to changes to RSPs. A minor change is one that does not substantively effect the actions required in the procedure. For example, typographical changes and formatting changes are considered to be minor changes.

4.71 Monitored Employee or Personnel - An individual who performs work within a restricted area and has the potential to receive greater than 500 millirem total effective dose equivalent in one calendar year.

4.72 Monitoring - The measurement of radioactivity in the whole body, in a region of the body, in material eliminated from the body or in the air for purposes of estimating the intake of radioactive material. The term monitoring also includes interpretation of the measurements. It may consist of the use of personnel dosimetry devices for measurement of deep dose equivalent from external sources, or bioassay services for measurement of committed effective dose equivalent.

4.72.1 Routine monitoring is monitoring carried out at regular intervals during normal operations.

4.72.2 Special monitoring is monitoring carried out in actual or suspected abnormal conditions.

4.72.3 Confirmatory monitoring is monitoring carried out in situations where workers are unlikely to be exposed to significant intakes, in order to demonstrate satisfactory work conditions.

4.73 Neutron - An uncharged elementary particle with a mass slightly greater than that of the proton, and found in the nucleus of every atom heavier than hydrogen.

4.74 Nucleus - The small, central, positively charged region of an atom that carries essentially all the mass. Except for the nucleus of ordinary hydrogen, which has a single proton, all atomic nuclei contain both protons and neutrons. The number of protons determines the total positive charge, or atomic number. The total number of neutrons and protons is called the mass number.

4.75 Nuclide - A general term referring to all known isotopes, both stable (about 279) and unstable (about 5,000), of the chemical elements.

4.76 Organ - A differentiated part of the body that performs a special function.

4.77 ORM E - Other Regulated Material (ORM) that may pose an unreasonable risk to health, safety or property when transported in commerce, and does not meet any of the definitions of the other hazard classes. This includes materials such as hazardous substances, n.o.s., polychlorinated biphenyls, mercaptans, or dinitrotoluene. Most shipments of hazardous waste as defined by the EPA and the RCRA regulations that do not satisfy the DOT hazard classes are defined as ORM-E.

4.78 Parent - A radionuclide that upon radioactive decay or disintegration yields a specific nuclide (the daughter).

4.79 Personnel Monitoring - The determination of the degree of radioactive contamination on individuals using survey meters, the determination of radioactivity inside of individuals using some form of bioassay, or the determination of radiation dosage received by means of dosimetry devices.

4.80 Placard - A large diamond shaped sign indicating the hazard class of the materials being transported. The placard shall be affixed to four sides of the transport vehicle.

4.81 President - Designated senior manager of SMC with the authority to commit SMC resources for health and safety purposes, and with administrative influence over all participants in radiation protection activities.

4.82 Proton - An elementary nuclear particle with a positive electric charge located in the nucleus of an atom.

4.83 Pocket Ionization Chambers (PIC) - A self-indicating, dose integrating device which is considered to be a "secondary" dosimetry device. A PIC shall not be worn without a primary dosimetry device (TLD) for the dose of record.

4.84 Quality Assurance Director (QAD) - Individual assigned to administer the quality assurance program at SMC.

4.85 Quality Assurance Record - A completed document that furnishes evidence of the quality of items and/or activities affecting quality.

4.86 Radiation - Alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions.

4.87 Radiation Area - Any area, accessible to individuals, in which there exists radiation at levels that could expose a major portion of the body to more than five (5) millirems in one hour measured at 30 cm from the source or surface that the radiation penetrates.

4.88 Radiation Safety Committee (RSC) - A standing committee comprised of management, health/safety, quality assurance, human resources, operations personnel and employee representatives that provides oversight for the radiation protection program. Members are appointed and empowered by the President. The RSO, the ARSO, the Safety Manager, the Vice President of Human Resources, and the Vice President/General Manager are permanent members of the RSC.

4.89 Radiation Safety Officer (RSO) - An individual who, by virtue of qualifications and experience, has been given the authority to implement the Radiation Protection Program Plan. The RSO directs the use of radioactive material or radiation-producing machines for their intended purpose in a manner that protects health and minimizes danger to life or property. The RSO is responsible for recognizing potential radiological hazards, developing a radiation safety program to protect against these hazards, training workers in safe work practices, and supervising day-to-day radiation safety operations.

4.90 Radiation Safety Procedure (RSP) - A document that specifies or describes how an activity is to be performed. It may include methods to be employed, equipment or materials to be used, the sequence of operations, and the records to be maintained.

4.91 Radiation Surveyors - Personnel who perform work at the Newfield site involving radioactive materials or radiation-producing machines, such as inventory/management, receiving activities, shipping/receiving activities, release surveys, area surveys, contamination surveys, leak tests, radiation survey records maintenance, and quality assurance activities as they pertain to radiation protection activities. Radiation Surveyors may be permanent employees, contracted workers, or consultants. Training and qualifications of Radiation Surveyors is contained in RSP-006, "Training and Qualifications of Radiation Protection Personnel".

4.92 Radiation Survey Instrument - An instrument capable of detecting ionizing radiation.

4.93 Radiation Worker - An occupational worker who may enter restricted areas and who has the potential to receive greater than 100 millirem TEDE in a calendar year. Training and qualifications of radiation workers is contained in RSP-007, "Training in Radiation Protection".

4.94 Radiation Work Permit (RWP) - An authorizing document that establishes the radiological requirements for working with known or potential radiological hazards. Its purpose is to instruct personnel how to work safely around radioactive materials and to define controls to prevent the spread of contamination. The contents of an RWP are described in RSP-012, "Control of Work".

4.95 Radioactive Material - Any solid, liquid or gaseous substance which emits radiation spontaneously.

4.96 Radioactive Material Storage Area - An area where radioactive materials are secured from unauthorized removal or access, or where constant surveillance over the materials is maintained.

4.97 Radioactive Shipping Labels - A label applied to two sides of a shipping package bearing the radiation symbol and the isotope and quantity contained in the package. The label shall be indicative of the external radiation levels measured on the surface of the package. Specifically:

4.97.1 White Bar I - gamma radiation levels on the surface of the package are less than 0.5 mR/hr.

4.97.2 Yellow Bar II - gamma radiation levels on the surface of the package are less than 50 mR/hr.

4.97.3 Yellow Bar III - gamma radiation levels on the surface of the package are less than 200 mR/hr.

4.98 Radiological Protection Hold Points - Checklist or procedures generated following a Stop-Work order that must be addressed before work can resume or continue past the holding point.

4.99 Reference Man - A person with the anatomical and physiological characteristics defined in the report of the ICRP Task Group on Reference Man (ICRP Report No. 23).

4.100 Rem - The special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rem is equal to the absorbed dose in rad multiplied by the quality factor. One rem is equal to one sievert.

4.101 Representative - Faithfully showing the quality and characteristics of the entire volume from which a sample is drawn or a measurement is made.

4.102 Research and Development - Theoretical analysis, exploration, or experimentation; the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials, and processes.

4.103 Restricted Area - An area at the Newfield facility, accessible to humans, to which access is limited by SMC for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. At the Newfield facility, a restricted area has an ambient exposure rate and/or contamination levels that may result in an individual receiving a total effective dose equivalent in excess of 100 millirem per year.

4.104 Restricted Use - Equipment, components, materials, land areas (property), and other items that, by virtue of their levels of fixed and/or removable radioactivity are maintained under the control of SMC or transferred to another licensee.

4.105 Retention Function - A mathematical expression for that fraction of the initial body content of radioactive material retained in the organ of reference at time t after intake. The retention function is represented by the expression R(t).

4.106 Roentgen - A unit of exposure to ionizing radiation that reflects the amount of gamma or x-rays (less than 3 MeV energy) required to produce ions carrying one (1) electrostatic unit o electrical charge in one (1) cubic centimeter of dry air under standard conditions.

4.107 Root Cause - The most basic, fundamental cause, which, if corrected will prevent recurrence. There may be more than one root cause of an incident or event.

4.108 Sample - A representative portion of an atmosphere, volume or mass of interest, or one or more separated constituents from a representative portion of an atmosphere, volume or mass.

4.109 Shall - The word shall is to be understood as a requirement.

4.110 Shallow Dose Equivalent (H_s) - The dose equivalent from external whole body exposure at a tissue depth of one (0.007) centimeter, averaged over an area of one (1) square centimeter.

4.111 Shield or Shielding - Any material or obstruction that absorbs radiation and thus tends to protect personnel or materials from the effects of ionizing radiation.

4.112 Shipping Paper - A bill of lading, shipping order, manifest or other shipping document containing information about the materials being transported. The information to be included in this shipping document is prescribed by the DOT in 49 CFR 172.202 through 172.204.

4.113 Should - The word should is to be understood as a recommendation.

4.114 Smear - Mechanism for removing surface contamination for the purpose of assessing its type and/or quantity.

4.115 Source Material - Materials that contain one-twentieth of one percent (0.05%) or more of uranium, thorium, or any combination thereof.

4.116 Specific Activity - The amount of radioactivity per unit mass of material. The units of specific activity are generally "curies per gram".

4.117 Strong, Tight Container - A package not likely to lose its contents under conditions normally incident to transportation.

4.118 Surface Contamination - Radioactive materials that are removable from the surface of equipment, tools, containers, structures or personnel.

4.119 Swipe - Mechanism for removing surface contamination for the purpose of assessing its type and/or quantity.

4.120 Thermoluminescent Dosimeter (TLD) - The thermoluminescence phosphor(s) used for determining external radiation exposure to beta, gamma, x-rays, and/or neutrons. The words TLD and dosimeter may be used interchangeably.

4.121 Thorium - An element whose atomic number is 90, and whose atomic weight is 232.038. Isotopes of thorium include thorium-227, thorium-228, thorium-230, and thorium-232. There are no stable isotopes of thorium.

4.122 Total Dose Equivalent (TDE) - The sum of the deep dose equivalent (for external exposures) and the committed dose equivalent (for internal exposures).

4.123 Total Effective Dose Equivalent (TEDE) - The sum of the deep dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

4.124 Transport Index - A number on the label of a package that indicates the degree of radiological control to be exercised by the carrier during transport. The transport index is the maximum radiation exposure rate, in units of "millirem per hour" measured at a distance of one (1) meter form the external surface of the package.

4.125 Type A Container - A shipping container designated by the Department of Transportation (DOT) to package radioactive materials. The configuration for each package is approved by the DOT and published in the Mound Laboratory Manual, MLM 3245 and supplements. The maximum quantity of radioactive materials is limited to the A_1 quantity for materials certified to be special form or limited to the A_2 quantity for other physical forms.

4.126 Type A Quantity - A quantity of radioactive material, the aggregate radioactivity of which does not exceed A_1 for special form radioactive material or A_2 for normal form radioactive material, where A_1 and A_2 are given in 49 CFR 173.435 or may be determined by procedures described in 49 CFR 173.433.

4.127 Uniform Hazardous Waste Manifest - A shipping paper on which all hazardous waste is identified. A copy of the manifest shall accompany each shipment of hazardous waste from the point of pickup to the destination.

4.128 Uncontrolled Copy - A facsimile of a master or controlled document, and so designated, that is intended for customer, contractor, or other internal use.

4.129 Unrestricted Area - Any area to which access is not controlled for the purposes of protecting individuals from exposure to radiation and radioactive material.

4.130 Unrestricted Use - Equipment, components, materials, land areas (property), and other items that may be used, transferred, sold, or disposed of without regard for their radiological constituents.

4.131 Uranium - An element whose atomic number is 92, and whose atomic weight is 238.029. Isotopes of uranium include uranium-233, uranium-235 and uranium-238. There are no stable isotopes of uranium.

4.132 USNRC - Acronym for "United States Nuclear Regulatory Commission", a federal regulatory agency.

4.133 Very High Radiation Area - Any area where an individual may receive an effective dose equivalent from external sources of 500 rads or greater in one hour measured at a distance of one (1) meter from the radiation source or from any surface through which the radiation penetrates.

4.134 Visitor - An individual who is not assigned to the Newfield site or field sites, and who does not perform physical work activities (e.g., inspectors, auditors, supervisors, vendors) for SMC.

4.135 Waste - A material of any form (e.g., solid, liquid, or gas) that serves no useful purpose.

4.136 Waste Generator - Any person who creates waste that is contaminated with radioactivity.

5 PROCEDURE

None

6 EXEMPTION PROVISIONS

None

7 DOCUMENTATION

None

8 ATTACHMENTS

None

SMC	RADIATION PROTECTION RECORDS - NEWFIELD FACILITY	Procedure No: RSP-004	Page: 1 of 11
		Revision No. 000	Date: September 19, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Co-Chair, RSC):	

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1 PURPOSE

This procedure describes the records necessary to document implementation of the Shieldalloy Metallurgical Corporation (SMC) Radiation Protection Program Plan and to demonstrate compliance with USNRC license requirements.

2 SCOPE

2.1 This procedure applies to records generated during implementation of the Radiation Protection Program Plan and Radiation Safety Procedures (RSPs).

2.2 Records that pertain to operations, facilities or personnel that do not involve license requirements and Radiation Protection Program Plan provisions are exempt from the requirements of this Radiation Safety Procedure.

3 REFERENCES

3.1 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.2 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan".

3.3 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-003, "Control of Radiation Safety Procedures".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The President and the RSC shall oversee the implementation of this RSP.

5.1.2 The Radiation Safety Officer (RSO) shall

5.1.2.1 Maintain copies of records generated during implementation of the radiation protection program and RSPs.

5.1.2.2 Periodically review the radiation protection records to ensure compliance with the requirements of this procedure.

5.1.2.3 Remain knowledgeable of the type, quantity and location of all radiation protection records.

5.1.2.4 Ensure backup copies of radiation protection records exist.

5.1.3 The Vice President of Human Resources shall maintain the original copy of records relating to individuals (e.g., training records, USNRC Form 5, and medical records).

5.1.4 Radiation Surveyors, Authorized Users, contractors and visitors that provide radiation protection services shall submit records generated during implementation of the Radiation Protection Program and RSPs to the RSO.

5.2 Form and Storage of Records

5.2.1 Records shall remain legible through the retention period specified in Section 5.10.

5.2.2 Records may consist of the original or a reproduced copy or a microfilm copy, provided the microfilm is authenticated by the RSO.

5.2.3 Occupational radiation exposure records shall be kept confidential, and the following controls shall be in place:

5.2.3.1 Records shall be kept in a locked cabinet (or equivalent) except when in use.

5.2.3.2 There shall be a primary and backup custodian for the records.

5.2.3.2.1 The primary custodian shall be the RSO.

5.2.3.2.2 The backup custodian shall be the Vice President of Human Resources.

5.2.4 Safeguards against tampering with and the loss of records should be implemented.

5.3 Records from Purchased Services

5.3.1 If SMC or the RSO purchases radiation protection services from another firm, records clearly delineating responsibilities both during and subsequent to the performance of the services shall be specified on the Request for Purchase Order.

Note: Common examples of purchased services include personnel dosimetry (TLD) services, bioassay analyses, radiation surveyor (health physics technician) support, instrument calibrations, and consulting services.

5.3.2 The RSO should ensure that pertinent records requirements are being met during contract administration.

5.3.3 Records requirements should include:

5.3.3.1 Retention of written information of sufficient scope to define the procedure and method of evaluation; and

5.3.3.2 Data and computed results.

5.4 Records Related to an Individual

5.4.1 The purpose of individual records is to enable the RSO to provide an accurate, quantitative description of the occupational radiation exposure received by monitored individuals.

5.4.2 Examples of individual records are:

5.4.2.1 External radiation monitoring results;

5.4.2.2 Internal radiation monitoring results;

5.4.2.3 Supplementary information on individual exposures (e.g., radiation incident investigation reports); and

5.4.2.4 Documentation of proficiency in radiological training and qualification requirements.

5.4.3 Identification of the individual:

5.4.3.1 Positive identification of the individual employee, visitor, or contractor shall be required.

5.4.3.2 Due to such factors as multiple employment, duplication of common names, and legal changes of names, the Social Security number shall be used for individual identification.

5.4.3.3 For those cases where Social Security numbers are not available (e.g., foreign nationals), the birth date and sex of the individual shall accompany the individual's employee number on all records.

5.4.4 Radiation exposure received during prior employment:

5.4.4.1 A summary of the occupational radiation exposure received by a monitored employee during previous employment shall be obtained.

5.4.4.2 The RSO shall attempt to secure and record the following information when radiation exposure is indicated for previous employment:

5.4.4.2.1 Period(s) of employment and identification of employer.

5.4.4.2.2 The nature and magnitude of prior occupational exposure, both internal and external, for the periods in question.

5.4.5 Exposure Received by Individuals at Other Installations or Facilities During Employment by SMC:

5.4.5.1 The RSO shall attempt to secure and record the radiation exposure received by monitored employees at facilities other than SMC.

5.4.5.2 When necessary, in order to maintain continuity in exposure data, the RSO may provide dosimetry devices to employees during official visits to other facilities.

5.4.5.3 The RSO shall encourage employees to report when radiation exposure is being incurred at other facilities.

5.4.6 Records of External Exposure

5.4.6.1 The following information shall be retrievable either directly or indirectly from personnel dosimetry records:

5.4.6.1.1 Identification of the wearer of the dosimeter;

5.4.6.1.2 Period of exposure or deployment;

5.4.6.1.3 Type(s) of phosphor, lot number, or processing batch identifiers;

5.4.6.1.4 Control dosimeter readings and confidence limits;

5.4.6.1.5 Personnel dosimeter readings and confidence limits;

5.4.6.1.6 Notation of abnormalities;

5.4.6.1.7 Identification of individual processing the dosimeter;

5.4.6.1.8 Computed dose for each type of radiation for the specified period;

5.4.6.1.9 Appropriate summation to facilitate comparison with permissible limits; and

5.4.6.1.10 Identification of the individual performing dose computations.

Note: This information is typically maintained by the vendor and should be requested in purchase orders

5.4.6.2 When the dosimeter is the primary means of external dose assessment, the records shall be continuous for the period in question.

5.4.6.3 If a valid measurement result cannot be obtained from the personnel dosimeter, an estimate of the radiation exposure shall be recorded after performance of an investigation. The record of investigation may include, but is not limited to:

5.4.6.3.1 Identification of the individual;

5.4.6.3.2 Dates involved;

5.4.6.3.3 Nature of the abnormality (e.g., contaminated dosimeter, lost dosimeter);

5.4.6.3.4 Location and tasks to which the individual was assigned;

5.4.6.3.5 Readings from other dosimeters worn by the individual;

5.4.6.3.6 Dose received by others working under similar conditions;

5.4.6.3.7 Results of time-and-motion studies;

5.4.6.3.8 Conclusions as to magnitude and type of occupational exposure actually incurred; and

5.4.6.3.9 Signature of the RSO.

5.4.7 *Records of Internal Exposure*

5.4.7.1 When indirect bioassay analyses are performed the following information should be directly or indirectly retrievable from the records:

5.4.7.1.1 Identification of the individual;

5.4.7.1.2 Purpose of the sample and, if applicable, date of suspected intake;

5.4.7.1.3 Collection period for the sample and the date submitted for analysis;

5.4.7.1.4 Type of sample and size of aliquot;

5.4.7.1.5 Type of radioactivity (e.g., alpha, beta);

5.4.7.1.6 Gross and net activity observed, and the counting time;

5.4.7.1.7 Identity of all radionuclides detected;

5.4.7.1.8 Cross reference to calibration and control data and confidence limits; and

5.4.7.1.9 Identification of the laboratory technicians performing the analysis.

Note: This information is typically maintained by the analytical laboratory or bioassay vendor and should be requested in purchase orders

5.4.7.2 Records of indirect bioassay interpretation shall include the following:

5.4.7.2.1 A listing of the bioassay data used in the interpretation and the identity of the radionuclide;

5.4.7.2.2 Reference to the method of interpretation;

5.4.7.2.3 Assumptions used in arriving at the conclusion including the known or assumed date of intake;

5.4.7.2.4 Conclusion as to the magnitude and location of the body burden, expressed in units of activity (i.e., curies or becquerels); and

5.4.7.2.5 Identification of the individual making the conclusion.

5.4.8 Other Individual Exposure Records

5.4.8.1 Completed Form USNRC Form-5

5.4.8.2 Completed Form USNRC Form-4

5.4.8.3 Accident Reports

5.4.8.4 Personnel Decontamination Records

5.4.8.5 Radiation Work Permits

5.4.8.6 Dose estimates and justifications for those estimates

5.5 Radiation Safety Training Records

5.5.1 The Vice President of Human Resources shall maintain records associated with delivery of general employee training in radiation protection, radiation worker training, authorized user training, and special briefings.

5.5.2 Specific training records should include:

5.5.2.1 Outline or course lesson plan indicating the name of the instructor, the company that provided the training, the date and time the training was conducted, the name or number of the test used for the class, employee test results, and course critiques.

5.5.2.2 Training Attendance Records

5.5.2.3 Performance Verification Sheets for all radiation protection personnel completed pursuant to RSP-006.

5.6 Medical Services Provided to an Individual

5.6.1 In certain cases, medical services (i.e., periodic chest x-rays, examinations following occupational injuries, medical qualification for respirator usage, etc) may be provided to SMC employees.

5.6.2 These records shall be forwarded to the Vice President of Human Resources.

5.7 Records to be Maintained by the RSO

5.7.1 Program Administration

5.7.1.1 Records Index

5.7.1.2 Minutes of the Radiation Safety Committee Meetings

5.7.1.3 Statement of RSO, Radiation Surveyor and Authorized User Qualifications

5.7.2 Radioactive Material License

5.7.2.1 Application

5.7.2.2 License and Amendments

5.7.2.3 Inspections by the USNRC

5.7.2.4 Correspondence with the USNRC

5.7.3 USNRC Regulations

5.7.3.1 Title 10, Code of Federal Regulations, Parts 19 and 20.

5.7.3.2 Referenced USNRC Regulatory Guides

5.7.3.3 Information Notices from the USNRC

5.7.4 Program Documentation

5.7.4.1 Current revision of active RSPs

5.7.4.2 Procedure Manual Transmittal Forms

5.7.4.3 Procedure Transmittal Forms

5.7.5 Contamination Control Records

5.7.5.1 Radiation Work Permits

5.7.5.2 Contamination Survey Records

5.7.5.3 Blank Floor Plans

5.7.5.4 Equipment/Area Decontamination Records

5.7.6 Licensed Material Inventory Records

5.7.7 Site Monitoring Records

5.7.7.1 Radiological survey results including ambient surveys, contamination surveys, airborne radioactivity surveys, and environmental monitoring surveys.

