Docket No.: 50-354

AUG 7 1984

APPLICANT: Public Service Electric & Gas Company (PSE&G)

FACILITY: Hope Creek Generating Station

SUBJECT: SUMMARY OF RADIOLOGICAL ASSESSMENT BRANCH (RAB) DRAFT SER OPEN ITEMS MEETING

On July 12, 1984, a meeting was held in the Bethesda, Maryland offices of the NRC to discuss RAB Draft SER open items. Representatives of the NRC, PSE&G and the Bechtel Power Corporation were in attendance (see Enclosure 1).

The open items discussed and their status are indicated in Enclosure 2 to to this meeting summary.

At this meeting, PSE&G presented to the staff the updated resume of the Radiation Protection Engineer (Enclosure 3). Additionally, an organizational draft of the Hope Creek radiation protection organization was provided (Enclosure 4). Both of these items will be incorporated into the FSAR by Amendment 7.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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Enclosure 1

MEETING TITLE: RADIOLOGICAL ASSESSMENT BRANCH DRAFT SER OPEN ITEMS

APPLICANT: Public Service Electric & Gas Company

FACILITY: Hope Creek Generating Station

DATE: Thursday, July 12, 1984

NAME	AFFILIATION
Dave Wagner	NRC
Patrick Glennon	PSE&G
Andrew R. Larson	Bechtel
William Gailey	PSE&G
Bruce A. Preston	PSE&G
Robert F. Yewdall	PSE&G
Charles Bradford	Becthel
Russell Lovell	PSE&G
Oliver D.T. Lynch, Jr.	NRC
Charles Hinson	NRC
John Recknagle	PSE&G

Enclosure 2

DSER Section 12.3.4.2

The proposed airborne radioactivity monitoring system at HCGS is in conformance with the guidelines of the SRP, NUREG-0800, with the following exceptions:

Section II.4.b of the SRP 12.3-12.4 states that continuous ventilation radioactivity monitors should be upstream of HEPA filters and should be capable of "detecting ten MPC-hours of particulate and iodine radioactivity from any compartment which has a possibility of containing airborne radioactivity by personnel, taking into account dilution in the ventilation system." In section 12.3.4.2.2 of the FSAR, the applicant states that the ventilation monitors at HCGS are downstream of the HEPA filters. The applicant also states that he will use these monitors, as well as in-plant surveys, and portable particulate and iodine sampling monitors, to assure that iodine concentrations in the plant will be maintained within ten MPC-hours. The applicant should clarify how he intends to use the ventilation monitors to accurately monitor plant iodine levels when the air being monitored by these monitors has been filtered through the plant HEPA and charcoal filter banks.

STATUS

The APPLICANT'S RESPONSE (ATTACHED) IS BEING REVIEWED.

HCGS

DSER Open Item No. 166 (DSER Section 12.3)

AIRBORNE RADIOACTIVITY MONITOR POSITIONING

The applicant should clarify how he intends to use the ventilation monitors to accurately monitor plant iodine levels when the air being monitored by these monitors has been filtered through the plant HEPA and charcoal filter banks.

RESPONSE

FSAR Section 12.3.4.2.2 has been revised to address how HCGS intends to accurately monitor particulates and iodine from any compartment which has a possibility of containing airborne radioactivity and which normally may be occupied by personnel, taking into account dilution in the ventilation system.

taps are located in the ducts next to the detectors so that grab samples can be taken.

Additional mobile samplers with monitoring detectors that are displayed, controlled, and recorded by the CRP are provided for use if needed.

More details about airborne radioactive material sampling and monitoring are included in Section 11.5.

The above described airborne radioactive material monitoring equipment and procedures are used to meet the applicable parts of Regulatory Guides 1.21, 1.97, 8.2, 8.8, 8.12, and ANSI N13.1-1969.

Acceptance Criteria II.B.17 of standard review plan 12.3 - 12.4 provides criteria for the establishment of locations for fixed continuous area gamma radiation monitors. The specific document referenced is ANSI/ANS-HPSSC-6.8.1-1981. The locations and numbers of monitors used at HCGS are not in full compliance with this standard. The location of these monitors are in the vicinity of personnel access areas only. These locations are based on the dose assessment and operating experiences from other nuclear power plants. In addition, these locations were finalized prior to the issuance of this standard and provide an acceptable method of monitoring area radiation levels.

