## UNIVERSITY OF CALIFORNIA, LOS ANGELES

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2557 BORLTER HALL SCHOOL OF ENGINEERING AND APPLIED SCHOOL LOS ANGELES, CALIFORNIA - 2024

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DONALD M. CARLSON U.S.N.R.C. PHYSICAL SECURITY LICENSING BRANCH SAFEGUARDS DIVISION OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS WASHINGTON, D.C. 20555

ADDRESSEE ONLY

FIRST CLASS EXPRESS MAIL

ENCLOSED PLEASE FIND A COPY OF 11/5/80 LETTER FROM RALPH SUAREZ OF PEAK TECHNOLOGIES AND HIS ATTACHED DESCRIPTIVE FLYERS ON INFRARED DETECTORS.

CHARLES ASHBAUGH 2567 BOELTER HALL NUCLEAR ENERGY LAB UCLA LOS ANGELES, CA 90024

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NUCLEAR ENERGY LABORATORY

IVAN CATTON. Director



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> 541 OLD COUNTY ROAD SAN CARLOS, CALIFORNIA 94070 (415) 595-3575

November 5, 1980

Mr. Charles E. Ashbaugh 2567 Boelter Hall Nuclear Energy Laboratory UCLA Los Angeles, CA 90024

. . . This is to follow-up Mr. Ashbaugh on my telecon with Mr. Neill Ostrander, in which we discussed your application. Although microwave could be utilized for your facility, it is my firm belief that you should utilize a combination of our infrared models IR-1330, IR-1335, and IR-1040, which will give you minimal problems and require less expertise in their installation.

Looking forward to your order, until then, . ..

Best Regards,

. A. Sumer

Ralph M. Suarez Vice President Marketing and Sales

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ALVANCE PRICE LIST

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INFRARED INTRUSION DETECT RU

- IR-1335 d5 rt. x 11 rt., single beam puttern. Chanplete with swivel mounting base. 1.V DC input. Powered by SPS-301 or SPS-201.
- IR-1040 125 ft. x 7 ft. 12V DC 10.put. Powerod by 280.00 SPS-301 or SPS-201.
- IR-31 30 11. x 45 11. Went housed. LLV 3C input. 250.00 Powered by SPS-301 or SPS-201.
- IR-41 #S (t. x 11 ft. vent housed. 1.7 DC chart. 255.00 Powered by SPS-301 or SFS-2.1
- IR-51 135 ft. x 12 ft. vent housed. 12V DC .nput. 180.00 Power Supply SPS-301 or SPS-201.
- MICROWAVE INTRUSION DETECTORS
- MA-1070 75 ft., wide angle pattern. 12V DC input. 280.00 Powered by SPS-301 or SPS-201.

## POWER SUPPLIES / ACCESSORIES

- SPS-301 12V DC power supply for any combination of 91.00 10 IR detectors & zone panel or two microwave units. Complete with 16V 20VA plug-in transformer.
- SPS-201 12V DC power supply for any combination of 78.00 5 IR detectors & zone panel or one microwave unit. Complete with plug-in transformer.
- 2N-6 Six zone annunciator for use with any combination of IR detectors. Powered by SPS-301 or SPS-201.
- IN-10 Ten zone remote annunciator panel for use 85.00 with any combination of IR detectors. Unique feature allows walk test lamps to be deactivated from panel. Independent of alarm relay. Powered by SPS-301.
- TR-2 16V AC 20VA Class II plug-in transformer. 7.50
- BA-1 Battery: scaled lead acid, 12V 2.5AH 49.00 (Replacement pack for SPS-301)





- Ease of installation
- Rugged, compact housing
- Handsome styling
- Wide angle coverage
- Multi-unit application
- Flush or surface mounting
- No shielded cable required

The IR-31 passive infrared intrusion detector features an advanced design using a new, high stability ceramic sensing element. The unit is powered by a 12 volt DC supply, model SPS-301, which will operate up to ten infrared detectors. The optical system has seven high resolution mirrors, giving five main beams covering 85 degrees, and two downward beams for coverage under the unit. An intruder will be detected within the pattern when crossing any one of the seven view zones. Range is 25 feet or more under typical conditions. The detector is completely passive, and emits no signals or light beams. Any number will operate without mutual interference.

The detector works by sensing the difference in temperature between a moving object and the background. As a moving intruder enters or leaves one of the seven zones, the ceramic sensing element responds to the sudden change in infrared energy in that zone, caused by the difference in temperature. An output signal from the sensing element is amplified and used to open a relay contact, thus sending in the alarm.

# APPLICATION

The IR-31 is a versatile detector suitable for a wide variety of applications, particularly multiple head installations. Each unit has a relay output and operates independently in the system. The detectors are compact, easily mounted, and blend with decor. The stability of the pattern and immunity to air turbulence make it an excellent choice for indoor protection of mercantile premises, offices, homes, and other high value areas. The unit fits into an existing wall and resembles an ordinary heating vent. The housing is held firmly in a rectangular cutout by means of two backing strips.



PASSIVE

**INFRA-RED** 

DETECTOR

Type IR 1330

## GENERAL

Model IR 1330 is a compact solidstate passive infra-red intruder detector. The seven facit optical system is computer designed for high precision and maximum performance

The rugged all metal casing is designed to complement the singlebeam IR 1040 and microwave MA-1070 intruder detectors.

The unit is resistant to high level radio frequency interference from L.F. to U.H.F.

# **TECHNICAL INFORMATION**

## APPLICATION

This completely passive unit is ideal for areas such as offices, shops, schools and domestic inicialiations.

The swivel head allows precise alignment of the fields of coverage.

The IR 1330 finds application in areas that may be unsuitable for other types of detectors such as microwave or ultrasonic.

Areas bounded by large glazed surfaces or lightweight partitioning materials may be effectively protected since there will be few penetration problems.





Model IR 1335 is a compact solidstate passive infra-red intruder detector.

system is computer designed for high precision and maximum performance.

The twin element pyro-electric sensor is designed to ignore signals produced by air turbulence in the region of the detector.

The unit is resistant to high level radio frequency interference from L.F. to U.H.F.

# **TECHINICAL INFORMATION**

## APPLICATION

This completely passive unit is ideal for corridor, perimeter and roof space protection in offices, factories, schools and warehouses, particularly where air conditioning systems are in operation.

The swivel head allows precise alignment of the field of coverage.

The IR 1335 finds applications in areas that may be unsuitable for other types of detectors such as microwave, ultrasonic or single element PIR units.

Areas bounded by large glazed surfaces or lightweight partitioning materials may be effectively protected since there will be few penetration problems.



# PÀSSIVE INFRA-RED DETECTOR MULTIBEAM

# Type IR1335



Model 18-1040 is a compact solidstate passive infraired intruder detector

The high performance advanced pyroelectric sensor and high accuracy optical system results in a single field of view with 100 ft, plus working range

# PASSIVE INFRA-RED DETECTOR UNIBEAM

Type IR-1040

The rugged all metal casing is designed to complement the multibeam IR-1330 and microwave MA-1070 intruder detectors.

The unit is resistant to high level radio frequency interference from L.F to U.H.F.

# **TECHNICAL INFORMATION**

#### AFPLICATION

This completely passive unit is ideal for corridor perimeter and roof space protection in offices factories schools and warehouses.

The tamper protected swivel head allows precise alignment of the single field of coverage

The IR-1040 finds application in areas that may be unsuitable for other types of detectors such as microwalle or ultrasonic

Areas bounded by large glazed surfaces or lightweight partitioning materials may be effectively protected since there will be few penetration problems.





The MA-1070 intrusion detector features a simplified design based on 12-volt DC operation. The un comes with universal mounting bracket, and is powered from an accessory power supply such as the Model SPS-301. Economy of operation is obtained and reliability is enhanced by use of the DC system. The unit will detect the movement of an intruder into a volume of space as shown by the pattern o back of page (approx. 75 by 48 by 20 feet, same as MA-6600).

The detector works by invisibly illuminating an area with microwaves in a floodlight type pattern. Each object in the pattern reflects some of the transmitted energy back to the detector. Waves reflected from a moving intruder are changed from the transmitted waves due to the *doppler effect*. This change is detected and used to open or close a relay contact, thus sending in the alarm.

# APPLICATION

The MA-1070 is a versatile detector, suitable for a wide variety of applications, particularly in multiple unit installations. It is compatible with other DC operated models in the Peak line, such as the MA-1070L and MA-1400, which can be powered from a common supply. The units are compact, light weight, easily installed, and blend well with decor. The stability of the pattern and immunity of air turbulence make it an excellent choice for indoor protection of mercantile premises, offices, homes and other high value areas. The very wide angle coverage provides good protection at the sides of the unit, for maximum security.

# CILITY-APPLICATION GUIDE

# . Intended as reference only. Use for consideration - not for absolute situations.

LIVIRONMENTAL & OTHER VARIABLES	ULTRASONIC	PASSIVE INFRARED	MICROWAVE
Vibration	Can balance to reduce.	Minimum	Can create problem.
Reduction of range by drapes, carpets.	Can change	None	None
Sensitivity to movement of overhead doors.	Careful placement	Minimum	Can create problem.
Effect of humidity change on range.	Can change	none	none
Water noise from faulty valves.	Can create problem	None	None
sitivity to small animals.	Problem if animals close.	Problem if animals close but can be aimed so beams are well above floor.	Problem if animals close.
Ultrasonic noise	Bells, hissing, some inaudible noises can cause problems.	None .	Nane
Heaters	Careful placement.	Minimum	Can cause problem.
Radio interference, AC line transients.	Can cause problem	Minimum	Can cause problem.
"Piping" of detec- tion field to unex- pected areas by AC	None	None	Can cause problem
Radar interference	Minimum	None	Can cause problem.
Effect of Temp. change on range.	Small change	Will change	None
A ement through thin walls or glass.	None	Nome	Careful placement

Page 1

#### TROUBLESHOOTING GUIDE Continued

#### Meter Test Procedure

1. Cover the front face of the detector with a 2" X 42" piece of 1/8 thick cardboard, held in place with a rubber band. (For single beam unit, use 35" sq. piece). See Fig 1.

2. Connuct a DC voltmeter to the unit as shown in Fig. 1. Insert the end of a paper clip in the red test jack for the positive (+) lead, and slightly loosen the cover retaining screw and clip the negative (-) lead to the screw head. Set the voltmeter to either a 1 or 3 volt DC range, or to the closest available range between.

3. Allow about 30 seconds for the reading to stabilize. (Do not touch the head while making the reading.) The meter will settle to a print approximately 3/10 volt positive.



4. Observe the reading for one minute. During this time the needle should not swing more than 2/10 volt either way from the stable point. Excessive swing means unit is defective and should be removed from switem and replaced with another unit.

#### Environmental Stability Check

5. Remove cardboard from front face, but leave meter connected as shown in Fig. 1.

6. Stay outside protection zones (remember the two downward zones) so you are not being seen by the detector.

7. Allow approximately 30 seconds for the unit to stabilize, then observe meter. The needle should not swing more than 1/4 volt above or below the stable point with no activity in the protected area. Should reading fluctuate more than  $\pm 1/4$  volt, then look for the following conditions:

a. Unit is viewing an Infrared source, such as: electric radiant heater elements, gas flame of space heater, lights on timers (flashing lights) direct or reflected sunlight, etc.

b. Unit is located in an airstream from a heater, air conditioner, or air return duct. (Use a tissue streamer taped to head to assist in determining this.)

c. Large objects are moving within the protective zones such as large banners, rotating signs, advertising materials, etc.

8. If any of the conditions in (7) above are found, re-aim or relocate unit as necessary to get stable reading on test meter.

For more information, refer to the installation guide.

page 2.

## PEAK TECHNOLOGIES, INC.

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# INFRARED INSTALLATION CHECK-OFF LIST

VEC	110	
		Dedicated 24 hour AC source.
		Fuse: check power supply fuse & detector fuse.
		Transformer 16 VAC - 20VA(BE14732001 or BE16V20, no substitute.)
		iswer supply - DC output isV with AC connected.**
		Power supply - DC output isV with AC disconnected after 4hr charge.
		Wire size is gage Xlong withno. of detectors.**See Char
		With IR front face covered stability voltage is ± 0. V. **
		Detector viewing: outside windows.
		Detector viewing infrared source: sun, electric lights, auto head lights, gas flame, heater, air conditioner coils, heater element.
		Detector viewing mirror or mirror surface which can reflect sunlight, or headlights directly back to detector front face.
		Detector viewing outside through cracks in wall.
		Detector viewing floor where small animals pass. (e.g. rat3, cats, dogs.)
		Detector viewing moving banners, rotating signs.
		Detector mounted upside down. (this requires shimming head for proper aiming.
		Detector mounted on vibrating wall.
		Detector within 5 feet of air draft: blower, large cracks or openings in the walls.
		Detector mounted directly over hot radiator, hot pipes, spot light, air conditioner.
		Measured on last detector DC voltage is**
		** REFERENCE: IR Installation Guide and IR Troubleshooting Guide.
		Installer's Name
		Date of Installation
		Place of Installation and Job No

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#### DETAILS

THE DOCUMENT IS NOT TO BE REPRODUCED WITHOUT SPECIFIC APPROVAL OF 12.Y

#### 1. Persons Contacted

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Dr. Ivan Catton, Director, Nuclear Energy Laboratory \*Dr. Neil C. Ostrander, Manager, Nuclear Energy Laboratory \*Mr. "Chuck" Ashbaugh, Security Officer, Nuclear Energy Laboratory Dr. Harold V. Brown, Environmental Health and Safety Officer Dr. John Everetts, Radiological Safety Officer Lt. G. J. Ares, UCLA Police Department Mr. Phil Arnold, Electrician, UCLA

\*Denotes those attending exit interview.

# 2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (50-142/77-02): Lack of tampersafing on some alarm lines. The inspector determined all alarm line junction boxes are now equipped with micro switches to detect tampering.

(Open) Noncompliance (50-142/77-02): Alarm sensitivity inadquate. The licensee stated in their letter of response to the previous inspection findings from Dr. Catton to Mr. Norderhaug, dated December 20, 1977, that, "An alarm sensitivity procedure is currently being formulated and will go into effect prior to January 20, 1978. The inspector determined that an alarm sensitivity procedure has not yet been prepared, and the alarm sensitivity although improved over the findings of the previous inspection, will still not detect an intruder prior to the intruder reaching the reactor (approximately fifteen feet).

(Open) Deviation (50-142/77-02): Vulnerability of reactor high bay locking mechanisms. The inspector determined through observation and testing of the locking devices that astricals and cylinder guard rings have been installed on all reactor high bay doors. It was noted by the inspector that the dead locking feature of two high bay door locks failed to operate. Records maintained by the Nuclear Energy Laboratory show that this malfunction was determined and reported to University maintenance for repair in February 1978 subsequent requests for repair were also made in May and July 1978. The locks are not yet repaired.

#### 3. Security Plan

The Security Plan for the UCLA Training Reactor Facility now consists of documents submitted by UCLA letters dated June 20, 1975, July 15, 1975, October 21, 1975, and April 1, 1976, excluding Appendix B to the letter dated April 1, 1976 (Appendix B

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contains background information which is not part of the security plan), May 26, 1976, June 9, 1976, and August 3, 1975. The foregoing documents are identified and approved as the licensee's security plan in a letter from NRR dated September 13, 1976.