5.7.7.2 Inventory list of radiological instruments used to perform surveys

5.7.7.3 Calibration and maintenance records for radiological survey equipment

5.7.7.4 Radiological survey instrument user manuals

5.7.8 Waste Disposal Records

5.7.8.1 Names, quantity, and release survey results of the radioactive material deemed waste

5.7.8.2 Location, method and date of disposal

5.8 Records to be Maintained by the Vice President of Human Resources

5.8.1 Individual training records

5.8.2 USNRC Form-5 for individuals

5.8.3 Medical records

5.9 Record Forms to be Maintained by the RSO

5.9.1 The signed original of the RSP and each revision, including PCN's and signed original of each Minor Change.

5.9.2 The signed original of each Minor Change.

5.10 Retention and Storage of Records

5.10.1 SMC legal counsel should be consulted prior to disposal or transfer of records generated pursuant to the radiation protection program plan.

5.10.2 Individual employee records and analyses performed using employee exposure records shall be preserved and maintained until license termination, at which time the records shall be transferred to the USNRC.

5.10.3 Records of dose to members of the general public shall be maintained until license termination.

5.10.4 Records relating to the radiation protection program shall be maintained for no less than five (5) years after the record was generated.

5.10.5 Records of surveillance activities shall be maintained for no less than five (5) years after the record was generated.

5.10.6 Records of waste disposal shall be maintained until license termination.

5.10.7 When the USNRC license is no longer in force, the RSO shall contact the USNRC for permission to dispose of radiation protection records other than personnel exposure records.

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President, and after consultation with SMC's legal counsel.

7 DOCUMENTATION

None

8 ATTACHMENTS

None

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1 PURPOSE

This procedure describes the Shieldalloy Metallurgical Corporation (SMC) ALARA (as low as reasonably achievable) program regarding exposures to ionizing radiation and radioactive material. This procedure is applicable to all operations, activities, and personnel at the Newfield plant.

2 SCOPE

This procedure applies to all SMC employees, visitors, and contractors performing work for SMC at the Newfield facility.

3 REFERENCES

3.1 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation".

3.2 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.3 U. S. Nuclear Regulatory Commission, Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable", 1982.

3.4 U. S. Nuclear Regulatory Commission, Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable", 1977.

3.5 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan"

3.6 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-004, "Radiation Protection Records".

3.7 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-010, "Exposure Control".

3.8 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-017, "Stop Work Authority"

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The President shall:

5.1.1.1 Ensure that plant personnel are aware and supportive of management's commitment to keep occupational radiation exposures ALARA.

5.1.1.2 Ensure that revisions to operating and maintenance procedures, and modifications to plant equipment and facilities are made if they will substantially reduce exposures at a reasonable cost.

5.1.1.3 Appoint and empower members of the Radiation Safety Committee (RSC).

5.1.1.4 Ensure that the resources needed to achieve ALARA goals are made available to the RSO and the RSC.

5.1.2 The Radiation Safety Officer (RSO) shall:

5.1.2.1 Perform radiological surveys in order to provide comprehensive and current information on the radiological status of SMC facilities and equipment.

5.1.2.2 Ensure that posting and labeling is appropriate and commensurate with the hazards.

5.1.2.3 Provide appropriate radiation protection information on Radiation Work Permits.

5.1.2.4 Ensure radiation monitoring and surveillance instruments are functional, calibrated, and available in adequate quantities to perform both routine and emergency tasks.

5.1.2.5 Serve as a permanent member of the RSC.

5.1.2.6 Determine the need for and provide a listing of ALARA goals to the RSC for consideration.

5.1.2.7 Participate in design reviews for facilities and equipment that may affect potential radiation exposures.

5.1.2.8 Identify locations, operations, and conditions that have the potential for causing significant exposures to radiation;

5.1.2.9 Initiate and implement an exposure control program

5.1.2.10 Develop plans, procedures and methods for keeping radiation exposures of SMC personnel ALARA;

5.1.2.11 Review, comment on, and recommend changes in job procedures to maintain exposures ALARA.

5.1.2.12 Maintain and exercise stop work authority as described in RSP-017.

5.1.3 The Radiation Safety Committee (RSC) shall

5.1.3.1 Ensure that a corporate program that integrates management philosophy and regulatory requirements is established, with specific goals and objectives for implementation included;

5.1.3.2 Ensure that measurement system results are reviewed on a periodic basis and that corrective actions are taken when attainment of specific objectives appears to be jeopardized.

5.1.3.3 Ensure that the authority for providing procedures and practices by which the specific goals and objectives will be achieved is delegated.

5.1.3.4 Review and approve ALARA goals at a frequency of not less than once per calendar quarter.

5.1.3.5 Support the RSO in formulating and implementing the program for maintaining radiation exposures ALARA.

5.1.4 SMC personnel shall:

5.1.4.1 Follow the basic radiation protection principles of "time", "distance", "shielding" and "contamination control" whenever possible.

5.1.4.2 Comply with instructions contained on Radiation Work Permits or given by the RSO.

5.1.4.3 Obtain special briefings pursuant to RSP-008 when advised by the RSO.

5.1.4.4 Comply with the listing of individual worker responsibilities for ALARA (Attachment 1)

5.2 ALARA Objectives at SMC

5.2.1 A program for maintaining occupational radiation doses ALARA shall be established.

5.2.2 Facilities and select equipment shall be designed with consideration for the ALARA concept;

5.2.3 Radiation controls shall be established in programs, plans, and procedures.

5.2.4 Supporting equipment, instrumentation, and facilities shall be made available.

5.3 Program for Maintaining Personnel Radiation Doses ALARA

5.3.1 A formal management policy and commitment to ALARA shall be established (See Attachment 2).

5.3.2 The policy should make clear that all personnel shall be responsible for ensuring that the work they perform is in accordance with the ALARA Policy.

5.3.3 Responsibility and authority for the programs shall be clearly delegated by the President.

5.3.4 A training program in the fundamentals of radiation protection and ALARA procedures shall be established.

Note: SMC has established an effective program which addresses these topics. The program is described in RSP-007.

5.4 Designing Facilities and Selecting Equipment Using ALARA Concepts

5.4.1 Whenever applicable, the design of facilities and selection of equipment shall be based upon the concept of ALARA.

5.4.2 These reviews shall be conducted by the RSC.

5.4.3 Reviews shall be based upon the guidance of Regulatory Guide 8.8, Section 2.

5.5 Establishing Radiation Controls

5.5.1 Radiation controls shall be established for work operations to ensure radiation exposures are ALARA, and should be included in:

5.5.1.1 Work planning and preparation,

5.5.1.2 Actual work operations, and

5.5.1.3 Post operation reviews.

5.5.2 The specific requirements for implementing radiation controls shall be described in job-specific procedures and/or work plans.

5.6 Supporting Equipment, Instrumentation, and Facilities

5.6.1 Appropriate support equipment, instrumentation, and facilities shall be provided for all SMC work involving ionizing radiation.

5.6.2 Support may include:

A. A radiation counting area

B. Radiation survey instrumentation (portable and nonportable)

C. Personnel monitoring devices

D. Protective clothing

E. Respiratory protection

F. Decontamination areas for personnel and equipment

G. Change rooms

H. Communication equipment

I. Office space and equipment

5.7 ALARA Goals

5.7.1 The RSC shall establish radiological goals to direct all levels of management and workers at SMC toward improvement in radiological performance.

5.7.2 ALARA goals, as necessary, shall be established, reviewed, and documented at a frequency of no greater than once per calendar quarter.

Note: Examples of alara goals are square footage of contaminated areas, maximum individual dose for employees, and maximum dose to a member of the general population.

5.7.3 The following steps for establishing an ALARA goal shall be included in the goal-setting process:

5.7.3.1 The RSC, with input from the RSO, shall determine which areas need improvement.

5.7.3.2 The RSC shall:

5.7.3.2.1 Evaluate the existing condition(s), root cause(s), and corrective action(s).

5.7.3.2.2 Determine the improvement needed and propose the goal.

5.7.3.2.3 Periodically review performance in achieving the goal and modify the action plan, if necessary.

5.7.3.3 The RSO shall document radiological goals, their status, and performance, and shall present them to the RSC at planned and periodic meetings.

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

7.1 All records pertinent to this procedure shall be maintained pursuant to RSP-004.

7.2 A listing of annual radiological goals, and method/date of closure shall be maintained.

7.3 The minutes of the RSC meetings shall reflect RSC action in establishing and monitoring ALARA goals.

8 ATTACHMENTS

8.1 Attachment 1 - Individual Worker's Responsibilities for ALARA

8.2 Attachment 2 - Management Policy Statement on Radiation Protection

ATTACHMENT 1

INDIVIDUAL WORKER'S RESPONSIBILITIES FOR ALARA

1. Obey promptly "stop work" and "evacuate" instructions of RSO.
2. Follow all procedures and instructions.
3. Wear monitoring devices as required by procedures and instructions, signs, or the RSO.
4. Keep track of your own radiation dose status.
5. Remain in as low a radiation area as practical to accomplish work.
6. Leave radiation areas or airborne radioactivity areas when not working, and use "wait areas" when designated.
7. **DO NOT** smoke, eat, drink, or chew in restricted areas, or bring smoking, eating, drinking, or chewing materials into such areas.
8. Wear protective clothing and respirators properly and whenever required by signs, RWPs, the RSO, procedures and instructions.
9. Remove protective clothing and respirators properly to minimize spread of contamination.
10. If directed by the RSO, frisk yourself or be frisked for contamination when leaving contamination zones.
11. Minimize the spread of a known or possible radioactivity spill and notify the RSO promptly.
12. Avoid unnecessary contact with contaminated surfaces, including your clothing, tools and other equipment.
13. If directed by the RSO, place contaminated tools, equipment, and solid waste on disposable surfaces (e.g., sheet plastic) when not in use, and inside plastic bags when work is finished.
14. Control the amount of materials brought into contaminated areas.
15. Report the presence of treated or open wounds to the RSO before working in areas where radioactive contamination exists. Exit the area promptly if a wound occurs while in such an area.
16. Report promptly unsafe or noncompliance situations to the RSO.
17. Report prior or concurrent occupational radiation exposure to the RSO.
18. Report pregnancy in accordance with SMC procedures and instructions.

ATTACHMENT 2

MANAGEMENT POLICY STATEMENT ON RADIATION PROTECTION

Shieldalloy Metallurgical Corporation (SMC) has the responsibility for providing a work-place environment in which employees, visitors and contractors are adequately protected from hazards, including the hazards associated with exposure to radiation and radioactive material. At SMC, some individuals, by nature of their work, will be exposed to these hazards to varying degrees.

While the majority of occupational radiation exposures are low, all exposures are assumed to entail some risk to the employee. Therefore, SMC has adopted the following three principles to govern all work activities with the potential for exposure to radiation or radioactive materials:

1. No activity or operation will be conducted unless its performance will produce a net positive benefit.

2. All radiation exposures will be kept as low as reasonably achievable (ALARA) considering economic and societal costs.

3. No individual will receive radiation doses in excess of federal limits.

The first principle is self-explanatory. SMC personnel will not be exposed to radiological hazards unless there is some benefit to be gained from the activity involving the exposure. The third principle is also self-explanatory. Federal authorities and SMC management have identified an upper limit on radiation doses to which workers may be exposed without incurring unacceptable risks. The second principle, ALARA, is the basis for much of our radiation protection program, other than demonstrating compliance with regulations. ALARA is an operating policy that is integrated into each of our Radiation Safety Procedures.

Incorporated into the SMC radiation protection program plan are the following goals:

1. Individual exposures will be ALARA.

2. Collective exposures will be ALARA.

3. Measures to keep radiation exposures ALARA will not result in an increased total risk to workers from other hazards.

The objective of these goals is to minimize the total risk to our employees. Working at SMC should not expose our workers to greater risk than is incurred by workers in other "safe" industries of occupations., These risks should also be no greater than those commonly accepted by each of us in our daily lives.

The SMC radiation protection policy can only be effective through the concern and commitment of employees and management and must be integrated into each aspect of our operations. As individuals, each of us must assume the responsibility to maintain our radiation exposures ALARA. Each supervisor must also assume additional responsibilities. They shall ensure that potential radiation hazards are assessed before workers are exposed to them, that measures to address these hazards are documented in appropriate health and safety plans, and that workers have adequate training to understand the hazards and protective measures. Supervisors shall maintain continual oversight and evaluate means by which radiation exposures to their employees can be minimized. They shall institute programs of exposure control, and encourage employee participation in ALARA activities.

In support of the employees and supervisors, SMC will maintain an effective radiation protection program designed to comply with our three principles, and a radiation protection staff of qualified personnel. Each SMC employee should become familiar with the procedures for radiation safety. This will ensure that all of our workday activities are conducted according to our three radiation protection principles and that we will meet our ALARA goals.

H. Nils Schooley
President

SMC	**TRAINING AND QUALIFICATIONS OF RADIATION PROTECTION PERSONNEL - NEWFIELD FACILITY**	Procedure No: RSP-006	Page: 1 of 10
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1 PURPOSE

This procedure details the knowledge, skills, abilities, and training that are necessary to ensure that radiation protection personnel at Shieldalloy Metallurgical Corporation's (SMC's) Newfield plant are able to provide effective services.

2 SCOPE

This Radiation Safety Procedure applies to all SMC personnel performing radiation protection functions at the Newfield, New Jersey plant or during work performed for SMC at off-site locations. Personnel performing functions that do not pertain to implementation of the Radiation Protection Program Plan are exempt from the requirements of this Radiation Safety Procedure.

3 REFERENCES

3.1 Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports for Workers; Inspection and Investigations"

3.2 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation".

3.3 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.4 U. S. Nuclear Regulatory Commission, Regulatory Guide 1.8, "Qualifications and Training of Personnel for Nuclear Power Plants", 1975

3.5 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan".

3.6 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-004, "Radiation Protection Records".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Qualifications of the RSO

5.1.1 The RSO should have an Associate's degree (or equivalent), and should have completed course work and/or have experience with the following:

5.1.1.1 Principles and practices of radiation protection;

5.1.1.2 Radioactivity measurements, monitoring techniques, and the use of instruments;

5.1.1.3 Mathematics and calculations basic to the use and measurement of radioactivity;

5.1.1.4 Biological effects of radiation;

5.1.1.5 Safety practices applicable to protection from the radiation, chemical toxicity, and other properties of the radioactive materials in use at SMC facilities;

5.1.1.6 Conducting radiological surveys and evaluating results;

5.1.1.7 Evaluating radioactive material processing facilities for proper operations from a radiological safety standpoint; and

5.1.1.8 Familiarity with applicable USNRC, USEPA, and OSHA regulations, as well as the terms and conditions of any licenses and permits issued to SMC by these agencies.

5.2 Qualifications of the ARSO

5.2.1 The ARSO should have an Associate's degree (or equivalent).

5.2.2 The ARSO shall perform work under the direct supervision of the RSO until such time as the ARSO meets the qualifications of the RSO.

5.3 Refresher Training of the RSO and ARSO

5.3.1 The RSO and ARSO should participate in a minimum of 20 hours of refresher training on an annual basis.

5.3.2 Refresher training may consist of:

5.3.2.1 Attendance at seminars or training courses on radiation protection issues

5.3.2.2 Self development through review of books and literature on radiation protection issues

5.3.2.3 Attendance at scientific meetings where radiation protection issues are discussed

5.3.2.4 Formal education in physics, health physics, statistics, meteorology, radiation biology, industrial hygiene and data base management.

5.4 Training of Radiation Surveyors

5.4.1 Training shall be conducted by the RSO.

5.4.2 Each knowledge item required shall be checked off by the RSO on the Performance Verification Sheet for Radiation Surveyors (Attachment 1), which is given to new Radiation Surveyors during orientation.

5.4.3 Instruction may take the form of practical demonstration, classroom instruction, and/or on-the-job training.

5.4.4 The RSO shall evaluate the knowledge of each individual as they receive training, review procedures and reference materials, and become familiar with each subject/task.

Note: The evaluation may be in the form of oral and/or written evaluations.

5.4.5 When the RSO is confident that the individual is knowledgeable of the subject/task, the RSO shall sign the Performance Verification Sheet for that task (Attachment #1).

5.4.6 Unless under the direct supervision of the RSO, personnel shall not perform the activities listed on the Performance Verification Sheet until that activity is signed off.

5.4.7 Personnel shall be considered fully trained when the Performance Verification Sheet has been completed (all checked subject/tasks signed off).

5.4.8 Refresher training should be conducted

5.4.8.1 A minimum of once a year, and more frequently if a need is identified.

5.4.8.2 Whenever major changes are made in operational procedures

5.4.8.3 When regulations which affect the radiological aspects of the work take effect

5.4.8.4 When assigned to a new job with a different exposure potential.

5.5 Review of Radiation Safety Procedures shall be reviewed by the RSO, the ARSO and Radiation Surveyors on a planned and periodic basis.

5.6 Training of Authorized Users

5.6.1 Training shall be conducted by the RSO or others designated by the RSO.

5.6.2 Each knowledge item required shall be checked off by the RSO on the Performance Verification Sheet for Authorized Users (Attachment 3).

5.6.3 Instruction may take the form of practical demonstration, classroom instruction, and/or on-the-job training.

5.6.4 The RSO shall evaluate the knowledge of each individual as they receive training, review procedures and reference materials, and become familiar with each subject/task.

Note: The evaluation may be in the form of oral and/or written evaluations.

5.6.5 When the RSO is confident that the individual is knowledgeable of the subject/task, the RSO shall sign the Performance Verification Sheet for that task (Attachment #1).

5.6.6 Unless under the direct supervision of the RSO, Authorized Users shall not perform the activities listed on the Performance Verification Sheet until that activity is signed off.

5.6.7 Authorized Users shall be considered fully trained when the Performance Verification Sheet has been completed (all checked subject/tasks signed off).

5.6.8 Refresher training should be conducted

5.6.8.1 A minimum of once a year, and more frequently if a need is identified.

5.6.8.2 Whenever major changes are made in operational procedures

5.6.8.3 When regulations which affect the radiological aspects of the work take effect

5.6.8.4 When assigned to a new job with a different exposure potential.

5.7 Training and Qualifications of RSC

5.7.1 RSC members are drawn from those departments and positions that can provide insights into decision-making on radiological issues at the Newfield plant.

5.7.2 RSC members shall receive introductory-level training in:

5.7.2.1 Radiation and radioactivity

5.7.2.2 Instrumentation

5.7.2.3 Radiation protection program management

5.7.2.4 Regulations and license requirements

5.7.3 Refresher training should be conducted a minimum of once per year.

5.8 Review of Radiation Safety Procedures shall be reviewed by the RSO, the ARSO, the RSC and Radiation Surveyors once per calendar year.

6 EXEMPTION PROVISIONS

6.1 A waiver of training/qualifications requirements for the RSO shall require the approval of the President and the RSC.

6.2 A waiver of training/qualifications of the ARSO shall require the approval of the RSO, the President, and the RSC.

6.3 A waiver of training for Radiation Surveyors shall require the approval of the RSO.

6.4 A waiver of training for Authorized Users shall require the approval of the RSO.

6.5 All other variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

7.1 All records associated with implementation of this procedure shall be maintained pursuant to RSP-004.

7.2 Completed Performance Verification Sheets shall be maintained by the RSO.

7.3 Individual employee training records shall be maintained by the Vice President of Human Resources.

7.4 Memoranda detailing waivers (Attachment 4) or exceptions to qualifications stated in this procedure shall be maintained in the individual's training file.

8 ATTACHMENTS

8.1 Attachment 1: "Performance Verification Sheet for Radiation Surveyors"

8.2 Attachment 2: "Performance Verification Sheet for Authorized Users"

8.3 Attachment 3: "Waiver of Training"

ATTACHMENT 1
PERFORMANCE VERIFICATION SHEET FOR RADIATION SURVEYORS

NAME OF RADIATION SURVEYOR:			
Performance Item	**Item Required (Check)**	**Date of Qualification**	**Signature of RSO**
Area 1 - Instrumentation			
1.1 Select, operationally check, and operate portable radiological monitoring instrumentation based upon expected or supplied radiological conditions, including the specific survey techniques to be used.			
1.2Select, operationally check, and operate stationary radiological monitoring instrumentation based upon expected or supplied radiological conditions.			
Area 2 - Instrumentation Use			
2.1 Describe the operational procedure of an exposure rate survey instrument.			
2.2 Describe the operational procedure of a contamination survey instrument.			
2.3 Describe pre-operational checks that should be performed prior to instrument use.			
2.4 Describe how an instrument is calibrated.			
Area 3 - Performing Surveys			
3.1 Describe the general methodology for performing ambient exposure rate and contamination surveys.			
3.2 Perform an ambient exposure rate survey and complete the required documentation.			
3.3 Perform a contamination survey and complete the required documentation.			
3.4 State the surface contamination limits for SMC.			
3.5 Describe how items being shipped from SMC are surveyed, including documentation.			
3.6 Describe how items are received at SMC, including documentation.			