Acceptance Criterion II.4.b.3 requires ventilation monitors to be placed upstream of the HEPA filters. HCGS design places the ventilation monitors downstream of the HEPA filter in order to assess the plant's effluents. This is achieved best at this location as:

replace with insert (attached)

a. It is more efficient to have a single monitoring point rather than multiple points.

b. The instrument is sufficiently sensitive to ensure compliance with technical specification release limits.

c. The ventilation effluent monitors referred to above and the HVAC in line monitors (see P&IDs in Section 9.4) are scintillation detectors. These monitors are used to detect gross activity and as such will indicate

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replace with insert (attached)

increases in airborn radioactivity concentrations. Maintenance of iodine concentration within 10 MPC-hours will be assured by the use of several methods including these monitors, in-plant surveys, and portable particulate and iodine sampling monitors. Grab samples may be obtained from the duct systems or the room air by using the portable samplers. These samples are then analyzed in the laboratory by multichannel analyzer (MCA). (See Section 12.5 for further information about MCA). Therefore, particulate and iodine sampling monitors are not provided upstream of the HEPA filters.

12.3.5 REFERENCES

12.3-1 J.J. Martin and P.H. Blichert-Toft, "Radioactive Atoms, Auger Electrons, and X-Ray Data," Nuclear Data Tables, Academic Press, October 1970.

12.3-2 J.J. Martin, Radioactive Atoms Supplement 1, ORNL 4923, Oak Ridge National Laboratory, August 1973.

12.3-3 W.W. Bowman and K.W. MacMurdo, "Radioactive Decays Ordered by Energy and Nuclide," Atomic Data and Nuclear Data Tables, Academic Press, February 1970.

12.3-4 M.E. Meek and R.S. Gilbert, Summary of X-Ray and Gamma- Ray Energy and Intensity Data, NEDO-12037, General Electric, January 1970.

13.3-5 C.M. Lederer, et al, Table of Isotopes, 6th edition, John Wiley, New York, 1967 (1st corrected printing March 1968).

12.3-6 D.S. Duncan and A.B. Spear, "Grace 1 - An IBM 704-709 Program Design for Computing Gamma Ray Attenuation and Heating in Reactor Shields," Atomics International, NAA-SR-3719, June 1959.

12.3-7 D.S. Duncan and A.B. Spear, "Grace 2 - An IBM 709 Program for Computing Gamma Ray Attenuation and

Insert

Acceptance Criterion II.4.B3 requires ventilation monitors to be placed upstream of HEPA filters. The HCGS design places scintillation detectors in ducts that are tributary to the release vent in order to provide warning of increased releases within the plant. These instruments detect increases in the gross noble gas concentrations of the effluent. Hence, placement of the detectors relative to HEPA and/or charcoal filters does not significantly affect their response. Since releases of iodines and particulates will be accompanied by much larger releases of noble gases, the changes in ventilation monitor readings provide indication of a change in airborne activity concentration in one or more of the plant's areas. If an increase is detected, its source and magnitude will be determined using portable samplers.

Normally occupied non-radiation areas in the plant do not have potential for significant airborne concentrations of particulates and iodine during plant operation because:

a. The ventilation systems are designed to prevent the spread of airborne radioactivity into normally occupied areas.

b. Highly radioactive piping/components are not located in normally occupied areas.

Certain activities, such as refueling, solid waste handling, or turbine teardown may increase the possibility of encountering significant airborne activities in some normally occupied areas. Continuous local airborne monitoring will be provided during these activities, as needed.

Exposure of personnel to high concentrations of airborne activity in radiation areas will be prevented through in-plant surveys and these portable particulate and iodine sampling monitors prior to personnel entrance. Continuous monitoring will be provided as required by area conditions and the nature of the entry. Administrative control will prevent inadvertent entry of personnel into normally unoccupied areas (Zone III and above). The provisions discussed above ensure that personnel will not be inadvertently exposed to significant concentrations of airborne activity.

Therefore, continuous ventilation radioactivity monitors capable of detecting 10 MPC-hrs of particulate and iodine from any normally occupied compartments are not provided as permanently installed equipment.

