NRC Decommissioning Lessons Learned

Search Criteria:

Year: 2005 ***Facility Type:*** All Facility Types

Stage: All Functional Areas ***Benefit:*** All Benefits

Lesson ID: 2005-01 ***Facility Type:*** Reactors ***Stage:*** Decommissioning Planning

Benefits: Facilitates Decommissioning Licensing, Facilitates Decommissioning Work

Subject: Licensees should develop a unique radionuclide profile for each of the major types of materials expected to remain onsite after remediation.

Discussion: A unique radionuclide profile must be developed for each of the major types of materials expected to remain onsite after remediation. A commercial light-water power reactor facility will likely require profiles for contaminated soil or sediments, surface contaminated materials, and activated materials. The licensee must consider that activation products in steels and concretes vary with the constituents and operational history. Concrete will also differ between facilities because of different trace elements. While one generic list cannot be developed that would be applicable to all power reactor licensees and types of contaminated materials, once radioactive decay has been considered to the time when final status surveys (FSSes) will be conducted, a set of radionuclides may be developed for surface contamination and for activated materials. The licensee should confirm, by using characterization surveys and historical assessments, that the radionuclide lists developed are applicable to the facility and appropriate for each medium.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Search Criteria: ***Year:*** 2005 ***Facility Type:*** All Facility Types

Stage: All Functional Areas ***Benefit:*** All Benefits

Lesson ID: 2005-02 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Planning

Benefits: Facilitates Decommissioning Licensing

Subject: Licensees should follow the guidance in NUREG-1757, Volume 2, Revision 1, regarding deselecting radionuclides from a detailed evaluation in demonstrating compliance during license termination.

Discussion: Guidance in Section 3.3 of NUREG-1757, Volume 2, Revision 1, states, “Once a licensee has demonstrated that radionuclides or exposure pathways are insignificant, then (a) the dose from the insignificant radionuclides and pathways must be accounted for in demonstrating compliance, but (b) the radionuclides and pathways may be eliminated from further detailed evaluations.” Therefore, during characterization of a facility, if a profile contains radionuclides that collectively contribute less than 10 % of the dose criterion, those nuclides may be deselected from the list. Since derived concentration guideline levels are developed to equate to the radiological criteria for license termination (0.25 mSv/y (25 mrem/y)) total effective dose equivalent to the average member of the critical group and ALARA, for unrestricted release in 10 CFR 20.1402), those radionuclides that collectively contribute less than 0.025 mSv/y (2.5 mrem/y) may be considered insignificant, given all appropriate exposure scenarios and pathways are considered

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Search Criteria:

Year: 2005 ***Facility Type:*** All Facility Types
Stage: All Functional Areas ***Benefit:*** All Benefits

Lesson ID: 2005-03 ***Facility Type:*** Reactors ***Stage:*** Decommissioning Planning

Benefits: Facilitates Decommissioning Work

Subject: Licensees should follow the guidance in NUREG-1757, Volume 2, Revision 1, when choosing acceptable methods for surveying embedded piping and buried piping.

Discussion: There are several methods that have been used to characterize the residual activity within embedded pipe, and these methods can be used for buried piping, as well. By definition, "embedded piping" is piping (e.g., part of a plant system) that is found in buildings and encased in concrete floors and walls, while "buried piping" is piping (e.g., culvert) that is buried in soils. To be found acceptable, each method should address the following nine issues:

a) radionuclides of interest and chosen surrogate,
b) levels and distribution of contamination,
c) internal surface condition of the piping,
d) internal residues and sediments and their radiation attenuation properties,
e) removable and fixed surface contamination,
f) instrument sensitivity and related scan and fixed minimum detectable concentrations,
g) piping geometry and presence of internally inaccessible areas/sections,
h) instrument calibration, and
i) data quality objectives

An industry study (Cline, J. E., "Embedded Pipe Dose Calculation Method," Electric Power Research Institute Report No. 1000951, November, 2000) evaluated several techniques for measuring the radiological contamination on the inside of embedded pipe. Measurement techniques included pipe crawlers, gamma-ray scanners, dose rate measurements with dose-to-curie computations, scraping samples with radiochemical analyses, and smear samples with radiochemical analyses.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-04 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Planning

