GENERAL ELECTRIC COMPANY

NUCLEAR ENERGY BUSINESS OPERATIONS

VALLECITOS NUCLEAR CENTER

RADIOLOGICAL CONTINGENCY PLAN

NOVEMBER, 1982

(REVISED MARCH, 1985)
(REVISED JUNE, 1986)
(REVISED MARCH, 1987)
(REVISED FEBRUARY, 1988)

SYNOPSIS OF EMERGENCY PROCEDURES

The VNC Emergency Procedures Manual, "Site Emergency Procedures - VNC", is attached to this radiological contingency plans document as Appendix B and shall be utilized in the event of the declaration of any emergency at the VNC site.

The emergency manual, "Site Emergency Procedures - VNC", consists of a general emergency control procedure plus individual procedures for specific types of emergencies. Procedure A-5, "Emergency Control Procedure - General", identifies an emergency control organization, summarizes the responsibilities of key personnel, briefly describes the emergency communication systems, and describes a classification system for emergencies. Other procedures in the emergency manual are:

B-5, Bomb Threats
C-5, Fire Protection
D-5, Criticality Emergency
E-5, Radiation Emergency
F-5, Confrontation
G-5, Civil Disorder
H-5, Earthquake, Tornado and Hurricane
J-5, Major Power Outage
K-5, Breach of Security
L-5, External Release of Emergency Information

Bomb Threats

Site personnel receiving a bomb threat will immediately notify the Security Shift Specialist, who will immediately notify the Emergency Operations Coordinator (EOC). The EOC will be responsible for decision making and initiating bomb threat response plans.

The procedure for handling bomb threats describes detailed aspects of the search patterns, squad organization, and how the alert is terminated after all areas have been cleared.

If an object of a suspicious nature or shape, the sound of a clock ticking, or other unidentifiable objects are located, the EOC is to be notified so that steps can be initiated to isolate the area and provide qualified inspectors to correct the situation. Under no condition should an object of a suspicious nature be touched or disturbed by an employee.

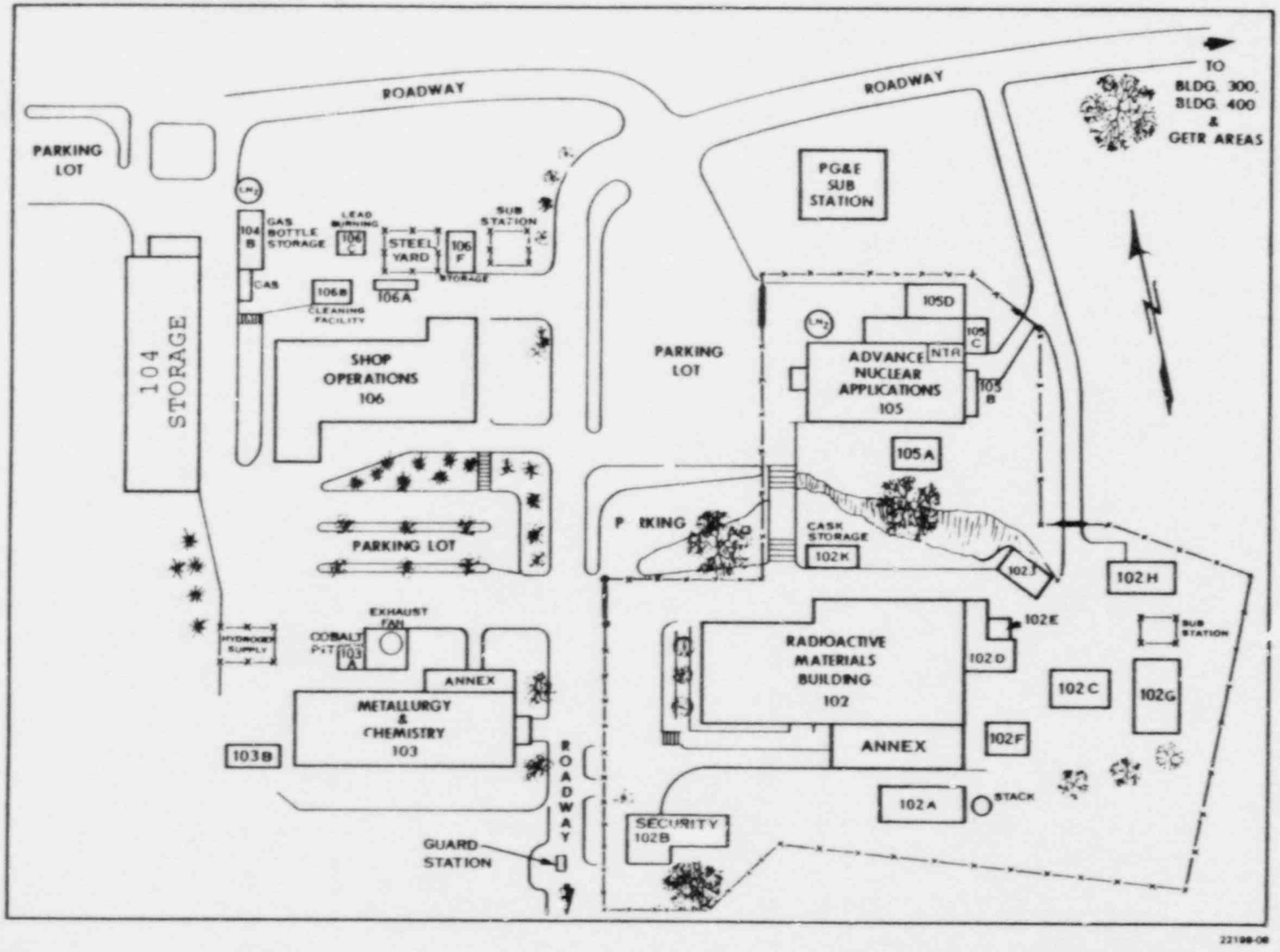


Figure 1.2-8. Plot Plan - 100 Area

A shielded in-floor dry storage pit is located immediately adjacent to the Radioactive Materials Laboratory water storage pool for temporary storage of irradiated fuel assemblies, rods, or other irradiated material.

