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Nuclear Regulatory Commission

Instructions and Guidance for Completing Physical Inventory Summary Reports

NRC Form 327

D. R. Joy

Office of Nuclear Material Safety and Safeguards

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CONTENTS

TABLES

I PURPOSE AND SCOPE

U.S. Nuclear Regulatory Commission (NRC) regulations [as specified in 10 CFR 74.17(a), (b), and (c)] require that certain licensees use NRC Form 327 to report inventory differences (IDs), and associated information needed to evaluate IDs, resulting from any physical inventory required by 10 CFR 70.51(e)(3), 74.31(c)(5), 74.33(c)(4), or 74.59(f).

The use of Form 327 is intended to:

(1) eliminate the need for a licensee to report the same information more than once, by informal means, to different NRC organizational units;

(2) standardize the type of information and format used in reporting physical inventory results; and

(3) allow a more efficient and meaningful evaluation of ID results.

The initial Form 327, which was initiated in October 1986, was found to be confusing in several regards, such as (1) the proper use of "+" and "–" signs; (2) the exact meaning and determination of "Net Sum of Biases"; and (3) the exact meaning and determination of "Prior-Period Adjustments." The initial Form 327 also needed to be expanded to incorporate the terminology and data reporting requirements associated with 10 CFR 74.59, which became effective in January 1990, and with the new 10 CFR 74.33 material control and accounting (MC&A) requirements for low enriched uranium (LEU) enrichment facilities. Thus, NRC has decided to revise Form 327 and to issue this NUREG document to provide more specific guidance and instructions with respect to completing the form.

II DEFINITIONS

The following terms are used either directly or indirectly with respect to physical inventories, and thus, within the scope of this NUREG, have the meanings as presented in this section.

ACTIVE INVENTORY (AI)—The sum of beginning inventory (BI), additions to inventory (A), removals from inventory (R), and ending inventory (EI), after all common terms have been totally excluded. A common term is any source material (SM) or special nuclear material (SNM) value (or item) that appears in both BI and EI, or both BI and R, or both A and R, or both A and EI, with both values derived from the same measurement (and thus does not contribute to the uncertainty associated with the current-period inventory difference). The active inventory is used as an indicator of processing throughput and/or measurement activity.

ADDITIONS TO INVENTORY (A)—SM and SNM which a "plant" receives, and which, prior to such receipt, was not part of the plant's total possessed SM or SNM quantity.

ADDITIONS TO PROCESS (ATP)—(1) SM or SNM receipts (or "additions to inventory") that are opened except for receipts (or "additions to inventory") opened only for sampling and subsequently maintained under tamper-safing; (2) opened sealed sources (i.e. encapsulated SM or SNM that has lost its sealed integrity); and (3) SNM removed from process for nonconformance with chemical or physical specifications that is subsequently reprocessed, measured for contained SNM, and resubjected to normal processing. [NOTE: "*Additions to process*" and "*additions to material in process*" have the same meaning.]

ADJUSTED INVENTORY DIFFERENCE (AID)—An inventory difference that has been adjusted (corrected) for both (1) the net sum of prior period adjustments; and (2) the net sum of bias corrections that were not applied to individual items. It is the adjusted ID that is evaluated against ID limits for determining the acceptability of the ID.

BEGINNING INVENTORY (BI)—The total itemized quantity of SNM (or SM) of a given material type code possessed by a "plant" at the start of a material balance period (inventory period). The BI quantity for any given material balance period is (by definition) exactly equal to the ending inventory quantity for the immediately previous period.

BIAS—See "*MEASUREMENT BIAS*"

BIAS CORRECTION TO ID (BC)—The net algebraic sum of all measurement biases (from measurement control program data) that have not been applied as corrections to individual items. Such net sum (expressed as grams element or grams isotope, as appropriate) is applied as a correction to the initially calculated ID.

BOOK INVENTORY—The total SM or SNM (of a given material type code) possessed by a "plant" as indicated by its accountability ledgers.

COMBINED LIMIT OF ERROR—A measurement uncertainty band (at a specified confidence level) derived from the respective limit of error (LE) values associated with each of two measurements (usually independent of each other) performed on a given material quantity. For both measurement values to be regarded as being in agreement, they must not differ from each other by more than the calculated combined LE, which is normally calculated by taking the square root of the sum of the squared individual LEs. That is:

$$\text{Comb. LE} = \left[(LE_1)^2 + (LE_2)^2 \right]^{\frac{1}{2}}$$

DEPLETED URANIUM—Any uranium-bearing material whose uranium isotopic distribution can be characterized as being (1) less than 0.700 percent by weight in combined U–233 plus U–235, and (2) at least 99.200 percent by weight U–238.

DETECTION QUANTITY (DQ)—A site-specific U–235 quantity for licensees subject to 10 CFR 74.31 or 74.33. The DQ is normally a function of annual throughput, but for low throughput LEU facilities, the DQ need not be less than 25 kilograms of U–235. The DQ can also be described as a goal quantity, the loss or theft of which must be detected with a 90 percent (or better) power of detection whenever a physical inventory is taken.

DETECTION THRESHOLD (DT)—An inventory difference (ID) limit that will be exceeded, with a 90 percent or higher probability, by an ID (resulting from the taking of a physical inventory) whenever there has been an actual loss of a detection quantity. The DT is a function of both the DQ and the standard error of ID (SEID), as shown by the following equation:

$$DT = DQ - 1.3(SEID)$$

EFFECTIVE KILOGRAMS OF SNM—(1) For plutonium and U–233, their weight in kilograms; (2) for uranium with an enrichment in the isotope U–235 of 1.00 percent (0.01 weight fraction) and above, its element weight in kilograms multiplied by the square of its enrichment expressed as a decimal weight fraction; and (3) for uranium with an enrichment in U–235 below 1.00 percent, but above 0.71 percent, its element weight in kilograms multiplied by .0001.

ELEMENT—Either the chemical element uranium (U) or plutonium (pu).

ENDING INVENTORY (EI)—The total itemized quantity of SNM (or SM) of a given material type code possessed by a "plant" at the end of a material balance period, as determined by a physical inventory. The EI quantity for any given material balance period is (by definition) exactly equal to the beginning inventory quantity for the next period. [NOTE: Physical inventories for source material (specifically, normal and depleted uranium) are only required for uranium enrichment facilities.]

ENRICHED URANIUM—Any uranium-bearing material which does not qualify as natural or normal uranium, and whose combined U–233 plus U–235 isotopic content is 0.725 percent or higher by weight, relative to total uranium element content.

ENRICHMENT LEVEL CODES—Codes used in lieu of, or in conjunction with, material type code "20" (enriched uranium) to designate the range of enrichment. Enrichment level codes are used in connection with reports, primarily DOE/NRC Form 742, submitted to the Nuclear Materials Management and Safeguards System (NMMSS), and NRC Form 327 sent to NRC Headquarters. For Form 742, there are four enrichment level codes (E1, E2, E3, and E4). For Form 327, there are just two enrichment codes (LEU and HEU) associated with material code 20.

