IRT

CORPORATION

FINAL STATUS SURVEY REPORT FOR THE DECOMMISSIONING

OF

IRT CORPORATION 3030 CALLAN ROAD FACILITY

SNM-1405

BACKGROUND

REASON FOR DECOMMISSIONING

The facility is being returned to unrestricted use because it is no longer necessary for IRT needs. The Corporate headquarters were relocated to 6020 Cornerstone Court West and IRT no longer utilizes any Special Nuclear Materials as part of its operations. The urgency for the release of the facility is due to the landlord's (TCW Realty Advisors) request that we vacate the IRT controlled lower floor by the end of January 1994.

MANAGEMENTS APPROACH

IRT Management assigned all responsibilities for the decommissioning exercise to its Director of Safety, Mr. Kay L Crosbie, who has been associated with the Radiation Safety and Regulatory Program since the initiation of the Special Nuclear Materials License in 1973. Mr. Crosbie is a Professional Engineer (Nuclear) and possesses a B of ChE degree and a MNE degree. He has a thirty two year working history associated with radiation, radiation safety, research reactors, and experimental physics. The approach to the decommissioning is brute force. IRT operations with SNM were restricted to a very small area within on the lower floor and there were no know incidences of spills or contamination any where within the area. Almost all operations with SNM were with sealed sources; operations not associated with sealed sources were with non-dispersible solids. Because of this it was not expected to find any fixed or removable activity. To assure this, areas which had materials not as sealed sources were surveyed and wipe tested over every square foot of floor space and approximately 10 square foot of wall space up to 1 meter above floor level. Areas having to do with sealed source operations only were surveyed and wipe tested in approximately 20 square foot areas of floor space. The only problem area expected was the activation of a below ground tube which was used to store neutron sources, one of which was SNM, a $^{238}PuBe$ source. The bulk of the sources stored in the underground location were ^{252}Cf which are licensed under IRT's State of California Radioactive Material License, 2468-80.

CORPORATE HEADQUARTERS
6020-B0 CORNERSTONE COURT WEST SAN DIEGO CA 92121
(619) 458-1421 (800) 456-7421
FAX (619) 552-9555

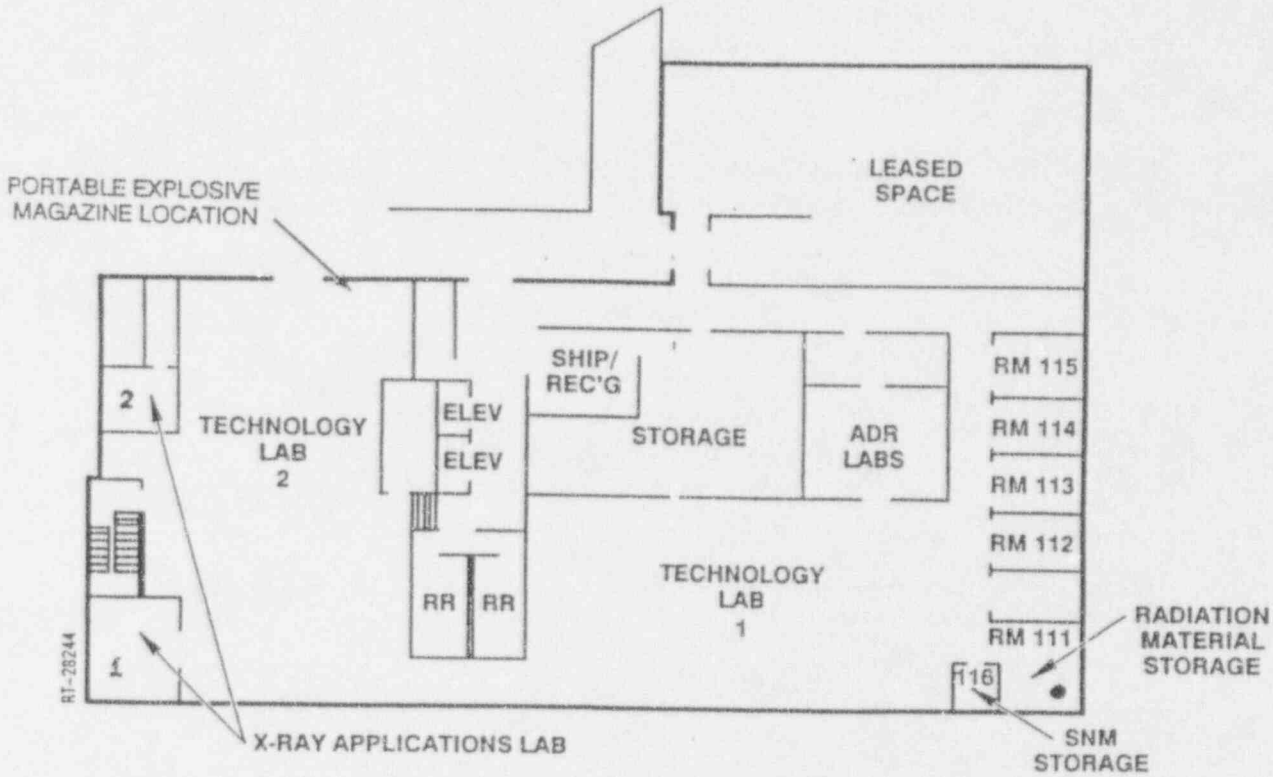
MAILING ADDRESS
P.O. BOX 85317 SAN DIEGO CA 92186-5317

SITE DESCRIPTION

TYPE AND LOCATION OF FACILITY

The facility is a standard office building with a bottom floor designed for technical operations. The building is constructed of concrete and wood with a marbleized concrete exterior; the lower floor has concrete floors and walls and is below grade level at the front and at grade level at the back. The total area of the lower floor is about 20,000 square feet; the ceiling height is 9 feet.

The building is located at 3030 Callan Road in San Diego California. A plan view of the IRT controlled area is shown in the following figure.



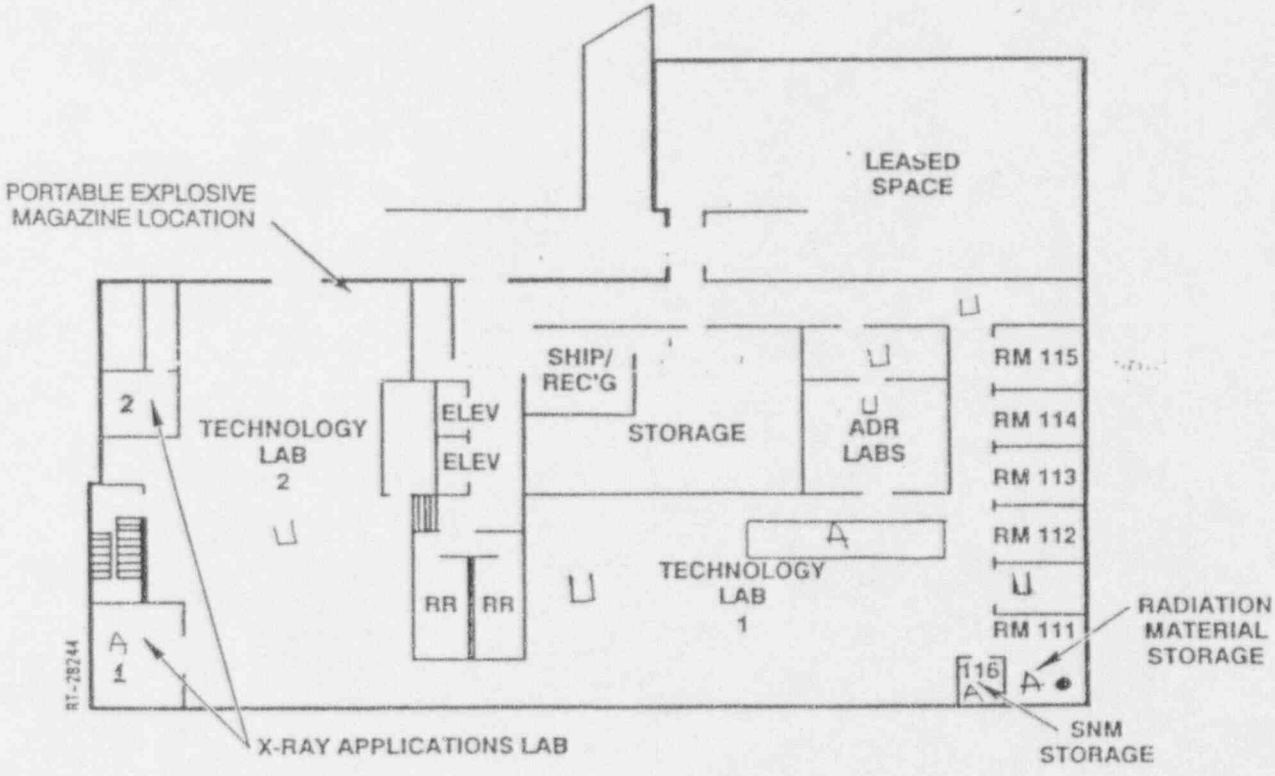
OWNERSHIP

The building is presently owned by TCW Realty Advisors of Los Angeles, California. The building was constructed in 1983 and owned by IRT Corporation until 1987 at which time it was sold and leased back to IRT Corporation.

OPERATING HISTORY

LICENSING AND OPERATIONS

This facility was licensed by the State of California, Radioactive Materials License 2468-80 for all materials other than Special Nuclear and by the Nuclear Regulatory Commission for Special Nuclear Material, SNM-1405. Exhibit 1 is a copy of the possession limits for both licenses. Please not that they reflect the possession limits which may or may not be the actual possession values. The primary type of work associated with all operations was the development of non-destructive gauges utilizing sealed isotopic sources and x-ray machines. Some of these devices were for the inspection of parts containing SNM. Activities related to SNM at this facility involved inspection systems to determine the enrichment and quality of nuclear fuel rods and just plain storage of unnecessary (excess) material awaiting disposal and/or disposition of government owned material. Regarding the SNM listed on the license, the only material used consisted of 1192 grams of 4% enriched uranium in the form of fuel rods and pellets and approximately 66 grams of fully enriched uranium in the form of a clean but "classified" fuel plate from the Naval Reactors Program. The operations involved (1) insertion of 347 grams into a stainless steel tube to simulate a fuel rod and the use of a test rod containing 845 grams with the subsequent removal of the pellets from both rods and (2) x-raying the fuel plate to look for defects. The following figure shows the location of each of these operations.



The loading and unloading operations took place in room 111, storage was in room 116; the rod scanner testing was done in the Technology Lab 1 area shown just outside of the ADR Lab; the X-ray operations were conducted in Applications Lab 1 adjacent to Technology Lab 2.

The loading operation of the 347 grams into a tube were conducted March 5 1987 in Room 111. Contamination survey results taken at the end of this operation indicated that gross beta was less than 30 dpm and the gross alpha was less than 5 dpm on the finished tube, the tools used, and the vials which contained the pellets. The used vials were placed in the radioactive waste container for ultimate disposal. The testing operation with the simulated fuel rods took place intermittently over the next few months; when not in use, the fuel rods were stored in the SNM vault, room 116. At the completion of the program the rods were placed in storage. X-ray testing of the UNC fuel plate took place from April 21, 1986 through April 25, 1986, with the plate being returned to storage between operations and at the end of the program. The subsequent removal of the fuel pellets from the aforementioned rods took place on June 30, 1990 in Room 111. Contamination measurements following the removal showed less than 30 dpm gross beta and less than 5 dpm gross alpha on either rod, the collection tray, the bottom of the hood, the floor around the hood, and the 4 containers in which the pellets were placed; the wipes covered 100 cm^2 or less. The pellets were poured out of the rods into plastic bags and the bags placed in metal containers. These containers were put in the storage vault, Room 116, awaiting ultimate transfer to the Arjons facility SNM vault and to disposal.

Storage of SNM involved all materials on hand at various and sundry times. Among the materials was a ^{238}PuBe neutron source. Because of its activity it was stored in an aluminum tube inside a mineral oil filled 10 inch diameter stainless steel tube situated vertically in the ground with the opening in the corner of Room 111. Also stored in this tube within individual aluminum tubes were a number of ^{252}Cf neutron sources carried under our California License. The PuBe source remained here for 6 and 2/3 years and had a neutron output of 3.8×10^7 neutrons/sec; the average quantity of Cf was 245 micrograms for 9 and 1/2 years with a neutron output of 5.8×10^8 neutrons/second (2.4×10^6 /microgram.) The time weighted ratio of the total neutron production is 18.5 to 1 in favor of the ^{252}Cf neutrons. Other PuBe sources were stored in their own shipping drums and were subsequently returned to DOE as government owned equipment. All SNM has been transferred from the Callan Road facility to the Arjons facility or to waste disposal. Exhibit 2 shows the transfer information on materials shipped from Callan Road. Exhibit 3 shows the relative amounts of ^{252}Cf and ^{238}PuBe over the years this facility has been licensed.

WASTE DISPOSAL PRACTICES

There are no waste disposal practices which would impact the the contamination status of the facility. No waste has been buried nor disposed of through the sanitary sewer system. There have been no incidences of spills nor has there been any evidence of contamination identified through routine surveys and sealed source leak testing operations.

DECOMMISSIONING ACTIVITIES

OBJECTIVES

The objective was to show that the facility was ready for decommissioning in its present condition. It was not expected to find any fixed or significant removable contamination. The only possible exception to the release without variance was the activation which had occurred in the neutron source storage tube; it was assumed that the majority of the activation was a result of the ^{252}Cf sources licensed by the State of California and therefore not a subject of this decommissioning effort.

RESULTS OF PREVIOUS SURVEYS

Previous surveys were routine and associated with the operations, not with decommissioning thoughts. Based upon the results of these surveys over the years, it was concluded that the facility might be ready in its present condition.

DECONTAMINATION PROCEDURES

N/A

FINAL SURVEY PROCEDURES

SAMPLING PARAMETERS

Even though there were no areas of potential high level or medium level of contamination, the approach to sampling consisted of covering the two rooms which involved operations with materials that were not specifically sealed sources in detail, and to cover other areas where SNM was used in a less defined pattern. The two areas were monitored 100% in that wipes were made over each square foot of floor space as were direct measurements of gross beta/gamma and alpha. Each wipe sample covered a minimum area of 900 cm^2 (1 square foot) and the wipes were analyzed for gross beta/gamma and alpha activity. A portion of the wipes were also analyzed for ^3H. The sanitary sewer drain in Room 111 was wiped around the throat and inside as deep as permissible, approximately 4 inches. A laboratory hood with HEPA filter, which had been initially located in Room 111, was removed in 1991 and relocated to another controlled area at our Linear Accelerator Facility, also licensed. At the time of the removal, wipe and activity surveys were taken and revealed no significant activity above background and no significant smearable activity on the hood or ductwork, inside or out. Other areas of SNM use were covered in the same manner but over larger unit areas of approximately 20 square feet, still maintaining the 1 square foot of wipe area. It was brought to our attention that the walls of the various areas should also be considered. Since there were no areas of measurable floor contamination a grid pattern of approximately 12 square feet was selected. Alpha and beta/gamma scans were made in both affected and unaffected areas revealing no measurable activity above instrument background. Subsequent measurements were made on the affected areas at contact with the floor and 1 meter above the the floor for gross beta/gamma (thin window G/M Pancake detector and scalar system) and dose rate (micro R meters) respectively. The same measurements were made on the unaffected areas for comparison. It should be noted that there was no significant difference between the measurements in affected and unaffected areas for all direct measurements and wipe surveys. Looking at the "calculated" Minimum Detectable Activity for each instrument, most measurements of fixed or removable surface activity are less than the MDA, and hence within the NRC Guideline Release Limits. A few ^3H wipes revealed levels above the MDA, but only a small percentage of the State of California Guideline Release Limits. The induced activity in the neutron source storage pipe was estimated (simple calculation) based upon the required flux necessary to produce the dose rate as measured with a pressurized ionization chamber survey instrument.

The calculated activity per unit mass was found to be above the concentration limits for release to an unrestricted area from both the NRC regulations and the State of California regulations. It is suggested that the storage tube be left in its present condition and filled with concrete. The activity is located approximately 7 feet below floor level and is not accessible and presents no threat to personnel or the environment. Jurisdiction over this tube must be established.

BACKGROUND/BASELINE LEVELS IDENTIFIED

There were no background/baseline levels established for this site per se. The intent was to have no measurable activity above normal background for the San Diego area with respect to the average doserate. This value is purported to be approximately 15 microR/hr. The baseline for the fixed surface contamination activity was no more than twice the normal instrument background and for removable surface activity it was no more than twice the minimum detectable for our wipe counting system which we have determined to be approximately 30 dpm for gross beta/gamma activity and approximately 5 dpm for alpha activity.

MAJOR CONTAMINANTS IDENTIFIED

There are no major contaminants. The activation in the neutron storage tube was determined to be ^{60}Co and ^{54}Mn. These estimated concentration levels are 60 picoCuries/gram of Cobalt and 165 picoCuries/gram of Manganese. These isotopes are located in the stainless steel storage tube in Room 111 and are in a band approximately 3 feet high with the midpoint location approximately 7 feet below the floor level. There is no measurable activity above the pipe at floor level greater than the room background of 14 microR/hr. The activation was induced by neutrons from ^{252}Cf and $^{238}PuBe$ sources. The relative abundance ratio was estimated to be 18.5 to 1, Cf to Pu. These sources were stored inside aluminum tubes for identification and access. The bundle of aluminum tubes were suspended in the stainless steel storage tube which was filled with technical grade mineral oil. When the tube bundle was removed form the storage tube and allowed to drip dry there was no measurable removable contamination and direct radiation measurements were less than twice background which was expected since most activation products associated with aluminum are short-lived. After the oil was removed from the storage tube, standard wipe test revealed that there was no detectable removable contamination on the storage tube. The oil was subsequently sampled and the sample analyzed for gamma activity. No isotopes were identified with concentrations above the release limits for unrestricted use. Both the tube bundle and the removed oil were relocated to the Linear Accelerator facility for storage and subsequent disposal (we found a dead mouse or rat in the oil when we ladled it out of the tube). Needless to say we did not analyze the mouse, it is still in the waste oil drum.

GUIDELINES ESTABLISHED

The Guidelines utilized for the survey are from the State of California Acceptable Surface Contamination Levels in "Facilities and Equipment to Unrestricted Use, DECON-1," State of California which also references "Guidelines for Decontamination of Facilities and Equipment Prior for Unrestricted Use or Termination of Licenses for Byproduct, Source or Special Nuclear Material," U. S. Nuclear Regulatory Commission, May 1987. The particular tables showing the limits are provided as Exhibit 4.