An area that was an analytical laboratory facility in support of the AFL is located on the main floor of Building 102. All plutonium-contaminated equipment has been removed to a DOE facility; the area has been decontaminated for alpha-emitting isotopes and converted into a "hot" shop used in support of RML.

1.2.7.2.2 Basement

The basement of Building 102 was formerly occupied by the Advanced Fuel Laboratory (AFL) and later the Fuel Fabrication Laboratory (FFL). The AFL was engaged in research and development of plutonium and mixed-oxide fuels. All potentially plutonium-contaminated equipment (e.g., glove boxes and fume hoods) has been removed to a DOE facility, and the laboratory and associated rooms have been decontaminated thoroughly for alpha-emitting isotopes. The FFL was a uranium fuels development facility employing low-enriched uranium. All activities involving SNM have been discontinued.

1.2.7.2.3 102 Annex

The Building 102 Annex (see Figure 1.2.8) currently houses a shielded cell used for the assembly of californium neutron sources, nonradioactive shops that support the hot cell facilities, and site shipping and receiving facilities. Inside the shielded facility is an 8-inch diameter, 6-foot deep storage pit.

1.2.7.3 Building 103

A second major laboratory building in the 100 Area is the Metallurgy, Chemistry, and Ceramic Laboratory - Building 103. This two-story building consists of laboratories, variously equipped with laboratory apparatus designed to handle relatively low-level quantities of radioactive materials, and offices. The functions served by this facility are research, development, and analytical chemistry services.

1.2.7.4 Building 104

This building formerly housed shops, offices, and storage space. Currently, it is used only for storage.

1.2.7.5 Building 105

Just north of Building 102 is Building 105. The principal facilities located in this building are a research reactor (the Nuclear Test Reactor) and laboratories. Offices for the assigned personnel are provided in the building.

The Nuclear Test Reactor may serve as a source of neutrons for irradiations, experiments, and as a sensitive device for reactivity measurements. The laboratories in Building 105 use only minute quantities of radioactive materials.

1.2.7.6 Building 106

Building 106 contains maintenance shops, radiation instrument calibration facilities, and the development shop. Radioactive materials are brought to the development shop as encapsulated devices for equipment or mechanical modification and radiography.

1.2.7.7 Area 200

This entire area was the GETR facility. The reactor was placed in a cold shutdown condition in October, 1977. The last fuel was shipped from the facility in October, 1982. The facility is deactivated, and a "possess only" license (TR-1, Amendment No. 14) was issued in February, 1986. The license authorizes possession of the by-product material as may have been produced by operation of the reactor. No source or special nuclear material is authorized.

1.2.7.8 Area 300

Originally, this was the VBWR facility. Later, the EVESR facility was added to the area. Both facilities have been deactivated for over 15 years. The support facilities have been modified to provide laboratory, test and storage facilities, and office space. The radioactive liquid waste evaporator plant is located in this area adjacent to the deactivated VBWR site.

1.2.7.9 Area 400

The 400 Area includes two buildings, 400 and 401. Building 401 is devoted to offices and non-radioactive material laboratories. Building 400 formerly contained an experimental low-enrichment uranium scrap recovery system, and there were some activities that involved by-product material licensed by the State of California. Building 400 experiment areas have been decontaminated, and there are no plans to use radioactive material in the building.

1.2.7.10 Solid Radioactive Waste Storage Facility

Solid radioactive wastes generated at the various laboratory and facility locations are stored in the waste storage facility located approximately midway between the VBWR and GETR areas. Shielded storage facilities consist of horizontal tubes for storing 5- and 7-inch diameter waste liners.

filters and ion exchange columns, and automatic control of the proper water level is maintained. A radiation detector located above the pit is equipped with an alarm to warn of a drop in shielding water level. The facility is locked, and all entries are made on a controlled basis.

A radiological evaluation assuming the loss of all material at risk authorized for this building resulted in site boundary consequences less than the lowest EPA PAG values.

1.3.4 Building 104

This building is a storage facility. Radioactive material in DOT Specification shipping containers and small sealed sources contained in equipment may be stored in this building. The contained radioactive material in Building 104 is judged not to be material at risk.

1.3.5 Building 105

This building contains the Nuclear Test Reactor (NTR), two vault-type rooms, special measurement laboratories, and offices. At the present time only the NTR facility uses significant amounts of radioactive materials.

1.3.5.1 Nuclear Test Reactor

The NTR is a heterogeneous, enriched uranium, graphite moderated and reflected, light-water-cooled, thermal reactor licensed to operate at powers up to 100 kW (thermal). The core is cooled by either natural or forced circulation of deionized light water circulated in an aluminum primary system located inside a heavy concrete, thick-walled, shielded cell. The reactor is a variable level neutron source used in the research, development, analytical, and commercial programs of General Electric and its customers. Presently, the reactor is used primarily for neutron radiography work; however, other potential uses are:

a. Reactivity measurements of fuel and structural materials for quality control purposes.

b. Variable neutron source for nuclear detector research, development, and quality control.

c. Radiation effects studies.

d. Limited isotopes production.

