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Nuclear Material Events Database

Coding Manual

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ABSTRACT

The Nuclear Regulatory Commission's (NRC) Nuclear Material Events Database (NMED) contains records of events involving nuclear material reported by NRC licensees, Agreement States, and non-licensees. The events are classified into the following categories based on event reporting requirements defined in Title 10 of the Code of Federal Regulations (CFR): (1) Lost/Abandoned/Stolen Material, (2) Medical, (3) Radiation Overexposure, (4) Release of Licensed Material or Contamination, (5) Leaking Sealed Source, (6) Equipment, (7) Transportation, (8) Fuel Cycle Process, and (9) Other. At the direction of the NRC, the Idaho National Laboratory (INL) developed and maintains the NMED. The database contains events submitted to the NRC from approximately January 1990 to present. Each workday, the NMED data are updated and uploaded to the NMED website (http://nmed.inl.gov), which can be accessed by NRC staff, Agreement State staff, and other users authorized by the NRC. Additionally, the INL developed and distributed software to the Agreement and Non-Agreement States to allow the creation of local NMED modules in a format similar to the national NMED. This report describes the methodology used to code events into the national database.

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Nuclear Material Events Database Coding Manual

1. OVERVIEW AND GENERAL GUIDANCE

The Nuclear Regulatory Commission's (NRC) Nuclear Material Events Database (NMED) contains records of events involving nuclear material reported to the NRC by NRC licensees, Agreement States, and non-licensees. The database is maintained by the Idaho National Laboratory (INL). The reported events are classified based on reporting requirements defined by Title 10 of the Code of Federal Regulations (CFR). The NMED data are uploaded to the NMED website (http://nmed.inl.gov) after each work day and may be accessed by NRC staff, Agreement State staff, and other users authorized by the NRC.

The purpose of this manual is to describe the methodology used to code events into the database. Event-level guidance is contained in Section 2 and table-level guidance is contained in Section 3. Therefore, questions like how to code a specific type of event are in Section 2, while questions regarding the use of the specific fields are in Section 3.

1.1 Data Description

The NMED contains records of events associated with the use of radioactive material including byproduct, source, and special nuclear material. Select events that do not have an associated 10 CFR reporting requirement are entered into NMED, but are designated as "not reportable". The following "not reportable" event types are excluded from NMED:

- Events that only involve non-AEA radioactive material that do not involve a loss (including theft, abandonment, etc.) of the material,
- Events that only involve radioactive material that is not regulated by the NRC or Agreement States, and
- Events that only involve non-radioactive material that are not related to an NRC-licensed program.

In addition to material events, fuel cycle process events are coded into NMED. Regarding commercial power reactors and research/test reactors, only those events where nuclear material entered the public domain and occupational/non-occupational overexposure events are entered into NMED.

1.2 Data Structure

The national NMED contains 12 separate data tables. Eleven of the tables are used during event data entry and their particular usage depends on the type of event being entered (medical, lost source, etc.). The other table (ABNOCC) contains the information published in NUREG-0090, *Report to Congress on Abnormal Occurrences*, for events in the national database.

Appendix A contains a listing of the files, data tables, and data fields used in NMED. Appendix A also contains a figure showing the relationships between the various data tables.

1.3 Data Sources

Nuclear material event reports are obtained from the following sources:

- NRC daily reports [Event Notification (EN) and Preliminary Notification of Event or Unusual Occurrence (PN)],
- Licensee or consultant written reports submitted to NRC,
- Agreement State reports, and

- NRC inspection reports, investigation reports, and enforcement action documents.

Nuclear material event reports are retrieved/received by the INL as follows:

- Daily downloads from the NRC public website,
- Daily downloads of publicly available documents from the NRC's Agencywide Documents Access and Management System (ADAMS), and
- Directly from NRC or state agencies, typically via e-mail.

All event documentation is printed and filed by the NMED item number. These files are retained for future reference. The INL has files back to 1995, but complete files only back to 1997.

The national NMED is maintained in Microsoft Access on a personal computer at the INL. New and updated material events are reviewed by INL staff each work day. Using the NRC-approved coding guidance contained in this manual, the events are entered into the national database using an NMED data entry program. The NRC PM is notified when events of particular interest are entered, such as potential Abnormal Occurrences (AOs).

1.4 Reference Documents

As outlined in Section 1.3, Data Sources, INL NMED staff receives reference documents from several sources to create and modify NMED event records. For NRC-regulated events, most of the documents are contained in an NRC document management system (like the EN database or ADAMS). Documents like e-mails or Agreement State event reports are typically sent directly to the INL, bypassing the NRC document management systems.

Effective 3/31/2013, INL will retain reference documents for two full years (see ML13044A418). INL prints working copies of reference documents for data entry and quality assurance purposes. These printed documents are placed into folders that are labled with the NMED item number, such that all printed documents associated with a particular record are in a single folder. These folders are retained for two full years (based on the NMED item number). The folders will be disposed of at the beginning of the third year.

The original electronic copies of the reference documents will also be retained for two full years (based on the date of receipt). The electronic documents will be deleted at the beginning of the third year.

1.5 Data Entry/QA

INL's commitment is to enter ENs and PNs into the NMED within two working days of receipt, and all other reports within two working weeks of receipt. Additionally, within two working weeks of receipt of NUREG-0090, Report to Congress on Abnormal Occurrences, the full text of the pertinent AO events are entered into NMED.

At the end of each work day, INL performs an independent quality assurance (QA) check of NMED data collection and entry activities. The QA procedures ensure that all reports received are properly accounted for and ensure accurate and consistent coding of events. Because information on events is received from several sources (for example, an event may initially be addressed in an EN, followed by a PN, a report from the licensee, and/or inspection report), QA checks ensure that information is not duplicated, but that new information from the different sources is accounted for. In additional to a manual QA check, an automated routine is used to check for certain data errors such as date order problems (see Appendix B for a listing of the items checked by the automated QA routine).

After the daily QA task is completed, the NMED is backed-up and uploaded to the NMED website.

1.6 Data Backup

INL performs an automated backup of the NMED electronic database files routinely, typically at the end of each day following the QA checks. These files are zipped into one file, which is named according to the date that the backup was performed. Daily backups are kept for at least one month, after which one file per month is kept. These files are stored on a server, which is also automatically backed up each day by the INL Information Technology department.

Other electronic project files (such as email, event reports, data analysis requests, etc.) are backed up to a server as needed by INL NMED staff.

1.7 Requests for Additional Information

Many event reports received by the INL do not include all of the information required to complete an analysis of the event. As a result, INL developed a procedure to request additional information (RAI) for incomplete NMED records of reportable events (Appendix C defines the data requirements for a complete record) and events of uncertain reportability. RAIs are not produced for non-reportable events.

In order to update incomplete records, INL contacts staff in Agreement States, NRC Regional Offices, or NRC Headquarters to obtain additional information. The INL developed an RAI computer program (NMED Communication Tool) using Microsoft Access to automate this process. The program identifies incomplete records of events that the responsible regulatory agency has had adequate time to investigate (see Appendix D for a detailed description of the automated RAI routine). The INL then requests additional information from the responsible agency via e-mail.

The RAI computer program tracks all RAIs and responses. If the applicable agency does not respond within a specified time frame, or the response is insufficient to complete the event, the INL generates a report for the NRC PM of those incomplete events that are also potential metric events (as defined in NUREG-1614, Vol. 2, Part 1, *U.S. Nuclear Regulatory Commission Strategic Plan*), which are a subset of all incomplete records.

1.8 General Coding Guidance

Duplicate Records

If duplicate event records are identified, one will be deleted from NMED so that only one record exists per event. The documentation from the deleted record will be placed in the specified file cabinet and the "Deleted Records" table will be updated.

INES Reports

International Nuclear Event Scale (INES) reports entered into the NMED will have the letter notifying INL of the incident as the reference document (LTRYYMMDD) and the document type will be "INES Report." In addition, a sentence will be added at the end of the narrative that specifies the INES Rating and the date it was rated.

Multiple Similar Events

When multiple, similar events are reported, the determination of the number of NMED records created will depend on the licensee's response to the event. Although these occurrences will be evaluated on a case-by-case basis, the following general criteria will be used when determining whether to code single or multiple NMED records:

1. If the licensee identified a problem, implemented corrective actions, and considered the problem solved, but the actions were later determined to be inadequate and resulted in additional events, multiple event records will be created.
2. If the licensee identified a problem and during the subsequent evaluation of the problem discovered that a similar problem(s) had previously occurred (systemic cause), only a single event record will be

created. The intent is to prevent generating additional records when problems are discovered while resolving the original problem. If problems found during the evaluation are reported in a separate report, a new event record will not be generated if it is clear that the problems were discovered during the evaluation of the original event.

2. EVENT-LEVEL CODING GUIDANCE

2.1 Code of Federal Regulations

NMED events are classified based on reporting requirements defined by 10 CFR. The NMED coders must be knowledgeable of the various sections of 10 CFR that are applicable to the NMED and their associated reporting requirements. These 10 CFR sections are:

- 10 CFR 20 Standards for Protection Against Radiation
- 10 CFR 21 Reporting of Defects and Noncompliance
- 10 CFR 30 Rules of General Applicability to Domestic Licensing of Byproduct Material
- 10 CFR 31 General Domestic Licenses for Byproduct Material
- 10 CFR 34 Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operators
- 10 CFR 35 Medical Use of Byproduct Material
- 10 CFR 36 Licenses and Radiation Safety Requirements for Irradiators
- 10 CFR 39 Licenses and Radiation Safety Requirements for Well Logging
- 10 CFR 40 Domestic Licensing of Source Material
- 10 CFR 50 Domestic Licensing of Production and Utilization Facilities
- 10 CFR 70 Domestic Licensing of Special Nuclear Material
- 10 CFR 71 Packaging and Transportation of Radioactive Material
- 10 CFR 72 Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor Greater Than Class C Waste
- 10 CFR 73 Physical Protection of Plants and Materials
- 10 CFR 74 Material Control and Accounting of Special Nuclear Material
- 10 CFR 76 Certification of Gaseous Diffusion Plants
- 10 CFR 150 Exemptions and Continued Regulatory Authority in Agreement States and in Offshore Waters Under Section 274

2.2 Event Type Descriptions and Criteria

The events are classified into the following nine categories.

Event Type	Displayed (Stored) Value
Lost/Abandoned/Stolen Material	LAS
Medical	MD2
Radiation Overexposure	EXP
Release of Licensed Material or Contamination	RLM
Leaking Sealed Source	LKS
Equipment	EQP
Transportation	TRS
Fuel Cycle Process	FCP
Other	OTH

2.2.1 Lost/Abandoned/Stolen Material (LAS)

The LAS event category includes those events where licensed radioactive material is lost or found, abandoned or discovered, and stolen or recovered. The radioactive material involved can be sealed or unsealed material, specifically or generally licensed, exempt or non-exempt quantities, involve a licensee or a non-licensee, and can be found anywhere. Abandoned well logging sources are included in this category.

NMED LAS reportable events are those that meet the reporting requirements of 10 CFR 20.2201, or in the case of stuck/abandoned well logging sources 10 CFR 39.77(d). Events that do not meet the 20.2201 reporting requirement thresholds are captured as not-reportable LAS events. Additionally, LAS events involving non-AEA material are entered into NMED as not-reportable events.

All reportable LAS events will be coded as one of the following reporting requirements. For events involving more than one source, the decision of 10 × or 1,000 × Appendix C to part 20 is based on **aggregate quantities** of licensed material. See Appendix H for the full text and any clarification of the reporting requirements.

Primary LAS Reporting Requirements	Reporting Requirement Summary
20.2201(a)(1)(i)	Aggregate activity ≥ 1,000 × Appendix C to Part 20
20.2201(a)(1)(ii)	Aggregate activity > 10 and < 1,000 × Appendix C to Part 20
39.77(d)	Irretrievable well logging source

The following additional (secondary) CFRs will be added as applicable. This should not occur frequently. See Appendix H for the full text and any clarification of the reporting requirements.

Secondary LAS Reporting Requirements	Reporting Requirement Summary
30.55(c)	Theft/diversion of 10 Ci (or 100 Ci per year) of H-3 (not generally licensed)
39.77(b)	Loss/theft of well logging sources
40.64(c)(1)	Theft/diversion of 15 lbs (or 150 lbs per year) of source material (uranium or thorium)
73.71(a)(1)	Lost shipment of any SNM
73.App G(I)(a)(1)	Actual or attempted theft or unlawful diversion of SNM.
74.11(a)	Loss, theft or unlawful diversion (actual or attempted) of SNM or the unauthorized production of enriched uranium.
76.120(a)(2)	Loss, other than normal operating loss, of special nuclear material.
76.120(a)(3)	Actual or attempted theft or unlawful diversion of special nuclear material.
150.16(b)(1)	Actual or attempted theft or unlawful diversion of SNM.
150.17(c)(1)	Attempted theft or unlawful diversion of more than 6.8 kg (15 lb) of Uranium or Thorium at any one time or more than 68 kg (150 lb) in any one calendar year.
150.19	Theft/diversion of 10 Ci (or 100 Ci per year) of H-3 (not generally licensed). Note: This requirement is just like 30.55(c), but applies to Agreement States and offshore waters.

Abnormal Occurrence Criteria

The criteria for determining whether or not an event is classified as an Abnormal Occurrence (AO) is contained in Federal Register Vol. 71, No. 197, pages 60198 - 60200. Criteria I.C. applies to LAS events. Although I.C.1. excludes sources if they are contained in "labeled, rugged source housings", this term is not well defined and may not have been intended to apply to stolen material. Direction received from the NRC in January 2012 is to mark all LAS events involving IAEA Category 1 or 2 sources as potential AOs (except irretrievable well logging sources and unrecoverable sources, such as those dropped into the ocean).

Contaminated Consumer Product

Consumer products that have been contaminated with radioactive material are coded with the keyword "Contaminated Consumer Product". The contamination generally occurs during manufacture (i.e., from a melted radioactive sealed source at a steel mill). These events are typically LAS events, but may have additional event types as well. This keyword is not used for consumer products that are designed to contain radioactive material (like smoke detectors, instrument dials, etc.). Also excluded are items contaminated through normal use (for example, NORM scale in pipes or water softeners).

Depleted Uranium Counterweights

Events involving counterweights (from aircraft, rockets, projectiles, or missles) containing depleted uranium that are found at scrap metal facilities/landfills will be listed as non-reportable, based on the 10 CFR 40.13 exemption. However, if the counterweight has been processed by the facility in any way, the record may be marked as reportable under 10 CFR 20.2201(a)(1)(ii) if the activity stipulation is met (DU is typically 360 nCi/gram, so 6.1 lbs meets reportability).

Failure to Block and Brace Device

If an employee fails to block and brace a device and that device is lost in transit, the cause will be listed as "Failure to Follow Procedures or Wrong Procedure Used".

Gate Monitor Alarms

I-131 that sets off the radiation monitor alarms at a landfill will be marked as reportable under 10 CFR 20.2201(a)(1)(ii), unless the calculated/estimated activity is provided to conclude otherwise. If the waste came from a residence, the event will be non-reportable and the cause will be listed as "Residential Patient Waste".

Tc-99m that sets off the radiation monitor alarms at a landfill will be marked as uncertain reportability unless the activity is provided and it meets a 10 CFR 20.2201 requirement. If the waste came from a residence, the event will be non-reportable and the cause will be listed as "Residential Patient Waste".

If the radionuclide that sets off landfill radiation monitor alarms is not provided, the reportability will be listed as uncertain. If the regulating agency assumes that a particular radionuclide was involved, that assumption will be listed in the NMED record.

"Greater than 10 Ci – not H-3" Keyword

If the "Greater than 10 Ci – not H-3" keyword is listed on a record, it will remain in the record even if the source is recovered or found.

Industrial/Commercial Smoke Detectors

Per 10 CFR 30.20, industrial/commercial smoke detectors manufactured or transferred per 10 CFR 32.26 that are found at scrap metal facilities/landfills are exempt from regulation and are not reportable.

National Source Tracking System

For all new or updated LAS events involving IAEA Category 1 or 2 sources (excluding irretrievable well logging sources abandoned downhole), an email is sent to NSTS.Help@NRC.gov with the subject line "NMED Report ######", where ###### is the event item number. A PDF version of the NMED event report is attached to to the email.

Orphan Sources

Orphan source events are entered into NMED (see NRC's official Orphan Source definition in Appendix J). The keyword "Orphan Source" is added to these events and is not removed – even if the owner of the source is subsequently identified. However, if the source is found and the owner is identified in the same initial reference document, the keyword is generally not added.

If a source is abandoned at a facility where the licensee has gone bankrupt or out of business, the incident will be listed as an orphan source event.

The state where an orphan source is found will be listed in the Licensee/Reporting Party fields until the owner is identified, at which time the owner's state will be listed.

Potential/Temporary Losses

The NRC's conservative approach is that the precise location of licensed material should be known by the possessor and should be verifiable at all times. Thus, a loss must be reported immediately after it has become known. In some cases, the licensee will take some time to look for the material and not make the determination that the loss has become known to them until exhausting all reasonable attempts to location the material. There is no specific determination as to what is an unreasonable amount of time to spend searching for the material prior to reporting the loss, but much more than one day is likely not acceptable. Note that reporting a source as "potentially missing" has no regulatory meaning.

Radiopharmaceutical Capsules

If an I-131 capsule is inadvertently not administered to a patient and is unknowingly shipped back to the provider in an "empty" shipping package, the event will be listed as LAS.

Reportability

LAS events are coded without regard to the clarifying statements [10 CFR 20.2201(a)(1)(i) - "exposure could result", or 10 CFR20.2201(a)(1)(ii) - found within the 30-day window]. The reportability of these events is based only on the radionuclide and activity.

Thorium-coated Lenses

All thorium-coated lenses found at scrap metal facilities/landfills are considered to contain less than 30% thorium by weight and will be listed as non-reportable based on the 10 CFR 40.13 exemption.

2.2.2 Medical (MD2)

MD2 events are determined and coded per the 10 CFR reporting requirements listed below. See Appendix H for the full text and any clarification of the reporting requirements.

MD2 Reporting Requirements	Reporting Requirement Summary
35.3045(a)(1)(i)	Total **dose** delivered that differs from the prescribed dose by 20% or more; and differs from the prescribed dose by more than 0.05 Sv (5 rem) EDE, 0.5 Sv (50 rem) to an organ or tissue, or 0.5 Sv (50 rem) SDE.
35.3045(a)(1)(ii)	Total **dosage** delivered differs from prescribed by 20% or more or falls outside the prescribed range; and results in a dose that differs from prescribed by more than 0.05 Sv (5 rem) EDE, 0.5 Sv (50 rem) to an organ or tissue, or 0.5 Sv (50 rem) SDE.
35.3045(a)(1)(iii)	**Fractionated dose** delivered that differs from the prescribed dose for a single fraction by 50% or more; and differs from the prescribed dose by more than 0.05 Sv (5 rem) EDE, 0.5 Sv (50 rem) to an organ or tissue, or 0.5 Sv (50 rem) SDE.
35.3045(a)(2)(i)	Administration of a **wrong radioactive drug** containing byproduct material that results in a dose that exceeds 0.05 Sv (5 rem) EDE, 0.5 Sv (50 rem) to an organ or tissue, or 0.5 Sv (50 rem) SDE.
35.3045(a)(2)(ii)	Administration of a radioactive drug containing byproduct material by the **wrong route** of administration that results in a dose that exceeds 0.05 Sv (5 rem) EDE, 0.5 Sv (50 rem) to an organ or tissue, or 0.5 Sv (50 rem) SDE to the skin.
35.3045(a)(2)(iii)	Administration of a dose or dosage to the **wrong individual** or human research subject that results in a dose that exceeds 0.05 Sv (5 rem) EDE, 0.5 Sv (50 rem) to an organ or tissue, or 0.5 Sv (50 rem) SDE to the skin.
35.3045(a)(2)(iv)	Administration of a dose or dosage delivered by the **wrong mode** of treatment that results in a dose that exceeds 0.05 Sv (5 rem) EDE, 0.5 Sv (50 rem) to an organ or tissue, or 0.5 Sv (50 rem) SDE to the skin.
35.3045(a)(2)(v)	**Leaking sealed** source that results in a dose that exceeds 0.05 Sv (5 rem) EDE, 0.5 Sv (50 rem) to an organ or tissue, or 0.5 Sv (50 rem) SDE to the skin.
35.3045(a)(3)	Dose to the skin, organ, or tissue, **other than the treatment site**, that exceeds the prescribed dose by 0.5 Sv (50 rem) and 50% or more (excluding permanently implanted seeds that migrated from the treatment site).
35.3045(b)	Event resulting from **patient intervention** in which the administration of byproduct material or radiation from byproduct material results in **unintended permanent functional damage** to an organ or a physiological system, as determined by a physician.

Events are not considered MD2 events if they involve:

- Only a linear accelerator.
- Doses administered in accordance with a written directive (even if the written directive is in error).
- Patient intervention, unless the event results in unintended permanent functional damage to an organ or physiological system – see 10 CFR 35.3045(b).

Events are considered MD2 events if, for example, a linear accelerator is used for therapy by mistake instead of a teletherapy unit or a teletherapy unit instead of a linear accelerator.

For purposes of determining whether to categorize an event as MD2 or EXP, MD2 events occur to patients only (i.e., those being administered a medical procedure). For example, if a patient receives too much dose during a procedure, the event would be categorized as MD2 rather than EXP. However, radiation exposure received from a cause other than the patient's medical procedure may be categorized as EXP.

Abnormal Occurrences

The Abnormal Occurrence (AO) Working Group determined that medical events in which the written directive was not followed, but the intended and planned dose was administered, are not considered to meet the AO criteria. For example, NMED item number 090574 (an administration that was not given in accordance with the written directive; however, the dose administered was the intended dose) was specifically determined to not meet the AO criteria.

Microspheres, TheraSpheres, and Sir-Spheres

Microspheres, TheraSpheres, Sir-Spheres, and similar sources are considered to be sealed sources and the procedure is listed as "Manual Implant."

No Dose/Dosage Delivered

A medical procedure is considered to have begun once the patient receives dose/dosage (even to an untintended location). In this case, reportability is determined per the standard criteria in 10 CFR 35. If no dose/dosage is delivered to the patient, the medical procedure never began and, thus, no medical event could have occurred.

Patient Intervention

Per 10 CFR 35.2, patient intervention is defined as actions by the patient or human research subject, whether intentional or unintentional, such as dislodging or removing treatment devices or prematurely terminating the administration.

Further clarification was received by email on 11/9/2010. The following examples are not patient intervention:

- Normal bodily functions, such as coughing, sneezing, excessive gas, excessive bowel movements, or restlessness.
- For bronchial guide tube placement, failure of the tape to hold due to a wet environment.
- Abnormal or unexpected anatomy, tortuous blood vessels, or reverse order of major blood vessels off the hepatic artery.

The patient has to intervene, such as grabbing and pulling the applicator out, getting up off the table, etc. The patient does not have to be conscious of their actions. They could have dementia that prevents them from knowing what they are doing, think someone told them to do it, or be asleep when they intervene.

Medical events caused by patient intervention are typically not reportable. However, 10 CFR 35.3045(b) states that a medical event is reportable if it results in permanent functional damage to an organ or a physiological system.

NRC Information Notice 2006-11 states: "NRC's position is that a medical event has occurred, even when the occurrence had patient movement or other involvement, if the licensee has not followed appropriate preventative and corrective procedures for usage, and if the criteria specified in 10 CFR 35.3045 (a) or (b) are met."

2.2.3 Radiation Overexposure (EXP)

EXP events are determined and coded per the 10 CFR reporting requirements listed below. See Appendix H for the full text and any clarification of the reporting requirements.

EXP Reporting Requirements	Reporting Requirement Summary
20.2202(a)(1)(i)	Immediate report - An individual received a **total effective dose equivalent of 25 rem** (0.25 Sv) or more.
20.2202(a)(1)(ii)	Immediate report - An individual received a **lens dose equivalent of 75 rem** (0.75 Sv) or more.
20.2202(a)(1)(iii)	Immediate report - An individual received a **shallow-dose equivalent to the skin or extremities of 250 rad** (2.5 Gy) or more.
20.2202(b)(1)(i)	24-hour report - Loss of control of material causing or threatening to cause an individual to receive a **total effective dose equivalent exceeding 5 rem** (0.05 Sv) in a period of **24 hours**.
20.2202(b)(1)(ii)	24-hour report - Loss of control of material causing or threatening to cause an individual to receive an **eye dose equivalent exceeding 15 rem** (0.15 Sv) in a period of **24 hours**.
20.2202(b)(1)(iii)	24-hour report - Loss of control of material causing or threatening to cause an individual to receive a **shallow-dose equivalent to the skin or extremities exceeding 50 rem** (0.5 Sv) in a period of **24 hours**.
20.2203(a)(2)(i)	30-day report - Doses in excess of the **occupational** dose limits for **adults** in 20.1201.
20.2203(a)(2)(ii)	30-day report - Doses in excess of the **occupational** dose limits for a **minor** in 20.1207.
20.2203(a)(2)(iii)	30-day report - Doses in excess of the limits for an **embryo/fetus of a declared pregnant woman** in 20.1208.
20.2203(a)(2)(iv)	30-day report - Doses in excess of the limits for an **individual member of the public** in 20.1301.
20.2203(a)(2)(v)	30-day report - Doses in excess of **any applicable limit in the license.**
20.2203(a)(2)(vi)	30-day report - Doses in excess of the **ALARA constraints for air emissions** established under 20.1101(d).

The EXP event category includes all regulatory overexposures of radiation workers or exposures of members of the public to radiation. The overexposure can be external or internal and can be whole body, extremity, skin, lens of the eye, or internal dose. When the overexposure involves multiple individuals or an individual with multiple overexposure types (such as whole body and extremity), the different types of overexposures are entered separately. Note that dosimeters record exposure if improperly stored near a radiation source and, depending on the type of dosimeter, may react as though they are in a radiation field when exposed to heat or humidity.

It is NRC policy to classify only those events that positively involve a personnel overexposure, and not just a dosimeter exposure, as reportable EXP events. For example, either the licensee does not contest the personnel overexposure, or in cases where the licensee does contest the overexposure, the State or NRC determines the event to be personnel overexposure. These events are marked as uncertain reportability until this determination has been made.

EXP limits do not apply to patients receiving medical procedures.

2.2.4 Release of Licensed Material or Contamination (RLM)

RLM events are determined and coded per the 10 CFR reporting requirements listed below. See Appendix H for the full text and any clarification of the reporting requirements.

RLM Reporting Requirements	Reporting Requirement Summary
20.2202(a)(2)	Immediate report - Release of radioactive material, inside or outside of a restricted area, so that had an individual been present for **24 hours**, the individual could have received an **intake 5 times the ALI**.
20.2202(b)(2)	24-hour report - Release of material, inside or outside of a restricted area, so that, had an individual been present for **24 hours**, the individual could have received an **intake in excess of 1 ALI**.
20.2203(a)(3)(i)	30-day report - Radiation or concentrations of radioactive material in a restricted area in excess of **any applicable limit in the license**.
20.2203(a)(3)(ii)	30-day report - Radiation or concentrations of radioactive material in an unrestricted area **in excess of 10 times any applicable limit set forth in Part 20 or in the license** – NMED metric.
20.2203(a)(4)	30-day report - Levels of radiation or releases of radioactive material in excess of the standards in 40 CFR 190, or of license conditions related to those standards.
30.50(a) 40.60(a) 70.50(a) 76.120(b)	Immediate report - Event that **prevents immediate protective actions** necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits or releases of material that could exceed regulatory limits.
30.50(b)(1) 40.60(b)(1) 70.50(b)(1) 76.120(c)(1)	24-hour report - Unplanned contamination event that requires access to be **restricted for > 24 hours**, involves **> 5 times the lowest ALI**, and has access restricted for a reason other than to allow isotopes with a **half-life of < 24 hours** to decay.
30.50(b)(3) 40.60(b)(3) 70.50(b)(3) 76.120(c)(3)	24-hour report - Event that requires **unplanned medical treatment** at a medical facility of an individual with **spreadable radioactive contamination** on the individual's clothing or body.
50.72(b)(3)(xii) 72.75(c)(3)	8-hour report - Event requiring the **transport of a radioactively contaminated person** to an offsite medical facility for treatment.

The RLM event category includes two types of events. The first type is a radioactive release to air or water exceeding the 10 CFR 20 Appendix B annual limit on intake (ALI) values. The second type of RLM event involves contamination events such as a radioactive spill outside of work areas, removable contamination found on equipment, or material tracked around a laboratory such that additional radiological control measures had to be implemented. This category does not include spills inside of laboratory hoods, radiopharmaceutical dose preparation areas, or hot cells where radioactive work routinely requires cleanup or changing of absorbent paper after the performance of a task. Should there be multiple release types (e.g., surface, air, water, or person) or areas of contamination associated with the release, this information is entered individually.

The CFRs 50.72(b)(3)(xii) and 72.75(c)(3) specify an “offsite” medical facility. Other similar CFRs, like 30.50(b)(3), 40.60(b)(3), 70.50(b)(3), and 76.120(c)(3), do not specify “offsite”. The cause “Contaminated Worker Received Medical Treatment” is used for both situations.

2.2.5 Leaking Sealed Source (LKS)

LKS events are determined and coded per the 10 CFR reporting requirements listed below. See Appendix H for the full text and any clarification of the reporting requirements.

LKS Reporting Requirements	Type of Source
31.5(c)(5)	Generally licensed
34.27(d)	Radiography
35.67(e)	Medical
39.35(d)(1)	Well logging (leaking)
39.77(a)	Well logging (ruptured)
30.50(b)(2)	All other sources

The NRC requires that most sealed sources be periodically leak tested to verify that the material is still sealed and that the source is still considered safe to use without contamination controls, including protective clothing or gloves. Sources are generally exempt from leak testing under the following conditions [see 10 CFR 31.5(c)(2), 34.27(c), 35.67(f), and 39.35(e)]:

- Sources containing only gaseous radioactive material (like H-3, Kr-85, etc.),
- Sources containing licensed material with a half-life of 30 days or less,
- Sources containing <= 100 μCi of other beta and/or gamma emitting material,
- Sources containing <= 10 μCi of alpha emitting material,
- Sources held in storage in the original shipping container prior to initial installation,
- Seeds of Ir-192 encased in nylon ribbon, or
- Sources in storage and not in use (must be leak tested prior to use or transfer).

A source is considered leaking if a leak test can detect greater than 0.005 μCi of removable radioactive material. The leaking source is then removed from service, disposed of or returned to the manufacturer for repair, and a report is sent to the NRC or Agreement State with the details of the leaking source.

For regulatory reporting purposes, a leaking source is generally considered a failed device under 10 CFR 30. Therefore, in most cases an LKS event is also coded as an EQP event. An exception is the Ni-63 foil source, which is coded as only an LKS event.

2.2.6 Equipment (EQP)

EQP events are determined and coded per the 10 CFR reporting requirements listed below. See Appendix H for the full text and any clarification of the reporting requirements.

EQP Reporting Requirements	Reporting Requirement Summary
21.21(d)(1)(i)	A failure to comply or a defect affecting the **construction or operation of a facility** or an activity that is subject to licensing requirements.
21.21(d)(1)(ii)	A failure to comply or a defect affecting a **basic component** that is supplied for a facility or an activity that is subject to licensing requirements.
30.50(a) 40.60(a) 70.50(a) 76.120(b)	Event that **prevents immediate protective actions** necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits or releases of material that could exceed regulatory limits.
30.50(b)(2) 40.60(b)(2) 70.50(b)(2) 72.75(d)(1) 76.120(c)(2)	Equipment is **disabled or fails to function** as designed.
30.50(b)(4) 40.60(b)(4) 70.50(b)(4) 76.120(c)(4)	**Unplanned fire or explosion** damaging any licensed material or any device, container, or equipment containing licensed material.
31.5(c)(5)	**Actual or indicated failure** to shielding, the on-off mechanism or indicator, or upon the detection 0.005 uCi or more of removable radioactive material.
34.101(a)(1)	**Unintentional disconnection** of the radiographic source assembly from the control cable.
34.101(a)(2)	**Inability to retract** and secure the radiographic source assembly to its fully shielded position.
34.101(a)(3)	**Failure of any radiographic component** (critical to the safe operation of the device) to properly perform its intended function.
36.83(a)(1)	An irradiator **source stuck** in an unshielded position.
36.83(a)(2)	**Fire or explosion** in an irradiator radiation room.
36.83(a)(3)	Damage to the irradiator **source racks**.
36.83(a)(4)	Failure of the irradiator **cable or drive mechanism** used to move the source racks.
36.83(a)(5)	Inoperability of the irradiator **access control system**.
36.83(a)(6)	Detection of irradiator source by the **product exit monitor**.
36.83(a)(7)	Detection of irradiator **radioactive contamination** attributable to licensed radioactive material.
36.83(a)(8)	**Structural damage** to the irradiator pool liner or walls.
36.83(a)(9)	**Abnormal water loss or leakage** from the irradiator source storage pool.
36.83(a)(10)	Irradiator pool **water conductivity** exceeding 100 microsiemens per centimeter.
39.77(a)	**Ruptured well logging** sealed source.
72.75(c)(1)	Defect in any spent fuel, HLW, or reactor-related GTCC waste storage structure, system, or component that is important to safety.

EQP Reporting Requirements	Reporting Requirement Summary
72.75(c)(2)	Significant reduction in the effectiveness of any spent fuel, HLW, or reactor-related GTCC waste storage confinement system during use.
72.242(d)	Design or fabrication deficiency for any spent fuel storage cask delivered to a licensee which affects the ability of components important to safety to perform their safety function.

The EQP event category includes all types of radiological equipment problems, including generally licensed device problems covered in 10 CFR 31; radiography equipment problems covered in 10 CFR 34; irradiator problems covered in 10 CFR 36; well logging problems covered in 10 CFR 39, and other types of equipment covered in 10 CFR 30, 40, 70, and 76. EQP events are defined as the failure of, or a defect in, any piece of equipment that either contains licensed radioactive materials as an integral part, or whose function is to interact with such materials.

Generally Licensed Devices

Generally licensed devices subject to 10 CFR 31.5(c)(5) must be reported to the NRC Operations Center per 10 CFR 30.50(b)(2). NMED codes these events with the 31.5(c)(5) reporting requirement, not 30.50(b)(2). See NRC Information Notice 2009-18.

Portable Gauges

Portable gauges licensed per 10 CFR 30 that are damaged are marked as reportable events with the 10 CFR 30.50(b)(2) reporting requirement when the source is damaged or the shielding is compromised (including any extraordinary efforts to retract a source to the shielded position). See NRC Information Notice 2005-06 and HPPOS-322.

Radiographic Exposure Devices

Radiographic exposure devices subject to 10 CFR 34 must be reported to the NRC Operations Center per 10 CFR 30.50(b)(2), with a 30-day report required per 10 CFR 34.101. NMED codes these events with the appropriate 10 CFR 34.101 reporting requirement, not 30.50(b)(2).

2.2.7 Transportation (TRS)

TRS events are determined and coded per the 10 CFR reporting requirements listed below. See Appendix H for the full text and any clarification of the reporting requirements.

TRS Reporting Requirements	Reporting Requirement Summary
20.1906(d)(1)	Transported package exceeds removable surface contamination limits.
20.1906(d)(2)	Transported package exceeds external radiation limits.
71.5	Transportation of licensed material.
71.95(a)(1)	Significant reduction in the effectiveness of any NRC-approved Type B or Type AF packaging during use.
71.95(a)(2)	Defects with safety significance in any NRC-approved Type B or fissile material packaging, after first use.
71.95(a)(3)	Conditions of approval in the Certificate of Compliance were not observed in making a shipment.
71.95(b)	Conditions in the Certificate of Compliance were not followed during a shipment.

10 CFR 71.95 Events

Per a request from the NRC's transporation group in late 2002, the certified container's docket number is used in the licensee/reporting party fields rather than the licensee's docket number. Also, the license number and program code fields are "NR". If these events involve a fuel cycle facility, the FCP event type is added and the program code field is populated based on the type of facility involved (like uranium enrichment plant or uranium fuel processing plant). It may be necessary to consider the material within the shipping container when choosing the appropriate program code.

Dose Rates in Occupied Spaces

Note that 20.1906(d)(2) includes a limit of 2 mrem/hr in occupied spaces (unless wearing dosimetry). If this limit is exceeded, the event is coded as TRS and OTH, both with the 20.1906(d)(2) requirement.

2.2.8 Fuel Cycle Process (FCP)

The FCP event type is used two ways. One usage is identical to the other event types in that it is used to code events involving FCP reporting requirements. However, it is also used to denote any type of event occurring at (or involving) a fuel cycle process facility. Therefore, reporting requirements other than those listed below can be used with the FCP event type. In this case, the event will be coded with multiple event types.

Fuel cycle process facilities are those licensees with the following NRC program codes:

NRC Program Code	Description
11400	Uranium Hexafluoride (UF6) Production Plants
21130	Hot Cell Operations
21135	Decommissioning of Advanced Fuel R&D and Pilot Plants
21200	Uranium Enrichment Plants
21210	Uranium Fuel Processing Plants
21215	Decommissioning of Uranium Fuel Fabrication Plants
21240	Uranium Fuel R&D and Pilot Plants
23100	Fresh Fuel Storage at Reactor Sites
23200	Interim Spent Fuel Storage

For those events involving only the FCP event type, the events are determined and coded per the 10 CFR reporting requirements, NRC Bulletin, and S.E.A. requirement listed below. See Appendix H for the full text and any clarification of the reporting requirements or the NRC Bulletin.

FCP Reporting Requirements	Reporting Requirement Summary
70.52(a)	Inadvertent nuclear criticality.
70.App A(a)(1)	Inadvertent nuclear criticality.
70.App A(a)(2)	Acute intake by an individual of 30 mg or greater of uranium in a soluble form.
70.App A(a)(3)	Acute chemical exposure to an individual from licensed material or hazardous chemicals produced from licensed material that exceeds the quantitative standards established to satisfy the requirements in 70.61(b)(4).
70.App A(a)(4)(i)	Event or condition such that no IROFSs remain available and reliable to perform the safety function IAW 70.61(b) and 70.61(c).
70.App A(a)(4)(ii)	Event or condition such that no IROFSs remain available and reliable to prevent a nuclear criticality accident (i.e., loss of all controls in a particular sequence).
70.App A(a)(5)	Loss of controls such that only one IROFS has been available and reliable (for longer than the past eight hours) to prevent a nuclear criticality accident.
70.App A(b)(1)	Event or condition that results in the facility being in a state not analyzed, improperly analyzed, or different from that analyzed, and results in failure to meet the performance requirements of 70.61.
70.App A(b)(2)	Loss or degradation of IROFSs that results in failure to meet the performance requirement of 70.61.