EQUIPMENT AND PROCEDURES SELECTED

There was no selection process. For the most part the job was straight forward and the equipment we use for routine surveying and contamination measurements is adequate for the job, standard wipe counting equipment for gross beta/gamma and alpha, thin window pancake GM detectors, alpha scintillation detectors, and ionization detector survey instruments. It was necessary for outside assistance for a portable sodium iodide scintillation system with multlichannel analyzer for determining the specific isotopes present in the activated neutron source storage tube and for the determination of tritium activity on wipe samples . A liquid scintillator system is required and we do not possess one at this time, and it was not feasible to purchase one since tritium use is a thing of the past for IRT. The procedures as mentioned earlier in this section were to extensively survey every affected area and to monitor the unaffected areas in a less severe fashion. In case of discovery of contaminated areas, they would be cleaned and resurveyed on the spot.

INSTRUMENTS AND EQUIPMENT

The following instruments were used in the course of the survey:

Instrument 1 --Ludlum Model 14 Ratemeter with HP210 Pancake detector; Calibrated 3/4/93; Due 3/4/94; Recalibrated as check on 11/2/93. This instrument is calibrated on an annual basis by on outside service and is used for routine detection operations. This was used in the survey for scanning surfaces for fixed activity by observing the relative count rates for each area of interest and for determining the dose rate (rads/min) in the neutron source storage tube. It was also used for determining the relative activity along the length of the storage tube. The calibration factor was determined to be 0.23 rads/hr per 1000 counts/min.

The calculated scan mode MDA based upon a background (detector face shielded) of 24 counts/minute, a time constant of 3 sec with a measured efficiency of 0.288 for the standard beta source and an active area of 15 cm^2 is **1700 dpm/100cm2.**

Instrument 2 --Eberline PAC-1SA scintillation Alpha Survey Meter with 1/2 mil aluminized mylar window, AC-3-7 Probe; Calibrated 6/8/93; Due 6/8/94. This instrument was used to determine the fixed alpha surface activity by observing the relative count rate in areas of interest. The efficiency was determined by measuring its response to the standard ^{239}Pu alpha source.

The calculated scan mode MDA based upon a background of 10 counts/minute, a time constant of 2.5 seconds, a measured efficiency of 0.173 for the standard alpha source, and an active area of 59 cm^2 is **500 dpm/100cm^2**.

Instrument 3 --Victoreen 450P microR Pressurized Ionization Chamber Survey Instrument; Calibrated 3/4/93; Due 3/4/94. This instrument is calibrated annually by an outside service. This instrument has a relatively flat response for all energies above 80 kev.

Instrument 4 --Eberline Model BC-4 Beta Counting System; Calibrated each day of use with standard beta $^{90}Sr/^{90}Yt$ source; Due next use.

The calculated MDA based upon the 27 cpm background and the measured efficiency with the standard beta source of 0.378 is **72 dpm**. We have always used 30 dpm as the minimum detectable based upon ignoring any count below 2.24 sigma, the 95% confidence level of the background count. This is what the measurement data report shows--- < 30 dpm.

Instrument 5 --Eberline Model SAC-4 Alpha Counting System; Calibrated each day of use with standard alpha ^{235} Pu source for efficiency determination; Due next use.

The MDA for this instrument is also based upon the 95% confidence level of the background and since the background is only a fraction of a count per minute, the procedure is to required at least 2 counts above this fraction to be real. With a measured efficiency of 0.39 for the standard alpha source the MDA is taken as **5 dpm**.

Instrument 6 --Packard 1600-TR Liquid Scintillation Counting System; Calibrated each day of use with standard ^{3}H source; Due next use. This system is located at the Salk Institute which provided the counting services for tritium activity.

The MDA is given with the data report as 100 dpm.

Instrument 7 --HP210 Pancake GM detector with Technical Associates model FS8 scaler; calibrated each day of use with standard beta $^{90}Sr/^{90}Yt$ source for efficiency determination. This instrument was used to determine the the dpm/100 cm^2 at a number of locations in affected and unaffected areas for comparison and to provide a better measure of the scanning operations. In conducting the scanning operations, only the count rate was recorded; this system was used to provide better data in the appropriate units.

The calculated MDA for this instrument with a measured background (face of detector shielded) of 24 cpm, a measured efficiency of 0.29, and an active area of 15 cm^2 is 590 dpm/100cm^2. The same argument applies for this system as for the BC-4 system. If it is considered that any counts above the 95% confidence level of the background are indicative of contamination, the MDA becomes 250 dpm/100 cm^2.

Instrument 8 --Ludlum Model 19 micro R meter; calibrated annually by an outside service; calibrated 1/94 due 1/95; used to measure dose rates for background measurements and to confirm Victoreen Model 450P measurements. This instrument was borrowed specifically to measure background directly in the microR realm. The 450P requires "eyeball integration" over a wide range of digital indications to determine the average background at very low levels since the minimum full-scale reading is 500 microR. Measurements in the 10's of microR are necessarily on a poor section of the scale, no matter that the readout is digital. The same argument applies for the integration mode of operation.

INSTRUMENT USE TECHNIQUES

The procedures were straight forward. Scanning activities were conducted in a step wise fashion in that the movement of the detectors was not continuous. This was to allow the instruments to respond to each area. This was especially important for the alpha survey instrument because of the nature of the decay process and the absence of significant amounts of alpha contamination. The instruments were used and operated in accordance with the manufacturer's manuals.

PROCEDURES FOLLOWED

As previously discussed, the procedural approach was to survey in detail the affected areas and to survey in less detail all unaffected areas. Because of the nature of our operations and the form of the materials utilized in this facility it was anticipated that there would be no measurable contamination, either fixed or removable.

It was known that there would be some activation associated with the neutron source storage tube, but the magnitude was unknown. The delay between the removal of the sources and the actual commencement of the survey operations was expected to be some what longer that the 258 days that elapsed. For some unexplained reason the building owner expedited the vacating of the facility by IRT. Once the concentration of the isotopes were estimated from the measurements it was known that the limits for an unrestricted area were exceeded. The big question was how much of a threat was this activity to personnel and the environment.

Because of its location and the minimal threat, we petitioned the State of California to allow us to leave the tube in place and fill it with concrete. No statistical studies were conducted to determine the extent of the survey and how many samples or measurements would be required to satisfy the release criteria. It was arbitrarily decided do a 100% area survey in those areas which had used or stored uncontained materials. These two locations were Room 111 and Room 116.

SURVEYING ORGANIZATION

No major decontamination activities were anticipated so the survey was conducted by the IRT Corporation Director of Safety/Radiation Safety Officer whose credentials were described earlier. A confirmatory check survey and review of our initial results was conducted by Occupational Services Incorporated. This is a local firm owned and operated by Mr. Nicola Rinaldi who has over 20 years experience as a practicing Health Physicist and Radiation Safety Officer. Occupational Services also provided counting services for ^{3}H activity.

SURVEY FINDINGS

The overall results of the survey show that the measured contamination levels and radiation levels at the facility are not significantly greater than normal background and well below the Nuclear Regulatory Commission and the State of California release criteria. Activation of the neutron source storage tube shows concentration levels of the identified isotopes to be greater than the limits for an unrestricted area.

The differences between activities in the affected and unaffected areas were indistinguishable. Averaged group data of measurements in both types of areas were compared and found to be the same with regard to surface measurement raw data. Since the same detection system, the HP210 probe with the FS 8 scaler, the raw counts were averaged. The unaffected areas averaged 57 +/- 3 cpm and the affected areas averaged 56 +/- 4 cpm, clearly showing that the licensed activities had no effect on the natural background associated with the building. In dpm/100cm^2, the averages are 760 and 740 respectively. Direct measurements of the radiation dose rate at 1 meter above the surface of the floor ranged from 13 to 16 microR/hr in both types of areas, again showing that the licensed activities had no effect on the normal background.

TECHNIQUES FOR REDUCING/EVALUATING DATA

There were no special techniques for reducing and evaluating the data. All computations utilized standard calculational techniques and the bulk of the data was direct reading in the proper units based upon measured efficiencies and calculated MDA's. The only unique evaluation was the determination of the induced activity in the neutron storage tube. This involved direct measurement of the dose rate in the center of the tube over the active area and back calculating the photon flux necessary to achieve the measured dose rate. The activation was distributed non-uniformly over the active area, i.e. the vertical distribution varied over a three foot span peaking in the middle of this span and dropping off to background approximately 18 inches either side of the peak. Circumferentially the dose rate was uniform. In order to determine the concentration of the activity it was necessary to integrate the dose rate along the vertical traverse and determine average doserate over the entire activated area. This turned out to be approximately 97 microR averaged over the entire three feet or approximately 210 microR averaged over 18 inches. The isotopes had been identified as ^{60}Co and ^{84}Mn so the concentration for each isotope was calculated assuming that the total contribution came from that particular isotope. Flux conversion factors were obtained from the Radiological Health Handbook for each isotope and the activity was calculated. The mass of the steel in the activated area was calculated and from these two numbers the concentration of each isotope was estimated. These concentrations were 1.2×10^{-10} Curies per gram and 3.3×10^{-10} Curies per gram, respectively. The relative contribution of each isotope to the total activity was estimated by comparing the flux to dose conversion factors and by looking at stainless steel activation data from past activation experiments. The flux to dose conversion factors from page 132 of the referenced document were comparable for both isotopes and the activation data decayed to the time period between removal of the sources and measurement of the dose rate, 258 days, showed that activities of ^{60}Co and ^{54}Mn were also comparable. For these reasons it was assumed that the isotopes made equivalent contributions to the dose rate. This then gave a concentration for the ^{60}Co of 6×10^{-11} Curies per gram and a concentration of 17×10^{-11} Curies per gram for ^{54}Mn. Both of these values are above the limits for an unrestricted area. The fact that the activated area is some 7 feet below ground level and unaccessible to personnel makes leaving the tube in the ground a viable alternative to removing it, especially if the tube is back-filled with concrete.

STATISTICAL EVALUATION

As previously noted there was no statistical methodology employed to selectively sample to provide a true representation of the data with the guidelines.

Full coverage of the affected areas using the statistical requirements for the MDA determination of the instruments should make the measurements a true representation of the data as applied to the guidelines. The following table compares the findings and the release criteria as defined by the Nuclear Regulatory Commission. The data sheets for all measurements and the activity calculation is given in Exhibit 5.

COMPARISON WITH GUIDELINES

NUCLIDE	GUIDELINE FIXED AVERAGE DPM/100SQCM	SURVEY ALL AREAS	GUIDELINE REMOVABLE DPM/100SQCM	SURVEY ALL AREAS
U-NAT,U-5,U-8 & DECAY PROD	5000 ALPHA	500 (MDA)	1000 ALPHA	LESS THAN 0.5
BETA/GAMMA EMITTERS DECAY MODES OTHER THAN ALPHA	5000BETA/GAMMA	590 (MDA)	1000 BETA/GAMMA	LESS THAN 4
TRITIUM	20000	NOT DETERMINED	4000	26 MAXIMUM

SUMMARY

IRT Corporation relocated the Corporate Headquarters approximately 14 months ago and are now required to vacate the facility located at 3030 Callan Road in the city of San Diego, State of California. The building owner, TCW Realty Advisors, has suddenly required that we vacate building completely in short order. Licensed activities were conducted on the lower floor of this facility. These activities were primarily storage and the use of non-dispersible materials for the development of detectors and non-destructive test equipment. To facilitate the exodus, we jumped directly into the measurement program to demonstrate that the facility was suitable for unrestricted use with regard to contamination and background radiation levels. The only possible exception was activation caused by the storage of neutron sources. A program of complete coverage of all areas in which uncontained materials were used was selected with less severe coverage of other areas. Operations and previous routine surveys throughout the course of the occupancy of this facility essentially precluded finding any significant contamination. Standard survey and detection instruments were used for the measurements and outside services were solicited for analysis which we could not perform.

The program was successful in demonstrating the the facility was, as expected, able to meet the requirements of both the NRC and State guidelines without major decontamination activities. The sole exception is related to the activation of a neutron source storage tube buried in the ground. The location of the activated area and the inaccessibility of the area lends it suitable for leaving the tube in position and back-filling it with concrete.

With the approval of the suggested method for dealing with the activated tube, all other release criteria have been met and the facility can be released for unrestricted use. It is therefore requested that the facility be released at this time.

SUBMITTED BY:

K. L. CROSBIE, P.E.
DIRECTOR OF SAFETY/RADIATION SAFETY OFFICER

EXHIBIT 1

LICENSES

SMN 1405 AND CAL 2458-80

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JAN 3 1 1986

FCUP:RDC
70-1359
SNM-1405, Amendment No. 1

IRT Corporation
ATTN: Paul R. Maschka
Radiation Safety Officer
P. O. Box 83517
San Diego, California 92138-5317

Gentlemen:

In accordance with your application dated October 18, 1985, and pursuant to Title 10, Code of Federal Regulations, Part 70, Special Nuclear Material License No. SNM-1405 is hereby amended to add 8221 Arjons Road as an authorized place of use and to change the possession limits. Accordingly, Conditions 6, 7, and 8 shall read as follows:

6. Byproduct, source, and/or special nuclear material	7. Chemical and/or physical form	8. Maximum amount that licensee may possess at any one time under this license
A Pu (75% Pu-239)	Sealed Sources	30 grams
B Pu (75% Pu-239)	Mixed oxide fuel rods as sealed sources	365 grams
C Pu (75% Pu-239)	Any	1 gram
D Pu (75% Pu-239)	PuBe Neutron Sources	33 grams
E Pu (80% Pu-238)	PuBe Neutron Sources	2 grams
F Pu-236	Any	10×10^{-9}
G Pu-242	Any	5×10^{-4}
H U-235	Sealed Sources	200 grams
I U-235	Any	5 grams
J U-235	Sealed Sources	200 grams
K U-235	Any	5 grams
L U-235	Mixed oxide fuel rods as sealed sources	284 grams
M U-235	Sealed Sources	1400 grams
N U-235	Non-dispersible solid	300 grams*
O U-235	Any	10 grams

* This 300 grams of non-dispersible solid material is included as a part of the 1400 gram limit for the U-235 as sealed sources (M).

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JAN 3 1 1986

F. Safeguards

The staff has reviewed the safeguards aspects of the proposed amendment and has recommended approval.

G. Region V

The amendment application was discussed with R. D. Thomas of Region V. He indicated that all of the Region's concerns had been adequately addressed and that Region V had no objections to amending the license as requested in IRT's amendment application.

Conclusions/Recommendations

The staff has reviewed IRT's amendment application dated October 18, 1985, and finds that IRT's proposed changes are adequate to protect the health and safety of the public or the environment. The staff therefore recommends approval of the amendment.

Ronald D. Cardarelli
Technical Assessment and
Evaluation Section
Uranium Fuel Licensing Branch
Division of Fuel Cycle and
Material Safety, NMSS

Approved by: _____
William T. Crow, Acting Chief

RADIOACTIVE MATERIAL LICENSE

Pursuant to the California Administrative Code, Title 17, Chapter 5, Subchapter 4, Group 2, Licensing of Radioactive Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, use, possess, transfer, or dispose of radioactive material listed below; and to use such radioactive material for the purpose(s) and at the place(s) designated below. This license is subject to all applicable rules, regulations, and orders of the Department of Health Services now or hereafter in effect and to any conditions specified in this license.

1. Licensee IRT Corporation 2. Address P.O. Box 80817 San Diego, CA 92138	3. License No. 2468-80 is hereby amended in its entirety. Amendment No. 33
	4. Expiration date December 20, 1989
Attention: Paul R. Maschka Radiation Safety Officer	5. Inspection agency Div. of Occupational Safety & Health - S

6. Nuclide	7. Form	8. Possession limit
A. Hydrogen-3	A. Any	A. Total not to exceed ~~100 millicuries~~ 21 Curies Amend. 3
B. Any radionuclide with Atomic Numbers 3-83 inclusive, except: (1) Strontium-90 and (2) Lead-210	B. Any	B. Not to exceed 1 millicur for any one radionuclide total not to exceed 100 millicuries
C. Any radionuclide with Atomic numbers, 3 - 83 inclusive.	C. Sealed sources	C. Total not to exceed 12 Curies.
D. Any radionuclide with Atomic Numbers 84 and above, except: (1) Source material, and (2) Special Nuclear Material	D. Any	D. Not to exceed 5 millicur for any one radionuclide total not to exceed 100 millicuries.
E. Any radionuclide with Atomic Numbers 84 and above, except: (1) Source material, and (2) Special Nuclear Material	E. Sealed sources	E. Total not to exceed 15 C

(cont'd)

RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

License Number 2468-80

Amendment Number 33

continued

6. Nuclide (cont'd)	7. Form (cont'd)	8. Possession limit (cont'd
F. Any radionuclide except: (1) Source Material, and (2) Special Nuclear Material	F. Sealed Sources	F. Total not to exceed 120 (
G. Source Material	G. Any	G. 100 pounds
H. Strontium-90	H. Any	H. Total not to exceed 10 millicurie. Amend. 44
I. Lead-210	L. Any	L. Total not to exceed 1 millicurie.
J. Californium-252	J. Sealed sources	J. Total not to exceed 28 Curies (50 milligrams
K. Any radionuclide, except: (1) Source material, and (2) Special Nuclear Material	K. Solid components of neutron activated materials	K. Total not to exceed 10 C
L. Any radionuclide except: (1) Source material, and (2) Special Nuclear Material	L. Mixed fission products and induced radioactive materials as contained in equipment and facilities activated by electrons, photons or neutrons.	L. Total not to exceed ~~500~~ 100 curies.
M. Hydrogen-3	M. Accelerator targets (Safety Light Corporation) or Amersham Amend. 40	M. Total not to exceed 500 curies. 250
N. Hydrogen-3	N. Contamination of neutron generators and associated equipment	N. Total not to exceed 100 curies.
O. Uranium, Natural or depleted	O. Metal	O. ~~10,000~~ 1000 pounds.
P. Cobalt-60	P. Sealed source (Picker Model Number P3801A) or AMS Mod. AMS-3802	P. 1 source not to exceed 1600 Curies.