FORMULA KILOGRAM (FKG)—1,000 formula grams of strategic special nuclear material (SSNM) computed by the following equation:

$$\text{Grams} = (\text{grams U–235 contained in HEU}) + 2.5(\text{grams U–233} + \text{Pu})$$

FORMULA QUANTITY—Strategic special nuclear material in any combination that amounts to 5,000 formula grams or more, as computed by the same equation as given above for the definition of "formula kilogram".

HIGH ENRICHED URANIUM (HEU)—Any uranium-bearing material whose combined U-233 plus U-235 isotope content is 20.00 percent or more by weight relative to total uranium element content.

HOLDING ACCOUNT—See *"WASTE HOLDING ACCOUNT"*

IN-PROCESS HOLDUP—Process related SM or SNM that has not been drained or discharged from its processing equipment at the time of physical inventory. The quantity of any in-process holdup must be included in the physical inventory determination. [NOTE: The term "in-process holdup" should not be confused with the term "residual holdup".]

INVENTORY DIFFERENCE (ID)—The arithmetic difference between a book inventory and the corresponding physical inventory, calculated by subtracting ending inventory (E1) p]us shipments (S) and measured discards (MD) from beginning inventory (BI) plus additions to inventory (A). Mathematically, this can be expressed as:

$$ID = (BI + A) - (EI + S + MD)$$

The above defined inventory difference is used in an accounting sense to reconcile the book inventory to the results of the physical inventory, but is normally regarded as an unadjusted ID. For regulatory purposes, adjustments for both measurement biases and prior period adjustments are made to the initially calculated ID to obtain an "adjusted inventory difference" (AID). It is the AID that is assessed and compared to ID limits.

ID LIMIT—(1) For licensees that conduct physical inventories pursuant to 10 CFR 70.51(e)(3), the ID limit is the greater of (i) 200 grams Pu or U-233, 300 grams HEU or U-235 contained in HEU, or 9,000 grams U-235 contained in LEU, as appropriate, or (ii) 1.50 times the limit for LEID.

(2) For licensees that conduct physical inventories pursuant to 10 CFR 74.59(f), the ID limit is the greater of (i) 200 grams Pu or U-233, 300 grams HEU or U-235 contained in HEU, as appropriate, or (ii) 3.00 times SEID.

(3) For licensees that conduct physical inventories pursuant to 10 CFR 74.31(c)(5), the ID limit is the detection threshold (DT). The DT is calculated by subtracting 1.3 times SEID from the licensee's applicable detection quantity (DQ).

(4) For licensees that conduct 12-month static physical inventories pursuant to 10 CFR 74.33(c)(4), associated with any material-type code other than "uranium in cascades", the ID limit is the detection threshold (where DT equals DQ minus 1.3 times SEID). For bimonthly dynamic physical inventories required by 10 CFR 74.33(c)(4) for "uranium in cascades", the ID limit is the DT minus the cumulative ID for the ten-month period just prior to the current two-month period.

INVENTORY RECONCILIATION—The adjustment of the book-record quantity of both element and fissile isotope, to reflect the results of a physical inventory, and calculating (1) the ID for the material balance period in question; (2) the uncertainty value (SEID or LEID) associated with the ID; (3) the AI for the period; and (4) any bias adjustment and/or prior period adjustment (PPA) associated with the ID value.

LIMIT OF ERROR OF THE ID (LEID)—The uncertainty (due to measurement uncertainty), at the 95 percent confidence level, associated with an ID value. Thus, if measurement uncertainty were the only contributor to a non-zero ID, there would be a 95 percent probability that the ID would be within the range of zero plus or minus LEID. [NOTE: Just as "ID" and "MUF" are interchangeable terms, so are "LEID" and "LEMUF".]

LEID LIMIT—For licensees subject to 10 CFR 70.51(e)(5), the regulatory limit for LEID is the greater of (1) 200 grams of plutonium or U-233, 300 grams of HEU or U-235 contained in HEU, or 9,000 grams of U-235 contained in LEU, as appropriate; or (2) 0.50 percent of the larger of "additions to material in process" or "removals from material in process".

LOW ENRICHED URANIUM (LEU)—Any uranium-bearing material whose U-233 plus U-235 isotope content is greater than 0.724 percent, but less than 20.00 percent by weight (relative to total uranium element content).

MATERIAL BALANCE—A comparison, on a measured basis, of beginning inventory (BI) plus additions to inventory (A) to ending inventory (EI) plus removals from inventory (R), for a given control area (or combination of control areas) over a specified period of time.

MATERIAL BALANCE PERIOD—The time span to which a material balance or physical inventory pertains.

MATERIAL-TYPE CODES—Number codes for identifying basic material types with respect to source material, special nuclear material, and by-product materials. The codes are used by the Nuclear Materials Management and Safeguards System (NMMSS) for tracking materials nation-wide. For SNM and uranium SM, there are seven material type codes as follows:

CODE	MATERIAL TYPE
10	Depleted Uranium
81	Normal Uranium
20	Enriched Uranium (*)
89	Uranium in Cascades
70	Uranium-233 (**)
50	Plutonium
83	Plutonium-238 (***)

(*) For DOE/NRC Form 742 purposes, material code 20 has four sub-codes, El, E2, E3, and E4, to denote enrichment range. For NRC Form 327 purposes, code 20 has two sub-codes, namely LEU and HEU.

(**) Uranium materials should be regarded as material code 70 if the U–233 isotopic distribution is greater than (1) 10.00 weight percent relative to total uranium element content, or (2) both the U–235 isotopic concentration and 5.00 percent by weight of the total uranium; otherwise report as material code 10, 20, or 81, as appropriate.

(***) Plutonium materials should be regarded as material code 83 if the Pu-238 isotopic distribution is greater than 10.00 weight percent relative to total plutonium element content. Otherwise, report as material code 50.

MATERIAL UNACCOUNTED FOR (MUF)—A term previously used for *"Inventory Difference"*

MEASURED DISCARD (MD)—A measured quantity of gaseous, liquid, or solid waste that is no longer possessed by a facility, or which has been transferred (accounting-wise) to a waste holding-account via a DOE/NRC Form 741 transaction.

MEASUREMENT—The process of determining (1) a uranium or plutonium element concentration; (2) a specific isotope content; (3) an isotopic concentration or distribution; (4) a bulk material mass or item mass; or (5) a bulk- material volume. Measurement values are derived through a calibration process which establishes the relationship between instrument (device) response and the parameter being determined.