FCP Reporting Requirements	Reporting Requirement Summary
70.App A(b)(3)	Acute chemical exposure to an individual from licensed material or hazardous chemicals produced from licensed materials that exceeds the quantitative standards that satisfy the requirements of 70.61(c)(4).
70.App A(b)(4)	Natural phenomenon or external event, including fires internal and external to the facility, that affected or may have affected the safety function, availability, or reliability of one or more IROFSs.
70.App A(b)(5)(i)	Occurrence of an event or process deviation that was considered in the ISA and was dismissed due to its likelihood.
70.App A(b)(5)(ii)	Occurrence of an event or process deviation that was considered in the ISA, categorized as unlikely, and whose associated unmitigated consequences would have exceeded those in 70.61(b) had the IROFSs not performed their safety function(s).
72.74(a)	Accidental criticality or any loss of special nuclear material.
76.120(a)(1)	Criticality event.
76.120(a)(4)	Emergency condition that has been declared an alert or site area emergency.
NRCB 91-01 *Immediate reports: NCRB 91-01 – A* *24 hour reports: NRCB 91-01 – B*	The loss of criticality safety controls where (1) moderation is used as the primary criticality control, or (2) more than a safe mass of fissionable material is involved (regardless of the type of controls used to satisfy the double contingency principle), and that meet one or more of the following **immediate** reporting criteria: 1. Any event that results in the violation of the double contingency principle, as defined in ANSI 8.1, and where the **double contingency principle cannot be re-established within 4 hours** after the initial observation of the event. 2. The occurrence of any unanticipated or unanalyzed event for which the safety significance of the event or corrective actions to re- establish the double contingency principle are not readily identifiable. 3. Any case where it is determined that a criticality safety analysis was deficient and where the necessary controlled parameters were not established or maintained. 4. Any event involving a controlled parameter previously identified by the NRC or the licensee as requiring immediate reporting to the NRC and where the double contingency principle cannot be re- established within 4 hours after the initial observation of the event. All other criticality safety events that do not meet the aforementioned criteria, but still result in a violation of the double contingency principle, such as events where the double contingency principle is violated but control is immediately re-established, should be reported to the NRC within **24 hours** in accordance with the commitments in the responses to the bulletin.
S.E.A	Safety equipment actuation.

2.2.9 Other (OTH)

The OTH event category includes the following types of events:

1. Doses to an embryo/fetus or nursing child. According to 10 CFR 35, these are not medical events. When coding these events, add the *Keyword* "EMBRYO/FETUS OR NURSING CHILD DOSE". If the event is reportable, mark the event as a potential abnormal occurrence.
2. Exposure rates in an unrestricted area in excess of 2 mR/hr, but no individual received a dose in excess of limits (if a dose in excess of limits is received, the event is an EXP event).
3. Reportable events that do not specifically fit into one of the previous event types.
4. Events not reportable to the NRC but included in the NMED program for informational purposes.

For items 1 and 2 above, OTH events are determined and coded per the 10 CFR reporting requirements listed below. See Appendix H for the full text and any clarification of the reporting requirements. Due to the nature of items 3 and 4 above, other reporting requirements may also be used.

OTH Reporting Requirements	Reporting Requirement Summary
35.3047(a)	Dose to an **embryo/fetus** greater than 50 mSv (5 rem) DE from administration of byproduct material or radiation from byproduct material to a pregnant individual unless specifically approved, in advance, by the authorized user.
35.3047(b)(1)	Dose to a **nursing child** greater than 50 mSv (**5 rem**) **TEDE** resulting from an administration of byproduct material to a breast-feeding individual.
35.3047(b)(2)	Dose to a **nursing child** resulting in **unintended permanent functional damage** to an organ or physiological system, as determined by a physician, resulting from an administration of byproduct material to a breast-feeding individual.
20.2203(a)(2)(iv)	Exposure rates in an unrestricted area in excess of **2 mR/hr**, but no dose received in excess of limits.

3. TABLE-LEVEL CODING GUIDANCE

3.1 General Event Information Page 1

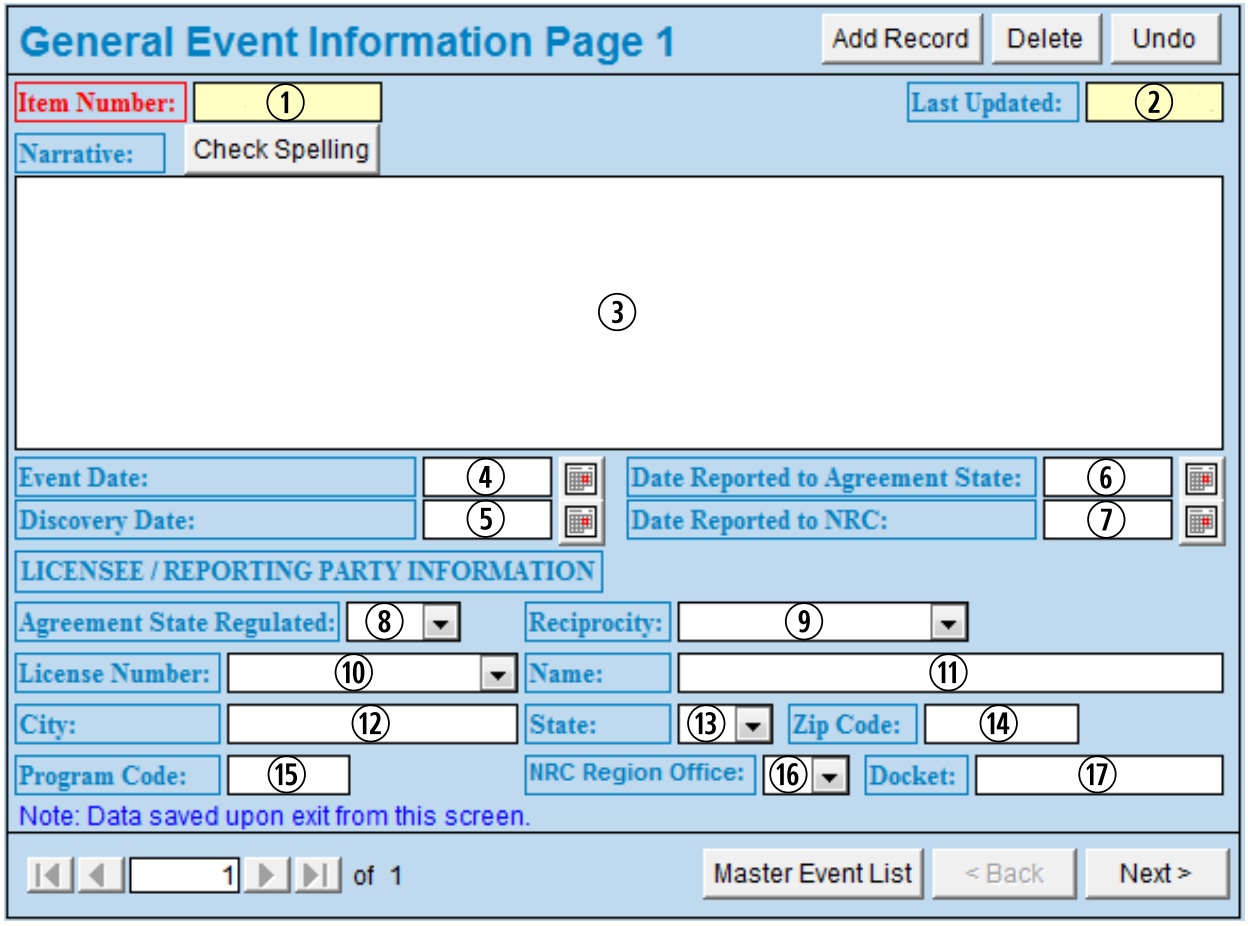

Figure 3-1. Fields Associated with Screen "General Event Information Page 1"

3.1.1 Item Number

Table: locBasic Field: ITEMNO Type: Text Size: 12

Definition: The *Item Number* field contains a unique value that represents the sequence in which the event was entered into the database.

Guidance: This field is a Primary Key field that links entries in various data tables together. By default, this field is automatically-generated. However, this capability can be turned off so that a unique *Item Number* can be entered manually. This field can not be edited once it is populated.

Valid Entries: In the national database, the *Item Number* field contains six characters in the format YYNNNN, where YY is the last two digits of the current year and NNNN is the order that the event was entered. Therefore, the first event entered in 2009 is 090001.

By default in the Agreement State database, the *Item Number* field contains eight characters in the format SSYYNNNN, where SS is the two-character State abbreviation, YY is the last two digits of the current year, and NNNN is the order that the event was entered. Therefore, the first event entered in Utah in 2009 is UT090001. However, Agreement States are allowed to disable the automatic *Item Number* generation and manually enter any unique value containing 12 characters or less.

3.1.2 Last Updated

Table: locBasic Field: LASTUPDATE Type: Date Size: NA

Definition: The *Last Updated* field contains the date that the record was created or last modified, whichever is more recent. This field is entered automatically based on the computer's system date.

Guidance: Because the *Last Updated* date changes automatically every time the record is modified, it can not be used to search for records changed within a past time period. It should only be used to search for records changed *since* a specified date – not *between* specified dates. For example, if a record is entered on 1/15 and updated on 2/10, it will not appear in a search with an end date prior to 2/10.

Valid Entries: The date the event was created or last modified, whichever is greater, in the format MM/DD/YYYY.

3.1.3 Narrative

Table: locBasic Field: ABSTRACT Type: Memo Size: NA

Definition: The *Narrative* field contains a concise statement of the important facts associated with the event. It is entered as a single paragraph written in the active verb voice (subject, verb, and object).

Guidance: Guidelines for writing a proper *Narrative*:

Begin the *Narrative* with a topic sentence that summarizes the event. For example, "The medical facility reported that an elderly patient undergoing therapy for urinary cancer received approximately 266 cGy (rad) instead of the prescribed 500 cGy (rad)."

Include a concise description that provides the relevant details that fully describes the event (who, what, when, where, and why). Include the cause of the event, who/what was affected by the event, and the consequences. State the maximum values of any limits exceeded and the types and amounts of the radionuclides involved (using international radiological units followed by English units in parentheses).

Include any corrective actions taken to prevent recurrence.

Summarize the report's most important topics. Only include relevant and factual information.

Do not reference other reports; the Narrative field must stand alone and contain all key information associated with the event.

Condense the information as concisely as possible, eliminating unnecessary words and ideas. However, do not delete articles or transitional words or phrases that make the Narrative too brusque or choppy. The Narrative should be grammatically correct.

Do not include information regarding regulatory agency citations and enforcement actions.

The Narrative should be consistent with the other coded fields. For example, the statement "The medical facility reported a possible medical event ...." is incorrect if the NRC Reportable Event field is "Yes". The statement would be correct if the NRC Reportable Event field is "Uncertain".

When utilizing e-mail messages from regulatory staff, take care not to incorporate personal opinions as facts. For example, investigators may suspect the cause of an event, but unless it is known for sure, the Narrative must state that the cause in unknown.

When updating the Narrative with additional information, the Narrative should be re-written as necessary. Initial information that is pertinent to the chronological event picture should be maintained in the Narrative along with the updated data.

The word "overexposure" should not be used in the Narrative if the event is a medical event. Words that could be used to convey the correct meaning in the event would be over treatment or dose greater than prescribed.

Do not use the word “misadministration” in the Narrative.

Identify if the NRC Registry of Radioactive Sealed Sources and Devices was used to determine the isotopes and activities of sources contained in a device, according to the manufacturer and model number.

The model and serial numbers of equipment will be tracked both in the Narrative and in their pertinent Device and Source tables.

The information in the Narrative should be technically correct.

Valid Entries: The *Narrative* is a single paragraph written in mixed case that begins with a summary sentence and contains all of the pertinent event information.

3.1.4 Event Date

Table: locBasic Field: EVTDATE Type: Date Size: NA

Definition: The *Event Date* field contains the date that the event occurred or began.

Guidance: A conservative approach is used for events that do not specify an exact date. For example, if an event occurred over a period of time, use the most conservative date, which is generally the first day of the time period. If an inventory identified that a source is missing, the last successful inventory date will be used (i.e., the last date the source was known to be in the licensee’s possession). If a report lists a partial date (e.g., May 2008, early in 2009, etc.), the earliest possible date should be used for the *Event Date* (while the latest possible date should be used for the *Discovery Date*). If the *Event Date* is not provided or not known, the *Discovery Date* or *Report Date* may be used. For stuck well logging sources, use the date the source became stuck (implemented 02/18/2004; previously, the date that the recovery actions were stopped was entered).

Valid Entries: The date the event occurred or began, in the format MM/DD/YYYY.

3.1.5 Discovery Date

Table: locBasic Field: DSCRDATE Type: Date Size: NA

Definition: The *Discovery Date* field contains the date that the licensee discovered that the event had occurred. For example, a medical event that occurred on 10/10 could have been discovered on 10/12 during a records review.

Guidance: If a report lists a partial date (e.g., May 2008, early in 2009, etc.), the latest possible date should be used for the *Discovery Date* (while the earliest possible date should be used for the *Event Date*). If the *Discovery Date* is not provided or inferred, the *Report Date* will be used.

Valid Entries: The date that the licensee discovered that the event occurred, in the format MM/DD/YYYY.

3.1.6 Date reported to Agreement State

Table: locBasic Field: RPTDATEAS Type: Date Size: NA

Definition: The *Date Reported to Agreement State* is the date the event was initially reported to the Agreement State regulatory agency, or the date the event was identified during an inspection by the Agreement State regulatory agency.

Guidance: This field was implemented on 10/1/2010 and is not used for NRC-regulated events. The *Date Reported to Agreement State* is not necessarily the date on the top of an event report (document date). Sometimes, an Agreement State will use forms containing a report date that indicates when the form was filled out rather than when the licensee reported the event. The date the form was filled out will be used as the *Date Reported to Agreement State* only if no other information is available that states the exact date the event was reported to the Agreement State agency. If the date of the form is not known, the date of the

earliest document associated with the event will be used. If no other date is known, the date that the event was reported to the NRC will be used.

Valid Entries: The date the event was initially reported to the Agreement State regulatory agency, in the format MM/DD/YYYY.

3.1.7 Date Reported to NRC

Table: locBasic Field: RPTDATENRC Type: Date Size: NA

Definition: The *Date Reported to NRC* is the date the event was initially reported to the NRC, or the date the event was identified during an inspection by the NRC.

Guidance: This field was implemented on 10/1/2010. Agreement State-regulated events reported since 1/1/2003 were backfit. For events requiring notification to the NRC's Headquarters Operations Officer (HOO), the date of that notification will be used – even if prior "unofficial" notification was received (such as an event being identified in an inspection report, or an Agreement State notifiying the INL of an event and then subsequently contacting the HOO). The *Date Reported to NRC* is not necessarily the date on the top of a report (document date). If the *Date Reported to NRC* is not clearly identified, the document date of the earliest document associated with the event will be used.

Valid Entries: The date the event was initially reported to the NRC, in the format MM/DD/YYYY.

3.1.8 Agreement State Regulated

Table: locBasic Field: AGRESTAT Type: Text Size: 2

Definition: The *Agreement State Regulated* field identifies if the event is regulated by an Agreement State. This is typically determined by which agency regulates the Licensee/Reporting Party. This field is only used in the national database.

Guidance: Federal facilities located within Agreement States are NRC licensees. If a facility holds both an NRC and an Agreement State license, the NRC license takes precedence unless the event is specifically reported under the Agreement State license. An exception to this is an event involving a well logging operation that is being performed offshore (clearly stated to be outside state jurisdiction) by a licensee that holds both an Agreement State license and an NRC license. In this case, the NRC license takes precedence even if the event is reported under the Agreement State license. See Appendix E Table E-1 for a listing of the Agreement States.

For foreign events, "No" is entered because they are not regulated by an Agreement State. This causes foreign events to be included when searching for events regulated by the NRC if the *Region* field is not also used in the search criteria.

Valid Entries:

Case	Displayed (Stored) Value
Agreement State Regulated	Yes (YS)
Not Agreement State Regulated (NRC or Foreign)	No (NO)

3.1.9 Reciprocity

Table: locBasic Field: RECPRCTY Type: Text Size: 5

Definition: The *Reciprocity* field identifies the type of reciprocity agreement (if any) in place during the event.

Guidance: See NUREG-1556, Vol. 19, Section 2 for guidance. A summary of this guidance is shown below (Table 2.1 of the NUREG).

Licensee and Proposed Location of Work	Regulatory Agency
NRC licensee (Federal Agency) regardless of location (however,Department of Energy [DOE] and, under most circumstances, its prime contractors are exempt from licensing [10 CFR 30.12])	NRC
NRC licensee (non-Federal) in non-Agreement State, U.S. territory, possession, or offshore waters	NRC
NRC licensee (non-Federal) in Agreement State at Federally controlled site subject to exclusive Federal jurisdiction	NRC
NRC licensee (non-Federal) in Agreement State at Federally controlled site ***not*** subject to exclusive Federal jurisdiction	Agreement State
NRC licensee in Agreement State at non-Federal facility	Agreement State
Agreement State licensee in non-Agreement State, U.S. territory, possession, or offshore waters	NRC
Agreement State licensee in Agreement State at Federally controlled site subject to exclusive Federal jurisdiction	NRC
Agreement State A licensee in Agreement State B at Federally controlled site not subject to exclusive Federal jurisdiction	Agreement State B
Agreement State A licensee in a different Agreement State's (B) jurisdiction	Agreement State B

Valid Entries:

Case	Displayed (Stored) Value
No Reciprocity	No Reciprocity (NONE)
NRC to Agreement State Reciprocity	NRC to AS Reciprocity (NRCAS)
Agreement State to NRC Reciprocity	AS to NRC Reciprocity (ASNRC)
Agreement State to Agreement State Reciprocity	AS to AS Reciprocity (ASAS)

3.1.10 License Number (Licensee/Reporting Party)

Table: locBasic Field: LICNO Type: Text Size: 14

Definition: The *License Number* field contains the license number issued by the NRC or the Agreement State for the Licensee/Reporting Party involved with the event. For non-licensees, this field is not applicable.

Guidance: For Agreement State licensees, the two-letter state abbreviation is included in the license number (for example, "CA-1234-56" for a California licensee").

Valid Entries: Although a pick list is used to ensure consistency, it is not provided in this manual because it is frequently modified. Selecting a license number from the pick list automatically populates the name, city, state, zip code, program code, NRC region, and docket number.

Case	Displayed/Stored Value
NRC Licensee	NRC License Number
Agreement State Licensee	Agreement State License Number
General Licensee	GENERAL LICENS
Non-Licensee	NON-LICENSEE
Not Reported	NR
Not Applicable	NA

3.1.11 Name (Licensee/Reporting Party)

Table: locBasic Field: LICENSEE Type: Text Size: 50

Definition: The *Name* field contains the Licensee/Reporting Party's name as it appears on the NRC or Agreement State license. For non-licensees, list their legal business name.

Guidance: The Licensee/Reporting Party will normally be the licensed or non-licensed organization, person, or agency that is primarily responsible for the event.

The *Name* field will usually contain the Licensee/Reporting Party that is being used by the reporting agencies for tracking the event. The Licensee/Reporting Party's name will be modified as new information is received. This information will be taken from inspection reports, regional information event updates, and licensee written reports.

The following guidelines apply in determining a Licensee/Reporting Party's name for initial data entry before more formal event investigation information is made available:

- If the NRC and another agency are using different names, default to the name used by the NRC.
- When multiple parties from different states are involved, list the party from the state that is responsible to complete/close the event.
- When the NRC or a State Agency reports an event, the licensee, person, or company that was involved or was named in the event will be captured as the licensee.
- When the responsible party is clearly identified (normally the owner of the radioactive material or equipment), they will be listed in the *Name* field. Events involving radioactive material found at a landfill, incinerator, or scrap metal facility, will list the waste disposal site as the licensee, until the owner/origin of the material is identified.
- The responsible party of a lost source that is being transported is the transportation company if they reported the event.
- If the responsible party is not clearly defined, as in a contaminated package event, the party reporting the event will be listed as the licensee. In these situations, the contamination could have occurred at either the sender's facility or the receiver's facility.
- If the package is damaged during shipment, the shipping agency will be the responsible party if they reported the damage.
- State agencies will not normally be listed as a licensee unless they are directly involved in the finding or use of the material and no other licensee, company, or individual is involved or known.

- With a gate monitor alarm at a landfill, the landfill is typically listed as the licensee. If a regulatory authority confirms the origin (owner) of the radioactive material, the licensee will be changed to list that origin (owner).
- On events where there is question as to who should be listed as the licensee because the event does not fit the above guidelines, contact the NRC PM for further guidance.

Valid Entries:

Case	Displayed/Stored Value
NRC Licensee	Name from NRC License
Agreement State Licensee	Name from Agreement State License
General Licensee	Name from General License, or Formal Business Name
Non-Licensee	Formal Business Name, or PRIVATE INDIVIDUAL
Not Reported	NR
Not Applicable	NA

3.1.12 City (Licensee/Reporting Party)

Table: locBasic Field: CITY Type: Text Size: 25

Definition: The *City* field contains the city that appears on the NRC or Agreement State license. For non-licensees, the city associated with the Reporting Party.

Guidance: If there is no license involved, enter the city associated with the Reporting Party.

Valid Entries: The Licensee/Reporting Party's city.

3.1.13 State (Licensee/Reporting Party)

Table: locBasic Field: STATE Type: Text Size: 2

Definition: The *State* field contains the state that appears on the NRC or Agreement State license. For non-licensees, the state associated with the Reporting Party.

Guidance: If there is no license involved, enter the state associated with the Reporting Party. For foreign events, enter the two-digit county code.

Valid Entries: The Licensee/Reporting Party's state.

3.1.14 Zip Code (Licensee/Reporting Party)

Table: locBasic Field: ZIP Type: Text Size: 10

Definition: The *Zip Code* field contains the zip code that appears on the NRC or Agreement State license. For non-licensees, the zip code associated with the Reporting Party.

Guidance: If there is no license involved, enter the zip code associated with the Reporting Party.

Valid Entries: The Licensee/Reporting Party's zip code.

3.1.15 Program Code (Licensee/Reporting Party)

Table: locBasic Field: PRGMCODE Type: Text Size: 5

Definition: The *Program Code* field contains the program code assigned to an NRC licensee to characterize the type of program or operation the licensee is involved. This field is only used in the national database.

Guidance: See Appendix E Table E-2 for a list of NRC program codes.

Valid Entries:

Case	Displayed/Stored Value
NRC Licensee	The NRC program code, or NR
Agreement State Licensee	NA
Non-Licensee	NA

3.1.16 NRC Region Office (Licensee/Reporting Party)

Table: locBasic Field: REGION Type: Text Size: 2

Definition: The *Region* field contains the NRC Region responsible for the event. This field is only used in the national version.

Guidance: In general, the responsible NRC Region is the region associated with the Licensee/Reporting Party's home of record. See Appendix E Table E-1 for a listing of the NRC Regions.

As of 10/01/2003, the NRC Region II nuclear materials program was consolidated within the Region I office. As a result, NRC Region I became responsible for material licensees previously overseen by Region II. Additionally, fuel cycle inspection responsibilities were consolidated into Region II. Thus, Region II became responsible for the large facilities primarily associated with the manufacture of commercial fuel and uranium products, while responsibility for the smaller, research related fuel manufacturers and those in decommissioning status remain with the Region in which they are located. Specifically, responsibility for the following facilities has been transferred to Region II:

Framatome ANP, Inc. (Richland, WA) – transferred from Region IV.

Honeywell Specialty Chemicals (Metropolis, IL) – transferred from Region III.

Paducah Gaseous Diffusion Plant (Paducah, KY) – although in a Region II state, it had been inspected by Region III.

Portsmouth Gaseous Diffusion Plant (Piketon, OH) – transferred from Region III.

The existing records were not backfit, but are updated as the INL receives event updates from the appropriate agencies indicating those records are closed.

Although the Department of Veterans Affairs Master Materials License is issued with a license number indicating a Region IV address (Arkansas), it is managed by Region III.

Valid Entries:

Case	Displayed/Stored Value
NRC Region I	1
NRC Region II	2
NRC Region III	3
NRC region IV	4
Foreign Event	0

3.1.17 Docket (Licensee/Reporting Party)

Table: locBasic Field: DOCKET Type: Text Size: 8

Definition: The *Docket* field contains the Licensee/Reporting Party's NRC docket number. This field is only used in the national database.

Guidance: None.

Valid Entries:

Case	Displayed/Stored Value
NRC Specific Licensee	The NRC docket number, or NR
NRC General Licensee	99990001 for Region I, or 99990002 for Region II, or 99990003 for Region III, or 99990004 for Region IV
Agreement State Licensee	NA
Non-Licensee	NA

3.2 General Event Information Page 2

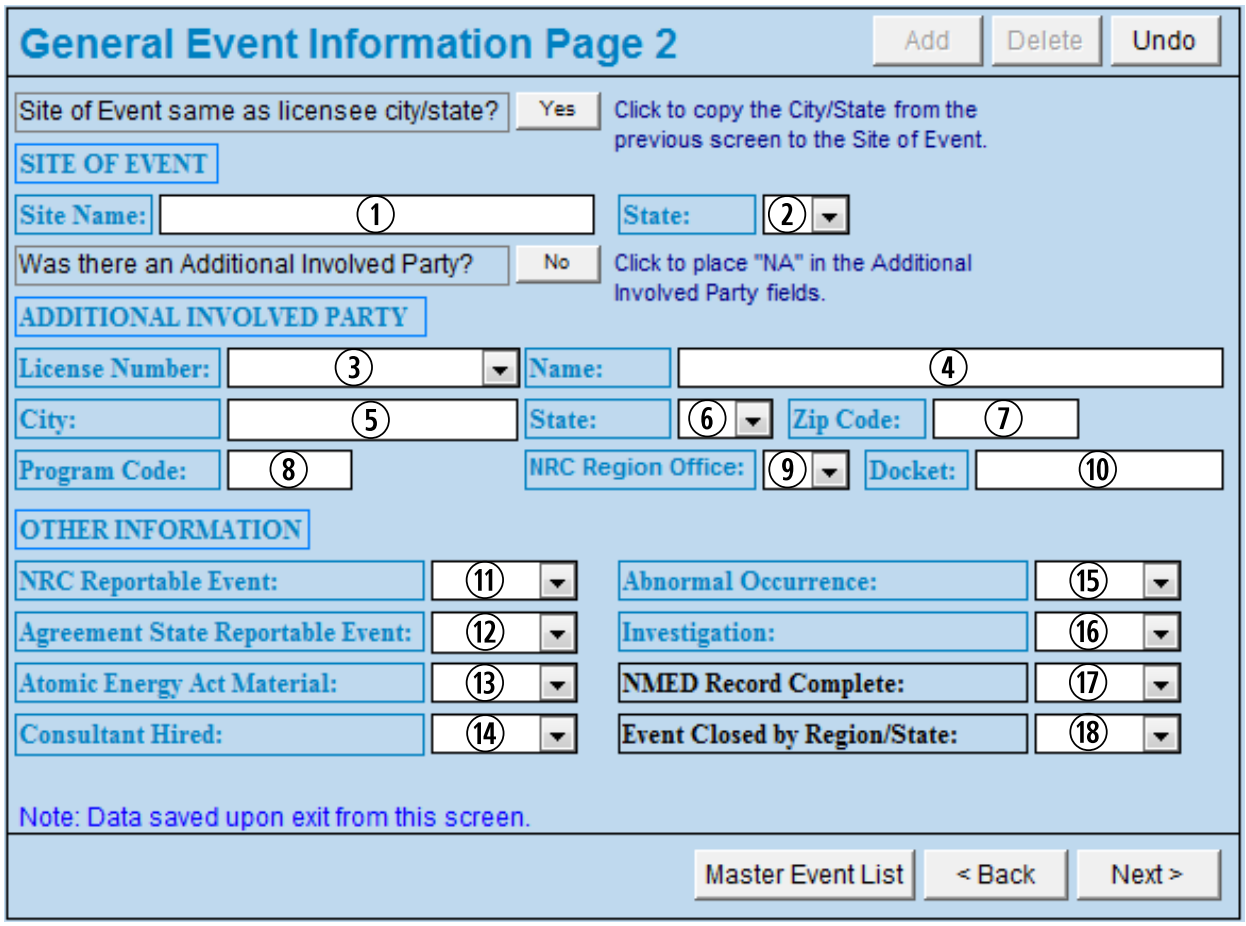

Figure 3-2. Fields Associated with Screen "General Event Information Page 2"

3.2.1 Site Name (Site of Event

Table: locBasic Field: SITEEVT Type: Text Size: 25

Definition: The *Site Name* field contains the city, county, parish, off-shore grid, military base, etc., where the event occurred.

Guidance: If the site of event was not reported and can not be inferred, the Licensee/Reporting Party's city will be used.

Valid Entries: The city, county, parish, off-shore grid, military base, etc., where the event occurred.

3.2.2 State (Site of Event)

Table: locBasic Field: STATEEVT Type: Text Size: 2

Definition: The *State* field contains the state where the event occurred.

Guidance: If the site of event was not reported and can not be inferred, the Licensee/Reporting Party's state will be used. For events occurring in coastal waters, enter "OS" for offshore. For foreign events, enter the two-digit county code.

Valid Entries: The state where the event occurred.

3.2.3 License Number (Additional Involved Party)

Table: locBasic Field: LICNOTHR Type: Text Size: 14

Definition: The *License Number* field contains the license number issued by the NRC or the Agreement State for the Additional Involved Party associated with the event.

Guidance: If there is no license involved or if there is no Additional Involved Party, enter “NA”. See Section 3.1.10, License Number (Licensee/Reporting Party).

Valid Entries: See Section 3.1.10, License Number (Licensee/Reporting Party).

3.2.4 Name (Additional Involved Party)

Table: locBasic Field: OTHRPRTY Type: Text Size: 50

Definition: The *Name* field contains the Additional Involved Party’s name as it appears on the NRC or Agreement State license.

Guidance: In contrast with the Licensee/Reporting Party that is primarily responsible for the event, an Additional Involved Party is a party that somehow contributed to, or was affected by, an event. Using a contaminated package as an example, the party that shipped the package is the Licensee/Reporting Party and the party that received the package is the Additional Involved Party. A party that only provides assistance in accessing or resolving the event is considered a consultant and not an Additional Involved Party.

The Additional Involved Party fields are not left blank. Enter "NA" (not applicable) if there was no Additional Involved Party. Enter "NR" (not reported) if the reporting document implicitly implies the involvement of an Additional Involved Party, but does not provide the applicable identifying information.

See Section 3.1.11, Name (Licensee/Reporting Party).

Valid Entries: See Section 3.1.11, Name (Licensee/Reporting Party).

3.2.5 City (Additional Involved Party)

Table: locBasic Field: CITYOTHR Type: Text Size: 25

Definition: The *City* field contains the city that appears on the NRC or Agreement State license. For non-licensee’s, the city associated with the Additional Involved Party.

Guidance: If there is no Additional Involved Party, enter “NA”.

Valid Entries: The Additional Involved Party’s city.

3.2.6 State (Additional Involved Party)

Table: locBasic Field: STATOTHR Type: Text Size: 2

Definition: The *State* field contains the state that appears on the NRC or Agreement State license. For non-licensee’s, the state associated with the Additional Involved Party.

Guidance: If there is no Additional Involved Party, enter “NA”. For foreign events, enter the two-digit county code.

Valid Entries: The Additional Involved Party’s state.

3.2.7 Zip Code (Additional Involved Party)

Table: locBasic Field: ZIPOTHR Type: Text Size: 10

Definition: The *Zip Code* field contains the Additional Involved Party’s zip code. For non-licensee’s, the zip code associated with the Additional Involved Party.

Guidance: If there is no Additional Involved Party, enter “NA”.

Valid Entries: The Additional Involved Party's zip code.

3.2.8 Program Code (Additional Involved Party)

Table: locBasic Field: PRGMOTHR Type: Text Size: 5

Definition: The *Program Code* field contains the program code assigned to an NRC licensee to characterize the type of program or operation the licensee is involved. This field is only used in the national database.

Guidance: If there is no Additional Involved Party, enter "NA". See Section 3.1.15, Program Code (Licensee/Reporting Party).

Valid Entries: See Section 3.1.15, Program Code (Licensee/Reporting Party).

3.2.9 NRC Region Office (Additional Involved Party)

Table: locBasic Field: REGOTHR Type: Text Size: 2

Definition: The *Region* field contains the NRC Region associated with the Additional Involved Party. This field is only used in the national version and is not searchable on the NMED website.

Guidance: If there is no Additional Involved Party, enter "NA". See Section 3.1.16, NRC Region OfficeNRC Region Office (Licensee/Reporting Party).

Valid Entries: See Section 3.1.16, NRC Region OfficeNRC Region Office (Licensee/Reporting Party).

3.2.10 Docket (Additional Involved Party)

Table: locBasic Field: DOCKOTHR Type: Text Size: 8

Definition: The *Docket* field contains the Additional Involved Party's NRC docket number. This field is only used in the national database.

Guidance: If there is no Additional Involved Party, enter "NA".

Valid Entries: See Section 3.1.17, Docket (Licensee/Reporting Party).

3.2.11 NRC Reportable Event

Table: locBasic Field: RPTBLEVT Type: Text Size: 1

Definition: The *NRC Reportable Event* field indicates if the event is reportable per the requirements of title 10 of the Code of Federal Regulations (10 CFR). Agreement States are required to have regulations compatible with 10 CFR. This field is only used in the national database.

Guidance: See the guidance for the specific event type of interest in Section 2.

Valid Entries:

Case	Displayed (Stored) Value
Reportable per 10 CFR	Yes (Y)
Not Reportable per 10 CFR	No (N)
Reportability not Determined	Uncertain (U)

3.2.12 Agreement State Reportable Event

Table: locBasic Field: ASRPTBLTY Type: Text Size: 1

Definition: The *Agreement State Reportable Event* field indicates of the event is reportable per Agreement State regulations.

Guidance: If the *NRC Reportable Event* field is marked "Yes", the *Agreement State Reportable Event* field will also be marked "Yes" because the Agreement State regulations must be compatible with 10

CFR. However, Agreement State regulations can be more stringent than 10 CFR, so it is possible for an event to be marked reportable per Agreement State regulations but not reportable per 10 CFR.

Valid Entries:

Case	Displayed (Stored) Value
Reportable per 10 CFR	Yes (Y)
Not Reportable per 10 CFR	No (N)
Reportability not Determined	Uncertain (U)

3.2.13 Atomic Energy Act Material

Table: locBasic Field: AEA Type: Text Size: 1

Definition: The *Atomic Energy Act Material* field indicates if the material involved in the event is regulated by the Atomic Energy Act of 1954. The Atomic Energy Act of 1954 was revised to expand the definition of byproduct material effective 11/30/2007. See "Byproduct Material" in the Glossary (Appendix J).

Guidance: If the initial event report indicates that no Atomic energy Act (AEA) material was involved in the event, the event is generally not entered into the national database. One exception involves certain fuel cycle process events that are entered even if no AEA material is involved. In this case, the AEA material field is marked "Yes" because the event occurred at an "AEA facility."

Valid Entries:

Case	Displayed (Stored) Value
AEA Material Involved	Yes (Y)
AEA Material not Involved	No (N)
AEA Material Involvement not Determined	Uncertain (U)

3.2.14 Consultant Hired

Table: locBasic Field: CONSHIRED Type: Text Size: 1

Definition: The *Consultant Hired* field indicates whether a consultant was hired in connection with the event.

Guidance: The NRC will sometimes hire a consultant as an expert to review an event to help determine what caused the event and the adequacy of the corrective actions. A contractor that is used to do clean-up work or dispose of waste is not considered a consultant.

Valid Entries:

Case	Displayed (Stored) Value
Consultant Hired	Yes (Y)
No Consultant Hired	No (N)

3.2.15 Abnormal Occurrence

Table: locBasic Field: ABNRMOCC Type: Text Size: 1

Definition: The *Abnormal Occurrence* (AO) field indicates whether an event is classified as an AO in accordance with the criteria contained in Federal Register Vol. 71, No. 197, pages 60199 – 60200.

Guidance: Events that appear to meet the AO criteria are listed as "Potential" until the *NUREG-0090 Report to Congress on Abnormal Occurrences* is published for the applicable fiscal year. If the event is contained in the report, this field is changed to "Yes"; otherwise, the field is changed to "No" or remains

"Potential", depending on whether or not the event was considered during preparation of NUREG-0090. The NRC PM is notified of events marked as "Potential" AOs and is notified of all changes to this field due to NUREG-0090. For events in the national database that appear in NUREG-0090, the applicable event information is added to table ABNOCC.

Valid Entries:

Case	Displayed (Stored) Value
New Event that Meets (or Could Meet) the AO Criteria	Potential (P)
Event Meets AO Criteria and Included in NUREG-0090	Yes (Y)
Event Does Not Potentially Meet the AO Criteria	No (N)
Event Considered but not Included in NUREG-0090	No (N)

3.2.16 Investigation

Table: locBasic Field: INVEST Type: Text Size: 1

Definition: The *Investigation* field identifies whether a regulatory agency performed an investigation or follow-up inspection because of the event.

Guidance: A normal or periodic inspection is not considered an investigation.

Valid Entries:

Case	Displayed (Stored) Value
Investigation Conducted	Yes (Y)
Investigation not Conducted	No (N)

3.2.17 NMED Record Complete

Table: locBasic Field: ANLRPT Type: Text Size: 1

Definition: The *NMED Record Complete* field identifies whether the reported information contained all of the pertinent information. Guidelines for a complete record are provided in the *Handbook on Nuclear Material Event Reporting in the Agreement States*, which is an appendix to the NRC Office of Federal and State Materials and Environmental Management Programs (FSME) Procedure SA-300, *Reporting Material Events*. Section 3 of the *Handbook on Nuclear Material Event Reporting in the Agreement States* describes the minimum basic information required for a complete event report.

Guidance: A record is complete when it contains the minimum information necessary to adequately describe the event (see Appendix C). The *NMED Record Complete* and *Event Closed by Region/State* fields are independent of each other; an event can be closed but not complete, and vice versa.

For incomplete records, an "R" is entered to signify that additional information has been requested. At the same time, the following statement is added to the end of the *Narrative* field: "Additional information for this event has been requested by the INL." If sufficient information is received to complete the record (either as a response to information request or from another source), the "R" is changed to "Yes" and the statement appended to the *Narrative* field is removed. If a response to an information request is received but does not complete the record, the "R" is changed to "No" and the statement appended to the *Narrative* field is removed.

The Record Complete determination process did not begin until 1999 (11/24/1998). Thus, this field is null for records with item numbers before 990001 (the first record entered in 1999). This does not mean that those older records are not complete, but simply that they will not be evaluated for completeness.

LAS events involving gate monitor alarms at waste, scrap, and recycling facilities frequently involve unknown radionuclides that do not present a hazard to the public. These events are considered complete if:

- There is enough information to fill out General Event Information Pages 1 and 2, and
  - The load is returned to the originator via a DOT exemption, or
  - The applicable regulatory agency gave permission to bury the material.

Events with "Uncertain" in the *NRC Reportable Event* field are normally coded as incomplete records.

Non-reportable events are considered complete records by default.

In the Agreement State software, this field is used to mark an event for inclusion in a transfer file to be sent to the INL.

Valid Entries:

Case	Displayed (Stored) Value
Record Complete	Yes (Y)
Record not Complete	No (N)
Information Request Response Pending	R (R)

3.2.18 Event Closed by Region/State

Table: locBasic Field: MULT Type: Number Size: Double

Definition: The *Event Closed by Region/State* field identifies whether an event is considered closed (i.e., no further action is being taken and no further information is expected) by the applicable NRC Region or Agreement State.

Guidance: An event is not marked as closed unless it is specifically stated to be closed by the applicable regulating agency. The *Event Closed by Region/State* and *NMED Record Complete* fields are independent of each other; an event can be closed but not complete, and vice versa.

The use of the *Event Closed by Region/State* field began on 11/1/2002. The existing records were not backfit, but are updated as new information is received. Thus, events entered/updated prior to 11/1/2002 are defaulted to null until they are updated.

The national database does not use the "Inactive" entry; events reported as "Inactive" are marked as not closed.