(cont'

Amend. 37

RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

License Number 2468-80

Amendment Number 33

continued

6. Nuclide (cont'd)	7. Form (cont'd)	8. Possession limit (cont'd)
Q. Any radionuclide except Alpha emitters	Q. Solid components of activated materials	Q. Total not to exceed 1 millicurie.
R. Cobalt-60	R. Sealed Sources (AECL Model No. 198)	R. Total not to exceed 2 ea = 26,400 Ci each 35,000 ~~8000~~ Curies. amend 4
S. Californium-252	S. Sealed sources (General Electric Gen-CF-100 or Monsanto REsearch Corp. 2765)	S. Six sources not to exceed six millicuries each (12 micrograms), and 36 millicuries (72 microgram total.
T. Americium-241	T. Sealed Sources (Isotope Products Model 245S)	T. Six sources not to exceed 50 millicuries and 300 millicuries total.
U. Cadmium-109	U. Sealed Sources (Isotope Products Model 245 B)	U. Six sources not to exceed 50 millicuries and 300 millicuries total.
V. Any radionuclide	V. Contamination on materials used for tests of leakage and/or contamination.	V. Total not to exceed 1 millicurie.
W. Cesium-137	W. Sealed Sources (Industrial Nucleonics custom source)	W. Two sources not to exceed 20 Curies each.
X. Californium-252	X. Sealed Sources (Savannah River Model SR-CF-100 or Monsanto Research Corp. Model 2765 or General Electric GEN-CF-100)	X. Four sources not to exceed 215 millicuries (430 micrograms) each.
Y. Californium-252	Y. Sealed Sources (Savannah River Model SR-CF-100, or General Electric GEN-CF-100 or Monsanto Research Corp. Model 2765.)	Y. Total not to exceed 11 Curies (20 Milligrams), each source not to exceed 6 Curies (11 Milligrams)

(cont'd)

continued

RADIOACTIVE MATERIAL LICENSE

Supplementary Sheet

License Number 2468-80

Amendment Number 33

6. Nuclide (cont'd)	7. Form (cont'd)	8. Possession limit (cont'd
Z. Any radionuclide with Atomic numbers 3-83 inclusive, except: (1) Strontium-90, and (2) Lead-210	Z. Any	Z. Not to exceed 100 microcuries for any one radionuclide; 1 millicurie to
AA. Strontium-90	AA. Any	AA. Total not to exceed 100 microcuries
AB. Lead-210	AB. Any	AB. Total not to exceed 100 microcuries
AC. Any radionuclide with Atomic number 84 and above except: (1) Source material (2) Special Nuclear Material	AC. Any	AC. Not to exceed 1 millicur for any one radionuclide and 5 millicuries maximu
AD. Any radionuclide with Atomic numbers 3-83, inclusive	AD. Sealed Sources	AD. Total not to exceed 100 Curies.
AE. Any radionuclide with Atomic Numbers 84 and above, except: (1) Source Material (2) Special Nuclear Material (3) Californium-252	AE. Sealed Sources	AE. Total not to exceed 5 Curies.
AF. Californium-252	AF. Sealed Sources	AF. Total not to exceed 20 millicuries (40 Microgra
AG. Uranium, natural or depleted	AG. Metal	AG. 5000 pounds.

(cont'd)

EXHIBIT 2

SMN TRANSFER DOCUMENTS

DOE/NRC Form 742C
(7-82)
MANDATORY DATA COLLECTION
AUTHORIZED BY 10 CFR 30, 40, 50, 70, 75, 150, Public Laws 83-703, 92-436, 93-91

U.S. DEPARTMENT OF ENERGY
AND
U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB

APPROVED BY GAO

PHYSICAL INVENTORY LISTING

1. NAME	2. DOE/NRC FORM 740M ATTACHED	4. REPORTING IDENTIFICATION SYMBOL (RIS)
IRT Corporation	☐ YES ☒ NO	XBC
STREET ADDRESS	**3. INVENTORY DATE**	**5. LICENSE NUMBER(S)**
P.O. Box 85317	2-11-93	CA-2468-80 SNM -1405
CITY / **STATE** / **ZIP CODE**		
San Diego / CA / 92138		

6. BATCH DATA

a. MATERIAL TYPE	b. COMP/FAC CODE	c. ELEMENT WEIGHT	d. ISOTOPE WEIGHT	e. DOE PROJECT NO.	f. SCRAP PROGRAM	g. WEIGHT PER CENT ISOTOPE	h. OWNER CODE	i. SEQUENCE NUMBER	j. BATCH NAME	k. NO. OF ITEMS	l. KEY MEASUREMENT POINT	m. MEASUREMENT I.D.			n. ENTRY STATUS
												MEAS. METHOD	OTHER MEAS. POINT	MEAS. METHOD	
53	64	ϕ	ϕ												
7. TOTALS															

To the best of my knowledge and belief, the information given above and in any attached schedules is true, complete, and correct.

8. SIGNATURE (See instructions for provisions regarding confidentiality.)
K. L. Crosbie, P.E. K. L. Crosbie

9. TITLE
Radiation Safety Officer

10. DATE
4-12-93

11. ENDING INVENTORY – NOT DOE OWNED
12. TOTAL (Lines 6 + 11)
13. BIAS ADJUSTMENT

SECTION B — COUNTRY CONTROL NUMBER DATA

1. COUNTRY CONTROL NUMBER	2. ELEMENT WEIGHT	3. ISOTOPE WEIGHT
US.L1.CC	ϕ 1.3	1.0
4. TOTAL WEIGHT (Total must agree with total on line 8)	ϕ 1.3	1.0

SECTION C — CERTIFICATION

To the best of my knowledge and belief, the information given above and in any attached schedules is true, complete, and correct.

SIGNATURE (See instructions for provisions on confidentiality.) K. L. Crosbie, P.E.

TITLE Radiation Safety Officer

DATE 4-12-93

NRC FORM 741
(82) Previous editions are obsolete.
MANDATORY DATA COLLECTION
AUTHORIZED BY 10 CFR 30, 40, 50, 70, L. 150, Public Laws 83-703, 93-438, 95-91

U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION

NUCLEAR MATERIAL TRANSACTION REPORT

Approved by OMB 038-R0478 *
Approved by GAO B-180225 (R0040)
Expires 6-30-83

SHIPPER'S RIS	2. RECEIVER'S RIS	3. TRANSACTION NO.	4. CORRECTION NO.	5. PROCESSING CODE (SHIPPER)	5. PROCESSING CODE (RECEIVER)	6. RESERVED	7. ACTION CODE (SHIPPER)	7. ACTION CODE (RECEIVER)	8. DATA CODE	DOCUMENTATION (Only if document is attached) SECRET
XBC	XBX	24					A	B		PAGE 1 OF 1 PAGES COPY 2 OF 5 COPIES REQUIRED

9. NAME AND ADDRESS OF SHIPPER
IRT CORPORATION
PO BOX 85317
SAN DIEGO CA 92138-9797
C. ATTENTION: K. L. CROSBIE
D. TELEPHONE: 619 450 4343

9. LICENSE NO. SNM 1405

10A. NAME OF REC'D / B. ADDRESS OF REC'D
SAM BLOCK 9
C. ATTENTION
D. TELEPHONE

9. LICENSE NO.

11. NO. OF DATA LINES: 04
12. NATURE OF TRANSACTION: N

13. A. SHIPPED FOR ACCOUNT OF / B. R/S

14. A. SHIPPED TO ACCOUNT OF / B. R/S

TRANSFER AUTHORITY (CONTRACT, MM DRAFT, OR ORDER NUMBER)

15. EXPORT OR IMPORT TRANSFERS: A. LICENSE NO. / B. U.S. PORT EXIT/ENTRY

MATERIAL TYPE AND DESCRIPTION
PACKAGE 1. CFX FUEL PLATES UNIFORM TYPE 20, 93%
PACKAGE 2. GdO/UO2 PELLETS MATERIAL TYPE 20 3.46%
PACKAGE 3. PRM SOURCES 92-235-4, 6 MATERIAL TYPE 20, 93%

A. MISCELLANEOUS FISSILE
EACH PACKAGE REMOTE & LIMITED QUANTITIES
RELOCATE TO ARCHIVE VAULT
RMBR. # 131989-4

B. Concise Note Attached: Yes ☐ No ☒
C. Concise Note Attached: Yes ☐ No ☐

18. TRANSPORTATION PROFILE

LINE NO.	B. CARRIER IDENTIFICATION	C. TRANSFER POINT
1		
2		
3		
4		
5		

19. PACKAGE IDENTIFICATION

A. MODEL ID	B. NUMBER

20. ACTION DATE

	MONTH	DAY	YEAR
A. SHIPMENT	12	19	89
B. SHIPPER'S CORRECTION			
C. RECEIPT			
D. RECEIVER'S MEASUREMENT			
E. RECEIVER'S CORRECTION			

22. TOTAL GROSS WEIGHT
23. TOTAL VOLUME (Waste Transfers Only)

NO.	DISTRIBUTION OF COPIES
1	XBX - XBC
2	XBX
3	XBX - QFA
4	QFA
5	XBC
6	
7	
8	
9	

LINE NO.	TYPE OF PKG.	IDENTIFICATION (BATCH NAME)	NO. OF ITEMS	PROJECT NUMBER	MAT. TYPE	COMP. FACILITY CODE	FROM CAMP	TRANS CAMP	COUNTRY CONTROL NUMBER	KEY MEAS. POINT	MEAS. IDENT 1	MEAS. IDENT 2	MEAS. IDENT 3	GROSS WEIGHT	NET WEIGHT	ELEMENT WEIGHT	ELEMENT LIMIT OF ERROR	HEIGHT IN SECTION	BOTTOMS WEIGHT	BOTTOMS LIMIT OF ERROR
01					20	271		J	US USOOOO							15.0		93.1	1.5	
02					20	455		J	US U3000							347.9		3.96	12	
03					20	455		J	US U5000							8.5		93.1	8	
04					20	455		J	US U3000							3.0		93.1	3	

24. SHIPPER'S DATA
K R Crosbie 12/13/89
SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED

25. RECEIVER'S DATA
K R Crosbie 12/13/89
SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED

SHIPPER'S VALUES ACCEPTED

18 U.S.C. SECTION 1001, ACT OF JUNE 25, 1948, 62 STAT. 749, MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

(7-80) Previous editions are obsolete
MANDATORY DATA COLLECTION
AUTHORIZED BY 10 CFR 30, 40, 50, 70, 75, 150; Public Laws 83-703, 93-438, 96-91

U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION

NUCLEAR MATERIAL TRANSACTION REPORT

Approved by OMB 038-R0478
Approved by GAO B-180725 (R0040)
Expires 6-30-83

1. SHIPPER'S RIA	2. RECEIVER'S RIA	3. TRANSACTION NO.	4. CORRECTION NO.	5. PROCESSING CODE (SHIPPER / RECEIVER)	6. RESERVED	7. ACTION CODE (SHIPPER / RECEIVER)	8. DATA CODE	DOCUMENTATION (Entry if document is assigned SECRET)
XBC	XBX	25				A / 13		PAGE 1 OF 1 PAGES COPY 2 OF 5 COPIES RETAINED

9. A. NAME AND ADDRESS OF SHIPPER
IRT CORPORATION
PO BOX 85317
SAN DIEGO CA 92138-9797
C. ATTENTION: K. L. CROSBIE
D. TELEPHONE: 619 450 4343

B. LICENSE NO: SNM 1405

10. A. NAME AND ADDRESS OF RECEIVER
SAME AS BLOCK 9

B. LICENSE NO.

C. ATTENTION:
D. TELEPHONE:

11. NO. OF DATA LINES: 03
12. NATURE OF TRANSACTION: N
13. A. SHIPPED FOR ACCOUNT OF
B. RIA:
14. A. SHIPPED TO ACCOUNT OF
B. RIA:

NO.	DISTRIBUTION OF COPIES
1	XBX - XBC
2	XBX
3	XBX - QFA
4	QFA
5	XBC
6	
7	
8	
9	

15. TRANSFER AUTHORITY: CONTRACT, NRC DRAFT, OR ORDER NUMBER

16. EXPORT OR IMPORT TRANSFERS: A. LICENSE NO.
B. U.S. PORT EXIT/ENTRY

17. MATERIAL TYPE AND DESCRIPTION
PACKAGE 1. PRU SOURCE 92-235-5 MATERIAL TYPE 30 93%
PACKAGE 2. GUASC PELLETS A MATERIAL TYPE 30 9%
PACKAGE 3. GUNC PELLETS B MATERIAL TYPE 30 9%

18. TRANSPORTATION PROFILE

A. VIA NO.	B. CARRIER IDENTIFICATION	C. TRANSFER POINT	19. PACKAGE IDENTIFICATION A. MODEL ID	B. NUMBER
1				
2				
3				
4				
5				

20. ACTION DATE

	MONTH	DAY	YEAR
A. SHIPMENT	12	19	89
B. SHIPPER'S CORRECTION			
C. RECEIPT	12	13	89
D. RECEIVER'S MEASURMENT			
E. RECEIVER'S CORRECTION			

21. A. MISCELLANEOUS
FISSILE
EACH PACKAGE EXEMPT / LIMITED QUANTITIES
RELOCATE TO ARMED VAULT
RMSR # 12889-B

B. Continue Note Attached: Yes ☐ No ☒
C. Continue Note Attached: Yes ☐ No ☒

22. TOTAL GROSS WEIGHT (KG)

23. TOTAL VOLUME (Waste Transfers Only) (M³)

LINE NO.	ITEM CONTROL NO.	IDENTIFICATION (BATCH NAME)	NO. OF ITEMS	PROJECT NUMBER	MATERIAL TYPE	COMPONENT FACILITY CODE	FROM ITEM	SAMPLE ITEM	COUNTRY CONTROL NUMBER	KEY MATERIAL WEIGHT	FAC. IDENT.	GROSS WEIGHT	NET WEIGHT	ELEMENT WEIGHT	ELEMENT LIMIT OF ERROR	WEIGHT % ISOTOPE	ISOTOPE WEIGHT	ISOTOPE LIMIT OF ERROR
01					30	455		J	US1500093					8.5		93%	B	
02					30	455		J	US1500094					329		4	13	
03					30	455		J	US1500095					329		4	13	

24. SHIPPER'S DATA
SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED (See instructions for provisions regarding confidentiality)
K R Crosbie 12/13/89

25. RECEIVER'S DATA
SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED (See instructions for provisions regarding confidentiality)
K R Crosbie 12/13/89

SHIPPERS VALUES ACCEPTED

18 U.S.C. SECTION 1001, ACT OF JUNE 25, 1948, 62 STAT. 749, MAKES IT A CRIMINAL OFFENSE TO KNOWINGLY AND WILLFULLY MAKE TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES ANY FALSE, FICTITIOUS OR FRAUDULENT STATEMENTS AS TO ANY MATTER WITHIN ITS JURISDICTION.

NRC FORM 741
(7-80) Previous editions are obsolete.
MANDATORY DATA COLLECTION
AUTHORIZED BY 10 CFR 30, 40, 50, 70, 75, 150, Public Laws 83-703, 93-438, 96-91

U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION

NUCLEAR MATERIAL TRANSACTION REPORT

Approved by OMB 038-R0478
Approved by GAO B-180225 (R0040)
Expires 6-30-83

1. SHIPPER'S RIE	2. RECEIVER'S RIE	3. TRANSACTION NO.	4. CORRECTION NO.	5. PROCESSING CODE (SHIPPER)	5. PROCESSING CODE (RECEIVER)	6. RESERVED	7. ACTION CODE (SHIPPER)	7. ACTION CODE (RECEIVER)	8. DATA CODE	DOCUMENTATION (Only if Required or Correcting Record)	
XBC	XBX	26					A	B		PAGE 1 OF 1 PAGES	COPY 2 OF 5 COPIES

9. A. NAME AND ADDRESS OF SHIPPER — B. LICENSE NO. SNM 1405
IRT CORPORATION
PO BOX 85317
SAN DIEGO CA 92138-9797
C. ATTENTION: K. L. CROSBIE
D. TELEPHONE: 619 450 4343

10. A. NAME AND ADDRESS OF RECEIVER — B. LICENSE NO.
SAME AS BLOCK 9
C. ATTENTION:
D. TELEPHONE:

11. NO. OF DATA LINES: 02
12. NATURE OF TRANSACTION: N
13. A. SHIPPED FOR ACCOUNT OF — B. AIS:
14. A. SHIPPED TO ACCOUNT OF — B. AIS:

NO.	DISTRIBUTION OF COPIES
1	XBX - XBC
2	XBX
3	XBX - QFA
4	QFA
5	XBC
6	
7	
8	
9	

15. TRANSFER AUTHORITY: CONTRACT, SNI DRAFT, OR ORDER NUMBER

16. EXPORT OR IMPORT TRANSFERS: A. LICENSE NO.
B. U.S. PORT EXIT/ENTRY

17. MATERIAL TYPE AND DESCRIPTION
QUNC PELLETS C MINERAL TYPE 20 4%
FISSION FOILS AND COUNTERS

18. TRANSPORTATION PROFILE

LINE NO.	A. CARRIER IDENTIFICATION	C. TRANSFER POINT	19. PACKAGE IDENTIFICATION A. MODEL ID	19. PACKAGE IDENTIFICATION B. NUMBER
1	3636-3361	3168-4411	4123-3511	4138-2911
2	3165-4811	3148-5311	4128-3311	4123-3511
3	3164-5311	3158-8211	4138-3511	4148-4211
4	3183-4811	3187-7711	4143-4811	4147-4911
5	3172-7611		4150-5311	4154-5811

20. ACTION DATE

	MONTH	DAY	YEAR
A. SHIPMENT	12	19	89
B. SHIPPER'S CORRECTION			
C. RECEIPT			
D. RECEIVER'S MEASUREMENT			
E. RECEIVER'S CORRECTION			

21. A. MISCELLANEOUS
PACKAGE FISSILE EXEMPT AND LIMITED QUANTITY
RELOCATE TO ARJAYS VAULT
RMSR: # 12 89-C
B. Certain Note Attached: Yes ☐ No ☒
C. Certain Note Attached: Yes ☐ No ☒

22. TOTAL GROSS WEIGHT (kg)
23. TOTAL VOLUME (Waste Transfers Only) (m³)

LINE NO.	TYPE OF ITEM	IDENTIFICATION (BATCH NAME)	NO. OF ITEMS	PROJECT NUMBER	WASTE MGMT TYPE	COMPT. FACILITY CODE	FEED COMP.	SHIPPER CODE	COUNTRY CONTROL NUMBER	KEY MEAS. POINT	MEAS. IDENT. 1	MEAS. IDENT. 2	MEAS. IDENT. 3	GROSS WEIGHT	NET WEIGHT	ELEMENT WEIGHT	ELEMENT LIMIT OF ERROR	WEIGHT % ISOTOPE	ISOTOPE WEIGHT	ISOTOPE LIMIT OF ERROR
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
01						155		J	USUS0060							197		9	8	
02						776		J	USUS0000							*		931	*	

