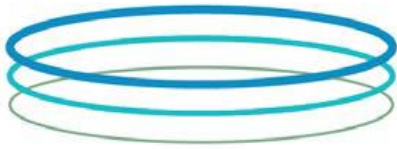


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NUCLEAR INDUSTRY STANDARD PROCESS

Radiological Protection

Level 3 – Information Use

Radiation Protection Standard Glossary of Terms

NISP-RP-013

Revision: 1 – Fatal Flaw Review

Industry Approval Date: December 11, 2018

This is an industry document for standardizing radiation protection processes. Standard processes and requirements are established to eliminate site-specific radiation protection procedures. The Institute for Nuclear Power Operations (INPO) maintains current procedures on the INPO website. Approval authority is granted by the industry contingent on a structured review and approval process by representatives of utility radiation protection organizations.

**Nuclear Industry Standard Process
Radiation Protection Standard Glossary of
Terms**

Document #: NISP-RP-013

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1.0 Introduction

- 1.1. This procedure describes standard definition of radiological terms used in the nuclear power industry and used in various Nuclear Industry Standard Processes (NISP).

2.0 Scope

- 2.1 The processes described in this procedure are based on common approaches used in the US nuclear power industry to provide job coverage by radiation protection personnel. The radiological concerns addressed by this procedure are based on the common radiological hazards for the PWRs and BWRs operating in the US.
- 2.2 Member utilities are expected to use this standard to enable supplemental workers to transition between nuclear power plants with minimal site-specific training. Compliance with these instructions is expected without additional site requirements or process deviations being imposed that may require additional training or challenge the performance of supplemental workers.
- 2.3 This procedure will be used to train and instruct supplemental radiological protection technicians. Member utilities will implement these process requirements in site procedures and update site procedures whenever requirements or process steps in this Nuclear Industry Standard Process (NISP) are revised. Current revisions are maintained on the INPO website.

3.0 Standard Definitions

- 3.1 **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).
- 3.2 **Access Control Guard** - An individual who has responsibility for direct surveillance of an HRA, LHRA and/or VHRA when the locks, barricades, and/or normal physical barriers for such an area are not in place.
- 3.3 **Accessible Area** - An area that can reasonably be occupied by a major portion of an individual's whole body. An area is not accessible if tools or other exceptional measures are needed to access the area. For example, a tank or vessel that has its cover bolted in place is inaccessible, or an opening in a shield wall that is physically difficult to access without a ladder or mobile platform is considered inaccessible. In addition, a pool of water such as the spent fuel pool is considered inaccessible unless a diver enters the pool.
- 3.4 **Action Level 1 PCE** - An individual's skin or clothing is contaminated with radioactive material detected ≥ 100 ccpm to 5,000 ccpm as measured at 1/2" by a standard pancake Geiger-Mueller (GM) detector.

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- 3.5 **Action Level 2 PCE** - An individual's skin or clothing is contaminated with radioactive material > 5,000 ccpm to 50,000 ccpm as measured at 1/2" by a standard pancake GM detector.
- 3.6 **Action Level 3 PCE** - An individual's skin or clothing is contaminated with radioactive material > 50,000 ccpm as measured at 1/2" by a standard pancake GM detector.
- 3.7 **Beta-Gamma to Alpha ratio** - The beta-gamma activity divided by the alpha activity
- 3.8 **Administrative Action Level (AAL)** - The level at which the CEDE dose is assigned. If a prospective analysis has been completed, the standard industry AAL is greater than or equal to 10 mrem.
- 3.9 **Aggressive Work** - Activities that have a high potential to change radiological conditions. Some examples include, but are not limited to, grinding, welding, burning, sandblasting, hydro lasing, use of solvents, and disassembly of components using power or air driven tools.
- 3.10 **Airborne Radioactivity Area (ARA)** - A room, enclosure, or area in which airborne radioactive materials, composed wholly or partly of licensed material, exist in concentrations in excess of the values of 10CFR20, Appendix B, Table 1, Column 3 (i.e., DAC values) OR to such a degree that an individual without respiratory protective equipment could exceed, during the hours an individual is present in a week, an intake of 12 DAC-hours.
- 3.11 **Air Purifying Respirator** - A respirator with an air purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
- 3.12 **ALARA** - (Acronym for "as low as reasonably achievable") means making every reasonable effort to maintain exposure to radiation as far below the dose limits as is practical consistent with the purpose for which the licensed activity is undertaken, taking into account the state of technology, the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed material in the public interest.
- 3.13 **ALARA Plan** - A documented job assessment that considers the radiological conditions expected during each phase of the job and the methods and controls to minimize contamination and collective radiation exposure (person-rem). The term "ALARA Plan" is equivalent to "ALARA Action Review" and "ALARA Review".
- 3.14 **Alpha Level I: (Minimal)** - Relative abundance of alpha contamination is minimal. Internal exposure from alpha emitters is not likely to exceed 10% of total internal