MEASUREMENT BIAS—An unidirectional component of error that affects (to the same degree) all members of a measurement data set. A bias can thus be estimated from the deviation of the mean of several measurements of a representative standard from the reference value (or assigned value) of such standard. If a bias is large enough to have an effect on the recorded value of SNM or SM items, the accountability values of such items should be appropriately adjusted. If a bias is too small to affect individual items, its effect across all measured items (or material quantities) should be determined as an absolute quantity (e.g., as grams U and grams U–235). The net sum of all biases (as absolute quantities) not applied as corrections to individual items is then applied as a bias correction to inventory difference.

MEASUREMENT SYSTEM—Any instrument or device, or combination of devices, used to derive a (1) bulk-material mass or item mass; (2) bulk-material volume; (3) plutonium or uranium element concentration; (4) isotope quantity; or (5) isotopic distribution or contration; and which can be characterized by systematic and random error components. Each measurement system can also be defined or identified by its unique set of the following parameters:

(a) Device or equipment utilized
(b) Standards used for calibration
(c) Representative standards used for control
(d) Sampling technique and equipment utilized (if applicable)

(e) Sample aliquoting technique (if applicable)
(f) Sample aliquot pre-treatment methodology (if applicable)

NATURAL URANIUM—Any uranium-bearing material whose uranium isotopic distribution has not been altered from its natural occurring state. Natural uranium is nominally 99.283% U-238, 0.711% U-235, and 0.006% U-234 (by weight relative to total uranium element).

NORMAL URANIUM—Any uranium-bearing material having a uranium isotopic weight distribution that can be described as being (1) 0.700 to 0.724% in combined U-233 plus U-235; and (2) at least 99.200% in U-238. [NOTE: All "*natural uranium*" having a U-235 isotopic concentration in the range of 0.700 to 0.724 percent is "*normal uranium*", but not all "*normal uranium*" is "*natural uranium*".)

PHYSICAL INVENTORY—A determination by physical means (visual and measurement) of the quantity of source material or special nuclear material (of a given material-type code) on-hand within a given "plant" at a specified point in time. The primary purpose for a physical inventory is to confirm the absence of (or detect) a loss or diversion of nuclear material. For a meaningful conclusion to be drawn from a physical inventory, the physical presence of all items and any significant quantities of material not in item form needs to be visually confirmed, and the quantities of material on inventory need to be measured or assurance provided that prior measurements are still valid.

PLANT—For SM and SNM control and accounting purposes, a plant is defined as a set of processes or operations (on the same site, but not necessarily all in the same building) coordinated into a single manufacturing, R&D, or testing effort. A scrap-recovery operation, or an analytical laboratory, serving both on-site and off-site customers (or more than one on-site manufacturing effort) must be treated as a separate plant. Physical inventories are to be conducted on a "plant" basis, as well as on a "material-type code" basis.

PRIOR-PERIOD ADJUSTMENT (PPA)—For Form 327 purposes, PPAs are limited to corrections (adjustments) applied to an inventory difference (ID) value due to a correction applied to a component of beginning inventory (BI), after the inventory period started. PPAs can arise only from (1) corrections of recording or measurement errors associated with material on BI; (2) resolution within the current period of statistically significant shipper-receiver differences involving material that was on BI; and (3) adjustments to initial receipt values pertaining to scrap, received in a prior period, due to better measurement following dissolution of such scrap in the current period. Since these type of corrections have nothing to do with the current-period losses or errors, and since the official BI value is not adjusted, an adjustment to the ID value (derived from the equation ID = BI + A – R – EI) is necessary to obtain an ID that reflects only current-period activity.

RECEIPT—A quantity of SM or SNM received by a "plant", via a shipment from an off-site source. A receipt is also an "addition to inventory".

REMOVALS FROM INVENTORY (R)—All measured quantities of SNM or SM falling within the categories of (1) shipments; (2) measured discards released to the environment; (3) declared and measured waste stored on-site and formally transferred (accounting-wise) to a waste holding account via a DOE/NRC Form 741 transaction; and (4) measured discards transported off-site, other than waste shipped from a "waste holding account". [NOTE: "*Removals from inventory*" is equal to "*shipments*" plus "*measured discards*"—that is, R = S + MD.]

REMOVALS FROM PROCESS (RFP)—Includes all SM or SNM which falls within the categories of (1) generation of ultimate product that is maintained under tamper-safing; (2) generation of sealed sources or encapsulated material; (3) generation of measured discards released to the environment; (4) generation of declared and measured waste remaining on site (but not stored within any processing area); and (5) shipment of any materials not described by categories (1), (2), (3), or (4). [NOTE: "*Removals from process*" and "*removals of material from process*" have the same meaning.)

RESIDUAL HOLDUP—Any SM or SNM that remains within processing equipment (including ventilation filters and ductwork) after system draindown and/or cleanout. If, at the time of physical inventory, the total quantity of residual holdup is significant, such holdup must be measured (or estimated on the basis of partial measurements and engineering calculations) and included in the physical inventory listing. The uncertainty associated with a total measured or estimated residual holdup quantity must be included in the calculation of SEID or LEID.

SEID LIMIT—For 10 CFR 74.31 licensees, the limit for SEID is the greater of (1) 6,400 grams U-235 for isotope and 200,000 grams uranium for element, when assuming that the measurement and non-measurement contributions to

SEID are equal; or (2) 0.177 percent of active inventory (for both element and isotope), when assuming that the measurement and non-measurement contributions to SEID are equal. For licensees subject to 10 CFR 74.33, SEID limit is the greater of (1) 3,500 grams for U–235 and 120,000 grams for uranium element, when assuming that measurement and non-measurement contributions to SEID are equal; or (2) 0.177 percent of active inventory (for both element and isotope), when assuming that measurement and non-measurement contributions to SEID are equal. For 10 CFR 74.51 licensees, the limit for SEID is the greater of (1) 200 grams for plutonium and U–233 (both element and isotope), and 300 grams for both HEU and U–235 isotope; or (2) 0.100 percent of active inventory (for both element and isotope). The term *"SEID LIMIT"* does not apply to licensees subject to 10 CFR 70.51(e).

SHIPMENT—Any transfer of SM or SNM, other than measured waste discards, to another on-site "plant" or to an off-site location.

SHIPPER-RECEIVER DIFFERENCE (SRD)—The difference between what a sending facility (shipper) claims was contained in a shipment (of SM or SNM) and what the receiving facility claims was received, where both shipper's and receiver's values are based on measurements.

SOURCE MATERIAL (SM)—Natural uranium, depleted uranium, natural thorium, or any combination thereof, provided the combined thorium plus uranium content is at least 0.05 percent by weight.

SPECIAL NUCLEAR MATERIAL (SNM)—(1) Plutonium, uranium-233, uranium enriched in the isotope U–233 and/or U–235; and any other material that NRC, pursuant to the provisions of Section 51 of the Atomic Energy Act of 1954 (as amended), determines to be SNM; and (2) any uranium material artificially enriched in U–233 and/or U–235 (e.g., by blending normal or depleted uranium with enriched uranium to form a homogeneous mixture).