25. SHIPPER'S UNIT

M. SHIPPER'S DATA
SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED (See instructions for processing restrictions): K. L. Crosbie 12/13/89

25. RECEIVER'S DATA
I. SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED (See instructions for processing restrictions): K. L. Crosbie 12/13/89

SHIPPERS VALUES ACCEPTED

25. RECEIVER'S UNIT

18 U.S.C. SECTION 1001, ACT OF JUNE 25, 1948, 62 STAT. 749, MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

NRC Clearance Review Office (1981) 541-815-1

NRC FORM 741
(80) Previous editions are obsolete.
MANDATORY DATA COLLECTION
AUTHORIZED BY 10 CFR 30, 40, 50, 70,
S. 150, Public Laws 83-703, 93-438, 96-91

U.S. DEPARTMENT OF ENERGY AND U.S. NUCLEAR REGULATORY COMMISSION

NUCLEAR MATERIAL TRANSACTION REPORT

Approved by OMB
038-R0478
Approved by GAO
B-180225 (R0040)
Expires 6-30-83

SHIPPER'S RIS	2. RECEIVER'S RIS	3. TRANSACTION NO.	4. CORRECTION NO.	5. PROCESSING CODE (1-6): SHIPPER	RECEIVER	6. RESERVED	7. ACTION CODE (1-6): SHIPPER	RECEIVER	8. DATA CODE	DOCUMENTATION (Only 1 document is allowed per SECRET)
XBC	XBX	27					A	B		PAGE 1 OF 1 PAGES COPY 2 OF 5 COPIES SERIES

9. NAME AND ADDRESS OF SHIPPER — 8. LICENSE NO. SNM 1405
IRT CORPORATION
PO BOX 85317
SAN DIEGO CA 92138-9797
C. ATTENTION: K. L CROSBIE
D. TELEPHONE: 619 458 9393

10A. NAME AND ADDRESS OF RECEIVER — 10B. LICENSE NO.
SAME AS BLOCK 9
C. ATTENTION:
D. TELEPHONE:

11. NO. OF DATA LINES: 01 — 12. NATURE OF TRANSACTION: N

13. A. SHIPPED FOR ACCOUNT OF — B. R/S

14. A. SHIPPED TO ACCOUNT OF — B. R/S

NO.	DISTRIBUTION OF COPIES
1	XBX-XBC
2	XBX
3	XBX-BFA
4	DOE/A
5	XBC
6	
7	
8	
9	

15. TRANSFER AUTHORITY: CONTRACT, NRC DRAFT, OR ORDER NUMBER

16. EXPORT OR IMPORT TRANSFERS: A. LICENSE NO.; B. U.S. PORT EXIT/ENTRY

17. MATERIAL TYPE AND DESCRIPTION
Pu FOILS & SCRAP MATERIAL TYPE 50

18. TRANSPORTATION PROFILE

19. PACKAGE IDENTIFICATION

20. ACTION DATE

A. SEQ. NO.	B. CARRIER IDENTIFICATION	C. TRANSFER POINT	A. MODEL ID	B. NUMBER		MONTH	DAY	YEAR
1					A. SHIPMENT	12	20	89
2					B. SHIPMENT CORRECTION			
3					C. RECEIPT	12	20	89
4					D. RECEIVER'S MEASUREMENT			
5					E. RECEIVER'S CORRECTION			

22. TOTAL GROSS WEIGHT

23. TOTAL VOLUME (Waste Transfers Only)

21. A. MISCELLANEOUS
EXEMPT FISSILE TYPE B QUANTITY
RMSR # 1220B9A
RELEASE TO AR3603 VAULT

B. Concise Note Attached: Yes ☐ No ☒
C. Concise Note Attached: Yes ☐ No ☒

LINE NO.	IDENTIFICATION (BATCH NAME)	NO. OF ITEMS	PROJECT NUMBER	MATL REQ TYPE	COMP FACILITY CODE	PHYS FORM	CHEM COMP	COUNTRY CONTROL NUMBER	KEY MEAS POINT	MEAS IDENT 1	MEAS IDENT 2	MEAS IDENT 3	GROSS WEIGHT	NET WEIGHT	ELEMENT WEIGHT	ELEMENT LIMIT OF ERROR	WEIGHT % ISOTOPE	ISOTOPE WEIGHT	ISOTOPE LIMIT OF ERROR
01				50	701		J	US0503300							*		1.2	*	

24. SHIPPER'S DATA — K L Crosbie 12/20/89
SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED (See instructions for processors regarding confidentiality)

25. RECEIVER'S DATA — K L Crosbie 12/20/89
SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED (See instructions for processors regarding confidentiality)

SHIPPERS VALUES ACCEPTED

18 U.S.C. SECTION 1001, ACT OF JUNE 25, 1948, 62 STAT. 749, MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFUL FALSE STATEMENT OR REPRESENTATION TO ANY DEPARTMENT OR AGENCY OF THE UNITED STATES AS TO ANY MATTER WITHIN ITS JURISDICTION.

PAGE OF PAGES

DOE/NRC FORM 741
(7-86) Previous editions are obsolete
MANDATORY DATA COLLECTION
AUTHORIZED BY 10 CFR 30, 40, 50, 70, 75, 150, Public Laws 83-703, 93-438, 95-91

U.S. DEPARTMENT OF ENERGY
AND
U.S. NUCLEAR REGULATORY COMMISSION

NUCLEAR MATERIAL TRANSACTION REPORT

APPROVED BY OMB, NO. 3150-0003
EXPIRES: 7/31/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 1.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0003), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

1. SHIPPER'S ID CODE	2. RECEIVER'S ID CODE	3. TRANSACTION DATE (MM/DD)	4. TRANSACTION NO. (TN)	5. PAGE/DATA CARD NO.	6. RESERVED	7. ACTION CODE (SHIPPER)	8. RESERVED	9. DATA CARD NO.	PAGE 01	PAGES 1	DATA CARDS 2 OF 5 (TOTAL BOXES)
XBC	XBX	28				A					

10. NAME AND ADDRESS OF SHIPPER	11. LICENSE NO.	12. NAME AND ADDRESS OF RECEIVER	13. LICENSE NO.	14. NO. OF ENCLOSURES (ENTER)	15. NATURE OF TRANSACTION (CODE)
IRT CORPORATION PO BOX 85317 SAN DIEGO CA 92186-5317 ATTENTION K. L CROSBIE, PE TELEPHONE 619 622-8814	SNM 1925	SAME ATTENTION TELEPHONE		01	N

16. SHIPPER'S ACCOUNT NO.	17. PO NO.	18. RECEIVER'S ACCOUNT NO.	19. PO NO.

20. TRANSPORTATION AUTHORITY CERTIFICATE AND ADDITIONAL DOE/NRC AUTHORIZATION CODES	21. EXPORT OR IMPORT TRANSACTION NO. & LICENSE NO. (IF REQ.)

22. NUCLEAR TYPE AND DESCRIPTION	23. TRANSPORTATION MODE(S)	24. PHYSICAL DESCRIPTION	25. REMARKS
Pu-238; PuBe SEALED SOURCE MATERIAL TYPE 83	N/A		

26. ITEM NO.	27. SUBMIT NRC FORM 742C	28. SUBMIT NRC FORM 742	29. NET WT. (KG)	30. NUMBER	31. MATERIAL	32. SHIPPER'S CONFIDENCE	33. RECEIPT	34. RECEIVER'S CORRECTION	35. RECEIVER'S CONFIDENCE
1							2	11	93
2							2	11	93

36. ENCLOSURE (TYPE)
1 XBX-XBC
2 XBX
3 XBX-QFA
4 QFA
5 XBC
6
7
8

37. ENCLOSURE ATTACHED		38. ENCLOSURE ORIG ATTACHED	
YES		YES	
NO	X	NO	X

INTERSITE TRANSFER TO ARIDAS VAULT

24. SHIPPER'S DATA

ITEM NO.	MATERIAL CODE	ELEMENT	ISOTOPE	CHEMICAL FORM	PHYSICAL FORM	GROSS WT.	TARE WT.	NET WT.	ENRICHMENT	BATCH NO.	NO. OF ITEMS	ITEM TOTAL U-235 GRAMS	ITEM TOTAL U GRAMS
01			83	84	J	USUSUXO					1.3		80	1.0	

34. SHIPPER'S DATA (See instructions (NUREG/BR-0006) for provisions regarding confidentiality)

37. SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED: Kay K Crosbie 4-12-93

35. RECEIVER'S DATA (See instructions (NUREG/BR-0006) for provisions regarding confidentiality)

37. SIGNATURE OF AUTHORIZED OFFICIAL AND DATE SIGNED

25. RECEIVER'S DATA

ITEM NO.	MATERIAL CODE	ELEMENT	ISOTOPE	CHEMICAL FORM	PHYSICAL FORM	GROSS WT.	TARE WT.	NET WT.	ENRICHMENT	BATCH NO.	NO. OF ITEMS	ITEM TOTAL U-235 GRAMS	ITEM TOTAL U GRAMS
											SAME AS	ABOVE	

WARNING: FALSE STATEMENTS IN THIS CERTIFICATE MAY BE SUBJECT TO CIVIL AND/OR CRIMINAL PENALTIES. NRC REGULATIONS REQUIRE THAT SUBMISSIONS TO THE NRC BE COMPLETE AND ACCURATE IN ALL MATERIAL RESPECTS. 18 U.S.C. SECTION 1001 MAKES IT A CRIMINAL OFFENSE TO MAKE A WILLFULLY FALSE

EXHIBIT 3

CALIFORNIUM 252 AND PLUTONIUM 238 NEUTRON SOURCES

YEARLY INVENTORY

CF-252 AND PU-238 INVENTORY BY YEAR

YEAR	CF-252 MICROGRAMS	YEAR	PU-238 CURIES
1984	1.7	1984	0
1985	188	1985	0
1986	183	1986(1/2)	16
1987	930	1987	16
1988	689	1988	16
1989	76	1989	16
1990	58	1990	16
1991	50	1991	16
1992	38	1992	16
1993(1/6)	35	1993(1/6)	16
YEARLY AVERAGE	245		16
TOTAL OUTPUT	1.7X10(17)		9.1X10(15)

EXHIBIT 4

GUIDELINE TABLES

TABLE 3

STATE OF CALIFORNIA ACCEPTABLE SURFACE CONTAMINATION LEVELS[1,2]

Nuclide[a]	(dpm/100cm²)[b]		
	Average[c]	Maximum[d]	Removable[e]
U-nat, U-235, U-238 and associated decay products	5,000	15,000	1,000
Transuranics,Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100	300	20
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000	3,000	200
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000	15,000	1,000
H-3, C-14 except as DNA	20,000	60,000	4,000

a) Where surface contamination by both alpha and beta-gamma emitting isotopes exists, the limits established for alpha and beta-gamma emitting isotopes should apply independently.

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

c) Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

d) The maximum contamination level applies to an area of not more than 100cm².

e) The amount of removable radioactive material per 100cm² of surface area should be determined by wiping that area with a dry filter or soft absorbent material, applying moderate pressure, and assessing the amount of radioactive material on the wipe with the appropriate instrument of known efficiency. When removable contamination of objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

f) DNA precursors mean molecules or compounds that are directly incorporated into the DNA molecule during DNA biosynthesis, purine and pyrimidine bases and their analogs, nucleotides and nucleosides. The acceptable surface contamination levels for H-3 and C-14 in DNA precursors are as tabulated in paragraph (d) for beta-gamma emitters.

---

1. "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, Special Nuclear Material," U.S. Nuclear Regulatory Commission, May 1987.

2. "DHS Criteria for Release of Facilities and Equipment to Unrestricted Use, DECON-1," State of California.

TABLE 2

USNRC ACCEPTABLE SURFACE CONTAMINATION LEVELS[1]

Nuclide[a]	(dpm/100cm²)[b,f]		
	Average[b,c,f]	Maximum[b,d,f]	Removable[b,e,f]
U-nat, U-235, U-238 and associated decay products	5,000 α	15,000 α	1,000 α
Transuranics,Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100	300	20
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000	3,000	200
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000 $\beta\gamma$	15,000 $\beta\gamma$	1,000 $\beta\gamma$

a) Where surface contamination by both alpha and beta-gamma emitting isotopes exists, the limits established for alpha and beta-gamma emitting isotopes should apply independently.

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

c) Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

d) The maximum contamination level applies to an area of not more than 100cm².

e) The amount of removable radioactive material per 100cm² of surface area should be determined by wiping that area with a dry filter or soft absorbent material, applying moderate pressure, and assessing the amount of radioactive material on the wipe with the appropriate instrument of known efficiency. When removable contamination of objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

f) The average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/hr at 1 cm and 1.0 mrad/hr at 1 cm, respectively, measured through not more than 7 milligrams per square centimeter of total absorber.

[1] "Guidelines for Decontamination of facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, source, or special Nuclear Material," U.S. Nuclear Regulatory Commission, May 1987.

EXHIBIT 5

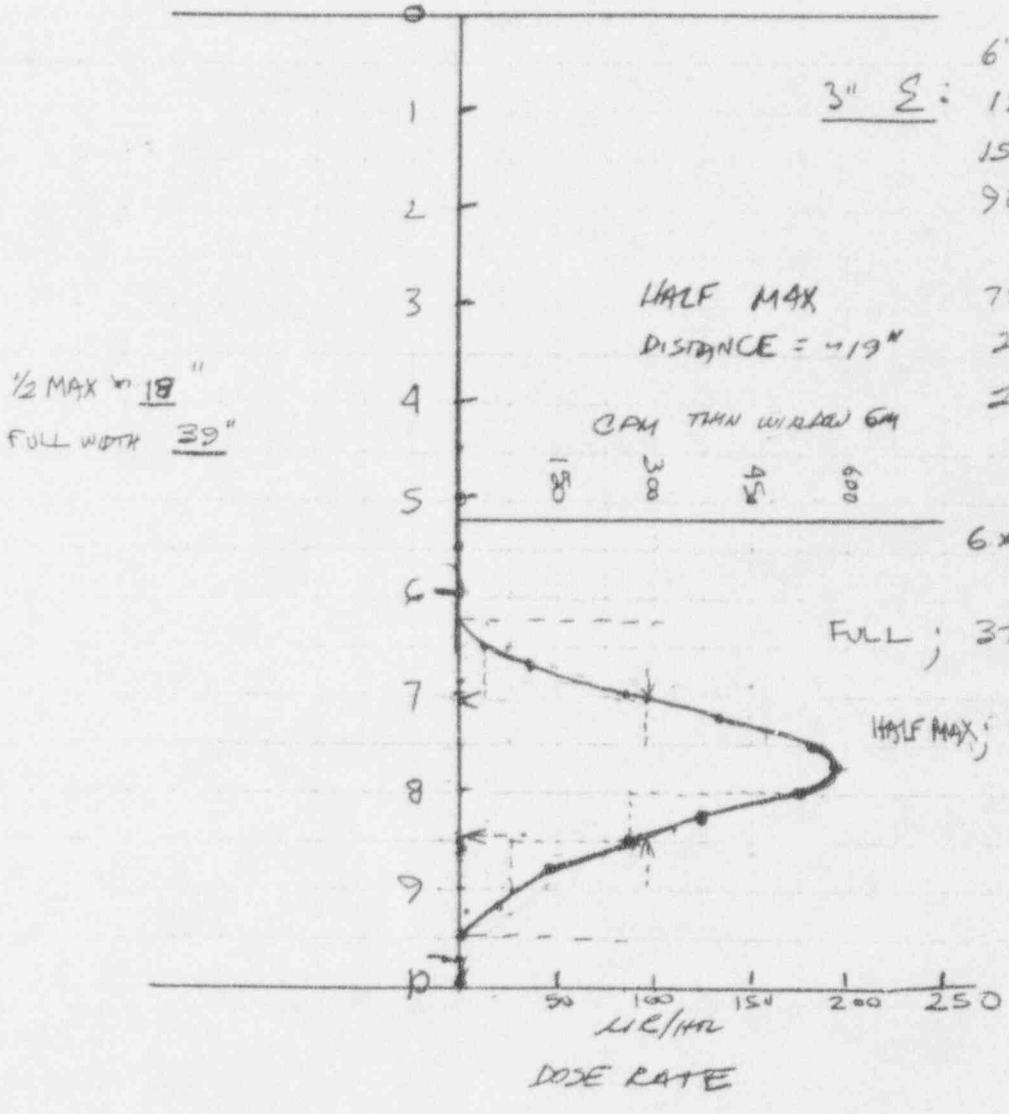
SURVEY DATA SHEETS

NEUTRON SOURCE STORAGE TUBE ACTIVATION ESTIMATE

START 10/25/93

ANALYSIS FOR CALLAN ROAD STORAGE AT NEUTRON ACTIVATION

DOSE RATE MEASUREMENTS TUBE C/L VERTICAL TRAVENSE VICTOREEN 450 P μR METER. DETECTOR IS SURROUNDED BY ACTIVATED MATERIAL ∴ SIMULATING 4π GEOMETRY. TUBE IS 10.5" O.D. BY 10" OD AND 10' IN LENGTH.



½ MAX = 18"
FULL WIDTH 39"

6" INTEGRATION

3" Σ:	
12 × ½ × ½	7.5
15 + ½ × 75	52.5
90 + ½ × 70	125
180	180
75 + ½ × 100	125
25 + ½ × 95	72.5
25 + ½ 60	55
½ × 25	12.5
	630

6 × 630 = 3780 $\frac{\mu R}{Hr} \cdot IN$

FULL; 3780 / 39 = 97. μR/Hr

HALF MAX; $\frac{3870}{18}$ = 210 μR/Hr

SURVEY WITH NaI DETECTOR 2" DIA CRYSTAL

IDENTIFIED ^{54}Mn AN ^{60}Co PEAKS - TYPICAL FOR

STAINLESS STEEL AFTER SEVERAL MONTHS DECAY.