Valid Entries:

Case	Displayed (Stored) Value
Event Closed	Yes (1)
Event not Closed	No (0)
Event Inactive	Inactive (2)

3.3 Event Type/Keywords

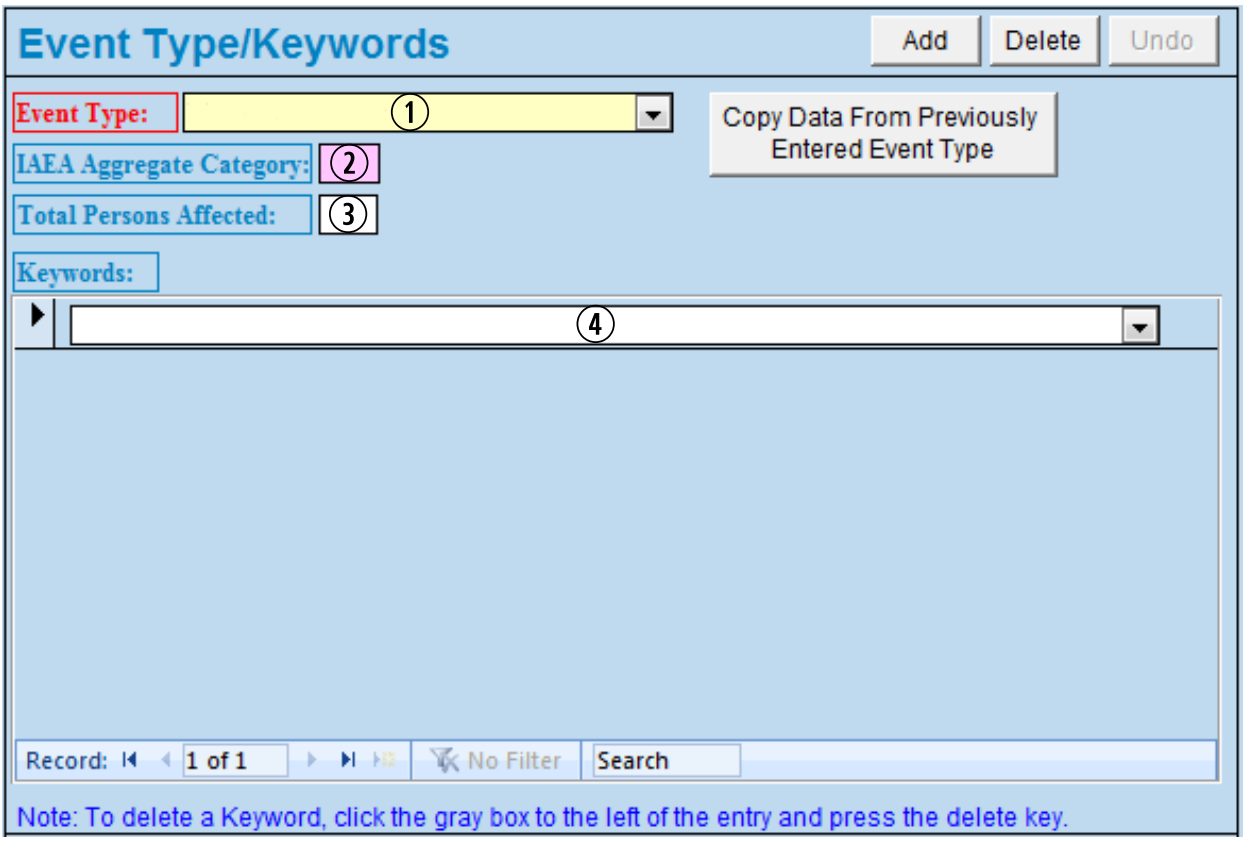

Figure 3-3. Fields Associated with Screen "Event Type/Keywords"

3.3.1 Event Type

Table: locEvent Field: CLASSEVT Type: Text Size: 3

Definition: The *Event Type* field designates the type of event that occurred. A single event can involve multiple event types (for example, a loss of material could result in an overexposure, or an equipment failure could result in a medical event).

Guidance: This is a Primary Key field (along with the ITEMNO field) that links entries in various data tables together.

For multiple event types to be listed on a reportable event, each type must meet the applicable reporting requirements. If an event is reportable, but a certain event type does not meet a reporting requirement, information concerning that event type should only be entered in the *Narrative* field. An example of this is an equipment failure that results in personnel exposure, but the exposure does not exceed any overexposure limit. Information for the equipment failure should be added to the applicable Source and Device tables, but no data should be added to the Overexposure table. The exposure information should only be entered into the *Narrative*.

See Section 2 for further guidance on coding various event types.

Valid Entries:

Case	Displayed/(Stored) Value
Equipment Event	EQUIPMENT (EQP)
Fuel Cycle Process Event	FUEL CYCLE PROCESS (FCP)
Leaking Sealed Source	LEAKING SOURCE (LKS)
Lost/Abandoned/Stolen Material	LOST/ABANDONED/STOLEN (LAS)
Medical Event	MEDICAL EVENT (MD2)
Personnel Overexposure (non-Medical)	OVEREXPOSURE (EXP)
Release of Material or Contamination	RADIOACTIVE MATERIAL REL. (RLM)
Transpiration Event	TRANSPORTATION (TRS)
Other	OTHER (OTH)

3.3.2 IAEA Aggregate Category

Table: locEvent Field: AggCat Type: Text Size: 2

Definition: The *IAEA Aggregate Category* field is automatically calculated (sum-of-the-ratios) based on the individual sources involved in the event.

Guidance: Appendix I contains a list of radionuclides derived from the International Atomic Energy Agency (IAEA) *Code of Conduct on the Safety and Security of Radioactive Sources* (2004). These radionuclides are grouped by the amount of radioactivity into five categories that correspond to relative hazard, with Category 1 being the most hazardous.

Valid Entries:

Case	Displayed/Stored Value
All Involved Radionuclides are IAEA Radionuclides and All Activities are Reported	1, 2, 3, 4, 5, or <5
All Involved Radionuclides are IAEA Radionuclides and Some (or All) Activities are Not Reported	NR
Combination of IAEA and non-IAEA Radionuclides and All IAEA Radionuclide Activities are Reported	1, 2, 3, 4, 5, or <5 (non-IAEA Radionuclides Ignored)
Combination of IAEA and non-IAEA Radionuclides and Some (or All) IAEA Radionuclide Activities are Not Reported	NR
Some (or All) Radionuclides are Not Reported	NR
All Involved Radionuclides are Non-IAEA Radionuclides	NA

3.3.3 Total Persons Affected

Table: locEvent Field: EXPNUMBR Type: Text Size: 3

Definition: The *Total Persons Affected* field contains the number of patients involved in a medical event or the number of individuals involved in a personnel overexposure event.

Guidance: None.

Valid Entries: The number of patients involved in a medical event or the number of individuals involved in a personnel overexposure event.

3.3.4 Keywords

Table: locClasscds Field: CLASSCDS Type: Text Size: 3

Definition: The *Keywords* field contains any Keywords used to classify the event. A code value is stored in locClasscds. The description of the code is contained in the DESCRIPTIO field of the CLASCODE pick list table.

Guidance: Keywords are used to group related events that can not be easily grouped using other fields.

Valid Entries: See Appendix F Table F-3.

3.4 Patient Information

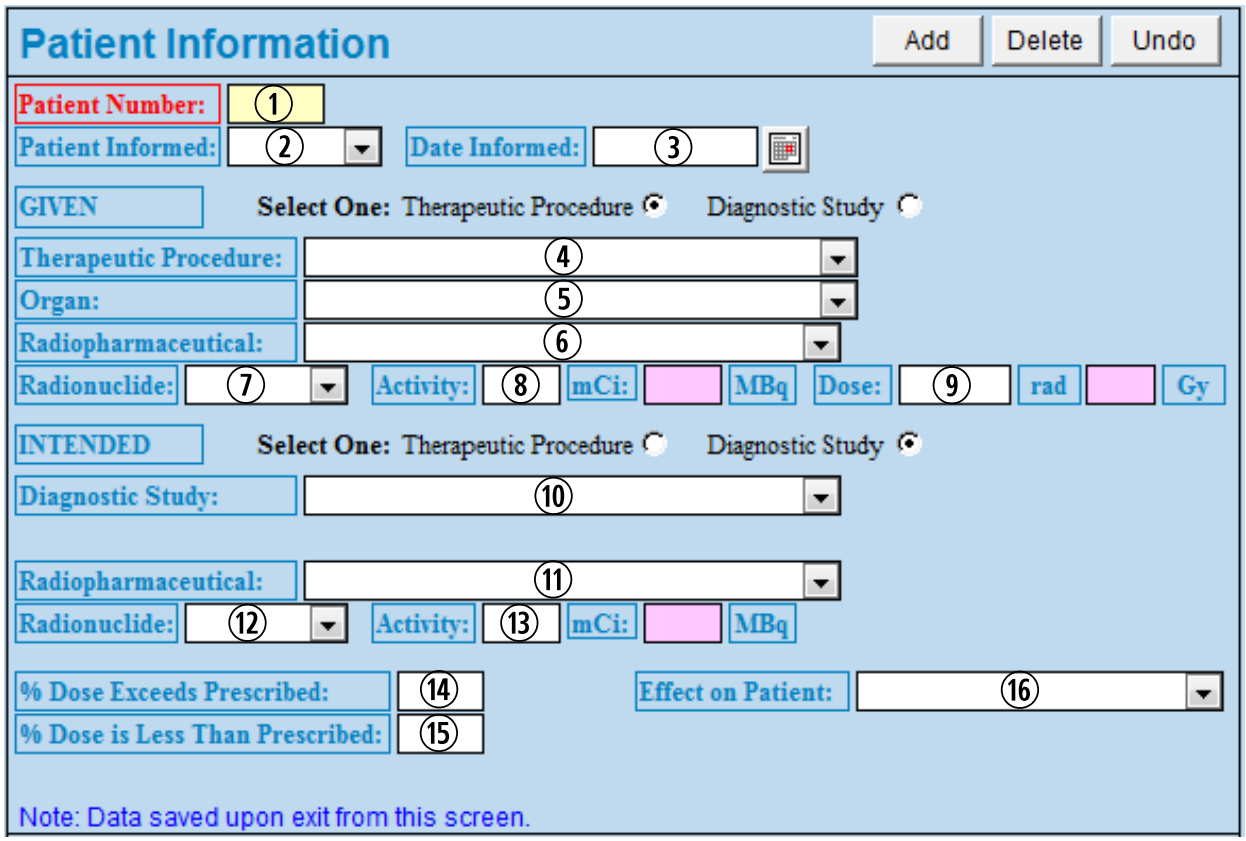

Figure 3-4. Fields Associated with Screen "Patient Information"

The fields displayed under the headings *Given* and *Intended* are determined by checking either the "Therapeutic Procedure" or "Diagnostic Study" radio buttons (see Appendix E Table E-3 for guidance). In order to display all of the fields in the figure, the "Therapeutic Procedure" radio button was selected for *Given*, and the "Diagnostic Study" radio button was selected for *Intended*.

Multiple Patients: When multiple patients are involved, identify the events as one medical event if they are from the same mistake. If the licensee simply made the same mistake multiple times, the events are considered separate medical events. An example of multiple patients involved in a singe medical event is a physician improperly calibrating the exposure rate from a Sr-90 eye applicator. All patients that receive a higher dose than prescribed because of the calibration error are included in a single medical event. An example of multiple patients involved in separate medical events is when a nuclear medicine technician mixes two NaI capsules of different activity and administers them to the wrong patients before discovering the error. This event is considered two separate medical events since the technician erred in verifying the dose before each of the administrations.

Unintended Treatments: In instances where a patient is given a treatment when no treatment was scheduled (i.e., no written directive), the *Intended* fields of the medical event table will be marked NA. If a patient receives the wrong treatment (for example, the wrong dose vial was selected), the applicable *Intended* fields will be filled in regardless of the treatment intended (concerning AEA or non-AEA material).

Fields of the *Intended* portion of the medical event table will be marked "NA" for a dose to an unintended site. An example of this type of event is a gamma knife treatment where an area of the left side of a patient's brain is treated instead of the intended right side. In this case, two tables are filled out; one for the intended site and one for the unintended site.

NaI Administrations: In the cases of I-125 and I-131 administrations, diagnostic studies generally involve doses of <10 mCi, therapeutic procedures are typically between 10 and 100 mCi, and ablations are >100 mCi.

3.4.1 Patient Number

Table: locMisadmin Field: PERIDNO Type: Text Size: 3

Definition: The *Patient Number* field is used to identify an individual patient in a group of patients in a medical event.

Guidance: This is a Primary Key field (along with the ITEMNO and CLASSEVT fields) that links entries in various data tables together. If the event involves more than one medical event to the same patient, enter "1" for the first medical event, "1A" for the second, and so on.

Valid Entries: See above.

3.4.2 Patient Informed

Table: locMisadmin Field: PATINFO Type: Text Size: 1

Definition: The *Patient Informed* field identifies whether the patient or the patient's family was informed of the event.

Guidance: None.

Valid Entries:

Case	Displayed (Stored) Value
Patient or Family Informed	Yes (Y)
Patient or Family not Informed	No (N)
Patient or Family Informed not Determined	Uncertain (U)

3.4.3 Date Informed

Table: locMisadmin Field: DATEINFO Type: Date Size: NA

Definition: The *Date Informed* field contains the date that the patient or the patient's family was informed of the medical event.

Guidance: If no date is given, this field is left blank.

Valid Entries: The date the patient or patient's family was informed of the medical event, in the format MM/DD/YYYY.

3.4.4 Therapeutic Procedure (Given or Intended)

Table: locMisadmin Field: PROCGVN/PROCINTD Type: Text Size: 35

Definition: The *Therapeutic Procedure* (given or intended) field contains the therapeutic procedure (administered or prescribed).

Guidance: Only displayed for therapeutic procedures. The therapeutic procedure can be a non-NRC regulated procedure, such as a patient scheduled for a sonogram and inadvertently administered a radiopharmaceutical, or NA for a patient that was not prescribed any procedure. For brachytherapy, MANUAL IMPLANTS involve microspheres or the permanent implant seeds. Seed ribbons and any other type of manual implant should be designated as MANUAL AFTERLOADER.

Valid Entries: See Appendix G Table G-2.

3.4.5 Organ (Given or Intended)

Table: locMisadmin Field: ORGNGVN/ORGNINTDType: Text Size: 30

Definition: The *Organ* (given or intended) field contains the target site for therapeutic procedure (administered or prescribed).

Guidance: Only displayed for therapeutic procedures.

Valid Entries: See Appendix G Table G-3.

3.4.6 Radiopharmaceutical (Given or Intended)

Table: locMisadmin Field: CHEMGVN/CHEMINTD Type: Text Size: 30

Definition: The *Radiopharmaceutical* (given or intended) field contains pharmaceutical name, chemical name, or NaI (administered or prescribed).

Guidance: None.

Valid Entries: See Appendix G Table G-4.

3.4.7 Radionuclide (Given or Intended)

Table: locMisadmin Field: ISOTGVN/ISOTINTD Type: Text Size: 7

Definition: The *Radionuclide* (given or intended) field contains the radionuclide associated with the radiopharmaceutical or radioactive source (administered or prescribed).

Guidance: None.

Valid Entries: See Appendix G Table G-1.

3.4.8 Activity (Given or Intended)

Table: locMisadmin Field: MCIGVN/MCIINTD Type: Text Size: 10

Definition: The *Activity* (given or intended) field contains the activity, in mCi, of the radiopharmaceutical or radioactive source (administered or prescribed).

Guidance: If the activity is provided in units of milligram radium-equivalent, used the following conversion:

Equivalent Activity (mCi) = mg Ra-eq $\times \Gamma_{Ra}/\Gamma_X$

Where:
Γ_{Ra} = 8.25 (R cm^2)/(mg hr)
$\Gamma_{Cs\text{-}137}$ = 3.3 (R cm^2)/(mCi hr) $\therefore$ (mg Ra-eq) × 2.5 = mCi Cs-137
$\Gamma_{Co\text{-}60}$ = 13.2 (R cm^2)/(mCi hr) $\therefore$ (mg Ra-eq) × 6.25E-01 = mCi Co-60
$\Gamma_{Ta\text{-}182}$ = 6.8 (R cm^2)/(mCi hr) $\therefore$ (mg Ra-eq) × 1.21 = mCi Ta-182
$\Gamma_{Ir\text{-}192}$ = 4.8 (R cm^2)/(mCi hr) $\therefore$ (mg Ra-eq) × 1.72 = mCi Ir-192
$\Gamma_{Au\text{-}198}$ = 2.32 (R cm^2)/(mCi hr) $\therefore$ (mg Ra-eq) × 3.56 = mCi Au-198
$\Gamma_{I\text{-}125}$ = 0.7 (R cm^2)/(mCi hr) $\therefore$ (mg Ra-eq) × 1.18E+01 = mCi I-125

From ICRU 86, Ra value is for Ra-226 with daughters and 0.5 mm Pt filter. The other radionuclides are unshielded.

Valid Entries: The activity in mCi.

3.4.9 Dose (Given or Intended)

Table: locMisadmin Field: DOSEGVN/DOSEINTD Type: Text Size: 6

Definition: The *Dose* (given or intended) field contains the dose, in rad, from the therapeutic procedure to the treatment site in brachytherapy, gamma knife, teletherapy, therapeutic radiopharmaceutical, therapeutic NaI, and ablative NaI procedures (administered or prescribed).

Guidance: Only displayed for therapeutic procedures.

Valid Entries: The dose in rad.

3.4.10 Diagnostic Study (Given or Intended)

Table: locMisadmin Field: STDYGVN/STDYINTD Type: Text Size: 30

Definition: The *Diagnostic Study* (given or intended) field contains the radiolabeled antibody, diagnostic radiopharmaceutical, or diagnostic NaI procedure (administered or prescribed).

Guidance: Only displayed for diagnostic studies.

Valid Entries: See Appendix G Table G-5.

3.4.11 Radiopharmaceutical (Given or Intended)

Table: locMisadmin Field: DOSEGVN/DOSEINTD Type: Text Size: 6

Definition: See Section 3.4.6, Radiopharmaceutical (Given or Intended).

Guidance: See Section 3.4.6, Radiopharmaceutical (Given or Intended).

Valid Entries: See Section 3.4.6, Radiopharmaceutical (Given or Intended).

3.4.12 Radionuclide (Given or Intended)

Table: locMisadmin Field: ISOTGVN/ISOTINTD Type: Text Size: 7

Definition: See Section 3.4.7, Radionuclide (Given or Intended).

Guidance: See Section 3.4.7, Radionuclide (Given or Intended).

Valid Entries: See Section 3.4.7, Radionuclide (Given or Intended).

3.4.13 Activity (Given or Intended)

Table: locMisadmin Field: MCIGVN/MCIINTD Type: Text Size: 10

Definition: See Section 3.4.8, Activity (Given or Intended).

Guidance: See Section 3.4.8, Activity (Given or Intended).

Valid Entries: See Section 3.4.8, Activity (Given or Intended).

3.4.14 % Dose Exceeds Prescribed

Table: locMisadmin Field: PCTOVREX Type: Text Size: 10

Definition: The *% Dose Exceeds Prescribed* field contains the percentage of the radiation dose administered exceeding the amount prescribed.

Guidance: Only used for therapeutic procedures; for diagnostic studies, enter “NA”.

Valid Entries:

Case	Displayed/Stored Values
Therapeutic Dose Exceeds Prescribed	Percent
Therapeutic Dose Value(s) not Reported	NR
Therapeutic Dose Less Than Prescribed	NA
Diagnostic Study	NA

3.4.15 % Dose is Less Than Prescribed

Table: locMisadmin Field: PCTUNDEX Type: Text Size: 10

Definition: The *% Dose is Less Than Prescribed* field contains the percentage of the radiation dose administered that is less than the amount prescribed.

Guidance: Only used for therapeutic procedures; for diagnostic studies, enter "NA".

Valid Entries:

Case	Displayed/Stored Values
Therapeutic Dose Less Than Prescribed	Percent
Therapeutic Dose Value(s) not Reported	NR
Therapeutic Dose Exceeds Prescribed	NA
Diagnostic Study	NA

3.4.16 Effect on Patient

Table: locMisadmin Field: CONSEQNC Type: Text Size: 30

Definition: The *Effect on Patient* field is not used in the national database. In the Agreement State software, this field contains any clinical effect on the patient due to the medical event.

Guidance: None.

Valid Entries: This field is not used in the national database.

3.5 Exposure Detail

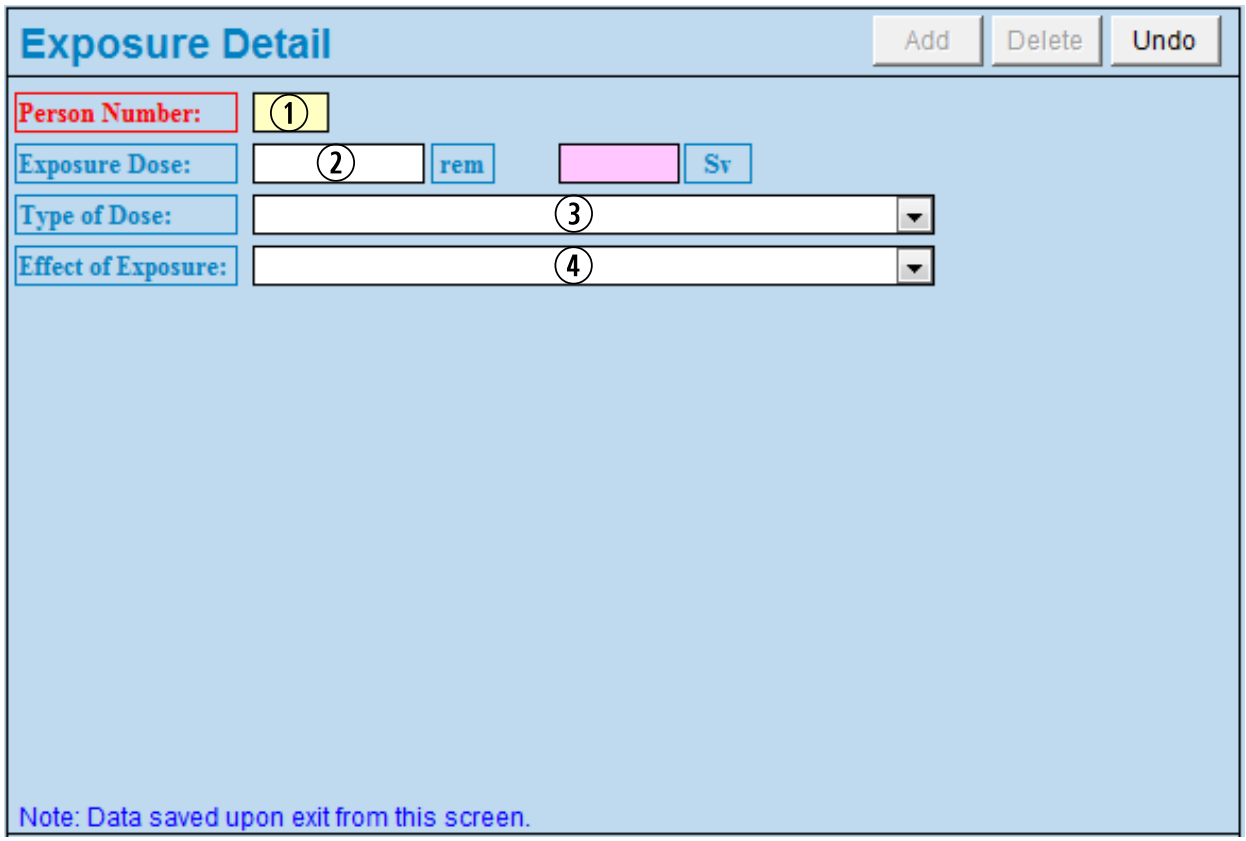

Figure 3-5. Fields Associated with Screen "Exposure Detail"

3.5.1 Person Number

Table: locOverexpo Field: PERIDNO Type: Text Size: 3

Definition: The *Person Number* field is used to identify an individual person in a group of people in a non-medical overexposure event.

Guidance: This is a Primary Key field (along with the ITEMNO and CLASSEVT fields) that links entries in various data tables together. If the event involves more than one overexposure to the same person, enter "1" for the first overexposure event, "1A" for the second, and so on.

Valid Entries: See above.

3.5.2 Exposure Dose

Table: locOverexpo Field: EXPDOSE Type: Text Size: 7

Definition: The *Exposure Dose* field contains the dose, in rem, received by the individual.

Guidance: None.

Valid Entries: The dose in rem.

3.5.3 Type of Dose

Table: locOverexpo Field: ORGNDOSE Type: Text Size: 35

Definition: The *Type of Dose* field contains the specific area that received the overexposure.

Guidance: Make a separate entry for each area that receives a reportable overexposure, such as whole body and extremity.

Valid Entries: See Appendix G Table G-6.

3.5.4 Effect of Exposure

Table: locOverexpo Field: CONSEQNC Type: Text Size: 30

Definition: The *Effect of Exposure* field is not used in the national database. In the Agreement State software, this field contains any clinical effect to the person due to the non-medical overexposure event.

Guidance: None.

Valid Entries: This field is not used in the national database.

3.6 Release of Material or Contamination

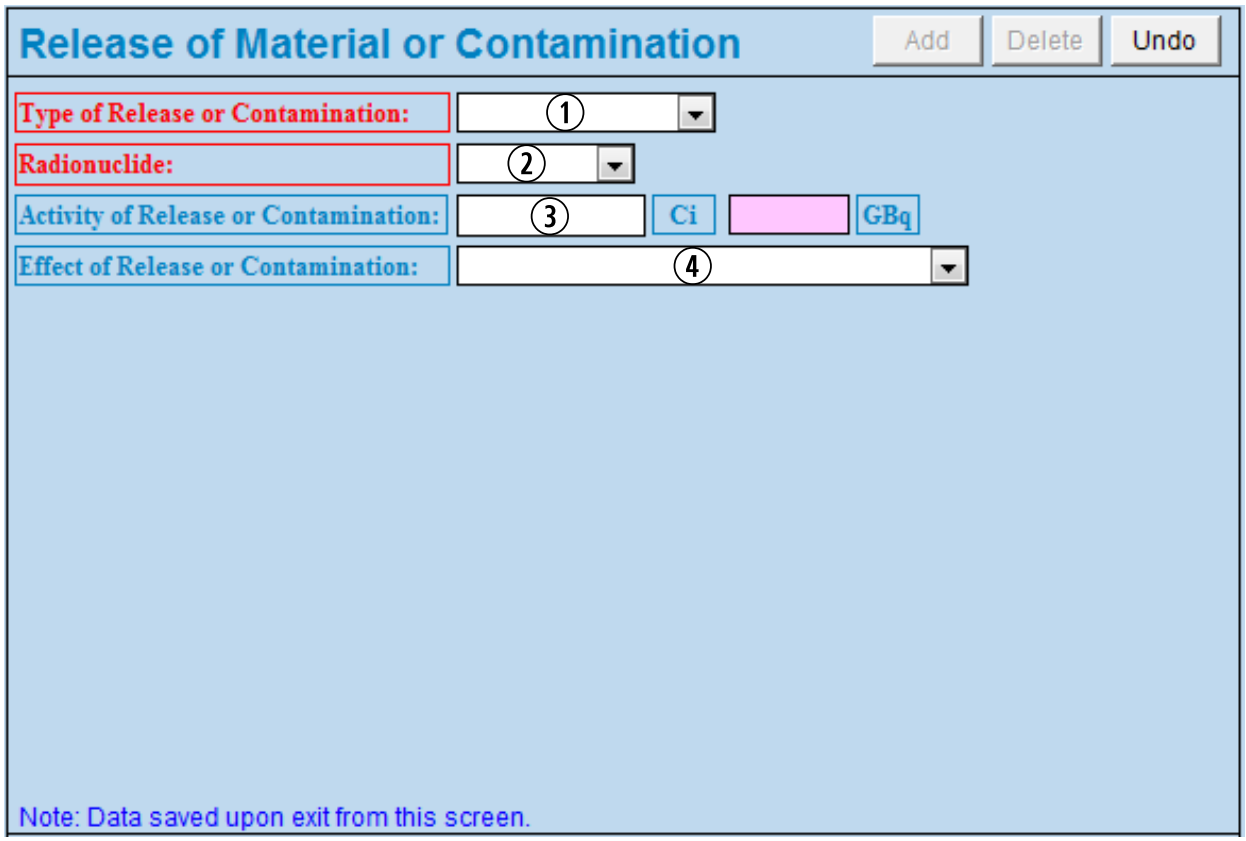

Figure 3-6. Fields Associated with Screen "Release of Material or Contamination"

Events captured on the *Release of Material or Contamination* Screen include releases to water/air and contamination of personnel/surfaces.

3.6.1 Type of Release or Contamination

Table: locRelease Field: RELESTYP Type: Text Size: 15

Definition: The *Type of Release or Contamination* field contains the type of release or contamination event that occurred.

Guidance: This is a Primary Key field (along with the ITEMNO, CLASSEVT, and ISOTOPE fields) that links entries in various data tables together.

Valid Entries:

Case	Displayed/Stored Value
Release to Air	AIR
Release to Water	WATER
Personnel Contamination	PERSON
Surface Contamination	SURFACE

3.6.2 Activity of Release or Contamination

Table: locRelease Field: ACTIVITY Type: Text Size: 15

Definition: The *Activity of Release or Contamination* field contains the activity, in Ci, of the material released or involved in a contamination event.

Guidance: None.

Valid Entries: The activity in Ci.

3.6.3 Radionuclide

Table: locRelease Field: ISOTOPE Type: Text Size: 7

Definition: The *Radionuclide* field contains the radionuclide associated with the release of material or contamination event.

Guidance: None.

Valid Entries: See Appendix G Table G-1.

3.6.4 Effect of Release or Contamination

Table: locRelease Field: CONSEQNC Type: Text Size: 30

Definition: The *Effect of Release or Contamination* field is not used in the national database. In the Agreement State software, this field contains any effects to the environment or personnel due to the release of material or contamination event.

Guidance: None.

Valid Entries: This field is not used in the national database.

3.7 Source of Radiation

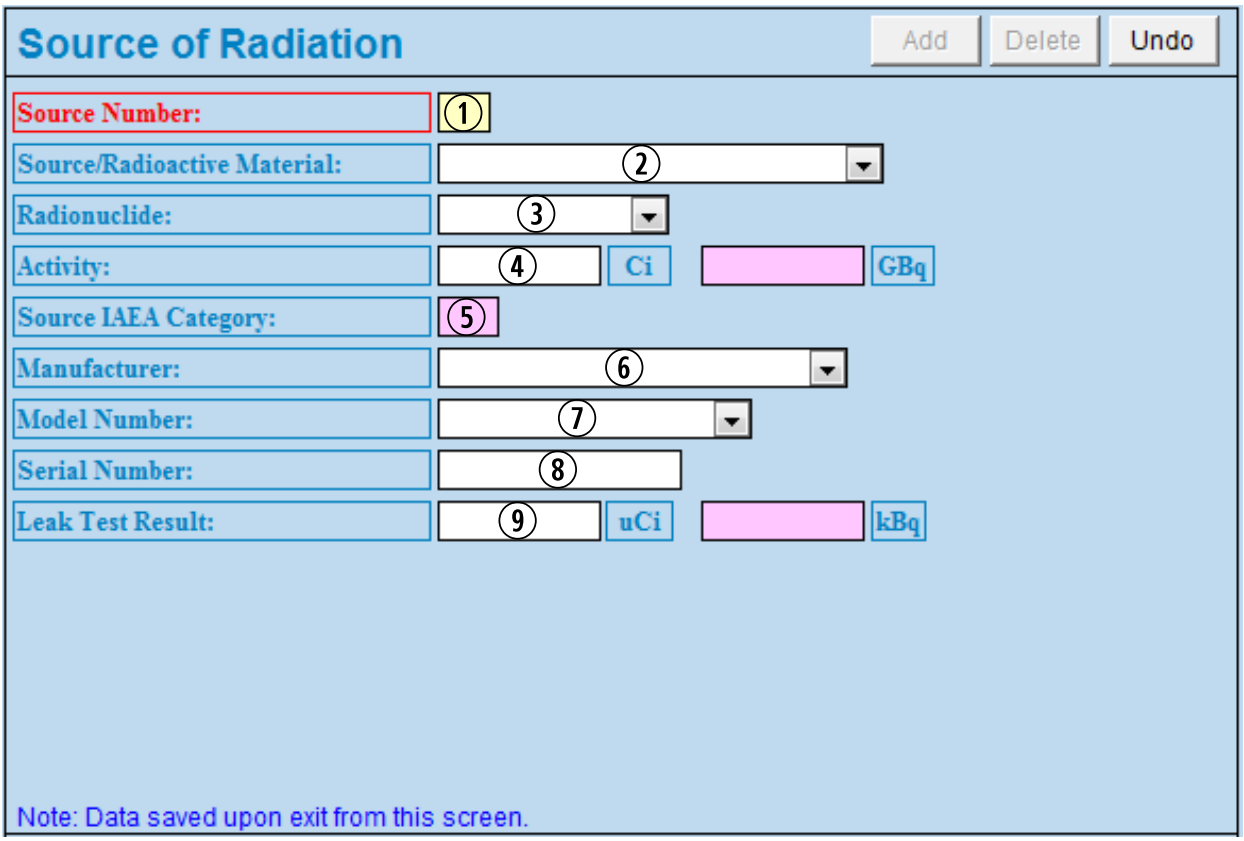

Figure 3-7. Fields Associated with Screen "Source of Radiation"

Typically, a separate source table is completed for each source. However, events involving more than 20 brachytherapy seeds or sources without individual serial numbers will be captured as aggregate quantities by entering “AGGREGATE” in the serial number field.

3.7.1 Source Number

Table: locComponen Field: COMPIDNO Type: Text Size: 2

Definition: The *Source Number* field is used to identify an individual source in a group of source. This field is filled in automatically.

Guidance: This is a Primary Key field (along with the ITEMNO and CLASSEVT fields) that links entries in various data tables together.

Valid Entries: The source number.

3.7.2 Source/Radioactive Material

Table: locComponen Field: COMPONID Type: Text Size: 30

Definition: The *Source/Radioactive Material* field contains the specific sealed source/radioactive material.

Guidance: None.

Valid Entries: See Appendix G Table G-7.

3.7.3 Radionuclide

Table: locComponen Field: ISOTOPE Type: Text Size: 15

Definition: The *Radionuclide* field contains the radionuclide associated with the event.

Guidance: For events involving parent/daughter mixtures, enter only the parent and its activity. For example, although Ba-137m is in equilibrium with Cs-137, list only Cs-137. For radiopharmaceutical generators, list the parent when the source is in the generator; list the daughter if the event deals with the eluted radionuclide.

Valid Entries: See Appendix G Table G-1.

3.7.4 Activity

Table: locComponen Field: ACTIVITY Type: Text Size: 15

Definition: The *Activity* field contains the activity, in Ci, of the radioactive material involved in the event.

Guidance: If no activity is provided, but it appears that the source is likely to meet IAEA Category 1 through 3, then estimate a reasonable maximum (or typical) activity and document this assumption in the narrative. Activity estimates typically come from the NRC's Radioactive Sealed Source and Device Registry or the manufacturer's website.

Valid Entries: The activity of the radioactive material in Ci.

3.7.5 Source IAEA Category

Table: locComponen Field: Cat Type: Text Size: 2

Definition: The *Source IAEA Category* field is automatically calculated based on the radionuclide and activity entered.

Guidance: Appendix I contains a list of radionuclides derived from the International Atomic Energy Agency (IAEA) *Code of Conduct on the Safety and Security of Radioactive Sources* (2004). These radionuclides are grouped by the amount of radioactivity into five categories that correspond to relative hazard, with Category 1 being the most hazardous. If NR is listed, the IAEA Category could not be determined because the radionuclide and/or the source activity is missing. If NA is listed, the radionuclide is not an IAEA radionuclide of interest.

Valid Entries:

Case	Displayed/Stored Value
IAEA Radionuclide with Activity Reported	1, 2, 3, 4, 5, or <5
IAEA Radionuclide, but Activity Not Reported	NR
Radionuclide Not Reported	NR
Non-IAEA Radionuclide	NA

3.7.6 Manufacturer

Table: locComponen Field: MANUFACT Type: Text Size: 20

Definition: The *Manufacturer* field contains the name of the manufacturer of the sealed source/radioactive material involved in the event.

Guidance: None.

Valid Entries: The name of the manufacturer of the sealed source/radioactive material, NR for Not Reported, or NA for Not Applicable. Although a pick list is used to ensure consistency, it is not provided in this manual because it is modified frequently.

3.7.7 Model Number

Table: locComponen Field: MODELNO Type: Text Size: 20

Definition: The *Model Number* field contains the manufacturer's model number for the sealed source.

Guidance: None.

Valid Entries: The manufacturer's model number for the sealed source (unsealed material does not typically have a model number), NR for Not Reported, or NA for Not Applicable. Although a pick list is used to ensure consistency, it is not provided in this manual because it is modified frequently.

3.7.8 Serial Number

Table: locComponen Field: SERIALNO Type: Text Size: 20

Definition: The *Serial Number* field contains the manufacturer's serial number for the sealed source (unsealed material does not typically have a serial number).

Guidance: For events involving multiple sources, enter a unique source table for each source for which a model/serial number is provided. If model/serial numbers are not provided, enter a unique source table for up to 20 individual sources; for more than 20 sources, enter "Aggregate".

Valid Entries: The manufacturer's serial number for the sealed source (unsealed material does not typically have a serial number), NR for Not Reported, NA for Not Applicable, or AGGREGATE.

3.7.9 Leak Test Result

Table: locComponen Field: LKTSTRES Type: Text Size: 12

Definition: The *Leak Test Results* field contains the results, in uCi, of a failed sealed source leak test.

Guidance: This field is only displayed for LKS events.

Valid Entries: The leak test results in uCi, NR for Not Reported, or NA for Not Applicable.

3.8 Device/Associated Equipment

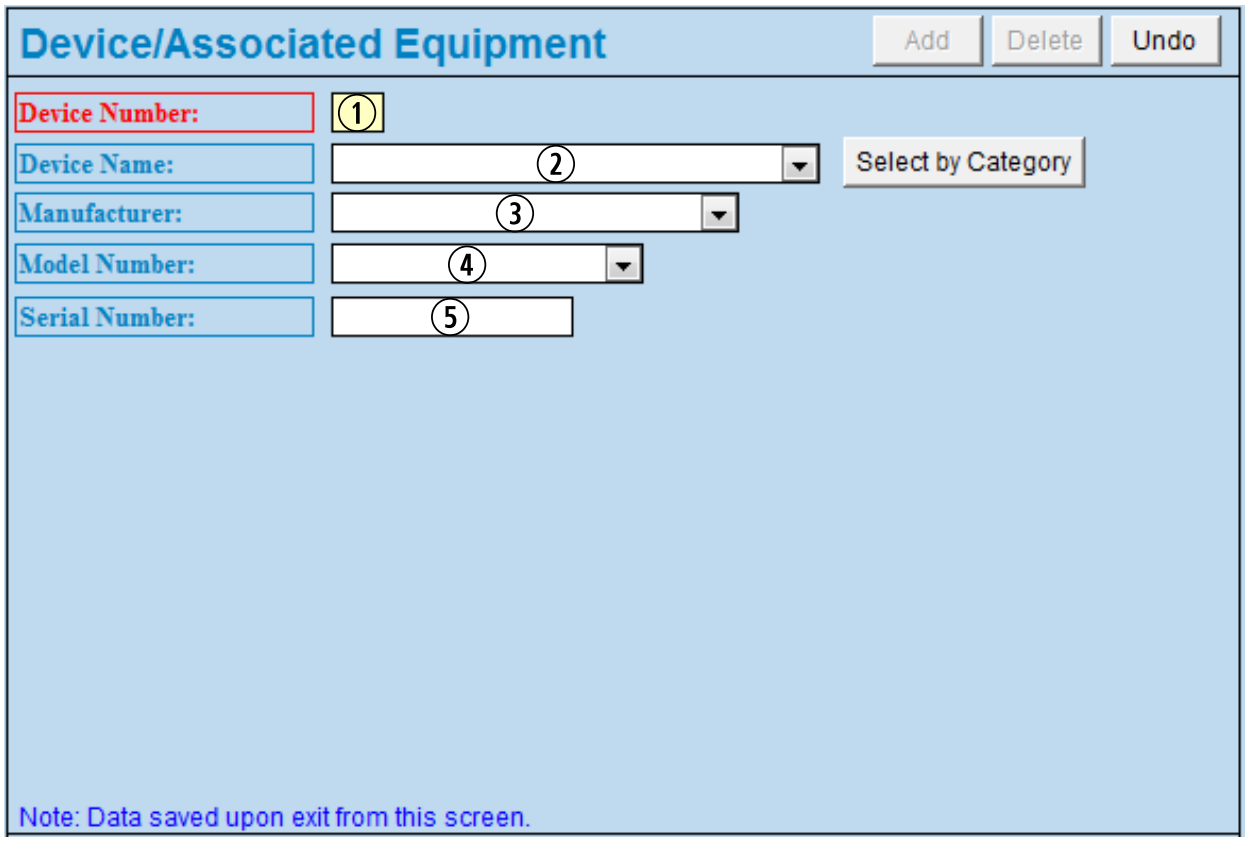

Figure 3-8. Fields Associated with Screen "Device/Associated Equipment"

3.8.1 Device Number

Table: locSystem Field: SYSIDNO Type: Text Size: 2

Definition: The *Device Number* field is used to identify an individual device in a group of devices. It also contains certain specific pieces of equipment associated with the device (like the shutter of a fixed gauge if the shutter contributed to the event). This field is filled in automatically

Guidance: This is a Primary Key field (along with the ITEMNO and CLASSEVT fields) that links entries in various data tables together.