The licensee has submitted to licensing, a new security plan dated January 20, 1977, and three amendments to the January 1977 security plan have also been submitted. The inspector determined that NRR has not yet approved in writing the new security plan or amendments.

The licensee has designated the reactor and the cooling system as essential equipment in their approved security plan. All fuel storage areas and the reactor high bay are designated and controlled as security areas. The reactor control room is under lesser security controls, and is the subject of a current dialogue between the licensee and NRR.

The radioactive storage room is described in the approved security plan as, "located below ground level so that all outside walls are backed by earth fill. The inside walls are two-foot-thick concrete block, and the two steel mesh doors provide the only access to the area. The inner door, #1, is backed by a steel plate and has two locks. One of the locks is keyed to "A" level, the Master level, and the other lock is a Sargent and Greenleaf combination padlock No. 8077A, which meets the specifications outlined in AEC Regulatory Guide 5.12. The outer door #2 is keyed to "A" level."

The inspector found the following conditions during a visual inspection of the radioactive storage room on October 31, 1978.

- a. The wall of the storage room adjacent to the stairwell is two foot thick from ground level to about eight feet. Above eight feet to the ceiling (estimated as sixteen feet by the inspector), it is approximately four inches thick standard plaster wall. The adjacent stairwell is protected by an ultrasonic intrusion alarm system.
- b. A two foot high by three foot wide area above the inner door into the radioactive storage room is constructed of an expanded metal grill covered with 1/2 inch pressed board with a total thickness of the wall slightly over a 1/2" thick.

The interior walls are to be redescribed in Amendment No. 4 to the licensee's security plan to be submitted to NRC November 30, 1978.

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c. The inner door into the radioactive storage room is a standard hollow metal door secured with a six pin tumbler, master keyed lockset and a standard duty hasp with a Sargent and Greenleaf combination padlock #8077A.

### 4. Protection of SNM

The inspector determined through interview of licensee employees that the licensee presently has in its possession 9.0 kg of Special Nuclear Material in the form of 93% enriched uranium (fuel plates, fuel scraps and uranyl nitrate) and two 32 gm Pu - Be neutron sources. The U-235 is located as follows: 3.6 kgs U-235 is in the reactor and 0.7 kg is in the radioactive storage pits, and 4.7 kgs is nonirradiated fuel stored in the radioactive storage room. The .7 kg of irradiated fuel in the storage pits is not self-protecting as defined by 10 CFR 73.6(b). The total non-exempt SNM presently located at the Nuclear Energy Laboratory is 5.4 kg.

On September 6, 1978, the licensee requested by letter to the Department of Energy (DOE), Washington, D.C., permission to ship the irradiated fuel plates (.7 kg) to the DOE reprocessing plant in Idaho. DOE is presently reviewing their request.

The licensee has not been asked by NRR (licensing) to provide the security stipulated in 10 CFR 73.50 or 10 CFR 73.60, nor is the licensee presently providing that level of security.

No items of noncompliance or deviations were identified.

#### 5. Access Control

The inspector examined the licensee's procedures and hardware used to control access to the Nuclear Energy Laboratory. The licensee is controlling access as indicated by the approved security plan except that the licensee has ten "A" level keys instead of seven as indicated in the approved security plan. NRR was notified by licensee letter dated March 10, 1978, that the number of "A" level keys had been increased to "no more than ten."

The licensee's new security plan, amendment three, submitted to NRR on March 10, 1978, Paragraph I,A, states that the reactor control room "becomes an 'A' level area (but non-alarmed) during non-working hours." The inspector determined this has not

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yet been implemented. The reactor control room is currently keyed for "B" level access both during working and non-working hours. The new security plan has be been approved in writing by NRR.

### 6. Alarm Systems

The licensee has installed a Kidde Model KD3 Ultrasonic Intrusion alarm system with sensors located in the reactor high bay, radioactive storage room and the stairwell adjacent to the radioactive storage room. The doors on the first and second floor of the stairwell are equipped with balanced magnetic switches. The double doors from the reactor high bay first floor to an alley outside the Engineering Building are secured with a self contained local alarm/dead bolt panic lock. The doors also have magnetic switches (not balanced) tied into the alarm system and annunciating at the campus police dispatchers office.

The inspector tested the licensee's alarm system in the reactor high-bay by having the licensee place the alarm system in a secure mode and establishing direct radio communication with the UCLA Police Alarm Station. The police alarm station was instructed to report incoming alarms for this test immediately. The inspector then entered the reactor high bay (room 1000), a security area. On the first test, the inspector entered the high bay on the second floor, at the control room door and walked (downstairs) to the first floor before the alarm activated. During the second test, the inspector entered at the second floor, control room door walked to the top of the reactor, walked to the crane electrical power box on the opposite side of the high-bay, and was on the second floor catwalk opposite the control room before an intrusion was signaled.

During the previous physical security inspection (50-142/77-02), conducted September 21-22, 1977, the licensee was cited when the inspector walked continuously within the reactor highbay both upstairs and downstairs without detection for nine minutes. The licensee stated in their letter to Region V, dated December 21, 1977, in response to that citation:

"The reactor high bay sensitivity problem (too many false alarms) was in the process of being solved at the time of the inspection. On September 22, 1977, during the Security Inspection, the alarm sensitivity was raised to a level such that the intrusion by the inspector was indicated on his third step into the security area. An alarm sensitivity procedure is currently being formulated and will go into effect prior to January 20, 1978."

Although the licensee corrected the sensitivity during the previous inspection, the licensee subsequently reduced the sensitivity because of a reoccurrence of false alarms. The inspector also determined through interview of licensee employees on October 31, 1978, that the licensee has not yet prepared or implemented an alarm sensitivity procedure as committed to in their letter to Region V, dated December 21, 1977.

During an examination of the alarm system, the inspector noted that the licensee has installed the alarm system so that an intruder would walk across the ultrasonic beam (least sensitive) rather than into/ away from the beam (most sensitive).

The sensitivity of the alarm system as determined through testing by the inspector during the current inspection is improved over the previous inspection, however, the licensee has not yet taken action to insure the sensitivity of the alarm system will promptly and accurately detect an intruder in the reactor high bay. The finding by the inspector that the licensee has not prepared a procedure, nor placed it in effect prior to January 20, 1978, represents a deviation.

# 7. Keys, Locks and Combinations

The inspector examined keys, locks and combinations and related equipment used to control access to security areas. The licensee is using astricals and cylinder rings on all entry doors into the reactor high bay. Within the reactor high bay, the controls for the overhead crane (necessary to gain access to the reactor core or fuel in storage pits) was secured with a Sargent and Greenleaf combination padlock #8077A.

The licensee is controlling the issue of keys to the Nuclear Energy Laboratory, and maintains records of key issue: An annual inventory of security keys is conducted by the NEL Security Officer. During the last inventory of keys, the Security Officer determined that a University employee had misplaced his "B" level NEL access key on March 15, 1978. On October 5, 1978, the licensee's security committee reviewed the question of the misplaced "B" level key and determined that a rekeying was not necessary. This action is consistent with the licensee's procedure "NEL Lock and Key System Guidelines," dated December 10, 1978.

The licensee in response to the previous inspection (50-142/77-02) by letter to Region V, dated December 21, 1977, stated, in part, in Paragraph B,1:

"Also, all latching mechanisms will be fixed by January 20, 1978, at which time a semi-annual complete lock check and preventative maintenance program will be initiated by the key shop. In addition, in order to ensure that all doors/latching mechanisms are in proper working order in the future, a monthly check on all doors will be made by the NEL Security Officer with any discrepancies taken care of immediately. This will begin after January 20, 1978."

The inspector determined by testing on October 31, 1978, that the dead locking feature of the reactor high-bay doors, that two of the doors did not deadlock when the doors were closed. The licensee (NEL) provided documentation that they had discovered the lock malfunction in February 1978 and had notified the University's Maintenance Department that the locks needed repair in February 1978, May 1978 and July 1978 and the locks have not yet been repaired.

The finding by the inspector that the licensee has not ensured that all doors/latching mechanisms are in proper working order, represents a deviation from the licensee's commitment to Region V.

#### 8. Communications

The inspector examined the licensee's facilities for internal communication and communication with the cognizant local law enforcement agency.

No items of noncompliance or deviations were identified.

#### 9. Surveillance

The inspector examined the licensee's practices and procedures for surveillance of security areas both during working hours and after normal working hours. The licensee's new security plan does not state what surveillance is provided during working hours, however, it states surveillance during non-working hours is provided by a security alarm annunciating at the UCLA Police Department.

The inspector determined through interview of licensee employees that surveillance of the fuel stored in the radioactive storage room is provided by the ultrasonic alarm system located in the room, and that the alarm only is put into access mode upon entry of an authorized individual into the room.

The reactor high-bay is placed in access mode each work day morning, and then returned to secure mode each evening. The placing of the high-bay alarm into access mode each work day is procedural and is not based on anticipated or scheduled activity within the high-bay security area. The normal work day assurance of integrity of the reactor high-bay security area is provided by the locked doors into the high-bay, and student and staff activities within the Nuclear Energy Laboratory.

No items of noncompliance or deviations were identified.

10. Procedures

The inspector determined the licensee has procedures for reacting to unauthorized intrusions into security areas, bomb threats and acts of civil disorder. The licensee has no procedures for security violations by authorized individuals.

No items of noncompliance or deviations were identified.

11. Security Program Review

The inspector examined the licensee's program for review of the NEL security activities and procedures.

No items of noncompliance or deviations were identified.

12. Protection Against Radiologica! Sabotage

The licensee's approved security plan describes controls on access to the reactor core, and except as noted elsewhere in this report the licensee has provided the controls committed to in the approved security plan. The licensee has not been asked by NRR to search persons prior to entry into security areas, nor is the licensee performing searches of personnel or packages prior to entry in security areas.

No items of noncompliance or deviations were identified.

## 13. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 31, 1978. The inspector summarized the scope and findings of the inspection. The licensee made no commitments as to corrective action proposed or planned for the deviations identified by the inspector.

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UNITED STATES ATOMIC ENERGY COMMISSION DIVISION OF NUCLEAR MATERIALS SAFEGUARDS DISTRICT III SAFEGUARDS OFFICE 2111 BANCROFT WAY BERKELEY, CALIFORNIA 94704

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REPORT OF THE INSPECTION OF SAFEGUARDS CONTROL OF NUCLEAR MATERIALS OF UNIVERSITY OF CALIFORNIA AT LOS ANGELES, CALIFORNIA

RIS: YEU

License Nos.: SNM-974 R-71	Docket Nos.: 70-223 50-142
Inspection No.: SO-III-16	
Inspection Date: January 14, 1971	
Report Date: January 25, 1971	
For the Period: July 1, 1966	To: January 14, 1971

Exhibit: I - Material Balance Statement, 7/1/66-1/14/71 :

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Vincent N. Rizzolo, Director District III Safeguards Office

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TELEPHONE . 841-5121

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## INSPECTION OF SPECIAL NUCLEAR MATERIALS SAFEGUARDS

UNIVERSITY OF CALIFORNIA AT LOS ANGELES, CALIFORNIA

INSPECTION NO. SO-III-16

#### A. INTRODUCTION

1.1

- The inspection was made on January 14, 1971, at the University of California Campus, Los Angeles (UCLA).
- UCLA has limited quantities of special nuclear materials for use in training and research. These quantities include, primarily, fuel for a research reactor, Pu/Be neutron sources, and alpha sources for instrument calibrations.

The University has an argonaut-type research reactor with an authorized power level up to 500 kilowatts thermal. The reactor itself is a heterogeneous, light water, graphite reflected type. The core, when fully loaded, consists of 24 fuel bundles contained in six water-filled aluminum boxes surrounded by graphite. Each fuel bundle is composed of 11 flat; aluminum clad, approximately 13.4% U/Al alloy fuel plates. The reactor operates at atmospheric pressure.

- UCLA has two licenses, SNM-974 and R-71, for special nuclear material.
- 4. In addition to these two licenses, UCLA has a State of California license, No. 1335-70, authorizing possession and use of source materials for research and educational activities.

#### B. SCOPE OF THE INSPECTION

- The University of California at Los Angeles is a Group V licensee exempt from the requirements in Section 70.22(b), Part 70, 10 CFR. This inspection, therefore, covered only the applicable requirements of Part 70 and the AEC licenses.
- 2. The inspection included the following:
  - a. Audit of the records, reports and source documents.
  - Review of the written material controls and accounting procedures.

Inspection No. SO-III-16

13.

c. Physical inventory of SNM which consisted of locating, identifying and recording all items on inventory.

d. Review of compliance with license requirements in regard to possession limits, use in authorized locations and for authorized uses.

# C. CATEGORIZATION

 The SNM inventory, consisting of both leased and privately owned materials, is grouped by license as follows:

		Grams	
<u>R-71</u>	U-235	Pu	<u>U-233</u>
Reactor fuel elements (U/A1, A1 clad plates) - approximately 93% U-235	3,500		
Pieces of U/Al fuel plates (cold)	19		
$UO_2(NO_3)_2.6H_2O$ in solution	250		
Pu/Be neutron source, @MRC-730		32	
SNM-974			
Pu/Be neutron source, ∉MRC-395		32	
Pu/Be neutron source, #MRC-908		. 32	
Four Pu plated alpha sources -		4	
as a set		۷۱	
One Pu plated alpha source		< 1	
Five Pu-239/Pu-238 alpha sources, \$54-58		<1	
$U-233$ as $U_{3}O_{8}$ - in solution			< 1
U-233 as five plated alpha sources, \$49-53			<1
U-235, 99.85% U, as standard	< 1		

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 The reactor fuel elements, including the three in the floor storage holes, were all located in the reactor facility in woelter Hall. The breakdown by fuel plates is as follows:

	No. of Elements	U-235 Grams
In-core	261	3,461
In storage holes (irradiated)	3	39
Fuel plate samples	•	19
		3.519

 The remaining inventory was located in the following locations:

	U-235	<u>U-233</u>	Pu
Reactor facility, Boelter Hall	250		64
Physics Dept., Knudsen Hall			32
Geophysics Dept., Geology Building	< 1	<1	
Chemistry Department		<1	∠1
Environmental Health & Safety Office			< 1
	250	<1	96

### D. SAMPLING PROCEDURES

- 1. No samples of the inventory were taken.
- 2. The inventory was verified by locating and accounting for all items comprising the SNM inventory. The quantities of the SNM items were accepted as described on available documentation. No weighings of inventory items were made since it was not meaningful for identification.