ACTIVITY CALCULATION:

- ^{60}Co ONLY

  1.17 MEV
  1.33 MEV > AVG 1.25 MEV

  $\Phi_{TRAY} = 4.6 \times 10^5$ PHOTONS/CM² SEC

  $\Phi_{210MC} = 96.6$ PHOTONS/CM² SEC

  $= 48.3$ dis/SEC CM² $= 13 \times 10^{-10}$ Ci/CM²

  $\Phi_{97} = 44.6$ PHOTONS/CM² SEC

  $= 22.3$ dis/SEC CM² $= 6 \times 10^{-10}$ Ci/CM²

  $A_{210} = 2\pi r h = 2\pi (12.7)(45.72) = 3648$ CM²

  $A_{97} = 2\pi r h = 2\pi (12.7)(99) = 7900$ CM²

  $r_1 = 13.33$ CM, $r_2 = 12.7$ CM, $h_1 = 45.72$ CM, $h_2 = 99$ CM

  $ACT_{210} = 4.74 \times 10^{-6}$ Ci; $V = \pi(r_1^2 - r_2^2)h_1 = 2375$ CM³

  $ACT_{97} = 4.74 \times 10^{-6}$ Ci; $V = \pi(r_1^2 - r_2^2)h_2 = 5142$ CM³

  $\rho = 7.84$ g/CM³

  $MASS_{210} = 18620$ g $MASS_{97} = 40313$ g

  CONCENTRATION:

  $C_{210} = 2.55 \times 10^{-10}$ Ci/g $C_{97} = 1.2 \times 10^{-10}$ Ci/g

  3.8×10^{-11} TOTAL PIPE 3.9×10^{-11} TOTAL PIPE

- ^{54}Mn ONLY $\Phi_{IA} = 6.4 \times 10^5$ PHOTONS/CM² SEC

  $\Phi_{210} = 134 \frac{\text{PHOT}}{\text{SEC CM}^2}$ $\Phi_{97} = 62$

  $= 3.62 \times 10^{-9}$ Ci/CM² $= 1.68 \times 10^{-9}$ Ci/CM²

  $ACT_{210} = 13.2 \times 10^{-6}$ Ci; $ACT_{97} = 13.2 \times 10^{-6}$ Ci

  CONCENTRATION:

  $C_{210} = 7.1 \times 10^{-10}$ Ci/g $C_{97} = 3.29 \times 10^{-10}$ Ci/g

  1.06×10^{-10} TOTAL PIPE 1.06×10^{-10}

OVER THE DECAY PERIOD, THE Co/Mn COUNT ~~RATE~~ RATIO = 0.034/0.054 (SEE ATTACHED IRRADIATED STAINLESS ~~STEEL~~ ANALYSIS (24 HR) ~~DATA~~) AND THE Ø TO DOSE CONVERSION FACTORS ARE SIMILAR 4.9/6.4, SO ~~SAY~~ EACH ISOTOPE CONTRIBUTES 50% OF THE ~~MEASURED~~ DOSE. ~~%~~ OVER ACTIVATED AREA,

PEAK $^{60}Co = 1.28 \times 10^{-10}$ Ci/g $\quad Mn = 3.55 \times 10^{-10}$ Ci/g
AVERAGE $= 6 \times 10^{-11}$ Ci/g $\quad Mn = 16.5 \times 10^{-11}$ Ci/g

AVERAGE OVER ENTIRE PIPE

$^{60}Co = 1.9 \times 10^{-11}$ $\quad Mn = 5 \times 10^{-11}$

ALSO MAX DOSE ~~RATE~~ AT 0.7 CM FROM SURFACE WAS MEASURED AS 1000 CPM WITH A HP-210 PROBE & LUDLUM 14 RATE METER WHICH IS EQUIVALENT TO ~ 0.26 MILLIRADS/HR. ~~SEE~~ ATTACHED CALIBRATION

11/2/93 /~~REC~~

ACQGRP	1	ADC	1	15-APR-86	11:32:52
KEV	0.529225	ZERO	-8.529	15-APR-86	10:26:35
TOTAL	0		0		
LIVE	01:00:00		01:00:00		
REAL	00:00:00		01:00:05		

STAINLESS STEEL 24 HOUR DECAY

15-APR-86 11:33:02 ND65 INTENSIFIED REGION PEAK EXTRACTION

GROUP 1
ID: STAINLESS STEEL 24 HOUR DECAY
SRCH FRM -8.000 TO 2159.180
E/CH 0.529 E(0) -8.529
CHNS 2
LT 3600 CT 3605

PN	ENERGY		AREA	BKGND	FWHM	LEFT	RW	CTS/SEC	%ER	
1	Se^{75} 135.662		766	2848	1.54	269	8	0.21277800	10.49	121d
2	Cr^{51} 321.225		39868	5136	1.91	617	12	11.0744000	0.56	27.8d
3	Sc^{46m1} 480.290	Nd^{147}	765	638	1.92	915	15	0.21250000	5.91	
4	511.980	As-74	3544	1062	3.24	977	15	0.98444400	2.12	
5	Ge^{77} 559.871	As-76	897	396	1.99	1070	9	0.24916700	4.58	11.3hr.
6	564.645		238	259	2.46	1080	7	0.06611110	11.55	2.75d
7	619.098	Br-82	137	238	1.71	1183	7	0.03805560	18.07	
8	657.528	Ag-110m	109	164	1.91	1255	9	0.03027780	19.18	
9	686.366	W-187 Ta-179	568	343	2.06	1310	7	0.15777800	6.23	
10	690.049		72	0.32	1319	3	-0.0005556	-6E+02		
11	773.316	Nb-95/Zr-95-2	77	126	1.32	1474	7	0.02138890	23.56	
12	810.992	Co-58	36	92	1.14	1547	5	0.01000000	41.20	
13	Mn^{54} 834.917		368	268	2.42	1589	10	0.10222200	8.17	291d
14	Mn^{56} 847.105		184	303	1.37	1615	5	0.05111110	15.28	2.58h
15	Ni^{56} 1099.020	Fe^{59}	1333	400	2.27	2088	10	0.37027800	3.46	45.1d
16	Co^{60} 1172.740		89	80	2.25	2226	11	0.02472220	17.73	
17	Fe^{59} 1291.080		798	281	2.25	2452	9	0.22166700	4.62	45.1d
18	Co^{60} 1332.380		49	60	1.60	2531	8	0.01361110	26.53	5.24y
19	Cu^{64} 1345.760		7	9	0.66	2558	3	0.00194444	71.43	12.8h
20	K^{40} 1459.690		266	42	2.66	2766	15	0.07388890	7.03	1.25x10^9y
21	Mn^{52} 1808.140		72	8	3.05	3426	12	0.02000000	13.03	2.58h
22	Na^{24} 2110.980		13	16	2.06	4001	8	0.00361111	51.60	2.58h

PEAK SEARCH DONE

SOURCES REMOVED 2/12/93
MEASUREMENTS 10/26/93

SEE SS ~~DATA~~

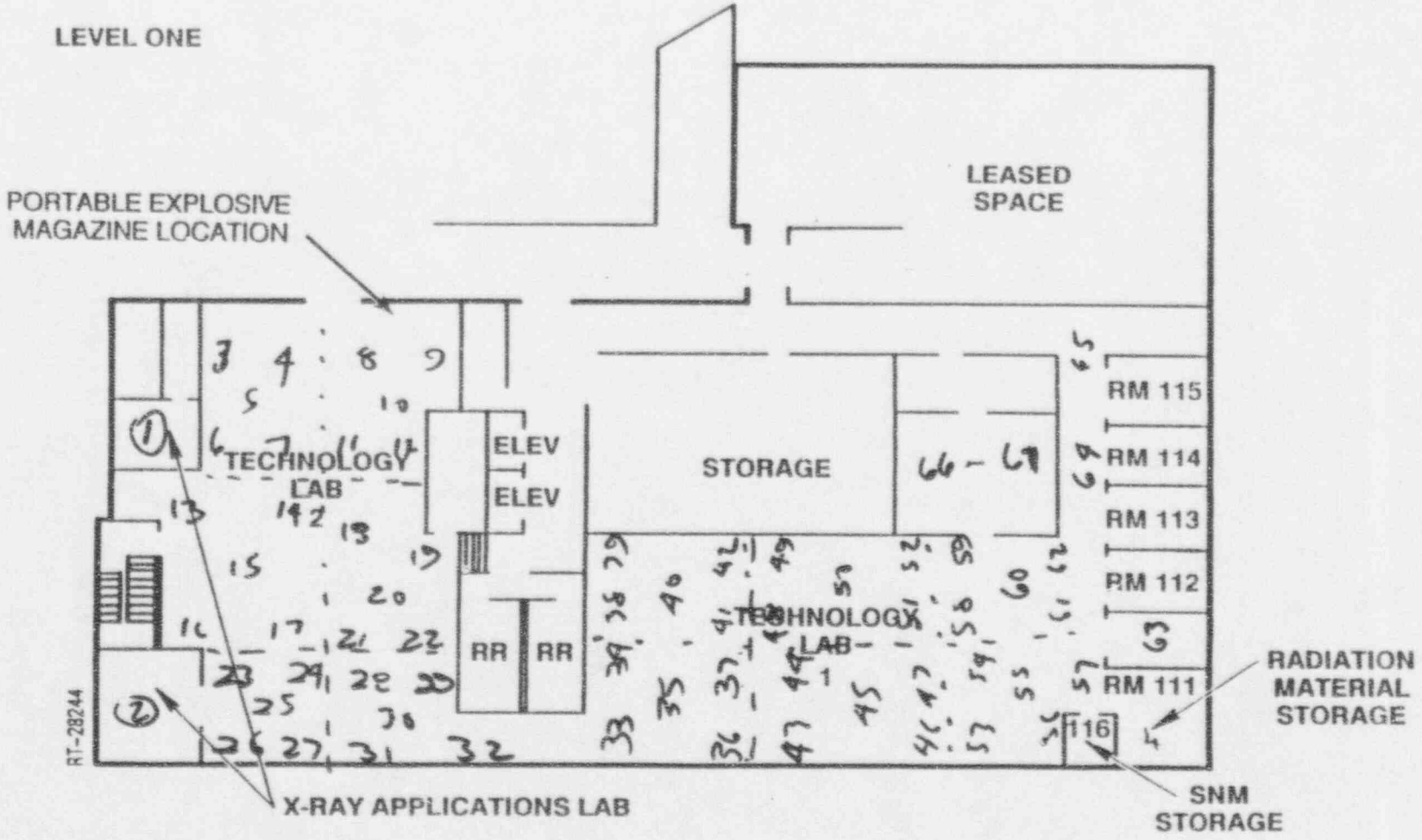
258 DAY DECAY

Co FACTOR 0.91

Mn FACTOR 0.54

Co (1.33)	→	0.0118	
(1.17)	→	0.0217	
		TOTAL	0.034
Mn (0.85)	→	0.054	0.054

HIGH BAY AND LOW BAY WIPE SURVEY DATA



Lower floor north

HIGH BAY & LOW BAY AREAS

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

13550 20200 1 OF 3

BETA COUNTER	BC-4 9/21/92 Date	ALPHA COUNTER	JAC 4 9-21-92 Date
BACKGROUND	28.4 cpm	BACKGROUND	016 cpm
SOURCE	5049.2 cpm	SOURCE	7902.1 cpm
EFFICIENCY	37 %	EFFICIENCY	39.1 %
BETA FACTOR	2.7 dpm/count	ALPHA FACTOR	2.55 dpm/count

Date	Time	GROSS Net β (cpm)	GROSS Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
9/21/92	1100	29	0	<30	<5	1 APP 1	RLC
		31	0			2 APP 2	
		34	1			3 HA	
		27	0			4	
		29	0			5	
		28	0			6	
		28	0			7	
		30	1			8	
		26	0			9	
		28	0			10	
		27	0			11	
		31	1			12	
		26	0			13	
		28	0			14	
		30	0			15	
		29	0			16	
		28	0			17	
		29	0			18	
		30	1			19	
		26	0			20	
		27	0			21	
		31	1			22	
		30	1			23	
		33	0			24	
		27	1			25	
		25	1			26	
		29	0			27	
		30	0			28	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

HB

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	~~Gross~~ Net B (cpm)	~~Gross~~ α (cpm)	FINAL RESULT B dpm	FINAL RESULT α dpm	Sample Number	Counted By
9-21-92	1330	28	0	< 30	< 5	29	KLC
		29	0			30	
		30	0			31	
		31	0			32	
		26	1			33 LB	
		27	0			34	
		33	1			35	
		30	1			36	
		27	0			37	
		24	0			38	
		26	0			39	
		30	0			40	
		36	0			41	
		25	1			42	
		33	0			43	
		30	1			44	
		28	0			45	
		29	1			46	
		31	1			47	
		29	0			48	
		30	0			49	
		24	0			50	
		27	0			51	
		31	1			52	
		35	1			53	
		26	0			54	
		28	1			55	
		34	0			56	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

HB 3 OF 3

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	~~Gross~~ ~~Net~~ β (cpm)	~~Gross~~ ~~Net~~ α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
9-21-92	1600	26	0	< 30	< 5	57	KLC
		29	0			58	
		27	0			59	
		25	1			60	
		31	1			61	
		29	1			62	
		26	0			63	
		24	1			64	
		32	1			65	
		30	0			66 ADR	
		26	1			67 ADR	

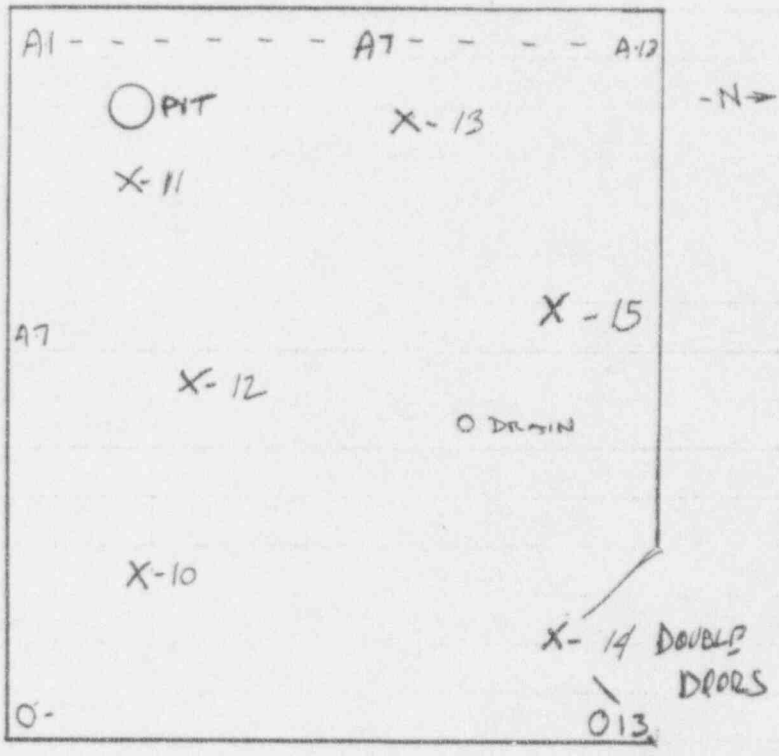
EF-121

RADIOACTIVE MATERIAL AND SNM STORAGE ROOMS WIPE SURVEY DATA

ROOM 111 RADIOACTIVE MATERIALS STORAGE

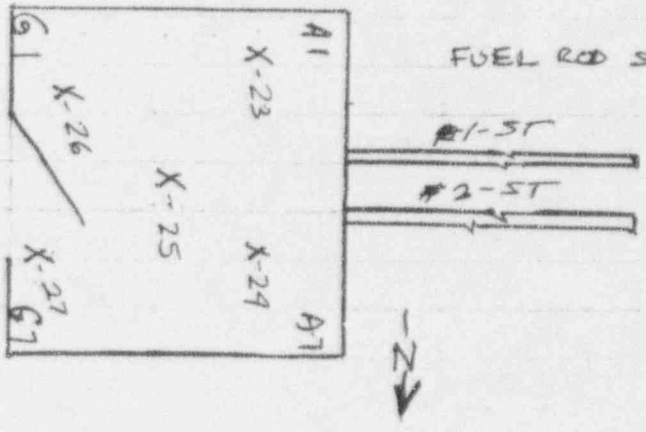
1 FT SQUARE SAMPLES A1 THROUGH O-13.