dose. The $\beta\gamma/\alpha$ ratio is greater than 30,000. Areas with low alpha activity levels, such as less than 20 dpm/100 cm², should be assigned Level 1 Areas. Action levels are recommended to verify low abundance of alpha emitters when high contamination or high airborne radioactivity is present.

- 3.15 **Alpha Level II (Significant)** - Relative abundance of alpha contamination is significant. The $\beta\gamma/\alpha$ ratio is between 30,000 and 300. Alpha inhalation contributes from 10 to 90 percent to the total inhalation hazard. Contamination survey action levels are intended to alert radiation safety personnel of presence of alpha emitters.
- 3.16 **Alpha Level III (Elevated)** - Relative abundance of alpha contamination is elevated. The $\beta\gamma/\alpha$ ratio is less than 300. Alpha inhalation contributes 90 percent or more to the total inhalation hazard. Most smears and all air samples should be counted for alpha contamination.
- 3.17 **Annual Limit on Intake (ALI)** - means 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 the reference man that would result in a committed effective dose equivalent of 5 rems (0.05 Sv) or a committed dose equivalent of 50 rems (0.5 Sv) to any individual organ or tissue.
- 3.18 **Assigned Protection Factors (APF)** - The expected workplace level of respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained users. Operationally, the inhaled concentration can be estimated by dividing the ambient airborne concentration by the APF.
- 3.19 **Barricade** – A conspicuous obstacle, such as a firmly secured rope or ribbon (by itself or used with physical barriers such as existing walls or hand railings), that completely surrounds an area and obstructs inadvertent entry.
- 3.20 **Barrier** - A conspicuous obstacle that blocks or is intended to block passage.
- 3.21 **Bioassay** - Determination of the kind, quantity, concentration and/or location of radioactive material in the human body via excreta removed from the body (i.e., in vitro bioassay) or counting equipment calibrated for external monitoring of internal radioisotope concentrations (i.e., in vivo bioassay)
- 3.22 **Boundary** - An established line beyond which exposure to radiation and/or radioactive material would occur (e.g., contaminated area rope, radiation tape, stanchion with a posting, or a step off pad).
- 3.23 **Boundary Guards** - An individual responsible for maintaining direct visual surveillance of a boundary posted for the purposes of radiographic operations in order to prevent any unauthorized entry.