### E. SUMMARY OF FINDINGS

- The licensee was in conformance with all safeguards requirements of 10 CFR 70.
- The licensee's SNM inventories were within the authorized possession limits of its licenses, SNM-974 and R-71.
- 3. During the inspection period, the licensee reported materials unaccounted for (MUF) of approximately 187 grams uranium and 21 grams U-235 related to the disposition of inventories and termination of license SNM-693 about June, 1968. SNM-693 covered the operation of a subcritical assembly utilizing uranyl sulfate dissolved in  $D_2O$  at an enrichment of 9.97% as its fuel. The licensee advised that the fuel solution was contained in aluminum tubes which corroded and reacted with the uranyl sulfate causing some precipitation and tube leakage. The shipper-receiver difference following recovery processing of the fuel was reported as MUF. No further investigation was possible or considered necessary during the inspection.
- 4. Program weaknesses.
  - a. Records maintained by the Radiation Safety Office: (SS Representative), Office of Environmental Health and Safety (EH&S), were considered minimally adequate in view of the limited inventory. However, data in support of burn-up reported in past material status reports was not available in the EH&S Office. The health and safety monitor assigned to the reactor facility working with data provided by reactor personnel calculates burn-up and provides EH&S with a draft of the material status report (Form AEC-742) to be issued to the AEC. Except . as noted on each material status report, no record of periodic or cumulative burn-up was maintained by either the EH&S Office, the monitor, or reactor facility. However, an operating log was maintained in the reactor facility detailing the reactor operating time in terms of kilowatt/hours.

Although burn-up quantities were minimal, the licensee agreed to establish a permanent record within the EH&S Office to correlate the conversion of reactor operating times to burn-up reported and to record the cumulative burn-up. Inspection No. SO-III-16

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 Labeling of some of the individual inventory items was minimal. The licensee agreed to label those items as appropriate with adequate identification.

#### EXHIBIT I

## UNIVERSITY OF CALIFORNIA LOS ANGELES, CALIFORNIA

## INSPECTION NO. SO-III-16

RIS: YEU

### SPECIAL NUCLEAR MATERIAL MATERIAL BALANCE STATEMENT JULY 1, 1966 - JANUARY 14, 1971

UNIT: GRAMS

	Enriched Uranium			Plutonium		U-233		Pu-238	
	<u>u</u>	<u>U-235</u>	Pu	Pu-239 & 241	n	<u>U-233</u>	Pu	<u>Fu-238</u>	
Bégin. Inventory, 7/1/66	4,377	3,809	64	60	<1	<1	-	-	
Receipts	-		32	29	<1	~1	5.0	4.0	
				—					
Total to Account For	4,377	3,809	96	89	≦1	<1	5.0	4.0	
Shipments	133	11	-				5.0	4.0	
MUF (1)	187	21	-	-					
Burn-up (2)	9	8	-						
Ending Inventory, 1/14/71	4,048	3,769	96	89	<1	<1	-	-	
				-					
Total Accounted For	4,377	3,809	96	89	<u>&lt;1</u>	<u>&lt;1</u>	5.0	4.0	

 Material unaccounted for upon AEC recovery of subcritical assembly fuel (9.97% enriched uranyl sulfate dissolved in D<sub>2</sub>O).

(2) Burn-up in the uranium element includes correction for reporting error for periods prior to July 1, 1966.

U. S. NUCLEAR REGULATORY COMMISSION . OFFICE OF INSPECTION AND ENFORCEMENT

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	REGION V		
IE Inspectio	50-142/75-03 ) IE-V-62		50.142
deensee	University of California	Docket No	70-223
	at Los Angeles	License 1	R-71 (0. <u>SNM-974</u>
		Priority_	R-71/F-5
acility	Nuclear Energy Laboratory	Category_	SNM-974/4-5
ocation	Los Angeles, California		
Type of Fac	ilityAcademic Institution		
Type of Ins	pectionAnnounced		
Dates of In	spection May 20, 1975		
Dates of Pr	evious Inspection January 14, 1971		
Principal I	nspector 717.1.		diety
Accompanyin	V. Kobori, Auditor		6/17.17s
neccompany 20	B. L. Brock, Chemist		Date
	7. XI. Handel		6/17/75
	G. L. Hamada, Chemist/Statist	tician	Date
Other Accor	ppanying Personnel: None		
Reviewed b	71. Kalon		chety
. 10	N. Rizzolo, Chief, Materials & Plant Branch	Protection	Date

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IE-V-54 Copy No.

## 10 CFR 27:0 IN ONIMIUN

#### REPORT OF INSPECTION OF SAFEGUARDS CONTROL OF NUCLEAR MATERIALS AT

### UNIVERSITY OF CALIFORNIA LOS ANGELES, CALIFORNIA

#### (1E - V - 62)

#### A. INTRODUCTION

- The inspection was made on May 20, 1975 at the University of California, Los Angeles (UCLA).
- The inspection covered the status of safeguards controls as of the inspection dates.
- UCLA, a nonprofit educational institution, has limited quantities of special nuclear materials (SNM) for use in training and research. These quantities include primarily fuel for a research
- reactor, Pu-Be neutron sources, and alpha sources for instrument calibrations.

The University has an Argonaut-type research reactor with an authorized power level of up to 100 kilowatts (thermal). The reactor is a heterogeneous light water graphite reflected type which uses Materials Test Reactor (MTR) type uranium aluminum alloy fuel elements. Each element contains 11 aluminum clad U-Al alloy fuel plates. When loaded, the core contains 24 fuel elements which are distributed in six water filled aluminum boxes surrounded by graphite.

- 4. UCLA has two NRC licenses for SNM, R-71 and SNM-974.
- In addition to the NRC licenses, UCLA has a State of California License No. 1335-70, authorizing possession and use of SNM (in locations not licensed by NRC) and source materials for research and educational activities.

## B. SCOPE OF INSPECTION

 UCLA is designated a Group V license for safeguards purposes and is exempt from certain requirements of 10 CFR 70.51 and 70.58. This inspection therefore covered only the applicable requirements of Part 70 and the NRC licenses.

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- 2. The inspection included the following:
  - a. A review of the records, reports and source documents.
  - b. A review of the written material control procedures.
  - c. A physical inventory of SNM.
  - d. A determination of compliance with applicable requirements of 10 CFR 70, "Special Nuclear Material."
- C. SUMMARY OF FINDINGS

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- Determined that the licensee was in full compliance with applicable requirements of 10 CFR 70, "Special Nuclear Material."
- 2. Enforcement Action
- None.
- D. <u>LICENSEE ACTION ON PREVIOUSLY IDENTIFIED ENFORCEMENT ITEMS</u> Not applicable.
- E. UNUSUAL OCCURRENCES

None.

F. OTHER SIGNIFICANT FINDINGS

Current Findings

None.

Status of Previously Reported Unresolved Items

None.

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G. MANAGEMENT INTERVIEW

The results of the inspection were discussed with Mr. H. V. Brown, Director, Environmental Health and Safety, and Mr. J. Evraets, Radiological Safety Officer, at the conclusion of the inspection on May 20, 1975.

#### H. REPORT DETAILS

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1. Individuals Contacted

H. V. Brown, Director, Environmental Health and Safety (EHS)

- J. Evraets, Radiological Safety Officer, EHS
- J. Horner, Health Physicist
- C. E. Ashbaugh, III, Reactor Supervisor
- B. Reyes, Physicist

# 2. Physical Inventory of Special Nuclear Material (SNM)

The Argonaut Reactor is operated by the Nuclear Energy Laboratory which is under the direction of Dr. T. E. Hicks. The reactor is located in Boelter Hall, and Mr. C. E. Ashbaugh, III, Reactor Supervisor, serves as custodian.

The inventory held under License R-71 was as follows:

	Element (g)	Isotope (g)
Enriched Uranium		
In-Core (Irradiated) Storage Pit (Irradiated) Vault (Unirradiated)	3805 793 4909	3540 738 4571
Total	9507	8849
Plutonium	32	30

The inventory held under SNM-974 consisted of a single 32 gram Pu-Be neutron source.

#### 3. Inventory Verification

The unirradiated SNM was stored in the vault, and the serial numbers were verified on each of the 23 fuel elements and 11 separate fuel plates (each fuel element contains 11 fuel plates). The additional instrumented fuel element was accepted on the basis of its container label along with 11 containers of enriched uranium in various forms. The single 32 gram Pu-Be neutron source held under License R-71 was verified by its serial number along with the similar Pu-Be source held under state license.

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The reactor core of 24 fuel elements was accepted based on the core map. The storage pit was opened in part to confirm the high radiation levels of the fuel contained therein (two of the four in use storage locations were checked using a Telector gamma detector with a telescoping probe or a Juno Model 8 detector). One of the two remaining in use locations contained three fuel plates and the other contained a Co-60 source. These were also accepted on the basis of the record.

The 32 gram Pu-Be source held under License SN1-974 was removed from its howitzer and verified by piece count in that the holder retention material obscured the serial number.

No samples were taken to independently determine the SNM content of the items inventoried.

#### 4. Reactor Thermal Output

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The reactor is authorized to operate at up to 100 kilowatt hours thermal. The power level is checked annually through a heat balance determination. An additional check makes use of a reference ion chamber that is fixed relative to the core.

#### 5. Nuclear Material Depletion and Production

Revised burnup calculations since reactor startup indicate 16.69 grams U-235 burned through December 31, 1974 with 0.37 grams of the U-235 burnup occurring during the last six months reporting period (July 1, 1974 - December 31, 1974).

Although the burnup calculations consider U-236 production, Pu production and burnup is not calculated. If Pu production during a reporting period exceeds 10 grams, then the code requires that it be reported. Pu production per reporting period to date has been significantly less than 10 grams and is not expected to increase at the authorized power level.

#### 6. Internal Control

The licensee's procedures for internal control were minimal and were a part of the Radiation Safety Procedures. The need for a specific inventory procedure was emphasized during the closeout meeting. The licensee has indicated in the interim that such a procedure has been prepared and its existence facilitated location of 19 grams of U-235 previously reported as MUF loss (December 31, 1974 Material Status Report (MSR)) which will be reported as a MUF gain in the ensuing MSR.

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#### 7. Records and Reports

1. 1. 1.

The licensee maintains files of Forms AEC-741, "Nuclear Material Transaction Report," and Forms AEC-742, "Material Status Report," supplemented by inventory listings and user reports as his formal record. Although no ledger type records were maintained, the licensee's files of documentation were determined adequate for material control and accounting purposes.

'All Forms AEC-742 issued by the licensee were signed by the Vice Chancellor for Administration.

The University of California has satisfactorily complied with 10 CFR 70, Parts 70.51(b) and (c) with respect to records and procedures and Parts 70.52, 70.53a, and 70.54 with respect to reporting.

#### 8. Authorized Uses of SNM

UCLA holds two NRC licenses, R-71 and SNM-974 and a California State License No. 1335-70. The SNM inventory held under these licenses, all reported under reporting identification symbol (RIS) YEU, was as follows:

License R-71	Element (g)	<u>Isotope (g)</u>
Enriched Uranium Plutonium	9507 32	8849 30
License SNM-974		
Enriched Uranium Plutonium	-0- 32	-0- 30
Calif. License 1335-70		
Plutonium	32	29

The University of California was in compliance with 10 CFR 70.41, "Authorized Use of Special Nuclear Material," as of the inspection date.

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Nuclear Material Balances (May 20, 1975) RIS: YEU

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	Enriched	Uranium (g)	ton the	n 20% 11-225
Less than	20% U-235	<u>Grea</u>	cer tria	Isotone
Element	ISOLOPE	Lie	ienc	1000000
-0-	-0-	950	17	8349
	Pluto	nium (g)		
	Element	Isotope		
	96	89		

## UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION V

SUITE 202, WALNUT CREEK PLAZA 1990 N. CALIFORNIA BOULEVARD WALNUT CREEK, CALIFORNIA 94596

Docket No. 50-142

The Regents of the University of California Nuclear Energy Laboratory Los Angeles, California 90024

Attention Harold V. Brown Environment, Health and Safety Officer

Gentlemen:

. . . .....

This letter refers to the inspection of your activities authorized under NRC License No. R-71 conducted by Mr. M. D. Schuster of this office on May 20, 1975. It also refers to the discussion of our inspection findings held by the inspector with you and members of your staff on May 20, 1975.

The inspection included examination of activities related to physical protection against industrial sabotage and against theft of special nuclear material in accordance with applicable requirements of Title 10, Code of Federal Regulations, Part 73, "Physical Protection of Plants and Materials," your Security Plan, and license conditions pertaining to physical protection. Within these areas, the inspection consisted of selective examinations of procedures and records, interviews with facility personnel and observations by the inspector.

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix A. The item of noncompliance is categorized into the level as described in our correspondence to you dated December 31, 1974.

This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice,", Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office within 20 days of your receipt of this notice, a written statement of explanation in reply, including: (1) steps which have been or will be taken by you to correct the violation, and the results achieved; (2) steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved.

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The Regents of the University of California

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In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special nuclear materials and your facility security procedures are exempt from disclosure; therefore, the enclosure to this letter, the inspection report, and your response to the item listed in the enclosure to this letter will not be placed in the Public Document Room and will receive limited distribution.

- 2 -

Should you have any questions concerning this letter, we will be glad to discuss them with you.

Sincerely,

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R. H. Engelken Director

Enclosure: Appendix A - Notice of Violation
#### APPENUIX: A

Locket No. 50-142 License No. K-71

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#### NOTICE OF VIOLATION

Based on the results of the NRC inspection conducted on May 20, 1975, it appears that one of your activities was not in full compliance with applicable NRC regulations and conditions of your license, as indicated below.

10 CFR 73.4 requires, in part, that security plans submitted to the Condission for approval shall be followed by the licensee. Your Security Plan, dated August 21, 1974 as amended August 29, 1974 states "Level D keys are given to qualified individuals who have taken our health physics course, and who have passed the health physics and laboratory procedures test."

Contrary to 10 CFR 73.40 and your Security Plan a Level "B" key was issued to the UCLA Police Department without the required training or testing.

This infraction had the potential for causing or contributing to an occurrence related to health and safety.

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#### CLEAR REGULATORY COMMISSION

REGION V

SUITE 202, WALNUT CREEK PLAZA 1990 N. CALIFORNIA DOULEVARD WALNUT CREEK, CALIFORNIA 94596

#### May 29, 1975

NRC Public Document Room, HQ

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Enclosed is a copy of a document listed below relating to the University of California, Los Angeles (Dacket No. 50-142).

R. H. Engelken Director

Enclosure: Letter, NRC (Region V) to UCLA dated 5/29/75

cc w/enclosure: NSIC State of California

cc w/o enclosure: Central Mail & Files Unit Document Room Clerk

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H. D. Thornburg, Chief, Field Support and Enforcement Branch Office of Inspection and Enforcement, Headquarters

UNIVERSITY OF CALIFORNIA AT LOS ANGELES (UCLA) DOCKET NO. 50-142

Enclosed is the subject report of the physical security inspection conducted on May 20, 1975.

With exception of the one infraction described in the report, the licensee is in compliance with the Security Plan. However, you will note in the report that two significant items were identified during the inspection which decrease the effectiveness of physical protection. These were discussed with licensee management who stated that they would "look into" possible solutions. Meanwhile, I feel that the matter should be referred to Reactor Licensing who could request the licensee to revise the Security Plan to include correction of the problem areas.