Valid Entries: The device number.

3.8.2 Device Name

Table: locSystem Field: SYSTEMID Type: Text Size: 30

Definition: The *Device Name* field contains the particular device or associated equipment.

Guidance: The device/associated equipment pick list can be filtered by category by clicking the *Select by Category* button. Regarding associated equipment, only enter the equipment directly involved in the event. For example, if a fixed gauge is involved in an EQP event, only enter the gauge shutter if it also failed.

Valid Entries: See Appendix G Tables G-8 and G-9.

3.8.3 Manufacturer

Table: locSystem Field: MANUFACT Type: Text Size: 20

Definition: The *Manufacturer* field contains the name of the manufacturer of the device/associated equipment involved in the event.

Guidance: None.

Valid Entries: The name of the manufacturer of the device/associated equipment, NR for Not Reported, or NA for Not Applicable. Although a pick list is used to ensure consistency, it is not provided in this manual because it is modified frequently.

3.8.4 Model Number

Table: locSystem Field: MODELNO Type: Text Size: 20

Definition: The *Model Number* field contains the manufacturer's model number for the device/associated equipment.

Guidance: None.

Valid Entries: The model number of the device/associated equipment, NR for Not Reported, or NA for Not Applicable. Although a pick list is used to ensure consistency, it is not provided in this manual because it is modified frequently.

3.8.5 Serial Number

Table: locSystem Field: SERIALNO Type: Text Size: 20

Definition: The *Serial Number* field contains the manufacturer's serial number for the device/associated equipment.

Guidance: None.

Valid Entries: The serial number of the device/associated equipment, NR for Not Reported, or NA for Not Applicable.

3.9 Cause/Corrective Action

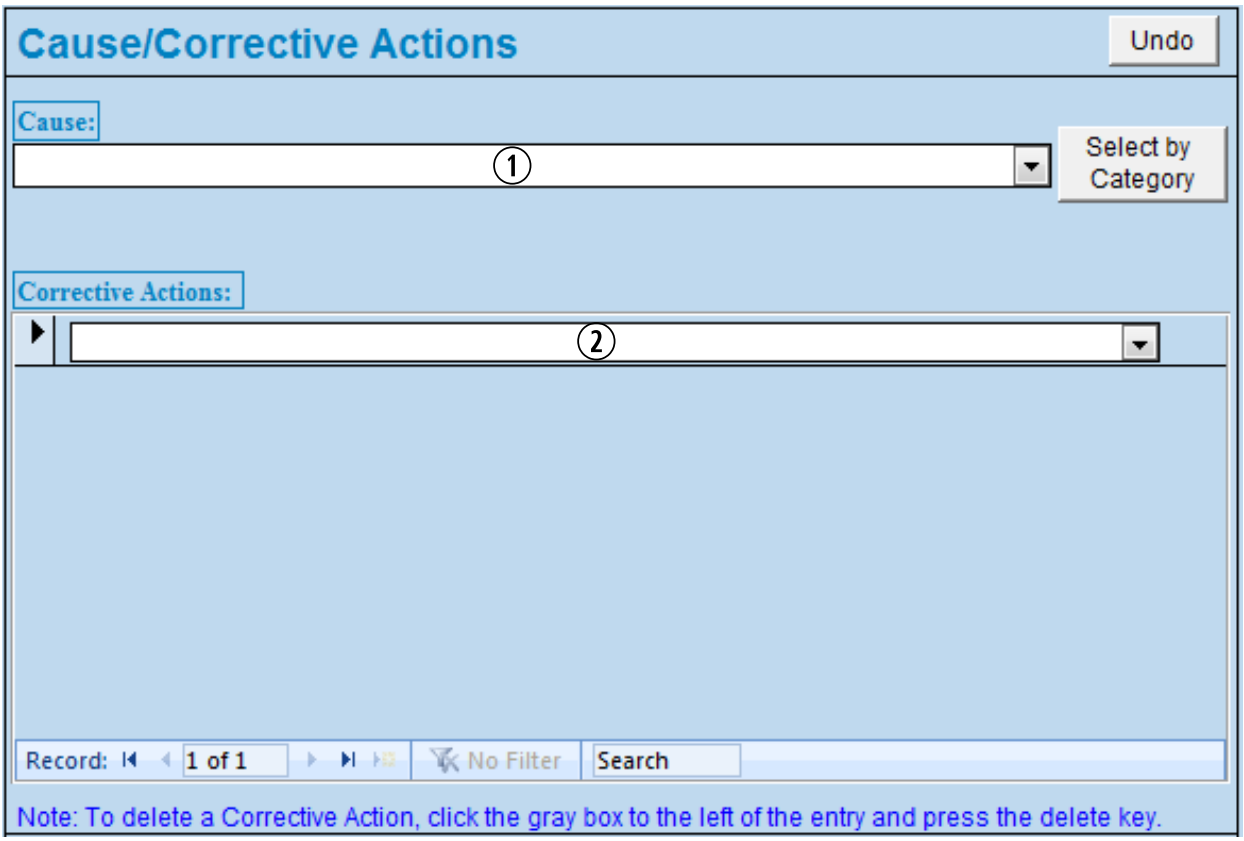

Figure 3-9. Fields Associated with Screen "Cause/Corrective Actions"

3.9.1 Cause

Table: locEvent Field: CAUSE Type: Text Size: 3

Definition: The *Cause* field contains the direct cause of the event. The direct cause is the cause that most directly resulted in the event. A code value is stored in locEvent. The description of the code is contained in the DESCRIP field of the CAUSE pick list table.

Guidance: The Cause pick list is grouped into categories with sub-categories. If enough information is provided, enter the cause from the sub-category. Otherwise, use the overall category. For example, if the specific cause of an equipment failure event is not adequately addressed by the sub-categories, then use the overall category of Equipment Problem.

Valid Entries: See Appendix F Table F-1.

3.9.2 Corrective Actions

Table: locActions Field: CORRACT Type: Text Size: 3

Definition: The *Corrective Actions* field contains the corrective actions taken to prevent recurrence. A code value is stored in locActions. The description of the code is contained in the DESCRIP field of the CORREC pick list table.

Guidance: Enter as many corrective actions as needed.

Valid Entries: See Appendix F Table F-2.

3.10 Reporting Requirements

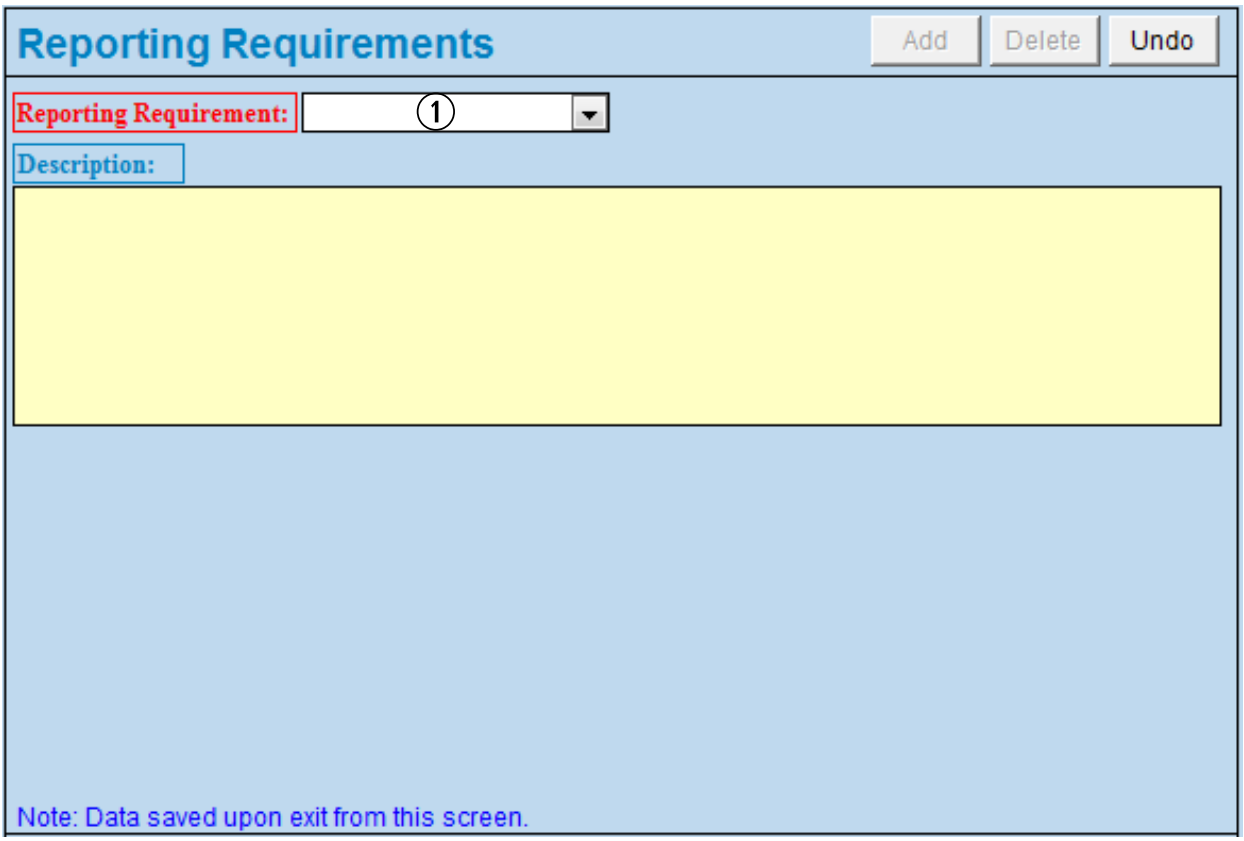

Figure 3-10. Fields Associated with Screen "Reporting Requirements"

3.10.1 Reporting Requirement

Table: locRpt_reqt Field: RPTREQ Type: Text Size: 25

Definition: The *Reporting Requirement* field contains the reference to the 10 CFR requirement that makes the event reportable. A 10 CFR requirement is stored in locRpt_reqt. The description of the 10 CFR requirement is contained in the REQUIREMT field of the RPTREQCD pick list table.

Guidance: This is a Primary Key field (along with the ITEMNO and CLASSEVT fields) that links entries in various data tables together. For events regulated by an Agreement State, enter the applicable NRC reporting requirement. Enter as many reporting requirements as needed.

Valid Entries: See Appendix H.

3.11 References

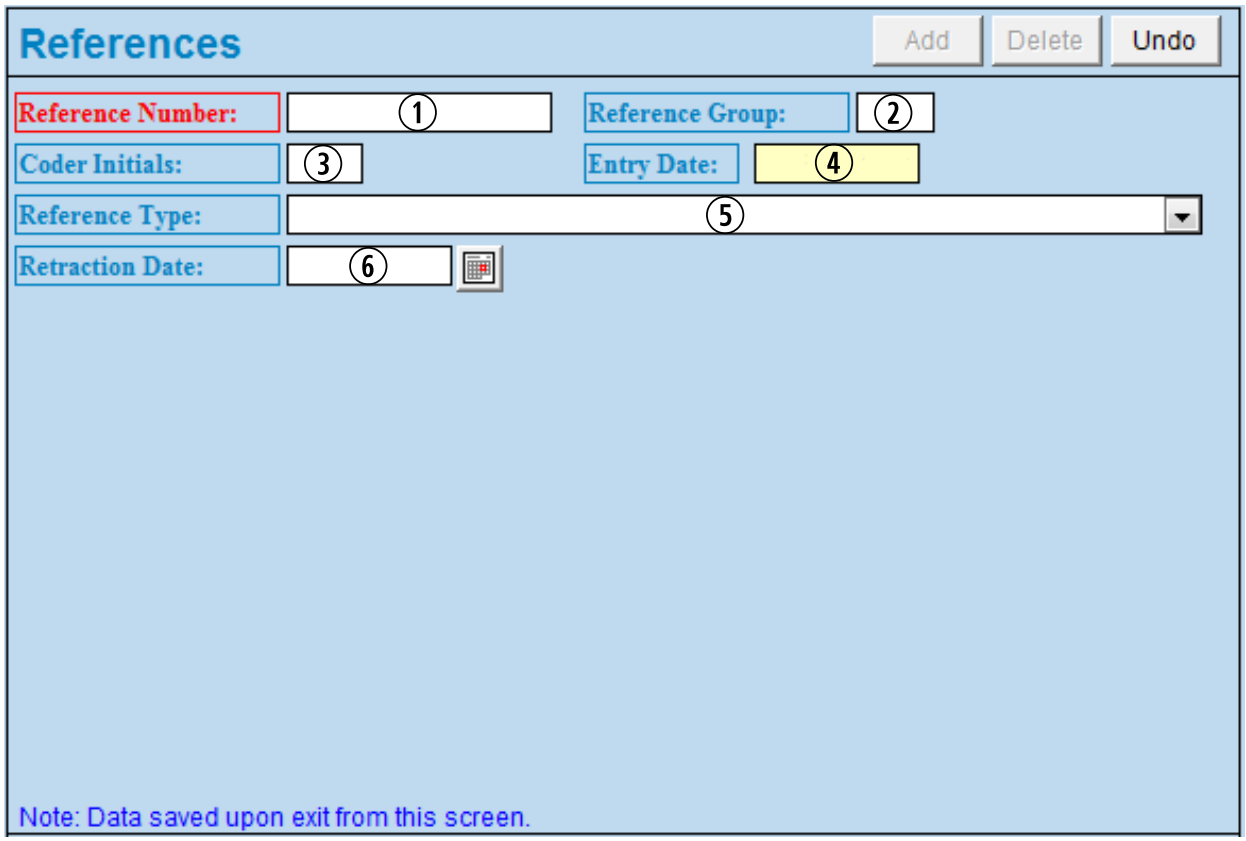

Figure 3-11. Fields Associated with Screen "References"

3.11.1 Reference Number

Table: locReport Field: RPTIDNO Type: Text Size: 15

Definition: The *Reference Number* field contains the document identification number for the supporting document used to code the event.

Guidance: This is a Primary Key field (along with the ITEMNO and RPTSRC fields) that links entries in various data tables together. All event updates should have an associated reference document.

Valid Entries: The reference document number. Typical formats are shown below. In some cases, a revised reference document is issued with the same document number (like ENs, PNs, Agreement State Event Reports, etc). When this occurs, append the reference number with A, B, C, and so on.

Case	Displayed/Stored Value
NRC Event Notification (EN) Report	ENXXXXX
NRC Preliminary Notification (PN) of Occurrence Report	PNRYYXXX, where: R is the NRC Region (1, 2, 3, or 4), YY is the two-digit year, and XXX is the incremental value.
NRC ADAMS Documents	MLXXXXXXXXX (the document's ADAMS accession number)
Reactor Licensee Event Reports	LERDDDYYYYSSSR#, where: DDD is the reactors three-digit docket number, YYYY is the four-digit year, SSS is the three-digit sequence number, and R# is the revision number.
DOT Hazardous Materials Incident Reports	DOTXXXXXXXXXX, where XXXXXXXXXX is the report's barcode number.
Agreement State Event Reports	For States using NMED: ZZAAAAAA, where ZZ is the state abbreviation and AAAAAA is the State's Item Number. For States not using NMED: The State's unique event identification number.
Letters or Emails	LTRYYMMDD, where YY is the two-digit year, MM is the two-digit month, and DD is the two-digit date. For letters, use the date the letter was created. For emails, use the date the email was sent.

3.11.2 Reference Group

Table: locReport Field: REFGROUP Type: Text Size: 5

Definition: The *Reference Group* field is used to group identical reference documents that have different reference numbers, such as an Agreement State event report where two tracking numbers are used, or a report sent to the INL that was subsequently added to the NRC's ADAMS library.

Guidance: The earliest document is typically considered to be the "original" document and is designated with a unique integer (like 1, 2, 3, etc.). Duplicate documents are designated with an integer followed by a letter (like 1A, 1B, 1C, etc.), where the integer identifies the original document and the letter designates the sort order for multiple duplicate documents. If a document received by the INL is subsequently added to ADAMS, the ADAMS accession number is typically designated as a duplicate document. If there are no duplicate documents, the *Reference Group* field is left blank.

Valid Entries: The reference group.

3.11.3 Coder Initials

Table: locReport Field: CODRINIT Type: Text Size: 3

Definition: The *Coder Initials* field contains the initials of the person who used the reference document to enter or update the event.

Guidance: None.

Valid Entries: The coder's initials.

3.11.4 Entry Date

Table: locReport Field: ENTRYDTE Type: Text Size: NA

Definition: The *Entry Date* field contains the date that the reference document was used to update the event. This field is entered automatically based on the computer's system date.

Guidance: None

Valid Entries: The date the event reference document was used to update the event.

3.11.5 Reference Type

Table: locReport Field: RPTSRC Type: Text Size: 3

Definition: The *Reference Type* field contains the type of report that the information was acquired from.

Guidance: This is a Primary Key field (along with the ITEMNO and RPTIDNO fields) that links entries in various data tables together. A code value is stored in locReport. The description of the code is contained in the SRCDESC field of the SOURCCD pick list table.

Valid Entries: See Appendix F Table F-4.

3.11.6 Retraction Date

Table: locReport Field: RTRCNDTE Type: Text Size: NA

Definition: The *Retraction Date* field contains the retraction date for the reference document.

Guidance: The most common usage of this field is for retracted ENs.

Valid Entries: The reference document's retraction date.

Appendix A

Data Dictionary

Appendix A
Data Dictionary

Two versions of the NMED software exist: the national version and state version. These versions are similar, but use some data fields differently. This document is based on the national version, but the major differences between it and the state version are mentioned.

The national NMED database consists of four files:

1. The program file contains the programming, screens, and reports that allow the user to enter event data. This file is named nmed7INL.mdb in the national version and nmed7.mdb in the state version.

2. The data file contains the actual event data. This file is named loc_data.mdb in the national version and locData7.mdb in the state version.

3. The pick list file contains the pick list data used for consistent data entry. This file is named loc_vald.mdb in the national version and locVald7.mdb in the state version.

4. A special file for recording coder comments for a particular event. This capability only exists in the national version, but these comments are not viewable on the website. This file is named locComm4.mdb. This file also contains tables used by NMEDComm2.mdb, a program used to assist in sending and tracking Requests for Additional Information (RAIs) sent to various state/NRC personnel.

Note that the state version also includes a transfer file, which provides the template to create the transfer files that the states may use to submit event data to the INL. This file is named locTran7.mdb in the state version.

In the national version, the NMED data file (loc_data.mdb) contains 12 separate data tables. Eleven of the tables are used during event entry and their particular usage depends on the type of event being entered (medical event, lost source, etc.). The other table (ABNOCC) contains the information published in NUREG-0090, *Report to Congress on Abnormal Occurrences*, for events in the national database. Table A-1 is a listing of the data tables and Table A-2 is a listing of the data fields (note that the ABNOCC fields are not included in Table A-2).

In the state version, the data file (locData7.mdb) contains 11 separate data tables, the use of which depends on the type of event being entered (medical event, lost source, etc.). The table missing from the state version that is included in the national version is ABNOCC.

Table A-1. Data Tables in loc_data.mdb

Data Table	Description
ABNOCC	This table contains the information published in NUREG-0090, *Report to Congress on Abnormal Occurrences*, for events in the national database.
locActions	This table contains any corrective action associated with the event.
locBasic	This is the table to which all other tables are linked. This table captures all of the basic event information, such as the licensee, location, and event summary.
locClasscds	This table contains any keywords (previously referred to as class codes) used to categorize the event.
locComponen	This table contains information on the source(s) of radiation involved in the event.
locEvent	This table contains the type of event, primary cause, and the number of persons involved in a medical event or personnel overexposure. The type of event determines which of the detail screens are available for data entry (locMisadmin for a medical event, locOverexpo for a personnel overexposure, etc.). A single event may involve more that one event type (such as a lost of material that results in an overexposure).
locMisadmin	This table contains the detailed information associated with a medical event.
locOverexpo	This table contains the detailed information associated with a personnel overexposure event.
locRelease	This table contains the detailed information associated with a release or contamination event.
locReport	This table contains the reference documents associated with the event.
locRpt_reqt	This table contains the regulatory requirement that makes the event reportable.
locSystem	This table contains information on the device/associated equipment involved in the event.

Table A-2. Data Fields in loc_data.mdb

Data Field	Type	Size	Description (followed by the Associated Tables)
ABNRMOCC	Text	1	A Yes/No/Potential (Y/N/P) designation of whether or not this event has been classified as an Abnormal Occurrence by the NRC. (locBasic)
ABSTRACT	Memo		A concise statement of the important facts associated with the event. (locBasic)
ACTIVITY	Text	15	The activity, in Curies, of the non-radiopharmaceutical sealed or unsealed source of radioactive material involved in the event. (locComponen, locRelease)
AEA	Text	1	A Yes/No (Y/N) designation of whether or not radioactive material regulated by the Atomic Energy Act was involved in the event. (locBasic)
AGRESTAT	Text	2	A Yes/No (YS/NO) designation of whether or not an Agreement State regulates the responsible licensee. This field is only used in the national database. (locBasic)
AggCat	Text	2	The aggregate IAEA Category of the event (auto-generated). If NR, the aggregate IAEA Category could not be determined because some or all of the radionuclide(s) and/or the source activity(s) are missing. If NA, none of the radionuclide(s) are an IAEA radionuclide of concern. (locEvent)
ANLRPT	Text	2	A Yes/No (Y/N) designation of whether or not the record is complete (field is blank for item numbers < 990001). In the state version, identifies whether the event record is included in the transfer file. (locBasic)
ASRPTBLTY	Text	1	A Yes/No (Y/N) designation of whether or not the event is reportable per Agreement State regulations. (locBasic)

Data Field	Type	Size	Description (followed by the Associated Tables)
Cat	Text	2	The IAEA Category of the source (auto-generated). If NR is listed, the IAEA Category could not be determined because the radionuclide and/or the source activity is missing. If NA is listed, the radionuclide is not an IAEA radionuclide of interest. (locComponen)
CAUSE	Text	3	A code identifying the cause of the event. The description of the code is contained in the DESCRIP field of the CAUSE pick list table. (locEvent)
CAUSEOLD	Text	3	A code identifying the cause of the event for events entered using NMED v5. The description of the code is contained in the DESCRIP field of the CAUSEOLD pick list table. For new events, this field is no longer used. (locEvent)
CHEMGVN	Text	30	The pharmaceutical or chemical name of the radiopharmaceutical or sodium iodide administered. (locMisadmin)
CHEMINTD	Text	30	The pharmaceutical or chemical name of the radiopharmaceutical or sodium iodide prescribed. (locMisadmin)
CITY	Text	20	The licensee's city as it appears on the license. For a non-licensee, the city of the responsible or reporting party. (locBasic)
CITYOTHR	Text	25	The city of record of the additional involved party. (locBasic)
CLASSCDS	Text	3	A code identifying the keywords associated with the event. The description of the code is contained in the DESCRIPTIO field of the CLASCODE pick list table. (locClasscds)
CLASSEVT	Text	3	A code identifying the type of event. The description of the code is contained in the DESC field of the EVT_VAL pick list table. (locActions, locClasscds, locComponen, locEvent, locMisadmin, locOverexpo, locRelease, locRpt_reqt, locSystem)
CODRINIT	Text	3	The initials of the person that entered (coded) the event. (locReport)
COMPIDNO	Text	2	The individual source within a group of sources. (locComponen)
COMPONID	Text	30	The form of the source of radiation. (locComponen)
CONSEQNC	Text	30	The consequence associated with the event. These fields are not used in the national database. (locMisadmin, locOverexpo, locRelease)
CONSHIRED	Text	1	A Yes/No (Y/N) designation of whether or not an outside consultant was hired to review or assist in resolving the event. (locBasic)
CORRACT	Text	3	A code identifying the corrective actions associated with the event. The description of the code is contained in the DESCRIP field of the CORREC pick list table. (locActions)
DATEINFO	Date	8	The date that the patient or family member was informed of the medical event, in the format MM/DD/YYYY. (locMisadmin)
DOCKET	Text	8	The licensee's NRC docket number or NR (Not Reported). For non-NRC licensee's, NA (Not Applicable). This field is only used in the national database. (locBasic)
DOCKOTHR	Text	8	The additional involved party's eight-digit NRC docket number, if applicable. This field is only used (and only exists) in the national version. (locBasic)
DOSEGVN	Text	6	The therapeutic radiation dose, in rad, received by the patient. (locMisadmin)

Data Field	Type	Size	Description (followed by the Associated Tables)
DOSEINTD	Text	6	The therapeutic radiation dose, in rad, prescribed for the patient. (locMisadmin)
DSCRDATE	Date	8	The date the event was discovered, in the format MM/DD/YYYY. (locBasic)
ENTRYDTE	Date	8	The program-generated date that the event information was entered into the database, in the format MM/DD/YYYY. (locReport)
EVTDATE	Date	8	The date the event occurred (or began), in the format MM/DD/YYYY. (locBasic)
EXPDOSE	Text	7	The dose, in rem, received during an overexposure (non-medical). (locOverexpo)
EXPNUMBR	Text	3	The number of people receiving the dose in a medical or overexposure event. (locEvent, locMisadmin, locOverexpo)
FACTNUM	Text	2	The specific corrective action within a group of corrective actions. (locActions)
INVEST	Text	1	A Yes/No (Y/N) designation of whether or not a regulatory agency performed an investigation or follow-up inspection of the event. (locBasic)
ISOTGVN	Text	7	The radionuclide administered or utilized in connection with the medical event. (locMisadmin)
ISOTINTD	Text	7	The radionuclide prescribed in connection with the medical event. (locMisadmin)
ISOTOPE	Text	15	The radionuclide associated with the event (not medical events). (locComponen, locRelease)
ITEMNO	Text	12	The unique identification number for the event that represents the sequence in which the event was entered into the database. This field cannot be edited once it is populated. (locActions, locBasic, locClasscds, locComponen, locEvent, locMisadmin, locOverexpo, locRelease, locReport, locRpt_reqt, locSystem)
LASTUPDATE	Date	8	The date that the record was created or last modified (auto-generated). (locBasic)
LICENSEE	Text	50	The licensee's name as it appears on the license. For a non-licensee, the name of the responsible or reporting party. (locBasic)
LICNO	Text	14	The license number assigned by the regulatory agency. Allowable entries are Non-Licensee, General License, NR (Not Reported), or the license number. (locBasic)
LICNOTHR	Text	14	The license number of the additional involved party. (locBasic)
LKTSTRES	Text	12	The results, in microcuries, of the failed sealed source leak test. (locComponen)
MANUFACT	Text	20	The manufacturer of the source or device/associated equipment associated with the event. (locComponen, locSystem)
MCIGVN	Text	10	The activity, in millicuries, of the brachytherapy source or the radiopharmaceutical administered. (locMisadmin)
MCIINTD	Text	10	The activity, in millicuries, of the brachytherapy source or the radiopharmaceutical prescribed. (locMisadmin)
MODELNO	Text	20	The manufacturer's model number for the source or device/associated equipment. (locComponen, locSystem)

Data Field	Type	Size	Description (followed by the Associated Tables)
MULT	Number	8	A Yes/No/Inactive (1/0/2) designation of whether or not the event is closed by the state/region. (locBasic)
OLDFORM	Text	30	The form of the radioactive material for an event entered using NMED v5. For new events, this field is no longer used. This field is only used (and only exists) in the state version. (locComponen)
OLDUSE	Text	30	The use of the radioactive material for an event entered using NMED v5. For new events, this field is no longer used. For new events, this field is no longer used. This field is only used (and only exists) in the state version. (locComponen)
ORGNDOSE	Text	35	The specific part of the body that received the overexposure. (locOverexpo)
ORGNGVN	Text	30	The actual target organ or target site of the therapeutic procedure. (locMisadmin)
ORGNINTD	Text	30	The intended target organ or target site of the therapeutic procedure. (locMisadmin)
OTHRPRTY	Text	50	The name of the additional involved party. (locBasic)
PATINFO	Text	1	A Yes/No (Y/N) designation of whether or not the patient or the patient's family was informed of the medical event. (locMisadmin)
PCTOVREX	Text	10	The percentage that the administered dose exceeds the prescribed dose. (locMisadmin)
PCTUNDEX	Text	10	The percentage that the administered dose is less than the prescribed dose. (locMisadmin)
PERIDNO	Text	3	The individual person in a group of people involved in the same medical or overexposure event. (locMisadmin, locOverexpo)
PRGMCODE	Text	5	The program code assigned to the licensee by the NRC to characterize the type of program or operation the licensee is involved in. This field is only used in the national version. (locBasic)
PRGMOTHR	Text	5	The program code assigned to the additional involved party by the NRC to characterize the type of program or operation the licensee is involved in. This field is only used (and only exists) in the national version. (locBasic)
PROCGVN	Text	35	The therapeutic procedure performed. (locMisadmin)
PROCINTD	Text	35	The therapeutic procedure prescribed. (locMisadmin)
RECPRCTY	Text	5	The type of reciprocity agreement (if any) in place when the event occurred. (locBasic)
REFGROUP	Text	5	Used to group identical reference documents that have different reference numbers. This field is only used (and only exists) in the national version. (locReport)
REGION	Text	2	The NRC Region responsible for the event. This field is only used in the national version. (locBasic)
REGOTHR	Text	2	The NRC Region that contains the additional involved party's home of record. This field is only used (and only exists) in the national version. (locBasic)
RELESTYP	Text	15	The type of material release or contamination that occurred. (locRelease)

Data Field	Type	Size	Description (followed by the Associated Tables)
RPTBLEVT	Text	1	A Yes/No (Y/N) designation of whether or not the event is reportable per 10 CFR requirements. This field is only used in the national database. (locBasic)
RPTDATE	Date	8	The date the event was reported to the applicable regulatory agency. This field was replaced by the fields RPTDATEAS and RPTDATENRC and is no longer used. (locBasic)
RPTDATEAS	Date	8	The date that the event was initially reported to the Agreement State regulatory agency, in the format MM/DD/YYYY. This field is not used for NRC-regulated events. (locBasic)
RPTDATENRC	Date	8	The date the event was initially reported to the NRC, in the format MM/DD/YYYY. (locBasic)
RPTIDNO	Text	15	The document identification number for the supporting document. (locReport)
RPTREQ	Text	25	The reporting requirement reference number. The description of the requirement is contained in the REQUIREMT field of the RPTREQCD pick list table. (locRpt_reqt)
RPTSRC	Text	3	A code identifying the type of report that the information was acquired from. The description of the code is contained in the SRCDESC field of the SOURCCD pick list table. (locReport)
RTRCNDTE	Date	8	The date that a licensee retracted a report notification, in the format MM/DD/YYYY. (locReport)
SERIALNO	Text	20	The manufacturer's serial number for the source or device/associated equipment. (locComponen, locSystem)
SITEEVT	Text	25	The location (city, county, parish, grid number, etc.) where the event occurred. (locBasic)
STATE	Text	2	The licensee's state as it appears on the license. For a non-licensee, the state of the responsible or reporting party. (locBasic)
STATEEVT	Text	2	The state where the event occurred. (locBasic)
STATOTHR	Text	2	The state of record of the additional involved party. (locBasic)
STDYGVN	Text	30	The diagnostic study performed. (locMisadmin)
STDYINTD	Text	30	The diagnostic study prescribed. (locMisadmin)

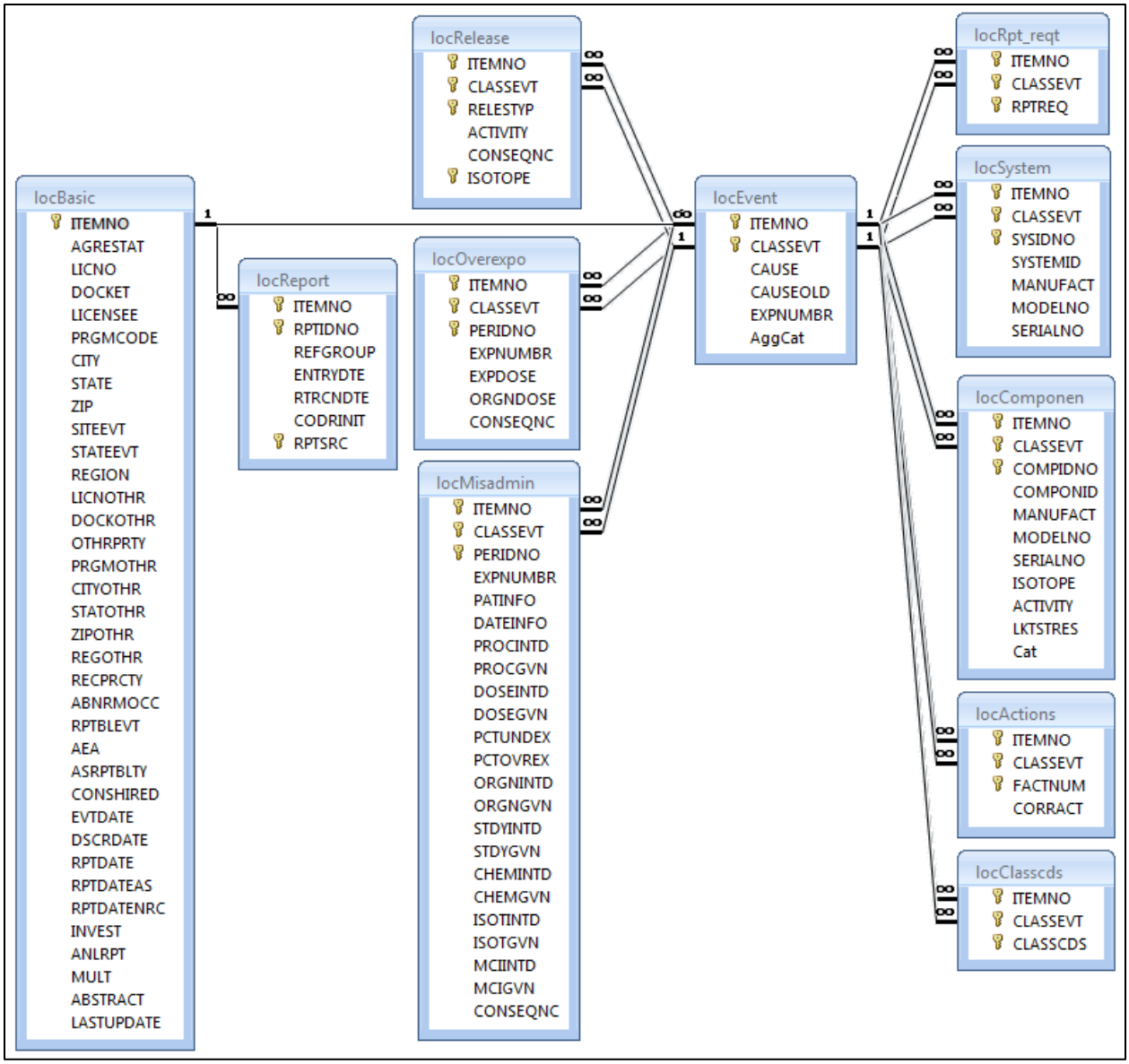

Figure A-12. Table Relationships in loc_data.mdb

Appendix B

Automated QA Routine

Appendix B
Automated QA Routine

Microsoft Access was used to develop an automated QA routine for NMED. The user inputs the date range over which to check event records (the date range applies to the date that the event was last updated). The following data checks are included in the routine:

1a. Each event record (locBasic) has at least one event type (locEvent).

2a. The number of people involved in a medical (MD2) or personnel overexposure (EXP) event (locEvent.EXPNUMBR) is not null.

3a. The number of people involved in a medical (MD2) or personnel overexposure (EXP) event (locEvent.EXPNUMBR) is consistent with the detailed information tables (locMisadmin.EXPNUMBR for MD2 events and locOverexpo.EXPNUMBR for EXP events).

4a. Medical (MD2) and personnel overexposure (EXP) events contain at least one record in the detailed information tables (locMisadmin and locOverexpo) for each person involved.

5a. **(No Longer Used)** If an event is marked to indicated that a consultant was hired (locBasic.CONSHIRED = Y), there is at least one record in the consultant table (locConsulta).

5b. **(No Longer Used)** If an event is marked to indicated that a consultant was not hired (locBasic.CONSHIRED = N), there is no record in the consultant table (locConsulta).

6a. If an event is NRC reportable (locBasic.RPTBLEVT = Y), there is at least one record in the reporting requirements table (locRpt_reqt).

6b. If an event is not NRC reportable (locBasic.RPTBLEVT = N), there is no record in the reporting requirements table (locRpt_reqt).

7a. Loss of material (LAS) events contain one of the “Material…” keywords (except abandoned well logging sources) in the keyword table (locClasscds.CLASSCDS = D76 or D77 or D78 or D79 or D80 or D89 or D90).

8a. Loss of material (LAS) events with source activities greater than 10 Ci contain the “Greater than 10 Ci – not H-3” keyword (except abandoned well logging sources or H-3) in the keyword table (locClasscds.CLASSCDS = D83).

8b. If locClasscds.CLASSCDS = D83 (Greater than 10 Ci, not H-3), then the event class must be LAS, and a source must have an activity greater than 10 Ci (not abandoned well logging sources or H-3).

9a. License numbers (locBasic.LICNO) for Agreement State-regulated events (locBasic.AGRESTAT = YS) are in the proper format.

10a. If locBasic.AGRESTAT = “YS”, then locBasic.RPTDATEAS is not null.

10b. If locBasic.RPTDATEAS is not null, then locBasic.AGRESTAT = “YS”.

10c. For Agreement State events, event date (locBasic.EVTDATE) <= discovery date (locBasic.DSCRDATE) <= Agreement State report date (locBasic.RPTDATEAS) <= NRC report date (locBasic.RPTDATENRC) <= current date. For NRC events, don’t include the Agreement State report date.

10d. **(No Longer Used)** locBasic.EVTDATE, locBasic.DSCRDATE, locBasic.RPTDATEAS, and locBasic.RPTDATENRC are with 1 year of the current date.

11a. Events involving NRC Fuel Cycle licensees (those with NRC programs codes of 11400, 21130, 21135, 21200, 21210, 21215, 21240, 23100, or 23200) include an event type of FCP (locEvent.CLASSEVT = FCP).

11b. NRC-regulated FCP events (locEvent.CLASSEVT = FCP) involve NRC Fuel Cycle licensees (those with NRC programs codes of 11400, 21130, 21135, 21200, 21210, 21215, 21240, 23100, or 23200).

12a. **(No Longer Used)** Reporting requirement 20.2201(b)(1) is paired with either 20.2201(a)(1)(i) or (ii) in the reporting requirements table (locRpt_reqt.RPTREQ).