NAME OF RADIATION SURVEYOR:			
Performance Item	**Item Required (Check)**	**Date of Qualification**	**Signature of RSO**
3.7 Describe the procedure for handling and maintaining radiation survey records.			
Area 4 - Performance of Radiation Safety Procedures			
4.1 Perform the activities described in RSP-008, "Instrumentation and Surveillance".			
4.2 Perform the activities described in RSP-009, "Contamination Control"			
4.3 Perform the activities described in RSP-011, "Radiological Areas and Posting"			
4.4 Perform the activities described in RSP-014, "Receipt, Handling and Identification of Radioactive Materials"			
4.5 Perform the activities described in RSP-015, "Packaging and Transportation of Radioactive Materials"			
4.6 Perform the activities described in RSP-005, "ALARA Program".			
4.7 Perform the activities described in RSP-016, "Emergency Response and Notifications".			

ATTACHMENT 2
PERFORMANCE VERIFICATION SHEET FOR AUTHORIZED USERS

NAME OF AUTHORIZED USER:			
Performance Item	**Item Required (Check)**	**Date of Qualification**	**Signature of RSO**
Area 1 - Basic Nuclear Safety			
Review of basic radiation principles			
Licensing overview			
Review of measurement instruments			
Safe handling procedures			
SMC documentation requirements			
Emergency Procedures			
Student proficiency and certification testing			

ATTACHMENT 3

WAIVER OF TRAINING

Individual's Name (Print): _____

Individual's Signature: _____

Training course being waived:

___ General Employee Training
___ Radiation Surveyors Training
___ Authorized User Training
___ Classroom Training
___ Practical Demonstrations

Reason for Waiver: _____

Escort's Name (Print): _____

Escort's Signature: _____

APPROVALS:

Radiation Safety Officer: _____
Signature and Date

President: _____
Signature and Date

Distribution: President
Individual
Escort

SMC	TRAINING IN RADIATION PROTECTION - NEWFIELD FACILITY	Procedure No: RSP-007	Page: 1 of 8
		Revision No. 000	Date: November 21, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Co-Chair, RSC):	

TABLE OF CONTENTS

CONTROLLED COPY NO. : _____

1 PURPOSE

In compliance with 10 CFR 19, this procedure describes the training program designed to instruct Shieldalloy Metallurgical Corporation (SMC) employees in the radiological hazards to which they are exposed.

2 SCOPE

The contents of this procedure applies to all SMC employees, visitors and contractors who have unescorted access to the Controlled Area at SMC. Escorted personnel are exempt from the provisions of this procedure.

3 REFERENCES

3.1 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.2 Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports for Workers: Inspection and Investigations".

3.3 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation"

3.4 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The President shall be responsible for ensuring implementation of this program.

5.1.2 The RSO shall be responsible for delivery, oversight and technical content of the training programs.

5.1.3 Supervisors and Authorized Users shall be responsible for ensuring that workers are trained prior to exposure to radiological hazards.

5.2 Requirements

5.2.1 All SMC employees, subcontractors, and visitors with unescorted access to the Newfield facility shall be trained in regard to radiological hazards they might face.

5.2.2 The level of training shall be commensurate with the level of radiological hazard to which they may be exposed.

5.3 Radiation Protection Training Programs

5.3.1 The SMC training program is designed to accommodate two groups of personnel:

5.3.1.1 Visitors

5.3.1.2 General Employees

5.3.2 Visitors may be trained by reading and signing a briefing form (Attachment 1).

5.3.3 General employees shall receive a General Employees Training in Radiation Protection (GET) program.

5.3.3.1 This program shall address the topics outlined in Attachment 2

5.3.3.2 The duration of GET shall be from one (1) to two (2) hours.

5.3.3.3 GET may be delivered as part of Hazard Communication Training provided to new employees.

5.3.4 Special Briefings shall be made available on a case-by-case basis

5.3.4.1 Special briefings shall provide comprehensive and in-depth knowledge of certain radiation protection topics (e.g., remote handling, containments, engineering controls).

5.3.4.2 The need for Special Briefings shall be determined and arranged by the RSO.

5.4 When Training is Required

5.4.1 Visitors should sign a "Visitor Briefing Form" at the start of each week that they access the Controlled Area.

5.4.2 General employees:

5.4.2.1 Shall receive GET within one week of assignment at SMC.

5.4.2.2 Shall be retrained at least annually thereafter by the end of the same quarter in which training was originally completed if the employee is at or has potential to work at the location covered by this RSP.

5.5 Conduct of Training

5.5.1 Visitors may be briefed by any individual who has received GET or RWT.

5.5.2 GET and RWT shall be conducted by individuals who are trained and qualified to provide such training, and who have been approved, in advance, by the RSO.

5.6 Testing

5.6.1 Testing to demonstrate proficiency in may be required for General Employees.

5.6.2 The self-graded written test should address all of the required topics shown in Attachments 2 and 3.

5.7 Credit for Non-SMC Training Courses

5.7.1 Credit for previous training shall require the following:

5.7.1.1 Evidence of satisfactory completion of training (i.e., certificate, test results).

5.7.1.2 List of subjects covered in the training.

5.7.1.3 Test score, if available.

5.7.2 The RSO shall review the training documentation and make a determination of equivalency.

5.7.3 The basis for RSO's decision shall be documented.

6 EXEMPTION PROVISIONS

6.1 A waiver of GET shall require the approval of the RSO.

6.2 A waiver of RWT shall require the approval of the RSO and the President.

6.3 Waivers shall be documented on the "Waiver of Training" form (Attachment 3).

6.4 All individuals who have training waived shall be escorted by individuals who are currently trained.

6.5 Other variances and exceptions to the requirements of this RSP shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

7.1 All records pertinent to this procedure shall be maintained pursuant to RSP-004, "Radiation Protection Records".

7.2 The following training records shall be maintained:

7.2.1 Instructor Qualifications

7.2.2 Course lesson plans.

7.2.3 Test results.

7.2.4 Copies of tests.

7.2.5 Training attendance rosters.

7.2.6 Equivalency determinations.

7.2.7 Course critiques or critique summaries.

7.2.8 Waivers of Training (Attachment 3).

7.3 Individual employee records shall be maintained by the Human Resources Director.

8 ATTACHMENTS

8.1 Attachment 1: Visitor Radiation Protection Briefing

8.2 Attachment 2 - General Employee Training in Radiation Protection

8.3 Attachment 3 - Waiver of Training

ATTACHMENT 1

VISITOR RADIATION PROTECTION TRAINING

The following guidelines shall be read and acknowledged by signing the bottom of this form.

1. I have been shown an example of a radiation symbol and a radiological caution sign.
2. I have been told that the Restricted Areas of the Newfield plant are D111, D203(A), D203(G), D102, and certain areas of the Laboratory.
3. I will not enter any Restricted Area or any area posted with a radiological warning or caution sign unless an escort has been provided to me.
4. I will contact the Shieldalloy Radiation Safety Officer, Mr. Scott Eves (Extension ___) if I have any questions or concerns about radiological issues.

Visitor's signature: _____ Date: _____

Visitor's printed name: _____

The visitor ☐ has ☐ has not been assigned an escort.

Individual administering briefing:

Signature: _____ Date: _____

Escort agreement: I understand that as the escort for the above mentioned visitor, I am responsible for their radiation protection while they are within the SMC controlled area.

Escort's signature: _____ Date: _____

Distribution: RSO (original)
Visitor
Escort

ATTACHMENT 2

GENERAL EMPLOYEE TRAINING IN RADIATION PROTECTION

1. General Employee Training in Radiation Protection (GET) is administered to all employees permitted unescorted access to the SMC plant at Newfield, New Jersey.

2. GET addresses the following topics:

   a. The type and form of radioactive material present at the facility.
   b. The location of USNRC and SMC radiation protection policies and procedures.
   c. Employee and management responsibilities for radiation safety.
   d. Identification of radiation postings and barriers.
   e. Emergency procedures.

3. GET consists of classroom lecture and a question/answer period.

ATTACHMENT 3

WAIVER OF TRAINING

Individual's Name (Print): _____

Individual's Signature: _____

Training course being waived:

___ Visitor Training

___ General Employee Training in Radiation Protection

___ Special Briefing

Reason: _____

_____

_____

_____

Escort's Name (Print): _____

Escort's Signature: _____

APPROVAL

RSO: _____
Signature Date

Distribution: RSO (original)
Individual
Escort

SMC	**INSTRUMENTATION AND SURVEILLANCE - NEWFIELD FACILITY**	Procedure No: RSP-008	Page: 1 of 37
		Revision No. 000	Date: October 10, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Co-Chair, RSC):	

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CONTROLLED COPY NO. : _____

1 PURPOSE

This procedure describes the requirements for calibration and use of radiation survey instruments, and for performing radiological surveillance at the Shieldalloy Metallurgical Corporation (SMC) plant in Newfield, New Jersey.

2 SCOPE

This procedure applies to all radiological instrumentation and surveys conducted by SMC employees, visitors and contractors at the Newfield plant pursuant to Radiation Protection Program Plan provisions, and for radiation protection purposes. Instruments that are not used for radiation protection purposes are exempt from the requirements of this procedure.

3 REFERENCES

3.1 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.2 American National Standard Institute, "Radiation Protection Instrumentation Test and Calibration," N323-1978m, 1977.

3.3 Instrument instruction manuals published by the instrument manufacturers.

3.4 U.S. NRC Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As is Reasonably Achievable".

3.5 U.S. NRC Regulatory Guide 8.21, "Health Physics Surveys for Byproduct Material at NRC-Licensed Processing and Manufacturing Plants," 1979.

3.6 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan".

3.7 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-004, "Radiation Protection Records".

3.8 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-009, "Contamination Control".

3.9 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-011, "Radiological Areas and Posting".

3.10 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-014, "Receipt, Handling and Identification of Radioactive Materials".

3.11 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-015, "Packaging and Transportation of Radioactive Materials".

3.12 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-018, "Operation of the SMC Smear Counter".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The President shall supply adequate resources to ensure compliance with this procedure.

5.1.2 The Radiation Safety Officer (RSO) shall:

5.1.2.1 Assure the adequacy of the radiation survey and instrumentation program.

5.1.2.2 Obtain and maintain calibration of all radiation detection instruments in the active inventory.

5.1.2.3 Maintain instrument calibration certificates on file for all radiation detection instruments in the active inventory.

5.1.2.4 Assure that all radiological surveillance is performed pursuant to this procedure.

5.1.2.5 Assure that all Radiation Surveyors are properly trained in the provisions of this procedure.

5.1.2.6 Verify compliance with this procedure during planned and periodic audits of the Radiation Protection Program.

5.1.3 Radiation Surveyors shall:

5.1.3.1 Verify that only calibrated radiation detection instruments are used.

5.1.3.2 Follow this procedure when performing radiological surveillance activities.

5.1.3.3 Periodically review this procedure.

5.2 Survey Program

5.2.1 Radiation surveys shall be performed, as necessary, to evaluate:

5.2.1.1 The magnitude of radiation exposures to personnel performing routine operations, maintenance, and/or research and development.

5.2.1.2 Fixed and removable contamination on equipment and materials to be released from the Newfield facility.

5.2.1.3 The radiological status of the Newfield facility with respect to applicable USNRC licensing requirements.

5.2.1.4 Radiological conditions in the event of non-routine circumstances (e.g., spills, decontamination efforts, special activities).

5.2.2 Radiation surveys for official purposes shall be performed by Radiation Surveyors who are qualified in accordance with RSP-006.

5.2.3 All official radiation surveys shall be documented on a survey form (Attachment 1).

5.3 Radiation Survey Instruments

5.3.1 Instrumentation used by Radiation Surveyors shall be of sufficient sensitivity and accuracy to assess the radiation exposure rates from radioactive materials which may be found at the Newfield plant; detect the presence of radioactive materials on tools, equipment, clothing, and personnel at all levels which may be found at SMC; and of sufficient quantity to support on-going or planned operations.

5.3.2 The basis for selection of instruments for use at SMC shall include:

5.3.2.1 Quality of radiation to be measured.

5.3.2.2 Sensitivity required.

5.3.2.3 Purpose of the survey.

5.3.3 Instruments maintained in the active inventory shall be evaluated, tested, and documentation obtained for the following:

5.3.3.1 Physical construction

5.3.3.2 Effect of shock, sound, vibration, electric transients, RF energy, magnetic fields and high humidity

5.3.3.3 Extent of switching transients, capacitance effects, geotropism and static charge effects

5.3.3.4 Power supply, including stability and battery life

5.3.3.5 Range, sensitivity, linearity, detection limit, and response to overload conditions

5.3.3.6 Accuracy and reproducibility precision

5.3.3.7 Energy dependence

5.3.3.8 Angular dependence

5.3.3.9 Response to ionizing radiation other than those being measured

5.3.3.10 Temperature and pressure dependence on measurements

Note: These tests are normally performed by the manufacturer and credit may be taken for the manufacturer's evaluation and testing. If credit is taken for manufacturer's testing, a copy of the test results shall be maintained along with instrument records.

5.4 Instrument Calibration

5.4.1 Instruments shall be calibrated every 12 months and following any repairs to the ratemeter and/or detector.

5.4.2 Each ratemeter shall be calibrated with a specific detector, designated by the detector serial number.

Note: The use of a ratemeter with a different detector or connecting cable may constitute the use of an un-calibrated meter.

5.4.3 A contractor shall provide the calibration services using radiation sources which are traceable to the National Institute of Standards and Technology (NIST).

5.4.4 Instruments shall be calibrated according to the guidelines of ANSI-N323-1978, "Radiation Instrumentation Test and Calibration".

5.4.5 The contractor shall be the manufacturer of the instrument or an individual/firm that has been pre-qualified by the RSO.

5.4.6 Calibration schedules shall be staggered to maintain at least one calibrated contamination survey meter, one calibrated ambient exposure rate instrument and one calibrated stationary smear counter at the Newfield facility at all times.

5.4.7 Reference Source Response

5.4.7.1 The response of each instrument to a reference source placed in a repeatable position shall be determined and recorded on the calibration label before the instrument is placed into active use and after each calibration.

5.4.7.2 With the instrument response switch in the "slow" position, as applicable, the reference source and detector shall be placed in the reference position and the instrument shall be allowed to stabilize.

5.4.7.3 The instrument reading shall be multiplied by 0.80 and that product shall be recorded on the calibration label as the "lower limit" (-20%).

5.4.7.4 The instrument reading shall be multiplied by 1.20 and that product shall be recorded on the calibration label as the "upper limit" (+20%).

5.5 Pre-operational Checks

5.5.1 Prior to each use, or daily when kept in use, each instrument shall be checked as follows (if applicable), and results recorded on Attachment 2.

5.5.1.1 Battery Check

5.5.1.1.1 The scale selector switch shall be moved to the "BAT" position.

5.5.1.1.2 The needle should move to the right of the battery test level on the scale of the ratemeter or the digital indicator should demonstrate a functional battery status.

5.5.1.1.3 The batteries shall be replaced if the needle does not move to the right of the battery test level or if the digital indicator demonstrates a non-functional battery status..

5.5.1.2 Daily Source Check

5.5.1.2.1 With the instrument response switch in the "slow" position, the reference source and detector shall be placed in the reference position and the instrument shall be allowed to stabilize.

5.5.1.2.2 The reading shall be verified as being between the "upper limit" and "lower limit" noted on the calibration label of the instrument.

5.5.1.3 The Reset Button shall be tested for functionality.

5.5.1.4 Test of the Audible Response

5.5.1.4.1 The Audio "AUD" toggle switch shall be moved to the "on" position to turn the speaker on.

5.5.1.4.2 With the instrument and the reference source in the reference position, an audible instrument response shall be verified.

5.5.1.5 The instrument shall be examined for physical damage

5.5.1.6 A calibration sticker shall be verified to be on the instrument and the instrument shall be confirmed to be "in calibration".

5.5.1.6.1 An instrument that is out of calibration shall not be used to perform radiation surveys.

5.5.1.6.2 The RSO shall be notified if an instrument is out of calibration.

5.5.1.7 Background Check

5.5.1.7.1 The background exposure rate for each instrument shall be obtained at a location that is in the vicinity of but not near known radiation sources or radiation-producing machines.

5.5.1.7.2 Background data for ambient exposure rate instruments should be acquired at a minimum of two locations, and should consist of the exposure rate (microR per hour) at a height of one meter above the ground surface.

5.5.1.7.3 Background data for contamination survey instruments should be acquired at a minimum of two locations, with the measurement made on a flat surface such as the side of the ratemeter or any other flat surface that is known to be free of surface contamination.

Note: For contamination surveys, instrument background should not be acquired with the detector surface in open air.

5.5.2 Instruments failing any pre-operational check shall be taken out of service, segregated from other instruments, tagged as "out of service", and repaired prior to use.

5.5.3 Each instrument shall be labeled with a unique identifier (e.g., serial number of detector and ratemeter) to enable traceability to surveys and records.

5.6 Survey Methods for Determining Ambient Exposure Rates

5.6.1 Surveys shall be performed with a portable radiation survey instrument that is sensitive to gamma radiation (e.g., sodium iodide detector, microR meter).

Note: Because of positioning and other effects, the response of an instrument placed in contact with radiation sources is not necessarily a valid response in light of the calibration methodology.

5.6.2 The exterior of the instrument shall be inspected for damage prior to initiating the survey.

5.6.3 The instrument shall be turned on and permitted to stabilize (approximately 30 seconds) before proceeding further.

5.6.4 A pre-drawn map of the area to be surveyed shall be obtained or a map shall be drawn on the side two of the survey form.

5.6.5 The battery status shall be determined and acknowledged on the survey form.

5.6.6 On the survey form, the make, model, and serial number of the ratemeter and detector; the calibration date of the instrument; and the response of the instrument to the check source shall be recorded.

5.6.7 With the range selector switch at the lowest setting, the background exposure rate shall be determined and recorded on the survey form.

Note: Do not correct subsequent readings for background exposure rates.

5.6.8 Surveys shall be conducted by walking slowly over the area of interest with the detector held at a height of approximately one meter above the ground (waist high).

5.6.8.1 An increase in the audible response or in the needle/indicator movement may indicate the presence of radioactivity.

5.6.8.2 The instrument shall be held stationary in the locations where the increased response is noted.

5.6.8.3 If the needle/indicator "pegs" on the meter face, the range selector switch shall be moved to the next highest setting, the reset button shall be pressed, and the measurement shall be repeated.

5.6.8.4 If the needle/indicator remains offscale, the area shall be secured and the RSO shall be notified immediately.

5.6.8.5 Readings shall be recorded on the survey form (Attachment 1).

Note: Carefully evaluate the position of the range selector switch when observing the meter reading.

5.6.8.6 Any comments and notations that may be necessary for interpretation of results should be recorded on the survey form.

5.6.8.7 The individual performing the survey shall sign and date the completed survey form.

5.7 Survey Methods for Determining Contact Exposure Rates on Equipment Surfaces

5.7.1 Surveys shall be performed with a portable radiation survey instrument that is sensitive to gamma radiation (e.g., sodium iodide detector, microR meter).

5.7.2 The exterior of the instrument shall be inspected for damage prior to initiating the survey.

5.7.3 The instrument shall be turned on and permitted to stabilize (approximately 30 seconds) before proceeding further.

5.7.4 A sketch of the equipment/surface to be surveyed shall be drawn on side two of the survey form (Attachment 1).

5.7.5 The battery status shall be determined and acknowledged on the survey form.

5.7.6 The make, model, and serial number of the ratemeter and detector; the calibration date of the instrument; and the response of the instrument/detector to the check source shall be recorded on the survey form.

5.7.7 With the range selector switch at the lowest setting, the background exposure rate shall be determined and recorded on the survey form.

Note: Do not correct subsequent readings for background exposure rates.

5.7.8 Surveys shall be conducted by holding the instrument stationary with the detector end of the instrument approximately 0.25 inch from the surface of the item being evaluated.

5.7.9 If the needle/indicator "pegs" on the meter face, the range selector switch shall be moved to the next highest setting, the reset button shall be pressed, and the measurement shall be repeated.

5.7.10 Readings shall be recorded on the survey form.

Note: Carefully evaluate the position of the range selector switch when observing the meter reading.

5.7.10.1 Any comments and notations that may be necessary for interpretation of the results should be recorded on the survey form.

5.7.10.2 The individual performing the survey shall sign and date the completed survey form.

5.8 Survey Methods for Determining the Extent of Total Contamination on Surfaces

5.8.1 Total (fixed plus removable) contamination shall be measured by direct survey with portable radiation survey instruments sensitive to beta/gamma radiation (e.g., Geiger-Mueller detector with a pancake detector) or alpha radiation (e.g., alpha scintillation detector)

5.8.2 The exterior of the instrument shall be inspected for damage prior to initiating the survey.

5.8.3 The instrument shall be turned on and permitted to stabilize (approximately 30 seconds) before proceeding further.

5.8.4 A pre-drawn sketch of the equipment/surface to be surveyed shall be obtained or a sketch shall be drawn on side two of the survey form (Attachment 1).

5.8.5 The battery status shall be determined and acknowledged on the survey form.

5.8.6 On the survey form, the make, model, and serial number of the ratemeter and detector; the calibration date of the instrument, and the response of the instrument/detector to the check source shall be recorded.

5.8.7 The background count rate shall be determined and recorded on the survey form.

Note: Do not correct subsequent readings for background count rates.

5.8.8 Surveys shall be conducted by moving the detector at a rate of approximately two inches per second at a distance of no greater than 0.25 inch above the surface.

5.8.8.1 An increase in the audible response or in the needle/indicator movement may indicate the presence of radioactivity.

5.8.8.2 The detector shall be held stationary over the areas where the increased response was noted.

5.8.8.3 If the needle/indicator "pegs" on the meter face, the range selector switch shall be moved to the next highest setting, the reset button shall be pressed, and the measurement shall be repeated.

5.8.8.4 If the needle/indicator remains offscale, the item shall be secured and the RSO shall be notified.

5.8.9 Survey points with the highest count rates shall be identified and recorded on the survey form, along with an estimate of the physical dimensions of the area with elevated readings.

5.8.10 Any comments and notations that may be necessary for interpretation of the results should be recorded on the survey form.