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V. N. Rizzolo, Chief Materials and Plant Protection Branch

Enclosure: IE Inspection Report No. 50-142/7502 (IE-V-60)

cc w/encl. IE Chief, M&PP IE:HQ (4) SG RL IE Files NRC Central Files

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#### 10 CFR 2793 LIESCHARTIGH U. S. NUCLEAR REGULATORY COMMISSION OFFICE OF INSPECTION AND ENFORCEMENT

# REGION V

Licensee University of California at	Docket No	
Los Angeles	License No	0. <u>R-71</u>
5 86	Priority_	F
FacilityUCLA	Category_	5
LocationLos Angeles, Galifornia 90024		
Type of Facility Argonaut Training Reactor		
Type of Inspection <u>Announced Physical Security and M</u>	aterials	
Dates of Inspection May 20 1075		
Dates of Previous Inspection None		
Principal Inspector M. D. Schuster In For		lala.
Physical Protection Inspector		Date
Accompanying Inspectors		
		Date
		Date
Other Accompanying Personnel:		
nolla		4
Reviewed by V. N. Rizzolo, Chief		6/3/-3
Materials and Plant Protection Branch		Date
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#### SUMMARY OF FINDINGS

- I. Enforcement Action
  - A. Violations

None

B. Infractions

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Contrary to 10CFR73.40 and the licensee's security plan a level "B" key was issued to the UCLA Police Department without the required training in the health physics course and testing in health physics and laboratory procedures.

C. Deficiencies

None

II. Licensee Action on Previously Identified Matters

Not applicable

III. Design Changes

Not applicable

IV. Unusual Occurrences

On May 20, 1975 at 1343 hours the alarm for the radioactive storage area was received by the UCLA central station, without prior notification from the reactor supervisor. A police unit was dispatched and arrived at 1345 hours. Investigation revealed that the reactor supervisor, when exiting the radioactive storage area, had reset the alarm and had not notified the police department. This was observed by the inspector.

- V. Other Significant Findings
  - A. The Reactor High Bay Area is vulnerable to unauthorized access through the ventilation duct from either the third or eighth floors. This is not recognized in the Security Plan. (See Section VII, Paragraph C.3., Physical Barriers.)
  - B. The inspector determined that the Acoustic Alarm System in the Reactor High Bay Area can be defeated, thus permitting intrusion without detection. (See Section VII, Paragraph C.5., Alarms, Response and Surveillance.)

VI. Management Interview

Conducted on May 20, 1975 with Messrs:

Harold V. Brown, Environment, Health and Safety Officer C. E. Ashbaugh, Reactor Supervisor Jack Hornor, Resident Health Physicist

The findings of this inspection were discussed and there was no disagreement with the findings or with the item of noncompliance. Mr. Brown agreed to pursue possible solutions for the alarm system and additional protection for the ventilation duct.

- VII. Details
  - A. Scope

This inspection encompassed physical security and accountability of the training reactor located at the University of California at Los Angeles (UCLA) and evaluates compliance with the security plan of August 1974 approved by the Directorate of Licensing on January 8, 1975.

B. Individuals Contacted

Harold V. Brown, Environment, Health and Safety Officer C. E. Ashbaugh, Reactor Supervisor John C. Evraets, Radiation Safety Officer Lt. Jymes Carter, UCLA Police Department Jack Hornor, Resident Health Physicist

- C. Inspection Audit Program
  - 1. Physical Security Plan

The licensee possesses an approved security plan and no changes have been made in the plan which decreases its effectiveness.

2. Security Organization

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The security organization as described in the licensee's security plan was verified. The UCLA police department includes 55 sworn, uniformed and armed police officers with a minimum of 6 officers in radio-equipped cars on duty per shift. Twenty-four hour, 7-days a week coverage is provided the University and is responsive to the needs of the Reactor Supervisor.

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The training received (4 months plus 2 months on-thejob training) by members of this department complies with the California Police Officers Standards and Training course taught other major police departments within the State of California.

The licensee's security plan states "Level "B" keys are given to qualified individuals who have taken our health physics course, and who have passed the health physics and laboratory procedures test". One level "B" key was issued to the-UCLA police department without the required training or testing. This was identified as an infraction.

In addition to the UCLA police, response and back up is available from the West Los Angeles Police Department. A mutual aid agreement has been signed.

#### 3. Physical Barriers

The training reactor is located in Room 2567, a northsouth wing, connecting the Mathematical Sciences and Boelter Hall buildings. These buildings are centrally located within the UCLA campus.

The physical barriers, e.g., walls, floors, are as described in the licensee's security plan.

Overall physical barrier protection is deemed inadequate to prevent an act of sabotage. Figure 11 of the licensee's security plan delineates a ventilation duct. Inspection of that duct revealed the grill work, covering an opening approximately 3x4 feet, was secured by four 1/8" diameter screws. Examination of the grill work also revealed that it appeared it could be removed with a minimum of effort.

Two entrances to the unprotected ventilation duct are possible through the 3rd and 8th floors. The 3rd floor entrance is possible from the patio via the ventilation inspection room. Door construction and lock hardware are insufficient to prevent picking or rapping. The 8th floor entrance is possible from the roof through an adjoining building. The ventilation shaft on the roof was secured by a padlock insufficient to prevent picking or cutting.

#### 4. Access Controls

The licensee controls access by means of escorts, visitor's register, alarms and key control systems.

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All visitors are escorted within the protected and vital areas, and required to sign a visitor's register. All doors leading into and within the Nuclear Energy Laboratory are under a lock and key system comprised of three levels: A, B, and C. The degree of access permitted by those keys is shown in Figures 11 and 12 of the licensee's security plan. Level A keys are master keys and are given to only permanent, full-time employees. Level B keys are issued to qualified students, police department, secretary and custodian. Level C keys are issued to unqualified students for office space or use of the library. Key control records are maintained by the Reactor Supervisor and all keys were accounted for. No key inventories have been conducted.

The reactor high bay and the radioactive storage have been designated as security (vital) areas. The door to the reactor high bay can be opened only with an "A" level key. The door of the radioactive storage room can be opened only with an "A" level key and the combination to the Sargent and Greenleaf combination padlock. Only the Reactor Supervisor and the Health Physicist have both.

#### 5. Alarms, Response and Surveillance

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(See also Section IV, Unusual Occurrences.) The location and type of the alarm system described in the licensee's security was verified. The ultrasonic motion detector, model ICMC 132, manufactured by Walter Kidde and Company, Inc., Belleville, New Jersey, failed to clarm during the three tests conducted.' (Two tests were performed by the inspector and one test by the Reactor Supervisor.)

Simulating access through the ventilation duct, the inspector was able to reach the reactor and return to the ventilation duct without detection. The test was repeated by both the inspector and the Reactor Supervisor, with the same results.

In July 1971 a technical evaluation of this equipment (Kidde ICMC-132) was published by the Technical Branch, Division of Securicy, AEC. They concluded in part that:

a. Did not meet the requirements of AEC Manual Chapter Appendix 2401, Part III and

b. Interim Federal Specifications W-A-00450A (GSA-FSS).

c. Disapproved its use for AEC installations.

All alarms annunciate in the UCLA Dispatcher's Office (manned 24 hours a day).

Surveillance of essential equipment is performed during working hours by the permanent employees, level "A" key holders. Surveillance during nonworking hours is performed by a combination of the alarm system (considered inadequate) and the UCLA Police Department.

#### 6. Special Nuclear Material

Fuel for the Argonaut-type research reactor is in the form of aluminum clad  $\sim 93\%$  EU-Al alloy fuel plates assembled into MTR type fuel assemblies.

The inventory of special nuclear material is as follows:

	<u>U (G)</u>	<u>U-235 (G)</u>
Fuel - In Core	3,805	3,540
Irradiated - In Cooling Basin	793	738
Other unused materials	4,909	4,571
	9,507	8,849

In addition to the reactor fuel, the University also possesses two plutonium beryllium neutron sources in conjunction with the operation of the reactor. One source is licensed under the reactor license R-71; the other is licensed under SNM-974. The inventory was as follows:

	Plutonium (G)	Fissile Isotope (	G)
Pu-Be Sources	64	60	

The bulk of the unused materials noted above, 4,022g U and 3,745g U-235, consists of unused fuel assemblies on hand since 1971 (fabricated by Atomics International).

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UNITED STATES

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SUITE 202. WALNUT CREEK PLAZA 1990 N. CALIFORNIA BOULEVARD WALNUT CREEK, CALIFORNIA 94596

AUG 10 1970

The Regents of the University of California School of Engineering Los Angeles, California 90024

Docket No. 50-142

Attention: Russel O'Neil Dean of Engineering

Gentlemen:

This letter refers to the inspection of your activities authorized under NRC License No. R-71 conducted by M. D. Schuster of this office on July 29-30, 1976. It also refers to the discussion of our inspection findings held by the inspector with Mr. N. Ostrander and members of his staff on July 30, 1976.

The inspection included examination of activities related to physical protection against industrial sabotage in accordance with applicable requirements of Title 10, Code of Federal Regulations, Part 73, "Physical Protection of Plants and Materials," your Security Plan, and license conditions pertaining to physical protection. Within these areas, the inspection consisted of selective examinations of procedures and records, interviews with facility personnel and observations by the inspector.

Based on the results of this inspection, it appears that one of your activities was not conducted in full compliance with NRC requirements as set forth in the Notice of Violation, enclosed nerewith as Appendix A. The item of noncompliance is categorized into the level as described in our correspondence to you dated December 31, 1974.

This notice is sent to you pursuant to the provisions of Section 2.201 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office within 20 days of your receipt of this notice, a written statement of explanation in reply, including: (1) steps which have been or will be taken by you to correct the violation, and the results acnieved; (2) steps which will be taken to avoid further violations; and (3) the date when full compliance with be achieved.)

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special



University of California

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nuclear materials and your facility security procedures are exempt from disclosure; therefore, the enclosure to this letter, the inspection report, and your response to the item listed in the enclosure to this letter will not be placed in the Public Document Room and will receive limited distribution.

- 2 -

Should you have any questions concerning this letter, we will be glad to discuss them with you.

Sincerel,,

V. N. Rizzolo, Chief Safeguards Branch

Enclosures:

A. Notice of Violation

B. IE Inspection Report No. 50-142/76-01

cc w/enclosures:

H. V. Brown, Environment, Health and Safety Officer

#### APPENDIX A

University of California at Los Angeles Docket No. 50-142 License No. R-71

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#### NOTICE OF VIOLATION

10 00 2110

Based on the results of the NRC inspection conducted on July 29-30, 1976 it appears that one of your activities was not in full compliance with applicable NRC regulations and conditions of your license, as indicated below.

During a key inventory taken August 8, 1975 it was determined by the Laboratory Security Officer that one security related key was lost and one security related key was duplicated. It was determined July 30, 1976 that contrary to good security practices no corrective action had been taken.

This is a deficiency.

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U. S. NUCLEAR REGULATORY COMMISSION 10 CFR 2790 STOCHASTON

REGION V

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IE Inspec	cion Report No. 50-142/76-01 (IE-V	-140)	
Licensee	University of California at	Docket No.	50-142
	Los Angeles	License No	R-71
		Priority	F
		Group	2
Facility_		00000000	
Location_	Los Angeles, California 90022		
Type of F	acilityTraining/Research React	or	
Type of I	inspection Special, Unannounced, P	hysical Security	
.,,	the provide state of the state		
Dates of	Inspection July 29-30, 1975		
Dates of	Previous Inspection May 20, 1975		
			~
Principal	Inspector nº 9 Schurter		8-13-76
	M. D. Schuster, Physical	Protection Inspector	Date
Accompany	ving Inspectors None		
necospeny			Date
			Date
Other Acc	companying Personnel: None		
			11.1
Reviewed	V N Rizzolo, Chief, Safequard	Branch	Date
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#### 10 CFR 2790 UTION LINICIS

#### Summary of Findings

#### Enforcement Action

A. Violations

None

B. Infractions

None

C. Deficiencies

The licensee had determined through a key inventory that one key had been lost and that one key had been duplicated. No corrective action had been taken as a result of that inventory. (Details, paragraph 5)

D. Deviations

None

#### Licensee Action on Previously Identified Enforcement Items

Inspection Report 50-142/75-02 (May 20, 1975) reported one infraction pertaining to the lack of required training in the health physics course for members of the UCLA Police Department.

The licensee took corrective action in July 1975 and completed the necessary training for members of the Police Department. This was verified during this inspection through the licensee's training records.

#### Unusual Occurrences

None

#### Other Significant Findings

- A. Weaknesses and Vulnerabilities
  - 1. Essential Equipment

Essential equipment is not specifically identified in the security plan. (Details paragraph 3)

# 10 CER 2792 MEDDINGTON

2. Security Areas

The reactor control room is not considered a security area. (Details, paragraph 4)

3. Procedures

There are no provisions for corrective actions as a result of reviews, inspections or inventories. In addition, only limited information is available in the event of a bomb threat (Details, paragraph 7)

- 2 -

At the time of notification to licensees (February 1976), UCLA was considered a safeguards group 5, accordingly they were not notified.

#### Management Interview

The exit interview was held on July 30, 1976. Attendees were as follows:

#### UCLA

- N. Ostrander, Laboratory Manager
- J. Horner, Resident Health Physicist
- C. Ashbaugh, Laboratory Security Officer
- B. Taylor, Research Physicist

NRC Region V

M. Schuster, Physical Protection Inspector

#### Items Discussed/Scope of Inspection

The scope of the special inspection was reiterated to be an examination of the licensee's security program and equipment with emphasis on their capabilities to withstand an external attack and included the following areas:

#### Procedure No.

#### Subject

81705B	Physical	Protection		Security Plan
81710B	Physical	Protection		Essential Equipment
81715B	Physical	Protection	÷	Security Areas
817208	Physical	Protection		Security Systems

10 CFR 2790 IL FORMATICN

B. Assessment of Licensee's Response to NRC Request for Review and Augmentation of Security

#### 10 CFR 2790 INFORMATION

- 3 -

817258	Physical	Frotection	-	Security Organization
81730B	Physical	Protection		Access Control
81735B	Physical	Protection		Surveillance
81740B	Physical	Protection		Procedures
81745B	Physical	Protection		Security Program Review
81750B	Physical	Protection		Protection of SHM

The licensee was advised of the item of noncompliance and replied that prompt corrective action would be taken. The licensee indicated they would consider the security weaknesses for possible solutions. With respect to defining essential equipment the licensee indicated they would pursue that item with Licensing.

## 10 CFR 2799 HIS PALATION

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#### Details

#### 1. Time on Site

Arrived - 1000 hours, July 29. 1976 Departed - 1200 hours, July 30, 1976

Total manhours on site - 10

#### 2. Persons Contacted

- T. Zane, Reactor Supervisor
- N. Ostrander, Laboratory Manager
- J. Horner, Resident Health Physicist
- C. Ashbaugh, Laboratory Security Officer
- J. Carter, Lt. UCLA Police Department

#### 3. Essential Equipment

The licensee's new security plan (April 1, 1976) paragraph I.A contains a general description and refers the reader to the attached Appendices A and B for a further description. Essential equipment, if any, for this Argonaut reactor such as; the reactor, reactor coolant system; reactor controls, etc. have not been designated.

#### 4. Security Areas

The fuel storage area (radioactive storage room) and the reactor room (reactor high bay) are identified as security areas, access to which is controlled by an "A" level key.

