



SCHOOL OF ENGINEERING AND APPLIED SCIENCE  
LOS ANGELES, CALIFORNIA 90024

April 1, 1976

Bernard C. Rusche  
Director  
Office of Nuclear Reactor Regulation  
United States Nuclear Regulatory Commission  
Washington, D. C. 20555

Dear Sir:

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

The physical security plan for the Nuclear Energy Laboratory at the University of California, Los Angeles as required by 10 CFR Part 73.40 is as follows:

The Nuclear Energy Laboratory 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. Of the SNM in the exempt form, 3.6 kgs of U-235 is in the reactor and 0.7 kg is in the radioactive storage pits. The 4.7 kgs of SNM in the non-exempt form are stored in the radioactive storage room.

I. Design Features

A. Essential Equipment


The UCLA reactor is an Argonaut-type nuclear reactor and is located in 2567 Boelter Hall. The reactor is described in figures (pages) 1 through 9 of Appendix A.

The UCLA R-1 Reactor is an extremely safe reactor. It has both a large negative void and a large negative temperature coefficient, since it is an under-moderated reactor. Figure 10 describes the cooling system of the reactor. A descriptive account of the safety systems, records and reporting procedures are included in Appendix B. Appendix B is a summary of our License No. R-71, our Technical Specifications.

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## B. Security Area

The security areas (reactor high bay and radioactive storage room) are identified in figures 11 through 13. Figure 11 describes the first floor, figure 12 describes the second floor, and figure 13 describes the radioactive storage area in detail. The alarm system is shown with the ultrasonic transmitter and receiver transducers identified by an "X", the magnetic switches for the doors by a "Y" and the two master control units by a "Z".

The radioactive storage room is 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. (Refer to Figure 13.) The fuel plates and fuel scraps are stored in a Metal File Cabinet Safe, Model T-20, Serial No. 48727, made by Underwriters Laboratory. It is secured to the north concrete wall and floor by 1x1x1/8 angle iron. A separate key and combination are required to open it. One fuel bundle with attached thermocouples is stored in an 8 foot long 6 inch steel schedule 40 pipe with a steel lid hinged and locked with a Sargent and Greenleaf combination padlock. The pipe is welded to the north concrete wall. All the bolts securing the safe and the schedule 40 pipe are welded to the angle iron to prevent easy removal. The two Pu - Be neutron sources are kept in steel drums filled with paraffin, chained to the east wall, and secured with the same type of Sargent and Greenleaf Combination padlocks. The uranyl nitrate (250 gms) is stored in padlocked steel lockers at the south end of the room.

The storage pits in the reactor high bay are composed of cylindrical holes, 6.5 feet deep, set into the concrete floor. The cylinders are secured with a 4 foot long, 10 inch diameter, 380 pound steel lined concrete plug which can only be removed with a special handling device or the reactor room crane. The concrete plug handling device and the crane are both secured with Sargent and Greenleaf padlocks.

The remainder of the enriched uranium is kept in the reactor. Due to its power history, the fuel is too hot to handle without cumbersome shielding. The crane, the handling cask, shielding and a great deal of time are required in order to remove it from the reactor and then from the facility.

## C. Operational Requirements

C-level areas are peripheral areas of the laboratory that include only the reception room and an adjacent library used by students. All keyholders of higher level (A and B) have access to the C-level. Access to the C-level is normally free during regular working hours, but is

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limited to keyholders at other times. A small number of C-level keys are assigned to student users of the library who are known to the school.

B-level areas are adjacent to the A-level areas and consist of the reactor control room, a class room, and laboratory space. The class room is used primarily for undergraduate instruction, the laboratory areas for graduate student and contract research. Key access to the B-level is limited to individual faculty members, and graduate students upon the basis of need and when they have completed a training course in radiological safety. The custodian and the secretary-receptionist are assigned B-level keys. Undergraduate students use the B-level areas only under supervision, they must successfully pass the radiological safety course, but are not assigned keys on the basis of class participation only.

A-level areas include the reactor room and the shop areas normally accessible only through the reactor room. The subcritical facility including the passageway leading to the radioactive storage room is also an A-level area. A-level access is provided to the Director of the Laboratory, the Resident Health Physicist, and five staff employees that engage in reactor operations and maintenance. Students, visitors, and building maintenance personnel must be escorted by an A-level keyholder in A-level areas.