DSER Section 12.3.4.2

If portable continuous air monitors are used to monitor plant airborne radioactivity levels, the applicant should demonstrate that he has a sufficient number of CAMs to continuously monitor for both particulate and iodine radioactivity levels in all normally occupied locations where airborne radioactivity may exist (such as solid waste handling areas, the spent fuel pool area, the reactor operating floor, and the turbine building).

STATUS

THE APPLICANT'S RESPONSE IS BEING REVIEWED.

DSER Open Item No. 167 (Section 12.3.4.2)

If portable continuous air monitors are used to monitor plant airborne radioactivity levels, the applicant should demonstrate that he has a sufficient number of CAMs to continuously monitor for both particulate and iodine radioactivity levels in all normally occupied locations where airborne radioactivity may exist (such as solid waste handling areas, the spent fuel pool area, the reactor operating floor, and the turbine building). This is an open item.

RESPONSE

Based on the response to DSER Open Item 166, portable CAMs will not normally be used to continuously monitor particulate and iodine activity in normally occupied areas.

DSER Section 12.5.2

The applicant will utilize portable ventilation systems equipped with HEPA filters, or HEPA and sorbant filters, to minimize airborne contamination in highly contaminated areas. Continuous air monitors will be used to monitor airborne concentrations at specific work locations. Section III.D.3.3 of NUREG-0737 states that each licensee shall provide equipment, and associated training and procedures for accurately determining the airborne iodine concentration in areas within the facility where plant personnel may be present during an accident. The applicant will provide a description of the equipment, training, and procedures to comply with Section III.D.3.3 by June 1, 1985.

STATUS

THE STAFF INDICATED, BASED ON THE APPLICANT'S RESPONSE, THIS ITEM IS CONFIRMATORY ON SUBMITTAL OF AN OUTLINE OF PROCEDURES.

RESPONSE TRANSMITTED
TO NRC ON: JUN 29 1984

DSER OPEN ITEM 168 (SECTION 12.5.2)

EQUIPMENT, TRAINING, AND PROCEDURES FOR INPLANT IODINE INSTRUMENTATION.

The applicant will utilize portable ventilation systems equipped with HEPA filters, or HEPA and sorbant filters, to minimize airborne contamination in highly contaminated areas. Continuous air monitors will be used to monitor airborne concentrations at specific work locations. Section III.D.3.3 of NUREG-0737 states that each licensee shall provide equipment and associated training and procedures for accurately determining the airborne iodine concentration in areas within the facility where plant personnel may be present during an accident. The applicant will provide a description of the equipment, training, and procedures to comply with Section III.D.3.3 by June 1, 1985. This is an open item.

Response

A description of the equipment, training, and procedures for accurately determining the airborne iodine concentration in areas within the HCGS plant where personnel may be present during an accident will be provided by June 1, 1985. These procedures and associated training will meet the intent of Section III.D.3.3 of NUREG-0737.

JES:mr

NC 6 1a

DSER Section 12.5.3

The applicant has not addressed how the guidance of the following Division 8 regulatory guides, as given in the SRP 12.5 of NUREG-0800, will be followed. If the guidance of these guides will not be followed, the applicant should describe the specific alternative approaches to be used.

Regulatory Guide 8.20, "Applications of Bioassay for I-125 and I-131."

Regulatory Guide 8.26, "Applications of Bioassay for Fission and Activation Products."

Regulatory Guide 8.27, "Radiation Protection Training for Personnel at Light-Water-Cooled Nuclear Power Plants."

Regulatory Guide 8.28, "Audible Alarm Dosimeters."

Regulatory Guide 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure."

STATUS

THIS ITEM IS CONSIDERED CLOSED, HOWEVER THE APPLICANT IS TO CLARIFY THEIR POSITION ON REGULATORY GUIDE 1.97.

DSER Open Item No. 169 (Section 12.5.3)

Division 8 Reg Guides

The applicant has not addressed how the guidance of the following Division 8 RGs, as given in the SRP Section 12.5, will be followed. If the guidance of these guides will not be followed, the applicant should describe the specific alternative approaches to be used.

(1) RG 8.20, "Applications of Bioassay for I-125 and I-131."

(2) RG 8.26, "Applications of Bioassay for Fission and Activation Products."

(3) RG 8.27, "Radiation Protection Training for Personnel at Light-Water-Cooled Nuclear Power Plants."

(4) RG 8.28, "Audible Alarm Dosimeters."