12b. **(No Longer Used)** Reporting requirement 20.2201(a)(1)(i) is paired with 20.2201(b)(1) in the reporting requirements table (locRpt_reqt.RPTREQ).

12c. **(No Longer Used)** Reporting requirement 20.2201(a)(1)(ii) is paired with 20.2201(b)(1) in the reporting requirements table (locRpt_reqt.RPTREQ).

13a. If the abstract (locBasic.ABSTRACT) contains "The INL has requested additional information for this event", the event is marked as having an open request for additional information (locBasic.ANLRPT = R).

13b. If the event is marked as having an open request for additional information (locBasic.ANLRPT = R), the abstract (locBasic.ABSTRACT) contains "The INL has requested additional information for this event".

14a. The most recent document entry date (locReport.ENTRYDTE) is the same as the update date (locBasic.LASTUPDATE).

15a. Item numbers (locBasic.ITEMNO) < 990001 have no entry in the complete record field (locBasic.ANLRPT is null).

15b Item numbers (locBasic.ITEMNO) >= 990001 have an entry in the complete record field (locBasic.ANLRPT is not null).

16a. NRC reportable events (locBasic.RPTBLEVT = Y) are marked as involving AEA material (locBasic.AEA = Y).

17a. Agreement State-regulated events (locBasic.AGRESTAT = YS) that are NRC reportable (locBasic.RPTBLEVT = Y) are also Agreement State reportable (locBasic.ASRPTBLTY = Y).

18a. Events marked as Abnormal Occurrences (locBasic.ABNRMOCC = Y) have an Abnormal Occurrence report listed (locReport.RPTSCR = 019) and have an entry in Abnormal Occurrence table (ABNOCC).

19a. For events with the 20.2201(a)(1)(i) reporting requirement (locRpt_reqt.RPTREQ), the activities of the sources (locComponen.ACTVITY) are >= 1000 times the Appendix C values.

19b. LAS events with source activities (locComponen.ACTVITY) >= 1000 times the Appendix C values have the 20.2201(a)(1)(i) reporting requirement (locRpt_reqt.RPTREQ).

20a. For events with the 20.2201(a)(1)(ii) reporting requirement (locRpt_reqt.RPTREQ), the activities of the sources (locComponen.ACTVITY) are > 10 times and < 1000 times the Appendix C values.

20b. LAS events with source activities (locComponen.ACTVITY) > 10 times and < 1000 times the Appendix C values have the 20.2201(a)(1)(ii) reporting requirement (locRpt_reqt.RPTREQ).

21a. Reportable LAS events (locEvent.CLASSEVT = LAS and locBasic.Rptblevt = Y) contain 20.2201(a)(1)(i), 20.2201(a)(1)(ii), or 39.77(d) in the reporting requirements (locRpt_reqt.RPTREQ).

21b. Events where locRpt_reqt.RPTREQ contains 20.2201(a)(1)(i), 20.2201(a)(1)(ii), or 39.77(d), then locEvent.CLASSEVT = LAS and locBasic.RPTBLEVT = Y.

22a. Events with locRpt_reqt.RPTREQ = 70.52(a) must also have locRpt_reqt.RPTREQ = 70.App A(a)(1).

22b. Events with locRpt_reqt.RPTREQ = 70.App A(a)(1) must also have locRpt_reqt.RPTREQ = 70.52(a)

23a. If locBasic.RPTBLVT = Y, locComponen.CLASSEVT = LKS and locComponen.COMPONID = SEALED SOURCE WELL LOGGING, then locRpt_reqt.RPTREQ must contain 39.35(d)(2) or 39.77(a).

23b. If locBasic.RPTBLVT = Y, locComponen.CLASSEVT = LKS and locComponen.COMPONID = SEALED SOURCE RADIOGRAPHY, then locRpt_reqt.RPTREQ must contain 34.27(d).

23c. If locBasic.RPTBLVT = Y, locComponen.CLASSEVT = LKS and locComponen.COMPONID = SEALED SOURCE BRACHYTHERAPY, then locRpt_reqt.RPTREQ must contain 35.67(3).

24a. Loss of material (LAS) events with (locEvent.Cause2 = 4D (Theft) contain one of the "Material Stolen…" keywords in the keyword table (locClasscds.CLASSCDS = D78 or D79 or D90).

24b. Loss of material (LAS) events with one of the “Material Stolen…” keywords in the keyword table (locClasscds.CLASSCDS = D78 or D79 or D90) contain (locEvent.Cause2 = 4D (Theft).
25a. Superceded reporting requirements should not be used on current events.
26a. Check of LAS events against AO criteria for event dates >= 10/1/2006.
26b. Check for possible MD2 AO events.
26c. Check for possible EXP AO events.
26d. Check for possible OTH AO events involving embryo/fetus doses.
27a. **(No Longer Used)** Events involving Nuclear Fuel Services (SNM-0124) and BWX Technologies (SNM-0042) should not be in NMED.
28a. Check the spelling of locBasic.CITY against tblCityStateCountyList.
28b. Check the spelling of locBasic.CITYOTHR against tblCityStateCountyList.
28c. Check the spelling of locBasic.SITEEVT against tblCityStateCountyList.
28d. Check the spelling of LICENSE.CITY against tblCityStateCountyList.
29a. If locReport.RPTSRC = “028” (INES Report), then locBasic.ABSTRACT must contain "INES Rating Level of".
29b. If locBasic.ABSTRACT contains "INES Rating Level of", then locReport.RPTSRC must include “028” (INES Report).
30a. If a radionuclide listed locComponen.ISOTOPE is contained in the table tblNewAEA, then locClasscds.CLASSCDS must include D95 (Revised Byproduct Material Definition).
30b. If locClasscds.CLASSCDS includes D95 (Revised Byproduct Material Definition), then one of the radionuclides listed in locComponen.ISOTOPE must be included in table tblNewAEA.
31a. If locComponen.Cat contains “1” or “2” for LAS events, email NMED report to NSTS.Help@nrc.gov with the subject line starting with “NMED Report”.

Note: QA Tests 23a/23b/23c check for specific reporting requirements for leaking well logging sources, radiography sources, and medical sources. For QA test 23c, only brachytherapy sources are checked, although other source types may also apply.

Appendix C

Complete Record Criteria

Appendix C
Complete Record Criteria

In order to mark an NMED record as "complete", specific information must be contained in the event report. Guidance on reporting is provided in the *Handbook on Nuclear Material Event Reporting in the Agreement States*, which is an appendix to the NRC Office of Federal and State Materials and Environmental Management Programs (FSME) Procedure SA-300, *Reporting Material Events*. Section 3 of the *Handbook on Nuclear Material Event Reporting in the Agreement States* describes the minimum basic information required for a complete event report.

Below is a more explicit listing of the minimum information that must be submitted in an event report for a compete record. This list is not intended as a substitute for the guidance given in the *Handbook on Nuclear Material Event Reporting in the Agreement States*.

Basic Information:
1. narrative event description
2. report identification number
3. event date and notification date
4. licensee/reporting party information (name, license number, and address)
5. site of event
6. whether the event is reportable and the applicable reporting requirement
7. cause and corrective actions

Source/Radioactive Material:
1. isotope and activity
2. manufacturer
3. model and serial numbers

Device/Associated Equipment:
1. manufacturer
2. model and serial numbers

Additional information is required for the specific event types listed below:

Release of Licensed Material or Contamination Event:
1. release type (air or water)
2. contamination (person or surface)
3. isotope and activity released

Medical Event:
1. procedure/study administered
2. dose intended and dose administered
3. isotope and activity administered
4. organ targeted

Radiation Overexposure Event:
1. radiation source and activity
2. exposure dose
3. exposure type (whole body, extremity, etc.)

Although the NMED was developed in the early 1990s, the complete record determination process did not begin until much later. Thus, only NMED item numbers 990001 (the first record entered in 1999) and newer have been evaluated for completeness. The complete record field is null for older item numbers. This does not mean that those older records are not complete, but simply that they have not been (and will not be) evaluated for completeness.

Appendix D

Request for Additional Information Process

Appendix D
Request for Additional Information Process

Many event reports received by the INL do not include all of the information required to complete an analysis of the event. As a result, INL developed a procedure to request additional information (RAI) for incomplete NMED records of reportable events (Appendix C defines the data requirements for a complete record) and events of uncertain reportability. RAIs are not produced for non-reportable events.

In order to update incomplete records, INL contacts staff in Agreement States, NRC Regional Offices, or NRC Headquarters to obtain additional information. The INL developed an RAI computer program (NMED Communication Tool) using Microsoft Access to automate this process. The program identifies incomplete records of events whose report date (the date the event was reported to the applicable regulatory agency) is at least 57 days old and greater than 11/01/2001. The INL then requests additional information from the responsible agency via e-mail. If the applicable agency does not respond within 60 days, or the response is insufficient to complete or close the event, the INL generates a report for the NRC PM of potential metric events. Note that the program actually uses reporting date and not event date, because some events are not reported in a timely fashion.

The RAI computer program tracks all RAIs and responses. If the applicable agency does not respond within a specified time frame, or the response is insufficient to complete the event, the INL generates a report for the NRC PM of those incomplete events that are also potential metric events (based on NUREG-1614, Vol. 2, Part 1, *U.S. Nuclear Regulatory Commission Strategic Plan: Fiscal Year 2000 - 2005*), which are a subset of all incomplete records.

The program defines an **incomplete record** as follows:

1. A reportable event (loc_data.mdb.locBasic.RPTBLEVT = Y or U), and
2. That is incomplete (loc_data.mdb.locBasic.ANLRPT < > Y and < > R).

   FCP events were previously excluded from the RAI process, but are now included.

The program defines a **potential metric** as follows:

1. Any LAS, EXP, or MD2 record that is not complete (loc_date.mdb.locBasic.ANLRPT < > Y and < > R), the reportability is unknown (loc_data.mdb.locBasic.RPTBLEVT = U), and the record is not closed (locBasic.MULT = 0 or locBasic.MULT Is Null).
2. Any RLM record where the reportability is unknown (loc_data.mdb.locBasic.RPTBEVT = U) and the record is not closed (locBasic.MULT = 0 or locBasic.MULT Is Null). Note that the actual metric is an RLM event with a reporting requirement of 20.2203(a)(3)(ii). However, NMED does not assign a reporting requirement unless the reportability is “Y”.
3. Any record with a cause of “intentional violation” (locEvent.CAUSE = 4I) and the record is not closed (locBasic.MULT = 0 or locBasic.MULT Is Null).

The program functions include:

1. Identifying the incomplete records and subset of potential metric events.
2. Aiding the user in developing a standardized information request to send to the applicable regulatory agency.

3. Documenting that an e-mail was sent.
4. Updating the complete record field to “R” and adding “The INL has requested additional information for this event” to the end of the narrative.
5. Documenting if a response is received and whether it was useful.
6. Producing a potential metric report to be sent to the NRC PM.

When responses to requests for additional information are received, the INL classifies the response as:

1. Completed Record.
2. Partially Completed Record-Investigation in Progress.
3. Partially Completed Record-Event Closed By State/Region.
4. Partially Completed Record-INL Sent Second Request. This will be used if it appears that the party just forgot to respond to part of the request.
5. Refused Request. This indicates the party actively replied that they would not answer the request. These responses should be rare.

When responses from categories 1, 2, 3, and 4 are received, the NMED coders remove the sentence “The INL has requested additional information for this event”, and change the completed record field from “R” to either “Y” or “N” as applicable.

Items from response category 3 are not included in the Potential Metric Report.

If INL does not receive an information request response, but receives other information that is sufficient to complete the record, the sentence “The INL has requested additional information for this event” and the “R” designation are removed.

Appendix E

General Information

Appendix E
General Information

Table E-1. NRC Regions and Agreement States

NRC Region I	NRC Region III	Agreement States			
Alabama	Illinois	Alabama	10/1/1966	Utah	4/1/1984
Connecticut	*Indiana*	Arizona	5/16/1967	Virginia	3/31/2009
Delaware	Iowa	Arkansas	7/1/1963	Washington	12/31/1966
District of Columbia	*Michigan*	California	9/1/1962	Wisconsin	8/11/2003
Florida	Minnesota	Colorado	2/1/1968		
Georgia	*Missouri* (NPP = RIV)	Florida	7/1/1964		
Kentucky	Ohio	Georgia	12/15/1969		
Maine	Wisconsin	*Idaho	*10/1/1968–4/26/1991*		
Maryland		Illinois	6/1/1987		
Massachusetts	**NRC Region IV**	Iowa	1/1/1986		
New Hampshire	*Alaska*	Kansas	1/1/1965		
New Jersey	Arizona	Kentucky	3/26/1962		
New York	Arkansas	Louisiana	10/1/1966		
North Carolina	California	Maine	4/1/1992		
Pennsylvania	Colorado	Maryland	1/1/1971		
Puerto Rico	*Guam*	Massachusetts	3/21/1997		
Rhode Island	*Hawaii*	Minnesota	3/31/2006		
South Carolina	*Idaho*	Mississippi	7/1/1962		
Tennessee	Kansas	Nebraska	10/1/1966		
Vermont	Louisiana	Nevada	7/1/1972		
Virgin Islands	Mississippi	New Hampshire	5/16/1966		
Virginia	*Montana*	New Jersey	9/30/2009		
West Virginia	Nebraska	New Mexico	5/1/1974		
	Nevada	New York	10/15/1962		
	New Mexico	North Carolina	8/1/1964		
	North Dakota	North Dakota	9/1/1969		
	Oklahoma	Ohio	8/31/1999		
	Oregon	Oklahoma	9/29/2000		
	South Dakota	Oregon	7/1/1965		
	Texas	Pennsylvania	3/31/2008		
	Utah	Rhode Island	1/1/1980		
	Washington	South Carolina	9/15/1969		
	Wyoming	Tennessee	9/1/1965		
		Texas	3/1/1963		

State = NRC Regulated

* Agreement State Status Terminated

Table E-2. NRC Program Codes

CODE	DESCRIPTION
01100	Academic Broad - Type A
01110	Academic Broad - Type B
01120	Academic Broad - Type C
02110	Medical Institution Broad
02120	Medical Institution - Limited Scope - Written Directive Required
02121	Medical Institution - Limited Scope - Written Directive Not Required
02200	Medical Private Practice - Written Directive Required
02201	Medical Private Practice - Written Directive Not Required
02210	Eye Applicators Sr-90
02220	Mobile Medical Service - Written Directive Not Required
02230	High Dose Rate Remote Afterloader
02231	Mobile Medical Service - Written Directive Required
02240	Medical Therapy - Other Emerging Technology
02300	Teletherapy
02310	Gamma Stereotactic Radiosurgery
02400	Veterinary - Non-Human Subjects
02410	In-Vitro Testing Laboratories
02500	Nuclear Pharmacies
02511	Medical Product Distribution - 32.72 Prepared Radiopharmaceuticals
02512	Medical Product Distribution - 32.72 Prepared Radiopharmaceuticals - Non-profit
02513	Medical Product Distribution - 32.74 Sources And Devices
03110	Well Logging - Byproduct and/or SNM Tracer and Sealed Sources
03111	Well Logging - Byproduct and/or SNM Sealed Sources Only
03112	Well Logging - Byproduct Only - Tracers Only
03113	Field Flooding Studies
03120	Measuring Systems - Fixed Gauges
03121	Measuring Systems - Portable Gauges
03122	Measuring Systems - Analytical Instruments
03123	Measuring Systems - Gas Chromatographs
03124	Measuring Systems – Other
03211	Manufacturing and Distribution Broad - Type A
03212	Manufacturing and Distribution Broad - Type B
03213	Manufacturing and Distribution Broad - Type C
03214	Manufacturing and Distribution Other
03218	Nuclear Laundry
03219	Decontamination Services
03220	Leak Test Service Only
03221	Instrument Calibration Service Only - Source <= 100 Curies
03222	Instrument Calibration Service Only - Source > 100 Curies
03223	Leak Test and Instrument Calibration Service - Source > 100 Curies

CODE	DESCRIPTION
03224	Leak Test and Instrument Calibration Service - Source > 100 Curies
03225	Other Services - Source <= 100 Curies
03231	Waste Disposal (Burial)
03232	Waste Disposal Service - Prepackaged Only
03233	Waste Disposal Service – Incineration
03234	Waste Disposal Service - Processing and/or Repackaging
03235	Incineration - Non-Commercial (Secondary Code)
03236	Waste Treatment Service (Other Than Compaction)
03240	General License Distribution - 32.51
03241	General License Distribution - 32.53
03242	General License Distribution - 32.57
03243	General License Distribution - 32.61
03244	General License Distribution - 32.71
03250	Exempt Distribution - 32.11 Exempt Concentrations and Items
03251	Exempt Distribution - 32.14 Certain Items
03252	Exempt Distribution - 32.17 Resins
03253	Exempt Distribution - 32.18 Small Quantities
03254	Exempt Distribution - 32.22 Self-Luminous Products
03255	Exempt Distribution - 32.26 Smoke Detectors
03256	Exempt Distribution - 32.21 C-14 Urea Capsules
03310	Industrial Radiography Fixed Location
03320	Industrial Radiograph Temporary Job Sites
03510	Irradiators - Self Shielded, <= 10,000 Curies
03511	Irradiators - Other, <= 10,000 Curies
03520	Irradiators - Self Shielded, > 10,000 Curies
03521	Irradiators - Other, > 10,000 Curies
03610	Research and Development Broad - Type A
03611	Research and Development Broad - Type B
03612	Research and Development Broad - Type C
03613	Research and Development Broad - Multisite - Multiregional
03620	Research and Development Other
03710	Civil Defense
03800	Byproduct Material Possession Only - Permanent Shutdown
03810	Byproduct Material Standby - No Operations
03900	Decommissioning of Byproduct Material Facilities
06100	Low Level Waste Storage at Reactor Sites
06101	Low-Level Waste Storage - Other (Secondary Code)
11100	Mills
11200	Source Material - Other, Less Than 150 Kilograms
11210	Source Material – Shielding
11220	Source Material - Military Munitions, Indoor Testing

CODE	DESCRIPTION
11221	Source Material - Military Munitions, Outdoor Testing
11230	Source Material - General License Distribution - 40.34
11300	Source Material - Other, Greater Than 150 Kilograms
11400	Uranium Hexafluoride (UF6) Production Plants
11500	In Situ Leach Recovery Facilities
11600	Heap Leach, Ore Buying Stations, and Byproduct Recovery
11700	Rare Earth Extraction And Processing
11800	Source Material - Possession Only, Permanent Shutdown
11810	Source Material - Standby, No Operations
11900	Decommissioning of Source Material Facilities
21130	Hot Cell Operations
21135	Decommissioning of Advanced Fuel R&D and Pilot Plants
21200	Uranium Enrichment Plants
21210	Uranium Fuel Processing Plants
21215	Decommissioning of Uranium Fuel Fabrication Plants
21240	Uranium Fuel R&D and Pilot Plants
21310	Critical Mass Material – University
21320	Critical Mass Material - Other Than Universities
21325	Decommissioning of Critical Mass - Other Than Fuel Fabrication
22110	SNM Plutonium - Unsealed, Less Than Critical Mass
22111	SNM U-235 and/or U-233 - Unsealed, Less Than Critical Mass
22120	SNM Plutonium - Sealed Neutron Sources, Less Than 200 Grams
22130	Power Sources with Byproduct
22140	SNM Plutonium - Sealed Sources in Devices
22150	SNM Plutonium - Sealed Sources, Less Than Critical Mass
22151	SNM, U-235 and/or U-233 Sealed Sources, Less Than Critical Mass
22160	Pacemaker - Byproduct and/or SNM, Medical Institution
22161	Pacemaker - Byproduct and/or SNM, Individual
22162	Pacemaker - Byproduct and/or SNM, Manufacturing and Distribution
22170	SNM General License Distribution - 70.39
22200	Decommissioning of Other SNM Facilities - Less Than Critical Mass
23100	Fresh Fuel Storage at Reactor Sites
23200	Interim Spent Fuel Storage
23300	SNM Possession Only (Non-Fuel) – Permanent Shutdown
23310	SNM Standby (Non-Fuel) - No Operations
25110	Transport - Private Carriage
41000	Reactor
NA	Not Applicable
NR	Not Reported

Table E-3. Medical Event Patient Information Coding Guidelines

"X" denotes required information; enter "NA" into the shaded fields.

PROCEDURE	EXPNUMBR	PERIDNO	PATINFO	DATEINFO	PROCINTD	PROCGVN	DOSEINTD	DOSEGVN	PCTUNDEX	PCTOVREX	ORGNINTD	ORGNGVN	STDINTD	STDYGVN	CHEMINTD	CHEMGVN	ISOTINTD	ISOTGVN	MCIINTD	MCIGVN	CONSEQNC
Brachy, Eye Applicator	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X
Brachy, Intravascular	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X
Brachy, Manual Afterloader	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X
Brachy, Manual Implant	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X
Brachy, Remote Afterloader, HDR	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X
Brachy, Remote Afterloader, LDR	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X
Brachy, Remote Afterloader, MDR	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X
Brachy, Type Not Reported	X	X	X	X	X	X	X	X	X	X	X	X					X	X	X	X	X
Gamma Knife	X	X	X	X	X	X	X	X	X	X	X	X									X
Teletherapy	X	X	X	X	X	X	X	X	X	X	X	X									X
Radiolabeled Antibodies	X	X	X	X	X	X					X	X	X	X	X	X	X	X	X	X	X
Radiopharmaceutical-T	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
Sodium Iodide-T	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
Radiopharmaceutical-D	X	X	X	X	X	X							X	X	X	X	X	X	X	X	X
Sodium-Iodide-D	X	X	X	X	X	X			X	X			X	X	X	X	X	X	X	X	X
Sodium Iodide-A	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X

OTHER

Computerized Axial Tomography Scan
Linear Accelerator
Non-Radiological Diagnostic Test
Sonogram
Ultrasound
X-Ray

These include non-NRC regulated activities that have been involved in reportable medical events.

These are involved by:

(1) Mistakenly being performed instead of a scheduled NRC regulated procedure.
(2) Having an NRC regulated procedure mistakenly performed instead of the non-NRC regulated procedure that was scheduled.
(3) When a patient not scheduled for an NRC regulated procedure is mistakenly given an NRC regulated procedure.

When a non-NRC regulated procedure is involved, the applicable fields are defined by the associated NRC regulated procedure that was either intended or performed.

Appendix F

Code-Based Pick Lists

Appendix F
Code-Based Pick Lists

Table F-1. Cause Pick List (CAUSE) with Additional Explanation

CODE	DESCRIPTION
1	EQUIPMENT FAILURE - A condition resulting from the failure, malfunction, or deterioration of equipment, parts, or material.
1A	DEFECTIVE OR FAILED PART - Equipment that experienced a general failure including age-related failures.
1B	DESIGN, MANUFACTURING, OR INSTALLATION ERROR - Equipment failure resulting from a defect in design, manufacturing, or installation.
1C	MAINTENANCE PROBLEM - Equipment failure resulting from inadequate or improper maintenance. For example, use of the wrong lubricant, failure to perform preventive maintenance, or incorrect reassembly.
1D	MECHANICAL IMPACT - Equipment failure resulting from an impact other than from a vehicle accident.
1E	EQUIPMENT MISUSE - Equipment failure resulting from the incorrect selection of equipment or from the use of equipment in a fashion other than what it was designed for. For example, the inability to retract a radiography source due to the use of an incompatible guide tube.
2	PROCEDURE PROBLEM - A condition resulting from the lack of a procedure or an inadequate procedure.
2A	DEFECTIVE OR INADEQUATE PROCEDURE - A procedure that either contains an error or lacks something essential to ensure the successful performance of the activity.
2B	LACK OF PROCEDURE - No written procedure was in place to perform the activity.
3	HUMAN ERROR - A condition resulting from a human error, mistake, or oversight.
3A	INATTENTION TO DETAIL - Inadequate attention to the specific details of the task. For example, a technician properly followed patient identification procedures but inadvertently selected the wrong syringe and injected the wrong radiopharmaceutical.
3B	FAILURE TO FOLLOW PROCEDURE OR WRONG PROCEDURE USED - The failure to use or the inappropriate use of written instructions, procedures, or other documentation. For example, a technician failed to follow patient identification procedures and injected the wrong patient.
3C	COMMUNICATION PROBLEM - Inadequate presentation or exchange of information. For example, H3 fire control devices were inadvertently included in a shipment of non-radioactive material because of a lack of communication between the radiation safety officer and the shipping department.
3D	INADEQUATE TRAINING - Inadequate training (or no training) to enable a person to perform a desired task. For example, a moisture density gauge was lost when it fell from a truck because the technician was not properly trained in the requirements for securing the gauge.
3E	MANAGEMENT DEFICIENCY - Deficient managerial policies, administrative controls, work planning, resource allocation, or supervision. For example, a hospital does not have adequate controls in place to prevent janitorial staff from disposing of radioactive material in the non-radioactive trash.
4	EXTERNAL - A condition resulting from factors that are not under the control of the reporting organization or the suppliers of the failed equipment or service.
4A	WEATHER OR AMBIENT CONDITION - Unusual weather or ambient conditions, such as hurricanes, tornadoes, flooding, earthquake, and lightning.
4B	POWER FAILURE OR TRANSIENT - Power loss attributed to outside supplied power.
4C	EXTERNAL FIRE OR EXPLOSION - A fire or explosion external to the device in question; not necessarily external to the facility. For example, a fire at a manufacturing facility that damaged a fixed gauge.
4D	THEFT, SABOTAGE, OR VANDALISM

CODE	DESCRIPTION
4E	PATIENT INTERVENTION - Actions by a patient or human research subject, whether intentional or unintentional, such as dislodging or removing treatment devices or prematurely terminating the administration.
4F	PATIENT PROVIDED INADEQUATE INFORMATION - Although not patient intervention, this cause specifically addresses situations where a patient does not provide needed information. For example, a woman that refuses a pregnancy test before a nuclear medical procedure and later discovers that she is pregnant.
4G	PATIENT OTHER - This cause refers to medical events that are not caused by patient intervention and are beyond the control of the licensee (not cause 4E or 4F). For example, an intravascular brachytherapy procedure that could not be performed due to a patient's restrictive vasculature.
4H	VEHICLE ACCIDENT OR DEVICE STRUCK BY VEHICLE - This cause typically refers to accidents involving vehicles carrying radioactive material and gauges that have been run over by vehicles.
4I	INTENTIONAL VIOLATION - The case where an individual is well aware of particular requirements regarding radioactive material and deliberately disregards those requirements, possibly for malevolent purposes.
5	OTHER - The cause does not fit into any of the above categories. When the Other category is used, a description of the cause shall be provided in the event narrative.
5A	CONTAMINATED WORKER RECEIVED MEDICAL TREATMENT
5B	WELL LOGGING SOURCE ABANDONED DOWNHOLE
5C	RESIDENTIAL PATIENT WASTE - Radioactive medical waste found in residential trash. In such a case, it is assumed that the waste came from a patient discharged in accordance with applicable regulatory requirements.
6	NOT REPORTED - The cause was not provided or could not be determined.

Table F-2. Corrective Action Pick List (CORREC)

CODE	DESCRIPTION
001	NEW PROCEDURE WRITTEN
002	PROCEDURE MODIFIED
003	PERSONNEL RECEIVE NEW TRAINING
004	PERSONNEL RECEIVED ADDITIONAL TRAINING
005	PERSONNEL REPRIMANDED
006	PERSONNEL TERMINATED
007	PERSONNEL RECEIVE IMPROVED SUPERVISION
008	NEW EQUIPMENT OBTAINED
010	ENGINEERING CHANGE TO SYSTEM
011	REPAIRS MADE WITH ENGINEERING CHANGE TO SYSTEM
012	REPAIRS MADE WITHOUT ENGINEERING CHANGE TO SYSTEM
014	IMPROVE RADIOACTIVE MATERIAL LABELING AND HANDLING
015	IMPROVED PATIENT IDENTIFICATION VERIFICATION
016	NO CORRECTIVE ACTION TAKEN
018	NEW QUALITY MANAGEMENT PLAN
019	NOT REPORTED
021	EQUIPMENT RETURNED TO MANUFACTURER FOR REPAIR OR DISPOSAL
022	MANUFACTURER WILL NOTIFY CUSTOMERS OF DEFECT
023	MATERIAL DISPOSED OF AS WASTE
024	NEW PERSONNEL HIRED
025	INCREASED MONITORING BY OUTSIDE AGENCIES TO ENSURE COMPLIANCE
026	REFER TO USEC-O CORRECTIVE ACTION PLANS DATED 12/22/97 AND 01/13/98.
027	SOURCE ABANDONED ACCORDING TO PROCEDURE

Table F-3. Keyword Pick List (CLASCODE)

CODE	DESCRIPTION
D52	RAD MATERIAL IN LANDFILL/INCINERATOR/SCRAP METAL
D59	ORPHAN SOURCE
D76	MATERIAL LOST AND NOT FOUND
D77	MATERIAL LOST AND FOUND
D78	MATERIAL STOLEN AND NOT RECOVERED
D79	MATERIAL STOLEN AND RECOVERED
D80	MATERIAL FOUND
D83	GREATER THAN 10 CI - NOT H-3
D84	MALEVOLENT EVENT
D85	EMBRYO/FETUS OR NURSING CHILD DOSE
D89	MATERIAL LOST AND PARTIALLY FOUND
D90	MATERIAL STOLEN AND PARTIALLY RECOVERED
D91	TRILATERAL TO MEXICO
D92	TRILATERAL TO CANADA
D93	TRILATERAL FROM MEXICO

CODE	DESCRIPTION
D94	TRILATERAL FROM CANADA
D95	REVISED BYPRODUCT MATERIAL DEFINITION
D96	CONTAMINATED CONSUMER PRODUCT

Table F-4. Reference Document Pick List (SOURCCD)

CODE	DESCRIPTION
002	DAILY REPORT
003	ENFORCEMENT ACTION
004	EVENT NOTIFICATION
005	INSPECTION REPORT
006	LICENSEE REPORT
007	LER (REACTOR EVENT REPORT)
008	REGION REPORT
009	MORNING REPORT
010	NOTICE OF VIOLATION
011	PRELIMINARY NOTIFICATION
012	OTHER
013	CONSULTANT REPORT
014	ENFORCEMENT CONFERENCE
015	NRC LETTER
016	ORDER SUSPENDING LICENSE
017	NOTIFICATION OF SIGNIFICANT ENFORCEMENT ACTION
018	AGREEMENT STATE LETTER
019	ABNORMAL OCCURRENCE NUMBER
020	CONFIRMATORY ACTION LETTER
021	NRC NEWS ANNOUNCEMENT
022	EVENT NOTIFICATION REPORTED FROM AN AGREEMENT STATE
023	PRELIMINARY NOTIFICATION REPORTED FROM AN AGREEMENT STATE
024	MORNING REPORT FROM AN AGREEMENT STATE
025	INSPECTION REPORT, EPA
026	NRC INFORMATION NOTICE
027	ADAMS DOCUMENT PACKAGE
028	INES REPORT
029	OLD FCNMED ITEM NUMBER
097	AGREEMENT STATE EVENT REPORT
098	OLD REGIONAL LOG NUMBER AS SOURCE
099	OLD ITEM NUMBER

Appendix G

Standard Pick Lists

Appendix G
Standard Pick Lists

Table G-1. Radionuclide Pick List (ISOTOPE)

AC-225	BI-212	ER-169	IR-191	P-33	PU-OTH	SN-117M	TL-209
AC-226	BI-213	EU-152	IR-192	PA-231	PU-RA	SN-125	TL-210
AC-227	BI-214	EU-154	K-40	PA-233	RA-223	SNM	TM-170
AC-228	BR-82	EU-155	K-42	PA-234	RA-224	SR-82	TM-171
AG-105	C-11	F-18	KR-81M	PA-234M	RA-225	SR-85	U-232
AG-108M	C-14	FE-55	KR-85	PB-203	RA-226	SR-89	U-233
AG-110M	CA-45	FE-59	KR-87	PB-209	RA-228	SR-90	U-234
AG-111	CA-47	FR-221	LA-140	PB-210	RA-BE	TA-182	U-235
AM-241	CD-109	FR-223	LLW	PB-211	RB-82	TB-160	U-238
AM-243	CD-113M	GA-67	LU-177	PB-212	RB-86	TC-96	U-DEP
AM-BE	CD-115	GA-68	MAP	PB-214	RE-183	TC-97	UF4
AR-41	CD-115M	GD-153	MFP	PD-103	RE-184	TC-97M	UF6
AS-73	CE-139	GE-68	MN-52	PD-109	RE-186	TC-99	U-HE
AS-74	CE-141	GE-71	MN-54	PM-147	RE-188	TC-99M	U-IE
AS-76	CE-143	GE-77	MO-95	PM-149	RH-102M	TE-125M	U-LE
AS-77	CE-144	H-2	MO-99	PO-210	RH-105	TE-127	U-NAT
AT-215	CF-249	H-3	NA	PO-211	RN-219	TE-127M	U-OTH
AT-216	CF-252	HF-181	NA-22	PO-212	RN-220	TE-129	U-OXIDE
AT-217	CL-36	HG-197	NA-24	PO-213	RN-222	TE-129M	V-48
AT-218	CM-242	HG-203	NB-93M	PO-214	RU-103	TE-131M	W-181
AU-195	CM-244	HLW	NB-94	PO-215	RU-106	TE-132	W-185
AU-196	CO-56	HO-166	NB-95	PO-216	RU-97	TH-227	W-187
AU-198	CO-57	I-123	NI-59	PO-218	S-35	TH-228	XE-133
BA-131	CO-58	I-124	NI-63	PR-143	SB-121	TH-229	XE-135
BA-133	CO-60	I-125	NI-65	PT-191	SB-122	TH-230	Y-90
BA-135	CR-51	I-126	NORM	PT-193	SB-124	TH-231	Y-91
BA-135M	CS-131	I-129	NP-234	PT-193M	SB-125	TH-232	YB-169
BA-137M	CS-134	I-131	NP-237	PT-197	SC-46	TH-234	YB-175
BA-140	CS-135	I-132	NR	PU-238	SC-47	TH-NAT	ZN-65
BE-7	CS-136	I-133	O-15	PU-239	SC-48	TL-201	ZR-93
BI-206	CS-137	IN-111	OS-185	PU-240	SE-75	TL-204	ZR-95
BI-207	CU-64	IN-113M	OS-191	PU-241	SM-151	TL-206	
BI-210	DY-165	IN-114M	OS-193	PU-242	SM-153	TL-207	
BI-211	DY-166	IR-190	P-32	PU-BE	SN-113	TL-208	

Table G-2. Medical Event: Therapeutic Procedure Pick List (PROCEDUR)

BRACHY, EYE APPLICATOR
BRACHY, INTRAVASCULAR
BRACHY, MANUAL AFTERLOADER
BRACHY, MANUAL IMPLANT
BRACHY, REMOTE AFTERLOADER, HDR
BRACHY, REMOTE AFTERLOADER, LDR
BRACHY, REMOTE AFTERLOADER, MDR
BRACHY, TYPE NOT REPORTED
COMPUTER AXIAL TOMOGRAPHY SCAN
GAMMA KNIFE
LINEAR ACCELERATOR
NA
NON-RADIOLOGICAL DIAGNOSTIC TEST
NR
RADIOLABELED ANTIBODIES
RADIOPHARMACEUTICAL - D
RADIOPHARMACEUTICAL - T
SODIUM IODIDE – A
SODIUM IODIDE – D
SODIUM IODIDE – T
SONOGRAM
TELETHERAPY
ULTRASOUND
X-RAY

Table G-3. Medical Event: Organ Pick List (ORGANCD)

ANKLE	HAND	PERI-PROSTATIC TISSUE
ANUS	HEAD	PHARYNX
ARM	HEART	PROSTATE
AXILLA	HIP	RECTUM
BLADDER	HYPOPHARYNX	RIB
BONE	ILIUM	SEMINAL VESICLE
BONE MARROW	INTESTINE	SHOULDER
BRAIN	KIDNEY	SINUS CAVITY
BREAST	LABIA	SKIN
BRONCHUS	LARYNX	SPLEEN
BUTTOCKS	LEG	SPINE
CERVIX	LIPS	STOMACH
CHEEK	LIVER	SUPERCLAVICLE
CHEST	LUNG	THORAX
CHIN	LYMPH, ARMPIT	THYROID
COLON	NA	TONGUE
DUCT, BILE	NASOPHARYNX	TRACHEA
EAR	NECK	TRUNK
ELBOW	NOSE	URETHRA
ESOPHAGUS	NR	UTERUS
EYE	ORAL CAVITY	VAGINA
FACE	OVARIES	WHOLE BODY
FOOT	PELVIS	WRIST
GALLBLADDER	PENILE BULB	
GROIN	PERINEUM	

Table G-4. Medical Event: Radiopharmaceutical Pick List (CHEM)

AGGREGATED ALBUMIN	MEBROFENIN/CHOLETEC
ANTI-CEA MONOCLONAL ANTIBODY	MEDRONATE
APCITIDE/ACUTECT	MERTIATIDE
CHLORMERODRIN (NEOHYDRIN)	METASTRON
CHROMIC PHOSPHATE	METHYLENE DIPHOSPHONATE
COLLOID	MIBG (METAIODOBENZYL GUANIDINE
CYANOCOBALAMIN	MIBI (METHOXY ISOBUTYL ISONITR
DISIDA	MICROLITE (ALBUMIN COLLOID)
DISOFENIN/HEPATOLITE	MYOVIEW
DMSA (DIMERCAPTOSUCCINIC ACID)	NA
DTPA (DIETHYLTRIAMINE-PENTAACE	NR
EDTMP/QUADRAMET	OLEIC ACID
ETHYL CYSTEINATE	OXIDRONATE
FDG (FLUORODEOXYGLUCOSE)	PENTETREOTIDE
FERRIC CHLORIDE	PYROPHOSPHATE
FERRUS CITRATE	RBC (RED BLOOD CELLS)
GALLIUM CITRATE	ROSE BENGAL
GAS	SATUMOMAB PENDETIDE
GLUCEPHAT	SELENOMETHIONINE
GLUCOHEPTONATE	SESTAMIBI/CARDIOLITE
HIDA (N-(2,6-DIETHYLACETANILID	SODIUM CHROMATE
HIPPURAN (ORTHO-IODOHIPPURATE)	SODIUM IODIDE
HMPAO/CERETEC (HEXAMETHYL PROP	SODIUM PHOSPHATE SOLUTION
HSA (HUMAN SERUM ALBUMIN)	SPECTAMIN
HSA (HUMAN SERUN ALBUMIN)	SPERT/PERT (PERTECHNETATE-TCO4
HYDROXYMETHYLENE DIPHOSPHONATE	STRONTIUM CHLORIDE
IBRITUMOMAB TIUXETAN	STRONTIUM NITRATE
IMINODIACETATES	SULFUR COLLOID
LABELED ANTIBODY	TAGGED LEUKOCYTES
MAA (MACROAGGREGATED ALBUMIN)	TEBOROXIN
MAA/PULMOLITE (MACROAGGREGATED	THALLOUS CHLORIDE
MAG3 (MERCAPTO ACETYL TRIGLYCI	WBC (WHITE BLOOD CELLS)
MDP/MEDRONATE/OSTEOLITE	

Table G-5. Medical Event: Diagnostic Study Pick List (STUDYCD)