The reactor control room is considered an operational area (as are the classrooms) rather than a security area. Access is controlled by the "B" level key.

#### 5. Security Systems

The licensee's security plan sets forth the controls and a description of the lock and key system. A review of the licensee's security log revealed that a key inventory was conducted on 8/18/75. The following was entered: "Leight lost "C" level key, Police Department made at least one extra "B" level key - marked it as B-14." As a result of that inventory the licensee had taken no action to correct the noted deficiencies. This was identified as an item of noncompliance.

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#### 6. Security Organization

The security organization and arrangements with LLEA are as described in the security plan. It was determined that 4 patrols (worst case) with one officer each could respond to an intrusion. In addition to the UCLA Police Department, the west Los Angeles Police Department would respond, with additional (number is unknown) patrols. Rapid radio communications are available between these two Police Departments.

#### 7. Procedures

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The licensee's security plan (April 1, 1976), page 8, paragraph E states "The security program will be reviewed and tested every twelve months by the Laboratory Security Officer. He will also conduct a key inventory on a semi-annual basis." No provisions for corrective action, if needed, as a result of those reviews and/or inventories have been included.

Bomb threat procedures provide that the laboratory would be secured and evacuated. That procedure does not contain guidance to the receiver of such calls to record all information, ask questions, listen for background noise, etc. Also there are no instructions as to actions to be taken for suspected items that may be an explosive device/suspected bomb or who will conduct searches.

### 10 CER 2.790 INCORMATION

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G. W. Roy, Chief, Field Coordination and Enforcement Branch, IE:HQ

UNIVERSITY OF CALIFORNIA AT LOS ANGELES DOCKET NO. 50-142

Enclosed is the report of the special physical security inspection conducted on July 29-30, 1976 for the above facility, as a result of that inspection one item of noncompliance and several security weaknesses were identified.

#### Security Weaknesses

- Essential equipment is not specifically identified in the Security 1. Plan. (See Report Details, paragraph 3)
- The reactor control room is considered an operational area rather 2. than a security area. Large plate glass windows, 1/8 inch in thickness, separate the control room from the reactor. (See Report Details, paragraph 4)
- There is need to improve the procedures pertaining to corrective 3. action resulting from inspections and inventories and to add additional information for bomb threats.

#### Vulnerabilities

We must conclude that UCLA, a non-power reactor licensee, is vulnerable to the three man threat, militarily trained, armed with semi-automatic times : 10/1 / 22 weapons and an insider's knowledge of the facility. With the exception of the materials storage area there are no door alarms. The present alarm system is concentrated in the reactor high bay. It would be possible to force any of the many doors leading and adjacent to the reactor, and then under cover of that room enter the reactor area. Once inside the reactor room, even though an alarm would sound, it is estimated that there would be sufficient time to complete a successful act of sabotage and depart by a different door into a multiple array of hallways to avoid apprehension.

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V. N. Kizzolo, Chief.

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 Letter to UQLA W/Notice of	Violation and	IE:V/mos	Re	
 It Inspection Report No.	50-142/76-01	Schaster: smg	Rizzolo	
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Letter sent to Accessions Unit, HQ, for: PDR, NSIC, TIC Central Files (w/enclosures & memu)

Letter distributed by IE:V:

Cy of ltr w/Appendix A: Engelken, Johnson

Sent w/enclosures to: W. Martin, IE:I W. Kenna, IE:II J. Hind, IE:III

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Dec 6, 1977

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UNITED STATES NUCLEAR REGULATORY COMMISSION REGION V

SUITE 202. WALNUT CREEK PLAZA 1950 N. CALIFORNIA BOULEVARD WALNUT CREEK, CALIFORNIA 94505

#### 007 1 9 1977

Docket No. 50-142

The Regents of the University of California School of Engineering Los Angeles, California 90024

Attention: Russel O'Neil, Dean of Engineering

Gentlemen:

Subject: NRC Inspection of Nuclear Energy Laboratory

This letter refers to the inspection of your activities authorized under NRC License No. R-71 conducted by Messrs. W. P. Mortensen and R. Blackman on September 21-22, 1977. It also refers to the discussion of our inspection findings held by the inspectors with Mr. I. Catton and members of his staff on September 22, 1977.

The inspection included examination of activities related to physical protection Against industrial sabotage and against theft of special nuclear material in accordance with applicable requirements of Title 10. Code of Federal Regulations, Part 73, "Physical Protection of Plants and Haterials," your Security Plan, and license conditions pertaining to physical protection as described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and records, interviews with facility personnel and observations by the inspectors.

Based on the results of this inspection, it appears that certain of your activities were not conducted in full compliance with NRC requirements, as set forth in the Notice of Violation, enclosed herewith as Appendix -. The items of noncompliance are categorized into the level as described in our correspondence to you dated December 31, 1974.

This notice is sent to you pursuant to the provisions of Section 2.201, of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations. Section 2.201 requires you to submit to this office,

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#### The Regents of the University of California -2-

within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved.

During this inspection it was also found that one of your activities appeared to deviate from the generally accepted practices in the industry as set forth in the Notice of Deviation, enclosed herewith as Appendix B. In your reply please include your comments concerning this item, a description of any steps that have been or will be taken to prevent recurrence, and the date all corrective actions or preventive measures were or will be completed.

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special nuclear materials and your facility security procedures are exempt from disclosure; therefore, Appendices A and B to this letter, the inspection report, and your response to the items listed in the appendices will not be placed in the Public Document Room and will receive limited distribution.

Should you have any questions concerning this letter, we will be glad to discuss them with you.

Sincerely,

LeRoy R. Norderhaug, Acting Chief Safeguards Branch

Enclosures:

- 1. Appendix A Notice of Violation
- 2. Appendix B Notice of Deviation
- 3. Inspection Report No. 50-142/77-02

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APPENDIX A

University of California at Los Angeles School of Engineering Los Angeles, California 90024

Docket 50-142 License No. R-71

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#### NOTICE OF VIOLATION

Based on the results of the NRC inspection conducted on September 21-22, 1977, it appears that certain of your activities were not in full compliance with applicable NRC regulations and conditions of your license as indicated below. These items are catagorized as infractions.

 The licensee's approved security plan (part 1, paragraph C2) states in part "The alarm system registers a security violation. A signal lis sent along an isolated tamper proof telephone line to the 24 nour manned honeywell Alarm Receiver W840B.D located at the UCLA Police Station."

Contrary to the above, the inspector found on September 22, 1977 through interviews with licensee personnel and through observations by the inspector that alarm lines associated to the security systems for the Nuclear Energy Laboratory are not isolated tamper proof lines and appear in regular telephone junction boxes and frames. In such boxes and frames the alarm lines are marked by red rubber caps. The inspector observed several junction boxes without tamper indicating devices.

 The licensee's approved security plan (part II, paragraph C2) states in part "During non-working hours, the lock and key system and the alarm system provide the surveillance of the security areas."

Math State Control

Contrary to the above, the inspector demonstrated on September 22, 1977, the alarm system was not providing non-working hour surveillance. The demonstration consisted of the inspector walking continuously in the reactor high bay, with the system in the secure mode, and the intrusion alarm failing to indicate an intrusion.

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REPORT

#### APPENDIX B

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University of California at Los Angeles School of Engineering Los Angeles, California 90024

Docket 50-142 License No. R-71

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#### NOTICE OF DEVIATION

Based on the results of an NRC inspection conducted during the period September 21-22, 1977, it appears that one of your activities deviated from generally accepted practices in the industry as indicated in the following notice.

 Regulatory Guide 5.12 states in part "Key locks...on doors or gates to material access areas in protected and vital area perimeters and for access to vital equipment should provide a high degree of resistance to opening by force or tamper techniques."

U.S.N.R.C. Office of Inspection and Enforcement Circular 77-04 states in part "Door locks must be of substantial construction that their neutralization or circumvention by common burglary techniques is precluded."

Contrary to the above, the inspector demonstrated on September 21. 1977 to the licensee that a reactor high bay door, could be opened using a snove knife technique. The door thereby weakened the security provided by the cubstantial barrier wall.

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10 CH 9750 INFORMATION

#### U. S. NUCLEAR REGULATORY COMMISSION OFFICE OF INSPECTION AND ENFORCEMENT

#### REGION V

Report No. 50-142/77-02	
Docket No. 50-142 License No. R-71	Safeguards Group <u>11</u>
Licensee: The Regents of the University of California	
School of Engineering	
Los Angeles, California 90024	
Facility Name: Nuclear Engergy Laboratory	
Inspection at: University of California at Los Angeles	
Inspection conducted: September 21-22, 1977	
Inspectors: LOnune Physical Protection Inspector	Date Signed
	Date Signed
1000 01 -	Date Signed
Approved by: L. H. Horderhoug, Acting Chief, Safeguards Bra	anch Date Signed

Summary:

Unannounced Inspection on September 21-22, 1977 (Report No. 50-142/77-02 Areas Inspected: Followup on previously identified items of noncompliance, essential equipment, security areas, security systems, organization, access control, surveillance and procedures. The inspection was started during regular working hours and involved 8 hours onsite by one NRC inspector. The inspector was accompanied by a representative of The Office of Inspection and Enforcement, Headquarters, U.S.N.R.C., who conducted a program review.

Results: Of the eight areas inspected, two items of noncompliance were identified in two areas. The areas of noncompliance were security systems (para. 5) and surveillance (para. 8). One deviation was identified in paragraph 5.

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10 CEB 2790 INFORMATION

#### DETAILS

1. Persons Contacted

\*Dr. Ivan Catton, Director, Nuclear Energy Laboratory Dr. Neil C. Ostrander, Manager, Nuclear Energy Laboratory \*Mr. "Chuck" Ashbaugn, Security Officer, Nuclear Energy Laboratory Lt. Jim Kuhen, UCLA Police Department Mr. Bud Ennis, Supervising Locksmith UCLA Mr. Phil Arnold, Electrician, UCLA

\*denotes those attending exit interview

2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (142/76-01): Failure to take corrective action when keys to security locks were lost and duplicated without authorization. The inspector found that written procedures now exist and approved key control practices are being followed to insure key system integrity.

3. Essential Equipment

The licensee has designated the reactor controls, the reactor and the cooling system as essential equipment.

No items of noncompliance or deviations were identified.

Security Areas

The inspector examined the security barriers as they existed September 21, 1977 and found them to be as described in the licensee's security plan dated January 20, 1977 as revised May 13, 1977 and August 24, 1977.

No items of noncompliance or deviations were identified.

5. Security Systems

Store 7 8

A. The inspector tested the dead locking feature of the Russwin Mortise latches installed on doors providing access to and within the Nuclear Energy Laboratory. In several of the locks it was noted the dead locking feature failed to operate. The inspector demonstrated to licensee staff that the door from classroom 2000 into the reactor high bay, keyed to operate from "A" level key, could be opened using a small screwdriver as a shove knife.

10 CER 2790 INEORMATION

10 CHR 2790 INFORMATION

Regulatory Guide 5.12 and The Office of Inspection and Enforcement Circular 77-04 indicate the accepted industrial practice of maintaining locking devices so that their circumvention by common burglary techniques is precluded.

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These findings represent a deviation.

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The licensee has installed a <u>Kidde Model KD 3</u> Ultrasonic Intrusion Alarm. Through interview of the licensee's employees and direct observation, the inspector determined that the telephone lines transmitting signals from the alarm system in the Nuclear Energy Laboratory to the UCLA Police Department passed through regular telephone junction boxes and frames. In the junction boxes and frames, the alarm lines are identified by red rubber caps on the terminals. The inspector also observed that junction boxes through which the alarm system lines traveled were not equipped with tamper indicating devices. Neither line supervision nor "fail-safe" alarm circuitry is incorporated to detect tampering or a break in the line.

The licensee's approved security plan states "The alarm system registers a security violation. A signal is sent along an isolated tamper proof telephone line'to the 24 hour manner Hore well Alarm Receiver [NS40 B.D.] located at the UCLA Police Station."

These findings represent an item of noncompliance.

#### 6. Organization

The inspector reviewed the licensee's security organization and the relationship with local law enforcement authorities on September 22, 1977, and found it to be as described in the security plan.

No items of noncompliance or deviations were identified.

7. Access Control

The inspector examined key control procedures and personnel access to the security areas.

No items of noncompliance or deviations were identified.

8. Surveillance

The licensee's approved security plan (part II, paragraph C2) states "That during non-working hours, the lock and key system and the alarm system provide the surveillance of security areas." Part 1, paragraph B of the security plan states "Security Areas

- 3 -

require A level access or higher. These areas, the reactor room (1000) and the radio active storage room (within room 1540), are identified in figures 6 through 8."

The inspector tested the licensee's alarm system by having the licensee place the alarm system in a secure mode and establishing direct radio communication with the UCLA Police Alarm Station. The police alarm station was instructed to report incoming alarms for this test immediately. The inspector then entered the reactor high bay (room 1000), a security area. The inspector walked continuously within the reactor room both upstairs and downstairs around the reactor without detection by the intrusion detector system. After approximately nine minutes while the inspector was touching the alarm control panel within the security area, the system indicated an alarm. Through interview of licensee staff, the inspector determined the alarm sensitivity had been decreased because of false alarms caused by wind drafts. The licensee increased the sensitivity of the alarm system and it was reteated in the same manner by the inspector. With the increased sensitivity, the alarm system indicated intrusion by the inspector on the third step within the security area.

These findings represent an item of noncompliance.

9. Procedures

The inspector reviewed the licensee's procedures for response to detected unauthorized intrusions, security violations by authorized personnel, bomb threats, acts of civil disorder, security program review and key control.

No items of noncompliance or deviations were identified.