Benefits: Facilitates Decommissioning Licensing

Subject: Licensees should follow the guidance in NUREG-1757, Volume 2, Revision 1, when developing input distribution coefficient (Kd) values for soil or concrete when using site-specific dose modeling codes

Discussion: Kd values for input into site-specific dose modeling codes may be determined by the following:
Use sensitivity analyses, which include an appropriate range of Kd values, to identify the importance of the Kd to the dose assessment and how the change in Kd impacts the dose (i.e., how dose changes as Kd increases or decreases). The range of Kd values that bound the sensitivity analysis may be obtained from (a) the literature, (b) the default distribution in DandD, or (c) the default distribution in the probabilistic code of RESRAD (please refer to the "Basis" section that follows). Using the results of the sensitivity analysis, choose a conservative Kd value, depending on how it affects the dose (e.g., if higher Kd values result in the larger dose, an input Kd value should be selected from the upper quartile of the distribution, or if lower Kd values result in the larger dose, an input Kd value should be selected from the lower quartile of the distribution). For those isotopes where the Kd does not have a significant impact on the dose assessment (i.e., Kd is not a sensitive parameter), the median value within the range is an acceptable input parameter. If the licensee feels that the Kd value is overly conservative, the licensee is encouraged to perform a site-specific Kd determination, so that the dose assessment reflects true site conditions.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Search Criteria: ***Year:*** 2005 ***Facility Type:*** All Facility Types

Stage: All Functional Areas ***Benefit:*** All Benefits

Lesson ID: 2005-05 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Planning

Benefits: Facilitates Decommissioning Licensing

Subject: Licensees can use illustrative examples to demonstrate appropriate selection of survey instrumentation

Discussion: Licensees can define the data quality objective process and acceptance criteria using examples that demonstrate the appropriate selection of radiation survey instrumentation for the expected types of final status survey surface conditions and radionuclides forming the basis of the derived concentration guidelines. For example, the selection of instrumentation may be grouped by category of surfaces with similar features and expected instrument responses over these surfaces. For each of the defined categories of survey instrumentation and methods presented in the license termination plan (e.g., soil scanning, surface scanning and surface fixed measurements), the licensee should provide the derivation of scan and fixed minimum detectable concentrations (MDCs). The derivation of the MDCs must take into account instrument efficiencies (surface and detector), scan rates and distances over surfaces, surveyor efficiency, and minimum detectable count rate, using the guidance in Multi-Agency Radiation Survey and Site Investigation Manual and NUREG–1507, “Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions.”

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-06 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Planning

Benefits: Facilitates Decommissioning Licensing

Subject: Licensees are not required to use characterization data to support the initial classification of Class 1 areas

Discussion: Areas classified as Class 1 do not require characterization data to support that classification.
Note that characterization data are needed to support decommissioning activities for all areas including:

- Determination of radionuclide distribution profiles and identification of surrogate radionuclides
- Dose modeling and development of derived concentration guideline levels
- Final status survey design and instrument selection
- Structuring the data quality objectives
- Assessment of spatial variability of radioactive contaminants on building surfaces and in surface and subsurface soils
- Assessment of whether ground water is impacted, using the results of the surface and subsurface soil characterization surveys
- Initially defining and changing the boundaries of Class 1 survey units with bordering and adjacent survey units
- Reclassification of survey units (using guidance in the Multi-Agency Radiation Survey and Site Investigation Manual, and Section A.1 of Appendix A of NUREG-1757, Volume 2, Revision 1)

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Search Criteria: ***Year:*** 2005 ***Facility Type:*** All Facility Types

Stage: All Functional Areas ***Benefit:*** All Benefits

Lesson ID: 2005-07 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Work

Subject: Requirements for calibration of instrument/detector combinations used for assessing residual radioactive material contamination levels