Analyses show that fuel melt is not possible from loss of coolant from the NTR.

1.3.5.2 Vault-Type Rooms

Neither of the two vault-type concrete-shielded rooms in Building 105 is used for radioactive materials work or storage.

1.3.5.3 Laboratories

Several laboratory areas in Building 105 contain equipment for research and special measurement activities. This work involves minimal amounts of radioactive material used in conjunction with the following types of equipment:

a. Mass Spectrometers

b. Scanning electron microscope

c. X-ray diffraction machine

d. Electron microprobe

e. Ion microprobe

A radiological evaluation assuming the loss of all licensed material at risk authorized for this building resulted in site boundary consequences much less than the lowest EPA PAG values.

1.3.6 Building 106

This building houses the machine shop, instrument shop, electrical shop, carpenter shop, development shop, an x-ray room, radiation instrument calibration room, and offices. The shops currently are equipped with machine tools, furnaces, welding equipment, leak detectors, controlled atmosphere chambers, hand tools, and other conventional shop equipment.

1.3.8.1 Building 300

In this building mechanical properties of irradiated Zircaloy are analyzed and radiochemistry training classes are conducted. On occasion, low levels of radioactive materials may be handled in designated building areas.

1.3.8.2 Building 302

Gas technology development operations were conducted in Building 302. Testing operations were conducted for filtering and trapping fission gases. These operations which utilized microcurie to millicurie quantities of gases have been discontinued. The deactivated equipment remains in storage.

1.3.8.3 Building 349

Liquid waste evaporator operations are conducted at Building 349. Low-level radioactive liquid wastes are collected from various site areas and transported in a portable 1,500-gallon tank to this facility for processing. The contents of this portable tank are pumped to a 5,000-gallon evaporator feed tank. The concentrates from the evaporation process are transferred into Department of Transportation (DOT) Specification 55-gallon drums and solidified with diatomaceous earth and cement. These solid wastes are stored temporarily at the waste evaporator area, then delivered to the solid radwaste storage facility prior to off-site shipment. Processing is on a batch basis, and approximately 800 gallons of liquid waste per 8-hour shift can be evaporated. Tanks which originally were part of the VBWR/EVESR tank farm are located in close proximity to the waste evaporator area and are used for interim storage of surplus low radioactive concentration liquid wastes. The off-gas stack for the facility is equipped with absolute filters and a stack monitor. A radiological evaluation assuming the loss of all material at risk authorized within this area resulted in site boundary consequences less than the lowest EPA PAG values.

1.3.9 Area 400

1.3.9.1 Building 400

A small pilot plant operation for the recovery of low-enriched (≤ 4%) uranium from unirradiated fuel scrap material was located in a high-bay laboratory addition to Building 400. All activities involving SNM have been terminated. The process system has been dismantled and has been disposed of. The building has been decontaminated and is used for non-radioactive work and storage.

TABLE 1.3-1

STACK AND STACK SAMPLER DATA

Stack Number	Stack Location, Building Number	Stack Height Above Roof, Feet	Stack Size, Inches	Nominal Stack Flow Rate, $ft^3/min.$	Number of HEPA Filters Final	Sampling Flow Rate, $ft^3/min.$	TYPE OF SAMPLING[c]		
							Particulate Filters	Charcoal Cartridge	Gaseous Activity
4	102A	75[b]	66 dia.	40,000[d]	90	1.5, 3.0	X	X	X
8[a]	102H	14	9.5 x 12.75	750	--	--			
12	103	48[b]	60 dia.	40,000[e]	40	1.5	X	X	
16	105 (NTR)	45[b]	13.5 x 13.5	3,000[f]	4	1.0	X	X	X
17[a]	105 (PCL)	11	16 x 22	1,200	2	1.0	X		
21[a]	106 (South)	12	13.75 x 20.5	3,700	--	--			
22[a]	106 (North)	9	12 x 16	750	--	--			
26	GETR	95[b]	38 dia.	7,000[g]	--	2.0	X		
30	Waste Evaporator	19.5	13 x 17.75	2,400	4	1.0	X	X	
31[a]	304	32[b]	18 dia.	2,900	0	--			
34	Waste Storage (Hillside)	13	13 x 17.75	1,000	1	1.0	X		
37[a]	400 (East)	45[b]	35 dia.	21,000	18	1.8	X	X	
38[a]	400	14[b]	18 dia.	5,000	6	2.5	X		
41	401	30[b]	15 x 18	4,000	--	--			
45	300 (Lab 108A)	21[b]	15.75 x 22.25	500	3	1.0	X		
46[a]	300 (Labs 108B&C)	15	16.5 x 17.75	4,600	6	1.5	X		
48	300 (Training Lab)	14.5	15.75 x 22	3,000	4	1.3	X		
50[a]	302	38[b]	21.65 dia.	6,000	6	1.0	X		

[a] On standby; not operated routinely.
[b] Feet above ground level.
[c] Type of sampling employed is indicated by X.
[d] Normal operation with two fans - 40,000 cfm. If four fans are used, then flow rate - 50,000 cfm.
[e] Large fan (day shift) - 40,000 cfm; small fan (nights and weekends) - 20,000 cfm.
[f] Cell door open - 3,000 cfm; cell door closed - 2,000 cfm.
[g] Slow speed - 7,000 cfm; high speed - 18,000 cfm.

abnormal conditions resulting from operator error or malfunction of process control equipment. Detail regarding specific systems is provided in the documents listed in Appendix A.

2.1.2 Alarm Systems and Release Prevention

Criteria in License SNM-960, Appendix A, Section 8.0 and the criteria presented above in Section 2.1 apply to detector and alarm systems provided to detect and alert operators to accidental releases of radioactive materials and to systems important to preventing or mitigating the consequences of accidental releases. Detail regarding specific systems is provided in the documents listed in Appendix A.