X DENOTES THIRD PARTY CHECK & TRITIUM COUNTING



ROOM 116 SNM STORAGE

1 FT. SQUARE WIPE G1 THROUGH G7



INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

RAD. MAT. STORAGE ROOM 111 20200 1 OF 7

BETA COUNTER	BC4 10/25/93 Date	ALPHA COUNTER	SAC4 10/25/93 Date
BACKGROUND	30.1 cpm	BACKGROUND	1 cpm
SOURCE (13210)	5062.1 cpm	SOURCE (20200)	7910 cpm
EFFICIENCY	38.1 %	EFFICIENCY	39.2 %
BETA FACTOR	2.63 dpm/count	ALPHA FACTOR	2.55 dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number (RAD STOR)	Counted By
10-25-93	01000	6	1	<30	<5	A1	KLC
		4	0			A2	
		3	0			A3	
		-1	-1			A4	
		1	2			A5	
		-3	0			A6	
		7	0			A7	
		1	0			A8	
		0	-1			A9	
		-2	1			A10	
		5	1			A11	
		3	0			A12	
		0	-1		↓	A13	
		4	2		5	B1	
		-1	0		<5	B2	
		6	3		7.65	B3	
		-3	1			B4	
		1	0			B5	
		0	1		↓	B6	
		2	3		7.65	B7	
		-4	0		<5	B8	
		6	2		5	B9	
		3	0		<5	B10	
		0	0			B11	
		1	-1			B12	
		2	2		5	B13	
		0	0	↓	<5	C1	
		-1	1			C2	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

RM 2 OF 7

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10-25-93	1120	3	0	<30	<5	C3	KLC
		-4	-1			C4	
		0	0			C5	
		1	2			C6	
		0	1			C7	
		2	0			C8	
		-1	0			C9	
		6	1			C10	
		8	-1			C11	
		2	0			C12	
		0	1			C13	
		-3	1			D1	
		-5	0			D2	
		1	-1			D3	
		0	-1			D4	
		4	1			D5	
		2	1			D6	
		-3	2			D7	
		1	-1			D8	
		0	0			D9	
		5	0			D10	
		2	1			D11	
		7	1			D12	
		-4	0			D13	
		-3	1			E1	
		0	0			E2	
		1	0			E3	
		6	0			E4	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT RM 3 of 7

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10-25-93	1330	7	0	<30	<5	E5	KLC
		1	-1			E6	
		0	0			E7	
		-3	0			E8	
		1	0			E9	
		2	1			E10	
		-4	1			E11	
		5	1			E12	
		1	0			E13	
		3	-1			F1	
		0	0			F2	
		2	2		5	F3	
		-1	2		<5	F4	
		6	0			F5	
		4	1			F6	
		1	0			F7	
		-3	0			F8	
		0	0			F9	
		-5	2		5	F10	
		0	1		<5	F11	
		1	-1			F12	
		4	0			F13	
		2	0			G1	
		6	1			G2	
		3	1			G3	
		-4	1			G4	
		0	0			G5	
		1	-1			G6	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT RM 4 OF 7

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10-25-83	1500	-3	-1	<30	<5	G7	KLC
		1	0			G8	
		0	1			G9	
		-1	2			G10	
		4	0			G11	
		8	2			G12	
		-2	-1			G13	
		5	1			H1	
		3	0			H2	
		0	0			H3	
		1	0			H4	
		0	-1			H5	
		-1	2			H6	
		6	0			H7	
		1	0			H8	
		3	0			H9	
		0	1			H10	
		1	-1			H11	
		7	1			H12	
		4	0			H13	
		-3	1			I1	
		-2	1			I2	
		-4	0			I3	
		5	-1			I4	
		0	0			I5	
		1	0			I6	
		6	1			I7	
		2	-1			I8	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT RM 5 OF 7

BETA COUNTER	BC4	ALPHA COUNTER	JAC4
Date	10-26-93	Date	10-26-93
BACKGROUND	29 cpm	BACKGROUND	1 cpm
SOURCE	5011 cpm	SOURCE	7892 cpm
EFFICIENCY	37.7 %	EFFICIENCY	39 %
BETA FACTOR	2.65 dpm/count	ALPHA FACTOR	2.56 dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10-26-93	0700	2	1	<30	<5	I9	KLU
		0	2		5	I10	
		1	0		<5	I11	
		5	-1			I12	
		-3	0			I13	
		-1	1			I1	
		6	1			J2	
		4	1			J3	
		0	0			J4	
		0	-1			J5	
		3	1			J6	
		5	0			J7	
		-2	0			J8	
		7	2		5	J9	
		8	1		<5	J10	
		3	-1			J11	
		0	0			J12	
		0	0			J13	
		2	0			K1	
		1	0			K2	
		-1	1			K3	
		-3	1			K4	
		5	-1			K5	
		2	0			K6	
		1	1			K7	
		0	0			K8	
		1	0			K9	
		4	0			K10	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

RM 6 of 7

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10-26-23	0812	-3	1	<30	<5	K11	KLC
		1	0			K12	
		0	-1			K13	
		4	0			L1	
		2	0			L2	
		5	0			L3	
		1	1			L4	
		-4	-1			L5	
		-2	-1			L6	
		1	1			L7	
		0	0			L8	
		3	-1			L9	
		6	1			L10	
		-3	1			L11	
		8	1			L12	
		0	-1			L13	
		1	-1			M1	
		1	0			M2	
		0	0			M3	
		2	0			M4	
		-1	1			M5	
		3	2		5	M6	
		-4	-1		<5	M7	
		1	0			M8	
		0	1			M9	
		2	0			M10	
		-1	1			M11	
		0	1			M12	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

RM 7 OF 7

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10-26-93	0930	6	2	<30	5	M13	
		-3	-1		<5	N1	
		0	0			N2	
		0	0			N3	
		1	1			N4	
		2	1			N5	
		-4	1			N6	
		7	1			N7	
		2	-1			N8	
		3	0			N9	
		-1	-1			N10	
		0	0			N11	
		6	0			N12	
		2	1			N13	
		3	1			O-1	
		1	0			O2	
		-2	-1			O3	
		-3	0			O4	
		5	0			O5	
		1	0			O6	
		0	1			O7	
		-4	1			O8	
		1	0			O9	
		0	0			O10	
		5	-1			O11	
		2	0			O12	
		-3	0			O13	
		1	0			DRAIN	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

SWM VAULT ROOM 116 SWM 1 OF 2

BETA COUNTER	10-28-93 Date	ALPHA COUNTER	10-28-93 Date
BACKGROUND	31 cpm	BACKGROUND	1 cpm
SOURCE (1320)	5021 cpm	SOURCE (2020)	7887 cpm
EFFICIENCY	37.8 %	EFFICIENCY	39 %
BETA FACTOR 2.64	dpm/count	ALPHA FACTOR 2.56	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10-29-93	0900	-4	1	<30	<5	A1	
		3	1			A2	
		0	1			A3	
		5	-1			A4	
		-1	-1			A5	
		-2	0			A6	
		4	1			A7	
		1	0			B1	
		6	0			B2	
		3	0			B3	
		-1	1			B4	
		2	-1			B5	
		-4	1			B6	
		0	1			B7	
		0	1			C1	
		1	-1			C2	
		6	-1			C3	
		3	0			C4	
		1	2		5	C5	
		0	1		<5	C6	
		-5	0			C7	
		2	-1			D1	
		0	2		5	D2	
		1	0		<5	D3	
		3	1			D4	
		6	1			D5	
		-1	1			D6	
		0	0			D7	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

SNM

2 OF 2

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10-28-93	1000	6	-1	<30	<5	E1	KAC
		2	1			E2	
		-3	1			E3	
		1	0			E4	
		0	0			E5	
		-4	-1			E6	
		-3	-1			E7	
		-1	0			F1	
		5	-1			F2	
		6	1			F3	
		4	1			F4	
		1	0			F5	
		0	0			F6	
		3	2		5	F7	
		-2	1		<5	G1	
		5	1			G2	
		1	1			G3	
		0	0			G4	
		-3	0			G5	
		-1	-1			G6	
		4	1			G7	
		3	0			#1 ST	
		1	0			#2 ST	

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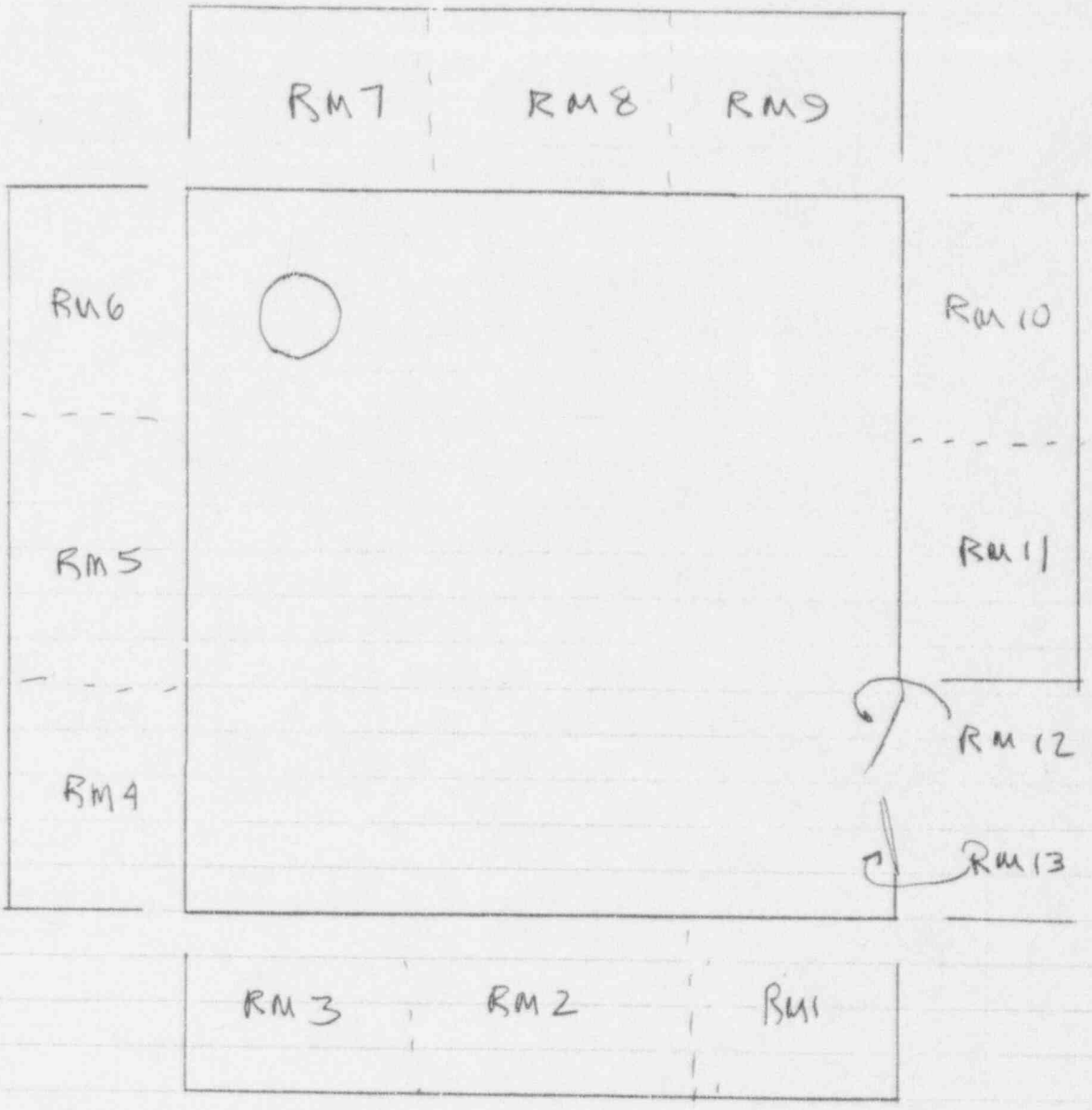
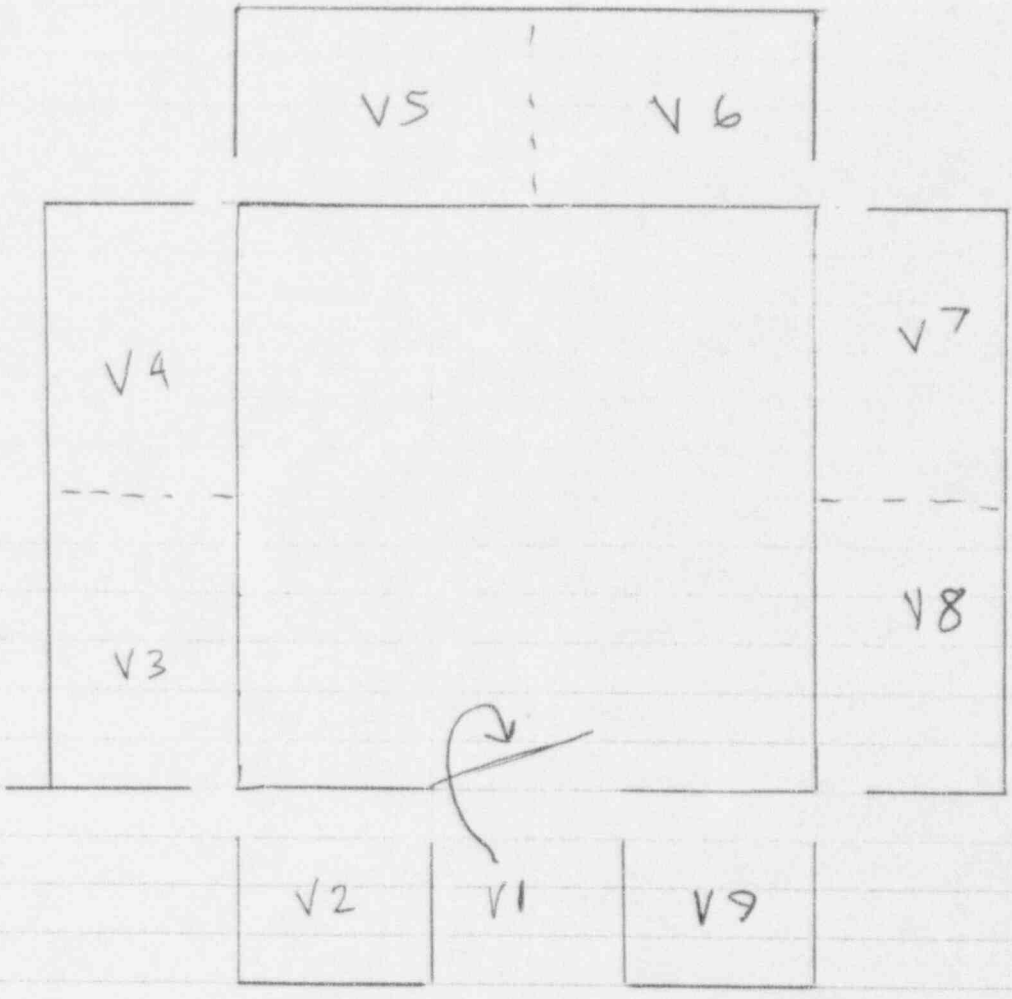


RADIOACTIVE MATERIAL STORAGE ROOM
WALL WIPE SURVEY

1/16/94



SNM VAULT ROOM WALL
WIPE SURVEY

1/10/94

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

BETA COUNTER BC4	1/10/84 Date	ALPHA COUNTER SAC 4	1/10/84 Date
BACKGROUND	275 cpm	BACKGROUND	0.2 cpm
SOURCE	5001 cpm	SOURCE	7910 cpm
EFFICIENCY	37.4 %	EFFICIENCY	0.392 %
BETA FACTOR 2.67	dpm/count	ALPHA FACTOR 2.55	dpm/count

Date	Time	~~GROSS Net~~ β (cpm)	~~GROSS Net~~ α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
1/10/84	0900	19	0	<30	<5	V1	RLG
		30	1			V2	
		26	1			V3	
		34	0			V4	
		20	1			V5	
		29	1			V6	
		27	0			V7	
		35	1			V8	
		30	2			V9	
		33	2			RM1	
		23	1			RM2	
		24	0			RM3	
		26	1			RM4	
		28	1			" 5	
		22	1			" 6	
		28	0			" 7	
		29	2			" 8	
		24	1			" 9	
		20	0			" 10	
		30	0			" 11	
		29	1			" 12	
						" 13	
1 SQUARE FT SWIPES ON WALLS 900 CM^2							
		∴	< 3	dpm / 100 CM^2			

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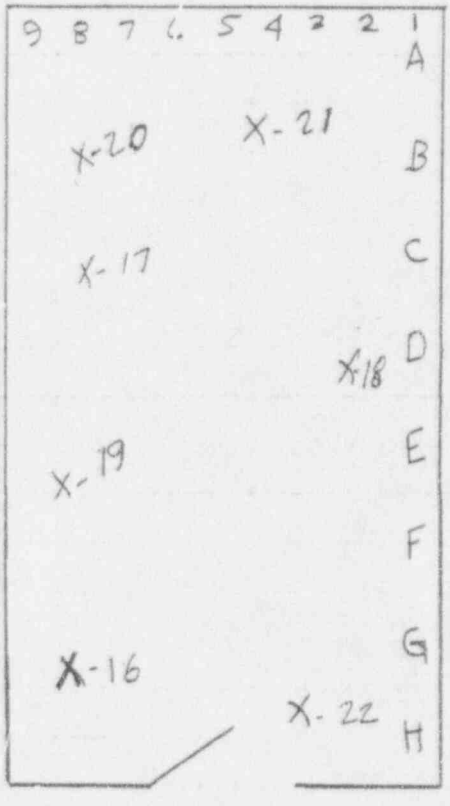
COUNTING ROOM WIPE SURVEY DATA

ROOM 115 COUNTING LAB



INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

Cousins Rat

BETA COUNTER	10/28/93 Date	ALPHA COUNTER	10/28/93 Date
BACKGROUND	30 cpm	BACKGROUND	0.9 cpm
SOURCE	5018 cpm	SOURCE	7898 cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10/28/93	1300	-1	0	<30	<5	A1	
		-2	0			A2	
		3	0			A3	
		5	-1			A4	
		1	0			A5	
		0	0			A6	
		-1	0			A7	
		-1	-1			A8	
		2	0			A9	
		5	0			B1	
		3	1			B2	
		-4	0			B3	
		4	0			B4	
		3	0			B5	
		0	-1			B6	
		1	0			B7	
		2	1			B8	
		-3	0			B9	
		-1	0			C1	
		0	0			C2	
		-2	0			C3	
		1	-1			C4	
		2	0			C5	
		4	-1			C6	
		0	0			C7	
		-1	0			C8	
		3	0			C9	
		4	1			D1	

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT CT RM 2 OF 3

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10/25/88		3	0	<30	<5	D2	
		-4	0			D3	
		1	0			D4	
		0	1			D5	
		3	0			D6	
		2	1			D7	
		0	0			D8	
		-2	0			D9	
		-4	0			E1	
		1	0			E2	
		0	1			E3	
		3	1			E4	
		0	1			E5	
		5	0			E6	
		-1	0			E7	
		0	1			E8	
		3	-1			E9	
		-2	-1			F1	
		-4	0			F2	
		0	-1			F3	
		1	-1			F4	
		5	0			F5	
		-1	0			F6	
		0	1			F7	
		-1	0			F8	
		0	0			F9	
		0	1			G1	
		1	1			G2	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

CT Room 3 OF 3

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10/28/03		6	1	<20	<5	G3	
		3	1			G4	
		-2	0			G5	
		1	0			G6	
		0	0			G7	
		0	-1			G8	
		0	0			G9	
		2	1			H1	
		1	0			H2	
		3	0			H3	
		-2	-1			H4	
		-1	0			H5	
		4	-1			H6	
		5	-1			H7	
		-3	0			H8	
		1	1			H9	
		0	1			BENCH SOUTH-NORTH	
		0	0			BENCH NORTH SOUTH	
		1	0			BENCH SOUTH NORTH	
		1	0			BENCH SOUTH SOUTH	
		2	-1			CABINET	

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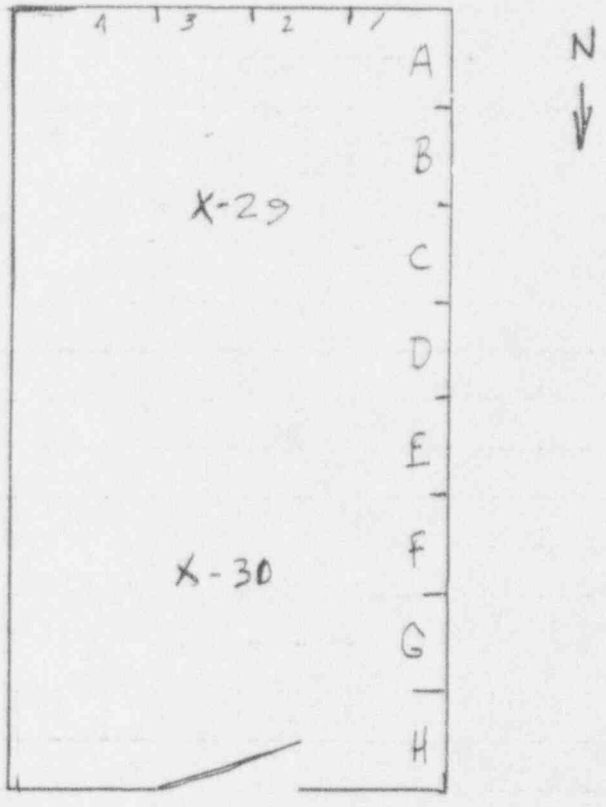
DETECTOR LABS WIPE SURVEY DATA