Access to the radioactive storage areas is necessary to (1) obtain experimental materials, (2) perform radiation surveys, (3) inventory SMM, (4) effect SMM transfers, and (5) escort and assist the UCLA police under alarm conditions. Spare reactor fuel elements and scrap, both of the non-exempt form are stored in a safe within the radioactive storage area. Access to that safe is required only for the inventory and/or transfer of that material. The Technical Specifications assign responsibility for the reactor fuel to the Reactor Supervisor.

#### D. Security Systems

##### 1.a. Locks and Keys

Every door leading into the Nuclear Energy Laboratory and every door within the facility is under a lock and key system comprised of three levels: A, B, and C. The lock and key system is under the control of the Laboratory Security Officer, who keeps a written and signed record of the individuals possessing keys. Proposed changes in the lock and key system must be reviewed and approved by the Laboratory Security Officer.

Level-B keys are issued to qualified individuals who have taken the laboratory health physics course and who have passed the health physics and laboratory procedures test. This group includes professors, students, the secretary, and the custodian.

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One level B key is also issued to the UCLA Police Department to be used by the patrol and the detective units only. The personnel of these two units are given a condensed course on health physics, equipment, access points, and emergency procedures. They are not given an exam, but will receive the course on an annual basis.

Level-C keys are issued to unqualified students for office space or for the use of our library.

The locks are Corbin heavy duty cylindrical six pin locks. The key blanks are off master and in the registered key section of UCLA, meaning that no one may obtain or use this type of blank which is of the east coast variety. This was done to reduce the possibility of compromise. The key level required for passage through the doors in this facility is shown by letters A, B, or C in figures 11, 12, and 13. The letter D means dummied lock, it cannot be unlocked by any key from the outside. The door can be opened only from the inside for emergency egress.

#### 1.b. Ultrasonic Intrusion - Detection System

The ultrasonic alarm system was manufactured by Walter Kidde and Co., and was installed by the Physical Plant of UCLA. The type, model, and part number of each piece of equipment for the system appears on page 14 in Appendix A.

#### 2. Communications

In the event of a security violation, the following communication system is used. The alarm system registers a security violation. A signal is sent along an isolated tamper proof telephone line to the 24 hour manned Honeywell Alarm Receiver WS40B,D located at the UCLA Police Station. At the station there is also a recorder which prints out the status on each and every alarm. The status categories are normal, alarm, and trouble. Trouble means tampering with the system and the appropriate action is to assume that it is an alarm.

An officer on duty then calls the patrol units on a two-way radio. If the officers are not in their cars, they still would have direct voice contact since they carry portable radios. The officer on duty then telephones the laboratory personnel listed in order on the Nuclear Energy Laboratory Emergency Procedure list until one is contacted. The contacted individual then proceeds to the laboratory to assist and to advise the police on the situation.

### II. Administrative Controls

#### A. Organization

##### 1. Security Organization

The Laboratory Security Officer is responsible for the facility security program. He controls the distribution of keys, maintains records of key distribution, provides up-dated personnel access lists, communicates

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with and provides limited training for the police, and performs the annual review and test of the security program. He is an A-level keyholder.

On a day-to-day basis, all A-level keyholders are responsible for observance of the Security Plan.

The UCLA Police Department is responsible for detecting any intrusion during working and non-working hours, and for taking the appropriate action in the event of a security violation. The Police Department has, at a minimum, 6 units (men) on duty at all times. At night between the hours of 1630 and 0130, there is in addition, a one man foot patrol around and through the Engineering Building, Boelter Hall. He checks the doors and looks to see if there is any unusual activity taking place.

## 2. Local Law Enforcement Authorities

The UCLA Police Department has as a back up the West Los Angeles Police Department. This is possible because of a mutual aid agreement between the two parties.

## B. Access Control

### 1. Personnel

At the present time, there are seven people who have A-level keys, and are authorized to enter the reactor high bay. This group includes the Director, the Resident Health Physicist, and five staff employees. Level-B and C keyholders may enter the reactor high bay if they are accompanied by one who has an A-level key. The following personnel, by title, are issued A-level keys: Director, Laboratory Manager, Laboratory Security Officer, Reactor Supervisor, Mechanician, Electronics Technician, Resident Health Physicist. The names of individuals holding these titles are on file with the UCLA police department and can be obtained from the Laboratory Security Officer.

### 2. Control

The door to the reactor room (and connecting shop areas) can be opened only with an A-level (master) key. All A-level personnel, and no others, are authorized to activate and deactivate the intruder detection system of the reactor room.