Detector and alarm systems installed to monitor "anticipated operational occurrences" (VNC definition includes normal operations and all events up to and including Design Bases Accidents) have been shown with over 20 years of experience to be adequate to detect significant accidental releases. Alarm systems which immediately alert operators and/or initiate automatic corrective or mitigative actions are installed based on a case-by-case evaluation of the release potential of the specific facility or process.

Upon detection of an accidental release of radioactive material, the following is a typical sequence of events that would be initiated to limit the release and to mitigate the consequences.

a. The release would be detected by one or more of the following systems:

   (1) stack radioactive material monitor;

   (2) local continuous air monitor (CAM);

   (3) local area gamma detectors;

   (4) process monitor such as level, temperature, or pressure detection systems.

b. An operator would respond to the alarm as described in the facility or process operating procedures. If appropriate, the emergency plan will be implemented. Typical response would be:

   (1) evacuate personnel from the area, and isolate system or area as necessary;

   (2) notify facility supervision/management and the Emergency Operations Coordinator (EOC), if appropriate;

   (3) verify that intended automatic actions occurred;

   (4) implement manual actions such as operate valves, turn off heaters, or shut down the process.

4. Establish surveillance procedures, including periodic tests to ensure the operational readiness of the emergency equipment. Maintain records that demonstrate compliance with the procedures for at least 2 years from the time of performance.

5. Develop and maintain current assigned emergency procedures.

6. Assign skilled craftsmen as members of the Building Emergency Teams.

7. Coordinate all activities pertaining to site and facility fire protection and fire fighting.

4.2.2.3 Senior Licensing Engineer

(Deleted)

4.2.2.4 Occupational Health Nurse

The Occupational Health Nurse has the following duties and responsibilities:

1. Provide medical assistance as required during the emergencies.

2. Coordinate arrangements for admissions to hospitals and for obtaining ambulance service or other transportation.

3. Obtain written agreements regarding the treatment and transportation of injured persons that are radioactively contaminated.

4. Obtain medical assistance, equipment, and supplies as required.

5. Maintain the emergency medical supplies.

VNC Actions (Continued)

9. Close out or recommend reduction in emergency class by briefing of off-site authorities followed by written summary within 48 hours of close-out or class reduction.

3.3 Range of Postulated Accidents

3.3.1 Action Levels - Notification of Unusual Event

1. Radiological effluent action levels as specified in Vallecitos Safety Standard (VSS) 7.2, "Effluent Control", for each facility are exceeded by a factor of 100 to 1,000 for a period > 1 hour.

   Assessment of off-site impact: < 50 milliRem equivalent whole body (WB) dose.

2. Loss of safety system or fire protection system function for a radioactive materials facility requiring a shutdown of operations because of technical specification requirements, license conditions, or as determined by the Area Manager.

3. Fire within any facility where radioactive materials are handled, used or stored lasting more than 10 minutes but without the potential for preventing a safety system from performing its intended function.

4. Security threat or attempted entry or attempted sabotage.

5. Natural phenomena being experienced or projected beyond unusual levels:

   a. Any earthquake felt at the site or detected on site seismic instrumentation.

   b. Any tornado or hurricane on site.

6. Other hazards being experienced or projected:

   a. Aircraft crash on site.

   b. Near or on-site explosion.

   c. Near or on-site toxic or flammable gas release.

7. Transportation of contaminated injured individual from site to off-site hospital.

8. Category 1 or 2 bomb threat. (See Appendix B, Procedure B-5.)

9. Loss of normal electrical power to a safety system that requires electrical power to perform its intended function.

3.3.2 Action Levels - Alert

1. Radiological effluent action levels as specified in VSS 7.2, "Effluent Control", for each facility are exceeded by a factor of 1,000 to 2,000 for a period > 1 hour.

   Assessment of off-site impact: < 0.5 Rem equivalent WB dose.

2. Fire that prevents or could prevent a safety system in one or more facilities where radioactive materials are handled, used, or stored from performing its intended function.

3. Ongoing security compromise.

4. Severe natural phenomena being experienced or projected:

   a. Earthquake of intensity equivalent to or greater than Modified Mercalli V*.

   b. Any tornado striking a facility on site.

   c. Hurricane winds with sustained speeds between 75 and 90 mph.

5. Other hazards being experienced or projected:

   a. Aircraft crash on any site facility.

   b. Missile impacts from whatever source on any site facility.

   c. Known explosion damage to any facility that prevents or could prevent a safety system for a radioactive material facility from performing its intended function.

   d. Entry into any facility of uncontrolled toxic or flammable gases.

---

*Modified Mercalli V: Felt by most people; some breakage of dishes, windows, plaster; disturbance of tall objects.

4.0 ORGANIZATION FOR CONTROL OF RADIOLOGICAL CONTINGENCIES

In this chapter the radiological contingency organization is described. Authorities and responsibilities of key individuals, groups and organizations are discussed.

4.1 Normal Plant Organization

The Vallecitos plant site provides working space for many company organizations. The site facilities are administered and maintained by Irradiation Processing (IP). Included in IP's responsibilities are site wide services such as nuclear safety, environmental protection, security, facilities maintenance, and emergency planning.

On-site organizations are:

BWR Technology*

Chemical Products Technology & Development

Process & Radiation Chemistry

Fuel & Plant Materials Technology

Irradiation Processing

Advanced Nuclear Applications

Reactor Operations & Support Services

Nuclear Safety

Radioactive Materials Services

Remote Handling Operation

Marketing

---

*Parent organization; not located on site.

