RSA CORPORATION

U.S. HIGHWAY 46 AND SCHLEY STREET DOVER, NEW JERSEY 07801 2[illegible]583

July 3, 1974

30-7026

Director, Division of Materials Licensing
United States Atomic Energy Commission
Washington, D.C. 20545

Subject; Report of leaking Co-60 Source

Ref: License No. 29-13848-01

During a scheduled plant shutdown of June 11-14, 1974 to transfer cobalt 60 sources from the old source holder to the new source holder, a leaky source was discovered.

The procedure for unloading the old source rack involves lifting the source positioning tube from the rack allowing the individual source pencils to fall out the bottom onto the floor of the pool. Each tube contains three source pencils. As the sources fall free the empty tube is removed from the pool under health physics supervision. These tubes are normally inactive.

As the eighth tube (out of 13) was being removed, it was observed to have a high gamma reading (400 mr/hr) from the central portion of the tube. Within 1-2 minutes of this observation the radiation monitor on the filters on the water recirculation system gave an alarm and the radiation level at the surface of the water rose to 30 mr/hr. Operations in the cell were stopped except for occasional radiation checks to determine whether the radiation levels were increasing or decreasing. Filter change out was initiated and continued through the night. The filters were removing the radioactive material, but the demineralizer appeared to have no effect. The demineralizer was bypassed in order to increase flow rate through the filters. By morning the rate of pick-up on the filters had fallen to one fifth the initial rate and the activity at the surface of the water was down to 10 mr/[illegible]

Operations in the cell were resumed in an effort to locate and isol[illegible]e the leaking source. The sources on the bottom of the pool were picked up and placed in a bucket for transfer to the new source holder. The magnet was checked after each source pickup to see if it would indicate by increased activity which one was the offending source. The sources were visually checked under 10 feet of water as they were transferred. Locating sources on the pool bottom is by combination of underwater light and Cherenkov glow. When all...

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the sources which could be readily lifted had been transferred to the bucket, the tally indicated one source yet to be picked up. The Cherenkov glow indicated one source still on the bottom, but the magnet could not lift it. The underwater light indicated another object which appeared to be a source but which did not glow. This second object was lifted by the magnet and was found to be a piece (approximately 12" long) of the outer encapsulation (the source pencils are 18" long). This was removed for examination. A visual search of the bottom of the tank located the other (~6") piece of outer encapsulation lying near the source itself. Attempts to pick up the source by magnet were not successful (the inner encapsulation does not have magnetic end caps). A stronger magnet was employed. When the source could not be lifted by the available end an attempt was made to lift by the end near the tank wall which was the end near the short piece of outer capsule. This was also unsuccessful, but when the magnet was raised for removal it gave a reading of 500 mr/hr while still 1 foot below the water surface. It was lowered back to the bottom.

At this point our evaluation of the situation was as follows:
1) There was only one leaky source and it was identified.
2) There was loose cobalt activity on one end of the source indicating the possibility that the short end of the outer encapsulation and the pool floor area in the vicinity would be highly contaminated.
3) The filters were doing a successful job in removing the material from the pool, although not with a high degree of efficiency.

Our next step was to attempt to contain the sources of loose activity. Several stainless steel 1" dia pipe sections were fabricated with screw threads at each end. In addition several 3" diameter pipes were made up with end plates and gaskets. One of the 1" pipe sections was lowered to the bottom of the pool. The leaky source pencil and the short piece of outer encapsulation were placed gently inside and the open end sealed by the screw cap. Next the area of the pool bottom around the location of the source and end cap was vacuumed using an airlift pump. Material so vacuumed was caught in a standard-sealed oil filter for trucks. Vacuuming was continued until the entire surrounding area was cleaned and the filter read 1R/hr at 2-feet when at the surface of the water. The rest of the pool floor area was also cleaned using two more oil filters. These did pick up some activity and read several hundred mr/hr. The magnet and the hot filter cartridge were then placed in one of the large 3" diameter pipes and sealed.