Discussion: Industry guidance for the calibration of instrument/detector combinations used for assessing residual radioactive material contamination levels requires calibrations be performed in a manner that simulates the environmental and se up conditions under which the equipment will be used (ANSI 1997 and NCRP 1991). Recent evaluations of surface activity discrepancies when evaluating comparative licensee and confirmatory survey measurements found a systematic under response in the licensee's reported activity levels during cold weather periods. In these cases, alpha plus beta or beta-only scans or measurements were being conducted using gas proportional detectors. Normal practice is to conduct calibrations in a laboratory setting. When these instruments are distributed for use, the conditions may change once the user is out in the field. Temperature variations on the order of 30 to 40° F over the course of a work day are common. Past investigations have determined that the optimal operating voltage plateau, established during calibration, shifts while the instrument is being used under varying temperature conditions.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-08 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Work

Subject: Some types of data logging instrumentation selected for final status surveys have audio response limitations that impact the surveyors ability, under certain conditions, to discern the presence of elevated activity.

Discussion: Some types of data logging instrumentation selected for final status surveys have audio response limitations that impact the surveyors ability, under certain conditions, to discern the presence of elevated activity. These instruments have a preset audio response that plateaus once the count rate reaches 4500 counts per minute (cpm). This condition does not impact alpha contamination assessment and normally does not interfere with assessing beta surface activity when ambient gamma backgrounds are at typical environmental levels. On the other hand, when these instruments are used for conducting gamma scans using NaI scintillation detectors, complicating factors occur. Typical background gamma levels range from approximately 2,500 to 12,000 cpm when using the more common NaI detector crystal sizes. It can be immediately seen that the background may saturate the audio capability of the instrument making it impossible for the surveyor to rely on increases in audio response to identify locations of elevated direct gamma radiation. There are essentially three solutions to this problem, all of which result in either additional complicating factors that must be addressed or potential further project costs.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Search Criteria: ***Year:*** 2005 ***Facility Type:*** All Facility Types
Stage: All Functional Areas ***Benefit:*** All Benefits

Lesson ID: 2005-09 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Work

Subject: NUREG-1757, Vol. 2, Rev.1 illustrates other issues that have been noted related to survey instrumentation

Discussion: Other instrument issues that have been noted include static (disconnection from a continuous gas supply) operation of gas proportional detectors, long detector to instrument cables, and altitude effects on the calibration of gas proportional detectors. When gas proportional detectors are operated in a static mode, there will be some gas leakage from the detector. As the gas supply decreases, the detector efficiency degrades accordingly. The rate of gas leakage greatly varies among detectors, particularly once the factory-installed face and gasket are removed for maintenance. The rate of leakage has been observed to range from minutes to days. Past field observations of FSSes and comparative measurements have found that these detectors may have had only a partial purge, resulting in the underestimation of surface activity levels. Therefore, procedures should specify that when surveying in a static mode, the operational parameters should be checked regularly through either a background or source check. If the detector falls below established parameters, repurging the detector would be required prior to continuing surveys. Operation at the alpha plus beta voltages more readily allows the surveyor to distinguish a drop in efficiency caused by gas leakage as the background levels — generally in the 200 to 500 cpm range for hand-held detectors — will noticeably decrease. However with the 0 to 5 cpm alpha voltage backgrounds of most hand-held gas proportional detectors, a decrease in efficiency will not be immediately observable and therefore will necessitate a regular operational source check to validate performance.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-10 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Work

Subject: Equations to calculate the scan minimum detectable concentration (MDC) using the MARSSIM approach are not applicable for instruments that have an alarm at a pre-determined count rate action level.

Discussion: There have been a number of instances where final status survey procedures have implemented the use of various detectors coupled to data logging instruments. These instruments in several cases were set to alarm at a pre-determined count rate action level that is calculated to correspond to the derived concentration guideline level, rather than relying on the surveyor listening to the audible response. Although this may be an acceptable practice, with the provision of an adequate technical basis, the MARSSIM scan minimum detectable concentration (MDC) equations are no longer appropriate. The reason for this position is that the derivation of the scan MDC equations are based on signal detection theory. That is, how a human observer theoretically processes the audible input and then makes decisions.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-11 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Work

Subject: Procedures for confirmatory surveys in Class 1 survey units require systematically spaced, fixed point gamma measurements rather than prescriptive surface scanning over 100 % of the survey unit area.