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- 3.24 **Breathing Zone Air Sample (BZAS)** - An air sample where the filter media is within approximately 12 inches of a worker's head (i.e. the nose and mouth).
- 3.25 **Buffer Zone** -Posting used for the area that surrounds a discrete radioactive particle area to control the migration of discrete radioactive particles from the area.
- 3.26 **$\beta\gamma/\alpha$ Ratio** – The total activity of beta-gamma emitters divided by the total activity of alpha emitters as measured by counting systems. An increasing presence of transuranics is indicated by a decreasing ratio. The term is called an Activity Ratio or the Beta-Gamma to Alpha Ratio.
- 3.27 **Capture Velocity** - The air velocity at any point in front of a hose or at the hose opening necessary to overcome opposing air currents and to capture the contaminated air at that point by causing it to flow into the hose. Capture velocity varies, depending on the size of the particles and the rate at which they are released into the air.
- 3.28 **Catch Containment** - Any of several styles of leakage gathering devices (drip funnel, drip pans, catch basin, etc.) designed to catch and funnel liquid or particulates into a suitable collection medium (i.e., floor drain, drain bottle, drum or absorbent material).
- 3.29 **Category 1 Quantity of Radioactive Material**– A quantity of radioactive material meeting or exceeding the category 1 threshold in Table 1 of Appendix A to 10 CFR 37. This is determined by calculating the ratio of the total activity of each radionuclide to the category 1 threshold for that radionuclide and adding the ratios together. If the sum is equal to or exceeds 1, the quantity would be considered a category 1 quantity. Category 1 quantities of radioactive material do not include the radioactive material contained in any fuel assembly, subassembly, fuel rod, or fuel pellet.
- 3.30 **Category 2 Quantity of Radioactive Material** - A quantity of radioactive material meeting or exceeding the category 2 threshold but less than the category 1 threshold in Table 1 of Appendix A to 10 CFR 37. This is determined by calculating the ratio of the total activity of each radionuclide to the category 2 threshold for that radionuclide and adding the ratios together. If the sum is equal to or exceeds 1, the quantity would be considered a category 2 quantity. Category 2 quantities of radioactive material do not include the radioactive material contained in any fuel assembly, subassembly, fuel rod, or fuel pellet.
- 3.31 **Committed Dose Equivalent (CDE) (HT, 50)** - The dose equivalent to organs or tissues of reference (T) that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

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- 3.32 **Committed Effective Dose Equivalent (CEDE) (HE, 50)** – The sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed does guarantee to the organs or tissues.
- 3.33 **Compartment Factors** - Factors used to weight the results from dosimeters placed over various compartments in order to relate the functional risk to the organs underlying the dosimeter to the total risk from uniform irradiation of the whole body.
- 3.34 **Conditional or Temporary Release** - A release of radioactive material to an individual other than RP with specific radiological restrictions or controls while outside a posted radiologically controlled area.
- 3.35 **Contact Reading** - Dose rate measurement taken by placing the detector housing on the surface being measured.
- 3.36 **Contaminated Area** - An area having smearable contamination equal to or greater than 1000 dpm/100 cm² (100 net counts per minute using a pancake frisker probe) beta- gamma or 20 dpm/100 cm² alpha.
- 3.37 **Continuous Air Monitor (CAM)** - A device for real-time monitoring of airborne radioactivity concentrations designed to alert workers of significant increases in airborne radioactivity. A CAM has an automatic alarm that sounds at a predetermined radioactivity level or rate of collection of radioactivity on the collection medium.
- 3.38 **Continuous Coverage** - Radiation Protection Technician who performs constant coverage of work activities and radiological conditions and who is available to direct or stop work activities as radiological conditions warrant. There are three types of continuous coverage:
1. **Remote Monitoring:** Used in a work area where dose rates vary due to worker position or changing dose rates. The Radiation Protection Technician has the ability to monitor the worker(s) visually or with a camera, teledosimetry, and voice communication
 2. **Direct Monitoring:** Used in a work area where dose rates vary due to worker position or changing dose rates. The Radiation Protection Technician is in the line of sight with worker(s) or is able to restrict worker(s) movement

by use of physical barriers. RP tech periodically checks accumulated dose for the worker(s).

3. **Indirect Monitoring** – Used in a work area where dose rates are constant. The Radiation Protection Technician in a low dose area monitoring worker (s) dose by means of maximum stay time or teledosimetry.

3.39 **Correction Factor** - The factor by which the reading of an instrument is multiplied to obtain the actual value of the quantity of the value that is being measured.

3.40 **DAC-Hour** - The product of the concentration of radioactive material in air (expressed as a fraction or multiple of the derived air concentration for each radionuclide) and the time of exposure to that radionuclide, in hours. 2000 DAC-hours equals one ALI.