5.8.11 The individual performing the survey shall sign and date the completed survey form.

Note: Carefully evaluate the position of the range selector switch (e.g., x1, x10) when observing the meter reading.

5.9 Survey Methods for Determining the Extent of Loose Contamination on Surfaces

5.9.1 A pre-drawn sketch of the equipment/surface to be surveyed shall be obtained or a sketch shall be drawn on side two of the survey form (Attachment 1).

5.9.2 Loose contamination shall be measured with dry disc smears wiped over a surface area of at least 100 cm^2.

5.9.2.1 A filter paper disc shall be placed on the surface to be smeared.

5.9.2.2 The disc shall be moved over an "S"-shaped area using moderate pressure, covering approximately 100 cm^2 (16 in^2), or about 20 inches in length, or the entire surface, if it is less than 100 cm^2 in area.

5.9.2.3 The disc smear shall be placed in a sample holder such that individual smears are separated from each other to prevent cross contamination (e.g., smear booklet or glassine envelope).

5.9.3 For each smear collected:

5.9.3.1 On side two of the survey form (map), the sample collection location and sample number shall be noted.

5.9.3.2 The smear number shall be recorded in the column marked "Comments",

5.9.4 Each smear may be submitted to an analytical laboratory for determination of gross alpha and/or gross beta activity (disintegrations per minute) or may be counted in-house pursuant to RSP-018.

5.10 Survey Methods for Determining Airborne Radioactivity

5.10.1 A pre-drawn sketch of the area to be surveyed shall be obtained or a sketch shall be drawn on side two of the survey form (Attachment 1).

5.10.2 Airborne radioactivity shall be collected with an air pump connected to a filter cartridge.

5.10.2.1 Either low (2 lpm or less) or high (greater than 2 lpm) volume pumps may be used.

5.10.2.2 The flow rate shall be determined with a flow calibrator immediately prior to use of breathing zone samplers.

5.10.2.3 The battery status of battery-powered pumps shall be determined immediately prior to use.

5.10.2.4 The filter cartridge shall contain a membrane filter.

5.10.2.5 Air shall be drawn through the filter for a minimum of four hours or until visible dust loading or decreased flow is noted.

5.10.2.6 The filter shall be removed from the cartridge and placed in a sample holder such that individual filters are separated from each other to prevent cross contamination (e.g., smear booklet or glassine envelope).

5.10.3 For each filter collected:

5.10.3.1 On side two of the survey form (map), the filter collection location and filter number shall be noted.

5.10.3.2 The "start time", "stop time" and pump flow rate shall be noted.

5.10.3.3 The filter number shall be recorded in the column marked "Comments",

5.10.4 Each filter may be submitted to an analytical laboratory for determination of gross alpha activity (disintegrations per minute) or may be counted in-house pursuant to RSP-018.

5.11 Analysis of Samples by an Analytical Laboratory

5.11.1 A chain-of-custody record (Attachment 3) shall be initiated by the individual collecting or overseeing the collection of samples.

Note: A copy of this form should accompany the samples throughout transportation and analyses; and any break in custody or evidence of tampering shall be documented.

5.11.2 Sample custody shall be assigned to one individual at a time in order to prevent confusion of responsibility.

Note: Custody is maintained when (1) the sample is under direct surveillance by the assigned individual, (2) the sample is maintained in a tamper-free or tamper-evident container, or (3) the sample is within a controlled-access facility.

5.11.3 Samples should be submitted to a radioanalytical laboratory for analysis, along with the completed "Request for Analysis" form used by the laboratory.

5.11.4 The samples shall be packaged and shipped to the laboratory by overnight carrier in order to demonstrate chain of custody.

Note: The "Request for Analysis" form and the chain of custody form shall accompany the shipment.

5.11.5 Each sample shall be analyzed for gross alpha and/or gross beta activity, with a nominal minimum detectable activity specification of 1.0 picocurie per sample.

5.11.6 The laboratory shall have written procedures that document the laboratory's analytical capabilities for gross alpha/beta activity and a QA/QC program which assures the validity of the analytical results.

5.12 Routine Surveillance Program

5.12.1 A surveillance program to assess the radiological status of the Newfield facility shall be performed.

5.12.2 The surveillance program shall include the restricted and unrestricted areas shown in Attachment 4.

5.12.3 Ambient exposure rates shall be measured as described in Section 5.6.

5.12.4 Total contamination shall be measured by direct surveys as described in Section 5.8.

5.12.5 Loose contamination shall be measured with dry disc smears as described in Section 5.9.

5.12.6 Airborne radioactivity shall be measured as described in Section 5.10.

5.12.7 The frequency of surveillance shall be as shown in Attachment 4.

6 *EXEMPTION PROVISIONS*

Variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

7.1 All records pertinent to this procedure shall be maintained pursuant to RSP-004.

7.2 The following records shall be maintained:

7.2.1 Instrument calibration and maintenance records.

7.2.2 Manufacturer instruction manuals for each type of ratemeter and detector.

7.2.3 Radiological Survey Forms

8 ATTACHMENTS

8.1 Attachment 1 - Survey Form

8.2 Attachment 2 - Daily Instrument Check

8.3 Attachment 3 - Chain of Custody Form

8.4 Attachment 4 - Routine Surveillance Program

8.5 Attachment 5 - Survey Maps

ATTACHMENT 1

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY FORM

Survey Number_____ Date of Survey_____

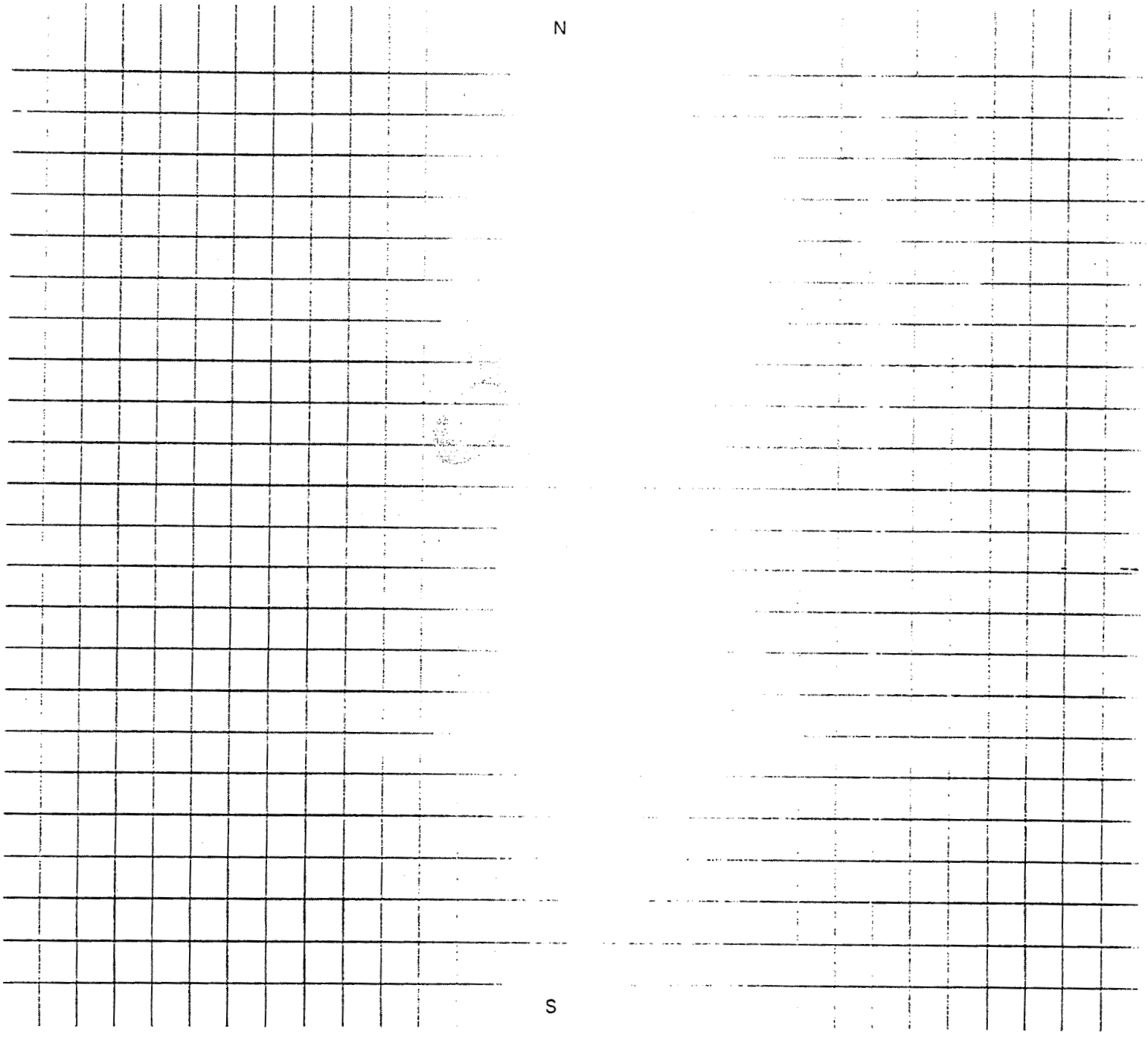
Survey Description:	Survey Performed by:
Drawing ☐ Yes ☐ No	_____ Signature _____ Print Name

Instrument (1)	Instrument (2)	Instrument (3)
Model:	Model:	Model:
Serial No.	Serial No.	Serial No.
Calibration Due:	Calibration Due:	Calibration Due:
Efficiency	Efficiency	Efficiency
MDA CF BKG	MDA CF BKG	MDA CF BKG

Survey Point	Contamination Levels					Ambient Radiation Levels	Instrument Used	Comments and Additional Information
	Fixed (F) or Total (T)	Beta/gamma		Alpha		(microR/hour)		
		cpm/area	(dpm/100 cm^2)	cpm/area	(dpm/100 cm^2)			

SHIELDALLOY METALLURGICAL CORPORATION
RADIOLOGICAL SURVEY MAP

Survey Number_____ Building/Area_____ Date of Survey_____



ATTACHMENT 2

SHIELDALLOY METALLURGICAL CORPORATION
INSTRUMENT DAILY CHECK FORM

Location:	Probe Type:	Probe Number
Meter Number:	Suggested Operating Voltage:	Check Source Number:

Number	Date	Location	Battery OK	Operating Voltage	Background cpm	Check Source cpm	Name	Remarks
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

ATTACHMENT 3

SHIELDALLOY METALLURGICAL CORPORATION
ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference No. _____

Page 1 of ____

(1) Shieldalloy Metallurgical Corporation	(7) Samples Shipment Date	(5) Bill to:
(2) Sample Team Leader	(8) Lab Destination	
(3) Task No.	(9) Lab Contact	
(4) Project Manager	(12) Technical Contact/Phone	(10) Report to:
(6) Purchase Order No.	(13) Carrier/Waybill No.	
(11) Required Report Date		

ONE SAMPLE PER LINE

(14) Sample Number	(15) Sample Description/Type	(16) Date/Time Collected	(17) Container Type	(18) Sample Volume	(19) Preservative	(20) Requested Testing Program

(23) Special Instructions

(24) Possible Hazard Identification
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

(25) Sample Disposal
Return to Client ☐ Disposal by Lab ☐ Archive _____ months

(26 Relinquished by: (signature, date, time):	Received by: (signature, date, time)
Relinquished by: (signature, date, time):	Received by: (signature, date, time)
Relinquished by: (signature, date, time):	Received by: (signature, date, time)

INSTRUCTIONS FOR COMPLETING THIS FORM

1. Shieldalloy Metallurgical Corporation
2. **Sample Team Leader**: List the name of the team taking these samples.
3. **Task No.**: Indicate the **SMC** task number, if applicable.
4. **Project Manager:** Record the project manager's name.
6. **Purchase Order No.**: Non-**SMC** personnel should use this space to record the purchase order number authorizing the analysis of these samples. **SMC** and **SMC** subcontractors should leave this space blank if a project number has been given for billing.
7. **Samples Shipment Date:** Indicate the date these samples are shipped to the laboratory.
8. **Lab Destination:** Indicate the laboratory designated for sample shipment. *Do not list more than one lab on this form.* Be certain before sending samples that the laboratory you are designating is aware of the shipment and is capable of accepting these sample types and has available capacity.
9. **Lab Contact:** Give the name of the laboratory contact (typically the lab's project manager).
10. **Report to:** Give the name, address and phone number of the person to receive the data report for these samples.
11. **Required Report Date:** Record the date which you and the laboratory contact have determined the results will be reported (include verba or final report as appropriate).
12. **Technical Contact/Phone:** Indicate the name of the person to be contacted in case of any questions regarding these samples and the phone number where the contact may be reached the day the samples arrive in the laboratory.
13. **Carrier/Waybill Number:** If you are sending the samples by a commercial carrier such as Airborne or Federal Express, record the courier company name and the waybill or airbill number under which these samples will be shipped (Example - Fed-Ex/#513631771).
14. **Sample Number:** List the complete, unique identification number of each sample. These numbers must correspond with the identification numbers on the sample containers and the field sample collection document(s).
15. **Sample Description/Type:** Provide a short physical description of the sample and the sample type such as soil, sediment, sludge, water wipe, air, concentrated waste or bulk.
16. **Date/Time Collected:** Record date and exact time each sample was collected. *Use a 24-hour clock; i.e., 1645 not 4:45 p.m.*
17. **Container Type:** Indicate the volume, color and type of the sample container used (Example - 1 gallon amber glass, 1 liter clear plastic 40 milliliter clear glass).
18. **Sample Volume:** Estimate the amount of sample in the container. For air samples, indicate the volume of air sampled.
19. **Preservative:** Indicate what type of preservative, if any, has been used for the samples (Example - ice to 4°C nitric acid, hydrochloric acid).
20. **Requested Testing Program:** List the analyses to be performed on each sample by method number or quotation number.
23. **Special Instructions:** Use this space to record any special instructions to the lab regarding the processing of these samples.
24. **Possible Hazard Identification:** Indicate all hazard classes associated with the sample(s).
25. **Sample Disposal:** Indicate how the samples should be disposed of following analysis. The lab may charge for packing, additional archiving and disposal.

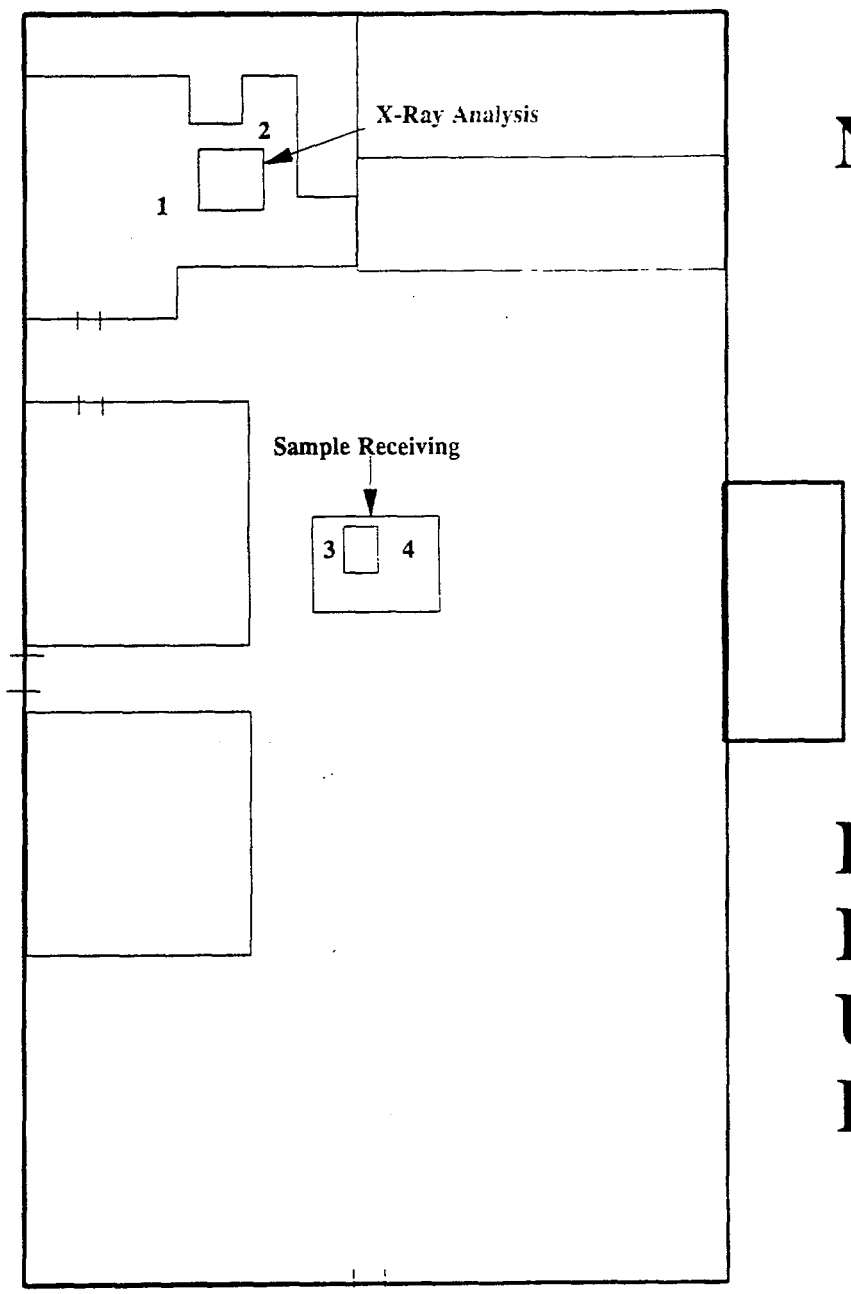
26 **Signatures:** When releasing custody of these samples, use the "Relinquished By" space to sign your full legal name, date and time of release. After verifying that all samples are present, the person receiving the samples must sign the "Received By" space to take custody of the samples.

ATTACHMENT 4
ROUTINE SURVEILLANCE PROGRAM

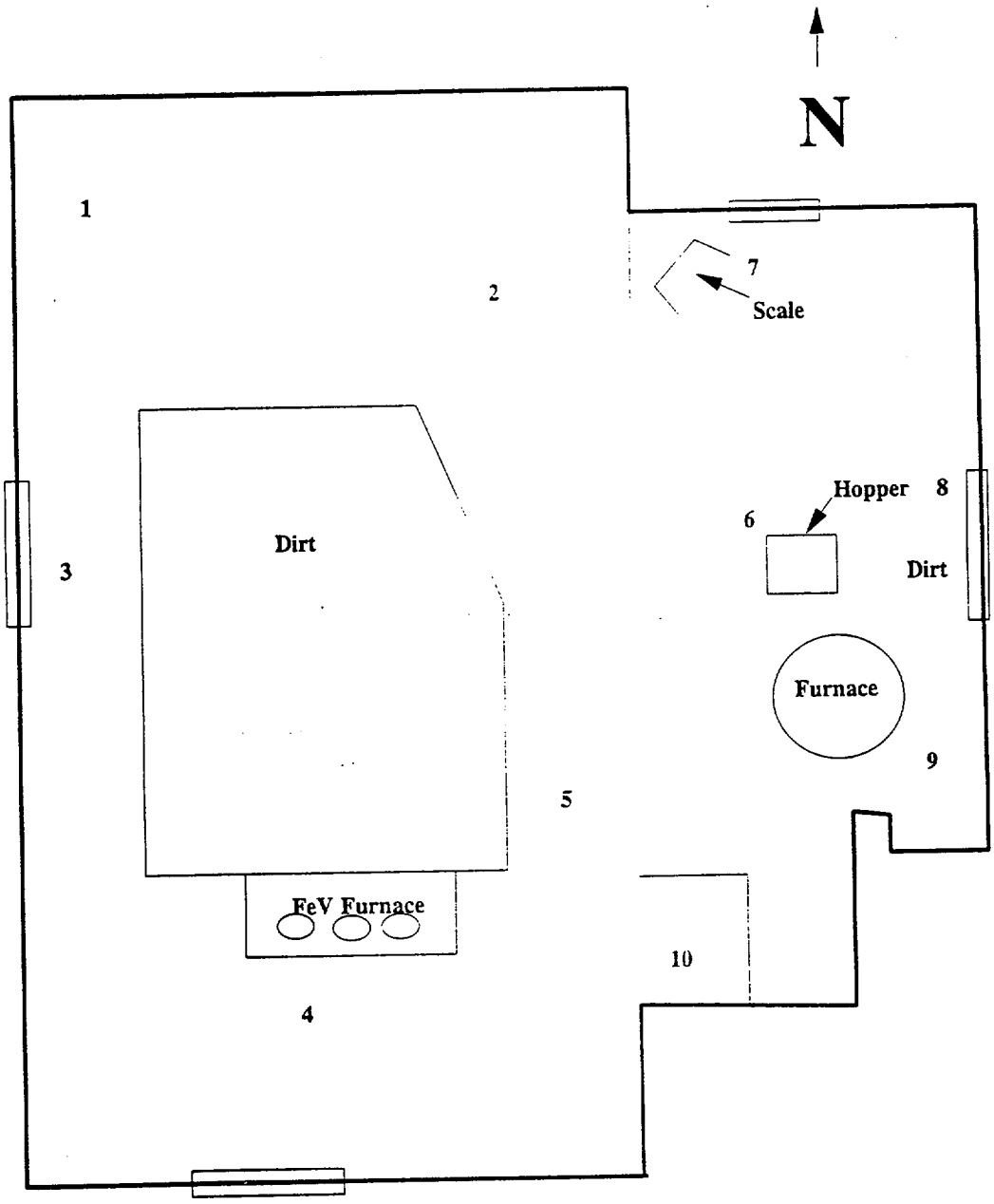
Area	Description	Location	Type	Frequency
Unrestricted	D202 Laboratory (Upper Level)	See Map	Total Contamination	Quarterly
Unrestricted	D202 Laboratory (Basement)	See Map	Ambient exposure rate, total contamination, removable contamination	Quarterly
Restricted	D203A Warehouse	See Map	Ambient exposure rate, total contamination, removable contamination	Quarterly if radioactive materials have been handled in this area during the past quarter
Restricted	D203G Warehouse	See Map	Ambient exposure rate, total contamination, removable contamination	Quarterly
Restricted	D203D Warehouse	See Map	Ambient exposure rate, total contamination, removable contamination	Quarterly if radioactive materials have been handled in this area during the past quarter
Unrestricted	D102 Lunch Room	See Map	Total Contamination	Quarterly -
Unrestricted	D117 Cave	See Map	Total Contamination	Quarterly
Restricted	D111 Office and Break Room	See Map	Ambient exposure rate, total contamination, removable contamination, airborne activity	Quarterly
Restricted	D111 Upper Level	See Map	Ambient exposure rate, total contamination, removable contamination, airborne activity	Quarterly
Restricted	D111 Lower Level	See Map	Ambient exposure rate, total contamination, removable contamination, airborne activity	Quarterly