10. Exit Interview

The inspector met with licensee representatives (denoted in paragraph 1) at the conclusion of the inspection on September 22, 1977. The inspector summerized the scope and findings of the inspection. The licensee representatives made the following remarks in response to certain of the items discussed by the inspector:

Stated the discription of the alarm system transmission wires Thad been given to them by their installation personnel and they would check into it. (paragraph 5)

Acknowledged the problems with the dead latching feature of their locks and stating their locksmiths have been instructed to alleviate the problem. (paragraph 5)

Stated they would adjust the alarm system to a performance standard and inform NRC of that standard, and/or procedures to assure a constant effective level of sensitivity in the security intrusion alarm system. (paragraph 8)

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	INSPEC	TION FINDINGS AND L	ICENSEE ACKNOWLED	GMENT
Un Lo	censee niversity of California, os Angeles, CA 90024	, Los Aggeles	U.S Nuclear Re Office of Insp 1990 N. Calif. Walnut Creek,	egulatory Commission Dection & Enforcement Blvd., Suite 202 CA 94596
3 00	CKET NUMBER(S)	4. LICENSE NUMBER	*(\$)	. DATE OF INSPECTION
		SNM-974		Sept. 27, 1977
Comm senial	SPECTION FINDINGS inspection was an examination of the mission's rules and regulations and the tive records, interviews with personnel.	activities conducted under y conditions of your license. T and observations by the inspe	our license as they relate to he inspection consisted of sel ector. The findings as a result	radiation safety and to compliance with the ective examinations of procedures and repre of this inspection are as follows:
X	No items of noncompliance or u	insafe conditions were for	und.	
The	following items of noncompliance	e related to records, signs,	and labels were found:	
	A. Rooms or areas were not pro	perly posted to indicate t	he presence of a RADIAT	TON AREA. 10 CFR 20.203(b) or 34 42
	B. Rooms or areas were not pro 10 CFR 20.203(c) (1) or 34.	perly posted to indicate to 42	he presence of a HIGH R	ADIATION AREA.
	C. Rooms or areas were not pro 10 CFR 20.203(d)	perly posted to indicate th	he presence of an AIRBO	RNE RADIOACTIVITY AREA.
	D. Rooms or areas were not pro	perly posted to indicate th	he presence of RADIOAC	TIVE MATERIAL. 10 CFR 20.203(e)
	E. Containers were not properly 10 CFR 20.203(f) (1) or (f) (	labeled to indicate the pr 2)	resence of RADIOACTIV	E MATERIAL
	F. A current copy of 10 CFR 20 made available, 10 CFR 20.2	0, a copy of the license, or 06(b)	r a copy of the operating	procedures was not properly posted or
	G. FormNRC-3 was not properl	y posted. 10 CFR 20.206	(c)	지수는 이번에 관계적
	H. Records of the radiation expe	osure of individuals were r	not properly maintained.	10 CFR 20.401(a) or 34.33(b)
	I. Records of surveys or dispose	ils were not properly mair	ntained. 10 CFR 20.401(t	b) or 34.43(d)
	J. Records of receipt, transfer, o 10 CFR 30.51, 40.61 or 70.5	disposal, export or invento 1	ory of licensed material w	ere not properly maintained.
	K. Records of leak tests were no	t maintained as prescribed	d in your license, or 10 Cl	FR 34.25(c)
	L. Records of inventories were r	not maintained. 10 CFR 3	4.26	비행이 가지 않는 것을 물었다.
	M. Utilization logs were not mai	ntained. 10 CFR 34.27		
	N. Records of radiation survey i	nstrument calibration wer	e not maintained. 10 CFI	R 34.24
	O. Records of teletherapy electr	ical interlock tests were n	ot maintained as prescribe	ed in your license.
	P. Other			
		Fence	R Zundin	she
7. Th no	he NRC Inspector has explained oncompliance will be corrected	I and I understand the i within the next 30 days	tems of honcompliance	listed above. The items of
	(Date)		(License Providence)	Title - Barris

(Licensee Representative - Title or Position)

ORIGINAL TO LICENSEE

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NUCLEAR REGULATORY COMMISSION

REGION V

SUITE 202. WALNUT CRIEK PLAZZ 1990 N. CALIFORNIA BUTLEVARD WALNUT CREEK, CALIFORNIA 94590

#### DEC 18 1978

Docket No. 50-142

Called Norderhang 1-3-79 moned response date bock. 10 days to Jan 20. 11 C. Ostrander

The Regents of the University of California School of Engineering Los Angeles, California 90024

Attention: Russell O'Neil Dean of Engineering

Gentlemen:

This letter refers to the inspection of your activities authorized under NRC License No. R-71 conducted by Mr. W. P. Mortensen of this office on October 30-31, 1978. It also refers to the discussion of our inspection findings held by the inspector with Mr. M. Ostrandar and members of his staff on October 31, 1978.

The inspection included examination of activities related to physical protection against industrial sabotage and against theft of special nuclear material in accordance with applicable requirements of Title 10. Code of Federal Regulations, Part 73. "Physical Protection of Plants and Materials," your Security Plan, and license conditions pertaining to physical protection as described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedure; and records, interviews with facility personnel and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were identified.

/ During this inspection it was found that certain of your activities appeared to deviate from your internal security procedures, and/or commitments you made to this office in your letter dated December 21, 1977, as set forth in the Notice of Deviation, enclosed herewith as Appendix A. Please rep'y within twenty (20) days of your receipt of

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Ericines ing Deans Office

Received 12-29-78, N.C. Ostrander

University of California

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this notice and comment concerning these items. Include a description of any steps that have been or will be taken to prevent recurrence, and the date all corrective actions or preventive measures were or will be completed.

In accordance with Section 2.790(d) of the NNC's "Rules of Practice." Part 2. Title 10. Code of Federal Regulations, documentation of fingings of your control and accounting procedures for safeguarding special nuclear materials are exempt from disclosure; therefore, the enclosure to this letter, the inspection report, and your response to the iters listed in the enclosure to this letter will not be placed in the Public Document Room and will receive limited distribution.

Should you have any questions concerning this letter, we will be also to discuss them with you.

Sincerelv. derhaug Safequards Branch

Enclosures: 1. Appendix A - Notice of Deviation 2. IE Inspection Report No. 50-142/78-03 (IE-V-264)

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#### APPENDIX A

The Regents of the University of California School of Engineering Los Angeles, California

Docket No. 50-142 License No. R-71

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#### Notice of Deviation

Based on the results of the NRC inspection conducted on October 30-31, 1978, it appears that certain of your activities appeared to deviate from your internal security procedures or your commitment contained in your letter to Region V, USNRC, dated December 21, 1977, as indicated below.

 The licensee stated in their letter to Region V, USNRC, dated December 21, 1977, Paragraph A.2, "An alarm sensitivity procedure is currently being formulated and will go into effect prior to January 20, 1978."

The inspector determined through interview of licensee personnel on October 31, 1978, that the licensee has not yet prepared or implemented an alarm sensitivity procedure.

2. The licensee stated in their letter to Region V, USMRC, dated December 21, 1977, Paragraph B.1, "In addition, to ensure that all doors/latching mechanisms are in proper working order in the future, a monthly check on all doors will be made by the NEL Security Officer with any discrepancies taken care of immediately."

Contrary to the above, the inspector determined through testing of the doors to the reactor high bay security area that the dead locking feature on two doors failed to operate. The inspector reviewed records in the NEL showing that the maintenance on the malfunctioning locks had been requested in February, May and July 1978. At the time of the inspection, the locks had not yet been repaired.

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The information on this page is considered to be exprepriate for public disclosure pursuant to 10 CFR 2.795.

U. S. NUCLEAR RECULATORY CONMISSION OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 50-142/78-03 (IE-V-264)

Docket No. 50-142 License No. R-71 Safeguards Group 2 Licensee: University of California at Los Angeles

Los Angeles, California

Facility Name: UCLA Research Reactor

Inspection at: UCLA Campus (Argonaut - 100PW)

Inspection Conducted: October 30-31, 1978

Inspectors: I Carton December 12/18/78

Date Signed 12/18/78 Approved By: Norderhaug, Chief, Satenuards Branch

Summary:

# Inspection on October 30-31, 1978 (Report No. 50-142/78-03)

Areas Inspected: Routine, unannounced inspection of licensee action on previous inspection findings; licensee's approved security plan; protection of SNM; security organization; access control; alarm systems; keys, locks and combinations; communciations system; surveillance; procedures; security program review; and protection against radiological sabotage. The inspection involved 12 inspector-hours onsite by one inspector.

Results: Of the 11 areas inspected, no items of noncompliance or deviations were identified in 9 areas; two deviations were identified in two areas (Paragraphs 6 and 7).

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#### DETAILS

#### 1. Persons Contacted

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Dr. Ivan Catton, Director, Nuclear Energy Laboratory \*Dr. Neil C. Ostrander, Manager, Nuclear Energy Laboratory \*Mr. "Chuck" Ashbaugh, Security Officer, Nuclear Energy Laboratory Dr. Harold V. Brown, Environmental Health and Safety Officer Dr. John Everetts, Radiological Safety Officer Lt. G. J. Ares, UCLA Police Department Mr. Phil Arnold, Electrician, UCLA

\*Denotes those attending exit interview.

2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (50-142/77-02): Lack of tampersafing on some alarm lines. The inspector determined all alarm line junction boxes are now equipped with micro switches to detect tampering.

(Open) Noncompliance (50-142/77-02): Alarm sensitivity inadquate. The licensee stated in their letter of response to the previous inspection findings from Dr. Catton to Mr. Norderhaug, dated December 20, 1977, that, "An alarm sensitivity procedure is currently being formulated and will go into effect prior to January 20, 1978. The inspector determined that an alarm sensitivity procedure has not yet been prepared, and the alarm sensitivity although improved over the findings of the previous inspection, will still not detect an intruder prior to the intruder reaching the reactor (approximately fifteen feet).

(Open) Deviation (50-142/77-02): Vulnerability of reactor high bay locking mechanisms. The inspector determined through observation and testing of the locking devices that astricals and cylinder guard rings have been installed on all reactor high bay doors. It was noted by the inspector that the dead locking feature of two high bay door locks failed to operate. Records maintained by the Nuclear Energy Laboratory show that this malfunction was determined and reported to University maintenance for repair in February 1978 subsequent requests for repair were also made in May and July 1978. The locks are not yet repaired.

#### 3. Security Plan

The Security Plan for the UCLA Training Reactor Facility now consists of documents submitted by UCLA letters dated June 20, 1975, July 15, 1975, October 21, 1975, and April 1, 1976, excluding Appendix B to the letter dated April 1, 1976 (Appendix B

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contains background information which is not part of the security plan), May 26, 1976, June 9, 1976, and Aunust 3, 1975. The foregoing documents are identified and approved as the licensee's security plan in a letter from NRR dated September 13, 1976.

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The licensee has submitted to licensing, a new security plan dated January 20, 1977, and three amendments to the January 1977 security plan have also been submitted. The inspector determined that NRR has not yet approved in writing the new security plan or amendments.

The licensee has designated the reactor and the cooling system as essential equipment in their approved security plan. All fuel storage areas and the reactor high bay are designated and controlled as security areas. The reactor control room is under lesser security controls, and is the subject of a current dialogue between the licensee and NRR.

The radioactive storage room is described in the approved security plan as, "located below ground level so that all outside walls are backed by earth fill. The inside walls are two-foot-thick concrete block, and the two steel mesh doors provide the only access to the area. The inner door, #1, is backed by a steel plate and has two locks. One of the locks is keyed to "A" level, the Master level, and the other lock is a Sargent and Greenleaf combination padlock No. 8077A, which meets the specifications outlined in AEC Regulatory Guide 5.12. The outer door #2 is keyed to "A" level."

The inspector found the following conditions during a visual inspection of the radioactive storage room on October 31, 1978.

a. The wall of the storage room adjacent to the stairvell is two foot thick from ground level to about eight feet. Above eight feet to the ceiling (estimated as sixteen feet by the inspector), it is approximately four inches thick standard plaster wall. The adjacent stairvell is protected by an ultrasonic intrusion alarm system.

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b. A two foot high by three foot wide area above the inner door into the radioactive storage room is constructed of an expanded metal grill covered with 1/2 inch pressed board with a total thickness of the wall slightly over a 1/2" thick.

The interior walls are to be redescribed in Amendment No. 4 to the licensee's security plan to be submitted to NRC November 30, 1978.

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c. The inner door into the radioactive storage room is a standard hollow metal door secured with a six pin tumbler, master keyed lockset and a standard duty hasp with a Sargent and Greenleaf combination publick #8077A.

#### 4. Protection of SNM

The inspector determined through interview of licensee employees that the licensee presently has in its possession 9.0 kg of Special Nuclear Material in the form of 93% enriched uranium (fuel plates, fuel scraps and uranyl nitrate) and two 32 gm Pu - Be neutron sources. The U-235 is located as follows: 3.6 kgs U-235 is in the reactor and 0.7 kg is in the radioactive storage pits, and 4.7 kgs is nonirradiated fuel stored in the radioactive storage room. The .7 kg of irradiated fuel in the storage pits is not self-protecting as defined by 10 CFR 73.6(b). The total non-exempt SMI presently located at the Nuclear Energy Laboratory is 5.4 kg.

On September 6, 1978, the licensee requested by letter to the Department of Energy (DOE), Washington, D.C., permission to shin the irradiated fuel plates (.7 kg) to the DOE reprocessing plant in Idaho. DOE is presently reviewing their request.

The licensee has not been asked by NRR (licensing) to provide the security stipulated in 10 CFR 73.50 or 10 CFR 73.60, nor is the licensee presently providing that level of security.

No items of noncompliance or deviations were identified.

#### 5. Access Control

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The inspector examined the licensee's procedures and hardware used to control access to the Nuclear Energy Laboratory. The licensee is controlling access as indicated by the approved security plan except that the licensee has ten "A" level keys instead of seven as indicated in the approved security plan. NRR was notified by licensee letter dated March 10, 1978, that the number of "A" level keys had been increased to "no more than ten."

The licensee's new security plan, amendment three, submitted to NRR on March 10, 1978, Paragraph I,A, states that the reactor control room "becomes an 'A' level area (but non-alarmed) during non-working hours." The inspector determined this has not

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yet been implemented. The reactor control room is currently keyed for "B" level access both during working and ron-working hours. The new security plan has not been approved in writing by NRR.

#### 6. Alarm Systoms

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The Ticensee has installed a <u>Kidde Hodel KD3</u> Ultrasonic Intrusion alarm system with sensors located in the reactor high bay, radioactive storage room and the stairwell adjacent to the radicactive storage room. The doors on the first and second floor of the stairwell are equipped with balanced magnetic switches. The double doors from the reactor high bay first floor to an alley cutside the Engineering Building are secured with a self contained local alarm/dead bolt panic lock. The doors also have <u>magnetic switches</u> (not balanced) tied into the alarm system and annunciating at the campus police dispatchers office.

The inspector tested the licensee's alarm system in the reactor high-bay by having the licensee place the alarm system in a secure mode and establishing direct radio communication with the UCL4 Police Alarm Station. The police alarm station was instructed to report incoming alarms for this test immediately. The inspector then entered the reactor high bay (room 1000), a security area. On the first test, the inspector entered the high bay on the second floor, at the control room door, and walked (downstairs) to the first floor before the alarm activated. During the second test, the inspector entered at the second floor, control room door walked to the top of the reactor, walked to the crane electrical power box on the opposite side of the high-bay, and was on the second floor catwalk opposite the control room before an intrusion was signaled.

During the previous physical security inspection (50-142/77-02), conducted September 21-22, 1977, the licensee was cited when the inspector walked continuously within the reactor highbay both upstairs and downstairs without detection for nine minutes. The licensee stated in their letter to Region V, dated December 21, 1977, in response to that citation:

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"The reactor high bay sensitivity problem (top many false alarms) was in the process of being solved at the time of the inspection. On September 22, 1977, during the Security Inspection, the alarm sensitivity was raised to a level such that the intrusion by the inspector was indicated on his third step into the security area. An alarm sensitivity procedure is currently being formulated and will go into effect prior to January 20, 1978."

Although the licensee corrected the sensitivity during the previous inspection, the licensee subsequently reduced the sensitivity because of a reoccurrence of false alarms. The inspector also datermined through interview of licensee employees on October 31, 1978, that the licensee has not yet prepared or implemented an alarm sensitivity procedure as committed to in their letter to Region V, dated December 21, 1977.

During an examination of the alarm system, the inspector noted that the licensee has installed the alarm system so that an intrudar would walk across the ultrasonic beam (least sensitive) rather than into/ away from the beam (most sensitive).