(5) RG 8.29, "Instruction Concerning Risks From Occupational Radiation Exposure."

This is an open item.

RESPONSE

A change to the FSAR will be made per the attached mark-up to indicate HCGS commitment to the guidance contained in the referenced Regulatory Guides.

used as a low volume grab air sample. The filter medium is removed and analyzed in more detail in the radiation protection counting room.

12.5.2.2.6 Personnel Protective Equipment

Special protective equipment such as coveralls, plastic suits, shoe covers, gloves, head covers, and respirators, including approved air purifying respirators, self-contained breathing apparatus (pressure demand), and airline respirators and hoods, are stored in various plant locations and clothing change areas. This equipment is used to prevent both deposition of radioactive material internally or on body surfaces and the spread of contamination. Most areas of the plant are kept free of contamination so that no special protective equipment is needed. Contaminated areas are identified with posted signs. Radiation signs and radiation ~~exposure~~ work permits (R~~E~~WPs) are the primary means of defining the equipment required to enter these contaminated areas.

A variety of combinations of protective equipment may be prescribed, depending on the nature and level of possible contamination. For example, cotton clothes may be adequate, but in wet areas, plastic rain suits or bubble suits may be prescribed. Respirators are required if airborne hazards exist, or if surface contamination could cause an airborne hazard as defined in the radiation protection procedures.

12.5.3 PROCEDURES

Radiation protection procedures, as described in this section, are implemented by Hope Creek radiation protection instructions, administrative procedures, ALARA procedures, and emergency plan procedures. The procedures are written to meet the guidelines of Regulatory Guides 1.8, 1.16, 1.33, 1.39, 8.2, 8.7, 8.8, 8.9, 8.10, ~~and~~ 8.13, 8.20, 8.26, 8.27 and 8.29.

12.5.3.1 Radiological Surveys

Area survey procedures describe the purpose and techniques of detecting and measuring levels of radiation and contamination. Contamination may be on surfaces or airborne. Area surveys are conducted throughout the plant. Such surveys may be routine or may be related to specific jobs. An area survey may be performed

To ensure adequate manpower at all times for radiation protection supervisory functions, the experience and qualification requirements of the ~~senior radiation protection supervisor and~~ radiation protection supervisor positions may be reduced on a temporary basis. The general manager - Hope Creek operations approves or disapproves such action following review of the radiation protection engineer's recommendations.

The qualifications of the radiation protection technicians meet or exceed the personnel requirements of ANSI 3.1-1981. The technicians are supported by personnel in the radiation protection department in the assistant and worker classification.

12.5.2 FACILITIES, EQUIPMENT AND INSTRUMENTATION

Radiation protection facilities, equipment, and instrumentation were designed and acquired to meet the requirements of Regulatory Guides 1.97, 8.3, 8.4, 8.8, 8.9, 8.12, 8.14, ~~and~~ 8.15, and 8.28.

12.5.2.1 Radiation Protection and Radiochemistry Facilities

12.5.2.1.1 Access Control

HCGS has two general area classifications for radiological control purposes: the restricted area and the radiologically controlled area (RCA). The restricted area is any area where access is controlled to protect all individuals from exposure to radiation or radioactive material. In general, the HCGS restricted area corresponds to the area inside the station security fence (protected area). The RCA, which is within the restricted area, features positive control over access, activities, and egress. Access is limited in accordance with operational requirements and individual training (in radiation protection). The RCA may include radiation areas, high radiation areas, contaminated areas, radioactive material storage areas, and airborne radioactivity areas. Entry to and exit from the permanent RCA is normally through two designated access control points. The access control points, shown on Figures 12.5-2 and 12.5-3, are located at elevations 124 and 137 feet in the service and radwaste areas of the auxiliary building. Self-survey personnel monitoring equipment, such as hand and foot, portal, or Geiger-Mueller (G-M) type friskers, are located at the exits from the RCA.