ROOM 112 DETECTOR LAB 1



INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

Room 112 1 of 2

BETA COUNTER	BC-4 10/27/93 Date	ALPHA COUNTER	SAC 4 10/27/93 Date
BACKGROUND	30.1 cpm	BACKGROUND	0.9 cpm
SOURCE	5002.1 cpm	SOURCE	7891.1 cpm
EFFICIENCY	37.6 %	EFFICIENCY	39.1 %
BETA FACTOR	2.65 dpm/count	ALPHA FACTOR	2.56 dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10/27/93	0900	-1	-1	<30	<5	A1	KLC
		3	0			A2	
		2	0			A3	
		-4	0			A4	
		0	-1			B1	
		1	-1			B2	
		3	1			B3	
		1	-1			B4	
		-1	-1			C1	
		0	-1			C2	
		5	0			C3	
		-2	0			C4	
		-1	-1			D1	
		-3	0			D2	
		1	0			D3	
		4	-1			D4	
		0	0			E1	
		1	0			E2	
		3	0			E3	
		-2	-1			E4	
		-1	-1			F1	
		-1	-1			F2	
		-2	-1			F3	
		0	-1			F4	
		0	0			G1	
		-1	0			G2	
		3	1			G3	
		2	0			G4	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

2 of 2

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10/27/93	1030	1	-1	<30	<5	H1	MLC
		-3	0			H2	
		2	0			H3	
		0	-1			H4	
		-1	1			DESK	
		3	0			TABLES	
		5	1			SINK	

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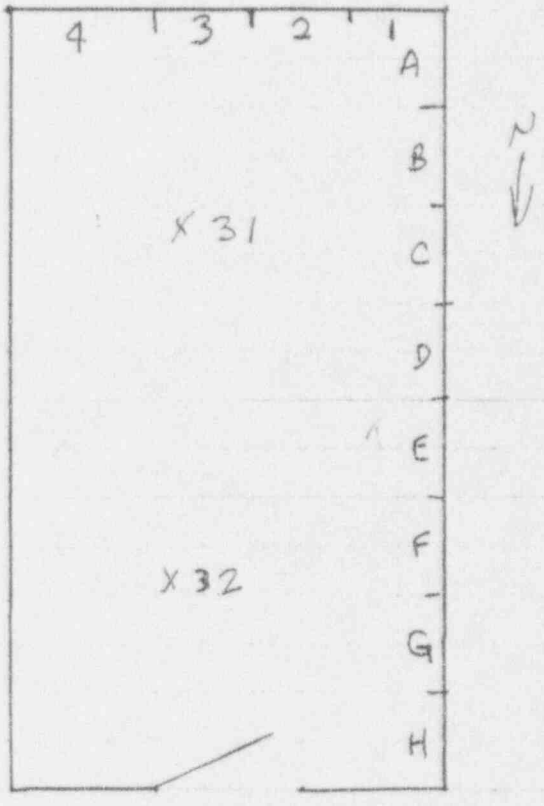
ROOM 113 DETECTOR LAB 2



INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

3200 ROOM 112 2070 1 OF 2

BETA COUNTER BC-4	Date	ALPHA COUNTER ~~SAC-4~~	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE ROOM 112 DATA ~~cpm~~		SOURCE ROOM 112 DATA	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
10/27/93	1105	1	-1	< 3	< 5	A1	KLC
		2	-1			A2	
		-4	0			~~A3~~	
		0	-1			~~A4~~	
		1	-1			B1	
		3	0			B2	
		-7	0			~~B3~~	
		0	0			B4	
		0	0			C1	
		3	-1			C2	
		-1	-1			C3	
		1	-1			C4	
		1	-1			D1	
		0	1			D2	
		0	0			D3	
		0	-1			D4	
		0	0			E1	
		-4	0			E2	
		3	0			E3	
		0	-1			E4	
		1	-1			F1	
		1	-1			F2	
		-1	0			F3	
		-2	-1			F4	
		-1	0			G1	
		0	0			G2	
		-1	0			G3	
		3	-1			G4	

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INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

BETA COUNTER	Date	ALPHA COUNTER	Date
BACKGROUND	cpm	BACKGROUND	cpm
SOURCE	cpm	SOURCE	cpm
EFFICIENCY	%	EFFICIENCY	%
BETA FACTOR	dpm/count	ALPHA FACTOR	dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
		1	-1	<30	<5	H1	KLC
		1	-1			H2	
		-3	-1			H3	
		0	0			H4	
		-1	1			FREEZER	
		2	0			SINK	
		4	0			~~TABLE~~	

TRITIUM COUNTING RESULTS

THIRD PARTY CHECK ALPHA AND BETA/GAMMA

REFER TO PREVIOUS WIPE SURVEY DATA AND GRIDS

X-RATED SAMPLE NOTATION ON GRID

X- COUNTS

Protocol #:11 Name:H-3 CPM 02-Nov-93 12:47
Region A: LL-UL= 0.0-18.6 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00
Region B: LL-UL= 2.0-18.6 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00
Region C: LL-UL= 0.0- 0.0 Lcr= 0 Bkg= 0.00 %2 Sigma=0.00
Time = 2.00 DIP = SIS

	S#	TIME	CPMA	SIS	FLAG		dpm/100 cm²
KG	1	10.00	10.90	25.871	B	D/M	
	2	2.00	14.60	13.403		24	2.6
	3	2.00	14.10	15.027		24	2.6
RM 112	4	2.00	12.10	3.494		19	2.1
	5	2.00	17.60	8.832			3.2 (MINIMUM 900 cm² WIPES)
	6	2.00	19.10	9.280			3.4
RM 113	7	2.00	20.10	9.773			3.5
	8	2.00	10.60	15.135			-
	9	2.00	15.60	13.020			2.7
	10	2.00	12.10	7.565			2.1
STORAGE RM	11	2.00	7.10	0.000			-
	12	2.00	4.60	0.000			-
111	13	2.00	24.10	9.212			4.2
	14	2.00	24.60	7.517			4.2
	15	2.00	27.60	13.606			4.9
	16	2.00	126.60	9.784		205	22.7
	17	2.00	222.60	10.880		360	26.2
COUNTING LAB	18	2.00	10.60	10.350			2
	19	2.00	106.10	9.988		171	19.0
RM 115	20	2.00	357.10	10.851		576	64.0
	21	2.00	57.60	11.405		94	10.0
	22	2.00	53.60	10.535		87	9.6
	23	2.00	12.10	15.278			2.1
	24	2.00	6.10	16.042			-
SM RM	25	2.00	7.10	14.105			-
116	26	2.00	10.10	12.114			-
	27	2.00	20.60	11.942			-
	28	2.00	84.60	9.429		137	15.2
MORE ROOM	29	2.00	59.10	8.351		95	10.5
	30	2.00	74.10	7.882		119	13.2
115	31	2.00	61.10	9.348		48	10.8
	32	2.00	59.10	7.398		95	10.5
	33	2.00	1.30	39.110			<MDA
	34	2.00	157482.	18.452		STD	

MAX: 4000
∴ 1.6 %

PACKARD 1600-TR LIQUID SCINTILLATION COUNTER

OSI WIPE SURVEY IRT CORP

2 NOV 93

OPERATIONAL CHECK:

CHANNEL A H-3 STANDARD CONTAINING 2.53 K-DPM (Feb 93) 157482 CPM 62 %eff.

CHANNEL B C-14 STANDARD CONTAINING 129 K-DPM NA CPM NA %eff.

CHANNEL C GROSS BETA--Total counts in this channel from both of the above standards. NA CPM NA %eff.

Background: CHANNEL A 11 CPM CHANNEL B _____ CPM CHANNEL C _____ CPM

Efficiency = $\frac{\text{Observed net CPM}}{\text{DPM in Standard}}$

Minimum Detectable Activity = MDA = 1.64 $\frac{\frac{\text{CPM (bkg)}}{\text{Time (bkg)}} + \frac{\text{CPM (bkg)}}{\text{Time (Sample)}}}{\text{Counter Efficiency}}$ = DPM

MDA Ch A = $\frac{1.64\sqrt{\frac{11}{10m} + \frac{11}{2m}}}{0.62\frac{C}{D}} = 4.2\,C/M \approx 7\,D/M$

W R Murrell

Person performing procedure

1/93

IRT 43-2 BKGD: 2/5 min ⇒ 0.4 cpm

ECON FS-8 BKGD: 353/10 min ⇒ 35.3 cpm

44-3 BKGD: 178/10 min ⇒ 17.8 cpm

^{14}C: 16313 cpm	I_{125}: 15,939 cpm	^{230}Th: 2282 cpm
.1025 μCi	77,126 dpm	68,000 dpm

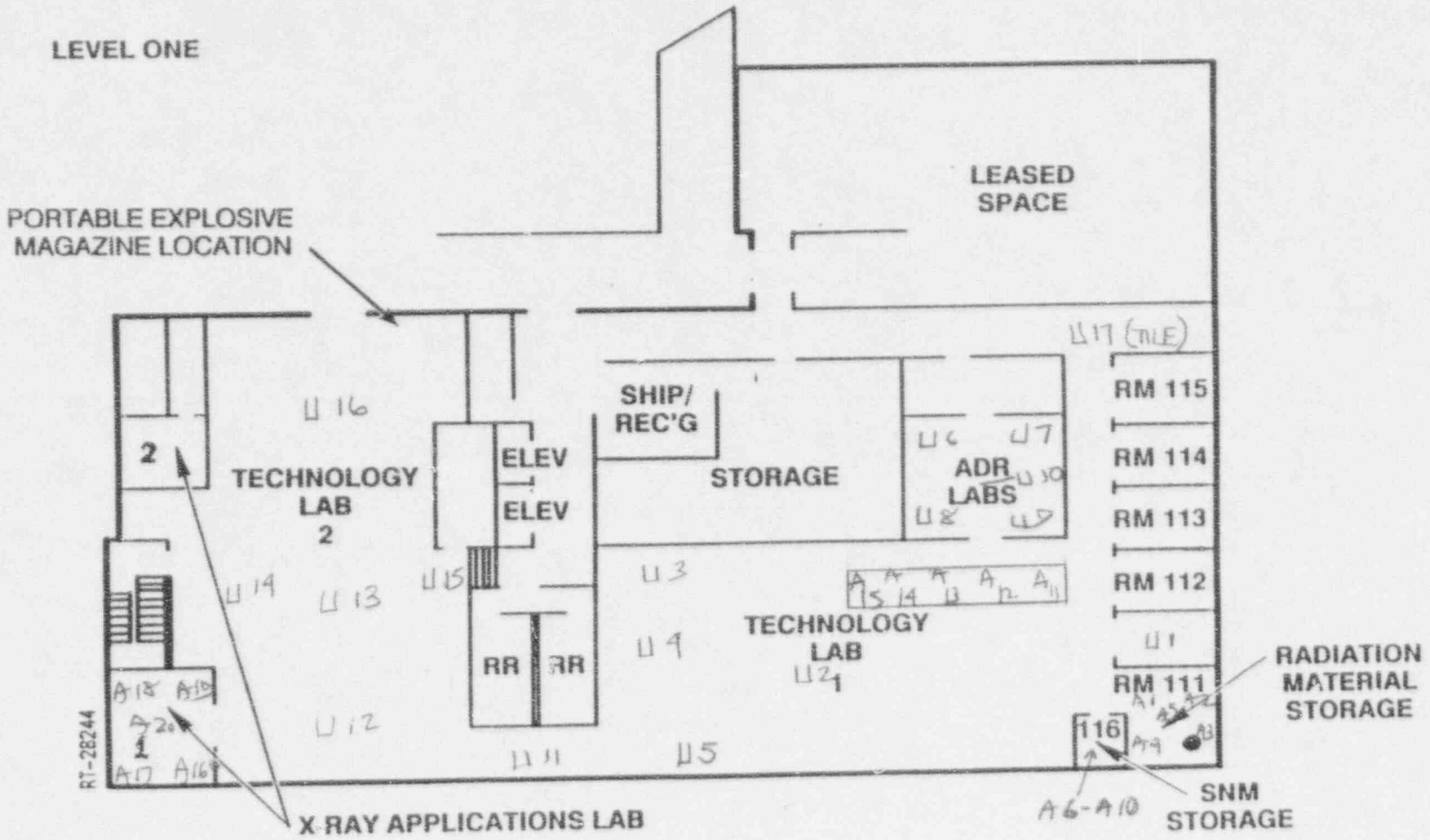
		1 min 43-2	10 min FS-8	10 min 44-3	
X-2	1	0	364	195	
(TECH	2	0	384	201	$MDCR(\alpha) = 1.64\sqrt{\frac{2}{25}+\frac{2}{25}} = 0.656$ cts
LAB #1)	3	0	341	181	
X-5	4	0	324	183	$MDCR(\beta) = 1.64\sqrt{\frac{753}{100}+\frac{353}{100}} = 4.36$ cts
113	1	0	357	179	
(TECH	2	0	366	209	$MDCR(\gamma) = 1.64\sqrt{\frac{178}{100}+\frac{178}{100}} = 3.09$ cts
LAB #2)	3	0	360	211	
X 9	4	0	333	197	$Eff(\alpha) = \frac{2282}{68,000} \Rightarrow 33.56\%$
	1	0	363	205	
(Rm-111	2	0	339	175	$Eff(\beta) = \frac{.1025}{16313} \Rightarrow .717\%$
	3	0	340	208	
	4	0	356	195	$Eff(\gamma) = \frac{15939}{77,126} \Rightarrow 20.7\%$
H	5	0	348	209	
	6	0	360	175	$MDA(\alpha) = \frac{0.656}{.3356} = 1.955$ dpm
Rm 115	1	0 ✓	357	204	≈ 0.0000009 μCi
X-17	2	0 ✓	371	194	
	3	0	365	178	$MDA(\beta) = \frac{4.36}{.0717} = 60.81$ dpm
	4	0 ✓	337	216	≈ 0.0000027 μCi
	5	0 ✓	324	194	
	6	0	355	195	$MDA(\gamma) = \frac{3.09}{.207} = 14.93$ dpm
X72	)	0	337	183	≈ 0.0000007 μCi
	1	0	371	169	
(Rm-116	2	0	380	190	— ALL < MD —
	3	0	363	216	
	4	0	314	184	
X21	5	0	332	179	

SCANNING AND FIXED ACTIVITY MEASUREMENTS

FOR COMPARISON OF AFFECTED AND UNAFFECTED AREAS

SCANS WERE MADE AT THE TIME OF THE WIPE SURVEYS FOR BOTH BETA/GAMMA AND ALPHA ACTIVITY WITH A LUDLUM MODEL 14 RATEMETER AND A HP210 PROBE AND A PAC 1SA AND AC-3-7 PROBE ALPHA SCINTILLATION DETECTOR, RESPECTIVELY. THESE MEASUREMENTS SHOWED NOTHING DISTINGUISHABLE FROM BACKGROUND COUNT RATES. SUBSEQUENT CONTACT MEASUREMENTS WITH THE HP210 PROBE AND A FS8 SCALER SYSTEM CALIBRATED FOR EFFICIENCY WITH THE STANDARD STRONTIUM BETA SOURCE INDICATED THAT THE DIFFERENCE BETWEEN AFFECTED AND UNAFFECTED AREAS WAS NOT MEASURABLE. IT IS CONCLUDED THAT THE ACTUAL MEASURED ACTIVITY IS DUE TO THE NORMAL ACTIVITY OF CONCRETE. THIS IS SUPPORTED BY THE FACT THAT IN LOCATIONS COVERED WITH TILE AND OR CARPET THE MEASURED ACTIVITY IS LESS.

SURVEY INSTRUMENT DOSERATE MEASUREMENTS AT I METER ABOVE THE FLOOR WITH THE TWO MICRO R METERS GAVE THE SAME RESULTS FOR BOTH AREAS.



Lower floor north

UNAFFECTED AREAS

NUMBER	CPM	DOSE RATE uR/hr
U1	58	15
U2	63	15
U3	61	13
U4	55	15
U5	58	13
U6	61	14
U7	53	14
U8	55	13
U9	59	13
U10	57	13
U11	60	14
U12	54	14
U13	58	15
U14	59	14
U15	56	13
U16	53	15
U17	35	14

AFFECTED AREAS

NUMBER	CPM	DOSE RATE μR/hr
A1	58	15
A2	59	14
A3	61	14
A4	56	15
A5	57	15
A6	51	14
A7	46	13
A8	56	15
A9	59	15
A10	53	13
A11	59	14
A12	57	14
A13	55	14
A14	61	13
A15	53	12
A16	60	12
A17	57	13
A18	54	15
A19	63	14
A20	60	16

MISCELLANEOUS LEAK TESTS AND ROUTINE SURVEY DATA

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

WEEKLY WIPE SURVEYS 10-15-86 DKeesling

BETA COUNTER BC-4	10-14-86 Date	ALPHA COUNTER SAC-4	10-14-86 Date
BACKGROUND	27.7 cpm	BACKGROUND	Ø.1Ø cpm
SOURCE	6372.2 cpm	SOURCE	8Ø46.7 cpm
EFFICIENCY	4Ø.Ø %	EFFICIENCY	39.8 %
BETA FACTOR	2.5Ø dpm/count	ALPHA FACTOR	2.51 dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By DKeesling
10-15-86	1405	Ø	Ø	<3Ø	<5	4879	1) OUTSIDE FLOOR AT VAULT DOOR
		1.3	Ø	<3Ø	<5	488Ø	2) INSIDE DOOR VAULT FLOOR
		3.3	1.9 4.7 Ø	<3Ø	<5	4881	3) FLOOR BY STOR. CABINET - VAULT
		Ø	Ø Ø	<3Ø	<5	4882	4) FLOOR UNDER TUBES - VAULT
		Ø	Ø.9	<3Ø	<5	4883	5) HOT LAB DOOR-WAY FLOOR
		Ø	Ø	<3Ø	<5	4884	6) FLOOR IN FRONT OF CABINET H.L.
		6.3	Ø	<3Ø	<5	4885	7) FLOOR BY DESK HOT LAB
		8.3	Ø	<3Ø	<5	4886	8) FLOOR AT END OF DESK - H. LAB
		Ø	Ø	<3Ø	<5	4887	9) FLOOR IN FRONT OF DESK H. LAB
		Ø	Ø	<3Ø	<5	4888	10) FLOOR BY CAVE H. LAB
		Ø	Ø	<3Ø	<5	4889	11) CAVE TOP HOT LAB
		4.3	Ø.4	<3Ø	<5	489Ø	12) CAVE SHELF HOT LAB
		3.3	Ø	<3Ø	<5	4891	13) FLOOR BY WELL - H. LAB
		Ø	1.9	<3Ø	<5	4892	14) FLOOR BY FUME HOOD H. LAB
		7.3	Ø	<3Ø	<5	4893	15) FUME HOOD SILL - H. LAB
		72.3	1.9	18Ø.75	<5	4894	1) CH 25 2 BAGS 88-252-19

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3-4-87

Had an R SC meeting.