3.41 **DAC Fraction (fDAC)** - The sum of each radionuclides (beta-gamma or alpha) emitting activity divided by its corresponding DAC value

3.42 **DAC fraction ratio** - The ratio of $fDAC_{\alpha}/fDAC_{\beta\gamma}$; the term is called the DAC Fraction Ratio. This ratio shows the relative significance of transuranics in contributing to potential internal dose to workers. This value can be determined using conservative assumptions for the nuclides present or use nuclide abundances from site characterization

3.43 **DOP/PAO Test** - the process in which the integrity of a HEPA (High Efficiency Particulate Air) or ULPA (Ultra Low Penetration Air) filter is tested through the introduction of particulates. Emery 3004 Poly-Alpha-Olefin (PAO), a non-hazardous material, is often used as the industry standard for filter testing.

3.44 **Declared Pregnant Worker (DPW)** - A worker who has voluntarily informed their supervisor and Radiation Protection of pregnancy in writing at the station(s) where they access a Radiologically Controlled Area (RCA

3.45 **Deep Dose Equivalent (DDE)** – Whole body dose equivalent at a tissue depth of 1 cm (1,000 mg/cm²)

3.46 **Derived Air Concentration (DAC)** - The concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work, results in an intake of 1 ALI. DACs are listed in 10 CFR 20, Appendix B, Table 2.

3.47 **Detectable Radioactivity** – Radioactivity is considered detectable whenever instrumentation gives a reproducible positive indication of its presence, i.e., a reproducible signal distinguishable from background. Detectability is different for different instrumentation and survey techniques.

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- 3.48 **Discrete Radioactive Particles (DRP)** - Small, loose, highly radioactive particles with > 500,000 dpm or 50,000 ccpm.
- 3.49 **Dosimeter of Legal Record (DLR)** - Generic name used to describe primary dosimeters (e.g. TLD, OSL, etc.).
- 3.50 **Effective Dose Equivalent (EDE)** - The sum of the products of the tissue or organ weighting factors from 10CFR20, and the dose to the corresponding body tissues and organs resulting from the exposure to radiation sources external to the body.
- 3.51 **Effective Alpha DAC** - Concentration of gross alpha radioactivity in air (from transuranic radionuclides), that if breathed for 2,000 hours, results in an intake of one effective alpha ALI. The effective Alpha DAC is based on Am-241 or site-specific value.
- 3.52 **Effective Beta DAC** – Concentration of gross beta radioactivity in air that is breathed for 2000 hours results in an intake of one effective ALI. The Effective Beta DAC Value is based on Co-60 ($1 \times 10^{-8} \mu\text{Ci}/\text{cm}^3$) or site specific determined value.
- 3.53 **Emergency Action Level (EAL)** - A pre-determined, site-specific, observable threshold for a plant condition that places the plant in an **emergency** classification.
- 3.54 **Expected/Anticipated Dose Rate Alarm** – A planned and briefed intermittent or momentary dose rate alarm resulting from anticipated dose rates encountered in the travel path to the work area or anticipated temporary work area dose rate changes, such as leaning into a pipe.
- 3.55 **External Dose** - That portion of dose equivalent received from sources of exposure outside the body.
- 3.56 **Extremity** - Hand, elbow, arm below the elbow, foot, knee, or leg below the knee.
- 3.57 **Eye Dose Equivalent** – Applies to the external exposure of the lens of the eye, is the dose equivalent at a tissue depth of 300 mg/cm² (0.3cm).
- 3.58 **Facial Contamination** - Contamination on the face within what is generally accepted as the sealing surface of a full-face respirator.
- 3.59 **fDAC_α** – The sum of each alpha emitting nuclide’s activity divided by its corresponding DAC value; the term is called the Alpha DAC Fraction. In some cases, the total alpha activity may be divided by the most restrictive nuclide DAC value (e.g. Am-241) for an approximation of the Alpha DAC Fraction.
- 3.60 **fDAC_{βγ}** – The sum of each beta-gamma emitting nuclide’s activity divided by its corresponding DAC value; the term is called the Beta-Gamma DAC Fraction. In some cases, the total beta-gamma activity may be divided by the most restrictive

nuclide (e.g. Co-60 or Cs-137) for an approximation of the Beta-Gamma DAC Fraction.

