



SCHOOL OF ENGINEERING AND APPLIED SCIENCE
LOS ANGELES, CALIFORNIA 90024

January 20, 1977

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

Gentlemen:

Docket 50-142

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:

Introduction

The Nuclear Energy Laboratory is located in the UCLA School of Engineering and Applied Science with the principal access via room 2567, Boelter Hall. Activities within the laboratory are varied and include (1) the operation of a 100 kw Argonaut nuclear reactor, (2) undergraduate laboratory classes, (3) graduate student projects that are often NRC or DOE supported by contract arrangements, (4) a major DOE sponsored fusion research program, and (5) functions performed in machine and electronics shops.

The various activities engage a staff of approximately 25, a number of faculty members with research and/or educational interests within the laboratory, a number of graduate students conducting research, and closely supervised and scheduled undergraduate student classes.

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 along with a 5 curie Co-60 radioisotope source. The 4.7 kgs of the SNM in the non-exempt form are stored in the radioactive storage room. The safeguarding of the reactor and these materials is the dominant consideration in providing a security plan.

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Amendment #3

I. Design Features

A. Essential Equipment

The materials described in the preceding paragraph and the nuclear reactor comprise the essential equipment of the laboratory. The essential equipment is described in pages 1 through 5 of the Appendix. The reactor console is considered semi-essential equipment. It is located in a controlled area (B-level) during university working hours but it becomes an A level area (but non-alarmed) during non-working hours. This is accomplished by an electric key control system. (See also paragraph IC1c.)

B. Security Areas

1. Security Areas (A-level)

Security areas require A-level access or higher. These areas, the reactor high bay (room 1000), the radioactive storage room (within room 1540), and the control room during non-university working hours, are identified in figures 6 through 8 of the Appendix. The alarm system is shown with the ultrasonic transmitter and receiver transducers identified by an "X", the magnetic door switches by a "Y", and the master control units by a "Z". Security areas are protected by an intrusion alarm system (except the control room and offices), hence permit limited access, and present well defined physical boundaries to both innocent and overt intrusion.

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 doors provide the only access to the area. The inner door, #1, is a double-plated door 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 NRC Regulatory Guide 5.12. The steel mesh outer door, #2, is keyed to "A" level. The fuel plates and fuel scraps are stored in an Insulated Record Safe, Model T-20, Serial No. 48727, made by Herring-Hall-Marvin Safe Company. 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 diameter 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 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.

For the purpose of radiological control and personnel safety, the subcritical facility of room 1540 requires A-level access. Upon occasion, encapsulated neutron sources may be left in the subcritical facility or the reactor high bay (room 1000) for class

demonstration purposes or for instrument calibrations. The subcritical facility houses two natural uranium subcritical assemblies (graphite and heavy water), and a Kaman 1001-A neutron generator. Permissive entry by A-level access provides a prudent means of radiological control, but the security implications are regarded as negligible.

The storage pits in the reactor high bay contain irradiated fuel elements and a 5 curie Co-60 radioisotope source. Other radioactive materials may be stored within these pits as demanded by special circumstances. The storage pits 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. The plug can be removed with a special handling device and the reactor room crane. The concrete plug handling device and the crane are both secured with a Sargent and Greenleaf padlock.

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.

2. Controlled Areas (B-level)

Controlled areas require B-level access or higher. These areas include the reactor control room (day time only), a classroom, and laboratory space. The classroom is used primarily for undergraduate instruction, the laboratory areas for undergraduate experiments and graduate or contract research.

These areas, because of physical and administrative controls, serve as a buffer region or perimeter of the security areas.

3. Non-Security Areas (C-level)

Non-security areas require C-level access or higher. These areas are peripheral areas of the laboratory and include the reception room, adjacent offices, a transformer vault, and the third floor penthouse.

The areas denoted C-level are not within the scope of the security plan presented here. Figures 6 and 7 delineate these areas as parts of the laboratory without implying that they constitute a part of the plan. These areas are controlled only for the purpose of preventing theft of office equipment, books, etc.

C. 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. A-level is deemed security, B-level is deemed controlled, and C-level is deemed non-security.