4.2 On-Site Radiological Contingency Response Organization

The Emergency Control Organization shall be as shown in Figure 4-1. From the moment he becomes aware of an emergency, an Emergency Operations Coordinator (EOC) is responsible for coordinating emergency response activities. At VNC, the organizational structure provides for an initial response phase and a secondary response phase for all emergencies.

Responsibilities of members of the Emergency Control Organization, VNC management, and support specialists shall include those listed below. Additional responsibilities and duties may be assigned in the implementing procedures.

4.2.1 Direction and Coordination

4.2.1.1 Manager, Irradiation Processing (IP)

The Manager, IP, is the senior GE employee on site. He or his delegated alternate has overall responsibility for emergency response and preparedness activities at VNC. His authority extends to that of enjoiner; and in the face of conflict or indecision, his judgment is final.

The responsibility and authority for directing and coordinating emergency response activities are assigned to Emergency Operations Coordinators (EOC). Duties and authorities of the EOC during initial and secondary phases of an emergency are discussed below.

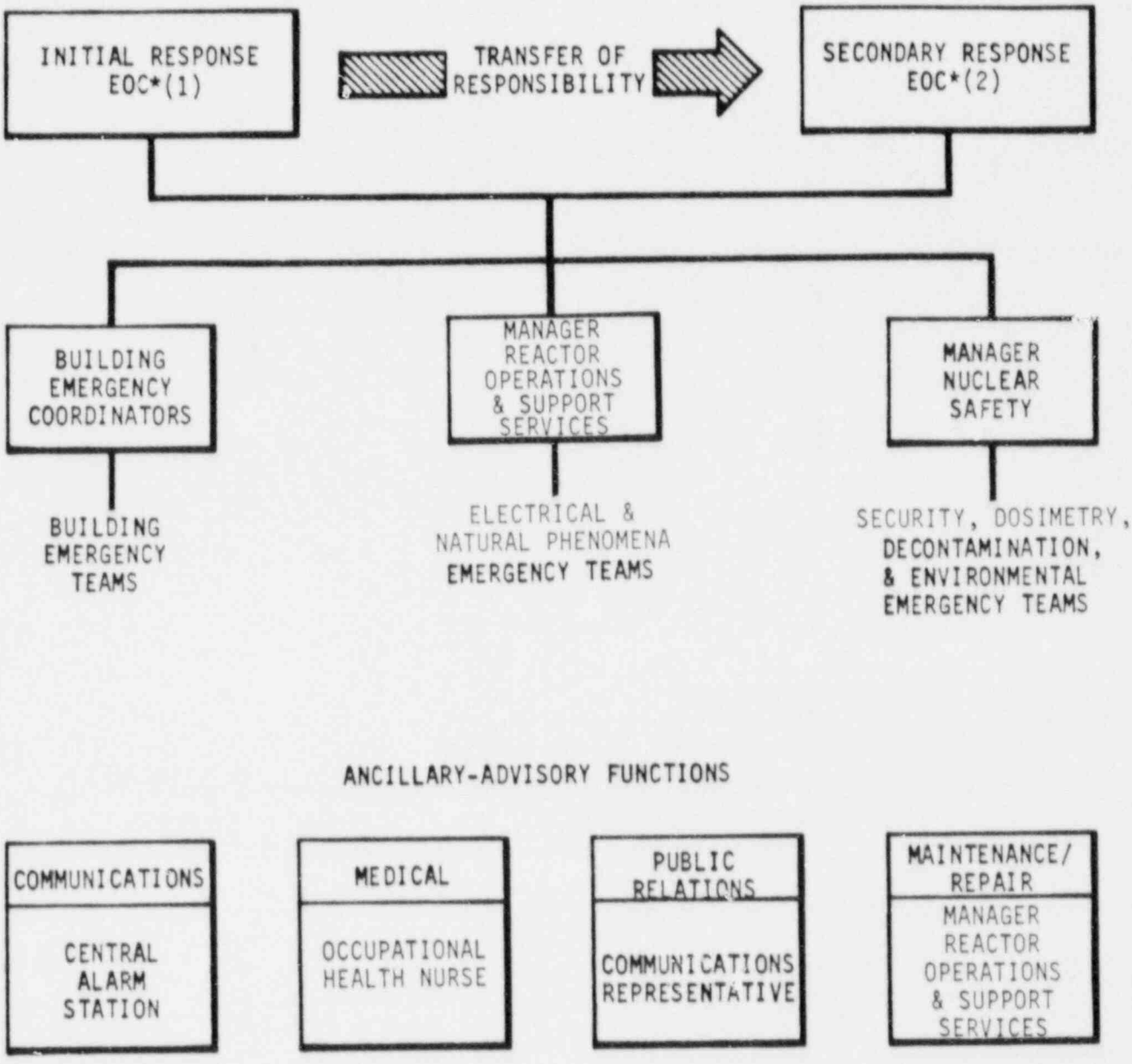
4.2.1.2 Emergency Operations Coordinator

The on-duty Specialist-Facilities Protection is the Initial Response Emergency Operations Coordinator (EOC) for all emergencies at VNC.

Specialists-Facilities Protection are GE employees trained for implementing and coordinating emergency response activities and assigned to provide continuous coverage at VNC on a three-shifts-per-day, seven-days-per-week schedule.

In the extremely rare instances when the regularly assigned Specialist, Facilities Protection (S-FP), is to be absent from the site or otherwise unavailable for emergency response, the Secondary Response EOC will be notified that he has Initial Response EOC responsibilities during the S-FP's absence. The name and phone number of the Secondary Response EOC will be posted at the emergency communications center.