- 3.61 **fDAC_{Total}** – The sum of $fDAC_{\beta\gamma}$ and $fDAC_{\alpha}$; the term is called the Total DAC Fraction.
- 3.62 **Field Count** - A quantitative analysis of an air sample or smear to assess contamination using a field survey instrument. Analysis results are used for prioritizing filter analysis
- 3.63 **Functional Check** - A check (often qualitative) to determine that an instrument is operational and capable of performing its intended function. Such checks may include, for example, battery check, zero setting, or source response check.
- 3.64 **General Air Sampling** - Air sampling performed to monitor or trend the radioactive airborne particulate and/or iodine concentration (particulate, iodine, noble gas or tritium) in a given area, over an extended period of time. Sample duration (other than CAMs) may vary based on events rates of change and filter-loading rates.
- 3.65 **General Area Survey** – A dose rate survey performed in the general area at least 30 cm from the radiation source or from any surface that radiation penetrates.
- 3.66 **General Radiation Work Permit (RWP)** - A permit that controls work tasks that have minimal radiological risk, significant radiation exposure or the potential to spread contamination. A General RWP is customarily used in areas with little or no loose surface contamination or airborne activity, and low direct gamma radiation. General RWPs are for routine work (inspections, rounds), do not involve work with complex radiological conditions, and radiological conditions are static. Additionally, general RWPs are normally not used for conditions >100 mrem/hr at 30 cm.
- 3.67 **Grab Sampling** - A general term used to denote air samples taken over a short time span (typically 10 to 15 minutes) to determine peak air concentrations. The technique is used to determine posting of area.
- 3.68 **Hard to Detect Radionuclides** - A term used to describe radionuclides, which due to their type, energy, or abundance of emission, are not readily detected by a specified instrument. For example, Co-58, Cr-51, Mn-54 and TRU isotopes are commonly identified as HTD radionuclides, but they are only hard to detect with instruments such as GM friskers, which are primarily beta-sensitive. Of these three radionuclides, only Co-58 emits beta particles, but then in only approximately 15% of all decays. With a gamma-sensitive article monitor, only Cr-51 would be classified as HTD since it emits a gamma ray in only about 15% of all decays; Mn-54 and Co-58 would not be HTD since they emit gamma rays with sufficient energies and abundances. C-14, however, would be classified as HTD for both of the above instruments, as it emits only low energy beta particles. Also referred to as “difficult-to-detect” (DTD) radionuclides.

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- 3.69 **HEPA Exhaust Protective Guard**: A structure that can be secured to the HEPA exhaust to prevent workers from inadvertently placing their hand or fingers in the line of fire with internal rotating parts (impeller, fan blades, etc.). The guard must not have openings greater than one-half inch in width. The use of concentric rings with spacing between them not exceeding a one-half inch are acceptable, provided that sufficient radial spokes and firm mountings are used to make the guard rigid enough to prevent it from being pushed into the fan blade during normal use.
- 3.70 **High Contamination Area (HCA)** - An area where the majority of the area has removable surface contamination equal to or greater than 100,000 dpm/100cm² beta-gamma.
- 3.71 **High Efficiency Particulate Air (HEPA) Filter** - A filter that provides highly efficient filtration of airborne particulate matter with a minimum of 99.97% efficiency for removing particles of greater than 0.3 microns in diameter.
- 3.72 **High Radiation Area (HRA)** - Any area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving a dose equivalent in excess of 0.1 rem in 1 hour at 30 centimeters from the radiation source or 30 centimeters from any surface that the radiation penetrates.
- 3.73 **Hot Spot** - Accessible hot spots when components have contact readings of more than 100 mrem/hour and more than five times the general area dose rates (typically 30 cm from the source).
- 3.74 **Individual Monitoring** – The assessment of dose equivalent using devices designed to be worn by an individual.
- 3.75 **Intake** - Radioactivity that enters the body through the respiratory tract, the gastrointestinal tract, or the skin. Intake may be acute, meaning a single intake occurring over a very short time, usually taken to be instantaneous, or chronic, occurring over a specified time. Common units used in this guide for intake are microcuries (μCi) and kilo-becquerel (kBq).
- 3.76 **Intermittent Coverage** - Cognizance of activities within the job and radiological surveillance consistent with the radiological hazards (e.g., touring the job site and having full knowledge of the work and radiological hazards associated with the job and individuals involved).
- 3.77 **Internal Dose** - That portion of the dose equivalent received for radioactive material taken in the body.
- 3.78 **Irradiated In-Core Components (ICC)** - Reactor vessel components that are irradiated, such as spent fuel, nuclear instrumentation (NI) control rod blades (CRB)