All locks are Corbin heavy duty cylindrical six pin locks. The locks are keyed different from all UCLA master key systems. The key section is a Russwin commercial key section H8. Copies of the keys are not kept by the Hardware Department. This is done in order to reduce the possibility of compromise to the keying system. The key level required for passage through the doors in this facility is shown by letters, A, B, or C in figures 6, 7, and 8 of the Appendix. The letter D means dummied lock, and 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 Company, and was installed by the Physical Plant of UCLA. The type, model, and part number of each piece of equipment for the system, and additions to the system, appears on page 9 of the Appendix.

1.c. Reactor Operation Tamper Alarm

In order to prevent unauthorized operation of the reactor during off hours, the reactor controls have been tied to the intrusion detection system. The actuation of an operations switch on the reactor console during a reactor startup would actuate the alarm switch thereby putting the intrusion detection system into the alarm position. The switch which connects the reactor console to the reactor alarm system is inside the reactor high bay. If experiments are in progress whereby this setup would hinder operation of the experiment, the control rod drive relays inside the reactor high bay would be disconnected for the duration of the experiment. The control room becomes an A level area, but non-alarmed, during non-university working hours.

1.d. Alarm Transmission from NEL to the UCLA Police Station

The alarm lines within NEL are relatively tamper-proof. All junction boxes and frames both within and outside the alarmed areas of NEL have microtamper switches tied to the tamper alarm circuits of the alarm system. The alarm lines enter into a telephone terminal board and are hidden spliced directly into a 200 pair telephone cable. The door to the terminal board is keyed to A level and also "bugged" with two magnetic switches tied into the radioactive storage alarm system tamper circuit.

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 a private telephone line to the 24 hour manned Honeywell Alarm Receiver (W840B,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 there is an intrusion.

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.

B. Access Control

1. Personnel

A-level keys are issued only to employees of UCLA who work within the confines of the Nuclear Energy Laboratory. The distribution of A level keys is limited to no more than 10 individuals intimately concerned with reactor operations and/or maintenance. This group includes the Director, Laboratory Manager, Laboratory Health Physicist, Reactor Supervisor, Development Engineers, Mechanics, and Electronic Technicians. The names of the individuals holding these titles are on file with the Laboratory Security Officer. One A-level key is also issued to the watch-commander of the UCLA Police Department. It is to be used only in case of an emergency. He receives the same classroom instruction as the other UCLA Police Department Officers.

B-level 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 faculty, staff, and students who work within the laboratory but do not need access to the reactor high bay. The custodian is also assigned a B-level key.

B-level keys are issued also to the UCLA Police Department to be used by the patrol and investigative units. 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.

C-level keys provide access to the reception room, office space adjacent to the reception room, and to a machine room on the third floor. C-level keys are issued only on a temporary basis, to visitors temporarily occupying office space, to students awaiting qualification, to maintenance personnel and to temporary office help.

D. Procedures

1. Response to Detected Unauthorized Intrusions

The silent alarm sends a signal via a private 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 two other units would be able to respond to the alarm if the situation warranted it. In case the problem is too large 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 is 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 10 of the Appendix. Subsequent procedures to be followed are on file with the Laboratory Security Officer and posted in certain locations within the Laboratory.

4. Acts of Civil Disorder

For acts of civil disorder, the emergency procedures would be followed and the UCLA Police Department contacted.

5. Miscellaneous Procedures

Procedures of the following nature are also on file with the Laboratory Security Officer.

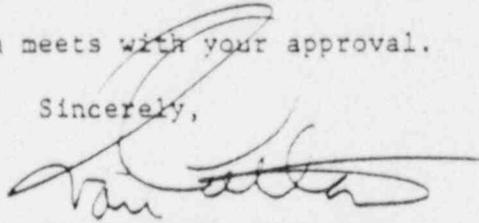
- a. Key request and approval
- b. Police or emergency call in of NEL employees during off hours
- c. Security violations and corrective actions
- d. Lost or compromised keys
- e. Ultrasonic alarm sensitivity

E. Security Program Review.

The security program will be reviewed every twelve months by the Laboratory Security Officer. He will also conduct a key inventory and I.D. check on an annual basis and a door/lock check on all A and B level doors on a monthly basis.

We hope that his security plan meets with your approval.

Sincerely,



Ivan Catton, Director
Nuclear Energy Laboratory

IC/CEA/NCO/14

Enclosures: Appendix

cc: LeRoy R. Norderhaug - NRC Region V
Harold Brown - Environmental Health & Safety
Chief Boyd Lynn - UCLA Police Department
C. E. Ashbaugh - Laboratory Security Officer