Probable Cause of Failure

Examination of the tubes in the bundle which hold the source pencils gave evidence on June 1, 1974 that an impact force had been transmitted to the tube bundle, although it did not appear that this force had been transmitted to the sources themselves. The capsule shroud has a design feature which was intended to take any impact in the r[illegible] instance of the source capsule falling into the pool and prevent the impact from being transferred to the sources. A series of events had caused such a source free fall on April 12, and twice more on April 25. While it is probable that the failure of the outer encapsulation

visible until the sources were removed from the tube on June 11. Examination of the fractured end of the outer encapsulation indicated a clean mechanical break. There was no evidence of corrosion and full wall thickness appears to be intact at the break point. That there was only one failed source is confirmed by visual check and the positive indication on only one of the source positioning tubes removed.

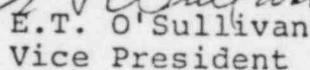
<u>Current Status</u>

All primary sources of pool water contamination have been sealed. Water samples taken after the release of contamination into the pool indicated an initial contamination level of $7\times10^{-4}\mu$ci/ml. This has been gradually reduced through filtration by the closed cycle recirculation system to a current activity level of $9\text{X}10^{-5}\mu$ci/ Nuclear Engineering Company has been contacted to pick up the radioactive waste in the form of the filter cartridges and we will review with them means of removing the 3" diameter sealed pipe from the pool. The leaky source will remain in its sealed stainless steel container at the bottom of the pool pending discussions with General Electric and Nuclear Engineering Company.

Throughout this period there was no personnel over-exposure and no release of activity to the environment. These events and the status of conditions in the building were reviewed with the AEC Regulatory Operations Inspector during his visit to our facility on June 26, 1974.

A report on the design changes incorporated to prevent recurrence of a free falling source and more positive means of assurance that any such fall would not transmit the impact to the sources, is being prepared for the Division of Licensing under Separate cover.

Respectfully submitted,



E.T. O'Sullivan
Vice President

ETO/mg

cc: Region I, Directorate of Regulatory Operations, USAEC
Marlin Ebert, General Electric Company
B. Roberts, Nuclear Engineering Company

A. Docket Number	B. Report Number	C. Priority Category	D. Inspection Date
—	7401	E/III	6/26/74

Licensee	F. Facility	G. License No.
RSA Corp.	Dover, N.J.	29-13848-0

Type of Inspection	I. No. and date of last Amendment	J. Dates of Last Inspection
Unannounced Reinsp.	05 - 5/6/74	

Principal Inspector and Date of Report	L. Accompanying Inspector	M. Other Accompanying Personnel
[signature] 7/9/74	None	None

Proprietary Info.	O. Reviewer	P. Date of Review
None	[signature]	7/10/74

Individuals Interviewed* and Titles

a. Martin Stein, Pres

b. E.T. O'Sullivan, Treas.

c.

d.

e.

f.

g.

h.

R. Date of Interview: 6/26/74

S. Place of Interview: Dover, N.J.

Enforcement Action	U. Previous Outstanding Items
See back of pg 2 / Z/C 13C - notification of Leaky Source / [illegible] 20.105 - See pg A2 / 19.11(b) - See pg. A-9 / Mtl. Calb. - "we understand" - see back of pg A-11	20.401(b) - Survey Records

Unresolved Items	W. Previously Reported Unresolved

X. Recom. Reinspection	Y. Name & Tele. # of RSO	Z. RMS Code Number
June '76	O'Sullivan 361-0583	

ZZ. Scope of Inspection: (✓) complete, ( ) partial, ( ) special ______

#A-1

Unusual Occurrence

Source failed to return to store pos. on 4/12/74 - alarm & safety devices indicated same. E.T.S.& O.S. checked @ entrance to lab, path & meter; found 40 mR/hr., closed door, heard source assembly fall back. Investigation indicated slack chain from chain fall had fouled around load line, however, no slack at this time so source fell "free" to end of chain, ~~no indication~~ breaking ~~out~~ cable. Replaced cable, thought ~~situation~~ remedied by rearrangement of slack chain bucket.