or drives (CRDs), dry tubes, fuel support pieces, jet pump, core barrels, baffle plates and components.

- 3.79 **Large Area Smear (LAS) Survey** - A qualitative contamination survey performed by wiping a large area and monitoring the cloth with a frisker survey instrument.
- 3.80 **Lens Dose Equivalent** - The external exposure dose equivalent to the lens of the eye at a tissue depth of 0.3 centimeters (300 mg/cm²).
- 3.81 **Locked High Radiation Area (LHRA)** - Any area accessible to individuals in which deep dose equivalent rates are greater than or equal to 1 rem per hour (but less than 500 rads in one hour at 1 meter) 30 centimeters from the source of radiation or from any surface that the radiation penetrates.
- 3.82 **LHRA Physical Barrier** - Physical barriers (such as chain link fencing or fabricated walls) used to prevent unauthorized personnel access to locked high radiation area (LHRA). Barriers used to control access to a locked high radiation areas should provide reasonable assurance that they secure the area against unauthorized access and cannot be easily circumvented. (That is, an individual who incorrectly assumes, for whatever reason, that he or she is authorized to enter the area, would be unlikely to disregard and/or circumvent the barrier.) A fence that is a minimum of 2 meters (approximately 6 ft.) high would normally be adequate to control access to a locked high radiation area at a nuclear power plant.
- 3.83 **Low Dose Waiting Area (LDWA)** - An area designated to minimize exposure to personnel where significant exposure savings may be realized.
- 3.84 **Lower Limit of Detection (LLD)** - The smallest concentration of radioactive material in a sample that will yield a net count above system background.
- 3.85 **Material Release Plan** - A written plan describing the survey requirements for removing material from the RCA when that material does not fall within the bounds of the procedure for release of material.
- 3.86 **Member of the Public** - Any individual except when that individual is receiving occupational dose.
- 3.87 **Micro ALARA Plan (MAP)** - A documented review and planning of work below the threshold for initiation of a formal ALARA Plan.
- 3.88 **Minimum Detectable Activity (MDA)** - The smallest quantity of radioactivity that could be distinguished from the blank under specified conditions. The MDA depends on the lower limit of detection and on the counting efficiency of the counting system. (Cember, Introduction to Health Physics)

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- 3.89 **Nasal Contamination** - Personnel contamination in or around the nasal tract identified by direct frisk or nasal blow.
- 3.90 **Naturally Occurring Radioactive Material (NORM)**- Radioactive material that consists of radionuclides found in the environment that are not a result of licensee activity. NORM can include uranium, radium, thorium and their various decay products.
- 3.91 **Neutron Area** – An area where the neutron dose rate is > 4 mrem/hour General Area at 30 cm from a source.
- 3.92 **Non-Uniform Field**- Work area dose rate gradients make it likely that total dose to a portion of the whole body will exceed the chest dose by more than 50 percent.
- 3.93 **Occupational Dose** - The dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation or to radioactive material from licensed and unlicensed sources of radiation, whether in the possession of the licensee or other person. Occupational dose does not include doses received from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released under 10CFR35.75, from voluntary participation in medical research programs, or as a member of the public.
- 3.94 **Personal Air Sample** - Sample collected by a small, lightweight air sampler worn by the worker that draws an air sample from the breathing zone (also known as a Lapel Air Sample).
- 3.95 **Personal Clothing** - Articles of clothing other than anti-contamination protective clothing (excluding hard hats and safety glasses).
- 3.96 **Personal Items** – Items normally carried by personnel while in the RCA. This does not include plant tools or equipment. Radiation Protection will develop and post a list of personal items at each RCA egress area. Personal items may be monitored by the individual possessing these items.
- 3.97 **Positive Control** - Control required by an individual assigned to prevent inadvertent entry into a LHRA or VHRA by unauthorized personnel. This control is provided by an individual positioned at a point sufficient to prevent inadvertent entry into the area by unauthorized personnel.
- 3.98 **Protection Factor** – A measure of the degree of protection afforded by a respirator, defined as the ratio of the concentration of airborne contaminant outside the respiratory protection equipment to that inside the equipment (usually inside the facepiece under conditions of use)