The sensitivity of the alarm system as determined through testing by the inspector during the current inspection is improved over the previous inspection, however, the licensee has not yet taken action to insure the sensitivity of the alarm system will promotly and accurately detect an intruder in the reactor high bay. The finding by the inspector that the licensee has not prepared a procedure, nor placed it in effect prior to January 20, 1978, represents a deviation.

#### 7. Keys, Locks and Combinations

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The inspector examined keys, locks and combinations and related equipment used to control access to security areas. The licensee is using astricals and cylinder rings on all entry doors into the reactor high bay. Within the reactor high bay, the controls for the overhead crane (necessary to gain access to the reactor core or fuel in <u>storage pits</u>) was secured with a Sargent and Greenleaf combination padlock #8077A.

The licensee is controlling the issue of keys to the Nuclear Energy Laboratory, and maintains records of key issue: An annual inventory of security keys is conducted by the NEL Security Officer. During the last inventory of keys, the Security Officer determined that a University employee had misplaced his "B" level NEL access key on March 15, 1978. On October 5, 1978, the licensee's security committee reviewed the question of the misplaced "B" level key

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and determined that a rekeying was not necessary. This action is consistent with the licensee's procedure "NEL Look and Key System Guidelines," dated December 10, 1978.

The licensee in response to the previous inspection (80-142/77-02) by letter to Region V, dated December 21, 1977, stated, in part, in Paragraph B,1:

"Also, all latching mechanisms will be fixed by January 20, 1978, at which time a semi-annual complete lock check and preventative maintenance program will be initiated by the key shop. In addition, in order to ensure that all doors/latching mechanisms are in proper working order in the future, a monthly check on all doors will be made by the NEL Security Officer with any distrepancies taken care of inmediately. This will begin after Jaruary 20, 1978."

The inspector determined by testing on October 31, 1978, that the dead locking feature of the reactor high-bay doors, that two of the doors did not deadlock when the doors were closed. The licensee (NEL) provided documentation that they had discovered the lock malfunction in February 1978 and had notified the University's Maintenance Department that the locks needed repair in February 1978, May 1978 and July 1978 and the locks have not yet been repaired.

The finding by the inspector that the licensee has not ensured that all doors/latching mechanisms are in proper working order, represents a deviation from the licensee's commitment to Region V.

#### 8. Communications

The inspector examined the licensee's facilities for internal communication and communication with the cognizant local law enforcement agency.

No items of noncompliance or deviations were identified.

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#### 9. Surveillance

The inspector examined the licensee's practices and procedures for surveillance of security areas both during working hours and after normal working hours. The licensee's new security plan does not state what surveillance is provided during working hours, however, it states surveillance during non-working hours is provided by a security alarm annunciating at the UCLA Police Department.

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The inspector determined through interview of licensee employees that surveillance of the fuel stored in the radioactive stored room is provided by the ultrasonic alarm system located in the room, and that the alarm only is put into access mode upon entry of an authorized individual into the room.

The reactor high-bay is placed in access rode each work day morning, and then returned to secure rode each evening. The placing of the high-bay alarm into access rode each work day is procedural and is not based on anticipated or scheduled activity within the high-bay security area. The normal work day assurance of integrity of the reactor high-bay security area is provided by the locked doors into the high-bay, and student and staff activities within the Nuclear Energy Laboratory.

No items of noncompliance or deviations were identified.

10. Procedures

The inspector determined the licensee has procedures for reacting to unauthorized intrusions into security areas, bomb threats and acts of civil disorder. The licensee has no procedures for security violations by authorized individuals.

No items of noncompliance or deviations were identified.

11. Security Program Review

The inspector examined the licensee's program for review of the NEL security activities and procedures.

No items of noncompliance or deviations were identified.

12. Protection Against Radiological Sabotage

The licensee's approved security plan describes controls on access to the reactor core, and except as noted elsewhere in this report the licensee has provided the controls committed to in the approved security plan. The licensee has not been asked by NRR to search persons prior to entry into security areas, nor is the licensee performing searches of personnel or packages prior to entry in security areas.

No items of noncompliance or deviations were identified.

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#### 13. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on October 31, 1978. The inspector summarized the score and findings of the inspection. The licensee made no commitments as to corrective action proposed or planned for the deviations identified by the inspector.

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## UNIVERSITY OF CALIFORNIA, LOS ANGELES

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SCHOOL OF ENGINEERING AND APPLIED SCIENCE LOS ANGELES, CALIFORNIA 90014

Boelter Hall 2567 January 18, 1979

Mr. L. R. Norderhaug, Chief Safeguards Branch U.S. Nuclear Regulatory Commission Region V Suite 202, Walnut Creek Plaza 1990 North California Boulevard Walnut Creek, California 94596

Dear Mr. Norderhaug:

This letter is in response to your letter and attachments of December 18, 1978 regarding the deviations noted in the course of an inspection of our facility. The inspection was conducted by Mr. W. P. Mortensen on October 30-31, 1978. Dean (Acting) Westmann forwarded the letter to me for response. Your verbal approval of a 10 day extension of response time is appreciated.

The attached response has been prepared by the laboratory staff and has been reviewed by Dean Westmann. The office of the Vice Chancellor, Facilities Division, concurs with those portions of the response that reflect opinions, or imply actions, by personnel of that Division. We will be happy to discuss these matters with you if further clarification is required.

Due to the sensitive nature of the contents of `is letter and attachments, we request that this document be withheld from public disclosure pursuant to Section 2.790 of 10 CFR Part 2.

Sincerely

Ivan Catton, Director Nuclear Energy Laboratory

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- cc: R. A. Westmann, Associate Dean, SEAS
  - B. Cowman, Facilities Resources Director
    - J. Evraets, Office of Environmental Health and Safety

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NUCLEAR ENERGY LABORATORY

Staff Response to NRC Notice of Deviations Dated December 18, 1978

## 1. Alarm Sensitivity Procedure

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The original and continuing intent is to implement the alarm sensitivity testing procedure recommended and described by the vendor (Kidde). At the present time, implementation of the procedure has been inhibited by apparent fluctuations or drifts in alarm sensitivity and a high false alarm rate. Lack of staff training in the sensitivity and balance adjustments and insufficient knowledge of perturbing factors have percluded analysis of the apparently random behavior.

During the past year, the alarm system has been subject to several revisions by the addition of tamper circuits and other devices. Further, it operates in a changing physical and electromagnetic environment. False alarms have been variously attributed to (a) intrinsic instability of the system, (b) overload of the tamper circuit power supply, (c) electromagnetic pulses associated with other laboratory operations (Tokamak and welding), (d) relocation of equipment in the reactor room, and (e) telephone company operations (the search for cable pairs by installers).

The alarm system is off during normal working hours, and alarms in that state are interpreted as tamper alarms triggered by telephone company operations. The relative contributions, and even existence, of the other hypothetical factors remain unassessed. The most troublesome alarms are those which do not reset and clear. The staff member responding to such an alarm is instructed to (a) seek evidence of intrusion, and if none exists to (b) reduce the alarm sensitivity by one unit. The staff lacks the expertise to otherwise analyze and correct the cause. The problem is referred to Mr. Phil Arnold of the UCLA Facilities Division. Mr. Arnold is the alarm system specialist for UCLA.

The situation is regarded as unsatisfactory by the laboratory staff and by Mr. Arnold. In a meeting with Mr. Arnold on January 5, 1979 it was agreed that:

- Mr. Arnold would provide training in the procedures for adjusting sensitivity and balance.
- Mr. Arnold and the NEL staff will jointly examine the adequacy of the tamper power supply and, if necessary, design a replacement power supply of greater capacity.
- Mr. Arnold, with the staff, will explore the use of diagnostic instrumentation to indicate critical voltages, currents, or pulses for the determination of drifts or other symptoms of malfunction.

As a result of a staff meeting with Mr. Arnold on January 18, 1979, it can be reported that:

Item 1 has been accomplished. Two staff members (Messrs. Ashbaugh and Zane) have been trained in the adjustment and balancing procedure. During the training, several areas of excessive sensitivity were identified. When rebalanced, the system appeared to be completely normal. January 18, 1979 Page Two

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Items 2 and 3 are now viewed as contingency plans to be implemented if or when, a high false alarm rate reappears.

A performance test of the reactor room system will be made weekly. A specification test of the reactor room will be made quarterly.

The radioactive storage room is entered infrequently, the only routine entries are semi-annual. The staff will conduct performance tests and specification tests of that area on a quarterly basis.

The laboratory security officer will be responsible for observation of the test schedule.

## 2. Failure of Dead Lock Mechanisms on Door Hardware

Significant difficulties with the dead locking mechanisms are acknowledged. We have reviewed this matter with the representatives of the UCLA Facilities Division who are responsible for lock maintenance and door hardware. They state that the mortise type panic hardware of our installation is not designed for frequent usage. The dead lock component is fragile and prone to malfunction. Maintenance requirements are severe with a high probability of failure between periodic inspections. The conversion to more reliable rim hardware would require door, frame, and hardware replacement costing an estimated \$1400 per opening for materials alone. There are 13 openings to the reactor and control rooms.

The dead lock mechanism is designed to prevent manipulation of the door bolt by insertion of devices in the crevice between the door and the jam. We propose to:

- (a) Install full length astragals on all nine doors not already so equipped. The astragals are to be 2" wide by 1/8" thick (minimum dimensions) steel strap and are to be approximately centered over the crevice between the door and jam.
- (b) Abandon dependence upon the unreliable dead lock feature of the existing hardware.

We note that the nine doors to be treated in this proposal all carry short astragals. Some of these will be retained because of their superior design. In these cases, full length coverage will be provided by supplementary astragal strips of the specified minimum width and thickness.

We note that our Security Plan makes no direct reference to the existence of the dead lock devices, and that the proposed modification should not require a Security Plan Amendment. The proposed modification can be completed within 30 days of our accification that Region V has accepted the proposal.



UNITED STATES NUCLEAR REGULATORY COMMISSION

REGION V

SUITE 202, WALNUT CREEK PLAZA 1990 N. CALIFORNIA BOULEVARD WALNUT CREEK, CALIFORNIA 94595

MAL 7 1079

Docket No. 50-142

The Regents of the University of California School of Engineering Los Angeles, California 90024

Attention: Ivan Catton, Director Nuclear Energy Laboratory

Gentlemen:

Thank you for your letter of January 19, 1979 in response to our Notice of Violation dated December 18, 1978.

The corrective actions you have taken and planned will be reviewed during the next physical protection inspection.

Sincerely,

R Norder UL. Chief Safeguards Branch

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UNITED STATES NUCLEAR REGULATORY COMMISSION REGION V 1990 N CALIFORNIA BOULEVARD SUITE 202, WALNUT CREEK PLAZA WALNUT CREEK, CALIFORNIA 94596

OCT 1 0 1979

Docket No. 50-142

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University of California, Los Angeles School of Engineering Los Angeles, California 90024

Attention: Russell O'Neil Dean of Engineering

Gentlemen:

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Subject: NRC Inspection

This letter refers to the inspection of your activities authorized under NRC License No. R-71 conducted by Messrs. E. J. Power and L. W. Ivey of this office on September 24-25, 1979. It also refers to the discussion of our inspection findings held by the inspectors with Dr. I. Catton and Mr. C. Ashbaugh on September 25, 1979.

The inspection included examination of activities related to physical protection against industrial sabotage and against theft of special nuclear material in accordance with applicable requirements of Title 10, Code of Federal Regulations, Part 73, "Physical Protection of Plants and Materials," your security plan, and license conditions pertaining to physical protection as described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and records, interviews with facility personnel and observations by the inspectors.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790(d) of the NRC "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of the findings of your safeguards and security measures are exempt from public disclosure; therefore, the enclosed inspection report will <u>not</u> be placed in the Public Document Room.

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Should you have any questions concerning this letter, we will be glad to discuss them with you.

Sincerely, /

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/\*. LeRoy R. Norderhaug, Chief Safeguards Branch

Enclosure: IE inspection Report No. 50-142/79-03 (IE-V-340) The information on this page is considered to be appropriate for public disclosure pursuant to 10 CFR 2.790.

U.S. NUCLEAR REGULATORY COMMISSION OFFICE OF INSPECTION AND ENFORCEMENT

Region V

50-142 R-71	Exformande Carolo
Docket No License No	Safeguards Group
icensee: University of California, Los Angeles	
Los Angeles, California 90024	
acility Name: Nuclear Energy Laboratory	
nspection at: UCLA campus at Los Angeles, California	1
nspection Conducted: September 24-25, 1979	
ate of Last Physical Security Inspection Visit:Octo	ber 30-31, 1978
ype of Inspection: Unannounced Physical Security	
nspectors: , come , " mare	Cer 17, 1979
E. J. Power, Physical Security Inspector	Date Signed
Denna d' day	0.+17/979
L. W. Ivey, Physical Security Inspector	Date Signed
	Date Signed
Approved by: CI Teter	Cit. 18 1979
1. L. R. Norderhaug, Chief, Safeguards Bran	ch Date Signed
Inspection Summary:	
Areas Inspected: Security Plan; Protection of S Access Control; Alarm Systems; Keys, Locks and S Surveillance; Procedures; Security Program Revie Radiological Sabotage.	SNM, Security Organization; Combinations; Communications; ew; and Protection Against
The inspection involved 16 inspector hours onsi	te by two NRC Inspectors.
Results: No items of noncompliance were identi	fied.

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## DETAILS

#### 1. Persons Contacted

\*Dr. I. Catton, Director, Nuclear Energy Laboratory \*Mr. C. Ashbaugh, Security Officer, Nuclear Energy Laboratory Lt. J. Ares, UCLA Police Department Sgt. W. Hansen; UCLA Police Department Mr. P. Arnold, Electrician, UCLA

\*Denotes those attending exit interview.

## 2. Licensee Action on Previous Inspection Findings

(Closed) Noncompliance (50-142/77-02): Alarm sensitivity inadequate. Several performance tests of the ultrasonic alarm system were conducted by the inspectors, and were found acceptable.

(Closed) Deviation (50-142/77-02): Vulnerability of reactor high] bay locking mechanisms. The inspectors determined through observation that the Nuclear Energy Laboratory had installed astragals on the laboratory doors to which they committed in a letter from Dr. Catton to Mr. Norderhaug, Region V, NRC, which was dated January 18, 1979.

## 3. Exit Interview

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The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on September 25, 1979. The inspectors summarized the scope and findings of the inspection.

## 4. MC 81405B - Security Plan

No items of noncompliance were noted. The inspection results were attained through:

- a. An onsite review of the physical security plan for the Nuclear Energy Laboratory at UCLA which was dated January 20, 1977 with four amendments.
- b. A walk-through tour observing the activities, operations and facilities of the laboratory which included the reactor and the reactor coolant system which were designated as essential equipment.
- c. Observation and confirmation that the designated security areas within the laboratory as specified in their security plan were: the reactor room, also called the reactor high bay (Room 1000); the radioactive storage room (within Room 1540); and the control room (Room 2001) during non-working hours at the university.