Area	Description	Location	Type	Frequency
Restricted	D.102	See Map	Ambient exposure rate, total contamination, removable contamination	Quarterly
Restricted	D.111 Flex-Kleen Dust Collector	See Map	Ambient exposure rate, total contamination, removable contamination	Quarterly
Restricted	D.111 AAF Dust Collector	See Map	Ambient exposure rate, total contamination, removable contamination	Quarterly

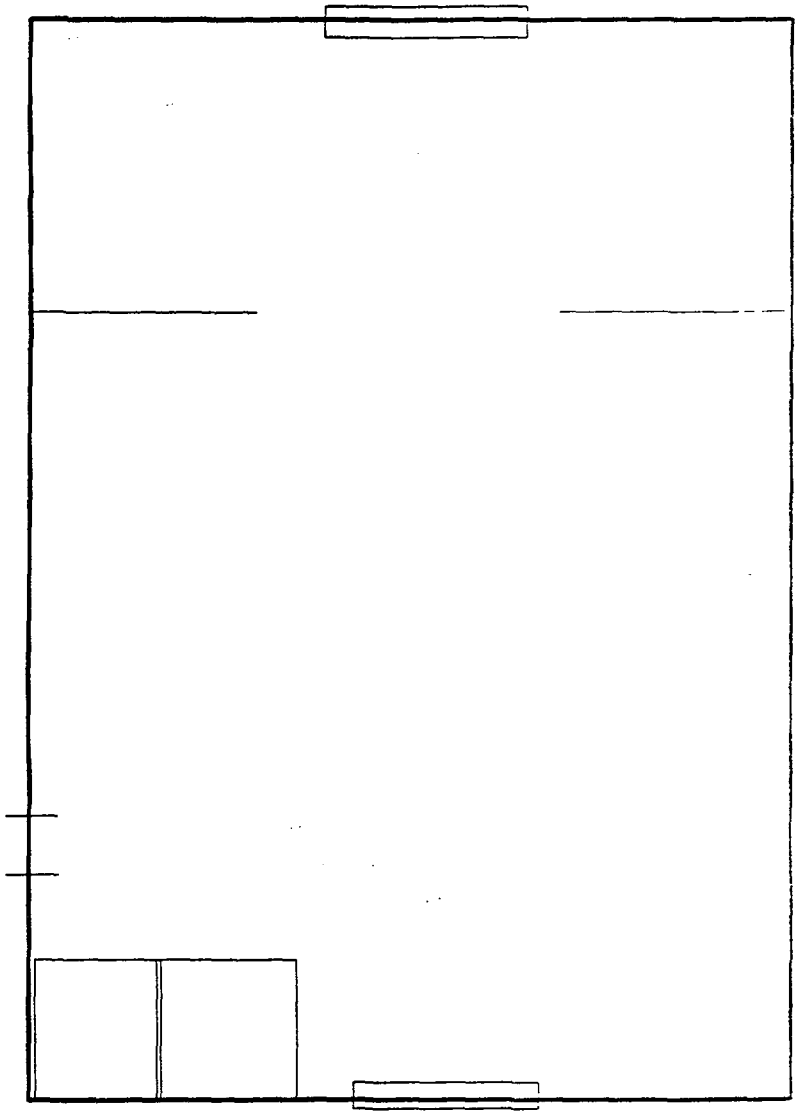
ATTACHMENT 5
SURVEY MAPS



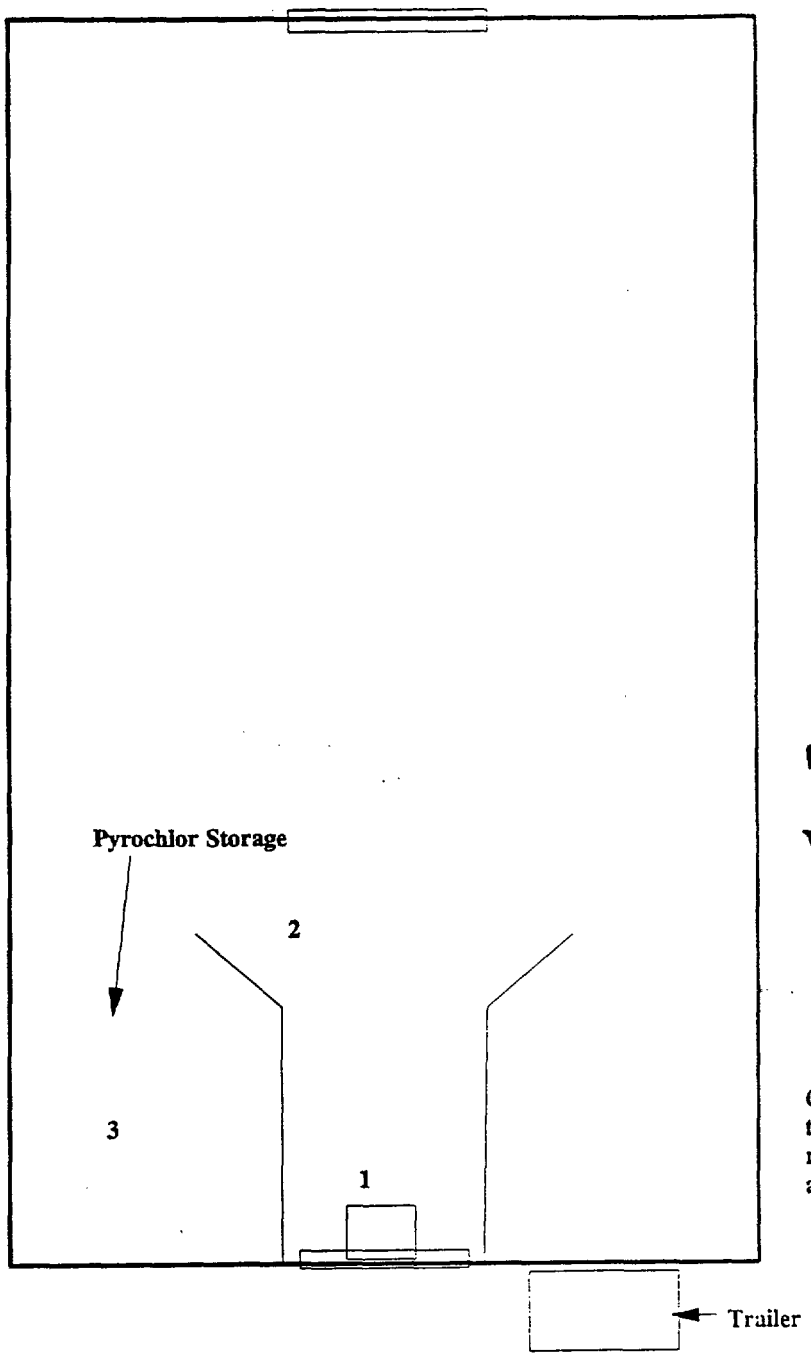
D202 Lab Upper Level



D111 - Lower Level

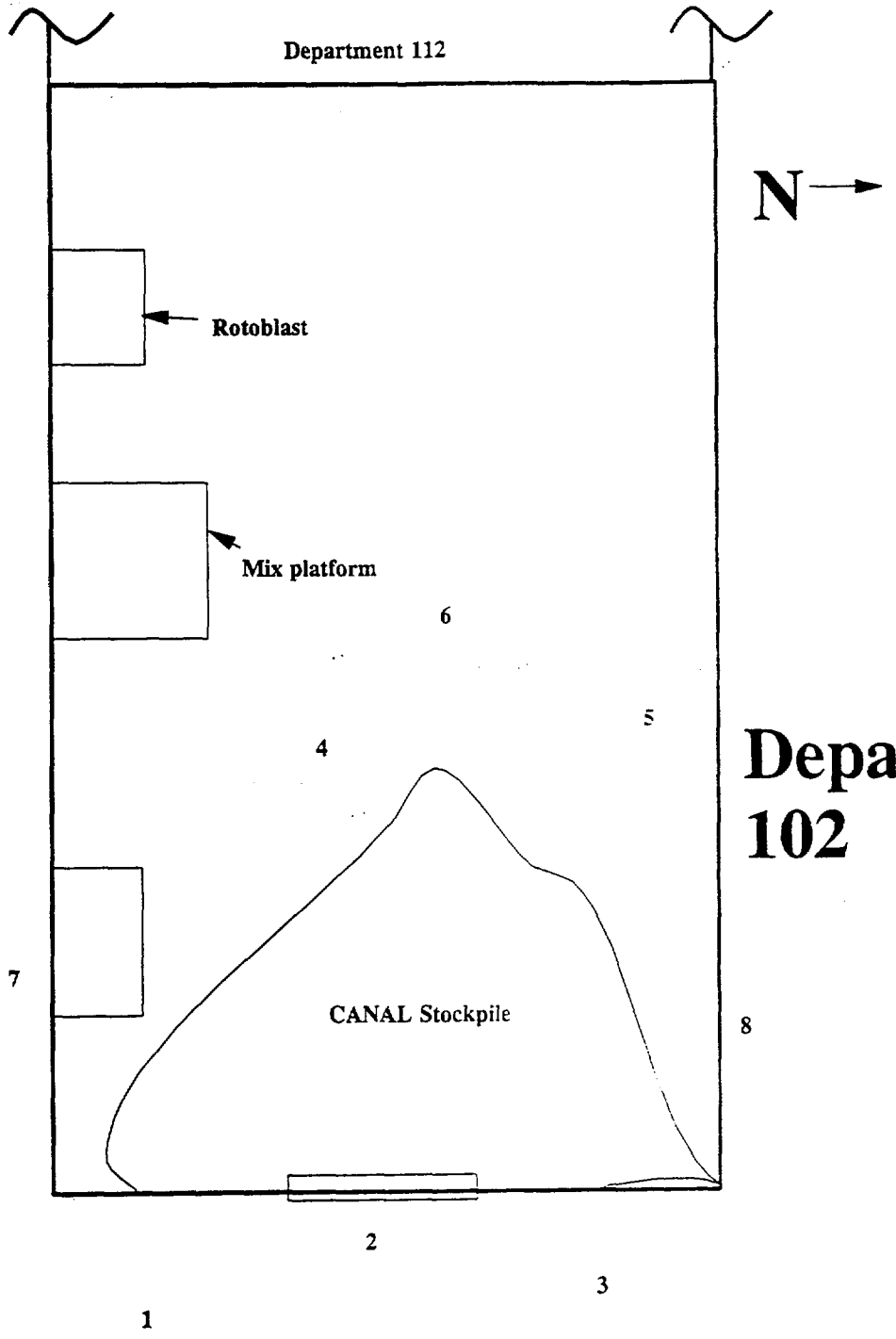


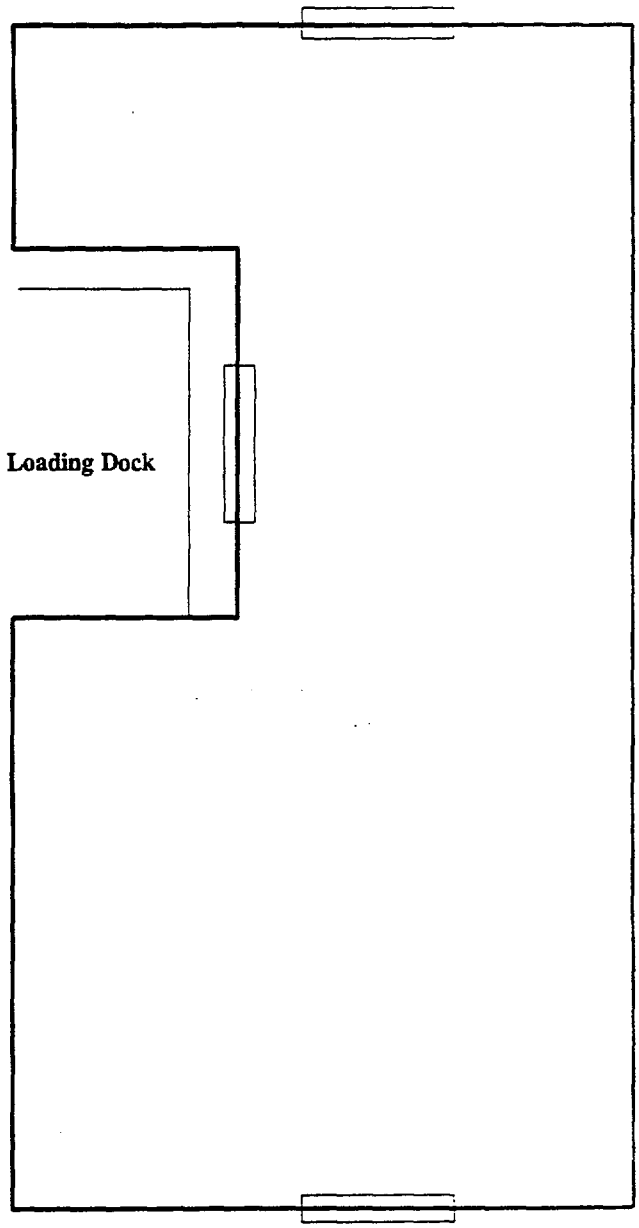
Surveys will be conducted as required based on whether radioactive materials were handled in the area.



"G" Warehouse

Other areas in G warehouse to be surveyed in locations where radioactive materials were handled, as needed

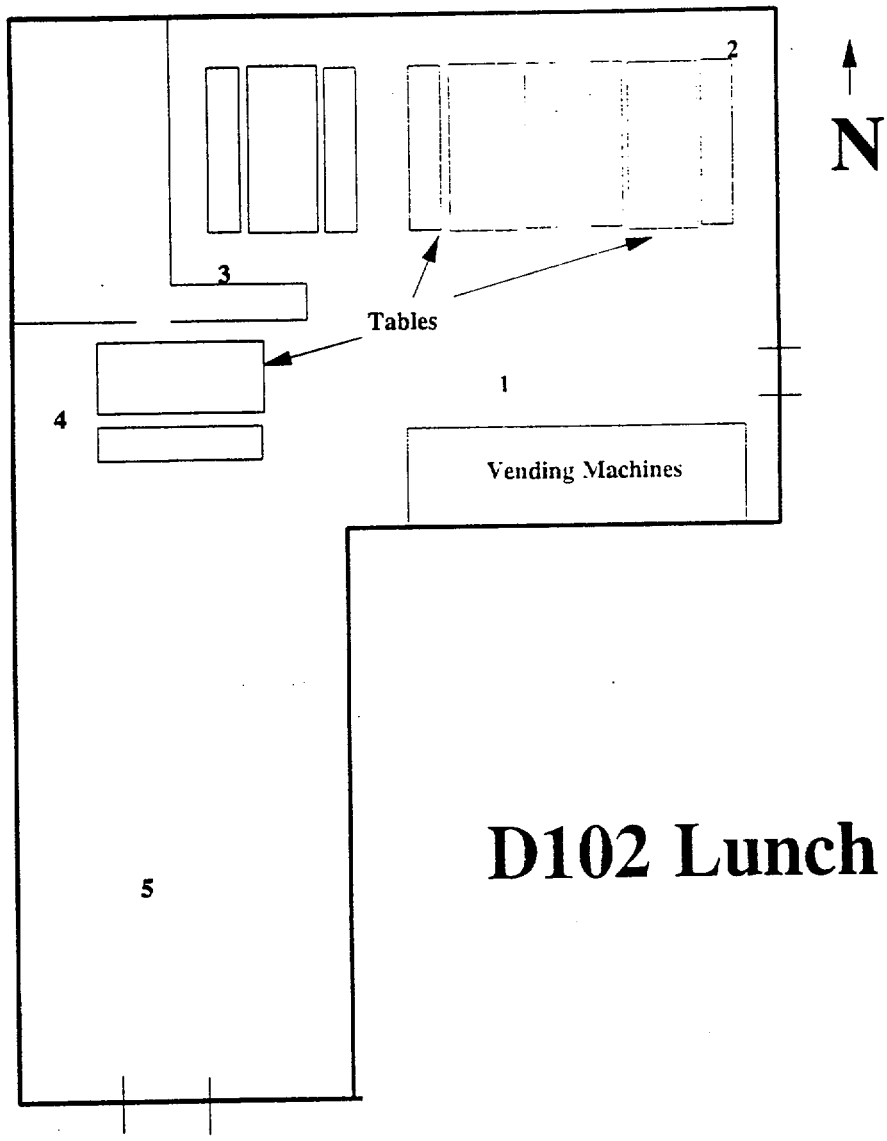

Department 112
N
Rotoblast
Mix platform
6
5
4
Department
102
CANAL Stockpile
7
8
2
3
1



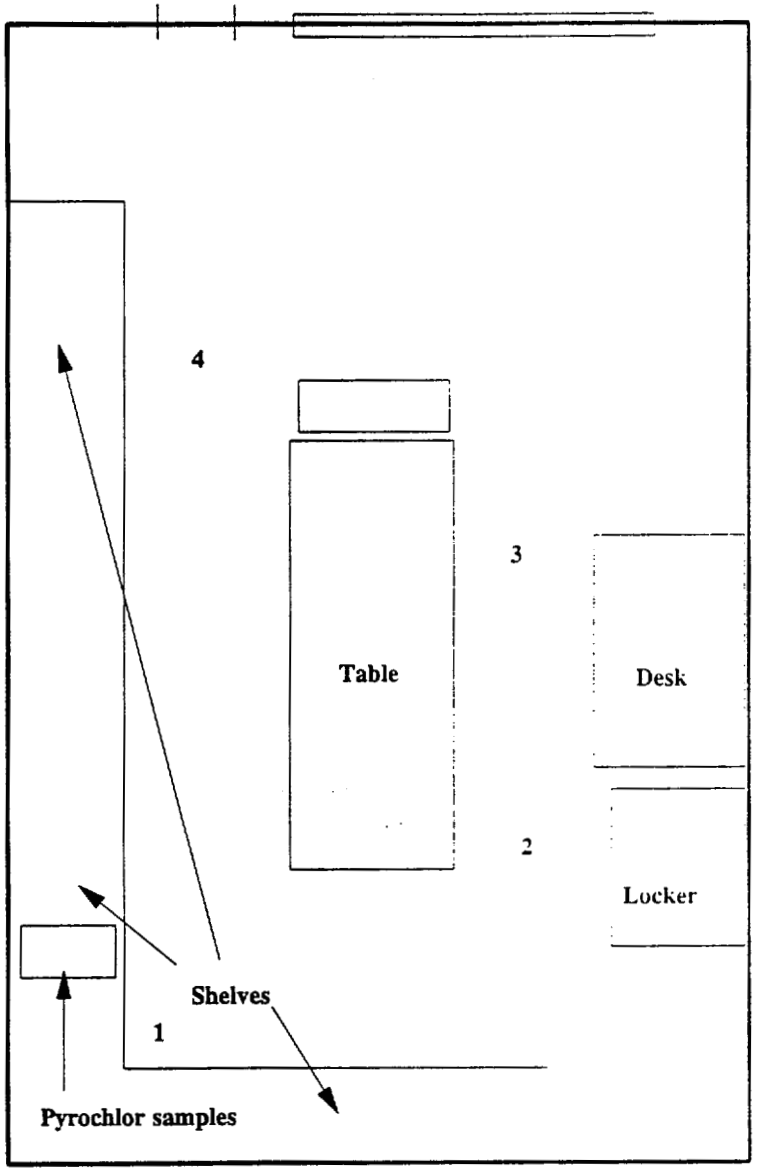
N→

"D" Warehouse

Surveys to be conducted as needed based on whether radioactive materials have been handled in the area