ADRENAL GLAND	LYMPHOSCINTIGRAPHY
ADRENAL MEDULLA	MECKELS DIVERTICULUM
BILIARY	MIRALUMA SCAN (BREAST IMAGING)
BILIARY LIVER	MUGA SCAN
BLADDER	MYOCARDIAL INFARCTION
BLADDER SCAN	MYOCARDIAL PERFUSION
BLOOD POOL	NA
BLOOD VOLUME	NEUROBLASTOMA
BONE	NR
BONE DENSITY	PARATHYROID
BONE MARROW	PERITONEAL SHUNT
BONE SCAN	PET SCAN
BRAIN	PULMONARY FUNCTION
BRAIN PERFUSION-SPECT	PULMONARY SYSTEM
BRAIN SCAN	RBC MASS SURVIVAL AND SEQUESTR
CARDIAC	RBC VOLUME MEASUREMENT
CARDIAC BLOOD	RENAL BLOOD FLOW
CARDIAC MUGA	RENAL-GLOMERULAR FILTRATION
CARDIAC PERFUSION	RENAL-TUBULAR FUNCTION (DMSA)
CARDIAC SCAN	RENAL-TUBULAR SECRETION (MAG3)
CARDIOIMAGING	RENOGRAM
CARDIOVASCULAR SYSTEM	SALIVARY GLAND
CISTERNOGRAM	SCHILLING TEST
CYSTOGRAM	SCINTIMAMMOGRAPHY
GALLBLADDER	SHUNTOGRAM
GALLIUM	SPLEEN
GASTRIC EMPTYING	SPLEEN SCAN
GASTROINTESTINAL BLEEDING	STOMACH SCAN
GASTROINTESTINAL SYSTEM	TESTICULAR
GATED BLOOD POOL	THERAPY
HEPATIC HEMANGIOMA	THROMBUS IMAGING STUDY
HEPATOBILIARY	THYROID CANCER WORK-UP
HODGKIN'S DISEASE EVALUATION	THYROID IMAGING
HYPERTHYROIDISM	THYROID UPTAKE MEASUREMENT
KIDNEY SCAN	TUMOR IMAGING
LIVER	VENTRICULOGRAM
LUNA V/Q	WHITE BLOOD CELL
LUNG	WHOLE BODY BONE
LUNG AEROSOL	WHOLE BODY I-131/THYROID
LUNG PERFUSION	X-RAY
LUNG VENTILATION	

Table G-6. Overexposure: Type of Dose Pick List (ORGDOSE)

BADGE ONLY
EXTREMITY, NON OCCUPATIONAL
EXTREMITY, OCCUPATIONAL
INTERNAL (CEDE), NON OCCUPATIONAL
INTERNAL (CEDE), OCCUPATIONAL
LENSES OF EYE, NON OCCUPATIONAL
LENSES OF EYE, OCCUPATIONAL
NR
ORGAN (CDE), NON OCCUPATIONAL
ORGAN (CDE), OCCUPATIONAL
SKIN, NON OCCUPATIONAL
SKIN, OCCUPATIONAL
WHOLE BODY, NON OCCUPATIONAL
WHOLE BODY, OCCUPATIONAL

Table G-7. Source of Radiation Pick List (COMPLKUP)

FUEL FABRICATION MATERIAL
FUEL PELLET
HOT PARTICLE
MICROSPHERES
MILL TAILINGS
NR
SEALED SOURCE BRACHYTHERAPY
SEALED SOURCE CAD/CAM
SEALED SOURCE CALIB/MARKER
SEALED SOURCE ECD
SEALED SOURCE GAMMA KNIFE
SEALED SOURCE GAUGE
SEALED SOURCE IONIZING
SEALED SOURCE IRRADIATOR
SEALED SOURCE LUMINOUS
SEALED SOURCE OTHER
SEALED SOURCE PACEMAKER
SEALED SOURCE RADIOGRAPHY
SEALED SOURCE TELETHERAPY
SEALED SOURCE WELL LOGGING
UNSEALED SOURCE GAS
UNSEALED SOURCE LAB
UNSEALED SOURCE LUMINOUS
UNSEALED SOURCE NORM
UNSEALED SOURCE OTHER
UNSEALED SOURCE RADIOPHARM
UNSEALED SOURCE SNM

Table G-8. Device/Associated Equipment Catetgoty Pick List (DEVCAT)

ID	DESCRIPTION
1	MEDICAL
2	RADIOGRAPHY
3	IRRADIATOR
4	TEST AND MEASURING
5	SELF LUMINOUS
6	CONTAINER
7	SCRAP/WASTE
8	WELL LOGGING
9	OTHER

Table G-9. Device/Assocaited Equipment Pick List (SYSTLKUP)

ID	DESCRIPTION	ID	DESCRIPTION
1	ACCELERATOR	3	IRRADIATOR PRODUCT CARRIER
1	APPLICATOR	3	RACK, SOURCE
1	CATHETER	3	RACK, STORAGE
1	COMPUTER, TREATMENT PLANNING	3	SOURCE CARRIER, OTHER
1	DOSE CALIBRATOR	4	ALARM, CRITICALITY
1	EYE APPLICATOR	4	ALARM, OTHER
1	GAMMA KNIFE UNIT	4	CALIBRATOR
1	IMAGING CAMERA	4	DETECTOR, AIRBORNE ACTIVITY
1	INTERLOCK, TELETHERAPY UNIT	4	DETECTOR, CHEMICAL AGENT
1	INTRAVASCULAR BRACHY UNIT	4	DETECTOR, LEAK
1	INTRAVASCULAR DRIVE MECHANISM	4	DETECTOR, OTHER
1	PACEMAKER	4	DETECTOR, RADIATION
1	PULMANARY STUDY MACHINE	4	DETECTOR, SMOKE
1	RADIOIMMUNOASSAY KIT	4	DOSIMETER, FILMBADGE
1	REMOTE AFTERLOADER DRIVE MECH	4	DOSIMETER, READER, TLD
1	REMOTE AFTERLOADER HDR	4	ELECTRON CAPTURE DETECTOR
1	REMOTE AFTERLOADER LDR	4	FLUORESCENCE ANALYZER
1	SEED RIBBON	4	FLUOROSCOPE
1	SOURCE CHANGER, HDR UNIT	4	GAS CHROMATOGRAPH
1	SYRINGE	4	GAUGE FIXED
1	TELETHERAPY UNIT	4	GAUGE PORTABLE
1	TELETHERAPY UNIT GANTRY ARM	4	LIQUID SCINTILLATION COUNTER
1	TUBING, INTRAVENOUS	4	MASS SPECTROMETER
1	VIAL	4	MONITOR, CHEMICAL AGENT
1	X-RAY UNIT	4	SHUTTER, GAUGE
2	CABLE, DRIVE	4	SOURCE HOLDER
2	CABLE, DRIVE CONNECTOR	4	STATIC ELIMINATOR
2	CAMERA, RADIOGRAPHY	5	INFLIGHT BLADE INDICATOR
2	COLLIMATOR, RADIOGRAPHY	5	MORTAR SIGHTING DEVICE
2	LOCK MECHANISM	5	RADIOLUMINESCENT ALIGNMENT DEV
2	SOURCE CHANGER, RADIOGRAPHY	5	RADIOLUMINESCENT COMPASS FACE
2	SOURCE GUIDE TUBE	5	RADIOLUMINESCENT DIAL
2	SOURCE PIGTAIL	5	RADIOLUMINESCENT EXIT SIGN
2	SOURCE RETRACTION MECHANISM	5	RADIOLUMINESCENT GUN SIGHT
3	CABLE, DRIVE, SOURCE RACK	5	RADIOLUMINESCENT LIGHT SOURCE
3	CABLE, OTHER	5	RADIOLUMINESCENT TELESCOPE
3	DOOR, LOAD CHAMBER	5	RADIOPHARMACEUTICAL GENERATOR
3	DRIVE MECHANISM, SOURCE RACK	5	SENSOR, MUZZLE REFERENCE
3	INTERLOCK, IRRADIATOR	6	CONTAINER, BOTTLE
3	IRRADIATOR	6	CONTAINER, CASK

ID	DESCRIPTION	ID	DESCRIPTION
6	CONTAINER, CASK, SHIPPING	9	ELECTRICAL DEVICE
6	CONTAINER, CASK, STORAGE	9	ELECTRONIC COMPONENT
6	CONTAINER, DRUM	9	FAN, EXHAUST
6	CONTAINER, OTHER	9	FILTER, EXHAUST
6	CONTAINER, OVERPACK	9	FILTER, HEPA
6	CONTAINER, PIG, LEAD	9	FILTER, OTHER
6	CONTAINER, POLYPACK	9	FILTER, PRE-FILTER
6	CONTAINER, SHIPPING	9	FIRE SUPPRESSION SYSTEM
6	CONTAINER, STORAGE	9	FISSION CHAMBER
6	CONTAINER, TYPE B	9	FREEZER-SUBLIMER
6	CONTAINER, WASTE	9	FUEL ASSEMBLY
6	CONTAMINATED METAL, SCRAP	9	FUEL ROD
6	PACKAGING, RADIOACTIVE MATERIA	9	FURNACE
6	TANK TRANSFER SYSTEM	9	FUSE
6	TANK, DIGESTION	9	GENERATOR, EMERGENCY ELECTRIC
6	TANK, ELECTROPHORESIS GEL	9	GENERATOR, NEUTRON
6	TANK, OTHER	9	GENERATOR, THERMOELECTRIC
6	TANK, RETENTION	9	GLASS, THORIATED, LENS
6	TANK, STORAGE	9	GLOVEBOX
6	TANK, STORAGE, UNDERGROUND	9	HOOD, EXHAUST
6	TANK, STORAGE, WASTE	9	HOOD, POWDER PREPARATION
6	TANK, WASTE, RADIOACTIVE	9	HOPPER, STORAGE
6	TANK, WATER SOFTENER	9	HOSE
6	VACUUM CLEANER	9	IGNITION EXCITER
7	WASTE, BIOHAZARDOUS	9	INCINERATOR
7	WASTE, HAZARDOUS	9	INSTRUMENT
7	WASTE, RADIOACTIVE	9	LINE, AMMONIUM UO2
8	WELL LOGGING TOOL	9	LINE, CONVERSION
9	AIRCRAFT PART, ENGINE PART	9	LINE, FEED
9	AIRCRAFT PART, NAV-TARGETING	9	LINE, SAMPLING
9	AUTOCLAVE	9	LINE, TRANSFER
9	BREAKER	9	LINE, UF6
9	CASCADE DATA PROCESSING SYSTEM	9	LINER, POND
9	CELL, GDP UF6	9	MANUAL AFTERLOADER
9	COLLIMATOR, OTHER	9	METAL, DEPLETED URANIUM
9	COMPUTER SOFTWARE	9	METAL, ROD
9	CONTROL UNIT SYSTEM	9	METAL, SCRAP
9	CYLINDER, UF6 PRODUCT	9	METAL, SCRAP, ALUMINUM
9	DISSOLVER	9	MICROFILTRATION SYSTEM
9	DUCTWORK	9	MOTOR
9	DUST COLLECTION SYSTEM	9	ORE

ID	DESCRIPTION	ID	DESCRIPTION
9	O-RING	9	SHIELD, VIAL
9	PIPE	9	SPRINKLER SYSTEM
9	POND, EVAPORATION	9	SWITCH
9	PROTECTIVE DEVICES	9	TRANSFER SYSTEM
9	PROTECTIVE SYSTEMS	9	TRANSFORMER
9	PUMP	9	TUBE
9	RELAY	9	TURBINE PARTS
9	RING, RASCHIG	9	UF6 PROCESS
9	SAND/DIRT/SOIL	9	UF6 RELEASE SAFETY SYSTEM
9	SEAL	9	VALVE
9	SHIELD, DEPLETED URANIUM	9	VAPORIZER
9	SHIELD, LEAD	9	VENTILATION SYSTEM
9	SHIELD, OTHER	9	WELL

Appendix H

Reporting Requirements

Appendix H
Reporting Requirements

There are many CFR reporting requirements not captured in NMED because they describe events that are not considered to be material events (for example, 26.73 fitness for duty reports, which involve alcohol, controlled substances, etc., within controlled areas). Additionally, the reporting requirements captured in NMED focus on those CFRs that describe the reportable condition of a material event, not those that just describe how and when the report is to be made. In the tables that follow, the CFRs that are labeled represent CFR reporting criteria that are captured in the database.

10 CFR 20: Standards for Protection Against Radiation

	20.1906 Procedures for receiving and opening packages (d) **Immediate Notifications**:
20.1906(d)(1)	(1) **Removable surface contamination** exceeds the limits of 71.87(i) [refers to 49 CFR 173.443 - beta, gamma, and low toxicity alpha emitters 4 Bq/cm^2, 10^{-4} mCi/cm^2, or 220 dpm/cm^2, all other alpha emitters 0.4 Bq/cm^2, 10^{-5} mCi/cm^2, or 22 dpm/cm^2]; or
20.1906(d)(2)	(2) **External radiation levels** exceed the limits of 71.47 [2 mSv/hr (200 mrem/hr) on package surface and transport index 10 (10 mrem/hr at 1 meter), 0.2 mSv/hr (2 mrem/hr) in occupied space unless wearing dosimetry]. Greater limits apply for exclusive use shipments.
NOTE	***Low toxicity alpha emitters*** *means natural uranium, depleted uranium, natural thorium; uranium-235, uranium-238, thorium-232, thorium-228 or thorium-230 when contained in ores or physical or chemical concentrates or tailings; or alpha emitters with a half-life of less than 10 days.*
	20.2201 Reports of theft or loss of licensed material. (a) **Telephone reports**. (1) Each licensee shall report by telephone as follows:
20.2201(a)(1)(i)	(i) **Immediately** after its occurrence becomes known to the licensee, any **lost, stolen, or missing** licensed material in an aggregate quantity **equal to or greater than 1,000** times the quantity specified in Appendix C to 10 CFR 20 under such circumstances that it appears to the licensee that an exposure could result to persons in unrestricted areas; or
20.2201(a)(1)(ii)	(ii) **Within 30 days** after the occurrence of any **lost, stolen, or missing** licensed material becomes known to the licensee, all licensed material in a quantity **greater than 10** times the quantity specified in Appendix C to 10 CFR 20 that is still missing at this time.
NOTE	*NMED codes actual loss events without regard to subjective statements such as "exposure could result" for 20.2201(a)(1)(i), or whether the material was found within the 3- day window for 20.2201(a)(1)(ii).* (b) **Written reports**. (1) Each licensee required to make a report under paragraph (a) of this section shall, **within 30 days** after making the telephone report, make a written report...

	20.2202 Notification of incidents.
	(a) **Immediate notification**. Notwithstanding any other requirements for notification, each licensee shall immediately report any event involving **byproduct, source, or special nuclear material** possessed by the licensee that may have caused or threatens to cause any of the following conditions --
	(1) An individual to receive:
20.2202(a)(1)(i)	(i) A total effective dose equivalent of **25 rems** (0.25 Sv) or more; or
20.2202(a)(1)(ii)	(ii) A lens dose equivalent of **75 rems** (0.75 Sv) or more; or
20.2202(a)(1)(iii)	(iii) A shallow-dose equivalent to the skin or extremities of **250 rads** (2.5 Gy) or more; or
20.2202(a)(2)	(2) The **release of radioactive material**, inside or outside of a restricted area, so that, had an individual been **present for 24 hours**, the individual could have received an **intake five times the annual limit on intake** (the provisions of this paragraph do not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures).
	(b) **Twenty-four hour notification**. Each licensee shall, within 24 hours of discovery of the event, report any event involving loss of control of licensed material possessed by the licensee that may have caused, or threatens to cause, any of the following conditions:
	(1) An individual to **receive, in a period of 24 hours**:
20.2202(b)(1)(i)	(i) A total effective dose equivalent exceeding **5 rems** (0.05 Sv); or
20.2202(b)(1)(ii)	(ii) A lens dose equivalent exceeding **15 rems** (0.15 Sv); or
20.2202(b)(1)(iii)	(iii) A shallow-dose equivalent to the skin or extremities exceeding **50 rems** (0.5 Sv); or
20.2202(b)(2)	(2) The **release of radioactive material**, inside or outside of a restricted area, so that, had an individual been **present for 24 hours**, the individual could have received an **intake in excess of one occupational annual limit on intake** (the provisions of this paragraph do not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures).

	20.2203 Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the constraints or limits.
	(a) Reportable events. In addition to the notification required by 20.2202, each licensee shall submit a **written report within 30 days** after learning of any of the following occurrences:
	(1) Any incident for which notification is required by 20.2202; or
	(2) **Doses in excess** of any of the following:
20.2203(a)(2)(i)	(i) The occupational dose limits for **adults** in 20.1201 [Annual: 5 rem TEDE; 50 rem organ DDE + CDE, 15 rem lense dose eq., or 50 rem shallow dose eq. to skin/extremity], or
20.2203(a)(2)(ii)	(ii) The occupational dose limits for a **minor** in 20.1207; [10% of adult; Annual: 500 mrem TEDE; 5 rem DDE + CDE to organ, 1.5 rem lense does eq., or 5 rem shallow dose eq. to skin/extremity] or
20.2203(a)(2)(iii)	(iii) The limits for an **embryo/fetus** of a declared pregnant woman in 20.1208 [500 mrem entire pregnancy; DDE of DPW + dose eq. of embryo/fetus from radionuclides in embryo/fetus + DPW], or
20.2203(a)(2)(iv)	(iv) The limits for an individual member of the **public** in 20.1301 [Annual: 100 mrem TEDE or 2 mrem/hr unrestricted area dose rate] ; or
20.2203(a)(2)(v)	(v) Any applicable limit in the license; or
20.2203(a)(2)(vi)	(vi) The ALARA constraints for air emissions established under 20.1101(d) [Annual 10 mrem TEDE to member of public, excluding Radon 222 and daughters]
	(3) Levels of radiation or concentrations of radioactive material in:
20.2203(a)(3)(i)	(i) A **restricted area** in excess of any applicable **limit in the license**; or
20.2203(a)(3)(ii) **NMED Metric**	(ii) An **unrestricted area** in excess of **10 times** any applicable limit set forth in this part or in the license (whether or not involving exposure of any individual in excess of the limits in 20.1301); or
20.2203(a)(4)	(4) For licensees subject to the provisions of EPA's generally applicable environmental radiation standards in 40 CFR 190, levels of radiation or releases of radioactive material in excess of those standards, or of license conditions related to those standards. [40 CFR 190.10 - dose eq. does not exceed 25 mrem whole body, 75 mrem thyroid, and 25 mrem any other organ of member of public from exposures to planned RAM discharges to environment, excluding radon and its daughters, from uranium fuel cycle operations and to radiation from these operations.]

10 CFR 21: Reporting of Defects and Noncompliance

	21.21 Notification of failure to comply or existence of a defect and its evaluation.
	(a) Each individual, corporation, partnership, dedicating entity, or other entity subject to the regulations in this part shall adopt appropriate procedures to:
	(2) Ensure that if an evaluation of an identified deviation or failure to comply potentially associated with a substantial safety hazard cannot be completed within 60 days from discovery of the deviation or failure to comply, an **interim report** is prepared and submitted to the Commission... within **60 days** of discovery of the deviation or failure to comply.
	(d) (1) A director or responsible officer subject to the regulations of this part or a person designated under 21.21(c)(5) must notify the Commission when he or she obtains information reasonably indicating a **failure to comply or a defect affecting** --
21.21(d)(1)(i)	(i) The **construction or operation of a facility or an activity** within the United States that is subject to the licensing requirements under parts 30, 40, 50, 60, 61, 70, 71, or 72 of this chapter and that is within his or her organization's responsibility; or
21.21(d)(1)(ii)	(ii) A **basic component** that is within his or her organization's responsibility and is supplied for a facility or an activity within the United States that is subject to the licensing requirements under parts 30, 40, 50, 60, 61, 70, 71, or 72 of this chapter.
	(3) Notification required by paragraph (d)(1) of this section must be made as follows --
	(i) **Initial notification**... **within two days** following receipt of information by the director... This paragraph does not apply to interim reports described in 21.21(a)(2).
	(ii) **Written notification** to the NRC **within 30 days** following receipt of information by the director...

10 CFR 30: Rules of General Applicability to Domestic Licensing of Byproduct Material

	30.50 Reporting requirements.
30.50(a)	(a) **Immediate report**. Each licensee shall notify the NRC **as soon as possible** but not later than **4 hours** after the discovery of an event that **prevents immediate protective actions** necessary to **avoid exposures** to radiation or radioactive materials that could exceed regulatory limits or **releases of licensed material** that could exceed regulatory limits (events may include fires, explosions, toxic gas releases, etc.). (b) **Twenty-four hour report**. Each licensee shall notify the NRC within **24 hours** after the discovery of any of the following events involving licensed material:
30.50(b)(1)	(1) An unplanned **contamination** event that: (i) Requires access to the contaminated area, by workers or the public, to be **restricted for more than 24 hours** by imposing additional radiological controls or by prohibiting entry into the area; (ii) Involves a quantity of material **greater than five times the lowest annual limit on intake** specified in Appendix B of 20.1001 - 20.2401 of 10 CFR 20 for the material; and (iii) Has access to the **area restricted** for a reason **other than** to allow isotopes with a half-life of less than 24 hours to decay prior to decontamination.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*
30.50(b)(2)	(2) An event in which **equipment** is disabled or fails to function as designed when: (i) The equipment is required by regulation or license condition to **prevent releases** exceeding regulatory limits, to **prevent exposures** to radiation and radioactive materials exceeding regulatory limits, or to **mitigate the consequences of an accident**; (ii) The equipment is required to be **available and operable** when it is disabled or fails to function; and (iii) **No redundant equipment** is available and operable to perform the required safety function.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*

30.50(b)(3)	(3) An event that requires **unplanned medical treatment** at a medical facility of an individual with **spreadable radioactive contamination** on the individual's clothing or body.
30.50(b)(4)	(4) An unplanned **fire or explosion** damaging any licensed material or any device, container, or equipment containing licensed material when: (i) The quantity of material involved is greater than **five times the lowest annual limit** on intake specified in Appendix B of 20.1001 - 20.2401 of 10 CFR 20 for the material; and (ii) The damage affects the **integrity** of the licensed **material or its container**. (c) Preparation and submission of reports. Reports made by licensees in response to the requirements of this section must be made as follows: (1) Licensees shall make reports required by paragraphs (a) and (b) of this section by **telephone** to the NRC Operations Center. (2) **Written report**. Each licensee who makes a report required by paragraph (a) or (b) of this section shall submit a written follow-up report **within 30 days** of the initial report. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement.... (3) The provisions of 30.50 **do not apply** to licensees subject to the notification requirements in **50.72**. They **do apply to those part 50 licensees possessing material licensed under part 30**, who are not subject to the notification requirements in 50.72.
NOTE	*Until 10/1/2006, (i) and (ii) were coded individually.*
	30.55 Tritium reports.
30.55(c)	(c) Except as specified in paragraph (d) of this section, each licensee who is authorized to possess tritium shall report **promptly**... any incident in which an attempt has been made or is believed to have been made to commit a **theft or unlawful diversion** of **more than 10 curies** of such material at any one time or **more than 100 curies** of such material in any one calendar year. The initial report shall be followed within a period of **15 days by a written report**...
NOTE	*NMED pairs 30.55(c) with 20.2201(a)(1)(i).* (d) The reports described in this section are **not required for tritium possessed pursuant to a general license** provided in part 31 of this chapter **or for tritium contained in spent fuel.**

10 CFR 31: General Domestic Licenses for Byproduct Material

	31.5 Certain detecting, measuring, gauging, or controlling devices and certain devices for producing light or an ionized atmosphere (c) Any person who acquires, receives, possesses, uses or transfers byproduct material in a device pursuant to the general license in paragraph (a) of this section:
31.5(c)(5)	(5) Shall immediately suspend operation of the device if there is a **failure of, or damage to**, or any indication of a possible failure of or damage to, the **shielding** of the radioactive material or the **on-off mechanism or indicator**, or upon the detection of 185 bequerel **(0.005 microcurie) or more removable radioactive material**... A report... must be furnished... within **30 days**...

10 CFR 34: Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations

	34.27 Leak testing and replacement of sealed sources
34.27(d)	(d) Any test conducted pursuant to paragraph (c) of this section which reveals the presence of 185 Bq **(0.005 microcurie) or more of removable radioactive material** must be considered evidence that the sealed source is leaking... A **report** must be filed... **within 5 days** of the test.
	34.101 Notifications.
	(a) **In addition to the reporting requirements specified in 30.50** and under other sections of this chapter, such as 21.21, each licensee shall send a **written report**... **within 30 days** of the occurrence of any of the following incidents involving radiographic equipment:
34.101(a)(1)	(1) Unintentional **disconnection of the source assembly** from the control cable;
34.101(a)(2)	(2) **Inability to retract the source** assembly to its fully shielded position and secure it in this position; or
34.101(a)(3)	(3) **Failure of any component** (critical to safe operation of the device) to properly perform its intended function;

10 CFR 35: Medical Use of Byproduct Material (Superseded 10/24/2002)

	35.33 Notifications, reports, and records of misadministrations.
	(a) For a misadministration:
35.33(a)(1)	(1) The licensee shall notify by **telephone** the NRC Operations Center no later than the **next calendar day** after discovery of the misadministration.
35.33(a)(2)	(2) The licensee shall submit a **written report** to the appropriate NRC Regional Office listed in 10 CFR 30.6 **within 15 days** after discovery of the misadministration.
	Misadministration codes
	1) A **radiopharmaceutical** dosage **greater than 30 microcuries** of:
-1A	A) sodium iodide **I-125** involving the **wrong patient**.
-1B	B) sodium iodide **I-125** involving the **wrong radiopharmaceutical**.
-1C	C) sodium iodide **I-131** involving the **wrong patient**.
-1D	D) sodium iodide **I-131** involving the **wrong radiopharmaceutical**.
-1E	E) sodium iodide **I-125** when both the **administered dosage differs from the prescribed dosage by more than 20 percent of the prescribed dosage** and the **difference between the administered dosage and prescribed dosage exceeds 30 microcuries**.
-1F	F) sodium iodide **I-131** when both the **administered dosage differs from the prescribed dosage by more than 20 percent of the prescribed dosage** and the **difference between the administered dosage and prescribed dosage exceeds 30 microcuries**.
	2) A **therapeutic** radiopharmaceutical dosage, **other than sodium iodide I - 125 or I - 131**, involving:
-2A	A) the **wrong patient**.
-2B	B) the **wrong radiopharmaceutical**.
-2C	C) the wrong **route of administration**.
-2D	D) an **administered dosage that differs from the prescribed dosage by more than 20 percent of the prescribed dosage**.
	3) A **gamma stereotactic radiosurgery dose** involving:
-3A	A) the **wrong patient**.
-3B	B) the **wrong treatment site**.
-3C	C) a **calculated total administered dose that differs from the total prescribed dose by more than 10 percent of the total prescribed dose**.

	4) A **teletherapy radiation dose** involving:
-4A	A) the **wrong patient**.
-4B	B) the **wrong mode of treatment**.
-4C	C) the **wrong treatment site**.
-4D	D) a treatment that consists of **three or fewer fractions** and the **calculated total administered dose differs from the total prescribed dose by more than 10 percent of the total prescribed dose**.
-4E	E) a **calculated weekly administered dose that exceeds the weekly prescribed dose by 30 percent or more of the weekly prescribed dose**.
-4F	F) a **calculated total administered dose differs from the total prescribed dose by more than 20 percent of the total prescribed dose**.
	5) A **brachytherapy radiation dose** involving:
-5A	A) the **wrong patient**.
-5B	B) the **wrong radioisotope**.
-5C	C) the **wrong treatment site** (excluding, for permanent implants, seeds that were implanted in the correct site but migrated outside the treatment site).
-5D	D) a **sealed source that is leaking**.
-5E	E) a **temporary implant**, when one or more sealed **sources are not removed** upon completion of the procedure.
-5F	F) a **calculated administered dose that differs from the prescribed dose by more than 20 percent of the prescribed dose**.
	6) A diagnostic radiopharmaceutical dosage, other than quantities **greater than 30 microcuries of either sodium iodide I - 125 or I - 131**,
	with the dose to the patient **exceeding 5 rem** effective dose equivalent, involving:
-6A	A) the **wrong patient**.
-6B	B) the **wrong radiopharmaceutical**.
-6C	C) the **wrong route of administration**.
-6D	D) an **administered dosage that differs from the prescribed dosage**
	with the dose to the patient **exceeding 50 rem** dose equivalent to any **individual organ**, involving:
-6E	E) the **wrong patient**.
-6F	F) the **wrong radiopharmaceutical**.
-6G	G) the **wrong route of administration**.
-6H	H) an **administered dosage that differs from the prescribed dosage**.

35.59(e)	**35.59 Requirements for possession of sealed sources and brachytherapy sources.** (e) If the leakage test reveals the presence of 0.005 microcurie or more of removable contamination, the licensee shall: (1) Immediately withdraw the sealed source from use and store it in accordance with the requirements in parts 20 and 30 of this chapter; and (2) File a **report within five days**... (f) A licensee need not perform a leakage test on the following sources: (1) Sources containing only byproduct material with a **half-life of less than 30 days**; (2) Sources containing only byproduct material as a **gas**; (3) Sources containing **100 microcuries or less of beta or gamma- emitting** material or **10 microcuries or less of alpha-emitting** material; (4) Sources **stored and not being used**. The licensee shall, however, test each such source for leakage before any use or transfer unless it has been leakage-tested within six months before the date of use or transfer; and (5) Seeds of **iridium-192 encased in nylon ribbon**.

10 CFR 35: Medical Use of Byproduct Material (Effective 10/24/2002)

	35.67 Requirements for possession of sealed sources and brachytherapy sources.
35.67(e)	(e) If the leak test reveals the presence of 185 Bq **(0.005 microcurie) or more of removable contamination**, the licensee shall-- (1) Immediately withdraw the sealed source from use and store, dispose, or cause it to be repaired in accordance with the requirements in parts 20 and 30 of this chapter; and (2) File a **report within 5 days** of the leak test in accordance with Sec. 35.3067. (f) A licensee need not perform a leakage test on the following sources: (1) Sources containing only byproduct material with a **half-life of less than 30 days**; (2) Sources containing only byproduct material as a **gas**; (3) Sources containing 3.7 MBq **(100 microcuries) or less of beta or gamma-**emitting material or 0.37 MBq **(10 microcuries) or less of alpha-**emitting material; (4) Seeds of **iridium-192 encased in nylon ribbon**; and (5) Sources **stored and not being used**. However, the licensee shall test each such source for leakage before any use or transfer unless it has been leakage-tested within six months before the date of use or transfer.

	35.3045 Report and notification of medical events
	(a) A licensee shall report any event, except for an event that results from **patient intervention**, in which the administration of byproduct material or radiation from byproduct material results in
	(1) A **dose that differs** from the prescribed dose or dose that would have resulted from the prescribed dosage by **more than** 0.05 Sv (**5 rem**) effective dose equivalent, 0.5 Sv (**50 rem**) to an organ or tissue, or 0.5 Sv (**50 rem**) shallow dose equivalent to the skin; and [**for an intended site**]
35.3045(a)(1)(i)	(i) The total dose delivered differs from the prescribed dose by **20 percent or more**;
35.3045(a)(1)(ii)	(ii) The total dosage delivered differs from the prescribed dosage by **20 percent or more** or falls outside the prescribed dosage range; or
35.3045(a)(1)(iii)	(iii) The **fractionated dose** delivered differs from the prescribed dose, for a single fraction, by **50 percent or more**.
NOTE	*35.3045(a)(1)* ***requires a written directive*** *to be a medical event.*
	(2) A **dose that exceeds** 0.05 Sv (**5 rem**) effective dose equivalent, 0.5 Sv (**50 rem**) to an organ or tissue, or 0.5 Sv (**50 rem**) shallow dose equivalent to the skin from any of the following **[for an intended site]**
35.3045(a)(2)(i)	(i) An administration of a **wrong radioactive drug** containing byproduct material;
35.3045(a)(2)(ii)	(ii) An administration of a radioactive drug containing byproduct material by the **wrong route** of administration;
35.3045(a)(2)(iii)	(iii) An administration of a dose or dosage to the **wrong individual** or human research subject;
35.3045(a)(2)(iv)	(iv) An administration of a dose or dosage delivered by the **wrong mode** of treatment; or
35.3045(a)(2)(v)	(v) A **leaking sealed source**.
NOTE	*35.3045(a)(2)* ***does not require a written directive*** *to be a medical event.*
35.3045(a)(3)	(3) A dose to the skin or an organ or tissue **other than the treatment site** that **exceeds** by 0.5 Sv (**50 rem**) to an organ or tissue and **50 percent or more** of the dose expected from the administration defined in the written directive (excluding, for permanent implants, seeds that were implanted in the correct site but migrated outside the treatment site).
NOTE	*35.3045(a)(3)* ***requires a written directive*** *to be a medical event.*
35.3045(b)	(b) A licensee shall report any event resulting from **intervention of a patient** or human research subject in which the administration of byproduct material or radiation from byproduct material results or will result in unintended **permanent functional damage** to an organ or a physiological system, as determined by a physician.
	(c) The licensee shall notify by **telephone**... no later than the **next calendar day** after discovery of the medical event.
	(d) The licensee shall submit a **written report... within 15 days** after discovery of the medical event.

	35.3047 Report and notification of a dose to an embryo/fetus or a nursing child
35.3047(a)	(a) A licensee shall report any dose to an **embryo/fetus** that is **greater than** 50 mSv (**5 rem**) dose equivalent that is a result of an administration of byproduct material or radiation from byproduct material to a pregnant individual unless the dose to the embryo/fetus was specifically approved, in advance, by the authorized user.
	(b) A licensee shall report any dose to a **nursing child** that is a result of an administration of byproduct material to a breast-feeding individual that--
35.3047(b)(1)	(1) Is **greater than** 50 mSv (**5 rem**) total effective dose equivalent; or
35.3047(b)(2)	(2) Has resulted in unintended **permanent functional damage** to an organ or a physiological system of the child, as determined by a physician.
	(c) The licensee shall notify by **telephone**... no later than the **next calendar day** after discovery of a dose to the embryo/fetus or nursing child...
	(d) The licensee shall submit a **written report**... **within 15 days** after discovery of a dose to the embryo/fetus or nursing child...

10 CFR 36: Licenses and Radiation Safety Requirements for Irradiators

	36.83 Reports.
	(a) In addition to the reporting requirements in other parts of NRC regulations, the licensee shall report the following events if not reported under other parts of NRC regulations:
36.83(a)(1)	(1) **Source stuck** in an unshielded position.
36.83(a)(2)	(2) Any **fire or explosion** in a radiation room.
36.83(a)(3)	(3) Damage to the **source racks**.
36.83(a)(4)	(4) Failure of the **cable or drive mechanism** used to move the source racks.
36.83(a)(5)	(5) Inoperability of the **access control system**.
36.83(a)(6)	(6) Detection of radiation source by the product **exit monitor**.
36.83(a)(7)	(7) Detection of radioactive **contamination** attributable to licensed radioactive material.
36.83(a)(8)	(8) Structural damage to the **pool liner or walls**.
36.83(a)(9)	(9) Abnormal **water loss** or leakage from the source storage pool.
36.83(a)(10)	(10) Pool **water conductivity** exceeding 100 microsiemens per centimeter.
	(b) The report must include a **telephone report within 24 hours** as described in 30.50(c)(1), and a **written report within 30 days** as described in 30.50(c)(2).

10 CFR 39: Licenses and Radiation Safety Requirements for Well Logging

	39.35 Leak Testing of Sealed Sources.
	(d) Removal of **leaking source** from service.
39.35(d)(1)	(1) If the test conducted pursuant to paragraphs (a) and (b) of this section reveals the presence of 185 Bq **[0.005 microcuries] or more of removable radioactive material**, the licensee shall...
	(2) The licensee shall submit a report to the appropriate NRC Regional Office listed in Appendix D of 10 CFR 20 of this chapter, **within 5 days** of receiving the test results...
	(e) Exemptions from testing requirements. The following sealed sources are exempt from the periodic leak test requirements set out in paragraphs (a) through (d) of this section:
	(1) Hydrogen-3 (**tritium**) sources; (2) Sources containing licensed material with a **half-life of 30 days or less**; (3) Sealed sources containing licensed material in **gaseous form**; (4) Sources of **beta- or gamma**-emitting radioactive material with an activity of 3.7 MBq **[100 microcuries] or less**; and (5) Sources of **alpha- or neutron**-emitting radioactive material with an activity of 0.37 MBq **[10 microcuries] or less**.
	39.77 Notification of incidents and lost sources; abandonment procedures for irretrievable sources.
39.77(a)	(a) The licensee shall **immediately notify** the appropriate NRC Regional Office by **telephone** and subsequently, within **30 days**, by **confirmation in writing**, using an appropriate method listed in 30.6(a) of this chapter, if the licensee knows or has reason to believe that a **sealed source has been ruptured**...
NOTE	*NMED uses this when a source is **ruptured while in use** and not just a failed periodic leak test.*
39.77(b)	(b) The licensee shall notify the Commission of the **theft or loss** of radioactive materials, radiation overexposures, excessive levels and concentrations of radiation, and certain other accidents as required by 20.2201 - 20.2202, 20.2203 and 30.50 of this chapter.
NOTE	*NMED pairs 39.77(b) with the applicable 20.2201 for LAS events, but not for EXP or RLM events.*
	(c) If a sealed source becomes lodged in a well, and **when it becomes apparent that efforts to recover the sealed source will not be successful**, the licensee shall --
	(1) Notify the appropriate NRC Regional Office by **telephone** of the circumstances that resulted in the inability to retrieve the source and-- (i) Obtain NRC approval to implement abandonment procedures; or (ii) That the licensee implemented abandonment before receiving NRC approval because the licensee believed there was an immediate threat to public health and safety; and
	(2) Advise the well owner or operator, as appropriate, of the abandonment procedures under 39.15 (a) or (c); and
	(3) Either ensure that abandonment procedures are implemented within 30 days after the sealed source has been classified as irretrievable or request an extension of time if unable to complete the abandonment procedures.
39.77(d)	(d) The licensee shall, **within 30 days** after a sealed source has been classified as **irretrievable**, make a report in **writing**...
NOTE	*NMED uses the "stuck" date for the event and discovery dates.*

10 CFR 40: Domestic Licensing of Source Material

	40.60 Reporting requirements.
40.60(a)	(a) **Immediate report**. Each licensee shall notify the NRC as soon as possible but not later than **4 hours** after the discovery of an event that **prevents immediate protective actions** necessary to **avoid exposures** to radiation or radioactive materials that could exceed regulatory limits or **releases of licensed material** that could exceed regulatory limits (events may include fires, explosions, toxic gas releases, etc.). (b) **Twenty-four hour report**. Each licensee shall notify the NRC within **24 hours** after the discovery of any of the following events involving licensed material:
40.60(b)(1)	(1) An unplanned **contamination** event that: (i) Requires **access** to the contaminated area, by workers or the public, to be **restricted for more than 24 hours** by imposing additional radiological controls or by prohibiting entry into the area; (ii) Involves a quantity of material **greater than five times the lowest annual limit on intake** specified in Appendix B of 20.1001 - 20.2401 of 10 CFR 20 for the material; and (iii) Has **access** to the area **restricted** for a reason **other than** to allow isotopes with a half-life of less than 24 hours to decay prior to decontamination.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*
40.60(b)(2)	(2) An event in which **equipment is disabled or fails to function** as designed when: (i) The equipment is required by regulation or license condition to **prevent releases** exceeding regulatory limits, to **prevent exposures** to radiation and radioactive materials exceeding regulatory limits, or to **mitigate the consequences** of an accident; (ii) The equipment is **required to be available and operable** when it is disabled or fails to function; and (iii) **No redundant equipment** is available and operable to perform the required safety function.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*
40.60(b)(3)	(3) An event that requires **unplanned medical treatment** at a medical facility of an individual with **spreadable radioactive contamination** on the individual's clothing or body.
40.60(b)(4)	(4) An unplanned **fire or explosion** damaging any licensed material or any device, container, or equipment containing licensed material when: (i) The quantity of material involved is **greater than five times the lowest annual limit on intake** specified in Appendix B of 20.1001 - 20.2401 of 10 CFR 20 for the material; and (ii) The damage affects the **integrity** of the licensed **material or its container**.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*

	(c) Preparation and submission of reports. Reports made by licensees in response to the requirements of this section must be made as follows: (1) Licensees shall make reports required by paragraphs (a) and (b) of this section by **telephone** to the NRC Operations Center. (2) **Written report**. Each licensee who makes a report required by paragraph (a) or (b) of this section shall submit a written follow-up report **within 30 days** of the initial report... (3) The provisions of **40.60 do not apply** to licensees subject to the notification requirements in **50.72.** They **do apply** to those **part 50** licensees possessing material licensed under part 40 who are not subject to the notification requirements in **50.72**.
40.64(c)	**40.64 Reports. (Superseded 10/01/2003)** (c) Except as specified in paragraph (d) of this section, each licensee who is authorized to possess uranium or thorium pursuant to a specific license shall **report promptly**... any incident in which an attempt has been made or is believed to have been made to commit a **theft or unlawful diversion** of more than **15 pounds** of such material at any one time or more than **150 pounds** of such material in any **one calendar year**. The initial report shall be followed within a period of **fifteen (15) days by a written report**...
40.64(c)(1)	**40.64 Reports. (Effective 10/01/2003)** (c) (1) Except as specified in paragraph (d) of this section, each licensee who is authorized to possess **uranium or thorium** pursuant to a specific license shall notify the NRC Headquarters Operations Center... any incident in which an attempt has been made or is believed to have been made to commit a **theft or unlawful diversion** of **more than** 6.8 kilograms (kg) [**15 pounds**] of such material at any one time or more than 68 kg [**150 pounds**] of such material in any one calendar year. (2) The licensee shall notify the NRC as soon as possible, but **within 4 hours**, of discovery... (3) The initial notification shall be followed **within a period of sixty (60) days by a written** followup notification... (d) The reports described in paragraphs (a), (b), and (c) of this section are **not required for**: (1) **Processed ores** containing less than **5 percent** of uranium or thorium, or any combination of uranium or thorium, by dry weight; (2) **Thorium** contained in magnesium-thorium and tungsten-thorium **alloys**, if the thorium content in the alloys does not exceed **4 percent** by weight; (3) **Chemical catalysts containing uranium depleted** in the U-235 isotope to **0.4 percent** or less, if the uranium content of the catalyst does not exceed **15 percent** by weight; or (4) Any source material contained in **non-nuclear end use devices** or components, including but not limited to permanently installed shielding, teletherapy, radiography, X-ray, accelerator devices, or munitions.