Bruce Kanaca, IRT/Ridge east coast Rep. called. He wanted to know what progress I was making on the FMI license and ARGUS registration.

I told him I ~~hadn't had~~ haven't had time to start on it yett, and that it would be 2-4 weeks before I could.

3-5-87

Started air sampler in Hot Lab.

Setting up to load Japanese Gd-Gd pellets into a test rod ~~for~~ with Lew Parks.

Removed pellets from the Vault and opened each container. Put vials in hood.

0% Gd = 11 pellets
2% Gd = 11 "
4% Gd = 11 "
6% Gd = 12 pellets

Wipes taken on vials

5	1000	0% Gd	<30 Bdpm <5 α dpm
5	101	2% Gd	
5	102	4% Gd	
5	103	6% Gd	

Opened the vials, Lewis measured the diameter of each pellet then placed it in the ~~tube~~ test rod.

Signed _____ Date _____

Read and understood by _____ Date _____

air Sample

5051 1.02×10^{-13} β uCi/ml 6.0×10^{-14} α uCi/ml

Paul P. Maschka

3-5-87

Sealed tube ends. Cleaned tube, vials and calipers

Wipes taken:

5497	Calipers	$\frac{<30}{}$	B dpm	$\frac{<5}{}$ α dpm
5498	Vials	$\frac{5}{}$	↓	$\frac{5}{}$ ↓
5499	tube	$\frac{5}{}$		$\frac{<5}{}$

With Dennis Piper; testing a PRM using .23gm Pu foil samples. after adjusting H.V. and windows the unit can the Pu easily.

Met with Chuck Preskitt: he wanted to know why I wasn't working on the FMI license. I told him

1. Semi-annual leak check
2. Cf-Co Irradiation cell.
3. Certification tests for CXI
4. Routine surveys & inspections at Linac, Arjons and Callan Rd.
5. Monitoring Irradiated Gemstones
6. Rewriting Linac Rad Safe Manual
7. Trying to get CAP's for Delco and Aries completed.
8. Monit., Pkg, label, and paperwork gemstone packages going to U. of Mo.
9. Film badge change.
10. Calibrate survey meters.

I told him that I need help writing the registration for ARAUS-200 and the FMI license.

Paul R. Maschka

3-5-87

completed SNM Inventory and wipes.

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

BETA COUNTER	F5-8	3/16/87	Date	ALPHA COUNTER	AC-4	3/16/87	Date
BACKGROUND	25.6	cpm		BACKGROUND	0.03	cpm	
SOURCE	4814.4	cpm		SOURCE	8032.6	cpm	
EFFICIENCY	30.9	%		EFFICIENCY	34.8	%	
BETA FACTOR	3.22	dpm/count		ALPHA FACTOR	2.51	dpm/count	

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By PRM
3/16	1320	0	0	<30	<5	5104	Lab Wall Light pipe
		0	0	<30		5	R.S. Lig. Counter
		0	0	<30		6	US-200 Chamber
		0	0	<30		7	US Lig. Counter
		0	0	<30		8	P&W Lig. Counter
		0	0	<30		9	10 gm U/Al plate
		0	1	<30		5104 10	5 gm U/Al plate
		0	4	<30	10	11	Pu hand unopened can
		0	0	<30	<5	12	6 Pu foils
		1	0	<30		13	Pu foils 4 gm
		6	0	<30		14	Pu foil scrap
		5	0	<30		15	5 gm Pu D.O.E.
		0	0	<30		16	US 3 gm PRM test
		0	0			17	US 16 gm PRM test
		0	0			18	92-238-2 & 3
		0	0			19	93-237-1 & 2
		3	0			5104 20	B&W Pellets U dep
		0	1			21	B&W Rods U dep.
		3	0	4		5104 22	94-238-1

3-6-87

Reviewed Guide for Registration of Devices

Met with Prescott and R. Lukens. Lukens will write AR&US-200 Registration. Want over the procedures and guidelines with him.

Semi-annual
SNM Leak Tes
Paul R. Maschka

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

BETA COUNTER FS-8 8/23/88 Date		ALPHA COUNTER SAC-4 8/22/88 Date	
BACKGROUND 22.4 cpm		BACKGROUND 0.24 cpm	
SOURCE 5733.6 cpm		SOURCE 8110.9 cpm	
EFFICIENCY 38.2 %		EFFICIENCY 40.1 %	
BETA FACTOR 2.61 dpm/count		ALPHA FACTOR 2.50 dpm/count	

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By PRM
8/23	1510	3	1	<30	<5	128	Rad 3065
		0	0			29	" 3137
		0	0			130	" 2085
		2	0			1	" 3138
		0	0			2	" 2008
		0	1			3	" 3104
		3	0			4	" Belgo
		1	0			35	" 3136
		0	0			6	" 3119
		0	0			7	" 3087
		2	0			8	" 2017
		0	0			9	" 2019
		4	0			140	" 3056
		5	1			1	10' Rad (Trash)
		0	0			2	U/Ld Japan Rad
		0	0			(DV & NV) 3	B&W U/Ld Rads
		0	0			4	U5 Fis Cnts
		4	0			45	U5 Ion Chamber
		2	1			6	R-S Fis Cnts
		0	0			7	Pu Fis Cnts
		0	0			8	EFX Plates
		0	1			9	Pu foils unopen
		0	6			150	Pu foils 0.237
		2	0			1	Pu foils 0.041
		0	0			2	Pu foils Gero.
		0	0			3	94-239-11
		4	3			4	98-237-1&2
		0	1			155	98-235-4

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Semi-annual
SNM Leak Tes
Paul R. Maschka

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

BETA COUNTER	FS-8	8/23/88	Date
BACKGROUND	22.4		cpm
SOURCE	5733.6		cpm
EFFICIENCY	38.2		%
BETA FACTOR	2.61		dpm/count

ALPHA COUNTER	SAC-4	8/23/88	Date
BACKGROUND	0.24		cpm
SOURCE	8110.9		cpm
EFFICIENCY	40.1		%
ALPHA FACTOR	2.50		dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By PRM
8/23	1510	3	1	<30	<5	128	Rad 3065
		0	0			29	" 3137
		0	0			130	" 2085
		2	0			1	" 3138
		0	0			2	" 2008
		0	1			3	" 3104
		3	0			4	" Belgo
		1	0			35	" 3136
		0	0			6	" 3119
		0	0			7	" 3087
		2	0			8	" 2017
		0	0			9	" 2019
		4	0			100	" 3056
		5	1			1	10' Rad Grave
		0	0			37 2	U/Gd Japan Rad
		0	0			(DU & NU) 3	B&W U/Gd Rads
		0	0			4	U5 Fis Cntr
		4	0			45	U5 Ion Chamber
		2	1			6	R-5 Fis Cntr
		0	0			7	Pu Fis Cntr
		0	0			8	CFX Plates
		0	1			9	Pu fails unopen
		0	0			150	Pu fails 0.237
		2	0			1	Pu fails 0.041
		0	0			2	Pu fails Gera
		0	0			3	94-239-11
		4	3			4	93-237-182
		0	1			155	98-235-4

IF-121

Semi-annu
SNM Leak Te
Paul R. Mache

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

BETA COUNTER	FS-8	8/23/88	Date
BACKGROUND	22.4		cpm
SOURCE	5733.6		cpm
EFFICIENCY	38.2		%
BETA FACTOR	2.61		dpm/count

ALPHA COUNTER	SAC-4	8/23/88	Date
BACKGROUND	0.24		cpm
SOURCE	8110.9		cpm
EFFICIENCY	40.1		%
ALPHA FACTOR	2.50		dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By Dzm
8/23	1610	0	0	<30	<5	156	92-235-6
		0	1			7	92-235-2
		2	0			8	B+W Dup Upst
		0	0			159	94-238-1

IF-121

7/11/89 INVENTORIED ALL SNM AT CALLAIN VAULT & RM STORAGE ROOM. WIPE TESTED ALL ITEMS AN ALSO VAULT FLOOR. NO. LEAKAGE OR CONTAMINATION DETECTED. RESULTS ATTACHED.

INTELCOM RAD TECH

HEALTH PHYSICS SAMPLE REPORT

BETA COUNTER	7/11/89 Date	ALPHA COUNTER	7/11/89 Date
BACKGROUND	21 cpm	BACKGROUND	0.1 cpm
SOURCE	5058 cpm	SOURCE	7945.9 cpm
EFFICIENCY	33.17 %	EFFICIENCY	39.89 %
BETA FACTOR	1.36 pCi/dpm 3.01 dpm/count	ALPHA FACTOR	1.15 pCi/dpm 2.59 dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
7-11-89	1100	0	2	<5000 pCi	<5000 pCi	190	U3O8 POWDER CAN KLP
		0	0			191	UO2 "
		0	0			192	Pu(DOE)
		1	0			193	Pu(SLAB CAN)
		1	1			194	Pu(FOILS)#2
		3	1			195	Pu(FOILS).5g
		4	1			196	Pu(FOILS) CAN
		5	0			197	U-235(1TB SOURCE)
		0	0			198	U-235(.5g SOURCE)
		2	0			199	Np FOILS CAN
		0	1			200	U-235 FOILS CAN
		2	0			201	U(DEP) FOIL CAN
		0	0			202	CFA FLOOR
		6	1	<30 dpm	<5 dpm	203	VAULT FLOOR
		2	1	"	"	204	MISC ITEMS

INTELCOM RAD TECH

FUEL PELLET UNLOAD

HEALTH PHYSICS SAMPLE REPORT

BETA COUNTER	BC-4	ALPHA COUNTER	SK4
Date	6/30/80	Date	6/30/80
BACKGROUND	22.1 cpm	BACKGROUND	0.2 cpm
SOURCE	5050.7 cpm	SOURCE	7920.0 cpm
EFFICIENCY	33 %	EFFICIENCY	39.2 %
BETA FACTOR	3.02 dpm/count	ALPHA FACTOR	2.55 dpm/count

Date	Time	Net β (cpm)	Net α (cpm)	FINAL RESULT β dpm	FINAL RESULT α dpm	Sample Number	Counted By
6/30/80	1500	0	.8	<30	<5	GAO Rod	KLC
		2	.8			GYNC Rod	
		1	0			Hood tray	
		0	.8			Hood Floor	
		2	.8			Room Floor	
		1	0			GAO A16	
		0	0			GAVC BAK A	
		2	.8			GAVC BAK B	
		0	0			GAVC BAK C	

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SNM INVENTORY, SSLT AND LOCATION

JULY 1992

A physical inventory of the Special Nuclear Material on hand at this time was completed on July 27, 1992. The following Material is on hand:

MATERIAL	DESCRIPTION	LOCATION
^{235}U oxide powder	Sealed source plastic vial 92-235-4 8.5/8.0 grams	SS container in white 5 gal bucket
^{235}U oxide powder	Sealed source plastic vial 92-235-5 8.5/8.0 grams	SS container in white 5 gal bucket
^{235}U oxide	Fission Counters RSN-34A-M1,K591 RSN-34A-M1,G1481 FC4A-300 */*	Loose, plastic wrap white 5 gal bucket
^{235}U Al alloy	Lg CFX Fuel Plate, Al clad SAJ 51 11/10.7 grams	Plastic wrap white 5 gal bucket
	Sm CFX Fuel Plate, Al clad SAL 22 SAK 128 5/4.6 grams (both)	Plastic wrap white 5 gal bucket
$^{235}U/^{239}Pu$ oxide	NFS fuel rods 2-017,019,085 3-136,137,138 6555/129 U grams 146/143 Pu grams Belgo fuel rod J0182 1154/0.6 U grams 42/42 Pu grams	Pipe container #1
	NFS fuel rods 2-008 3-056,065,087,104,119 6525/148 U grams 183/180 grams	Pipe Container #2

MATERIAL	DESCRIPTION	LOCATION
^{239}Pu metal	Unopened foil 0.237/0.234 grams	Green 6M container 2R in metal can
	Foils 0.0417/0.0412 grams	Blue 2R
	Foils 0.237/0.234 grams	Yellow 6M container 1 inch 2R
	Scrap 0.195/0.193 grams	3 inch 2R
^{239}Pu oxide	Fission counter FC4A-300 */*	White 5 gal bucket loose
^{239}Pu salt	Plated source S-21 94-239-12 */* grams	Callan Road Counting lab
$^{238}PuBe$	Sealed neutron source 94-238-1 1.1/1.0 grams	Callan RM storage source storage pit

All wipe tests were negative: < 13 picoCuries beta/gamma
< 2.3 picoCuries alpha.

Also, wipe tests of storage tubes, floor, and calibration sources were negative, i. e. less than minimum detectable.

Spectrum name: MIMOIL.SPC

Sample description
MINERAL OIL FOR K. CROSBIE

Spectrum Filename: MIMOIL.SPC

Acquisition information

Start time	07-DEC-93	08:42:46
Live time	9025	
Real time	9031	
Dead time	.07%	
Detector/Geometry IDs	1 &	1

Detector system
No detector description was entered

Calibration
Filename: CRUN0222.SPC
Created: 29-SEP-93 13:00:27 & Two point calibr
RECALIBRATION FOR 30 GM HOLDER, SOURCE M-10
S1B01883

Zero offset -1.770 keV; Gain .750 keV/channel

Library Files
Main analysis library: TOPAZ.LIB

Analysis parameters

Start channel	20 for an energy of	13.23keV	
Stop channel	3500 for an energy of	2617.30keV	
Peak rejection level	50.000%		
Activity scaling factor	1.0000E+00/	1.5000E+01 =	6.6667E-02

Detection limit method:
Don't print isotope if not found
15 cc
Additional random error: 1.0000000E+00
Additional systematic error: 1.0000000E+00
Background width: best method (based on spectrum).

Corrections	Status	Comments
Decay correct to date	NO	
Decay during acquisition	NO	
Peaked background correction	NO	
Absorption (Internal)	NO	
Geometry correction	NO	
Random summing	NO	

Energy calibration normalized difference: .3138

MPC table filename: TOPAZ.TBL

***** S U M M A R Y O F N U C L I D E S I N S A M P L E *****

NUCLIDE	TIME OF COUNT ACTIVITY BQ PER [redacted] cc	UNCERTAINTY 1 SIGMA COUNTING	% of MPC	
F-18 Au=511	3.7203E-01	17.04%	.37	]
ZR-89 #	2.5184E-02	43.96%	.03	]
K-40 #	9.1342E-01	14.82%	.91	]

\# All peaks for activity calculation had bad shape.

] Default value from table used for MPC.

---------- S U M M A R Y ----------

TOTAL ACTIVITY (13.2 to 2617.3 keV) 1.3106270E+00 BQ PER [redacted] cc

The library has energies which are not separable.

********* S U M M A R Y O F D I S C A R D E D P E A K S *********

14.15	&	Y-88	15.80	&	Y-88	27.20	&	J-126	27.47 % J-126
31.00	&	J-126	31.70	&	J-126	35.49	&	SB-125	53.16 % BA-133
57.98	&	TA-182	59.32	&	TA-182	67.75	%	TA-182	79.62 % BA-133
81.00	&	BA-133	84.68	+	TA-182	100.11	&	TA-182	113.67 & TA-182
127.19	&	NI-57	133.03	%	HF-181	136.28	+	HF-181	142.65 % FE-59
145.44	&	CE-141	152.43	&	TA-182	156.38	&	TA-182	160.61 + BA-133
165.85	%	CE-139	176.33	%	SB-125	179.39	+	TA-182	192.35 & FE-59
222.10	%	TA-182	223.23	&	BA-133	229.32	%	TA-182	255.06 & SN-113
276.40	&	BA-133	279.20	&	HG-203	302.85	&	BA-133	308.46 & IR-192
316.51	&	IR-192	320.08	!	CR-51	345.94	%	HF-181	356.02 % BA-133
380.43	%	SB-125	383.85	&	BA-133	427.89	&	SB-125	463.38 & SB-125
468.07	&	IR-192	475.35	%	CS-134	482.18	%	HF-181	492.00 & J-126
511.00	%	Ge-69	511.00	%	ANN-511	563.23	*	CS-134	569.32 & CS-134
573.90	+	Ge-69	588.59	&	IR-192	600.56	&	SB-125	604.70 ! CS-134
606.64	%	SB-125	612.47	&	IR-192	634.78	+	AS-74	635.90 % SB-125
656.00	&	J-126	664.50	-	J-126	671.41	&	SB-125	722.79 & SB-124
724.20	+	ZR-95	730.00	%	J-126	763.94	&	AG-110M	765.78 ! NB-95
795.84	&	CS-134	801.93	?	CS-134	810.77	%	CO-58	834.83 & MN-54
863.96	&	CO-58	871.70	%	Ge-69	898.02	&	Y-88	937.49 & AG-110M
1001.68	%	TA-182	1038.57	%	CS-134	1099.25	%	FE-59	1106.40 % Ge-69
1115.55	+	ZN-65	1121.28	&	TA-182	1167.94		CS-134	1173.24 + CO-60
1189.05	%	TA-182	1221.42	&	TA-182	1230.97	%	TA-182	1257.47 % TA-182
1274.53	&	NA-22	1289.17	&	TA-182	1291.60	+	FE-59	1332.50 + CO-60
1336.20	%	Ge-69	1365.15	&	CS-134	1368.53	+	NA-24	1620.80 % ZR-89
1657.30	&	ZR-89	1690.98	&	SB-124	1712.90	%	ZR-89	1744.50 & ZR-89
1757.48	%	NI-57	1836.01	%	Y-88	1919.43	&	NI-57	2090.94 % SB-124

* - Peak is too wide, but only one peak in library.
! - Peak is part of a multiplet and this area went negative during deconvolution.
? - Peak is too narrow.