Manager, IP, or his emergency response alternate is the Secondary Response EOC.



*Emergency Operations Coordinator

(1) Specialist, Facilities Protection.
(2) Manager, IP, or his emergency response alternate who is the IP manager determined from a succession list.

Figure 4-1. VNC Emergency Control Organization

The Manager-IP's alternate for Secondary Response EOC is the IP manager determined from a succession list composed of at least three members of his staff. The emergency response alternate will be the manager whose name is highest on the list that is present at the site. If none of the managers are present, call-in will be according to the succession list.

The Emergency Operations Coordinator (EOC) has the responsibility and authority for the following:

1. Initiation and implementation of the site emergency procedures and coordinating the emergency response activities of the Emergency Control Organization (and off-site assistance) for the duration of the declared emergency.

2. The Initial Response EOC shall coordinate activities until relieved by the Secondary Response EOC; his duties and responsibilities include:

   a. Assessment of the indicated or reported situation and initiation of whatever action is deemed necessary to minimize personnel injury and property damage.

   b. Prompt notification of the Secondary Response EOC if needed. Upon request by the Secondary Response EOC, initiate actions such as designating the location of the Emergency Support Center (ESC); notification of Manager, IP, and other Emergency Control Organization members, or off-site support agencies or personnel; and initiate implementation procedures.

   c. Provide a status report and relinquish command to the Secondary Response EOC when he arrives on site.

3. Upon arrival on site and receipt of a status report from the Initial Response EOC, the Secondary Response EOC assumes all EOC responsibilities for implementation of the site emergency procedure and coordinating emergency response activities; his duties and responsibilities include:

   a. Activation of emergency teams, if needed, and coordination of their activities.

   b. Notification of appropriate management representatives, ancillary-advisory function personnel, and off-site agencies.

4.2.2.5 Area Managers

Area Managers are designated by the Manager, IP, in VSS 1.3.1, "Area Manager Assignment Listing". Where more than one Area Manager is assigned to a building or area and it is unreasonable for each to issue procedures, maintain an emergency team, etc., one of them is assigned the responsibility for coordinating these activities. Area Managers are assigned the following duties and responsibilities:

1. Establish written procedures as necessary to provide the additional details necessary to implement the site emergency plans and procedures for their area(s) of responsibility.

2. Maintain in operational readiness the equipment and personnel required to implement the site emergency plans and implementing procedures for their area(s) of responsibility.

3. Ensure appointment of a Building Emergency Team, including a Building Emergency Coordinator who is the emergency team leader, for their area(s) of responsibility.

4. Education and training of all assigned personnel for proper emergency response in their area(s) of responsibility.

5. Hold drills and exercises as necessary to demonstrate the effectiveness of emergency procedures and training and the availability and operational readiness of equipment for their area(s) of responsibility.

6. Provide and update response procedures for the Site Alarm Systems Action Book, located at the emergency communications center, for each alarm from his assigned area(s) connected into the system.

4.2.2.6 Building Emergency Teams

Area Managers will ensure there is a Building Emergency Team (BET) appointed for each building or area for which he has emergency response responsibility. Minimum functions on each team will be team leadership, assembly area control, fire suppression, and first aid; in addition, where warranted by the nature of the facilities, there may be additional functions (e.g., radiation monitoring and equipment operation and service). There will be at least one alternate designated for each function except fire suppression. The fire suppression function is provided by a site fire team which has a sufficient number of appointed members that alternates are unneeded. This site fire team responds to fires in all buildings and is considered a component of the BET it is supporting.

4.3.2 First Aid Personnel and Ambulance Services

First aid assistance is available on an informal basis from the Alameda County Sheriff's Department and the State of California Highway Patrol. Normally, contact with these agencies would be by telephone; however, radio communication with the Sheriff's Department is available at the Central Alarm Station (CAS) in the security building (102B).

Ambulance service is available from a privately owned company. During normal work hours, when there is no declared emergency, arrangement for transportation will be made by telephone by the VNC Occupational Health Nurse; at other times, these arrangements will be made by the Specialist, Facilities Protection. During a declared emergency, the arrangements will be made through the emergency communications center as directed by the EOC.

4.3.3 Services of Other Medical Personnel On Site

A company physician is on site one-half day per week and on call for emergencies. A company nurse is available on site during normal work hours and will be called in for emergencies. These individuals provide the emergency response medical function. There are no other on-site medical personnel.

4.3.4 Fire Fighting Backup

VNC has fire fighting backup from the participants in the Twin Valley Mutual Aid Agreement. Request for assistance will be made by telephone or radio. In the event of a request for assistance, first response will be by the California Division of Forestry (CDF). If additional assistance is needed, personnel and equipment are available from LLNL, Alameda County, City of Livermore, City of Pleasanton, Veterans Administration Medical Center, Dublin-San Ramon Service District, Alameda OES Headquarters, and Camp Parks.

4.3.5 Police Assistance

VNC has a formal agreement for police assistance with the Alameda County Sheriff's Department. Assistance is available from the California State Highway Patrol on an informal basis. Communications with either agency can be by telephone and with the Sheriff's Department by radio.

4.3.6 Other

None.

4.4 Coordination With Participating Government Agencies

VNC is located in an unincorporated area of Alameda County, California. For this area, the County is responsible for government agency initial response. Assistance from appropriate state and/or federal agencies is available. The agencies or organizations for each level of government that may participate are identified below.