10 CFR 50: Domestic Licensing of Production and Utilization Facilities

~~50.72(b)(2)(v)~~	(b) **Non-emergency events (Superseded 1/23/01)** (2) **Four-hour reports**. If not reported under paragraphs (a) or (b)(1) of this section, the licensee shall notify the NRC as soon as practical and in all cases, within four hours of the occurrence of any of the following: (v) Any event requiring the **transport of a radioactively contaminated person** to an offsite medical facility for treatment.
50.72(b)(3)(xii)	(b) **Non-emergency events (Effective 1/23/01)** (3) **Eight-hour reports**. If not reported under paragraphs (a), (b)(1) or (b)(2) of this section, the licensee shall notify the NRC as soon as practical and in all cases within eight hours of the occurrence of any of the following: (xii) Any event requiring the **transport of a radioactively contaminated person** to an offsite medical facility for treatment.

10 CFR 70: Domestic Licensing of Special Nuclear Material

	70.50 Reporting requirements.
70.50(a)	(a) **Immediate report**. Each licensee shall notify the NRC as soon as possible but not later than **4 hours** after the discovery of an event that **prevents immediate protective actions** necessary to **avoid exposures** to radiation or radioactive materials that could exceed regulatory limits or **releases of licensed material** that could exceed regulatory limits (events may include fires, explosions, toxic gas releases, etc.). (b) **Twenty-four hour report**. Each licensee shall notify the NRC within **24 hours** after the discovery of any of the following events involving licensed material:
70.50(b)(1)	(1) An unplanned **contamination** event that: (i) Requires **access** to the contaminated area, by workers or the public, to be **restricted for more than 24 hours** by imposing additional radiological controls or by prohibiting entry into the area; (ii) Involves a quantity of material **greater than five times the lowest annual limit** on intake specified in Appendix B of 20.1001 - 20.2401 of 10 CFR 20 for the material; and (iii) Has **access** to the area **restricted** for a reason **other than** to allow isotopes with a half-life of less than 24 hours to decay prior to decontamination.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*
70.50(b)(2)	(2) An event in which **equipment is disabled or fails to function** as designed when: (i) The equipment is required by regulation or licensee condition to **prevent releases** exceeding regulatory limits, to **prevent exposures** to radiation and radioactive materials exceeding regulatory limits, or to **mitigate the consequences** of an accident; (ii) The equipment is **required to be available and operable** when it is disabled or fails to function; and (iii) **No redundant equipment** is available and operable to perform the required safety function.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*
70.50(b)(3)	(3) An event that requires **unplanned medical treatment** at a medical facility of an individual with **spreadable radioactive contamination** on the individual's clothing or body.

70.50(b)(4)	(4) An unplanned **fire or explosion** damaging any licensed material or any device, container, or equipment containing licensed material when: (i) The quantity of material involved is **greater than five times the lowest annual limit on intake** specified in Appendix B of 20.1001 - 20.2401 of 10 CFR 20 for the material; and (ii) The damage affects the **integrity** of the licensed **material or its container**.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*
	(c) **Preparation and submission of reports**. Reports made by licensees in response to the requirements of this section must be made as follows: (1) Licensees shall make reports required by **paragraphs (a) and (b)** of this section, and by Sec. 70.74 and Appendix A of this part, if applicable, by **telephone** to the NRC Operations Center... (2) **Written report**. Each licensee that makes a report required by paragraph (a) or (b) of this section, or by Sec. 70.74 and Appendix A of this part, if applicable, shall submit a written follow-up report **within 30 days** of the initial report. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement... (d) The provisions of Sec. **70.50 do not apply** to licensees subject to Sec. **50.72**. They **do apply** to those **Part 50** licensees possessing material licensed under **Part 70** that are **not subject** to the notification requirements in Sec. **50.72**.
	70.52 Reports of accidental criticality or loss or theft or attempted theft of special nuclear material. (Superseded 3/24/2003)
70.52(a)	(a) Each licensee shall notify the NRC Operations Center within **one hour** after discovery of any case of **accidental criticality or any loss, other than normal operating loss, of special nuclear material**.
NOTE	*NMED uses 70.52(a) for process type losses and 70.52(b) for physical removal type losses.*
70.52(b)	(b) Each licensee who possesses **one gram or more** of contained uranium-235, uranium-233, or plutonium shall notify the NRC Operations Center within **one hour** after discovery of any **loss or theft or unlawful diversion of special nuclear material** which the licensee is licensed to possess or any incident in which an attempt has been made or is believed to have been made to commit a theft or unlawful diversion of such material. (c) This notification must be made to the NRC Operations Center via the Emergency Notification System if the licensee is party to that system. If the Emergency Notification System is inoperative or unavailable, the licensee shall make the required notification via commercial telephonic service or other dedicated telephonic system or any other method that will ensure that a report is received by the NRC Operations Center within one hour. The exemption of 73.21(g)(3) applies to all telephonic reports required by this section. (d) Reports required under **73.71 need not be duplicated** under the requirements of this section.
	70.52 Reports of accidental criticality. (Effective 3/24/2003)
70.52(a)	(a) Each licensee shall notify the NRC Operations Center within **one hour** after discovery of any case of **accidental criticality.**
NOTE	*NMED pairs this with the identical requirement **70 App A(a)(1)**.*
	70.74 Additional reporting requirements. (a) **Reports to NRC Operations Center**. (1) Each licensee shall report to the NRC Operations Center the events described in Appendix A to 10 CFR 70... (b) **Written reports**. Each licensee that makes a report required by paragraph (a)(1) of this section shall submit a written follow-up report **within 30 days** of the initial report...

	Appendix A to 10 CFR 70--Reportable Safety Events Licensees must comply with reporting requirements in this appendix, except for (a)(1), (a)(2), and (b)(4), after they have submitted an ISA Summary in accordance with 70.62(c)(3)(ii). Licensees must comply with **(a)(1), (a)(2), and (b)(4) after October 18, 2000**. As required by 10 CFR 70.74, licensees subject to the requirements in subpart H of 10 CFR 70, shall report: (a) **One hour reports**. Events to be reported to the NRC Operations Center within 1 hour of discovery, supplemented with the information in 10 CFR 70.50(c)(1) as it becomes available, followed by a **written report within 30 days**:
70 App A(a)(1)	(1) An inadvertent nuclear criticality.
NOTE	*NMED pairs this with the identical requirement **70.52(a)**.*
70 App A(a)(2)	(2) An **acute intake** by an individual of **30 mg or greater of uranium** in a soluble form.
70 App A(a)(3)	(3) An **acute chemical exposure** to an individual from licensed material or hazardous chemicals produced from licensed material that exceeds the quantitative standards established to satisfy the requirements in 70.61(b)(4). [endanger life of worker or lead to irreversible or other serious, long-lasting health effects to any individual outside the controlled area]. (4) An event or condition such that **no items relied on for safety**, as documented in the Integrated Safety Analysis summary, **remain available and reliable**, in an accident sequence evaluated in the Integrated Safety Analysis, to perform their function:
70 App A(a)(4)(i)	(i) In the context of the performance requirements in 70.61(b) and 70.61(c) [high and intermediate consequence events], or
70 App A(a)(4)(ii)	(ii) Prevent a nuclear criticality accident (i.e., loss of all controls in a particular sequence).
70 App A(a)(5)	(5) Loss of controls such that **only one item relied on for safety**, as documented in the Integrated Safety Analysis summary, **remains available and reliable** to prevent a nuclear criticality accident, and has been in this state for **greater than eight hours**.

	(b) **Twenty-four hour reports**. Events to be reported to the NRC Operations Center within 24 hours of discovery, supplemented with the information in 10 CFR 70.50(c)(1) as it becomes available, followed by a **written report within 30 days**:
70 App A(b)(1)	(1) Any event or condition that results in the facility being in a state that was **not analyzed**, was **improperly analyzed**, or is **different from that analyzed** in the Integrated Safety Analysis, and which results in failure to meet the performance requirements of 70.61.
70 App A(b)(2)	(2) **Loss or degradation of items relied on for safety** that results in failure to meet the performance requirement of 70.61.
70 App A(b)(3)	(3) An **acute chemical exposure** to an individual from licensed material or hazardous chemicals produced from licensed materials that exceeds the quantitative standards that satisfy the requirements of 70.61(c)(4). [irreversible or other serious, long-lasting health effects to a worker or cause mild transient health effects any individual outside the controlled area].
NOTE	*70.4 defines "hazardous chemicals produced from licensed materials" as substances having licensed material as precursor compound(s) or substances that physically or chemically interact with licensed materials; and that are toxic, explosive, flammable, corrosive, or reactive to the extent that they can endanger life or health if not adequately controlled. These include substances commingled with licensed material, and include substances such as hydrogen fluoride that is produced by the reaction of uranium hexafluoride and water, but do not include substances prior to process addition to licensed material or after process separation from licensed material.*
70 App A(b)(4)	(4) Any **natural phenomenon or other external event**, including fires internal and external to the facility, that has affected or may have affected the **intended safety function or availability or reliability** of one or more **items relied on for safety**.
	(5) An occurrence of an event or process deviation that was considered in the Integrated Safety Analysis and:
70 App A(b)(5)(i)	(i) Was dismissed due to its likelihood; or
70 App A(b)(5)(ii)	(ii) Was categorized as unlikely and whose associated unmitigated consequences would have exceeded those in 70.61(b) [high consequence event] had the item(s) relied on for safety not performed their safety function(s).
	(c) **Concurrent Reports**. Any event or situation, related to the health and safety of the public or onsite personnel, or protection of the environment, for which a **news release is planned** or **notification to other government agencies** has been or will be made, shall be reported to the **NRC Operations Center** concurrent to the news release or other notification.

10 CFR 71: Packaging and Transportation of Radioactive Material

71.5	**71.5 Transportation of licensed material**
NOTE	*NMED uses this reporting requirement for:* *~~1. **Accidents** involving vehicles carrying licensed material, regardless of whether the material is damaged or spilled as a result, or~~* *2. **Fire, breakage, spillage**, or suspected radioactive **contamination** occurs involving a shipment of radioactive material. See 49 CFR 171.15(b)(2).* *As of 12/21/2006, vehicle accidents are reportable TRS events per 10 CFR 71.5 only if the material/container was damaged or ejected from the vehicle.*
	71.95 Reports (Superseded 10/01/2004) The licensee shall report to the Director, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, **within 30 days** --
71.95(a)	(a) Any instance in which there is **significant reduction** in the effectiveness of any approved **Type B, or fissile, packaging** during use;
71.95(b)	(b) Details of any **defects** with safety significance in **Type B, or fissile, packaging** after first use, with the means employed to repair the defects and prevent their recurrence; or
71.95(c)	(c) Instances in which the conditions of approval in the **certificate of compliance** were not observed in making a shipment.
	71.95 Reports. (Effective 10/01/2004) (a) The licensee, after requesting the certificate holder's input, shall submit a **written report within 60 days** (see 71.95c) to the Commission of--
71.95(a)(1)	(1) Instances in which there is a **significant reduction** in the effectiveness of any NRC-approved **Type B or Type AF packaging** during use; or
71.95(a)(2)	(2) Details of any **defect**s with safety significance in any NRC-approved **Type B or fissile material packaging**, after first use.
71.95(a)(3)	(3) Instances in which the conditions of approval in the **Certificate of Compliance** were not observed in making a shipment.
71.95(b)	(b) The licensee shall submit a **written** report to the Commission of instances in which the conditions in the certificate of compliance were not followed during a shipment.
NOTE	*Pair 71.95(a)(3) and (b), which are essentially identical.*

10 CFR 72: Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor Greater Than Class C Waste

	72.74 Reports of accidental criticality or loss of special nuclear material.
72.74(a)	(a) Each licensee shall notify the NRC Operations Center within **one hour** of discovery of **accidental criticality or any loss of special nuclear material**. (c) Reports required under **73.71 of this chapter need not be duplicated** under the requirements of this section.
	72.75 Reporting requirements for specific events and conditions. (Superseded 10/03/2003)
72.75(a)	(a) **Emergency notifications** -- Each licensee shall notify the NRC **Operations Center** upon the **declaration of an emergency** as specified in the licensee's approved emergency plan addressed in 72.32 of this part. The licensee shall notify the NRC immediately after notification of the appropriate State or local agencies, but **not later than one hour** after the time the licensee declares an emergency.
	(b) **Non-emergency notifications**: **Four-hour** reports. Each licensee shall notify the NRC as soon as possible but not later than four hours after the discovery of any of the following events or conditions involving **spent fuel, HLW. or reactor-related GTCC waste**:
72.75(b)(1)	(1) An event that **prevents immediate actions** necessary to **avoid exposures** to radiation or radioactive materials that could exceed regulatory limits, or **releases of radioactive materials** that could exceed regulatory limits (e.g., events such as fires, explosions, and toxic gas releases).
72.75(b)(2)	(2) A **defect** in any **spent fuel storage structure**, system, or component which is important to safety.
72.75(b)(3)	(3) A **significant reduction** in the effectiveness of any **spent fuel storage confinement system** during use.
72.75(b)(4)	(4) An **action taken in an emergency that departs from a condition or a technical specification** contained in a license or certificate of compliance issued under this part when the action is immediately needed to protect the public health and safety and no action consistent with license or certificate of compliance conditions or technical specifications that can provide adequate or equivalent protection is immediately apparent.
72.75(b)(5)	(5) An event that requires **unplanned medical treatment** at an offsite medical facility of an individual with radioactive **contamination** on the individual's clothing or body which could cause further radioactive contamination.

72.75(b)(6)	(6) An unplanned **fire or explosion** damaging any spent fuel or HLW, or any device, container, or equipment containing spent fuel or HLW when the damage affects the **integrity of the material or its container**.
	(c) **Non-emergency notifications**: **Twenty-four hour** reports. Each licensee shall notify the NRC within 24 hours after the discovery of any of the following events involving **spent fuel or HLW**:
72.75(c)(1)	(1) Any unplanned **contamination** event that requires **access** to the contaminated area by workers or the public to be **restricted for more than 24 hours** by imposing additional radiological controls or by prohibiting entry into the area.
	(2) An event in which **safety equipment is disabled or fails to function** as designed when:
72.75(c)(2)(i)	(i) The equipment is required by regulation, license condition, or certificate of compliance to be available and operable to **prevent releases** that could exceed regulatory limits, to **prevent exposures** to radiation or radioactive materials that could exceed regulatory limits, or to **mitigate the consequences** of an accident; and
72.75(c)(2)(ii)	(ii) **No redundant equipment** was available and operable to perform the required safety function.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually. However, they had already been superseded on 10/1/ 2006, when the other CFRs were updated*.
	(d) Preparation and submission of reports. Reports made by licensees in response to the requirements of this section must be made as follows:
	(1) Licensees shall make reports required by paragraphs (a), (b), or (c) of this section by telephone to the NRC **Operations Center**.(1)
	(2) **Written report**. Each licensee who makes an initial notification required by paragraphs (a), (b), or (c) of this section also shall submit a written follow-up report **within 30 days** of the initial notification. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement if the reports contain all the necessary information and the appropriate distribution is made.

	72.75 Reporting requirements for specific events and conditions. (Effective 10/03/2003) (a) **Emergency notifications**: Each licensee shall notify the NRC Headquarters Operations Center upon the **declaration of an emergency** as specified in the licensee's approved emergency plan addressed in 72.32. The licensee shall notify the NRC immediately after notification of the appropriate State or local agencies, but not later than **one hour** after the time the licensee declares an emergency. (b) **Non-emergency notifications**: **Four-hour** reports. Each licensee shall notify the NRC as soon as possible but not later than four hours after the discovery of **any of the following** events or conditions involving spent fuel, HLW, or reactor-related GTCC waste: (1) An **action taken in an emergency that departs from a condition or a technical specification** contained in a license or certificate of compliance issued under this part when the action is immediately needed to protect the public health and safety, and no action consistent with license or certificate of compliance conditions or technical specifications that can provide adequate or equivalent protection is immediately apparent. (2) Any event or situation related to the health and safety of the public or onsite personnel, or protection of the environment, for which a **news release** is planned or **notification to other Government agencies** has been or will be made. Such an event may include an onsite fatality or inadvertent release of radioactively contaminated materials. (c) **Non-emergency notifications**: **Eight-hour** reports. Each licensee shall notify the NRC as soon as possible but not later than eight hours after the discovery of **any of the following** events or conditions involving spent fuel, HLW, or reactor-related GTCC waste:
72.75(c)(1)	(1) A **defect** in any **spent fuel, HLW, or reactor-related GTCC waste storage structure**, system, or component that is important to safety.
72.75(c)(2)	(2) A **significant reduction** in the effectiveness of any **spent fuel, HLW, or reactor-related GTCC waste storage** confinement system during use.
72.75(c)(3)	(3) Any event requiring the **transport of a radioactively contaminated person to an offsite medical facility** for treatment.
	(d) **Non-emergency notifications**: **24-hour** reports. Each licensee shall notify the NRC within 24 hours after the discovery of **any of the following** events involving spent fuel, HLW, or reactor-related GTCC waste:
72.75(d)(1)	(1) An event in which important to **safety equipment is disabled or fails to function** as designed when: (i) The equipment is required by regulation, license condition, or certificate of compliance to be available and operable to **prevent releases** that could exceed regulatory limits, to **prevent exposures** to radiation or radioactive materials that could exceed regulatory limits, or to **mitigate the consequences** of an accident; and (ii) **No redundant equipment** was available and operable to perform the required safety function.
NOTE	*Until 10/1/2006, (i) and (ii) were coded individually.*

	(e) Initial notification: Reports made by licensees in response to the requirements of this section must be made as follows: (1) Licensees shall make reports required by paragraphs (a), (b), (c), or (d) of this section by **telephone** to the NRC Headquarters Operations Center... (g) Preparation and submission of written reports. Each licensee who makes an initial notification required by paragraphs (b)(1), (c)(1), (c)(2), or (d)(1) of this section shall also submit a **written** follow-up report to the Commission **within 60 days** of the initial notification...
72.216(a)(1) **72.216(a)(2)**	**72.216 Reports. (Superseded 1/23/01)** (a) The general licensee shall make an **initial report** under Sec. 50.72(b)(2)(vii) of this chapter of any: (1) **Defect** discovered in any **spent fuel storage cask structure**, system, or component which is important to safety; or (2) Instance in which there is a **significant reduction** in the effectiveness of any **spent fuel storage cask confinement system** during use. (b) A **written report**, including a description of the means employed to repair any defects or damage and prevent recurrence, must be submitted using instructions in Sec. 72.4 within **30 days** of the report submitted in paragraph (a) of this section...
72.242(d)	**72.242 Recordkeeping and reports.** (d) Each certificate holder shall submit a **written report** to the NRC within **30 days** of discovery of a **design or fabrication deficiency**, for any **spent fuel storage cask which has been delivered** to a licensee, when the design or fabrication deficiency **affects the ability** of structures, systems, and components important to safety to perform their **intended safety function**...

10 CFR 73: Physical Protection of Plants and Materials

	73.71 Reporting of safeguards events. (Effective 9/25/01)
73.71(a)(1)	(a) (1) Each licensee subject to the provisions of 73.25, 73.26, 73.27(c), 73.37, 73.67(e), or 73.67(g) shall notify the NRC Operations Center within **one hour** after discovery of the **loss of any shipment of SNM or spent fuel**, and within one hour after **recovery of or accounting** for such lost shipment. (4) The initial telephonic notification must be followed within a period of **60 days** by a **written report**... (b) (1) Each licensee subject to the provisions of 73.20, 73.37, 73.50, 73.51, 73.55, 73.60, or 73.67 shall notify the NRC Operations Center within **1 hour** of discovery of the **safeguards events** described in paragraph **I(a)(1) of Appendix G** to this part. Licensees subject to the provisions of 73.20, 73.37, 73.50, 73.51, 73.55, 73.60, or each licensee possessing strategic special nuclear material and subject to 73.67(d) shall notify the NRC Operations Center within 1 hour after discovery of the safeguards events described in paragraphs **I(a)(2), (a)(3), (b), and (c) of Appendix G** to this part. Licensees subject to the provisions of 73.20, 73.37, 73.50, 73.51, 73.55, or 73.60 shall notify the NRC Operations Center within 1 hour after discovery of the safeguards events described in paragraph **I(d) of Appendix G** to this part. (b) (2) This notification must be made in accordance with the requirements of paragraphs (a)(2), (3), (4) [**60 day written**], and (5) of this section. (e) Duplicate reports are not required for events that are also reportable in accordance with 50.72 and 50.73 of this chapter.
	Appendix G to 10 CFR 73--Reportable Safeguards Events Pursuant to the provisions of 10 CFR 73.71 (b) and (c), licensees subject to the provisions of 10 CFR 73.20, 73.37, 73.50, 73.55, 73.60, and 73.67 shall report or record, as appropriate, the following safeguards events. I. Events to be reported within **one hour** of discovery, followed by a **written report within 60 days**. (a) Any event in which there is reason to believe that a person has committed or caused, or attempted to commit or cause, or has made a credible threat to commit or cause:
73.App G(I)(a)(1)	(1) A **theft or unlawful diversion of special nuclear material**; or (2) Significant physical damage to a power reactor or any facility possessing SSNM or its equipment or carrier equipment transporting nuclear fuel or spent nuclear fuel, or to the nuclear fuel or spent nuclear fuel a facility or carrier possesses; or (3) Interruption of normal operation of a licensed nuclear power reactor through the unauthorized use of or tampering with its machinery, components, or controls including the security system. (b) An actual entry of an unauthorized person into a protected area, material access area, controlled access area, vital area, or transport. (c) Any failure, degradation, or the discovered vulnerability in a safeguard system that could allow unauthorized or undetected access to a protected area, material access area, controlled access area, vital area, or transport for which compensatory measures have not been employed. (d) The actual or attempted introduction of contraband into a protected area, material access area, vital area, or transport.

10 CFR 74: Material Control and Accountability of Special Nuclear Material

	74.11 Reports of loss or theft or attempted theft or unauthorized production of special nuclear material.
74.11(a)	(a) Each licensee who possesses one gram or more of contained uranium-235, uranium-233, or plutonium shall notify the NRC Operations Center within **1 hour** of discovery of any **loss or theft or other unlawful diversion of special nuclear material** which the licensee is licensed to possess, or any incident in which an attempt has been made to commit a theft or unlawful diversion of special nuclear material. The requirement to report within 1 hour of discovery does not pertain to measured quantities of special nuclear material disposed of as discards or inventory difference quantities. Each licensee who operates an **uranium enrichment facility** shall notify the NRC Operations Center within **1 hour** of discovery of any **unauthorized production of enriched uranium**. For centrifuge enrichment facilities the requirement to report enrichment levels greater than that authorized by license within 1 hour does not apply to each cascade during its start-up process, not to exceed the first 24 hours. (c) Reports required under **73.71 need not be duplicated** under requirements of this section.

10 CFR 76: Certification of Gaseous Diffusion Plants

	76.120 Reporting requirements.
	(a) **Immediate report**. The Corporation shall notify the NRC Operations Center within **1 hour** after discovery of:
76.120(a)(1)	(1) A **criticality** event;
76.120(a)(2)	(2) Any **loss**, other than normal operating loss, of **special nuclear material**;
76.120(a)(3)	(3) Any **theft or unlawful diversion of special nuclear material** which the Corporation is authorized to possess or any incident in which an attempt has been made or is believed to have been made to commit a theft or unlawful diversion of special nuclear material; or
76.120(a)(4)	(4) An **emergency** condition that has been declared an alert or site area emergency.
76.120(b)	(b) **Four-hour report**. The Corporation shall notify the NRC Operations Center as soon as possible but not later than 4 hours after discovery of an event that prevents immediate protective actions necessary to avoid releases or exposures to radiation or radioactive materials that could exceed regulatory limits.
	(c) **Twenty-four hour report**. The Corporation shall notify the NRC Operations Center within **24 hours** after the discovery of any of the following events involving radioactive material:
76.120(c)(1)	(1) An unplanned **contamination** event that: (i) Requires **access** to the contaminated area, by workers or the public, to be **restricted for more than 24 hours** by imposing additional radiological controls or by prohibiting entry into the area; (ii) Involves a quantity of material **greater than five times the lowest annual limit on intake** specified in Appendix B to 20.1001 through 20.2402 of 10 CFR 20 for the material; and (iii) Causes **access** to the contaminated area to be **restricted** for any reason **other than** to allow isotopes with a half-life of less than 24 hours to decay prior to decontamination.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*

76.120(c)(2)	(2) An event in which **equipment is disabled or fails** to function as designed when: (i) The equipment is required by a Technical Safety Requirement to **prevent releases**, **prevent exposures** to radiation and radioactive materials exceeding specified limits, **mitigate the consequences** of an accident, or **restore this facility** to a preestablished safe condition after an accident; (ii) The equipment is **required** by a Technical Safety Requirement to be **available and operable** and either should have been operating or should have operated on demand; and (iii) **No redundant equipment** is available and operable to perform the required safety function.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*
76.120(c)(3)	(3) An event that requires **unplanned medical treatment** at a medical facility of an individual with radioactive **contamination** on the individual's clothing or body.
76.120(c)(4)	(4) A **fire or explosion** damaging any radioactive material or any device, container, or equipment containing radioactive material when: (i) The quantity of material involved is greater than **five times the lowest annual limit on intake** specified in Appendix B to 20.1001 through 20.2402 of 10 CFR 20 for the material; and (ii) The damage affects the **integrity** of the radioactive **material or its container**.
NOTE	*Until 10/1/2006, (i), (ii), and (iii) were coded individually.*
	(d) Preparation and submission of reports. Reports made by the Corporation in response to the requirements of this section must be made as follows: (1) **Operations Center reports**. The Corporation shall make reports required by paragraphs (a), (b), and (c) of this section by telephone to the NRC Operations Center... (2) **Written report**. A report required by paragraph (a), (b) or (c) of this section must be followed by a written report **within 30 days** of the initial report. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement if the reports contain all of the necessary information and the appropriate distribution is made...

10 CFR 150: Exemptions and Continued Regulatory Authority in Agreement States and in Offshore Waters Under Section 274

	150.16 Submission to Commission of nuclear material transfer reports.
150.16(b)(1)	(b) (1) Each person who, pursuant to an Agreement State License, possesses 1 gram or more of contained uranium-235, uranium-233, or plutonium shall **report immediately** to the Regional Administrator of the appropriate NRC Regional Office listed in Appendix A of 10 CFR 73 of this chapter, by **telephone**, any **theft or other unlawful diversion of special nuclear material** which the licensee is licensed to possess or any incident in which an attempt has been made, or is believed to have been made, to commit a theft or unlawful diversion of special nuclear material. (2) **Within 15 days**, the licensee shall follow the initial report with a **written report** that sets forth the details of the incident...
	150.17 Submission to Commission of source material reports.
150.17(c)(1)	(c) (1) Except as specified in paragraph (d) of this section, each licensee who is authorized to possess **uranium or thorium** pursuant to a specific license shall notify the NRC Headquarters Operations Center by telephone, at the numbers listed in Appendix A to 10 CFR 73 of this chapter, of any incident in which an attempt has been made or is believed to have been made to commit a **theft or unlawful diversion** of **more than** 6.8 kilograms (**15 pounds**) of such material at any one time or more than 68 kg (**150 pounds**) of such material in any one calendar year. (2) The licensee shall notify the NRC as soon as possible, but within **4 hours** of discovery of any incident in which an attempt has been made or is believed to have been made to commit a theft or unlawful diversion of such material. (3) The initial notification shall be followed **within a period of 60 days** by a **written** followup notification... (d) The reports described in paragraphs (a), (b), and (c) of this section are not required for: (1) **Processed ores** containing less than **5 percent** of uranium or thorium, or any combination of uranium and thorium, by dry weight; (2) **Thorium** contained in magnesium-thorium and tungsten-thorium **alloys**, if the thorium content in the alloys does not exceed **4 percent** by weight; (3) **Chemical catalysts containing uranium depleted** in the U-235 isotope to **0.4 percent** or less, if the uranium content of the catalyst does not exceed **15 percent** by weight; or (4) Any source material contained in **non-nuclear end use devices** or components, including but not limited to permanently installed shielding, teletherapy, radiography, X-ray, accelerator devices, or munitions.
	150.19 Submission to Commission of tritium reports.
150.19(c)	(c) Except as specified in paragraph (d) of this section, each person who, pursuant to an Agreement State license, is authorized to possess tritium shall **report promptly** to the appropriate NRC Regional Office as shown in Appendix D of 10 CFR 20 of this chapter by **telephone** and telegraph, mailgram, or facsimile any incident in which an attempt has been made or is believed to have been made to commit a **theft or unlawful diversion of more than 10 curies** of such material at any one time or **100 curies** of such material in any one calendar year. The initial report shall be followed within a period of **fifteen (15) days by a written report** submitted... (d) The reports described in this section are **not required** for tritium possessed pursuant to a **general license** issued pursuant to regulations of an Agreement State equivalent to 10 CFR 31 of this chapter or for tritium in spent fuel.

GDP Safety Equipment Failures/Actuations

S.E.A. USEC shall notify the NRC within **24 hours** of any automatic or manual actuation of a Q safety system that results from an event or condition that has the potential for significant impact on the health or safety or personnel. Events having the potential for significant impact are those events where actual plant conditions existed that the system was designed to protect against.

The intent of this reporting requirement is to ensure that the NRC is notified of those events where a Q safety system was actuated, either manually or automatically, in response to a valid signal. Per discussion with NRC staff, this reporting requirement specifically excludes the reporting of:

A. Actuations which result from and are part of a pre-planned sequence during testing or operation;

B. The actuation is valid and:
(1) Occurs while the system is properly removed from service;
(2) Occurs after the safety function has already been completed;

C. Actuations caused by invalid signals (e.g., non-safety system signal, instrument drift, spurious signals,human error, or other invalid signals). Invalid Q safety system actuations are documented and evaluated through the Problem Reporting System.

NRC Bulletin 91-01: Reporting Loss of Criticality Safety Controls (ML031210840)

OMB No: 3150-0009
NRCB 91-01

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

October 18, 1991

NRC BULLETIN 91-01: REPORTING LOSS OF CRITICALITY SAFETY CONTROLS

Addressees

All fuel cycle and uranium fuel research and development licensees.

Purpose

This bulletin requests that addressees inform the Commission of their criteria and procedures that assure the prompt evaluation and reporting of the degradation of any controlled parameters used to prevent nuclear criticality to licensee management and the immediate reporting to the Commission of any significant degradation of such controls as required by 10 CFR 20.403(a). A written response to this bulletin is required.

Background

On October 3, 1990, all licensees who possess more than a critical mass quantity of special nuclear material were informed of the need for management attention to the establishment and maintenance of their nuclear criticality safety program (Information Notice No. 90-63, attached). That Notice referred to previous Information Notice No. 89-24, dated March 6, 1989, also on the subject of criticality safety. The Commission needs assurance that proper attention is being addressed to these important criticality concerns. Also, licensees must assure that significant degradation of any controls used to prevent criticality is promptly reported to management, and as required by 10 CFR 20.403(a)(1), to the Commission, to assure that appropriate actions are taken to prevent further system degradation.

Description of Circumstances

In May 1991, a process upset occurred in the solvent extraction portion of a uranium recycle unit of a fuel manufacturing operation. The process upset caused the accumulation of enriched uranium in favorable geometry tanks in a waste processing area. When these tanks filled, their uranium contents were transferred, in some instances without sample measurement, to an unfavorable geometry tank waste accumulation tank, and then to a second, unfavorable geometry waste treatment tank. Although the upset was observed by operators late on an evening shift, the process was not shut down until around 5:30 the next morning, when measurements indicated high uranium concentrations in the favorable geometry tanks. A high concentration of uranium was measured in the waste treatment tank at 7:00 a.m.

Licensee management was made aware of the incident later that morning, and a technical evaluation/recovery team was established. The NRC was notified of the incident around 3:45 p.m. that day. A criticality incident did not occur, but the margin of safety was reduced. The licensee removed the excess uranium from the waste treatment tank over a period of several days using centrifuge techniques.

The licensee's investigation team concluded that there were several areas of operational control which were significant contributors to the incident, including: (1) failure to always follow procedures or inadequate procedures; (2) insufficient supervision and/or technical support of operations; (3) lack of adequate overchecks/audits on conformance with criticality safety control requirements; and (4) inadequate records systems. The Commission's investigation is reported in NUREG-1450.

Discussion of Safety Significance

Because of the above event and knowledge of similar circumstances at other licensed activities, the Commission is concerned that there may be insufficient attention by licensees to the need for internal reporting and prompt evaluation of failures of controlled parameters related to criticality safety. The Commission is also concerned that licensees may not have procedures in place to assure compliance with the requirements under 10 CFR 20.403 to report immediately to the Commission any significant failure of criticality safety controls. As discussed in the appendix to this bulletin, several controls may be used to maintain a controlled parameter for preventing a criticality excursion. If substantial control over a controlled parameter is lost, the event should be reported to the Commission.

Following are specific examples of events related to criticality control that should be reported to the Commission **immediately**:

1. **Complete loss of a controlled parameter.**

2. **Substantial degradation of a controlled parameter.**

3. **Failure of a controlled parameter previously identified by the Commission or the licensee's criticality safety specialists as requiring reporting upon failure.**

4. **Determining that a criticality safety analysis was deficient in evaluating actual plant conditions and necessary controlled parameters were not established.**

5. **An unusual event or condition for which the severity and remedy are not readily determined.**

Reports of such events must be made to the NRC Operations Center, which is staffed 24 hours per day, and to the appropriate Regional Administrator.

Some types of events, though not warranting reporting to the Commission, nevertheless merit attention within the licensee's own organization, particularly by the criticality safety specialists. The Commission intends that all events involving degradation of criticality controls be reported for evaluation within the licensee's organization. Since some events which can occur in process systems and their relative importance to criticality safety cannot be determined before the event, criteria are needed in order to make the judgement as to whether the event should be reported to the Commission as required by 10 CFR 20.403(a). Each recipient of this bulletin, therefore, should assure that specific criteria for such internal reporting is in place. When doubt exists as to the extent of degradation, licensees are encouraged to report to the Commission. If initial indications of an event do not seem to warrant Commission notification, but further developments prove it to be more serious, the Commission should be immediately notified at that point.

Addressees are also reminded that all necessary corrective actions must be taken promptly, regardless of any reporting action. Reports to the Commission do not require that corrective actions be completed prior to reporting.

Requested Action

Addressees are requested to evaluate their criticality safety criteria and procedures, modify them as appropriate to assure that events involving degradation of controls will be promptly evaluated and reported to licensee management and NRC as appropriate, and provide a description of their criteria and procedures to NRC. In completing this evaluation, licensees should include the following:

1. Based on your current analyses of criticality safety, and any further criticality analyses that may be necessary for this determination, identify and examine each individual controlled parameter whose failure could contribute to a decrease in criticality control. For each individual controlled parameter, determine whether or not degradation of the system of controls would constitute a significant loss of effectiveness. Loss of a single controlled parameter should be considered to have occurred upon total failure or substantial degradation of the control.

2. Any list of methods of control, such as indicated in the appendix, should be considered from the point of view of importance to maintaining its associated controlled parameter. The possibility of combinations of loss of more than one control should be considered; i.e., are some controls likely to fail simultaneously and what is the level of significance of such an occurrence.

3. Whenever an event occurs in which criticality safety controls do not function entirely as expected, a management-established reporting system should ensure that proper levels of licensee management will be promptly informed. This reporting system will allow plant and safety management to evaluate the significance of a criticality event precursor and to take appropriate action. Significant loss of control may dictate activation of the Emergency Plan during the evaluation and recovery activities.

Reporting Requirements

Within 90 days of the receipt of this bulletin, pursuant to 10 CFR 70.22(d), each recipient shall provide the Commission with a statement describing its reporting criteria and management implementation procedures for evaluation and reporting related to loss of criticality safety controls which meet the requirements of 10 CFR 20.403(a). The statement should indicate the results whereby responsible licensee management will be made aware of any relevant failures, the criteria used by licensee management to determine the importance of those failures to criticality safety, and the related reporting levels. The statement should also indicate how the determination will be made that a controlled parameter is sufficiently degraded such that any Emergency Plan procedures will be activated and indicate how the implementation of these procedures for reporting will be documented. Implementing procedures and documentation will be reviewed during NRC inspection.

The written reports required above shall be submitted to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555. In addition, a copy shall be submitted to the appropriate Regional Administrator. The reporting requirements for reports in response to this bulletin are covered by OMB clearance number 3150-0009, which expires May 31, 1994. The estimated average number of burden hours is 80 person hours per licensee response, including those needed to assess the new recommendations, search data sources, gather and analyze the data, and prepare the requires letters. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the information and Records Management Branch, Division of Information Support Services, Office of Information Resources Management, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

On November 19, 1991, the Commission will sponsor a workshop concerning reporting of criticality safety events. The location for the workshop will be announced as soon as arrangements can be made.

NRC Bulletin 91-01, Supplement 1: Reporting Loss of Criticality Safety Controls (ML031220020)

OMB No: 3150-0009
NRCB 91-01, Supp. 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

July 27, 1993

NRC BULLETIN 91-01, SUPPPLEMENT 1: REPORTING LOSS OF CRITICALITY SAFETY CONTROLS

Addressees

For Action All fuel fabrication facilities.