~2 weeks later repeat performance, but in this instance free fall broke "C" link in chain. Suspected "C" link had hung up on guide tube; repaired by adding 2 or 3 links of chain - keeping C link within guide tube. As an incidental to this operation it was found that one source holder ~~guide~~ tube was bent - it was then removed from service; ~~by~~ placing sources into storage @ bottom of pool. On a removal the top of the tube was found to have been "peaned" over. no ready reason for this. Normal operation thereafter - but new shipment of Co60 on way so resolution of problem deferred until whole rack changed.

~~~1st of June~~ Customers informed out of service for ~10 days ~~to~~ around end of May, early June. ~1st of June sources removed from old rack & rack examined. All tubes found deformed as above - cause traced to deformity in J slot which allowed pin to ride up inside guide tube, allowing tops to hit upper plate.

Corrected by change in design of base - presently being prepared for submission to licensing. Incidental examination of slack chain bucket revealed that a guide trough had broken off & was in bottom of bucket. - Repaired.

Continued - back of next pg.

...of the Prog...
-Number of Indiv...
-Number of Indi...
-Potential for...
~~~

of the Program

-Number of individuals occupationally exposed 4.

-Number of individuals subject to significant* risk 4.

-Potential for external exposure

	Negligible	Slight	Moderate	High
Whole body				4
Skin				
Extremities				

-Potential for internal exposure ( ) negligible (✓) slight ( ) moderate ( ) high

-Effluents

	Negligible	Slight	Moderate	High
Airborne	✓			
Liquids				✓

-Unusual aspects

General

All records examined and all inquiries made by the inspector related to records and events made or experienced in the time interval from the date of the last inspection, or the date of license issuance in the case of initial inspections, until the date of this inspection, unless otherwise noted.

Unless otherwise specified, radiation level measurements, shown in these notes as having been made by the inspector, were made using a radiation survey meter type Gm, model E120G, calibrated OK by BNL.

The findings reported here were based on: (1) observations made by the inspector during his physical inspection of the licensee's facilities (2) a selective examination of procedures and representative records and documents, (3) information furnished by individuals interviewed and (4) Measurements made by the inspector.

*Reasonable probability of incurring 25% or more of MPC or MPE.

by illumination of underwater light and Cherenkov glow. When all

New source holder now in [illegible]
source holder.

On ~ 1 June, during source change shutdown, 5 tubes
could not be removed so old sources remained in them,
new sources left in — on Tues 6/11 new tool made
up for removal — one came out readily — sources fell
out — water monitor sounded. 1st two sources
ok & put into storage. 3rd obviously lighter &
shorter than ~~other~~ it should be — further
examination showed this was only upper ~12"
of ~ 18" of outer encapsulation shell. — When
pulled up this measured 400 mR/hr, immed lowered
same. Examined bottom of tool — after discussion
decided remainder of sources — no magnetic "foot"
on inner source hence could not recover same
c magnetic. Decided inner capsule had also failed.
made up s/s shield — pushed source into s/s
pipe — one end welded — upper end threaded — to
contain gross contamin. ~ 40 mR/hr. @ surface
of pool. Other end of outer encapsulation also included
c source by "sweeping" same into pipe. Same is
still in pool as of now.

Pool water is now ~ 5×10^{-4} uCi/ml. Filters were
reading ~ 400 mR/hr; being replaced routinely —
stored in shielded vault. Will be disposed of as rad
waste. Piping will be replaced when problem
known to be corrected.

lc → Reporting requirement, per L/C 13C overlooked —, will be sent
See report dated 7/3/74 — rec'd @ RO:I
7/8/74

copy attached
continued — back of pg 3

...ens of Nonco...
The licensee...
pliance and/...
attention d...
section bel...
prejudicia...