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- 3.99 **Radiation Area**- An area, accessible to individuals, in which radiation levels could result in an individual receiving a dose equivalent in excess of 5 mrem in 1 hour at 30 cm from the radiation source or from any surface that the radiation penetrates.
- 3.100 **Radiation Work Permit (RWP)** - A document that provides a method for documenting and controlling work with potential or actual radiological hazards in a Radiologically Controlled Area (RCA)
- 3.101 **Radioactive Material Area** - An area in which licensed radioactive material in an amount exceeding 10 times the quantity specified in Appendix C, 10CFR20, is used or stored. This does not apply to radioactive materials contained within process equipment or materials in transport and packaged and labeled in accordance with appropriate regulations.
- 3.102 **Radioactive Material Label** - A label or tag which contains the standard radiation symbol and the words, "Caution Radioactive Material" or "Danger Radioactive Material" and has sufficient information, (dose rates, contamination levels or other information deemed necessary), to permit workers handling the material to keep their exposures ALARA.
- 3.103 **Radiography** - An examination of the structure of materials by nondestructive methods, utilizing ionizing radiation to make radiographic images.
- 3.104 **Radiography Area** - A radiographic work area posted and controlled in accordance with the licensee (radiography group) Operating and Emergency Procedures.
- 3.105 **Radiography Restricted Area** - An area with established boundaries defined and posted by Radiation Protection for assuring that unauthorized personnel are prevented from entering the radiography area
- 3.106 **Radiologically Controlled Area (RCA)** - An area within the restricted area posted in accordance with procedures for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.
- 3.107 **Radiological Medium Risk Activity** - Radiological work where planned barriers are desirable to prevent inadequately controlled radiation levels, unplanned/unmonitored internal and external dose, minimize potential for EPRI level 2 or 3 personnel contamination events, or potential contamination of non-radiological facilities or the environment within the protected area.
- 3.108 **Radiological High-Risk Activity** - Radiological work where detailed planning and multiple, diverse barriers are essential to prevent radiological events involving significant radiation levels, threats to individual regulatory radiation exposure limits, or may result in unanalyzed effluent release pathways to the environment or exposure to members of the public.