For Information - All facilities whose activities include, Hot Cell Operations, Uranium Enrichment Operations, Uranium Fuel R&D, and Critical Mass Operations.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this bulletin to (1) provide addressees clearer reporting criteria, (2) request that action addressees take certain actions, and (3) require that all action addressees report to NRC whether and to what extent the requested actions will be taken and notify the NRC when actions associated with this bulletin are complete.

This document is not intended to address accident mitigation, emergency response, long-term corrective actions, or license requirements. Such actions should be performed in accordance with the license and established regulations.

Background

This is a follow-up to Bulletin 91-01, “Reporting Loss of Criticality Safety Controls,” which was issued on October 18, 1991. The bulletin requested that addressees inform the NRC of their criteria and procedures to ensure the prompt evaluation and reporting of conditions and events involving criticality safety.

Description of Circumstances

The NRC staff has reviewed each licensee's response to the bulletin. Most responses reflected a commitment to promptly evaluate events with criticality safety implications, report the most significant events immediately to the NRC, and report less significant events within 24 hours.

Also, we received numerous comments on the bulletin through correspondence and various meetings and workshops. A major comment concerned the bulletin's statement that loss or lack of a controlled parameter related to criticality safety should be reported to the NRC immediately. Several persons noted that further clarification regarding the definition of “a loss of a controlled parameter” is needed. Also, several persons noted that a loss of a controlled parameter is not always a significant event warranting an immediate report, for example, if the event involves a small amount of special nuclear material. These

licensees maintained that they should only report events immediately to the NRC if there is a significant threat of a criticality accident or if the severity of the threat cannot be readily determined.

Discussion

We have considered these comments and conclude that further clarification is warranted. Therefore, we are clarifying that we want reported to the NRC **immediately**, those cases where **(1) moderation is used as the primary criticality control, or (2) more than a safe mass of fissionable material is involved (regardless of the type of controls used to satisfy the double contingency principle),** and that meet one or more of the following immediate reporting criteria.

Immediate Reportinq Criteria

1. Any event that results in the violation of the double contingency principle, as defined in ANSI 8.1, and where **the double contingency principle cannot be re-established within 4 hours** after the initial observation of the event.

2. The occurrence of any unanticipated or unanalyzed event for which the safety significance of the event or corrective actions to re- establish the double contingency principle are not readily identifiable.

3. Any case where it is determined that a criticality safety analysis was deficient and where the necessary controlled parameters were not established or maintained.

4. Any event involving a controlled parameter previously identified by the NRC or the licensee as requiring immediate reporting to the NRC and where the double contingency principle cannot be re-established within 4 hours after the initial observation of the event.

Events and/or conditions that satisfy the above criteria should be **reported within 4 hours** from the initial observation, in accordance with 10 CFR 20.403 and 10 CFR 70.50.

All other criticality safety events that do not meet the aforementioned criteria, but still result in a violation of the double contingency principle, such as events where the double contingency principle is violated but control is immediately re-established, should be **reported to the NRC within 24 hours** in accordance with the commitments in the responses to the bulletin.

It is expected that criticality safety events will be promptly evaluated and that appropriate management and technical personnel will be available 24 hours a day to perform such evaluations.

It should be emphasized that it is important that NRC be notified of events related to criticality safety and that if there is any doubt'as to whether an event should be reported, the NRC should be contacted.

Requested Actions

Addressees are requested to review their criticality safety reporting procedures to ensure that they meet or exceed the reporting criteria described in this clarification of NRC Bulletin 91-01. Questions may be directed to the contact listed below.

Reporting Requirements

Within 60 days of this bulletin, pursuant to 10 CFR 70.22(d), each recipient shall provide the Commission with a statement (1) confirming that their current reporting criteria and management implementation

procedures meet these minimum criteria, or (2) describing those procedures revised to be consistent with the reporting criteria.

Address any such written correspondence to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, under oath or affirmation under the provisions of Section 182a, Atomic Energy Act of 1954, as amended. In addition, submit a copy to the appropriate regional administrator.

QUESTIONS AND ANSWERS TO BULLETIN 91-01-

Ql. If reporting criteria currently contained in the licensee's emergency plan cover the 91-01 requirements for immediate reporting and are consistent with the 91-01 immediate reporting criteria, does the 91-01 procedure need to cover only the 24-hour criteria?

Al. Yes. No other immediate reporting would be required under 91-01.

Q2. The double contingency requirement includes all control parameters that have previously, before the event, been identified in the nuclear criticality safety analysis. Therefore, if a work station has six controls, and four are lost, is reporting required?

A2. No. If some controls are lost, and the double contingency requirement is still fulfilled, it is not reportable under 91-01. However, it should be noted that in some instances several controls may be necessary to provide an adequate barrier. For example, dual sampling is required when sampling is utilized as a criticality control.

Q3. In cases where a deficiency in the criticality analysis is found, and in the same analysis a mitigating condition not previously identified is found, is the deficient criticality analysis reportable?

A3. Yes. The licensee should report it. In addition, the licensee should prepare a corrected analysis.

Q4. If an event or condition occurs, as envisioned in criteria 2 or 3 for immediate reporting, does the licensee have 4 hours to determine if it is within the established safety parameters and report it to the NRC?

A4. Yes. The licensee has a total of 4 hours to report the event or condition to the NRC, from the time the event or condition is first noted or identified.

Q5. What determines that a controlled parameter was previously identified formally by the NRC or licensee?

A5. Controlled parameters identified in the NRC approved section of license application or in a license condition would be considered formally identified by the NRC, and those controlled parameters identified in current nuclear criticality safety analyses would be considered formally identified by the licensee.

Definitions:

Safe Mass: 45 percent of the minimum critical mass of special nuclear material for a given enrichment.

Re-establish: establish within 4 hours after the identification of the conditions to assure that the double contingency principle and established licensed conditions for that system exist.

Appendix C to 10 CFR 20: Quantities of Licensed Material Requiring Labeling

Radionuclide	Quantity (µCi)
Hydrogen-3	1,000
Beryllium-7	1,000
Beryllium-10	1
Carbon-11	1,000
Carbon-14	100
Fluorine-18	1,000
Sodium-22	10
Sodium-24	100
Magnesium-28	100
Aluminum-26	10
Silicon-31	1,000
Silicon-32	1
Phosphorus-32	10
Phosphorus-33	100
Sulfur-35	100
Chlorine-36	10
Chlorine-38	1,000
Chlorine-39	1,000
Argon-39	1,000
Argon-41	1,000
Potassium-40	100
Potassium-42	1,000
Potassium-43	1,000
Potassium-44	1,000
Potassium-45	1,000
Calcium-41	100
Calcium-45	100
Calcium-47	100
Scandium-43	1,000
Scandium-44m	100
Scandium-44	100
Scandium-46	10
Scandium-47	100
Scandium-48	100
Scandium-49	1,000
Titanium-44	1
Titanium-45	1,000
Vanadium-47	1,000
Vanadium-48	100
Vanadium-49	1,000
Chromium-48	1,000
Chromium-49	1,000
Chromium-51	1,000
Manganese-51	1,000
Manganese-52m	1,000
Manganese-52	100
Manganese-53	1,000
Manganese-54	100
Manganese-56	1,000

Radionuclide	Quantity (µCi)
Iron-52	100
Iron-55	100
Iron-59	10
Iron-60	1
Cobalt-55	100
Cobalt-56	10
Cobalt-57	100
Cobalt-58m	1,000
Cobalt-58	100
Cobalt-60m	1,000
Cobalt-60	1
Cobalt-61	1,000
Cobalt-62m	1,000
Nickel-56	100
Nickel-57	100
Nickel-59	100
Nickel-63	100
Nickel-65	1,000
Nickel-66	10
Copper-60	1,000
Copper-61	1,000
Copper-64	1,000
Copper-67	1,000
Zinc-62	100
Zinc-63	1,000
Zinc-65	10
Zinc-69m	100
Zinc-69	1,000
Zinc-71m	1,000
Zinc-72	100
Gallium-65	1,000
Gallium-66	100
Gallium-67	1,000
Gallium-68	1,000
Gallium-70	1,000
Gallium-72	100
Gallium-73	1,000
Germanium-66	1,000
Germanium-67	1,000
Germanium-68	10
Germanium-69	1,000
Germanium-71	1,000
Germanium-75	1,000
Germanium-77	1,000
Germanium-78	1,000
Arsenic-69	1,000
Arsenic-70	1,000
Arsenic-71	100
Arsenic-72	100

Radionuclide	Quantity (µCi)
Arsenic-73	100
Arsenic-74	100
Arsenic-76	100
Arsenic-77	100
Arsenic-78	1,000
Selenium-70	1,000
Selenium-73m	1,000
Selenium-73	100
Selenium-75	100
Selenium-79	100
Selenium-81m	1,000
Selenium-81	1,000
Selenium-83	1,000
Bromine-74m	1,000
Bromine-74	1,000
Bromine-75	1,000
Bromine-76	100
Bromine-77	1,000
Bromine-80m	1,000
Bromine-80	1,000
Bromine-82	100
Bromine-83	1,000
Bromine-84	1,000
Krypton-74	1,000
Krypton-76	1,000
Krypton-77	1,000
Krypton-79	1,000
Krypton-81	1,000
Krypton-83m	1,000
Krypton-85m	1,000
Krypton-85	1,000
Krypton-87	1,000
Krypton-88	1,000
Rubidium-79	1,000
Rubidium-81m	1,000
Rubidium-81	1,000
Rubidium-82m	1,000
Rubidium-83	100
Rubidium-84	100
Rubidium-86	100
Rubidium-87	100
Rubidium-88	1,000
Rubidium-89	1,000
Strontium-80	100
Strontium-81	1,000
Strontium-83	100
Strontium-85m	1,000
Strontium-85	100
Strontium-87m	1,000
Strontium-89	10
Strontium-90	0.1
Strontium-91	100

Radionuclide	Quantity (µCi)
Strontium-92	100
Yttrium-86m	1,000
Yttrium-86	100
Yttrium-87	100
Yttrium-88	10
Yttrium-90m	1,000
Yttrium-90	10
Yttrium-91m	1,000
Yttrium-91	10
Yttrium-92	100
Yttrium-93	100
Yttrium-94	1,000
Yttrium-95	1,000
Zirconium-86	100
Zirconium-88	10
Zirconium-89	100
Zirconium-93	1
Zirconium-95	10
Zirconium-97	100
Niobium-88	1,000
Niobium-89m (66 min)	1,000
Niobium-89 (122 min)	1,000
Niobium-90	100
Niobium-93m	10
Niobium-94	1
Niobium-95m	100
Niobium-95	100
Niobium-96	100
Niobium-97	1,000
Niobium-98	1,000
Molybdenum-90	100
Molybdenum-93m	100
Molybdenum-93	10
Molybdenum-99	100
Molybdenum-101	1,000
Technetium-93m	1,000
Technetium-93	1,000
Technetium-94m	1,000
Technetium-94	1,000
Technetium-96m	1,000
Technetium-96	100
Technetium-97m	100
Technetium-97	1,000
Technetium-98	10
Technetium-99m	1,000
Technetium-99	100
Technetium-101	1,000
Technetium-104	1,000
Ruthenium-94	1,000
Ruthenium-97	1,000
Ruthenium-103	100
Ruthenium-105	1,000

Radionuclide	Quantity (µCi)
Ruthenium-106	1
Rhodium-99m	1,000
Rhodium-99	100
Rhodium-100	100
Rhodium-101m	1,000
Rhodium-101	10
Rhodium-102m	10
Rhodium-102	10
Rhodium-103m	1,000
Rhodium-105	100
Rhodium-106m	1,000
Rhodium-107	1,000
Palladium-100	100
Palladium-101	1,000
Palladium-103	100
Palladium-107	10
Palladium-109	100
Silver-102	1,000
Silver-103	1,000
Silver-104m	1,000
Silver-104	1,000
Silver-105	100
Silver-106m	100
Silver-106	1,000
Silver-108m	1
Silver-110m	10
Silver-111	100
Silver-112	100
Silver-115	1,000
Cadmium-104	1,000
Cadmium-107	1,000
Cadmium-109	1
Cadmium-113m	0.1
Cadmium-113	100
Cadmium-115m	10
Cadmium-115	100
Cadmium-117m	1,000
Cadmium-117	1,000
Indium-109	1,000
Indium-110 (69.1 min.)	1,000
Indium-110 (4.9 h)	1,000
Indium-111	100
Indium-112	1,000
Indium-113m	1,000
Indium-114m	10
Indium-115m	1,000
Indium-115	100
Indium-116m	1,000
Indium-117m	1,000
Indium-117	1,000
Indium-119m	1,000
Tin-110	100

Radionuclide	Quantity (µCi)
Tin-111	1,000
Tin-113	100
Tin-117m	100
Tin-119m	100
Tin-121m	100
Tin-121	1,000
Tin-123m	1,000
Tin-123	10
Tin-125	10
Tin-126	10
Tin-127	1,000
Tin-128	1,000
Antimony-115	1,000
Antimony-116m	1,000
Antimony-116	1,000
Antimony-117	1,000
Antimony-118m	1,000
Antimony-119	1,000
Antimony-120 (16 min.)	1,000
Antimony-120 (5.76 d)	100
Antimony-122	100
Antimony-124m	1,000
Antimony-124	10
Antimony-125	100
Antimony-126m	1,000
Antimony-126	100
Antimony-127	100
Antimony-128 (10.4 min.)	1,000
Antimony-128 (9.01 h)	100
Antimony-129	100
Antimony-130	1,000
Antimony-131	1,000
Tellurium-116	1,000
Tellurium-121m	10
Tellurium-121	100
Tellurium-123m	10
Tellurium-123	100
Tellurium-125m	10
Tellurium-127m	10
Tellurium-127	1,000
Tellurium-129m	10
Tellurium-129	1,000
Tellurium-131m	10
Tellurium-131	100
Tellurium-132	10
Tellurium-133m	100
Tellurium-133	1,000
Tellurium-134	1,000
Iodine-120m	1,000
Iodine-120	100
Iodine-121	1,000
Iodine-123	100

Radionuclide	Quantity (µCi)
Iodine-124	10
Iodine-125	1
Iodine-126	1
Iodine-128	1,000
Iodine-129	1
Iodine-130	10
Iodine-131	1
Iodine-132m	100
Iodine-132	100
Iodine-133	10
Iodine-134	1,000
Iodine-135	100
Xenon-120	1,000
Xenon-121	1,000
Xenon-122	1,000
Xenon-123	1,000
Xenon-125	1,000
Xenon-127	1,000
Xenon-129m	1,000
Xenon-131m	1,000
Xenon-133m	1,000
Xenon-133	1,000
Xenon-135m	1,000
Xenon-135	1,000
Xenon-138	1,000
Cesium-125	1,000
Cesium-127	1,000
Cesium-129	1,000
Cesium-130	1,000
Cesium-131	1,000
Cesium-132	100
Cesium-134m	1,000
Cesium-134	10
Cesium-135m	1,000
Cesium-135	100
Cesium-136	10
Cesium-137	10
Cesium-138	1,000
Barium-126	1,000
Barium-128	100
Barium-131m	1,000
Barium-131	100
Barium-133m	100
Barium-133	100
Barium-135m	100
Barium-139	1,000
Barium-140	100
Barium-141	1,000
Barium-142	1,000
Lanthanum-131	1,000
Lanthanum-132	100
Lanthanum-135	1,000

Radionuclide	Quantity (µCi)
Lanthanum-137	10
Lanthanum-138	100
Lanthanum-140	100
Lanthanum-141	100
Lanthanum-142	1,000
Lanthanum-143	1,000
Cerium-134	100
Cerium-135	100
Cerium-137m	100
Cerium-137	1,000
Cerium-139	100
Cerium-141	100
Cerium-143	100
Cerium-144	1
Praseodymium-136	1,000
Praseodymium-137	1,000
Praseodymium-138m	1,000
Praseodymium-139	1,000
Praseodymium-142m	1,000
Praseodymium-142	100
Praseodymium-143	100
Praseodymium-144	1,000
Praseodymium-145	100
Praseodymium-147	1,000
Neodymium-136	1,000
Neodymium-138	100
Neodymium-139m	1,000
Neodymium-139	1,000
Neodymium-141	1,000
Neodymium-147	100
Neodymium-149	1,000
Neodymium-151	1,000
Promethium-141	1,000
Promethium-143	100
Promethium-144	10
Promethium-145	10
Promethium-146	1
Promethium-147	10
Promethium-148m	10
Promethium-148	10
Promethium-149	100
Promethium-150	1,000
Promethium-151	100
Samarium-141m	1,000
Samarium-141	1,000
Samarium-142	1,000
Samarium-145	100
Samarium-146	1
Samarium-147	100
Samarium-151	10
Samarium-153	100
Samarium-155	1,000

Radionuclide	Quantity (µCi)
Samarium-156	1,000
Europium-145	100
Europium-146	100
Europium-147	100
Europium-148	10
Europium-149	100
Europium-150 (12.62 h)	100
Europium-150 (34.2 y)	1
Europium-152m	100
Europium-152	1
Europium-154	1
Europium-155	10
Europium-156	100
Europium-157	100
Europium-158	1,000
Gadolinium-145	1,000
Gadolinium-146	10
Gadolinium-147	100
Gadolinium-148	0.001
Gadolinium-149	100
Gadolinium-151	10
Gadolinium-152	100
Gadolinium-153	10
Gadolinium-159	100
Terbium-147	1,000
Terbium-149	100
Terbium-150	1,000
Terbium-151	100
Terbium-153	1,000
Terbium-154	100
Terbium-155	1,000
Terbium-156m (5.0 h)	1,000
Terbium-156m (24.4 h)	1,000
Terbium-156	100
Terbium-157	10
Terbium-158	1
Terbium-160	10
Terbium-161	100
Dysprosium-155	1,000
Dysprosium-157	1,000
Dysprosium-159	100
Dysprosium-165	1,000
Dysprosium-166	100
Holmium-155	1,000
Holmium-157	1,000
Holmium-159	1,000
Holmium-161	1,000
Holmium-162m	1,000
Holmium-162	1,000
Holmium-164m	1,000
Holmium-164	1,000
Holmium-166m	1

Radionuclide	Quantity (µCi)
Holmium-166	100
Holmium-167	1,000
Erbium-161	1,000
Erbium-165	1,000
Erbium-169	100
Erbium-171	100
Erbium-172	100
Thulium-162	1,000
Thulium-166	100
Thulium-167	100
Thulium-170	10
Thulium-171	10
Thulium-172	100
Thulium-173	100
Thulium-175	1,000
Ytterbium-162	1,000
Ytterbium-166	100
Ytterbium-167	1,000
Ytterbium-169	100
Ytterbium-175	100
Ytterbium-177	1,000
Ytterbium-178	1,000
Lutetium-169	100
Lutetium-170	100
Lutetium-171	100
Lutetium-172	100
Lutetium-173	10
Lutetium-174m	10
Lutetium-174	10
Lutetium-176m	1,000
Lutetium-176	100
Lutetium-177m	10
Lutetium-177	100
Lutetium-178m	1,000
Lutetium-178	1,000
Lutetium-179	1,000
Hafnium-170	100
Hafnium-172	1
Hafnium-173	1,000
Hafnium-175	100
Hafnium-177m	1,000
Hafnium-178m	0.1
Hafnium-179m	10
Hafnium-180m	1,000
Hafnium-181	10
Hafnium-182m	1,000
Hafnium-182	0.1
Hafnium-183	1,000
Hafnium-184	100
Tantalum-172	1,000
Tantalum-173	1,000
Tantalum-174	1,000

Radionuclide	Quantity (µCi)
Tantalum-175	1,000
Tantalum-176	100
Tantalum-177	1,000
Tantalum-178	1,000
Tantalum-179	100
Tantalum-180m	1,000
Tantalum-180	100
Tantalum-182m	1,000
Tantalum-182	10
Tantalum-183	100
Tantalum-184	100
Tantalum-185	1,000
Tantalum-186	1,000
Tungsten-176	1,000
Tungsten-177	1,000
Tungsten-178	1,000
Tungsten-179	1,000
Tungsten-181	1,000
Tungsten-185	100
Tungsten-187	100
Tungsten-188	10
Rhenium-177	1,000
Rhenium-178	1,000
Rhenium-181	1,000
Rhenium-182 (12.7 h)	1,000
Rhenium-182 (64.0 h)	100
Rhenium-184m	10
Rhenium-184	100
Rhenium-186m	10
Rhenium-186	100
Rhenium-187	1,000
Rhenium-188m	1,000
Rhenium-188	100
Rhenium-189	100
Osmium-180	1,000
Osmium-181	1,000
Osmium-182	100
Osmium-185	100
Osmium-189m	1,000
Osmium-191m	1,000
Osmium-191	100
Osmium-193	100
Osmium-194	1
Iridium-182	1,000
Iridium-184	1,000
Iridium-185	1,000
Iridium-186	100
Iridium-187	1,000
Iridium-188	100
Iridium-189	100
Iridium-190m	1,000
Iridium-190	100

Radionuclide	Quantity (µCi)
Iridium-192 (73.8 d)	1
Iridium-192m (1.4 min.)	10
Iridium-194m	10
Iridium-194	100
Iridium-195m	1,000
Iridium-195	1,000
Platinum-186	1,000
Platinum-188	100
Platinum-189	1,000
Platinum-191	100
Platinum-193m	100
Platinum-193	1,000
Platinum-195m	100
Platinum-197m	1,000
Platinum-197	100
Platinum-199	1,000
Platinum-200	100
Gold-193	1,000
Gold-194	100
Gold-195	10
Gold-198m	100
Gold-198	100
Gold-199	100
Gold-200m	100
Gold-200	1,000
Gold-201	1,000
Mercury-193m	100
Mercury-193	1,000
Mercury-194	1
Mercury-195m	100
Mercury-195	1,000
Mercury-197m	100
Mercury-197	1,000
Mercury-199m	1,000
Mercury-203	100
Thallium-194m	1,000
Thallium-194	1,000
Thallium-195	1,000
Thallium-197	1,000
Thallium-198m	1,000
Thallium-198	1,000
Thallium-199	1,000
Thallium-200	1,000
Thallium-201	1,000
Thallium-202	100
Thallium-204	100
Lead-195m	1,000
Lead-198	1,000
Lead-199	1,000
Lead-200	100
Lead-201	1,000
Lead-202m	1,000

Radionuclide	Quantity (µCi)
Lead-202	10
Lead-203	1,000
Lead-205	100
Lead-209	1,000
Lead-210	0.01
Lead-211	100
Lead-212	1
Lead-214	100
Bismuth-200	1,000
Bismuth-201	1,000
Bismuth-202	1,000
Bismuth-203	100
Bismuth-205	100
Bismuth-206	100
Bismuth-207	10
Bismuth-210m	0.1
Bismuth-210	1
Bismuth-212	10
Bismuth-213	10
Bismuth-214	100
Polonium-203	1,000
Polonium-205	1,000
Polonium-207	1,000
Polonium-210	0.1
Astatine-207	100
Astatine-211	10
Radon-220	1
Radon-222	1
Francium-222	100
Francium-223	100
Radium-223	0.1
Radium-224	0.1
Radium-225	0.1
Radium-226	0.1
Radium-227	1,000
Radium-228	0.1
Actinium-224	1
Actinium-225	0.01
Actinium-226	0.1
Actinium-227	0.001
Actinium-228	1
Thorium-226	10
Thorium-227	0.01
Thorium-228	0.001
Thorium-229	0.001
Thorium-230	0.001
Thorium-231	100
Thorium-232	100
Thorium-234	10
Thorium-natural	100
Protactinium-227	10
Protactinium-228	1

Radionuclide	Quantity (µCi)
Protactinium-230	0.1
Protactinium-231	0.001
Protactinium-232	1
Protactinium-233	100
Protactinium-234	100
Uranium-230	0.01
Uranium-231	100
Uranium-232	0.001
Uranium-233	0.001
Uranium-234	0.001
Uranium-235	0.001
Uranium-236	0.001
Uranium-237	100
Uranium-238	100
Uranium-239	1,000
Uranium-240	100
Uranium-natural	100
Neptunium-232	100
Neptunium-233	1,000
Neptunium-234	100
Neptunium-235	100
Neptunium-236 (1.15 E+05 y)	0.001
Neptunium-236 (22.5 h)	1
Neptunium-237	0.001
Neptunium-238	10
Neptunium-239	100
Neptunium-240	1,000
Plutonium-234	10
Plutonium-235	1,000
Plutonium-236	0.001
Plutonium-237	100
Plutonium-238	0.001
Plutonium-239	0.001
Plutonium-240	0.001
Plutonium-241	0.01
Plutonium-242	0.001
Plutonium-243	1,000
Plutonium-244	0.001
Plutonium-245	100
Americium-237	1,000
Americium-238	100
Americium-239	1,000
Americium-240	100
Americium-241	0.001
Americium-242m	0.001
Americium-242	10
Americium-243	0.001
Americium-244m	100
Americium-244	10
Americium-245	1,000
Americium-246m	1,000
Americium-246	1,000

Radionuclide	Quantity (µCi)
Curium-238	100
Curium-240	0.1
Curium-241	1
Curium-242	0.01
Curium-243	0.001
Curium-244	0.001
Curium-245	0.001
Curium-246	0.001
Curium-247	0.001
Curium-248	0.001
Curium-249	1,000
Berkelium-245	100
Berkelium-246	100
Berkelium-247	0.001
Berkelium-249	0.1
Berkelium-250	10
Californium-244	100
Californium-246	1
Californium-248	0.01
Californium-249	0.001
Californium-250	0.001
Californium-251	0.001
Californium-252	0.001
Californium-253	0.1

Radionuclide	Quantity (µCi)
Californium-254	0.001
Einsteinium-250	100
Einsteinium-251	100
Einsteinium-253	0.1
Einsteinium-254m	1
Einsteinium-254	0.01
Fermium-252	1
Fermium-253	1
Fermium-254	10
Fermium-255	1
Fermium-257	0.01
Mendelevium-257	10
Mendelevium-258	0.01
Any alpha emitting radionuclide not listed above or mixtures of alpha emitters of unknown composition.	0.001
Any radionuclide other than alpha emitting radionuclides not listed above, or mixtures of beta emitters of unknown composition.	0.01

The quantities listed above were derived by taking1/10th of the most restrictive ALI listed in table 1, columns 1 and 2, of Appendix B to Sections 20.1001-20.2401 of this part, rounding to the nearest factor of 10, and arbitrarily constraining the values listed between 0.001 and 1,000 Ci. Values of 100 Ci have been assigned for radionuclides having a radioactive half-life in excess of 109 years (except rhenium, 1000 Ci) to take into account their low specific activity.

Note: For purposes of Sections 20.1902(e), 20.1905(a), and 20.2201(a) where there is involved a combination of radionuclides in known amounts, the limit for the combination should be derived as follows: determine, for each radionuclide in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific radionuclide when not in combination. The sum of such ratios for all radionuclides in the combination may not exceed ``1" (i.e., ``unity").

Appendix I

IAEA Radionuclide Categorization

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IAEA Radionuclide Categorization

Table J-1 lists the radionuclides that this report uses to determine the safety significance for events involving the loss, abandonment, or theft of radioactive sources. This list is derived from the IAEA *Code of Conduct on the Safety and Security of Radioactive Sources* (2004) and from IAEA Safety Guide RS-G-1.9, *Categorization of Radioactive Sources*. Based on the amount of radioactivity involved, the radionuclides are grouped into five categories, with Category 1 being the most hazardous. These categories may be summarized as follows (derived from IAEA Safety Guide RS-G-1.9, *Categorization of Radioactive Sources*):

Category 1: **Extremely dangerous.** These sources could cause permanent injury within a few minutes if handled. Doses could be fatal to someone in close proximity to an unshielded source for periods ranging from a few minutes to an hour.

Category 2: **Very dangerous.** These sources could cause permanent injury within minutes to hours if handled. Doses could be fatal to someone in close proximity to an unshielded source for periods ranging from hours to days.

Category 3: **Dangerous.** These sources could cause permanent injury within hours if handled. Doses could possibly (but unlikely) be fatal to someone in close proximity to an unshielded source for periods ranging from days to weeks.

Category 4: **Unlikely to be dangerous.** These sources would not cause permanent injury, although delayed health effects are possible. Doses could possibly (but unlikely) cause temporary injury to someone in close proximity to an unshielded source for a period of many weeks.

Category 5: **Most unlikely to be dangerous.** These sources would not cause permanent injury.

Table I-1. IAEA Code of Conduct Category 1 through 5 Radionuclide Activity Thresholds

Radionuclide	Category 1		Category 2		Category 3		Category 4		Category 5	
	TBq	Ci [1]	TBq	Ci [1]	TBq	Ci [1]	TBq	Ci [1]	TBq	Ci [1]
Am-241	60	1,622	0.6	16.2	0.06	1.62	0.0006	0.0162	1.0e-08	2.7e-07
Am-241/Be	60	1,622	0.6	16.2	0.06	1.62	0.0006	0.0162	1.0e-08	2.7e-07
Cf-252	20	541	0.2	5.4	0.02	0.54	0.0002	0.0054	1.0e-08	2.7e-07
Cm-244	50	1,352	0.5	13.5	0.05	1.35	0.0005	0.0135	1.0e-08	2.7e-07
Co-60	30	811	0.3	8.1	0.03	0.81	0.0003	0.0081	1.0e-07	2.7e-06
Cs-137	100	2,703	1.0	27.0	0.10	2.70	0.001	0.0270	1.0e-08	2.7e-07
Gd-153	1,000	27,030	10.0	270.3	1.00	27.03	0.01	0.2703	1.0e-05	2.7e-04
Ir-192	80	2,162	0.8	21.6	0.08	2.16	0.0008	0.0216	1.0e-08	2.7e-07
Pm-147	40,000	1,081,200	400.0	10,812.0	40.00	1,081.20	0.4	10.8120	1.0e-05	2.7e-04
Pu-238	60	1,622	0.6	16.2	0.06	1.62	0.0006	0.0162	1.0e-08	2.7e-07
Pu-239/Be	60	1,622	0.6	16.2	0.06	1.62	0.0006	0.0162	1.0e-08	2.7e-07
Ra-226	40	1,081	0.4	10.8	0.04	1.08	0.0004	0.0108	1.0e-08	2.7e-07
Se-75	200	5,406	2.0	54.1	0.20	5.41	0.002	0.0541	1.0e-06	2.7e-05
Sr-90 (Y-90)	1,000	27,030	10.0	270.3	1.00	27.03	0.01	0.2703	1.0e-08	2.7e-07
Tm-170	20,000	540,600	200.0	5,406.0	20.00	540.60	0.2	5.4060	1.0e-06	2.7e-05
Yb-169	300	8,109	3.0	81.1	0.30	8.11	0.003	0.0811	1.0e-05	2.7e-04

Notes:

1. The primary values are given in TeraBequerel (Tbq). Curie (Ci) values are provided for practical usefulness only and are rounded after conversion.

Appendix J

Glossary

Appendix J
Glossary

Activity is the rate of disintegration (transformation) or decay of radioactive material per unit time. The units of activity are the curie (Ci) and the becquerel (Bq).

Annual Limit On Intake (ALI) is 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. (ALI values for intake by ingestion and by inhalation of selected radionuclides are given in Table 1, Columns 1 and 2, of Appendix B to 10 CFR 20.1001-20.2401).

Becquerel (Bq) is the SI unit of activity equal to one disintegration per second. (1 Bq = 2.7E-11 Ci)

Byproduct Material (from 10 CFR 20.1003)

5. Any radioactive material (except special nuclear material) yielded in, or made radioactive by, exposure to the radiation incident to the process of producing or using special nuclear material;
6. The tailings or wastes produced by the extraction or concentration of uranium or thorium from ore processed primarily for its source material content, including discrete surface wastes resulting from uranium solution extraction processes. Underground ore bodies depleted by these solution extraction operations do not constitute "byproduct material" within this definition;
7. (i) Any discrete source of radium-226 that is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; or
   (ii) Any material that—
      (A) Has been made radioactive by use of a particle accelerator; and
      (B) Is produced, extracted, or converted after extraction, before, on, or after August 8, 2005, for use for a commercial, medical, or research activity; and
8. Any discrete source of naturally occurring radioactive material, other than source material, that—
   (i) The Commission, in consultation with the Administrator of the Environmental Protection Agency, the Secretary of Energy, the Secretary of Homeland Security, and the head of any other appropriate Federal agency, determines would pose a threat similar to the threat posed by a discrete source of radium-226 to the public health and safety or the common defense and security; and
   (ii) Before, on, or after August 8, 2005, is extracted or converted after extraction for use in a commercial, medical, or research activity.

Note: From the Federal Register (Vol 72, page 55868), regarding the revised Byproduct Material definition -

> For the purposes of this rulemaking, the NRC divided particle accelerators into three groupings: (1) Those that are always operated to intentionally produce radioactive materials in quantities useful for their radioactive properties for a commercial, medical, or research activity; (2) those that are operated to produce only particle beams and not radioactive materials; and (3) accelerators that are used to produce both radioactive materials and particle beams for other uses. Examples of accelerators that are operated to produce only particle beams and not radioactive materials include linear accelerators used for medical treatment of cancer and other health-related conditions. Other examples include the experimental particle physics research colliders used to probe the fundamental properties of nature (as long as that is their only use) and electron microscopes, i.e., particle accelerators that probe the structure of materials at a very

small dimension (high magnification). Ion implanters are particle accelerators used to modify the electrical properties of materials in semiconductor fabrication. In these activities, no radioactive material is intentionally created; all activation is incidental to the intended use of the accelerator.

The NRC will regulate the radioactive material both intentionally and incidentally produced by all accelerators that are intentionally operated to produce a radioactive material for its radioactive properties. The NRC will not regulate the incidental radioactive material produced by accelerators that are operated to produce only particle beams and not radioactive materials for use for a commercial, medical, or research activity. For those accelerators that are used to produce both radioactive material and particle beams, the NRC will regulate the intentionally produced radioactive material and all of the incidentally produced radioactive material, including incidental radioactive material produced when the accelerator is operated to produce radioactive material, as well as incidental radioactive material produced when it is operated to produce only a particle beam. The incidental radioactive materials produced in these accelerators are indistinguishable, so both will be considered byproduct material. The NRC believes very few, if any, accelerators are operated in this way.

Committed Dose Equivalent (CDE) is the dose equivalent to organs or tissues of reference that will be received from an intake of radioactive material by an individual during the 50-year period following the intake.

Committed Effective Dose Equivalent (CEDE) is the sum of the products of the weighting factors applicable to each of the body organs or tissues that are irradiated and the committed dose equivalent to these organs or tissues.

Curie (Ci) is the special unit of activity equal to 3.7E+10 disintegrations per second. (1 Ci = 3.7E+10 Bq)

Deep-Dose Equivalent (DDE) is the external whole-body exposure dose equivalent at a tissue depth of 1 cm (1000 mg/cm^2).

Derived Air Concentration (DAC) is 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 (inhalation rate 1.2 cubic meters of air per hour), results in an intake of one ALI. DAC values are given in Table 1, Column 3, of Appendix B to 10 CFR 20.1001-20.2401.

Derived Air Concentration-Hour (DAC-hour) is 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. A licensee may take 2,000 DAC-hours to represent one ALI, equivalent to a committed effective dose equivalent of 5 rem (0.05 Sv).

Dose Equivalent is the product of the absorbed dose in tissue, quality factor, and all other necessary modifying factors at the location of interest. The units of dose equivalent are the rem and sievert (Sv).

Effective Dose Equivalent is the sum of the products of the dose equivalent to the organ or tissue and the weighting factors applicable to each of the body organs or tissues that are irradiated.

Event Notification (EN) system is an internal NRC automated event tracking system used by the NRC Operations Center to track information on incoming notifications of the occurrence of significant material events that have or may affect public health and safety. Significant material events are reported to the NRC Operations Center by NRC licensees, staff of the Agreement States, other Federal agencies, and the public.

Extremity is the hand, elbow, arm below the elbow, foot, knee, or leg below the knee.

Gray (Gy) is the SI unit of absorbed dose. One gray is equal to an absorbed dose of 1 joule/kilogram. (1 Gy = 100 rads).

Lens Dose Equivalent is the external exposure dose equivalent to the lens of the eye at a tissue depth of 0.3 centimeters (300 mg/cm^2).

Licensed Material is source material, special nuclear material, or byproduct material received, possessed, used, transferred or disposed of under a general or specific license issued by the NRC.

Not Applicable (NA) specifies that a particular field is not applicable to the event.

Not Reported (NR) specifies that information applicable to the particular field was not included in the event report.

NRC Ops Center, in Rockville, Maryland, serves as the focal coordination point for communicating with NRC licensees, State agencies, and other Federal agencies about operating events in both the nuclear reactor and nuclear material industry. The Operations Center is staffed 24 hours a day by an NRC Headquarters Operations Officer (HOO), who is trained to receive, evaluate, and respond to events reported to the Operations Center.

Occupational Dose is 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 dose received from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive materials and released in accordance with 10 CFR 35.75, from voluntary participation in medical research programs, or as a member of the general public.

Orphan Sources generally refer to sealed sources of radioactive material contained in a small volume (but not radioactively contaminated soils and bulk metals) in any one or more of the following conditions:

1. In an uncontrolled condition that requires removal to protect public health and safety from a radiological threat.
2. Controlled or uncontrolled, but for which a responsible party cannot be readily identified.
3. Controlled, but the material's continued security cannot be assured. If held by a licensee, the licensee has few or no options for, or is incapable of providing for, the safe disposition of the material.
4. In the possession of a person, not licensed to possess the material, who did not seek to possess the material.
5. In the possession of a State radiological protection program for the sole purpose of mitigating a radiological threat because the orphan source is in one of the conditions described above and for which the State does not have a means to provide for the material's appropriate disposition.

Preliminary Notification (PN) is a brief summary report issued by the NRC staff to notify the Commission of the occurrence of a significant event that appears to have health and safety significance or major public or media interest. PNs are based on information provided by State radiation control program staff.

Public Dose is the dose received by a member of the public from exposure to radiation or to radioactive material released by a licensee, or to any other source of radiation under the control of a licensee. Public

dose does not include occupational dose or doses received from background radiation, from any medical administration the individual has received , from exposure to individuals administered radioactive materials and released in accordance with 10 CFR 35.75, or from voluntary participation in medical research programs.

Quality Factor is the modifying factor (listed in tables 1004(b).1 and 1004(b).2 of 10 CFR 20) that is used to derive dose equivalent from absorbed dose.

Rad is the special unit of absorbed dose. One rad is equal to an absorbed dose of 100 ergs/grams or 0.01 joule/kilogram. (1 rad = 0.01 gray).

Radiation (ionizing radiation) is alpha particles, beta particles, gamma rays, x-rays, neutrons, high-speed electrons, high-speed protons, and other particles capable of producing ions. Radiation, as used in this part, does not include non-ionizing radiation, such as radio- or microwaves, or visible, infrared, or ultraviolet light.

Rem is the special unit of any of the quantities expressed as dose equivalent. The dose equivalent in rem is equal to the absorbed dose in rads multiplied by the quality factor. (1 rem = 0.01 sievert).

Shallow-Dose Equivalent (SDE) is the external exposure dose equivalent to the skin or an extremity at a tissue depth of 0.007 centimeters (7 mg/cm^2) averaged over an area of 1 square centimeter.

Sievert (Sv) is the SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor. (1 Sv = 100 rem)

Source Material

1. Uranium, thorium, or any combination of uranium and thorium in any physical or chemical form; or
2. Ores that contain, by weight, one-twentieth of 1 percent (0.05 percent), or more, of uranium, thorium, or any combination of uranium and thorium. Source material does not include special nuclear material.

Special Nuclear Material (SNM)

1. Plutonium, uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material that the Commission, pursuant to the provisions of section 51 of the Act, determines to be special nuclear material, but does not include source material; or
2. Any material artificially enriched by any of the foregoing but does not include source material.

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

Whole Body for purposes of external exposure is the head, trunk (including male gonads), arms above the elbow, or legs above the knee.