... of Noncompliance and Safety Found in the Last Inspection

The licensee's action to correct and prevent recurrence of items of noncompliance and/or safety, found in the last inspection, were given particular attention during this inspection. Unless these items are shown under the section below, entitled "Findings Indicating Noncompliance or Conditions Prejudicial to Health and Safety", the inspector found that the licensee's corrective and preventive action was adequate.

Findings Indicating Compliance

Annex A identifies the specific procedures followed by the inspector in determining compliance with each relevant section of Title 10. The inspector also made such inquiries, examined such records and made such observations as were necessary for him to determine that the licensee had complied with the requirements of each license condition.

When a section of Annex A is notated "N/I", this means that compliance with this section was not determined during this inspection. During the next inspection this area will be covered.

When a section of Annex A is notated "N/A", this means that it is readily apparent that the section is not applicable to the licensee's program (e.g. the requirements of 10 CFR 20.103 or 106 are not applicable if the licensee possesses only sealed sources).

The paragraphs in Annex A that are initialed by the inspector indicate how the inspector determined compliance.

Status of Previously Reported Unresolved Items

Additional Information Relating to Incidents Reported Since Last Inspection

Attached as Annex B, or referenced on identified pages of these notes.

Findings Indicating Noncompliance or Conditions Prejudicial to Health and Safety

Attached as Annex C, or referenced on identified pages of these notes.

Principals

Persons	Radionuclides	Locations of Use	Rate of Use

Source was up ~ 8 hrs out of 10 around the clock until new sources arrived. Present situation is ~ 1/3 of above because source is ~ 3X original.

Present loading is ~ 200,000 Ci., vs ~ 65,000 before source change. "new" source = 134,452 Ci, added to old array

Tube containing leaker was found to be hot in a[illegible]
only. No activity on other Tubes. Present situat[illegible]
is being closely watched - Bldg no longer
open to customers, visitors, etc - auth peop[illegible]
only.

Line of Authority (from user to Management)

D.E. O'Sullivan is only technician; all other ops by Stein or O'S.

Facilities

Use: ( ) Radiochemistry labs used exclusively for licensed material; ( ) Conventional labs used exclusively for licensed material; ( ) Conventional labs with shared use; ( ) Room or area used exclusively for preparation and application of licensed material, and storage; ( ) Mfg or processing areas designated for radiologic operations only; ( ) Entire building used exclusively for radiologic operations ( ) Other:

Storage:

( ) Ample space, ( ) Adequate lighting, ( ) Uncluttered, ( ) Shielding adequate
( ) Material identified
( ) Refrigerator, ( ) cabinet, ( ) fume hood, ( ) cave, ( ) separate room, ( ) separate building

Access Control:

( ) locked, ( ) posted and administratively controlled
( ) locked when unattended, ( ) custodial personnel instructed

Control Devices and Alarms: ( ) 20.203(c)(2), ( ) Other

Comments:

Equipment

Monitoring, portable: ( ) alpha, ( ) beta, (✓) gamma, ( ) neutron
( ) adequate no., ( ) accessible, ( ) calibrated, ( ) appropriate sensitivity

Monitoring, area: ( ) alpha, ( ) beta, (✓) gamma, ( ) air sampling, ( ) adequate no.
(✓) properly located, ( ) calibrated, ( ) tested, (✓) appropriate sensitivity.