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- 3.109 **Discrete Radioactive Particle (DRP) Area** - Posting used for an area that is controlled due to the presence (or concern) of discrete radioactive particles greater than 500,000 dpm (50,000 ccpm).
- 3.110 **RP Hold Point** - Any point specifically designated by Radiation Protection in a Radiation Work Permit, Work Order, Procedure or RP briefing, where an action by RP personnel is conducted prior to execution of the next work step or activity.
- 3.111 **RP Self Briefing** - The process where Radworkers can brief themselves to the radiological conditions without having to interface directly with radiation protection
- 3.112 **Self Reading Dosimeter (SRD)** - A pocket ionization chamber (PIC) or electronic dosimeter (ED) worn by the worker and used to provide an immediate indication of the estimated dose received by the worker.
- 3.113 **Shallow Dose Equivalent (SDE)** - The external exposure of the skin of the whole body or an extremity taken at a tissue depth of 0.007 cm (7 mg/cm²)
- 3.114 **Special Nuclear Material (SNM)** - Plutonium, Uranium-233, Uranium enriched in the isotope 233 or the isotope 235, and any other material that the NRC, pursuant to the provisions of Action 51 of the Act, determines to be special nuclear material, but does not include source material. Any material artificially enriched by any of the foregoing, but does not include source material.
- 3.115 **Stay Time** - A calculated time an individual may stay in a work area of a given dose rate without exceeding a predetermined dose.
- 3.116 **Stop Work Authority** - Authority granted to RP personnel to cease any work when worker radiological safety is jeopardized
- 3.117 **Survey** – An evaluation of the radiological conditions and potential hazards incident to the production, use, transfer, release, disposal or presence of radioactive material or other sources of radiation. When appropriate, such an evaluation includes the physical survey of the location of radioactive material and measurements or calculations of levels of radiation, or concentrations or quantities of radioactive material present.
- 3.118 **TEDE ALARA Evaluation** - An ALARA evaluation performed to determine whether or not respirators should be used. The TEDE ALARA evaluation estimates the benefits of internal dose avoided compared with any additional external dose accumulated as a result of wearing a respirator. It should also consider industrial and safety risks associated with respirator use.
- 3.119 **Tool Equipment Monitor (TEM)**- Generic name given for the various automated devices to count tools and equipment.

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- 3.120 **Total DAC** - The summation of individual DAC values for particulate (beta, alpha), iodine, noble gas, and tritium. Each may not pertain to an air sample, but the total DAC is the summation of each DAC value
- 3.121 **Total Effective Dose Equivalent (TEDE)** - The sum of the effective dose equivalent (for external exposure) and the committed effective dose equivalent (for internal exposure).
- 3.122 **Transport Container** - A box, drum, enclosed trailer, sealand, rail car or other approved RAM container that is of robust construction and exhibit essential design features of packages intended for highway transport such that there is low potential for packaging failure during the period of storage.
- 3.123 **Transuranic Nuclides** - The transuranium elements (also known as **transuranic** elements) are the chemical elements with atomic numbers greater than 92 (the atomic number of uranium). All of these elements are unstable and decay radioactively into other elements.
- 3.124 **TRU multiplier** - A value equal to $1 + DAC_{FractionRatio}$ that can be multiplied by the $fDAC_{\beta\gamma}$ to estimate the $fDAC_{Total}$.
- 3.125 **Unconditional Release** - Material or equipment that has **no** detectable licensee generated material above background and therefore may be released from the site for unrestricted use.
- 3.126 **Unexpected/Unanticipated Dose Rate Alarm** - Any valid dose rate alarm that is due to: a change in radiological conditions, an inadequate radiological survey, or poor radiation worker practices such as entering an area where radiological conditions were not communicated.
- 3.127 **Unrestricted Area** – An area to which access is **neither** limited **nor** controlled by the licensee.
- 3.128 **Uptake** - The quantity of material that enters the body fluids from the respiratory tract, the gastrointestinal tract, or through the skin. The term also is sometimes used to indicate material taken into a tissue or organ from circulation. Common units used in this guide for uptake are μCi and kBq .
- 3.129 **Very High Radiation Area (VHRA)** - An area, accessible to individuals, in which radiation levels from radiation sources external to the body could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in 1 hour at 1 meter from a radiation source or 1 meter from any surface that the radiation penetrates.

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- 3.130 **Weighting Factor** - A factor, W_T , representing the proportion of the stochastic risk resulting from a particular organ or tissue to the total risk to the individual when the whole body is irradiated uniformly.
- 3.131 **Whole Body** - That part of the body including: the head, chest, back, gonads, arms above the elbows, and legs above the knees.

4.0 Responsibilities

- 4.1 Radiation Protection is responsible for the implementation of the requirements of this procedure per Efficiency Bulletin 17-01 and the Nuclear Industry Standard Process Initiative.

5.0 General Requirements

NONE

6.0 Process Instructions

NONE

7.0 Records/Documentation

NONE

8.0 References

NONE

9.0 Attachments

NONE