5.5.1.2 Radiation Protection Program

Exposures at VNC are controlled in accordance with Vallecitos Safety Standard 5.2, "Exposure Limits". When immediate action is necessary to mitigate or prevent a hazardous situation, the responsible Area Manager or the EOC may authorize entry into exposure rates greater than 150 Rem per hour without further approval. In no case shall planned whole body doses exceed those identified in Table 5-1; that is, 25 Rems for protection of health and property and 75 Rems for saving human life.

5.5.1.3 Monitoring

Emergency monitoring to determine doses and dose commitments to personnel at VNC is described in implementing procedures which specifically address the subjects of personnel decontamination, an emergency dosimetry team, and a personnel emergency decontamination team.

5.5.2 Decontamination of Personnel

Based on VNC's operating philosophy of no personnel contamination or internal depositions, the action levels for decontamination are based on detectable levels with the instrumentation used for the isotopes of concern. Personnel exhibiting the greatest degree of contamination and with the greatest potential for internal deposition from this contamination normally will be decontaminated first unless an unusual case of localized contamination could cause severe damage in the contaminated area; e.g., >> 1.0 $\mu Ci/cm^2$ beta-gamma or 0.004 $\mu Ci/cm^2$ alpha.

Decontamination methods, supplies, instruments, materials, and procedures are described in implementing procedures as mentioned above. Also, there is a procedure for emergency locker inspection and maintenance.

5.6 Medical Transportation

Transport of injured persons to off-site medical facilities (see 5.7) will be by private ambulance or Company vehicle(s). Arrangements for transportation of injured persons are the responsibility of the Occupational Health Nurse or in her absence the EOC upon determination of severity and urgency. During an emergency, communications with the off-site agencies will be made by the emergency communications center. Individuals who are contaminated and due to medical urgency must be transported prior to decontamination shall be accompanied by a qualified radiation monitor to control the spread of contamination.

Supplies are available such as oxygen, a variety of dressings, splints, IV fluids, and emergency medicines. There are also two large trunks filled with emergency medical supplies at another location on site.

6.4.2 Personnel Decontamination

In the event of a radiological emergency wherein personnel have been contaminated, they will be taken to a designated decontamination center on site. They will be decontaminated by trained teams using agents and tools maintained at the centers.

6.4.2.1 Decontamination Centers

Decontamination centers have been established at Building 102 and Building 103. The selection of which center to use will be made by the EOC based on the location of the emergency. Such factors as type and severity of the event and numbers of people involved also will be considered.

6.4.2.2 Decontamination Teams, Equipment and Supplies

Decontamination teams, methods, equipment, materials, and supplies are described in the implementing procedure discussed in Paragraph 5.5.2.

6.5 Emergency Monitoring Equipment

The following paragraphs list and describe the emergency equipment that is available for personnel and area monitoring, as well as that for assessing the release of radioactive materials to the environment. All equipment is periodically maintained and calibrated as discussed in Section 7.5.2. The operational readiness of equipment between maintenance periods is assured by daily use in change rooms, at step-off pads, or other monitoring activities.

6.5.1 Personnel Survey Meters

6.5.1.1 Eberline Model PIC-6A

The Eberline Model PIC-6A is a small, lightweight, portable, battery-powered dose rate meter which measures beta-gamma radiation.

The detecting element is a gas-filled ionization chamber which operates in the proportional gas multiplication mode. A beta window is located in the bottom of the instrument case and provides capabilities for the detection of energetic betas.

The PIC-6A has a six-decade range (from 1 mR/hr to 1,000 R/hr) using a two-range switch of three decades each.

and cadmium shield, higher energy neutrons can be detected. The dual-scale meter has three ranges: 0-800; 0-8,000; and 0-80,000 cpm; and 0-24, 0-240 and 0-2,400 thermal neutrons/cm^2-sec.

Dose rates can be estimated with this meter by use of a conversion graph if neutron energies are known.

6.5 1.13 Other Monitoring Instruments

In addition to the above-listed instruments, there are a few of the same basic instruments on site, such as G-M's, manufactured by other instrument companies. Permanent hand-and-foot monitors are installed at the exits from the major radioactive materials facilities on site. They detect beta-gamma or alpha activity as appropriate to the facility.

6.5.2 Assessment Systems

These systems are used to assess the magnitude and likely dispersion of releases.

6.5.2.1 Water Sampling and Monitoring Systems

Four large basins (60,000 gallons) receive the site industrial liquid waste. In normal operation, no radiological waste enters the system. Such waste goes into a closed system and is collected in waste tanks for processing. The basins represent an excellent collection/retention resource in case of a spill of radiologic wastes into the drain lines. Manual sampling is done on effluents, and any basin could be held until cleanup has been accomplished.

6.5.2.2 Meteorological Monitors

The VNC meteorological station is located on a round-topped knoll about 2,000 feet south-southeast of GETR and just south of Lake Lee. Wind speed and direction are measured by an anemometer and vane atop a pole 45 feet above the terrain. This is at an elevation of about 630 feet above sea level. The speed and direction data are recorded on a two-pen strip chart recorder. These records give the general flow patterns of wind over the site. There are two temperature sensors mounted on the pole, one at 20 feet and one at 40 feet above the ground. These data are recorded on two circular charts. A standard rain gauge located approximately 5 feet above ground level is recorded. All data records collected from the station are provided on a routine basis to the Specialist, Facilities Protection. All instruments are calibrated as necessary.

7.0 MAINTENANCE OF RADIOLOGICAL CONTINGENCY PREPAREDNESS CAPABILITY

7.1 Written Procedures

The responsibility for ensuring implementing procedures are prepared and reviewed for effectiveness is assigned to Manager, Nuclear Safety. Each implementing procedure will be reviewed, evaluated and approved by the appropriate individuals.