...l Equipment:

( ) BZ samplers: ( ) adequate no., ( ) properly used, ( ) accessible ( ) fume hoods, ( ) glove boxes, ( ) hot cells-large, ( ) hot cells-small ( ) local exhaust ventilation, ( ) remote tongs, ( ) shields, ( ) protective handwear, ( ) protective footwear, ( ) protective clothing, ( ) absorbent paper, ( ) working trays, ( ) designated radioactive waste disposal sinks, ( ) respirators, ( ) eye wash fountains, ( ) DOP filter testing equipment, ( ) disposable pipettes, ( ) disposable syringes, ( ) Other:

Management Interview

The inspector(s) met with _____, _____ and _____ in _____'s office, on __________, at the conclusion of the inspection. The inspector(s) gave
date
_____ a Form AEC-591 indicating (that no items of) noncompliance had been found during the inspection.

- - - - - - - - - - - - - - - -

The inspector(s) met with _____, _____, and _____ in _____'s office, on __________, at the conclusion of the inspection. The inspector(s) informed
date
_____ that no items of noncompliance had been found during this inspection. He informed ____ that he would receive a letter enclosing a Form AEC-591 confirming these findings (Inspector: No Form AEC-591 may be issued if there were Outstanding Items reviewed during this inspection except, if our acknowledgement letter, written following the issuance of an AEC Form 592, predated July 1, 1971.)

No form AEC-591 was issued because Outstanding Items had been reviewed during this inspection.

- - - - - - - - - - - - - - - -

The inspector(s) met with _____, _____, and _____ in _____'s office, on __________, at the conclusion of the inspection. The inspector(s) explained the purpose of the inspection. With respect to the item(s) of noncompliance, the inspector(s) explained the relevant requirements of the AEC regulations and described the inspection findings that indicated noncompliance with these requirements. _____ acknowledged the validity of the citation(s) and stated that prompt action would be taken to correct them. He also described procedures whereby he would assure that these and similar item(s) of noncompliance would not recur. He signed and dated the Form AEC-591.

- - - - - - - - - - - - - - - -

The inspector(s) met with ____, A and B in A's office, on 6/26, at the conclusion of the inspection. The inspector(s) ex-
date

[illegible]

...ed the purpose of the inspection. With respect to the items of noncompliance, the inspector(s) explained the relevant requirements of the AEC regulations and/or the conditions of the license and described the inspection findings that indicated noncompliance with these requirements. A acknowledged the validity of the citations and stated that prompt action would be taken to correct them. He also described procedures whereby he would assure that these and similar items of noncompliance would not recur.

- - - - - - - - - - - - - - - - -

Other:

ANNEX A

1.0 10 CFR 20

1.1 20.101, "EXPOSURE OF INDIVIDUAL TO RADIATION IN RESTRICTED AREAS"

1.1.1 By examination of records of ( ) receipts, ( ) inventories, ( ) surveys, ( ) personnel dosimetry, and ( ) disposal transfers, and/or ( ) by questioning the RSO and/or ( ) these users _______ _______ ________, ( ) and by my physical inspection of the restricted areas, I IDENTIFIED those INDIVIDUALS WHOSE external EXPOSURES MIGHT reasonably be expected to EXCEED 25% OF THE LIMITS of 20.101(a).

1.1.1.1 I asked the RSO and/or the principal users HOW the EXPOSURES to these individuals had been EVALUATED and what magnitudes of exposure had been found.

1.1.2 I found that the licensee's METHODS of evaluating exposures was in each case APPROPRIATE to the type and energy of the radiation and the area of the individuals body that was at risk.

1.1.3 I found that the licensee's evaluations of exposures showed that NO INDIVIDUAL had been EXPOSED IN EXCESS of the limits of 20.101.

1.1.4 ______ stated that the licensee did not avail himself of the provisions of 10 CFR 20.101(b) and therefore NO FORMS AEC-4 WERE MAINTAINED.

1.1.5 ( ) I observed a CORRECTLY COMPLETED FORM AEC-4 for each individual whose quarterly whole body exposure exceeded 1.25 rems; or

( ) I identified approximately _____% of the individuals whose quarterly whole body exposure had exceeded 1.25 rems and examined each individual's Form AEC-4 and found each to b correctly completed.