The inspectors did not identify any measures which were different from those specified in their plan; the measures to which the licensee was committed were found to be adequate; there was no decrease in the effectiveness of their plan; and there were no additional findings which were considered a weakness in their security systems.

#### 5. MC 81410B - Protection of SNM

No items of noncompliance were noted. The NEL has in its possession approximately 8.3 kgs of SNM in the form of 93% enriched U-235. The SNM was secured in accordance with their physical security plan in the following locations:

- a. There were approximately 3.6 kgs of SNM in the reactor core.
- b. There were 4.6 kgs of non-irradiated SNM secured in the radioactive storage room.
- c. There were 0.7 kgs of irradiated SNM contained in the fuel storage pits in the reactor bay.

As indicated in the last security inspection report in 1978, the licensee has continued its coordination with the Department of Energy to effect the transfer of 0.7 kgs of irradiated fuel, and has kept NRR advised of these developments. Under the licensee's current plans, the irradiated fuel is scheduled to be transferred from the facility during December 1979.

## 6. MC 814158 - Security Organization

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No items of noncompliance were noted. The inspectors determined that the licensee's security organization is as described in their physical security plan. Through interviews and review of procedures, it was determined that the Director of the laboratory was responsible for the implementation and enforcement of the security plan with the security functions performed by the appointed Security Officer.

The security force for the laboratory is provided by the UCLA Police Department which was visited by the inspectors. The UCLA PD is composed of 57 sworn peace officers who operate on three shifts to provide coverage of the campus to include the Nuclear Energy Laboratory. These officers are individually armed with a minimum of a .38 caliber weapon and, when dispatched, they maintain communications with the police dispatcher and other officers with portable two-way radios or vehicle radios. In their routine duties, the UCLA PD conducts daily, periodic, random patrols of the exterior of the facility. Response time from the UCLA PD to the laboratory is, three to five minutes. The campus police have arrangements for assistance if needed with other local law enforcement agencies, e.g., Los Angeles Police Department (LAPD). The annual requalification of the UCLA PD is scheduled to begin on or about October 1, 1979 and will include representatives of the LAPD. This annual requalification (or orientation) will be one to three hours in duration and cover radiation hazards, security alarms, tour of the physical layout, discussion of responses to alarms, etc.

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#### 7. MC 81420B - Access Control

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No items of noncompliance were noted. The results of the inspection were attained through:

- a. A review of the licensee's procedures used to control access to the Nuclear Energy Laboratory.
- b. Observation of the ingress and egress of the staff, employees, students, and visitors to the facility during the period of the inspection.
- c. Observation that access controls have been implemented as described in the security plan to control personnel and vehicle access to the essential equipment, security areas, and the facility, and these means are adequate.
- d. Interviews and review of procedures that visitors are identified, authorized for access, and escorted at the facility.
- e. A review of the visitor's register.
- f. Interviews of personnel and observation that individuals having access to the unirradiated SNM are visually searched upon departing from the SNM storage room, and the procedure is considered adequate.

## 8. MC 814258 - Alarm Systems

No items of noncompliance were noted. The inspectors determined through interviews and observation that intrusion alarm devices (i.e., ultrasonic, magnetic door switches, and tamper) are installed, maintained, tested and operated in accordance with their physical security plan. The inspectors, in the company of the Security Officer and an alarm electrician, witnessed testing of several of these alarms.

Subsequently, during a visit to the UCLA campus police department during the inspection, the inspectors confirmed by observation and interview that the Nuclear Energy Laboratory alarm system terminates with an audio-visual display in a continuously manned dispatcher room of the police, and written procedures are available for police response and actions upon receipt of an alarm.

## 9. MC 81430B - Keys, Locks and Combinations

No items of noncompliance were identified. The procedures for keys, locks and combinations were reviewed and are in conformance with the physical security plan. The annual physical inventory of all keys was in the process of being accomplished at the time of the inspection, but had not been completed. A random check of the locking hardware on the doors was accomplished and found to be adequate.

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#### 10. MC 81435B - Communications

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No items of noncompliance were identified. The Nuclear Energy Laboratory utilizes the commercial telephone system for communication on and off the campus which is the primary means of contact with the campus police department. The UCLA police department operates its own radio network on a 24-hour basis with radio equipped automobiles and portable radios carried by the individual police officers.

#### 11. MC 81440B - Surveillance

No items of noncompliance were identified. The inspectors determined that the surveillance of SNM, essential equipment, security areas, physical barriers, and avenues of approach to security areas have been implemented as stated in their physical security plan.

## 12. MC 814458 - Procedures

No items of noncompliance were identified. Through interviews and review of records, it was determined that Nuclear Energy Laboratory had procedures regarding unauthorized intrusions, security violations, bomb threats, and acts of civil disorder.

## 13. MC 81450B - Security Program Review

No items of noncompliance were identified. The last change, Amendment No. 4 to the security plan was submitted to NRR by letter dated November 30, 1978; however, it was determined through interview with the Security Officer that review of the plan is a continual process with notes maintained in the Security Log which was reviewed. The licensee was presently in the process of evaluating their plan in view of the upgrading of security requirements for non-power reactors per 10 CFR 73.47.

#### 14. MC 81455 B - Protection Against Radiological Sabotage

No items of noncompliance were identified. Protection against sabotage is of concern to the licensee and is primarily effected by the security consciousness of the laboratory personnel and adherence to established procedures and policies.



#### UNITED STATES NUCLEAR REGULATORY COMMISSION REGION V

1990 N. CALIFORNIA BOULEVARD SUITE 202, WALNUT CREEK PLAZA WALNUT CREEK, CALIFORNIA 94596

- HYPORMATICS

FEB 2 ; 1980

Docket Nos. 70-223 50-142

University of California Los Angeles, California 90024

Attention: Dr. Harold V. Brown Environmental Health & Safety Officer

Gentlemen:

Subject: NRC Inspection

This refers to the inspection conducted by Messrs. G. Hamada and A. Wieder of this office on February 11 and 12, 1980 of activities authorized under NRC License Nos. SNM-974 and R-71. It also refers to the discussion of our inspection findings with members of your staff at the conclusion of the inspection.

The areas examined during the inspection included your program for controlling and accounting for special nuclear material pursuant to applicable provisions of Part 70, Title 10, Code of Federal Regulations, and specific requirements of NRC License Nos. SNM-974 and R-71. Within these areas, the inspection consisted of selective examinations of procedures and records, interviews with campus personnel and observations by the inspectors.

No items of noncompliance with NRC requirements were identified within the scope of this inspection.

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of findings of your control and accounting procedures for safeguarding special nuclear materials are exempt from disclosure; therefore, the inspection report will not be placed in the Public Document Room and will receive limited distribution.

IN CONTACT CONTACT

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University of California

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FEB 1 3 1980

Should you have any questions concerning this inspection, we will be glad to discuss them with you.

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Sincerely, R. Norderhaug, Ghief

Safeguards Branch

Enclosure: IE Inspection Report Nos. 70-223/80-01 & 50-142/80-01 (IE-V-369)

cc w/enc: \* Professor Ivan Catton Director, Nuclear Engineering Laboratory UCLA

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The information on this page is considered to be appropriate for public disclosure pursuant to 10 CFR 2.790.

U.S. NUCLEAR REGULATORY COMMISSION OFFICE OF INSPECTION AND ENFORCEMENT

Region V

70-223/80-01 Report No. 50-142/80-01 (IE-V-369) Docket No. 70-223 & 50-142 License No. SNM-974 & R-71 Safeguards Group 2 Licensee: University of California, Los Angeles Los Angeles, California 90024 Facility Name: Inspection at: Inspection Conducted: February 11-12, 1980 Date of Last Material Control and Accounting Inspection Visit: December 5-6, 1977 Type of Inspection: Material Control and Accounting 'nspec\* "s: ama 2/25 Signed Date Signed Approved by: derhoug, Chief, Safequards Branch ianed Inspection Summary:

Areas Inspected: The licensee was inspected for compliance with applicable sections of the regulations. The inspection involved 18 inspector-hours onsite by two NRC inspectors.

Results: No items of noncompliance were identified in the areas inspected.



#### REPORT DETAILS

#### 1. Persons Contacted

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THIS DECLASING IS NOT TO BE REAGONATED VALUES SPECIFIC AFPROVAL OF 15/V

\*C. E. Ashbaugh, III, Physical Security Officer AFPHOVAL OF IEV
\*Dr. I. Catton, Director, N.E.L.
\*J. Evraets, Radiological Safety Officer
\*J. Hornor, Health Physicist
\*N. Ostrander, Manager, N.E.L.
\*Dr. W. Wegst, Director, Office of Research & Occupational Safety A. Zane, Reactor Supervisor

\*Denotes attendance at the exit interview.

#### 2. Licensee Action on Previous Inspection Findings

There were no items of noncompliance noted on the previous inspection. (Report 77-02, 77-03)

#### 3. Exit Interview

The inspectors met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on February 12, 1980. The inspectors summarized the scope and findings of the inspection. Several items of interest were brought to the attention of the licensee. It was pointed out that it would be desirable to have a more detailed written procedure for taking a physical inventory of all special nuclear material (SNM) possessed by the licensee. With respect to the spent fuel bundles that are expected to be shipped for reprocessing, it was suggested that the licensee formally request the reprocessor to obtain and submit to the licensee a listing of the plate serial numbers comprising each bundle. This would help to resolve a longstanding uncertainty concerning the identity of fuel plates associated with fuel bundles. While the total number of plates have been accounted for, the exact location of a given plate has remained unclear for 5 fuel bundles ever since a mixup occurred some 5-6 years ago.

#### 4. Storage and Internal Control

Records maintained for in-reactor and storage were reviewed.

No items of noncompliance were identified.

#### 5. Inventory

An inventory of stored fresh fuel bundles, by serial number, and scrap, by weight, was conducted. Spent fuel elements were identified by piece count at specific locations in the storage pits. The core content was accepted on the basis of a fuel bundle location chart. Plutonium-Berylium sources were identified by serial number. Except for a small amount of burnup, the total SNM inventory has not changed since the last inspection.

The cumulative burnup to January 1, 1980 is approximately 21.4 gms. U-235. A conservative estimate of Pu-239 production to January 1, 1980 is 0.013 gms, a nonreportable quantity.

No items of noncompliance were identified.

#### 6. Records and Reports

The licensee's special nuclear material accounting records, reports and other documentation applicable to the period December, 1977 through February 11, 1980 were reviewed for compliance with the records and reports requirements of the regulations.

No items of noncompliance were identified.

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UNITED STATES UNITED STATES NUCLEAR REGULATORY COMMISSION REGION V MISSION LANE, SUITE 210 WALNUT CHURCH, ENERGIANA STATES

August 30, 1982

Docket No. 50-142

University of California, Los Angeles Office of Research and Occupational Safety Lus Angeles, California 90024

Attention: Dr. Walter Wegst

Gentlemen:

This letter refers to the inspection of your activities authorized under NRC License No. R-71 conducted by Mr. W. P. Mortensen of this office on August 23 and 24, 1982. It also refers to the discussion of our findings held by the inspectors with Dr. N. Ostrander and his staff on August 24, 1982.

The inspection included examination of activities related to physical protection against industrial sabotage and against theft of special nuclear material in accordance with applicable requirements of Title 10, Code of Federal Regulations, Part 73, "Physical Protection of Plants and Materials," your Security Plan, and license conditions pertaining to physical protection as described in the enclosed inspection report. Within these areas, the inspection consisted of selective examinations of procedures and records, interviews with facility personnel and observations by the inspector.

Within the scope of this inspection, no items of noncompliance were observed.

In accordance with Section 2.790(d) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, documentation of the findings of your safeguards and security measures are exempt from public disclosure; therefore, the enclosed inspection report will not be placed in the Public Document Room.

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August 30, 1982

Should you have any questions concerning this letter, we will be glad to discuss them with you.

Sincerely, 11 L. R. Norderhaug a Chief, Safeguards Branch

Enclosure: IE Inspection Report No. 50-142/82-03 (IE-V-520)

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U. S. NUCLEAR REQUEATORY COMMISSION OFFICE OF INSPECTION AND ENFORCEMENT

Report No. 50-142/82-03 (1E-V-520)

Docket No. 50-142 Licensee No. R-71

Licensee: University of California, Los Angeles

Los Angeles, California 90024

Facility Name: Nuclear Energy Laboratory

Inspection at. Los Angeles, California

Inspection Conducted: August 23-24, 1982

Date of Last Physical Security Inspection Visit: September 24-25, 1979

Type of Inspection Routine, Unannounced, Physical Security

W. P. Portunison, Physical Security Inspector Inspectors:

Approved by: mD Aluster, Chief, Physical Security Section

Inspection Summary

Areas Inspected: Use and Storage Areas; Detection Devices, Access Control, Security Organizations, Communications and Response Procedures. The inspection involved 12 hours by one NRC Inspector.

Results: No violations were identified.

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## DETAILS

## 1. Ir mons Contacted

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2. manual

- \*N. Ostrander, Laboratory Manager
- 'C. Ashbaugh, Laboratory Security Officer
- \*1. Zane, Reactor Supervisor
- J. Kuehn, Commander, UCPD Patrol Division

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\*Denotes those individuals present at the August 24, 1982 exit meeting.

## 2. Fait Meeting

The inspector met with the individuals identified above on August 24, 1982, at the conclusion of the inspection. The inspector stated that no violations were identified during the inspection. The inspector suggested that the licensees contingency response plans be reviewed to determine if the requirements of 10 CFR 73.71(c) for notification of NRC, should be included in the procedures as a specific action to be taken by licensee personnel when required by the rule.



#### UNITED STATES NUCLEAR REGULATORY COMMISSION REGION V

1450 MARIA FANE SUITE 219 MAYNUT CHEEK - 20 ORNIA 945-95

## JUL 201983

Docket Nos. 70-223 50-142

University of California at Los Angeles 405 Hilgard Avenue Los Angeles, California 90024

Attention: Dr. Russell O'Neil Dean, School of Engineering

Gentlemen:

Subject: NRC Inspection Report Modification

This refers to a modification of an inspection report that was issued July 8, 1983 from this office. This inspection was conducted by Mr. Gilbert B. Nelson of this office on June 28, 1983, of activities authorized under NRC License Nos. SNM-974 and R-71. The modification is enclosed.

Should you have any questions concerning this modification, we would be glad to discuss them with you.

Sincerely,

LeRoy R. Norderhaug, Chief Safeguards and Emergency Preparedness Branch

Enclosure: Modification of Inspection Report Nos. 50-142/83-02 70-223/83-01 (IE-V-577)

cc w/enclosure: Professor Ivan Catton Director, Nuclear Energy Laboratory UCLA Ms. Colleen P. Woodhead, ELD Mr. Edward S. Christenbury, ELD

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Table I summarizes the physical inventory at UCLA

TABLE I

## SSNM Physical Inventory UCLA as of June 28, 1980

License	<u>U-235</u>	Pu_g
R-71	4921.13	32
SNM-974	0	32
1335-70	0	32

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Applying the exemption embodied in 10 CFR  $\S73.67(b)(1)(ii)$ , the 4921.13 g U-235 in NEL is an amount defined to be "special nuclear material of moderate strategic significance", under 10 CFR  $\S73.2(x)(1)$ .