Review shall be obtained from all organizational functions identified within the procedure.

Changes to the Site Emergency Procedures (see Section 5.1) will be in accord with NS Administrative Procedure, "Document Control". Manager, Nuclear Safety, shall approve all proposed changes and determine whether additional review and approval are needed. Paragraph 7.4 establishes an annual review cycle for the radiological contingency plan.

7.2 Training

Emergency procedures, no matter how well written, are effective only if the persons who are to respond to them and who implement them are familiar with their contents and have the capability of following them. Consequently, training is one of the most important aspects of any emergency preparedness program. This section is intended to specify who the emergency response personnel are and to describe the training that is provided to the emergency staff and off-site support personnel.

7.2.1 Emergency Training Program

Emergency preparedness training (except fire fighting and first aid), reviews, and coordination of tests, drills, and critiques are provided by the Nuclear Safety function; but the responsibility for assuring facility specific personnel are trained rests with the Area Manager(s) for the facility. Fire fighting training is provided by the Site Fire Marshal. Assigned emergency response personnel are given the appropriate radiological safety training courses as well as specific training related to their particular team or functional assignments. Off-site support personnel are invited to participate in these training sessions; and tours can be arranged to familiarize them with the topographical layout, site facilities, types of work performed, and the materials handled at the VNC site.

The following courses are given as appropriate for the facilities, activities, and materials at risk at VNC to provide the necessary degree of training as part of the required emergency preparedness program.

7.3 Tests and Drills

Periodically, on-site emergency drills will be conducted to test the adequacy of emergency plans and procedures. The drills will be planned and performed to specifically test the following:

(1) System for notification of on-site personnel.

(2) Prompt and effective evacuation of the involved facility or area.

(3) Performance of the on-site emergency organization.

(4) Availability of emergency equipment.

(5) System for notification of off-site personnel and organizations.

At least annually, drills will be held to test the integrated response of the on-site emergency control organization to (1) simulated fire in the 100 Area and (2) simulated criticality in each facility that has a potential for an accidental criticality accident. The location for the fire drill will be selected by the Site Fire Marshal; it will be a building in which activities authorized by License SNM-960 are performed.

At least every two years, drills will be performed to test the system for notification of off-site personnel and organizations.

A critique will be held for each drill performed. Lessons learned and pertinent observations will be identified and reported to management for evaluation. If appropriate, changes to emergency plans and procedures will be made.

7.4 Review and Updating of the Plan and Procedures

The Manager, IP, is responsible for:

1. Preparing and instituting an emergency plan.

2. Periodically reviewing the plan's effectiveness.

3. Reviewing the plan for potential modification annually.

The Manager, IP, has assigned the responsibility for coordination of these activities to the Manager, NS. Responsibility for maintenance of specific portions of the plan is assigned to appropriate organizational components. Area Managers are responsible for developing and maintaining appropriate implementing procedures. The site plan will be reviewed annually and the implementing procedures biennially and whenever there are significant changes in processes, kinds of material or inventory at risk, and plant organization.

9.0 RECOVERY

While it is not practicable or even possible to plan detailed recovery actions for all conceivable situations, general criteria applicable to any recovery operation can be specified. From these criteria, specific recovery plans can be developed, when required, based on whatever emergency situation occurred.

9.1 Reentry

Reentry into an affected area during an emergency situation may be necessary to rescue injured or trapped personnel and to limit the actual or potential consequences. For some emergencies such as a fire, reentry may be necessary to effectively terminate the emergency; for other emergencies, reentry may be necessary for assessment purposes. Personnel and procedures used will depend on many factors such as the class of emergency, type of emergency, purpose of the reentry, timing, etc. Nevertheless, the following criteria will apply to all reentries:

1. Reentry must be authorized by the BEC or the EOC. The BEC will restrict his authorization to cases where to the best of his knowledge immediate action is necessary to prevent loss of life or serious injury, and the reentry will not endanger the health or lives of those reentering. The BEC cannot authorize exposure in excess of normal operating limits.

2. Radiation exposure control for emergency workers will be in accordance with Section 5.5.1.

3. If there is the possibility of a radiological hazard, one member of the reentry team will be a person qualified to perform the radiation monitoring duties.

4. Prior to permitting the reentry, the person giving the authorization, either the BEC or the EOC, will ensure that personnel making the reentry have been:

   a. instructed regarding the purpose of the reentry;

   b. instructed about the actual and potential hazards;

   c. provided with the necessary protective equipment and tools or instruments to accomplish the goals for the reentry team.

5. Fire and Damage Control Training (FDCT). This course is directed toward the site fire team and selected plant maintenance personnel. The training includes operation of installed fire protection systems, portable fire extinguishers, life support systems, and techniques employed to limit the damage caused by an accident.

6. First Aid (FA). First aid designates for the building emergency teams will participate in this course. The training meets the standards established by the American Red Cross and covers basic first aid, cardiopulmonary resuscitation (CPR), and rescue techniques.

7. Radiation Safety Technician Certification Course (RSTCC). The course is intended to complement on-the-job monitoring training for health physics technicians. The initial sections of the course deal with basic information concerning atomic structure and physical quantities; natural radioactivity; properties of alpha, beta, gamma, X-rays, and neutrons; radiation units and external dose determinations; and shielding.

   Biological effects of radiation are noted, followed by discussions of background radiation, radiation protection standards, and internal dose calculations.

   The remaining sections cover topics dealing with certain aspects of radiation monitoring: radiation detection principles; instrument operation and counting statistics; health physics instruments and personnel monitoring devices; and the nature of, principles of operation of, and monitoring approaches to air sampling, reactors, hot cells, and accelerators.