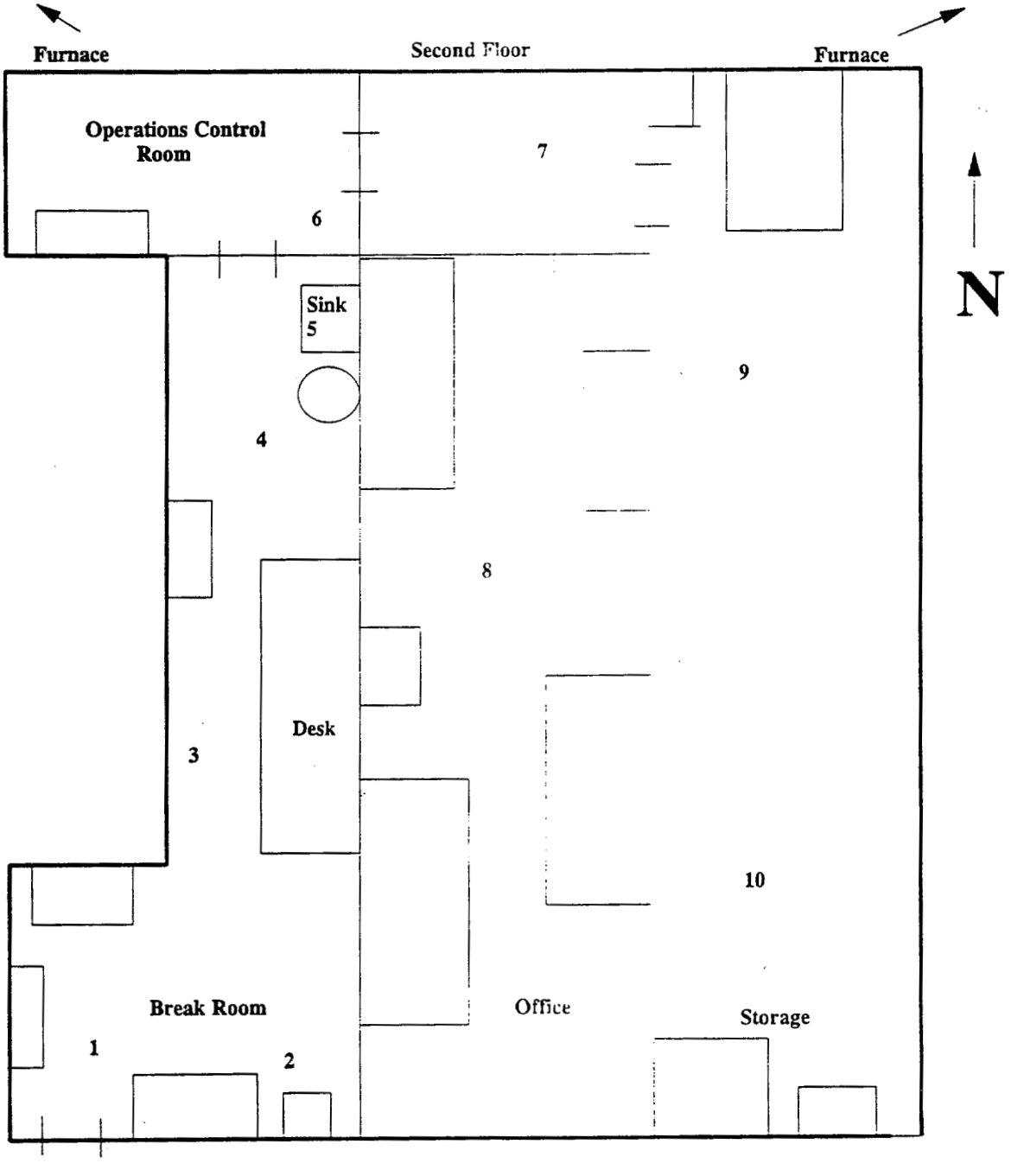
D102 Lunch Room



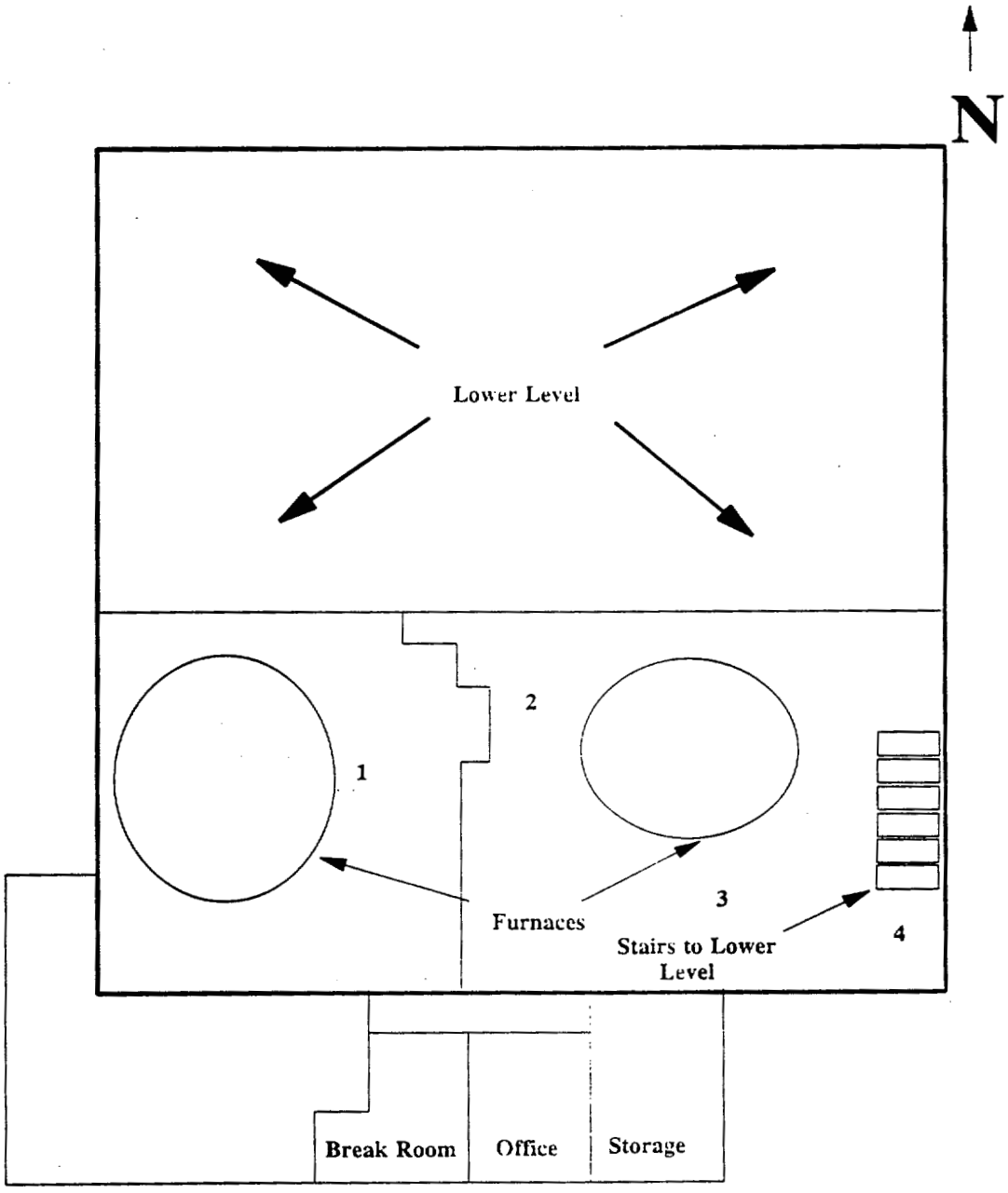
N

D117
The Cave

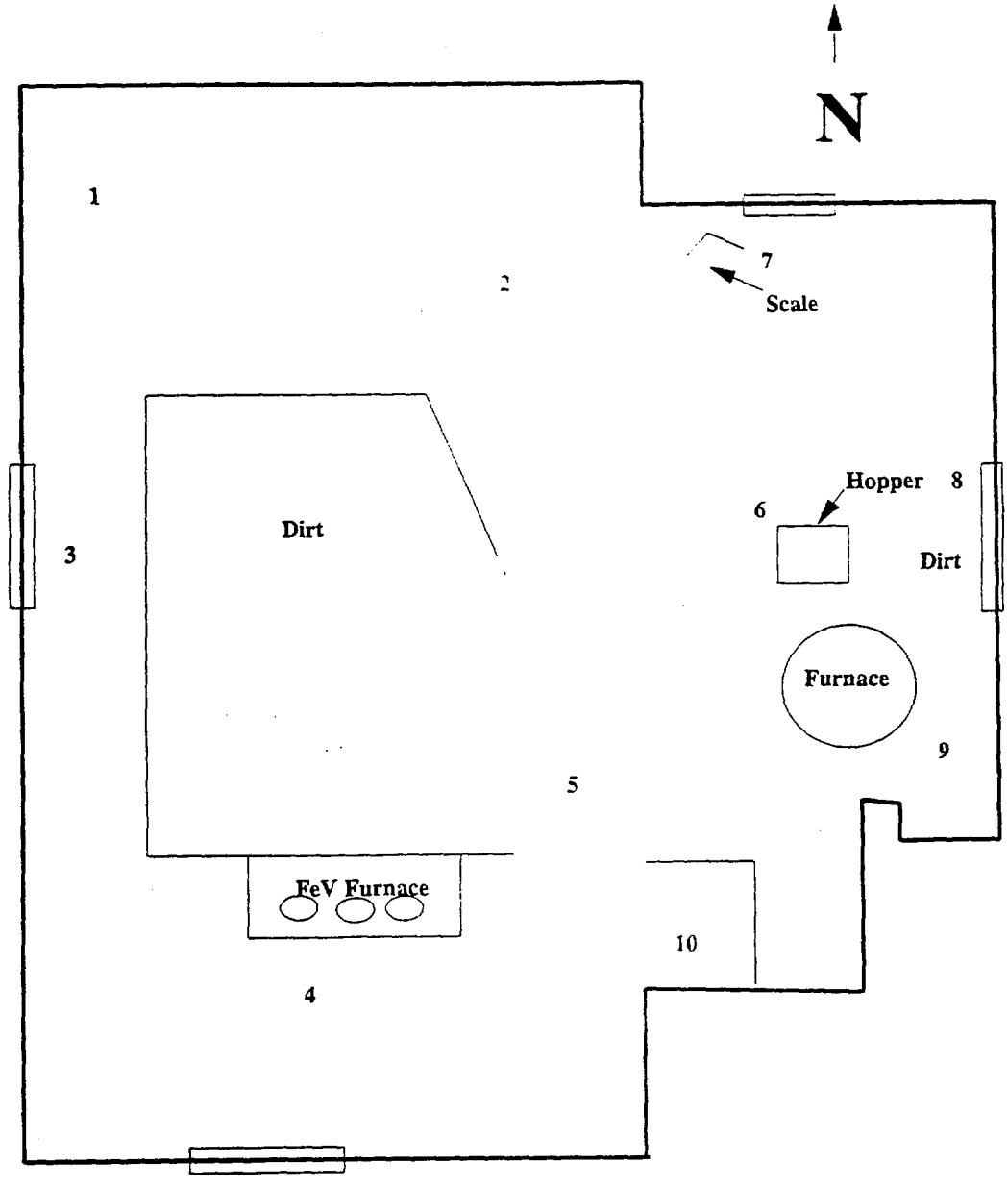
Quarterly surveys will be conducted until radioactive materials are no longer stored in the Cave.



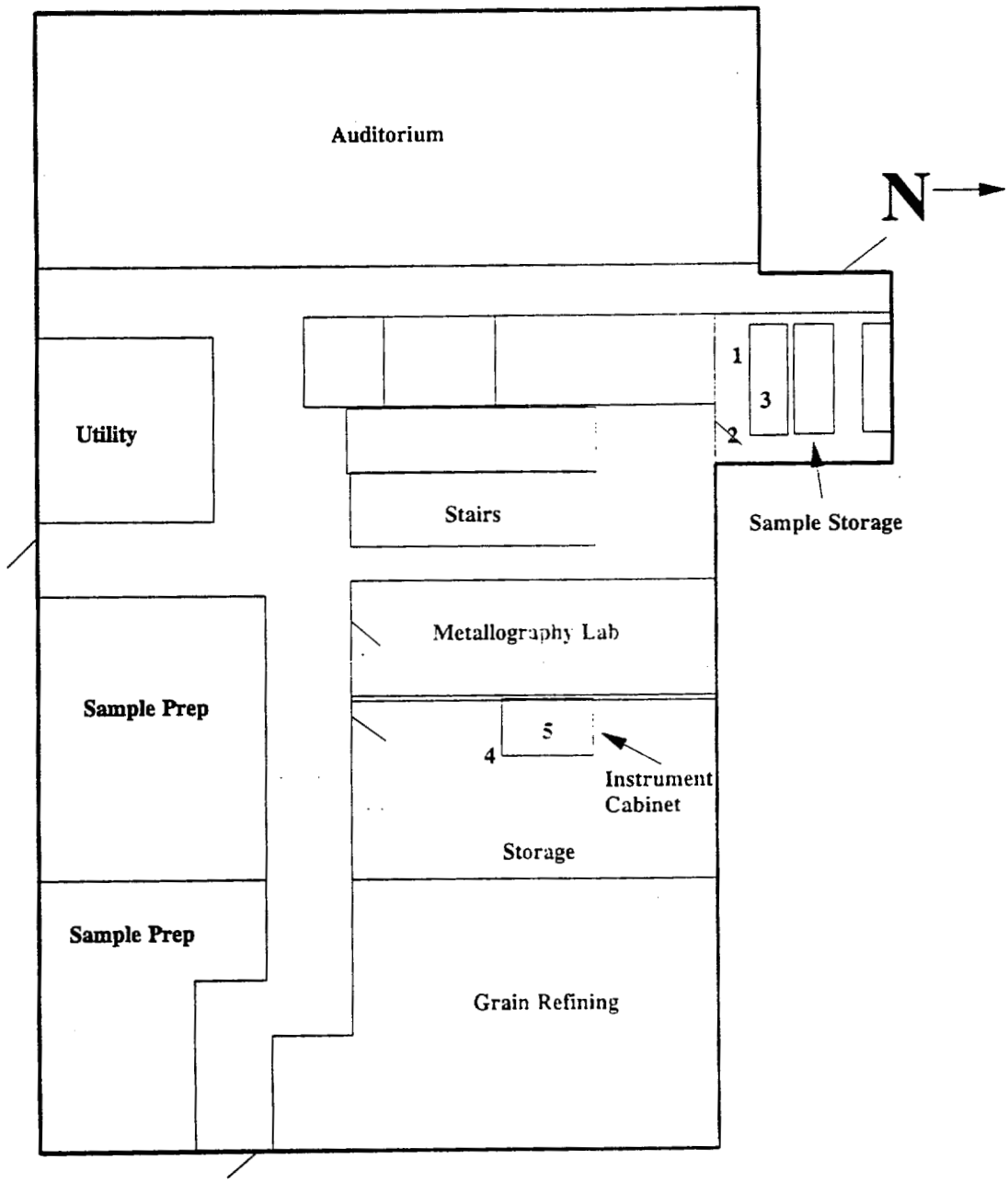
D111 - Office and Break Room



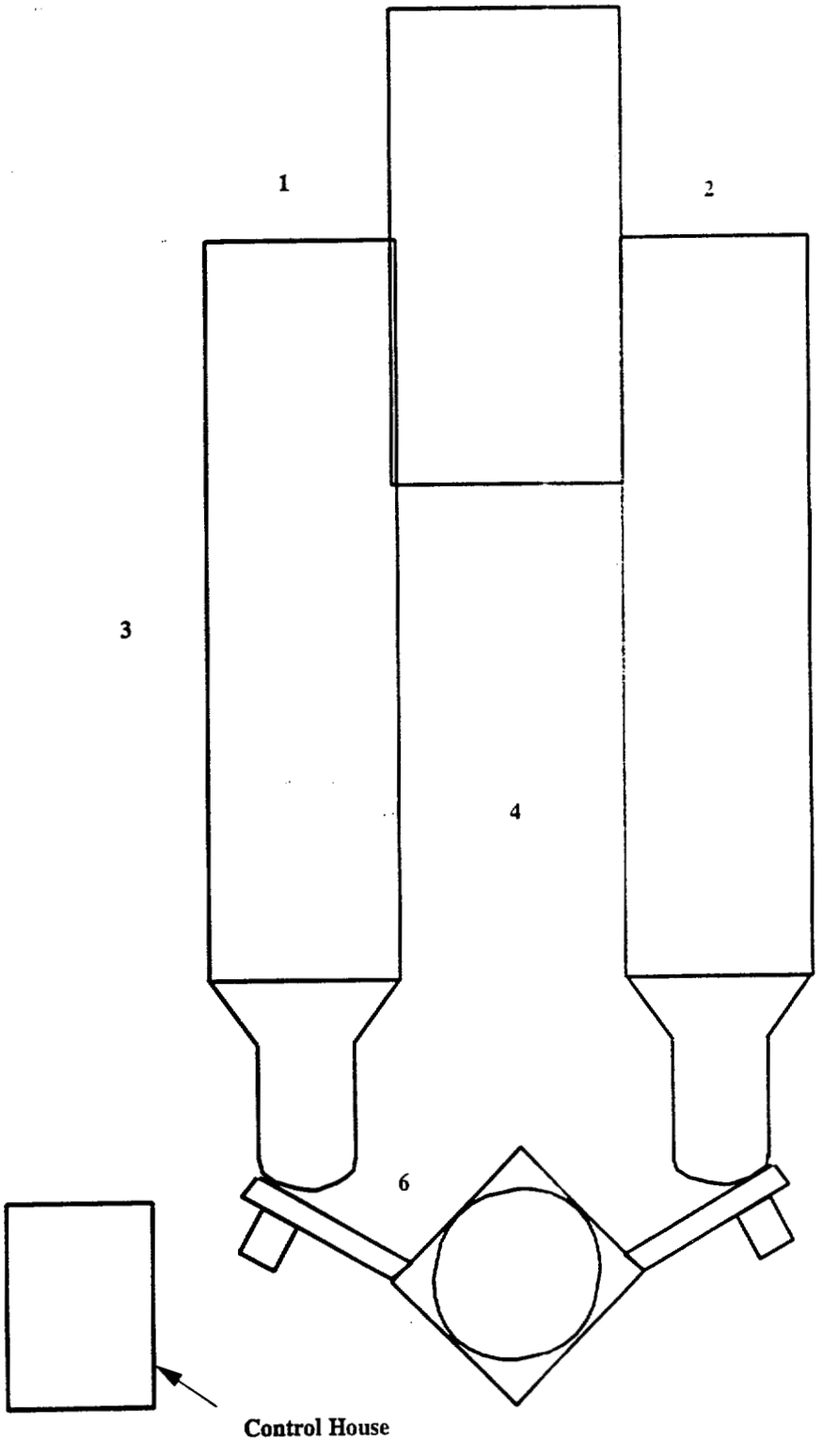
D111 - Upper Level



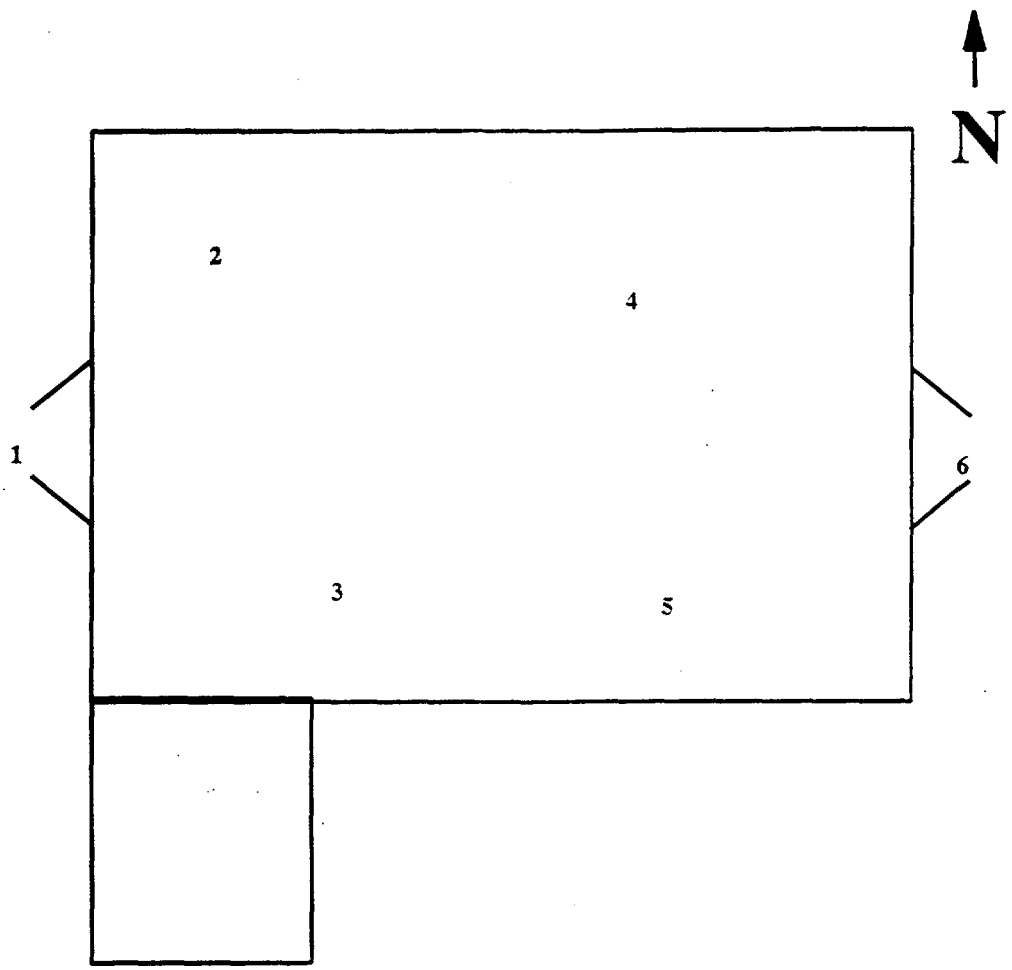
D111 - Lower Level



D202 Lab - Lower Level



D111 Flex-Kleen Dust Collector



D111 AAF Dust Collector

SMC	CONTAMINATION CONTROL - NEWFIELD FACILITY	Procedure No: RSP-009	Page: 1 of 5
		Revision No. 000	Date: September 19, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Co-Chair, RSC):	

TABLE OF CONTENTS

CONTROLLED COPY NO. : _____

1 PURPOSE

This procedure provides requirements and guidelines for controlling radioactive contamination at Shieldalloy Metallurgical Corporation's (SMC's) Newfield plant.

2 SCOPE

This procedure applies to all areas at SMC, and to all SMC employees, contractors and visitors that perform work in radiologically controlled areas at the Newfield plant.

3 REFERENCES

3.1 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.2 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan"

3.3 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-004, "Radiation Protection Records".

3.4 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-005, "ALARA Program".

3.5 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-008, "Instrumentation and Surveillance".