There are three levels of strategic significance applied to SNM, depending on the type and quantity, defined as follows:

FORMULA QUANTITY—The highest level of strategic significance—see definitions for *"Formula Quantity"* and *"Strategic Special Nuclear Material"*.

SNM OF MODERATE STRATEGIC SIGNIFICANCE—(1) Less than a formula quantity, but more than 1,000 grams of U–235 contained in HEU, or more than 500 grams of U–233 or plutonium, or more than a combined quantity of 1,000 formula grams, when computed by the equation:

$$\text{Grams} = (\text{grams U–235 in HEU}) + 2\,(\text{grams U–233} + \text{grams Pu})$$

or (2) 10,000 grams or more of U–235 contained in LEU enriched from 10.00 to 19.99 percent by weight in U–235.

SNM OF LOW STRATEGIC SIGNIFICANCE—(1) Less than an amount of SNM of moderate strategic significance, but more than 15 grams of (i) U–235 contained in HEU, (ii) U–233, (iii) plutonium, or (iv) any combination thereof; (2) less than 10,000 grams but more than 1,000 grams of U–235 contained in LEU enriched from 10.00 to 19.99 percent by weight in the U–235 isotope; or (3) 10,000 grams or more of U–235 contained in LEU enriched from 0.725 to 9.999 percent by weight in the U–235 isotope.

STANDARD DEVIATION—The random error (at the 67 percent confidence level) associated with a single value of a data set, which in turn is also a measure (or indication) of the precision relating to a set of measurements (or set of data) pertaining to the same item or sample of material. Standard deviation is calculated as follows:

$$\text{Std. Dev.} = \left[\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n - 1} \right]^{\frac{1}{2}}$$

Where: n = number of measurements performed

x_i = the value obtained for the i th measurement for i = 1, 2, 3 ..... n

$\bar{x}$ = the average value for all n measurements

STANDARD ERROR OF INVENTORY DIFFERENCE (SEID)—(1) For licensees subject to 10 CFR 74.31 or 74.33, SEID is equal to the square root of the sum of both measurement and non-measurement variances associated with an inventory difference. (2) For licensees subject to 10 CFR 74.51 (and hence to 74.59), SEID is equal to the square root of the measurement variance (only) associated with an inventory difference.

STRATEGIC SPECIAL NUCLEAR MATERIAL (SSNM)—U-235 contained in HEU, uranium-233, or plutonium.

WASTE—Any SM or SNM that (1) is not suitable (in its present form) for the production of product material, and (2) is not regarded as economically recoverable for reuse.

WASTE HOLDING ACCOUNT—An accounting ledger, separate from a facility's book-inventory account, which shows the total current quantity of declared and measured waste stored on site (but not within any processing area) and awaiting final disposition. All such waste must have been generated while being part of the facility's book inventory, and transferred to the waste holding account via a DOE/NRC Form 741 transaction. [**NOTE:** Waste holding accounts for liquid waste stored in ponds or lagoons are sometimes designated as *"LAGOON ACCOUNTS" or "LAGOON HOLDING ACCOUNTS."*

III GENERAL GUIDANCE

SNM licensees that are required to use NRC Form 327 to report the results of physical inventories are those that are subject to any of the following regulations within Chapter One, Title 10 of the Federal Code of Regulations:

(a) 10 CFR 70.51(e)(3)
(b) 10 CFR 74.31(c)(5)
(c) 10 CFR 74.33(c)(4)
(d) 10 CFR 74.59(f)(1)

10 CFR 74.17(a), (b), and (c) specifically require such licensees to submit Form 327 reports. Such report forms should be completed in accordence with the instructions provided in this NUREG document.

A separate 327 form report is to be used for each material-type code within each plant (see definitions for "material type codes" and "plant"). For example, let's assume that XYZ Nuclear Corporation conducts the following operations under a single license at a single site:

OPERATION A—Conversion of high enriched uranium hexafluoride to high enriched uranium metal.

OPERATION B—Fabrication of mixed plutonium oxide/uranium oxide fuel rods, in which some of the uranium oxide is enriched between 1.00 and 3.50 percent in U-235, while the remaining is either normal or depleted uranium.

OPERATION C—Recovery of high enriched uranium scrap generated from both operation A and from off-site facilities.

OPERATION D—Analytical laboratory which provides sample analyses on samples generated from operations A, B, and C.

Operations A and B are separate and independent of each other (with no SNM flowing between the two operations). Thus, A and B must be regarded as separate plants. Although part of the uranium processed by operation C relates to operation A, operation C must be considered as a separate plant because it is processing scrap generated from both on-site and off-site operations (i.e., from more than one plant). Likewise, operation D must be regarded as a separate plant because it receives samples (i.e., SNM) from more than one plant. Thus, the four above operations can be designated as Plants A, B, C, and D, and in this hypothetical example, a separate Form 327 report would be necessary for each of the following:

(a) any HEU physical inventory conducted in Plant A
(b) any plutonium physical inventory conducted in Plant B
(c) any LEU physical inventory conducted in Plant B
(d) any HEU physical inventory conducted in Plant C
(e) any LEU physical inventory conducted in Plant D

(f) any HEU physical inventory conducted in Plant D
(g) any plutonium physical inventory conducted in Plant D.

In addition to LEU, HEU and plutonium, as used in the example above, separate 327 forms are to be used for reporting any physical inventories associated with (1) uranium–233, (2) plutonium-238, (3) uranium in cascades, (4) normal uranium at an enrichment facility, and (5) depleted uranium at an enrichment facility. For each SM or SNM material type, inventory results are to be reported for both element and isotope as shown in Table I, below.

Table I—Material Types To Be Inventoried Separately

Material Type	Material Code	Reporting Weight Unit (to nearest)	Weight Element	Weight Isotope
Depleted Uranium (1)	10	Kilogram	Uranium	U–235
Normal Uranium (1)	81	Kilogram	Uranium	U–235
Low Enr. Uranium (2)	20	Gram	Uranium	U–235 or U–233 + U–235
High Enr. Uranium (2)	20	Gram	Uranium	U–235 or U–233 + U–235
Uranium in Cascades (1)	89	Gram	Uranium	U–235
Uranium–233 (3)	70	Gram	Uranium	U–233
Plutonium–238 (4)	83	0.1 Gram	Plutonium	Pu–238
Plutonium	50	Gram	Plutonium	Pu–239 + 241

(1) Only uranium enrichment facilities subject to 10 CFR 74.33(c)(4) are required to conduct physical inventories for material codes 10, 81, and 89.

(2) For Form 327 purposes, LEU and HEU are two sub-codes of material code 20, and physical inventories for LEU and HEU must be conducted and reported separately.