1.2 20.103, "EXPOSURE OF INDIVIDUALS TO CONCENTRATIONS OF RADIOACTIVE MATERIAL IN RESTRICTED AREAS" N/A

1.2.1 By examination of records of ( ) receipts, ( ) inventories, ( ) surveys, ( ) personnel dosimetry, ( ) effluent monitoring, ( ) bioassay, and ( ) disposals/transfers, by questioning the RSO and these users ______ ______ _____, and by my physical inspection of the restricted areas, I IDENTIFIED those INDIVIDUALS WHOSE internal EXPOSURES MIGHT reasonably be expected to EXCEED 25% OF THE LIMITS of 20.103.

1.2.1.1 I asked the RSO and/or the principal users HOW the EXPOSURES to these individuals had been EVALUATED and what magnitude of exposure had been found.

1.2.2 I found that the licensee's METHODS of evaluating compliance with 20.103 was APPROPRIATE to the circumstances of exposure in each case.

1.2.3 I found that the licensee's evaluations of exposures showed that in NO instance had an INDIVIDUAL been EXPOSED IN EXCESS of the limits of 20.103.

1.3 20.104, "EXPOSURE OF MINORS" N/A

1.3.1 I determined by questioning ( ) the RSO, and/or ( ) _____, and/or ( ) examining Forms AEC-5 or their equivalents and/or ( ) observing individuals in the restricted areas that NO INDIVIDUALS under 18 years of age had been EXPOSED in the restricted areas, or

1.3.2 In the manner indicated above, I IDENTIFIED those INDIVIDUALS under 18 years of age who had been exposed in the restricted areas by questioning ( ) the RSO, ( ) the minors, ( ) the minor's supervisors. I determined the circumstances of exposure and the licensee's method of evaluating the minor's exposures. I determined that the METHOD OF EVALUATION had been ADEQUATE. I found that the evaluations showed that the exposures had NOT EXCEEDED 10% of the limits of 10 CFR 20.101(a).

1.4 20.105, "PERMISSIBLE LEVELS OF RADIATION IN UNRESTRICTED AREAS"

1.4.1 By questioning the RSO and/or the principal users, and ( ) by examining records of ( ) receipts, ( ) inventories, ( ) disposals/transfers, and ( ) surveys, and by a physical inspection of the restricted areas, I DETERMINED the TIMES AND CIRCUMSTANCES under WHICH the licensee's use and/or storage of materials would have resulted in the generation of exposure levels in the unrestricted area of a magnitude of WARRANTED CALCULATION OR MEASUREMENT to assure compliance with 20.105.

1.4.2 I questioned the RSO and/or the involved principal users to determine if these calculations or MEASUREMENTS had been MADE; HOW they had been MADE; and what CONCLUSIONS had been DRAWN. I found that adequate surveys had been made indicating that the levels of radiation in the unrestricted area had not exceeded the limits of 20.105.

1.4.3 I MEASURED THE EXPOSURE RATES IN THE UNRESTRICTED AREAS and found that at the time of inspection none exceeded the allowed levels.

Radiation monitoring survey done recently - no records

105?
101?

O'Sullivan said he will keep records in future; reminded him that this is a repeat item.

1.4.4 Following the procedures described in paragraph 1.4.1 above, I determined that there had been NO circumstances under which there was any REASONABLE PROBABILITY OF the levels HAVING EXCEEDED the limits of 20.105.

1.5 20.106, "CONCENTRATION IN EFFLUENTS TO UNRESTRICTED AREAS"

1.5.1 By questioning the RSO and these principal users _____ _____ _______, by examination of records of ( ) receipts, ( ) inventories, ( ) effluent monitoring, and ( ) surveys, ( ) and by observations made during my physical inspection of the restricted areas, I IDENTIFIED those OPERATIONS WHERE there was a REASONABLE PROBABILITY of generation OF CONCENTRATIONS of radioactive material in effluents to the unrestricted area.