3.6 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-011, "Radiological Areas and Posting"

3.7 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-012, "Control of Work"

3.8 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-016, "Emergency Response and Notifications".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The President shall supply adequate resources to ensure compliance with this procedure.

5.1.2 The Radiation Safety Officer (RSO) shall:

5.1.2.1 Assure that the requirements of this procedure are met.

5.1.2.2 Assure that all Radiation Surveyors are properly trained in the provisions of this procedure.

5.1.2.3 Verify compliance with this procedure during planned and periodic audits of the Radiation Protection Program.

5.1.3 The Radiation Safety Committee (RSC) shall review unusual incidents involving contamination pursuant to RSP-016.

5.1.4 Radiation Surveyors, Authorized Users and Contractors shall

5.1.4.1 Comply with applicable requirements of this procedure.

5.1.4.2 Report any unusual findings to the RSO.

5.2 Contamination Limits

5.2.1 Personnel and equipment are considered to be contaminated if the surface being surveyed exceeds the Surface Radioactivity Guides (Attachment 1).

5.2.2 At the Newfield plant, loose contamination limits for unrestricted areas are as shown in Attachment 1.

Note: Loose contamination in Contamination Zones within Restricted Areas may exceed these criteria.

5.2.3 At the Newfield plant, total (fixed plus removable) contamination limits for unrestricted areas are as shown in Attachment 1.

Note: Total contamination in Contamination Zones within Restricted Areas may exceed these criteria.

5.3 Tagging and Posting

5.3.1 Contamination Zones shall be posted/labeled in accordance with RSP-011.

5.3.2 All contaminated items that are not secured within the controlled area shall be tagged with information on extent and type of contamination.

5.4 Protection of Personnel

5.4.1 All unescorted personnel should wear personal protective equipment (PPE) in contaminated areas.

Note: PPE may include shoe covers, dust masks, coveralls, hood, gloves, face shields, other items, or any combination thereof.

5.4.2 The level of PPE shall be specified in a Radiation Work Permit (RSP-012) or by the RSO.

5.4.3 Whole body frisks upon exiting Contamination Zones may be required by the RSO and/or specified on a Radiation Work Permit.

5.5 Measurement Methodologies

5.5.1 Removable contamination on surfaces shall be measured pursuant to RSP-008.

5.5.2 Total (fixed plus removable) contamination on surfaces shall be measured pursuant to RSP-008.

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

All records pertinent to this procedure shall be maintained pursuant to RSP-004.

8 ATTACHMENTS

Attachment 1: Surface Radioactivity Guides

ATTACHMENT 1
SURFACE RADIOACTIVITY GUIDES

NUCLIDE[1]	REMOVABLE[2,4]	TOTAL[2,3] (FIXED PLUS REMOVABLE)
U-nat, U-235, U-238 and associated decay products	1,000 dpm α/100 cm^2	5,000 dpm α/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200 dpm/100 cm^2	1,000 dpm α/100 cm^2
Mixture of U-nat and Th-nat		600 dpm α/100 cm^2 by direct frisk

[1] Where surface contamination by both α and β-gamma-emitting radionuclides exists, the limits established for α and β-gamma-emitting radionuclides should apply independently.

[2] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[3] The levels may be averaged over 1 m^2, provided the maximum surface activity in any area of 100 cm^2 is less than three times the guide values. For purposes of averaging, any square meter of surface shall be considered to be above the activity guide G if: (1) from measurements of a representative number (n) of sections it is determined that $1/n\ \Sigma_n\ S_i \geq G$, where S_i is the dis/min-100 cm^2 determined from measurement of section I; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds 3G.

[4] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. (Note - The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. Except for transuranics and Ra-226, Ra-228, Ac-227, Th-228, Th-230, and Pa-231 α emitters, it is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[4] Assumes removable activity is limiting

DO

NOT

FILM

SMC	**CONTAMINATION CONTROL - NEWFIELD FACILITY**	Procedure No: RSP-009	Page: 1 of 5
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		Approved by (President):	
		Approved by (RSO):	
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5.1.2.2 Assure that all Radiation Surveyors are properly trained in the provisions of this procedure.

5.1.2.3 Verify compliance with this procedure during planned and periodic audits of the Radiation Protection Program.

5.1.3 The Radiation Safety Committee (RSC) shall review unusual incidents involving contamination pursuant to RSP-016.

5.1.4 Radiation Surveyors, Authorized Users and Contractors shall

5.1.4.1 Comply with applicable requirements of this procedure.

5.1.4.2 Report any unusual findings to the RSO.

5.2 Contamination Limits

5.2.1 Personnel and equipment are considered to be contaminated if the surface being surveyed exceeds the Surface Radioactivity Guides (Attachment 1).

5.2.2 At the Newfield plant, loose contamination limits for unrestricted areas are as shown in Attachment 1.

Note: Loose contamination in Contamination Zones within Restricted Areas may exceed these criteria.

5.2.3 At the Newfield plant, total (fixed plus removable) contamination limits for unrestricted areas are as shown in Attachment 1.

Note: Total contamination in Contamination Zones within Restricted Areas may exceed these criteria.

5.3 Tagging and Posting

5.3.1 Contamination Zones shall be posted/labeled in accordance with RSP-011.

5.3.2 All contaminated items that are not secured within the controlled area shall be tagged with information on extent and type of contamination.

5.4 Protection of Personnel

5.4.1 All unescorted personnel should wear personal protective equipment (PPE) in contaminated areas.

Note: PPE may include shoe covers, dust masks, coveralls, hood, gloves, face shields, other items, or any combination thereof.

5.4.2 The level of PPE shall be specified in a Radiation Work Permit (RSP-012) or by the RSO.

5.4.3 Whole body frisks upon exiting Contamination Zones may be required by the RSO and/or specified on a Radiation Work Permit.

5.5 Measurement Methodologies

5.5.1 Removable contamination on surfaces shall be measured pursuant to RSP-008.

5.5.2 Total (fixed plus removable) contamination on surfaces shall be measured pursuant to RSP-008.

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

All records pertinent to this procedure shall be maintained pursuant to RSP-004.

8 ATTACHMENTS

Attachment 1: Surface Radioactivity Guides

ATTACHMENT 1
SURFACE RADIOACTIVITY GUIDES

NUCLIDE[1]	REMOVABLE[2,4]	TOTAL[2,3] (FIXED PLUS REMOVABLE)
U-nat, U-235, U-238 and associated decay products	1,000 dpm α/100 cm^2	5,000 dpm α/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200 dpm/100 cm^2	1,000 dpm α/100 cm^2
Mixture of U-nat and Th-nat		600 dpm α/100 cm^2 by direct frisk

[1] Where surface contamination by both α and β-gamma-emitting radionuclides exists, the limits established for α and β-gamma-emitting radionuclides should apply independently.

[2] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[3] The levels may be averaged over 1 m^2, provided the maximum surface activity in any area of 100 cm^2 is less than three times the guide values. For purposes of averaging, any square meter of surface shall be considered to be above the activity guide G if: (1) from measurements of a representative number (n) of sections it is determined that $1/n\ \Sigma_n\ S_i \geq G$, where S_i is the dis/min-100 cm^2 determined from measurement of section I; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm^2 area exceeds 3G.

[4] The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. (Note - The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. Except for transuranics and Ra-226, Ra-228, Ac-227, Th-228, Th-230, and Pa-231 α emitters, it is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[4] Assumes removable activity is limiting

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		Revision No. 000	Date: September 19, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Co-Chair, RSC):	

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CONTROLLED COPY NO. : _____

1 PURPOSE

The purpose of this procedure is to describe the method for assessing and controlling radiation exposures at the Shieldalloy Metallurgical Corporation (SMC) plant in Newfield, New Jersey. The objective of the procedure is to assure that the potential for radiation exposure of SMC personnel, visitors, and contractors is minimized by establishing and enforcing dose limits and administrative dose control points.

2 SCOPE

This procedure pertains to all work activities that involve licensable radioactive materials or the potential for internal exposure to radioactive materials. It applies to all SMC employees, visitors and contractors performing work in controlled areas.

3 REFERENCES

3.1 Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports for Workers; Inspection and Investigations"

3.2 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation".

3.3 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.4 International Commission on Radiological Protection, "ICRP Task Group on Reference Man", ICRP Publication 23, 1975.

3.5 International Commission on Radiological Protection, "Limits of Intakes of Radionuclides by Workers", ICRP Publication 30, 1980.

3.6 National Bureau of Standards, "NVLAP Dosimetry LAP Handbook - Operational and Technical Requirements of the Laboratory Accreditation Program for Personnel Dosimetry Processors", NBS 85-3170, May, 1985.

3.7 American National Standards Institute, "Personnel Dosimetry Performance - Criteria for Testing", ANSI N13.11, 1983.

3.8 Lessard, E., et al., "Interpretation of Bioassay Measurements", NUREG/CR-4884, U. S. Nuclear Regulatory Commission, September, 1981.

3.9 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-001, "Radiation Protection Program Plan".

3.10 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-004, "Radiation Protection Records".

3.11 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-005, "ALARA Program".

3.12 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-007, "Training in Radiation Protection".

3.13 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-009, "Contamination Control".

3.14 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-019, "Internal Exposure Monitoring".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The President shall:

5.1.1.1 Assure that radiation exposures of all employees, visitors and contractors are maintained as low as is reasonably achievable (ALARA) pursuant to RSP-005.

5.1.1.2 Approve all planned exposures in excess of regulatory or administrative limits.

5.1.1.3 Enforce participation in the monitoring program as scheduled by the RSO.

5.1.2 The Radiation Safety Officer (RSO) shall:

5.1.2.1 Develop and administer an industry-standard radiation monitoring program.

5.1.2.2 Disseminate this policy to all applicable personnel.

5.1.2.3 Approve all planned exposures in excess of regulatory or administrative limits.

5.1.2.4 Review the results of the radiation monitoring program.

5.1.3 The Radiation Safety Committee (RSC) shall review unusual exposure incidents.

5.1.4 Monitored Personnel shall

5.1.4.1 Participate in the radiation monitoring program as directed by the RSO.

5.1.4.2 Provide past exposure history for the employee exposure history files.

5.1.4.3 Maintain an awareness of the radiation dose limits if pertinent to a job assignment.

5.1.4.4 Comply with the contents of this procedure as instructed by the RSO.

5.1.4.5 Maintain their own radiation dose ALARA.

5.1.4.6 Notify the RSO if any unusual conditions or circumstances occur or are observed.

Note: Unusual conditions or circumstances may include spills, abnormal equipment operating conditions, suspected radiation exposures, etc.

5.2 Dose Limits

5.2.1 Regulatory Dose Limits

5.2.1.1 Individual doses for occupational workers shall not exceed 5,000 millirem TEDE or 50,000 millirem TDE per calendar year, excluding medical radiation exposures.

5.2.1.2 Individual doses for visitors and members of the general public shall not exceed 100 millirem TEDE per calendar year as a result of SMC activities.

5.2.1.3 The total radiation dose to the unborn child shall not exceed 500 millirem TEDE.

5.2.1.4 Doses to the skin, the eye and the extremities shall not exceed 50,000 millirem H_S, 15,000 millirem H_E, and 50,000 millirem H_D, respectively.

5.2.2 Administrative Dose Limits

5.2.2.1 Individual doses for radiation workers should not exceed 2,500 millirem per calendar year, excluding medical radiation exposures.

5.2.2.2 Individual doses for general employees should not exceed 100 millirem per calendar year, excluding medical radiation exposures.

5.2.2.3 Approval by the President is required for any employee to exceed these limits.

5.2.3 Notifications

5.2.3.1 The RSO shall immediately inform the USNRC of any instance in which an individual receives more than 25,000 millirem in a calendar year.

5.2.3.2 The RSO shall, within 24 hours, inform the USNRC of any instance in which an individual may have exceeded a regulatory dose limit.

5.2.3.3 The RSO shall, within 30 days, inform the USNRC:

5.2.3.3.1 Of any instance in which a member of the general public receives more than 100 millirem in a calendar year.

5.2.3.3.2 Of any instance in which an embryo/fetus of a declared pregnant female receives more than 500 millirem.

5.2.3.4 The RSO shall, within 30 days, submit a written report to the USNRC for:

5.2.3.4.1 Any instance in which an individual receives more than 2,500 millirem in a calendar year.

5.2.3.4.2 Any instance in which a general employee or member of the general public receives more than 100 millirem in a calendar year.

5.2.3.4.3 Any instance in which an embryo/fetus of a declared pregnant female receives more than 500 millirem.

5.2.3.4.4 Any incident for which notification is required in SMB-743.

5.3 Dose Control for Monitored Personnel

5.3.1 An individual shall participate in an internal or external radiation monitoring program if there is a potential to receive greater than 10% of a regulatory dose limit from either internal or external sources of radiation.

5.3.2 Each individual shall be responsible for controlling their own exposure to radiation hazards such that their annual dose remains below the administrative limits.

5.3.3 Work involving radioactive materials shall be planned and performed in a fashion that minimizes the radiation exposures received.

5.4 Declared Pregnant Female Policy

5.4.1 Female employees, visitors, and contractors who work in restricted areas should inform the RSO and/or the Vice President of Human Resources of a pregnancy.

5.4.2 All radiation workers and monitored personnel who perform work in a restricted area shall be instructed in the effects of radiation exposure on the unborn child pursuant to RSP-007.

Note: Both male and female personnel are included in this requirement.

5.4.3 Declared pregnant females working in a restricted area may request a transfer to a different job assignment for the duration of pregnancy.

5.5 Previous Exposure History

5.5.1 Monitored personnel shall complete an USNRC Form-4, "Occupational External Radiation Exposure History" (See Attachment 1).

5.5.2 The RSO shall attempt to obtain previous exposure histories from an individual's former employer(s) whenever possible by initiating a "Request for Occupational Exposure History" form (See Attachment 2).

5.5.3 No employee, visitor or contractor should be permitted to exceed 100 millirem TEDE for occupational exposure in a calendar year at SMC without a known or estimated exposure history on file.

5.6 External Exposure Monitoring

5.6.1 The RSO shall provide monitored personnel with a primary dosimetry device capable of measuring the individual's deep dose equivalent, shallow dose equivalent and eye dose equivalent from external sources.

5.6.2 The primary dosimetry device shall be a TLD-based personnel dosimeter.

5.6.3 Other SMC employees or contractors may be issued a personnel dosimeter at the discretion of the RSO.

5.6.4 Secondary Dosimetry Devices

5.6.4.1 The RSO may provide each monitored individual who may enter a restricted area as part of their work a self-indicating, dose integrating device such as a Pocket Ionization Chamber (PIC), which is considered to be a "secondary" dosimetry device.

5.6.4.2 The monitored individual shall place the primary dosimetry device and the PIC within a hand's width of each other on the part of the whole body that is expected to receive the highest exposure.

5.6.4.3 The monitored individual should read their PICs periodically when in radiation areas and frequently in high radiation areas to ensure doses received are consistent with expectations.

5.6.4.4 The RSO shall identify individuals whose PIC totals indicate they are at or near administrative dose levels, process their primary dosimetry device, and exclude them from further exposure until primary dosimeter results are available and evaluated.

5.6.4.5 Monitored personnel shall <u>not</u> wear a PIC without a primary dosimetry device.

5.6.5 Placement of Monitoring Devices

5.6.5.1 Monitored personnel shall place the primary dosimetry device on the part of the whole body that is likely to receive the highest exposure.

5.6.5.2 If the highest exposure location on the whole body is not known, monitored personnel may wear additional primary dosimetry devices on those parts of the whole body that might receive the highest exposure.

5.6.5.3 Monitored personnel shall place extremity dosimetry such that they are as close as possible to the radiation source during work operations without restricting the use of the extremity.

5.6.6 Monitoring for Extremity Exposures

5.6.6.1 For work situations in which extremity exposures are expected to be significantly greater than whole body exposures, or if extremity exposures are expected to exceed 1000 millirem per calendar quarter, or if specified by license or permit requirements, the RSO shall specify additional dosimetry devices to be placed on the extremities to measure and control extremity dose.

5.6.6.2 Each extremity shall be provided with a dosimetry device if the extremity is to be placed into a radiation field (including both penetrating and non-penetrating radiation) in which the extremity could receive 1000 millirem or more than twice the expected whole body dose.

5.6.7 Monitoring for Skin Exposure

5.6.7.1 Due to the complexity of assessing skin dose, the RSO shall control skin dose rates by shielding and decontamination as described in RSP-009.

5.6.7.2 Dose to the skin of the extremities shall be considered extremity dose rather than dose to the skin of the whole body.

5.6.7.3 The RSO shall calculate the skin dose if a worker may have received greater than 1000 millirad from skin contamination or if detectable skin contamination cannot be removed by decontamination.

5.6.8 Equipment Specifications

5.6.8.1 Primary dosimetry services for routine use and for area monitoring, including dosimeters and processing equipment, shall be accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) in all applicable categories, except neutron.

5.6.8.2 Supplementary neutron dosimeters, if issued, shall be accredited by NVLAP in the neutron categories.

5.6.8.3 The RSO shall ensure that dosimeter issuance, retrieval, handling, storage, and processing practices; personnel training and qualifications; quality assurance; documentation; calibration; and record keeping practices meet the minimum conditions for accreditation by NVLAP, and the requirements of ANSI N13.11, "Criteria for Testing Personnel Dosimetry Performance".

5.6.9 Calibration of Dosimetry Devices

5.6.9.1 The RSO shall ensure that primary dosimetry devices are calibrated by the vendor to measure dose equivalent directly or indirectly through calibration factors.

5.6.9.2 The RSO shall ensure that primary dosimetry processing systems are calibrated at least quarterly using NIST-traceable standards.

5.6.9.3 Beta and neutron sensitive dosimeters shall be calibrated using sources that represent the energies of the radiations encountered at SMC.

5.6.9.4 The RSO shall use radiation survey results acquired pursuant to RSP-008 to determine the need for monitoring in particular work areas.

5.6.9.5 The RSO shall ensure that secondary dosimetry devices (e.g., PICs) are calibrated at least annually or any time results indicate that a device is potentially defective.

Note: ANSI N322 *guidance should be used in performing these checks.*

5.6.10 Deployment, Storage, and Retrieval of Primary Dosimeters

5.6.10.1 The RSO shall retrieve and process primary dosimetry devices issued to employees once every six months.

5.6.10.2 The RSO shall retrieve and process primary dosimetry devices of personnel who enter high radiation areas at least monthly.

5.6.10.3 Primary dosimetry devices of personnel who enter radiation areas may be processed monthly, at the discretion of the RSO.

5.6.10.4 If an individual is known or suspected to have reached or exceeded an administrative dose limit, the RSO shall process the primary

dosimetry device prior to that individual being allowed to receive additional external radiation exposure.

5.7 Internal Exposure Monitoring

5.7.1 All employees with the potential to exceed 500 millirem CEDE from internal sources shall participate in a routine internal exposure monitoring program.

5.7.2 Routine monitoring shall be performed by the methodology of indirect bioassay or breathing zone sampling pursuant to RSP-019.

5.8 Radiation Dose Assessment

5.8.1 Assessment of External Dose

5.8.1.1 The deep dose equivalent, H_D, of record is the dose recorded from processing of the personnel dosimeter, in units of "millirem".

5.8.1.2 In the event of dosimeter damage or disfunction, external doses may be estimated from the use of stay time information and ambient exposure rate information determined during routine or job-specific surveillance.

5.8.1.3 Dose assessments shall be reviewed and approved by the RSO and President prior to entering it into the dose of record unless measured by a personnel dosimeter.

5.8.1.4 The results of the dose assessment shall be entered in the individual's radiation dose totals (USNRC Form-5), and a copy of the dose assessment shall be placed in the individual's dosimetry record file (See Attachment 3).

5.8.2 Assessment of Internal Dose

5.8.2.1 The RSO may solicit the assistance of an internal dosimetrist for performing internal dose assessments.

5.8.2.2 The committed dose equivalent (non-stochastic) incurred by the employee shall be estimated by:

$$CDE_T\ (millirem) = \frac{Intake}{ALI_{NS}} \times 50{,}000$$

Where T = the organ or tissue of interest, Intake = the activity taken into the body as determined from bioassay measurements, and ALI_{NS} = the non-stochastic Annual Limit on Intake for the radionuclide of interest.

Note: Values of ALI can be found in Title 10, Code of Federal Regulations, Part 20, Appendix B.

5.8.2.3 The committed effective dose equivalent (stochastic) incurred by the employee shall be estimated by:

$$CEDE_T\ (millirem) = \frac{Intake}{ALI} \times 5{,}000$$

Where T = the organ or tissue of interest, Intake = the activity taken into the body as determined from bioassay measurements, and ALI = the stochastic Annual Limit on Intake for the radionuclide of interest.

Note: Values of ALI can be found in Title 10, Code of Federal Regulations, Part 20, Appendix B.

5.9 Calculation of TDE

5.9.1 The TDE is computed from the deep dose equivalent (H_D) as determined from external radiation monitoring, and the committed dose equivalent (CDE) as determined from internal radiation monitoring.

Note: If external radiation monitoring is not performed, $H_D = 0$.

5.9.2 The TDE is estimated by:

$$TDE\ (millirem) = CDE + H_D$$

5.10 Calculation of TEDE

5.10.1 The TEDE is computed from the deep dose equivalent (H_D) as determined from external radiation monitoring, and the committed effective dose equivalent (CEDE) as determined from internal radiation monitoring.

Note: If external radiation monitoring is not performed, $H_D = 0$.

5.10.2 The TEDE is estimated by:

$$TDE\ (millirem) = CEDE + H_D$$

5.11 Trend Analysis of Dosimetry Results

Trend analysis of personnel dosimetry and dose assessment results should be performed as part of the ALARA program described in RSP-005.

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

All Records pertinent to this procedure shall be maintained pursuant to RSP-004.