Access to the radioactive storage room requires (1) an A-level key, (2) knowledge of the combination to the Sargent & Greenleaf combination lock, and (3) knowledge of a code word to the police station that permits deactivation of the alarm system covering that area. The police department is instructed to comply with deactivation requests only during the normal working hours of 8:00 AM to 5:00 PM of the 5 day work week.

Only two A-level personnel possess items (2) and (3). The Director of the Laboratory appoints these two individuals from among the five A-level keyholders exclusive of himself and the Reactor Supervisor.

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Access to the safe containing the reactor fuel requires (1) access to the room, (2) knowledge of the combination to the safe, and a key to the safe. The two individuals having access to the room also possess the combination (but not the key) to the safe. The Director and the Reactor Supervisor possess the only keys to the safe. Accordingly, access to the safe requires the mutual consent of at least two distinct individuals, each possessing part of the total access requirement.

### C. Surveillance

#### 1. Working Hours

There are two separate alarm systems and each alarm system can be deactivated only by specified individuals. All A-level personnel are authorized to deactivate the alarm system of the reactor high bay by telephoning the University Police Department, stating his name, waiting for recognition and permission, and then properly deactivating the system at the master control unit. While the system is deactivated, the surveillance is done by the working personnel holding A-level keys and by students and faculty who are in the facility. All A-level personnel are authorized to reactivate the system by first telephoning the University Police Department, stating his name and intention, reactivating the alarm system at the master control unit, and then again telephoning the University Police Department to see if the alarm system has cleared and that the system is functioning properly.

Two individuals appointed by the Director of the Laboratory are authorized to deactivate the alarm system of the radioactive storage room. Their names and an entry code are on file with the UCLA Police Department. Legal entry can only be effected between the hours of 0800 and 1700 on university working days. The normal sequence of events for entry into the radioactive storage room is for one of the above two individuals to call the police, wait for recognition, state his name, his intent, and the entry code. Upon recognition, he estimates the probable duration of the entry. Upon entry, he deactivates the alarm at the master control. Upon departure, he reactivates the alarm, secures the door, calls the police department, gives his name, states that the area is secured, and asks for confirmation of the alarm system reactivation and condition of non-alarm. This alarm system is rarely deactivated, but when it is, at least one of the authorized individuals will remain in this room during the entire period. Normally, this alarm system is kept on and surveillance of this area is accomplished by the working personnel, the lock and key system and the ultrasonic alarm system. Backing up these systems are the UCLA Police Department and the West Los Angeles Police Department.



## 2. Non-Working Hours

During non-working hours, the lock, key system and the alarm system provide the surveillance of the security areas. A special foot patrol also offers some surveillance between the hours of 1630 and 0130. His rounds are such that he can see and check the outer doors of the facility at least once every one and one-half hours. The UCLA Police Department and the West Los Angeles Police Department back up these systems.

### D. Procedures

#### 1. Response to Detected Unauthorized Intrusions

The silent alarm sends a signal via the isolated telephone line to the UCLA Police Station. The signal registers on the 24 hour on-site manned Honeywell Alarm Receiver. Notification is then sent via two-way radio for two units to converge immediately on this facility to take the appropriate action. Since the police have portable radios, a minimum of three other units would be able to respond to the alarm if the situation warranted it. In case the problem is too great for them to handle, the UCLA Police Department could call as a back up, the West Los Angeles Police Department.

#### 2. Security Violations by Authorized Personnel

For the Reactor High Bay, there are no provisions for security violations by authorized personnel other than proper screening during hiring. However, the SNM is of the exempt form, being highly radioactive. If anyone were to remove this material from the high bay, he would need time and would risk receiving a lethal dose of radiation in removing the material from the facility.

The Radioactive storage area can be entered only by the individuals mentioned previously. Entry is impossible during non-working hours. If entry is attempted, the police will assume that the entry was unauthorized, and will take appropriate action. A security violation (entry) is limited to two individuals and a security violation involving the safe would require a minimum of two individuals acting in concert.

#### 3. Bomb Threats

In the event of a bomb threat, the laboratory would be secured and evacuated. The standard emergency procedures would be followed. The emergency procedures are given on page 15 of Appendix A.

4. Acts of Civil Disorder

For acts of civil disorder, the emergency procedures would be followed.

F. Security Program Review

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.

We hope that this security plan meets with your approval.

Sincerely,

*William E. Kastenberg*

William E. Kastenberg  
Acting Director  
Nuclear Energy Laboratory

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Enclosures: Appendix A  
Appendix B