(3) To be regarded as material code 70, the U–233 must be greater than 10.00 weight percent of the total uranium content, or greater than both the U–235 content and 5.00 weight percent of the total uranium content. Otherwise, report as material code 10, 81, or 20, as appropriate.

(4) To be regarded as plutonium-238, the Pu-238 isotopic distribution must be greater than 10.00 weight percent relative to total plutonium element content. Otherwise, report as material code 50.

All the blocks ("A" through "I") on the upper portion of Form 327 are to be filled in as follows:

Block A—"Licensee Name"—Name of corporation or company to which license is issued.

Block B—"Facility Location"—Nearest town to which facility site is located, or licensee's mailing address.

Block C—"Docket No."—List appropriate Part 70 docket number.

Block D—"SNM License No."—List SNM license number under which possession and use of SNM is authorized.

Block E— "Plant Designation"—For licensees conducting only a single operation, enter "Single plant operation". For licensees that are authorized to operate two or more plants, as described within their approved Fundamental Nuclear Material Control Plan (FNMCP), designate the plant (by code or name as given in the FNMCP) to which the 327 form report pertains.

Block F—"Beginning Date" & "Ending Date"—For the ending date, enter the cut off date for the physical inventory in question. For the beginning date, enter the cut off date for the physical inventory just previous to the one in question. [NOTE: If the cut off time for the previous physical inventory was midnight or 11:59 p.m. of a given day, the beginning date for the current period should be regarded as having started at 12:01 A.M. of the following day.]

Block G—"Material Type"— Place an "X" in one of the eight boxes, to indicate which material type the 327 form report pertains. [NOTE: Do not mark more than one box per form, except in the case of a total material balance inventory difference report associated with a uranium enrichment facility, which must be reported in addition to the individual material type reports.]

Block H—"Licensee's Certifying Official and Date"—The printed name and signature of a licensee supervisor or manager is to be entered in this block. By signing this block, an individual is certifying that he/she has reviewed and checked all entries, and that to the best of their knowledge, all entries are correct. The date on which the 327 Form is signed should also be entered.

For lines one through thirteen, enter the appropriate value for both the "Grams Element" and "Grams Isotope" columns. Immediately under the grams isotope heading, enter a "0", "2","3", "5", or "8" within the isotope code box, to indicate the isotope being reported. The isotope codes are as follows:

0 =	Pu-239 plus Pu-241 content	2 =	U-233 plus U-235 content
3 =	U-233 content	5 =	U-235 content

8 = Pu-238 content

For physical inventories of either depleted uranium or normal uranium at uranium enrichment facilities, both element and isotope quantities are to be reported to the nearest kilogram. For physical inventories pertaining to plutonium-238, both element and isotope quantities are to be reported to the nearest tenth of a gram. All other material types are to be reported to the nearest gram. When reporting the results of depleted uranium or normal uranium physical inventories (at enrichment facilities), either (1) cross out the "GRAMS" at the top of both column headings and write in "KG", or (2) add three zeros after each rounded kilogram quantity.

For lines 6, 7, 8, and 9, a plus ("+") or minus ("–") sign, as appropriate, must precede each entered quantity for both element and isotope. The specific instructions given in the next section provide guidance for determining whether a sign should be positive or negative.

Transmittal of Completed Forms:

Completed 327 forms are to be mailed to the NRC and addressed as follows:

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
ATTENTION: Branch Chief
Domestic Safeguards Branch
Division of Safeguards and Transportation
Mail Stop: 4E4, WFN
Washington, DC 20555

To satisfy the time frame cited by 10 CFR 74.17(a), (b), or (c), as appropriate, for transmitting the completed form, the transmittal letter must be postmarked on or before the last day of the specified time period.

Any 327 form which is reporting information associated with an SSNM physical inventory must be properly identified as "CONFIDENTIAL, National Security Information" (see 10 CFR Part 95, Appendix A).

IV SPECIFIC INSTRUCTIONS

Line 1—Beginning Inventory (BI):

The "beginning inventory" value must be identical to the previous period's "ending inventory" value. If, after the start of the current period, adjustments were made to items that were on BI (due to discovered errors in recording or measurement, or due to a resolution of one or more shipper-receiver differences), the net sum of such adjustments is to be reflected in Line 8 rather than adjusting the BI value itself.

NOTES:

(1) Do not include in the BI quantity any waste material that was on hand at the start of the inventory period, but which had been measured and transferred to a waste holding account prior to the BI date. (See definition for "*Waste Holding Account*").

(2) As used in these instructions, the term "current period" means the material balance period that ended on the cut off date for the physical inventory being reported.

Line 2—Additions to Inventory (A):

"Additions to inventory" represent the total of all SNM (or SM in the case of enrichment facilities) of a particular material-type code received during the current period—either from off-site suppliers or from other on-site plants (that are not being covered by the specific 327 form report in question). For enrichment facility reports dealing with uranium in cascades, "additions to inventory" include any SM (either depleted or normal uranium) or any SNM (low enriched uranium) fed into the cascade system, except for material withdrawn from the cascade system and recycled back to the cascade(s) during the same material balance period. For enrichment facility 327 form reports dealing with LEU, "additions to inventory" represents all LEU withdrawn from the cascade system during the material balance period, plus any LEU received as a shipment from an off-site supplier.

NOTES:

(1) For LEU reports, "additions to inventory" should also include any normal, depleted, or high enriched uranium that was blended with LEU (during the current period within the plant to which the 327 form pertains), if the resulting blend is greater than 0.724 weight percent, but less than 20.00 weight percent in combined U–233 plus U–235, relative to total uranium content.

(2) For HEU reports, "additions to inventory" should also include any normal, depleted, or low enriched uranium that was blended with HEU (during the current period within the plant to which the 327 report pertains), if the resulting blend is 20.00 weight percent or higher in combined U–233 plus U–235, relative to total uranium content.

(3) Whenever a correction (adjustment) is made during the current period to an SNM (or SM) quantity that was received in a prior period, such adjustment must be included in the total Additions to Inventory quantity for Line 2 due to the requirements imposed by the Nuclear Materials Management Safeguards System (NMMSS). That is, such an adjustment is not in reality a current period receipt, but NMMSS requires a DOE/NRC Form 741 transaction to be executed to reflect such an adjustment, and NMMSS does not distinguish between actual receipts and corrections to previous receipts when totalizing 741 transactions. Hence, licensees are forced to treat current period adjustments to prior period receipts as though they were actual current period receipts so as to have their unadjusted ID agree with that shown by NMMSS. (Also see the instructions pertaining to Line 8, *Prior Period Adjustments*.)