8 ATTACHMENTS

8.1 Attachment 1 - USNRC Form 4

8.2 Attachment 2 - Request for Occupational Exposure History

8.3 Attachment 3 - USNRC Form 5

ATTACHMENT 1
USNRC FORM-4

ATTACHMENT 2
REQUEST FOR OCCUPATIONAL EXPOSURE HISTORY

Date:

Name of Former Employer
Address of Former Employer

Re: Request for Occupational Exposure History

Gentlemen:

So that we may compile radiation exposure histories for new employees, we request your cooperation in providing us with the history of exposure to radioactive materials, including both internal and external exposures, for the following individual, who was formerly employed at your facility.

Name:

Social Security No:

Dates of Employment:

Signature Authorizing Release: _____

Your assistance is appreciated. Should you have any questions, please telephone me at (609) 690-4200. Please mail your response to the attention of the Radiation Safety Officer, Shieldalloy Metallurgical Corporation, West Boulevard, Post Office Box 758, Newfield, New Jersey 08344.

Sincerely,

_____
C. Scott Eves
Radiation Safety Officer

ATTACHMENT 3
USNRC FORM-5

SMC	RADIOLOGICAL AREAS AND POSTING - NEWFIELD FACILITY	Procedure No: RSP-011	Page: 1 of 6
		Revision No. 000	Date: September 19, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Co-Chair, RSC):	

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1 PURPOSE

This procedure describes the radiological areas and posting requirements for the Shieldalloy Metallurgical Corporation (SMC) facility in Newfield, New Jersey.

2 SCOPE

This procedure applies to all controlled and restricted areas at SMC.

3 REFERENCES

3.1 Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports for Workers; Inspection and Investigations".

3.2 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation".

3.3 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.4 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-001, "Radiation Protection Records".

3.5 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-007, "Training in Radiation Protection".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The Radiation Safety Officer (RSO) shall:

5.1.1.1 Establish radiological areas based upon radiological conditions.

5.1.1.2 Approve all work in radiological areas prior to the beginning of work.

5.1.1.3 Ensure that all employees understand the appropriate labeling of radiological areas.

5.1.1.4 Remove radiation hazard identification postings when the conditions requiring their use no longer exists.

5.1.2 Radiation Surveyors shall periodically observe radiological areas to ensure that the requirements of this procedure are being met.

5.1.3 SMC personnel shall:

5.1.3.1 Observe and obey radiological areas and postings.

5.1.3.2 Periodically review this procedure.

5.2 Areas to be Posted

5.2.1 Radiological area posting/labeling requirements throughout SMC facilities shall be as described in 10 CFR 20, Subpart J.

5.2.2 The following radiological areas may be established by the RSO:

5.2.2.1 Restricted Areas

5.2.2.2 Radiation Areas

5.2.2.3 Airborne Radioactivity Areas

5.2.2.4 Contamination Areas

5.2.3 Each area, building, or room in which licensed radioactive materials are stored in quantities that exceed 10 times the quantity of such materials shown in 10 CFR Appendix C of 20.1001-2401 shall be posted with the magenta and yellow symbol and the words "CAUTION - RADIOACTIVE MATERIAL(S)" at each entrance point.

Note: For natural thorium and natural uranium, the Appendix C quantity is 100 microcuries each. If a combination of materials is present (i.e., a combination of uranium and thorium), the following relationship must be true:

$$\frac{\mu Ci_{Th}}{100} + \frac{\mu Ci_{U}}{100} \geq 1$$

5.2.4 Caution signs may not be necessary in areas/rooms containing source materials for a period of less than eight (8) hours, provided that the materials are attended throughout the temporary storage period by an individual who has been trained in the precautions for radiation exposure of personnel.

5.3 Posting Requirements

5.3.1 The yellow and magenta trefoil (three-blade) radiation symbol shall be used to signify the actual or potential presence of ionizing radiation and to identify objects, devices, materials, or combinations of materials which emit ionizing radiation.

5.3.2 The symbols and color combination of yellow and magenta are not to be used for purposes other than to warn of the actual or potential presence of a radiation or contamination hazard.

5.3.3 Each sign, tag, or label shall be displayed prominently and must be recognizable from a safe distance.

Note: The signs and symbols shall conform to 10 CFR 20.1901.

5.3.4 Each posted area shall be defined and clearly marked with appropriate signs and may include a portion or all of a room, building, area, or vehicle.

Note: Areas without clearly defined existing boundaries (e.g., walls or fences) should be defined by the use of radiation tape, ribbon, or rope.

5.3.5 Supplementary notices specifying the requirements for entry to and exit from areas and other special precautions that are to be exercised should be posted in conjunction with radiation warning signs and tags to provide personnel with any required additional instructions or information not given by the signs and tags.

5.3.6 Information signs, tags, labels, and notices shall be kept current, reflecting any changes in radiological conditions.

5.3.7 Warning signs, tags, labels, notices and other radiation hazard identification markings shall be removed only by the RSO when conditions requiring their use no longer exist.

5.3.8 Form USNRC-3, "Notice to Employees" (See Attachment 1) shall be posted in prominent locations within the SMC controlled area, such as employee break rooms and bulletin boards.

5.3.9 Radiation Work Permits shall be posted at the entrance to radiological areas where work is being performed under a Radiation Work Permit.

5.4 Training

General employees and other personnel permitted unescorted access to the SMC Controlled Area shall be trained in recognition of posting/labeling pursuant to RSP-007.

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

All records pertinent to this procedure shall be maintained pursuant to RSP-004.

8 ATTACHMENTS

Attachment 1 - USNRC Form-3, "Notice to Employees"

ATTACHMENT 1
NOTICE TO EMPLOYEES

SMC	CONTROL OF WORK - NEWFIELD FACILITY	Procedure No: RSP-012	Page: 1 of 9
		Revision No. 000	Date: November 21, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Co-Chair, RSC):	

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1 PURPOSE

This procedure establishes the method to be followed to control work involving radioactive materials and radiation producing machines, and for obtaining a Radiation Work Permit (RWP).

2 SCOPE

This procedure applies to all work within a restricted area at Shieldalloy Metallurgical Corporation (SMC) that is not covered by Radiation Safety Procedures, or for work in unrestricted areas for which a RWP is deemed necessary by the RSO.

3 REFERENCES

3.1 Title 10, Code of Federal Regulations, Part 19, "Notices, Instructions and Reports for Workers; Inspection and Investigations".

3.2 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation".

3.3 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.4 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-003, "Radiation Protection Records".

3.5 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-007, "Training in Radiation Protection".

3.6 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-009, "Contamination Control".

3.7 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-010, "Exposure Control".

3.8 Shieldalloy Metallurgical Corporation Radiation Safety Procedure No. RSP-016, "Emergency Response and Notification".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The Radiation Safety Officer (RSO) shall:

5.1.1.1 Maintain a supply of Radiation Work Permit (RWP) forms (Attachment 1)

5.1.1.2 Insure that all work performed inside an SMC restricted area is covered by a RSP or a current RWP.

5.1.1.3 Provide RWPs to job Supervisors upon request.

5.1.1.4 Review the RWP submittal from the Supervisor and complete and issue the RWP.

5.1.1.5 Perform periodic surveillance to determine compliance with this procedure.

5.1.1.6 Maintain copies of completed RWP's as part of the radiation protection records.

5.1.2 Supervisors shall:

5.1.2.1 Initiate RWP's by completing Part A of the RWP form.

5.1.2.2 Obtain RSO review and approval of the RWP.

5.1.2.3 Post completed RWP's at the work location or maintain at the work site.

5.1.2.4 Ensure that RWP requirements are followed by all personnel that enter the area.

5.1.3 SMC personnel performing work under an RWP shall:

5.1.3.1 Review completed RWP's with the Supervisor or the RSO, who shall provide additional instructions if required.

5.1.3.2 Read the RWP and sign the RWP to indicate knowledge of requirements.

5.1.3.3 Perform the work in accordance with the requirements specified in the RWP.

5.2 Initiating the RWP

5.2.1 Upon determination that construction, demolition, or maintenance work activities or non-routine operations are scheduled within a restricted area, the Supervisor shall notify the RSO and shall initiate the RWP process.

5.2.2 The Supervisor shall enter the following information in the shaded portion of the RWP form:

5.2.2.1 Location of the proposed work, including the department and the work area.

5.2.2.2 The start and finish dates anticipated for the proposed work.

5.2.2.3 Names and status (employee, contractor, visitor) of individuals who are expected to enter the restricted area.

5.2.2.4 A brief description of the proposed work including the type of tools and equipment that will be brought into the work area.

5.2.2.5 The signature of the Supervisor.

5.2.2.6 The date of the application.

5.3 Completing the RWP

5.3.1 Upon receipt of the RWP form, the RSO shall review it for completeness and establish the requirements for the RWP.

5.3.2 The RSO shall complete Part B of the RWP form by providing the following:

5.3.2.1 RWP number. This number shall be the month and year that the RWP is issued, plus a sequential number at the end (ex., 0394-01). This information shall be entered into a log maintained by the RSO (see Attachment 2).

5.3.2.2 Current and expected radiological conditions.

5.3.2.3 Protective requirements.

5.3.2.4 Need for Special Briefing pursuant to RSP-007.

5.3.2.5 Special instructions.

5.3.2.6 Approval signature.

5.4 General Requirements

5.4.1 The RWP shall be posted at the boundary of the work area, as near the entrance as practical.

5.4.1.1 All employees performing the job shall sign the RWP.

5.4.1.2 This signature shall demonstrate the employee's understanding of all requirements.

5.4.2 If job requirements on a RWP change or any unusual/unexpected events occur:

5.4.2.1 The RSO shall be notified as soon as possible

5.4.2.2 A new RWP shall be issued or changes shall be made to the existing RWP.

5.4.3 The RSO shall investigate any suspected personnel contamination incidents pursuant to RSP-016.

5.5 Terminating the RWP

5.5.1 A RWP shall be valid for the duration specified.

5.5.2 If an activity covered by a RWP exceeds the specified duration, an extension may be granted by the RSO.

5.5.3 The Supervisor shall notify the RSO when the work with the radioactive material is completed.

5.5.4 The RSO shall:

5.5.4.1 Confirm that the work performed under the RWP is complete.

5.5.4.2 Confirm that all contaminated materials are properly stored.

5.5.4.3 As necessary, perform an ambient and contamination survey of equipment and surfaces that came in contact with the radioactive material.

5.5.5 The RSO shall remove the RWP and other restrictions from the area after the results of the surveys are complete.

6 EXEMPTION PROVISIONS

Variances and exceptions to the requirements of this Radiation Safety Procedure shall be permitted pursuant to the written authorization of the RSO and the President.

7 DOCUMENTATION

All Records pertinent to this procedure shall be maintained pursuant to RSP-003.

8 ATTACHMENTS

8.1 Attachment 1 - Radiation Work Permit

8.2 Attachment 2 - RWP Log

ATTACHMENT 1
RADIATION WORK PERMIT

Permit No:	Type: ☐ Job Specific ☐ Extended
Start Date:	Expiration Date:

Location of Work:
Description of Work:
Involved Personnel:
Tools Required:

SURVEY INFORMATION

General Area Dose Rates (mR/hr):
Maximum Accessible Dose Rates (mR/hr):
Removable Contamination (dpm/100 cm^2):

ALARA REVIEW

Estimated Total Dose:	Actual Total Dose:
Dose Reduction Techniques to be Employed:	

DOSIMETRY REQUIREMENTS

☐ TLD Badge	☐ Finger Ring	☐ Pocket Dosimeter	☐ BZA	☐ Stay-Time Estimate
☐ Other (Specify):				

PROTECTIVE EQUIPMENT

☐ Coveralls	☐ Lab Coat	☐ Hood	☐ Rubber Gloves	☐ Booties
☐ Rubbers	☐ Respirator	☐ Taped Seams	☐ HP Coverage	☐ Air Sampling
☐ Pre-job Bioassay	☐ Post-job Bioassay	☐ Special Briefing in:		
Other Precautions and Special Instructions:				

Requested by:	Date:
Authorized by:	Date:
Terminated by:	Date:

Minor Change Number: By: Date: / /	**CONTROL OF WORK - NEWFIELD FACILITY**	No. RSP-012 Rev. No. 000 Date: 11/21/95 Page: 8 of 9

ATTACHMENT 1 (continued)
ACKNOWLEDGMENT OF RWP REQUIREMENTS

Permit No.____________________

Printed Name	Signature	Date that RWP was Reviewed

ATTACHMENT 2
RWP LOG

Permit No.	Preparer	Authorization Date	Termination Date	Description of Work

SMC	EMERGENCY RESPONSE AND NOTIFICATIONS - NEWFIELD FACILITY	Procedure No: RSP-016	Page: 1 of 10
		Revision No. 000	Date: November 21, 1995
		Approved by (President):	
		Approved by (RSO):	
		Approved by (Co-Chair, RSC):	

TABLE OF CONTENTS

CONTROLLED COPY NO. : _____

1 PURPOSE

This procedure contains the general policies and actions to be implemented during incidents or emergencies where radioactive materials are handled or stored at Shieldalloy Metallurgical Corporation (SMC). It establishes the responsibilities and methods by which incident/events are to be reported, documented, reviewed, distributed, and the root cause(s) determined in order to develop corrective action to minimize or prevent the same or similar occurrences.

2 SCOPE

This procedure applies to all SMC and contractor personnel working with or in the vicinity of radioactive material or radiation sources at SMC facilities. Incidents or emergencies that do not involve radioactive materials or radiation-producing machines are exempt from the requirements of this RSP.

3 REFERENCES

3.1 Title 10, Code of Federal Regulations, Part 20, "Standards for Protection Against Radiation".

3.2 U. S. Nuclear Regulatory Commission Source Material License Number SMB-743.

3.3 Shieldalloy Metallurgical Corporation, "Emergency Notification and Evacuation Plan".

3.4 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-010, "Exposure Control".

3.5 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-004, "Radiation Protection Records".

3.6 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-008, "Instrumentation and Surveillance".

3.7 Shieldalloy Metallurgical Corporation, Radiation Safety Procedure No. RSP-011, "Radiological Areas and Posting".

4 DEFINITIONS

The definition of terms used in this RSP that may not be commonly understood should be found in RSP-002, "Definitions".

5 PROCEDURE

5.1 Responsibilities

5.1.1 The President shall supply adequate resources to ensure compliance with this procedure.

5.1.2 The Radiation Safety Officer (RSO) shall:

5.1.2.1 Supervise decontamination efforts.

5.1.2.2 Provide consultation to fire fighting or other emergency personnel by direct involvement.

5.1.2.3 Ensure an Incident/Event (I/E) Report (Attachment 1) is submitted to the President within four (4) working days of an incident or emergency which involves a radiological hazard.

5.1.2.4 Notify the USNRC of any incident involving licensed material pursuant to the reporting requirements contained in 10 CFR 20.

5.1.3 The Radiation Safety Committee (RSC) shall review unusual incidents involving radioactivity or radiation-producing machines, provide recommendations to the President on how their reoccurrence shall be prevented, and verify that post-incident corrective actions have been implemented.

5.1.4 SMC personnel shall

5.1.4.1 Comply with the requirements of this procedure, as applicable.

5.1.4.2 Be aware of the location of emergency exits, eyewash stations, safety showers and fire alarms.

5.1.4.3 Immediately notify the RSO of any known or suspected incident or emergency that involves radioactive materials.

5.1.4.4 Periodically review this procedure, as required.

5.2 General Requirements

5.2.1 The basic initiatives and actions for responding to incidents or emergencies at SMC are contained in the SMC Emergency Notification and Evacuation Plan.

5.2.2 All applicable safety and compliance guidelines set forth by SMC and federal, state, and local regulations shall be followed during performance of this procedure.

5.2.3 Work shall be stopped in the event of a known or potential compromise to the health or safety of any SMC or contractor personnel and shall be reported immediately to the RSO.

5.2.4 Following a radiological incident or emergency, the RSO shall determine the need for collecting personnel dosimeters for immediate processing.

5.2.5 If it is known or suspected that radioactive material has been taken into the body, the RSO shall evaluate the amount of material ingested/inhaled and the resulting exposure.

Note: This investigation may include air sampling and analysis, bioassays, or whole body counting, as needed.

5.3 Emergency Response

5.3.1 When an individual identifies an I/E, they shall perform the following:

5.3.1.1 Ensure the situation is in a stable, safe condition, taking all required immediate corrective action;

5.3.1.2 Notify the appropriate personnel responsible for the area or activity; and,

5.3.1.3 Notify the RSO.

5.3.2 After notification, the RSO shall then perform the following:

5.3.2.1 Make a determination if an I/E has occurred or may have occurred.

5.3.2.2 Ensure required notifications are made.

5.3.2.3 Ensure an I/E Report (Attachment 1) is initiated and recorded in the Incident/Event Report Log (Attachment 2) for tracking purposes.

5.3.3 The remainder of the report shall then be completed and all accompanying information attached.

5.3.3.1 Long-term corrective action shall be specified, assigned, and a response due date entered.

Note: If more than two items are required, add another page 2 of the report and denote accordingly.

5.3.3.2 Each organization/individual assigned long-term corrective action shall indicate their concurrence with these assignments by signature.

Note: Use additional forms if more than two are assigned action.

5.3.3.3 Approval of the I/E Report by the President shall be mandatory.

5.3.4 After completion, the I/E Report shall be distributed as indicated on the report.

NOTE: The original shall be maintained by the RSO.

5.3.5 Verification of corrective action completion shall be periodically conducted by the RSO and the RSC.

5.3.6 Reports of findings shall be addressed to the RSO copied to the President.

5.4 Minor Spills or Releases of Radioactive Materials

5.4.1 All other persons in the area shall be notified at once.

5.4.2 The spill should be confined immediately.

5.4.3 The RSO shall be notified as soon as possible.

5.4.4 The RSO shall establish a contamination zone in the area of the spill by erecting barriers and or posting signs, as necessary.

5.4.5 The RSO shall restrict access of unnecessary personnel to the spill area.

5.4.6 The RSO shall supervise decontamination efforts.

5.5 Injuries to Personnel Involving Contamination

5.5.1 Minor wounds shall be flushed immediately with lukewarm water while spreading the edges of the wound.

5.5.2 Radiological accidents (wounds, overexposure, ingestion, inhalation) shall be reported promptly to the RSO.

5.5.3 No person involved in a contaminating injury shall be allowed to return to work without the approval of the RSO and/or the attending physician.

5.6 Fires or other major emergencies

5.6.1 All other persons in the area shall be alerted and the building shall be evacuated.

5.6.2 The RSO shall be notified.

5.6.3 Other instruction as provided in the SMC Emergency Notification and Evacuation Plan shall be followed.

5.6.4 If ingestion or inhalation of radioactivity is possible, sand shall be used instead of fire extinguisher to smother the fire.

5.6.5 The RSO shall provide consultation to fire fighting or other emergency personnel by direct involvement.

5.6.6 Following the emergency, monitoring and decontamination, as needed, shall be directed by the RSO.

5.7 Notifications

5.7.1 The RSO and/or President shall notify the USNRC of any incident involving licensed material pursuant to the reporting requirements contained in 10 CFR 20, Subpart M.

Note: Failure to comply with these guidelines may result in violation of the USNRC license and could result in the suspension of the license.

5.7.2 The RSO shall submit a report to the President within four working days detailing the circumstances, corrective actions, materials involved, exposures, etc., for each incident or emergency which involved a radiological hazard.

6 DOCUMENTATION

6.1 All Records pertinent to this procedure shall be maintained pursuant to RSP-004.

6.2 The following documents shall be retained:

6.2.1 Personnel Decontamination Records

6.2.2 Area/Equipment Decontamination Records

6.2.3 RSO contingency or emergency reports

6.2.4 Incident/Event Reports

6.2.5 Incident/Event Logs

7 ATTACHMENTS

7.1 Attachment 1 - Incident/Event Report Forms

7.2 Attachment 2 - Incident/Event Report Log Form

ATTACHMENT 1

SHIELDALLOY METALLURGICAL CORPORATION

INCIDENT/EVENT REPORT

I/E Number _____ Page ___ of ___

I/E Date:	I/E Location:
I/E Time:	Areas/Equipment Effected:

I/E CLASSIFICATION	EVENT TYPE	
☐ Site Area Emergency	☐ Electrical Failure	☐ Injury to Personnel Involving Contamination
☐ Alert	☐ Water/Sewer Failure	☐ Natural Disaster
☐ Unusual Event	☐ Security	☐ Fire
☐ Incident	☐ Minor Spill or Release (on-site)	☐ Minor Release (off site)
☐ Transportation Event	☐ Major Spill or Release (on-site)	☐ Major Release (off site)
☐ Information Only	☐ Other (Describe)	
☐ Other		

EVENT DESCRIPTION

NOTIFICATIONS			
☐ USNRC Region I	☐ New Jersey Department of Environmental Protection	☐ New Jersey State Highway Patrol	☐ Other
☐ USNRC Operations Center	☐ Newfield Emergency Medical Services	☐ Other	☐ Other
☐ Newfield Fire Department	☐ Newfield Police Department	☐ Other	☐ Other

☐ CRITIQUE HELD:	☐ IF YES, DATE/TIME:
APPARENT CAUSE:	IMMEDIATE CORRECTIVE ACTIONS:

ATTACHMENT 1(CONTINUED)

SHIELDALLOY METALLURGICAL CORPORATION

INCIDENT/EVENT REPORT
(Continued)

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ADDITIONAL INFORMATION/CORRECTIVE ACTIONS/COMMITMENTS

SIGNATURES	
Prepared by:	Approved by (President):
Approved by (RSO)	Approved by (Other, specify):
Long-term Corrective Action Plan Approved by:	

ATTACHMENT 2
INCIDENT/EVENT REPORT LOG SHEET

SHIELDALLOY METALLURGICAL CORPORATION

INCIDENT/EVENT REPORT LOG

Page ___ of ___

I/E NUMBER YY-XXX	DESCRIPTION	DATE OF OCCURRENCE	DATE REPORT INITIATED	DATE REPORT COMPLETED