Discussion: Confirmatory surveys conducted in Class 1 soil survey units at several sites have identified small areas of residual gamma-emitting contamination that when evaluated, exceeded the derived concentration guideline level. A root cause analysis was performed and determined that the site procedures required systematically spaced, fixed point gamma measurements rather than prescribing surface scanning over 100 % of the survey unit area in accordance with MARSSIM. Experience has shown that for characterization surveys, where contamination may be more distributed, systematic fixed point gamma measurement can be useful for identifying large areas requiring investigation.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-12 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Work

Subject: Not listening to audio to audio responses during surface scans can impact a person's ability to identify locations of residual contaminations

Discussion: A significant number of facilities assessed during decontamination and decommissioning do not require the surveyor to listen to the instrument audio response while conducting radiological surface scans. Rather, the analog meter is visually observed, an instrument alarm is set to notify the surveyor when to pause and investigate, a peak trap mode (the maximum observed count rate value is stored in the instrument memory) is used and the data are reviewed for anomalies post-survey, or a second person - rather than the individual using the detector - listens to the instrument audio. Each of these techniques have inherent deficiencies that impact one's ability to identify locations of residual contamination.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-13 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Work

Subject: Licensees should consistently apply instrument calibration guidance for assessing alpha and beta surface activity recommended in ISO 7503-1 (ISO 1988) to avoid underestimation of surface-level activity of radionuclides

Discussion: The implementation of the instrument calibration guidance for assessing alpha and beta surface activity recommended in ISO 7503-1 (ISO 1988) and adapted into the MARSSIM is not always consistently applied. This issue was identified while reviewing either license termination plans or specific licensee calibration procedures. The ISO 7503-1 guidance more accurately accounts for surface conditions encountered at decommissioning sites - typically rough, dirty, or porous - and emission energy of the radionuclides of concern. Without the proper application of the ISO 7503-1 guidance, surface activity levels for alpha and low-energy beta-emitting contaminants will be significantly underestimated. The guidance recommends a total efficiency that is the product of two components - an instrument efficiency (εi) and a source efficiency (εs).

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Search Criteria: ***Year:*** 2005 ***Facility Type:*** All Facility Types
Stage: All Functional Areas ***Benefit:*** All Benefits

Lesson ID: 2005-14 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Work

Subject: Beta measurements provide a more accurate evaluation than alpha measurements for natural thorium contamination on structural surfaces

Discussion: There have been several instances where residual natural thorium surface contamination was assessed by performing only alpha activity measurements. Natural thorium emits both alpha and beta radiations, therefore, either alpha or beta activity may be measured for determining the residual activity of the thorium contaminant. However, beta measurements provide a more accurate evaluation of thorium contamination on structural surfaces due to the problems inherent in measuring alpha contamination on rough, porous, and/or dirty surfaces. For the thorium series in secular equilibrium, for each beta emission there are approximately 1.5 alpha emissions - a beta to alpha ratio of 0.67. At one site, both alpha and beta surface activity measurements were performed during confirmatory surveys at the same location and the results compared. The data clearly showed the significant and widely varying alpha attenuation with beta to alpha ratios ranging from 3 to 280 - much greater than the theoretical ratio of 0.67. This provides further evidence that alpha activity is difficult to measure on surfaces that are typically encountered during radiological surveys and when possible, beta measurements should be performed.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-15 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Planning

Benefits: Facilitates Decommissioning Licensing, Facilitates Decommissioning Work

Subject: Derivation of site-wide ratios between various contaminants in a facility should consider collecting soil samples in such a manner that the ratio developed accurately represents both spatial and depth variability of the radionuclide concentrations

Discussion: There have been several instances where a limited number of soil samples were used to determine a site-wide ratio between various contaminants. A surrogate contaminant was then to be measured and the ratio used to account for the remaining site contaminants. In one case, the sampling procedure did not take into account the actual site spatial contaminant distribution. Instead, a limited sample data set from one area of the site was relied upon to prepare the radionuclide ratios. A review of site data collected during earlier scoping surveys clearly demonstrated that the ratio varied among the radionuclides of concern, dependent upon which area of the site the sample represented. When the varying ratios were analyzed, it was determined that the site-specific surrogate ratio that had been developed would significantly underestimate the inferred radionuclide concentrations for portions of the site. This issue can be readily avoided provided representative samples are collected in such a manner that the ratio developed accurately represents both spatial, and in some cases, depth variability.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-16 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Licensing

Subject: Licensees should use the unity rule to demonstrate compliance with the release criteria if there are multiple contaminants in the facility.