Line 3—Shipments (S):

"Shipments" represents the total of all SNM or SM, of a given material-type code, shipped off-site or to other on-site plants during the current period with the exception of (1) prior-period waste shipped from a "waste holding account"; and (2) any current-period waste that was shipped. **NOTE:** If a correction (adjustment) is made during the current period to an SNM (or SM) quantity that was shipped in a prior period, such adjustment must be included in the total *Shipment* quantity for Line 3 due to the requirements imposed by the Nuclear Materials Management Safeguards System (NMMSS). That is, such an adjustment is not in reality a current period shipment, but NMMSS requires a DOE/NRC Form 741 transaction to be executed to reflect such an adjustment, and NMMSS does not distinguish between actual shipments and corrections to previous shipments when totalizing 741 transactions. Hence, licensees are to treat current period adjustments to prior period shipments as though they were actual current period shipments so as to have their unadjusted ID agree with that shown by NMMSS. (Also see the instructions pertaining to Line 8, *Prior Period Adjustments*.)

Line 4—Measured Discards (MD):

"Measured discards" include all SNM or SM waste (solid, liquid, and gaseous), of a given material-type code, that was generated, measured, and removed from the accounting ledgers during the current period. Whether the waste

was shipped, discharged to the environment, or stored on-site as part of a waste holding account is irrelevant with respect to this line entry. **NOTE:** Any waste (liquid or solid) that is stored on-site, but which has not been transferred to a waste holding account, is to be regarded as part of ending inventory.

Line 5—Ending Inventory (EI):

The "ending inventory" value is the total of all SNM or SM, of a given material- type code, on hand at the cut off time, as determined by the physical inventory, except for any waste stored on-site as part of a waste holding account.

Line 6—Inventory Difference (ID):

The "inventory difference" is the mathematical combination of the five preceding lines. That is, ID = BI + A – S – MD – EI. A negative ID suggests a gain in material—i.e., the physical inventory total was more than the amount shown on the accounting books. A positive ID implies a loss of material—i.e., the physical inventory total was less than that indicated by the accounting ledgers. Some prefer to define ID as being equal to book inventory minus physical inventory, which is identical to the ID equation given above. That is, the book inventory is the same as BI plus A minus S minus MD, and the physical inventory is the same as EI.

Line 7—Bias Correction to the Inventory Difference (BC):

Bias corrections to inventory difference are to be made in accordance with a licensee's FNMC Plan commitments. Any bias correction that has been applied to individual SNM or SM items (thus resulting in the changing of accounting ledger entries) must <u>not</u> be applied as a correction to ID. Most biases are too small to affect individual items, but their effect over many items can have a significant effect on the ID value. For those biases that are to be applied as adjustments to ID, the methodology used to derive the overall net bias correction adjustment should satisfy (or approximate) the following model:

$$BC = \left[\begin{matrix}\text{Net Bias}\\ \text{Corr. BI}\end{matrix}\right] + \left[\begin{matrix}\text{Net Bias}\\ \text{Corr. A}\end{matrix}\right] - \left[\begin{matrix}\text{Net Bias}\\ \text{Corr. S}\end{matrix}\right] - \left[\begin{matrix}\text{Net Bias}\\ \text{Corr. MD}\end{matrix}\right] - \left[\begin{matrix}\text{Net Bias}\\ \text{Corr. EI}\end{matrix}\right]$$

NOTE: If bias is negative (causing an understatement), the bias correction is positive. If bias is positive (causing an overstatement), the bias correction is negative. The BI bias correction is due to biases that existed during prior periods. The S and EI bias corrections can be a combination of prior and current period biases. The A and MD bias corrections are due to biases that existed during the current period only.

Line 8—Prior Period Adjustments (PPA):

There are two general types of prior period adjustments, which can be referred to as "Type A PPAs" and "Type B PPAs". Type A are true PPAs, while Type B are adjustments needed to compensate for NMMSS requirements/ practices. Type A PPAs are changes (made during the current period) to accountability values that were assigned during previous periods and which pertain to items or material that are part of BI. Type A PPAs can arise only from:

(1) Corrections of a recording or measurement error associated with material on BI,

(2) Resolution within the current period of a statistically significant shipper- receiver difference involving material that was on BI, and

(3) An adjustment to the initial receipt value pertaining to scrap, received in a prior period, due to better measurement following dissolution of such scrap in the current period.

NOTE: If an accountability value generated in a prior period causes BI to be overstated, the associated Type A PPA is given a negative sign. If BI is understated, the PPA is positive.

Type B PPAs are changes made in the current period to SNM (or SM) quantities that are not part of BI and were either received or shipped in a prior period. Type B PPAs must be made because NMMSS does not distinguish between actual receipts and corrections to previous receipts, and likewise does not distinguish between actual shipments and corrections to previous shipments. The algebraic sign (+ or –) given to a particular Type B PPA is the opposite of the sign given to the corresponding adjustment to the prior period receipt or shipment in question.

Line 9—Adjusted Inventory Difference (AID):

The adjusted inventory difference is the algebraic sum of the amounts entered on Lines 6, 7, and 8. It is this final AID value that is compared to:

(i) a licensee's Detection Threshold Value when subject to either 10 CFR 74.31(c)(5) or 74.33(c)(4),

(ii) three times SEID when subject to 10 CFR 74.59(f)(1)(i), and

(iii) one and a half times LEID limit (i.e., 0.75 percent of throughput as indicated by the larger of *additions to* or *removals from process*) when subject to 10 CFR 70.51(e).

The AID value is also used with regard to 10 CFR 74.13(b)(1).

Lines 10a & 10b—SEID and LEID:

Licensees subject to 10 CFR 74.51 are to complete Line 10a, with SEID meaning the square root of measurement variance associated with the ID. Licensees subject to 10 CFR 74.31 or 74.33 are to complete both Lines 10a and 10b, with SEID meaning the square root of the sum of both measurement and non-measurement variances associated with the ID, and with LEID meaning two times the square root of the measurement variance associated with the ID. Licensees subject to 10 CFR 70.51(e) are to complete Line 10b, with LEID meaning two times the square root of the measurement variance associated with the ID.

Lines 11a & 11b—Active Inventory and Throughput:

Licensees subject to 10 CFR 74.31, 74.33, or 74.51 are to complete Line 11a. Active inventory is the summation of BI plus A plus S plus MD plus EI after deducting all covariant items (or material quantities) from each of the preceding terms. That is, any item appearing twice among the five terms (with both listings based on the same measurement, or set of measurements) is not to be included within any of the terms when determining active inventory. Licensees subject to 10 CFR 70.51(e) are to complete Line 11b. See the definitions for "additions to process" and "removals from process" in the DEFINITIONS section.

Lines 12a & 12b—SEID and LEID Limits:

Licensees subject to 10 CFR 74.51 are to complete Line 12a, whereas licensees subject to 10 CFR 74.31 or 74.33 are to complete both Lines 12a and 12b, and 70.51(e) licensees are to complete line 12b.