1.5.2 I asked the RSO or the principal user to describe the evaluation that had been made to ASSURE that the CONCENTRATION of radioactive material in these effluents DID NOT EXCEED THE LIMITS of 20.106.

1.5.3 I determined that the licensee's ( ) calculations, ( ) location of samplers, ( ) collection methods, and ( ) assay methods were SUITABLE for EVALUATION of the concentrations of the types of radioactive material that were discharged (i.e. considering its identity, physical and chemical form, particle size, the presence of dust loading or moisture . . . etc). I noted that the licensee's evaluations showed compliance with 20.106.

1.5.4 Having assured myself, from the findings of previous AEC inspectors, that the licensee's procedures for calculating, sampling and assaying the samples were in accord with accepted practices I ONLY EXAMINED the RECORDS of his measured concentrations. I found that these showed him to be in compliance with 20.106.

1.5.5 Following the procedures described in paragraph 1.5.1 above, I determined that quantities and forms of the material, and the circumstances under which it was handled were such that THERE WAS NO SIGNIFICANT PROBABILITY OF VIOLATION OF THE SECTION.

1.6 20.201, "SURVEYS"

1.6.1 In the course of determining the licensee's status of compliance with all sections of Part 20, I found that ADEQUATE SURVEYS had been CONDUCTED

[illegible]

1.7 20.202, "PERSONNEL MONITORING"

1.7.1 As stated in paragraph 1.1.1 above, I identified those individuals whose external exposure might reasonably be expected to exceed 25% of the 20.101(a) limits. I ascertained that a FORM AEC-5 or its equivalent was maintained FOR EACH of these INDIVIDUALS.

23

1972 total - high - 160 mrem to O.S
'73 " 10 mrem to both OS + S
'74 " 0 " to both - [illegible]
5/19/74

1.7.1.1 I concurred in the licensee's evaluation that personnel monitoring was not required for any individual using material under this license.

1.7.1.2 _____ stated that each of these individuals had been INSTRUCTED TO WEAR his personnel DOSIMETER while he was in the restricted areas.

1.7.1.3 I noted that the licensee's written OPERATING PROCEDURES directed occupants of the restricted areas to wear their personnel dosimeters.

1.7.1.4 During my inspection of the restricted areas I OBSERVED that all individuals who I encountered, and who were required to wear PERSONNEL DOSIMETERS, were wearing them.

1.7.2 _______ identified those individuals under 18 YEARS OF AGE who entered the restricted areas. He DESCRIBED the PROCEDURES followed by each of these individuals and the duration of times spent in the restricted areas. I noted that for each individual whose exposures could reasonably be expected to EXCEED 5% of the LIMITS of 20.101(a) there was on file a Form AEC-5 or its equivalent.

1.7.3 ______ stated that NO individuals UNDER 18 YEARS OF AGE entered the restricted areas.

1.7.4 By questioning the following individuals ____, ____, and ____ who were responsible for controlling access to High Radiation Areas or who entered these areas, I determined that all INDIVIDUALS WHO ENTERED the HIGH RADIATION AREAS were PROVIDED with PERSONNEL MONITORING equipment.

1.7.5 _____ stated, and my findings verified the fact, that there were NO HIGH RADIATION AREAS under the licensee's control.

Pocket dosimeter was worn by man @ pool during [illegible] source ops. Not > 30 mrem in any one day.

June 9 73 - [illegible] 1 liter [illegible] = 3.([illegible]

(tank capacity ~~1551~~ 1912 gal) [illegible] total [illegible]

Nov 19, 1973 2.8×10^{-6} µCi/ml

Dec 19, '73 1.0×10^{-5} µCi/ml

Pool activity has been [illegible]
since event - From 4/11 - 7.0×10^{-4} to 6/26 - 4.2×10^{-4}

Meters calib semi ann - will be done qtrly. O'Sull

20.407 reports?