Discussion: Recent reviews of final status survey data packages have identified a critical oversight with demonstrating compliance with the release criteria at some sites with multiple contaminants. What has occurred is that each individual radionuclide is compared with the respective derived concentration guideline level (DCGL) and a conclusion reached as to the acceptability of a survey unit for release. However, an additional requirement is to apply the unity rule (also known as "sum of fractions") to the data to ensure that the basic dose limit is met. This is based on the DCGL for each radionuclide equating to the dose limit for release of the site. Due to the additive nature of the dose from each radionuclide, the total residual activity must be proportionality reduced to ensure the sum of each radionuclide divided by its DCGL does not exceed one (unity).

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Lesson ID: 2005-17 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Planning

Benefits: Facilitates Decommissioning Licensing

Subject: Licensees should consistently apply the recommendations in the Multi-Agency Survey and Site Investigation Manual (MARSSIM) for classification of radiological survey units.

Discussion: Evaluations of licensee survey unit designations and confirmatory surveys have identified inconsistencies with the recommendations in MARSSIM on survey unit classification; primarily involving contaminated Class 2 survey units. That is, contamination in excess of the derived concentration guideline level that has been found during past confirmatory surveys within Class 2 survey units. As expected, the contamination was usually identified in that portion of the survey unit bordering adjacent Class 1 areas. The simplest solution for the observed occurrences would have been for the licensee to have extended the size of the Class 1 survey units to include adjacent regions. In one case, the contamination was found on the wall portion of the interface between the Class 1 floor and Class 2 wall.

References: NUREG-1757: Consolidated Decommissioning Guidance: Characterization, Survey, and Determination of Radiological Criteria, Vol. 2, Rev. 1, Appendix O
http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf

Search Criteria:

Year: 2005 ***Facility Type:*** All Facility Types
Stage: All Functional Areas ***Benefit:*** All Benefits

Lesson ID: 2005-18 ***Facility Type:*** Reactors, Material Facilities ***Stage:*** Decommissioning Work

Benefits: Facilitates Decommissioning Licensing

Subject: Licensees should conduct additional data assessment during final status surveys (FSS) if there are hot spots remaining in survey units to demonstrate compliance with the basic dose limit.

Discussion: There have been isolated instances where reviews of FSS data packages or confirmatory survey findings identified survey units where the derived concentration guideline level (DCGL) was statistically satisfied, but hot spots were not fully addressed. When hot spots remain in a survey unit, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) recommends additional data assessment to ensure compliance with the basic dose limit. The first recommendation is that each hot spot be evaluated against the (DCGL), relative to hot spot size and allowable concentration within the hot spot area. Generally, for hot spots documented in FSS packages, this recommendation is addressed adequately. A component for demonstrating compliance that has been overlooked is showing that the combination of residual hot spot contamination in addition to any uniformly distributed activity is less than the basic dose limit. MARSSIM, Section 8.5.2, provides the equation and narrative guidance for implementation and documentation in survey units where this condition exists.There have been isolated instances where reviews of FSS data packages or confirmatory survey findings identified survey units where the derived concentration guideline level (DCGL) was statistically satisfied, but hot spots were not fully addressed. When hot spots remain in a survey unit, the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) recommends additional data assessment to ensure compliance with the basic dose limit. The first recommendation is that each hot spot be evaluated against the (DCGL), relative to hot spot size and allowable concentration within the hot spot area. Generally, for hot spots documented in FSS packages, this recommendation is addressed adequately. A component for demonstrating compliance that has been overlooked is showing that the combination of residual hot spot contamination in addition to any uniformly distributed activity is less than the basic dose limit. MARSSIM, Section 8.5.2, provides the equation and narrative guidance for implementation and documentation in survey units where this condition exists.

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http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1757/v2/sr1757v2r1.pdf