For 74.31 licensees, SEID limit is the greater of (1) 6,400 grams U–235 for isotope and 200,000 grams uranium for element, when assuming that measurement and non-measurement contributions to SEID are equal; or (2) 0.177 percent of Line 11a (for both element and isotope), when assuming that measurement and non-measurement contributions to SEID are equal. For licensees subject to 74.33, SEID limit is the greater of (1) 3,500 grams U– 235 for isotope and 120,000 grams uranium for element, when assuming that the measurement and non-measurement contributions to SEID are equal; or (2) 0.177 percent of Line 11a (for both element and isotope), when assuming that measurement and non-measurement contributions to SEID are equal. For 74.51 licensees, SEID limit is the greater of (1) 200 grams for plutonium and U–233 (both element and isotope), and 300 grams for both HEU element and U–235 isotope; or (2) 0.100 percent of Line 11a (for both element and isotope).

For 74.31 licensees, LEID limit is the greater of (1) 9,000 grams U–235 for isotope and 300,000 grams uranium for element; or (2) 0.25 percent of Line 11a. For 74.33 licensees, LEID limit is the greater of (1) 5,000 grams U–235 for isotope and 170,000 grams uranium for element; or (2) 0.25 percent of Line 11a. For 70.51(e) licensees, LEID limit is the greater of (1) 300 grams for HEU element and isotope, 9,000 grams U–235 for LEU isotope, and 300,000 grams uranium for LEU element; or (2) 0.50 percent of Line 11b.

Line 13—Inventory Difference Limit:

Licensees subject to 10 CFR 70.51(e) should enter the greater of:

(i) 200 grams Pu or U–233, 300 grams HEU or U–235 contained in HEU, or 9,000 grams U–235 contained in LEU, as appropriate, or

(ii) 1.50 times the LEID limit, where LEID limit is 0.50 percent of Line 11b.

NOTE: When the U–235 ID limit for LEU inventories is 9,000 grams, there is no uranium element ID limit. Thus, in this situation, enter "NA" in the element column for Line 13.

When conducting 12-month physical inventories, licensees subject to either 10 CFR 74.31 or 74.33 should enter their U–235 Detection Threshold (DT) value, where DT equals the site-specific U–235 Detection Quantity (DQ) minus 1.30 times the U–235 SEID. For bimonthly dynamic inventories (for "uranium in cascades") conducted by 10 CFR 74.33 licensees, the ID limit is the DT minus the cumulative ID for the ten-month period just prior to the current two-month period. The limits just described are U–235 ID limits. For 10 CFR 74.31 and 74.33 licensees, there are no uranium element ID limits. Thus, always enter "N/A" in the element column for Line 13.

Licensees subject to 10 CFR 74.51 [and thus 74.59 (f)] should enter the larger of: (1) 200 grams Pu or U–233, 300 grams HEU or U–235 contained in HEU, as appropriate, or (2) three times SEID.

V RESPONSE ACTIONS FOR EXCESSIVE INVENTORY DIFFERENCES

Whenever a finally determined inventory difference value is in excess of its regulatory limit, the licensee should (not necessarily as a regulatory requirement, but as a responsible and professional course of action) do the following:

(a) Immediately notify the appropriate NRC safeguards licensing authority by telephone of such a situation, even if the regulatory time limit for reconciling and reporting the ID has not expired.

(b) Initiate an investigation to determine the probable cause of the excessive ID, even though the regulatory time limit for reconciling and reporting the ID has not yet expired.

(c) When officially reporting the ID on NRC Form 327, attach an official letter to the 327 form that (1) acknowledges that the ID limit has been exceeded; (2) confirms that investigative activities, as required by the licensee's FNMC plan and/or NRC regulations, have been initiated; and (3) provides the status of the investigation, and investigative findings, if the investigation has been completed.

The actual regulatory ID limit will depend on which MC&A physical inventory regulation a licensee is subject to, and the amount of throughput and/or processing activity for the inventory period in question.

For 10 CFR 70.51(e)(3) licensees:

Licensees subject to 10 CFR 70.51(e) must respond to the requirement of 10 CFR 74.13(b)(1) whenever an ID exceeds both (1) 200 grams of plutonium or U–233, 300 grams of HEU or U–235 contained in HEU, or 9,000 grams U–235 contained in LEU, as appropriate; and (2) its associated LEID. It should be noted, however, that LEID is not to be regarded as a regulatory limit for ID. Thus, if an ID exceeds both the de minimus level and LEID, but is less than the ID limit, no response other than that called for by 74.13(b)(1) is required. The ID limit which is to be indicated on Line 13 of Form 327 is 1.50 times the LEID limit (see "LEID Limit" in Definitions Section). Whenever an official ID result exceeds the ID limit, the licensee is to initiate a reinventory. It should be noted that although both element and isotope IDs are to be reported for plutonium, Pu-238, and U–233 physical inventories, there are no isotope ID limits for those material types (i.e., for material codes 50, 70, and 83).

If the ID exceeds 1.50 times LEID limit, but is no greater than 2.00 times LEID limit, the reinventory may be conducted in the same manner as a regular physical inventory (including a 30-day period following the reinventory date to reconcile and report the results of the reinventory). If the ID resulting from a reinventory is equal to or less than 1.50 times the LEID limit for the combined initial inventory plus reinventory period, no further corrective action is required. If the reinventory ID is, however, greater than 1.50 times the combined period LEID limit, the appropriate NRC safeguards licensing authority is to be notified by phone or other telephonic means as soon as such ID result has been finalized (i.e., don't wait until the 30-day reconciliation period is used up).

If an ID exceeds twice the LEID limit, the reinventory is to be conducted on the basis of a complete plant-process shutdown and cleanout, and restarting the process is not to be initiated without prior written approval from the NRC. Details of the shutdown and cleanout activities must be well defined in the licensee's FNMC plan.

For 10 CFR 74.31 licensees:

The ID limit for licensees subject to 74.31 is the calculated U–235 detection threshold (DT) value for the inventory period in question (see "Detection Threshold", "Detection Quantity", and "Standard Error of the Inventory Difference" in the Definitions Section). 74.31 licensees should note that while both element and isotope IDs are to be reported, only the isotope ID has an ID limit. Due to the low strategic significance of the SNM possessed by 74.31 licensees, the ID limit is very liberal (in most cases greater than five times SEID). However, if an ID (either positive or negative) equals or exceeds the ID limit, the NRC would normally regard such a situation as very serious, and a lengthly process shutdown and extensive NRC investigation would be a likely consequence. In any event, the licensee's response actions for an ID that equals or exceeds its associated DT should be well defined in its FNMC plan.

Additionally, any isotope ID (of positive sign) that exceeds twice its associated SEID by more than 500 grams U–235, or by more than 250 grams U–233 or Pu-239 + Pu-241, or Pu-238, must be regarded as an indicator of possible loss, and as such must be subject to the investigation and resolution commitments (pertaining to loss indicators) contained in the licensee's FNMC plan.

For 10 CFR 74.33 licensees:

With respect to 12-month static physical inventories, associated with any material-type code other than "uranium in cascades", the ID limit is equal to the detection threshold (DT) value for the inventory period in question (see *"Detection Threshold"*, *"Detection Quantity"*, and *"Standard Error of the Inventory Difference"* in the Definitions Section). For bi-monthly dynamic physical inventories (for "uranium in cascades"), the ID limit is the DT minus the cumulative ID for the ten-month period just prior to the current two-month period. Because of the low strategic significance of LEU being produced by 74.33 licensees, the ID limits are very liberal (in most cases greater than five times SEID). However, if an ID equals or exceeds its ID limit, the NRC would normally regard such a situation as very serious, and, depending on circumstances, a complete process shutdown might be deemed necessary. In any event, the licensee's response actions for an ID that equals or exceeds its associated DT should be well defined in its FNMC plan.

Additionally, any U–235 ID (of positive sign) that exceeds twice its associated SEID by more than 500 grams U–235 must be regarded as an indicator of possible loss, and as such must be subject to the investigation and resolution commitments (pertaining to loss indicators) contained in the licensee's FNMC plan.

For 10 CFR 74.59(f) licensees:

The ID limit for those licensees subject to the physical inventory requirements of 74.59(f) is the larger of (1) 200 grams of plutonium or U–233, or 300 grams of HEU or U–235 contained in HEU, as appropriate; or (2) three times SEID. Whenever an ID result (regardless of its algebraic sign) exceeds its limit, an investigation is to be initiated, pursuant to 74.59(f)(1)(i). The investigation must include a determination, pursuant to 74.59(f)(1)(ii), of the historical standard deviation of ID (see NUREG–1280 for more specific guidance). Such investigation should be initiated as soon as a final, official ID result is known to be in excess of its limit. When reporting an ID value that has exceeded its limit, a cover letter should accompany the Form 327, in which the excessive ID is acknowledged, and the status of the investigation noted. If, after determining that an ID has exceeded its limit, it is also determined that the ID also exceeds three times the historical standard deviation of ID, that fact must be reported to the NRC, pursuant to 74.59(f)(1)(iii).

VI REPORTING REQUIREMENTS

Table II—MC&A Reporting Requirements

REQUIREMENT SPECIFIED BY 10 CFR	APPLIES TO LICENSEES SUBJECT TO (BUT NOT LIMITED TO)	NATURE OF REPORTING REQUIREMENTS
74.11(a) & (b)	70.51(e), 74.31(c), 74.33(c) & 74.59(f)	Discovery of any loss or theft
74.13 (a)	70.51(e), 74.31(c), 74.33(c) & 74.59(f)	Semi–annual submital of Form 742
74.13(b)(1)	70.51(e)	ID exceeds both LEID and de minimus
74.13 (b)(2)	70.51(e)	LEID exceeds LEID limit
74.15(a) &(b) or (c)	70.51(e), 74.31(c), 74.33(c), & 74.59(f)	Completing and distributing Form 741
74.17(a)	74.31(c) & 74.33(c)	Submittal of NRC Form 327
74.17(b)	70.51(e)	Submittal of NRC Form 327
74.17(c)	74.59(f)	Submittal of NRC Form 327
74.31(c)(5)	74.31(c)	Inability to resolve any ID that equals or exceeds its DT value
74.33(c)(4)	74.33(c)	Inability to resolve any ID that equals or exceed its DT value
74.57(f)(2)	74.59(f)	Initiation of resolution procedure for abrupt loss detection indicator involving 5 or more FKG
74.59(f)(1)(i)	74.59(f)	SEID equals or exceeds 0.10 % of active inventory, and/or any ID that exceeds its limit
74.59(f)(1)(ii)	74.59 (f)	ID exceeds both (i) ID limit, and (ii) three times the std. dev. of historical IDs determined from sequential analysis

NRC FORM 327 (7-92)
10 CFR 70.51(e)(5), 74.31(c)(5), 74.33(c)(4), and 74.59(f)(1)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: 3150-0139
EXPIRES: 7-31-95

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 4 HOURS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0139), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

SPECIAL NUCLEAR MATERIAL (SNM) AND SOURCE MATERIAL (SM) PHYSICAL INVENTORY SUMMARY REPORT

(Physical inventories of SM pertain only to uranium enrichment facilities.)
(See NUREG/BR-0096 for instruction and guidance for completing this form)

A. LICENSEE NAME	B. FACILITY LOCATION

C. DOCKET NUMBER	D. SNM LICENSE NUMBER	E. PLANT DESIGNATION

F. MATERIAL BALANCE PERIOD	BEGINNING DATE	ENDING DATE

G. MATERIAL TYPE								
		LEU		U-233		Pu-238		NORMAL URANIUM
		HEU		PLUTONIUM		URANIUM IN CASCADES		DEPLETED URANIUM

H. LICENSEE'S CERTIFYING OFFICIAL (Printed Name and Signature)	DATE

LINE NUMBER	DESCRIPTION		GRAMS ELEMENT (U or Pu)	GRAMS ISOTOPE *Isotope Code*
* Indicate whether the entered values are positive or negative by use of appropriate "+" or "-" signs.				
1	BEGINNING INVENTORY	(BI)		
2	PLUS ADDITIONS TO INVENTORY	(A)		
3	MINUS SHIPMENTS	(S)		
4	MINUS MEASURED DISCARDS	(MD)		
5	MINUS ENDING INVENTORY	(EI)		
* 6	EQUALS INVENTORY DIFFERENCE	(ID)		
* 7	PLUS BIAS CORRECTION TO ID (Net sum of all bias corrections pertaining to, but not included in the above quantities)	(BC)		
* 8	PLUS SUM OF PRIOR PERIOD ADJUSTMENTS THAT AFFECT THE CURRENT PERIOD ID	(PPA)		
* 9	EQUALS ADJUSTED INVENTORY DIFFERENCE	(AID)		
10a	STANDARD ERROR OF THE ID	(SEID)		
10b	LIMIT OF ERROR OF THE ID	(LEID)		
11a	ACTIVE INVENTORY	(AI)		
11b	THE LARGER OF "ADDITIONS TO PROCESS" OR "REMOVALS FROM PROCESS"	(ATP) (RFP)		
12a	SEID LIMIT			
12b	LEID LIMIT			
13	ID LIMIT			

NRC FORM 327 (7-92) NOTE: ANY SPECIAL EXPLANATIONS OR COMMENTS TO THIS COMPLETED FORM SHOULD BE ATTACHED ON A CORPORATE LETTERHEAD.