RADIATION PROTECTION ENGINEER

NAME: John Russell Lovell

LICENSES AND CERTIFICATES:

American Board of Health Physics certification in Power Reactor Health Physics

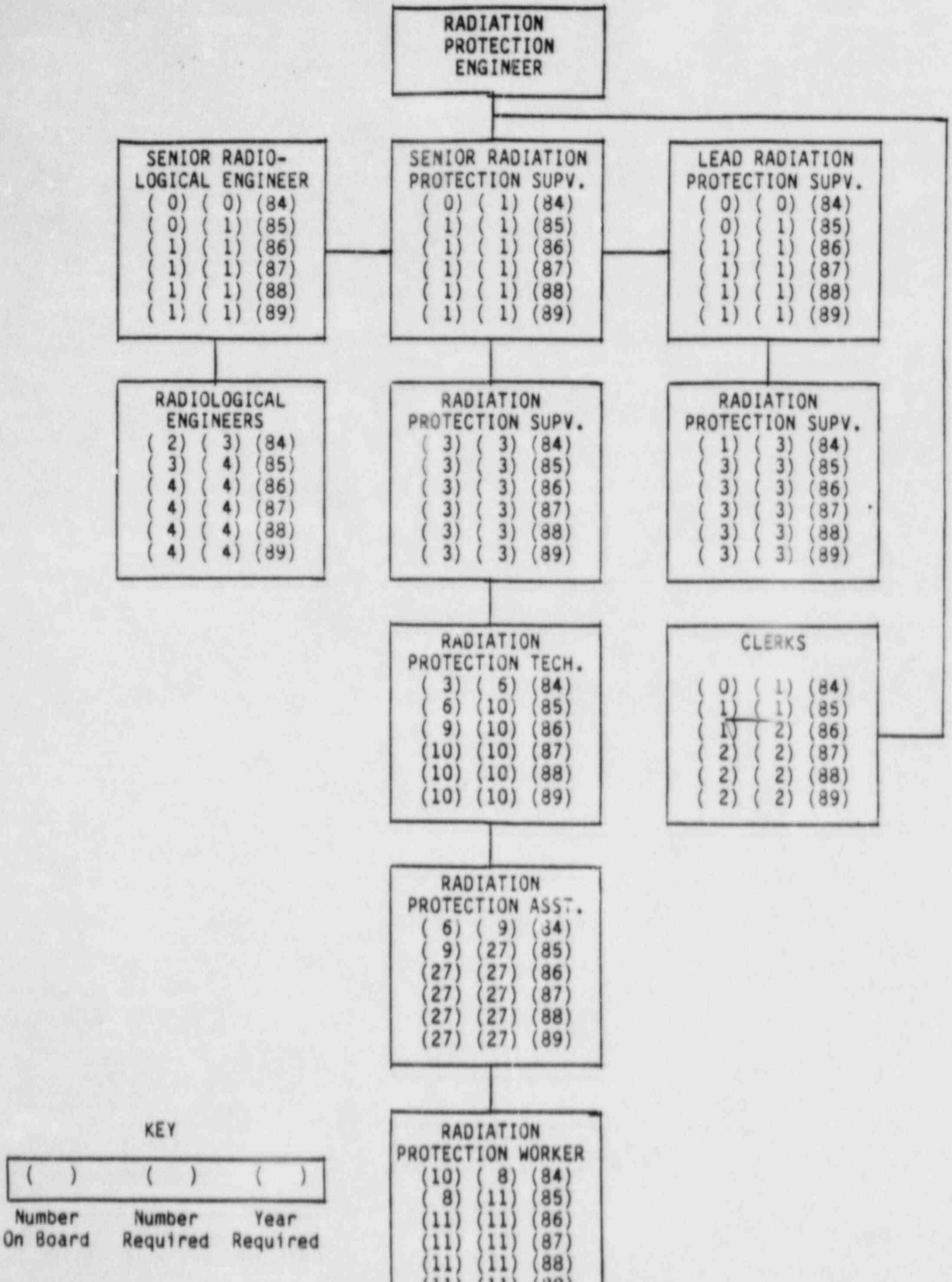
EDUCATION:

1976	Brigham Young University BA, Japanese/Zoology
1978	Harvard University School for Public Health MS, Radiological Sciences

EXPERIENCE:

1983 - Present	Radiation Protection Engineer - Hope Creek Operations: Primary responsibilities as Radiation Protection Department Head include development and implementation of the Station Radiation Protection and Radioactive Material Control Programs to ensure that personnel radiation exposure and releases of radioactive material are as low as reasonably achievable (ALARA).
1982 - 1983	Plant Health Physicist for Consumer Power Palisades Nuclear Power Plant, Covet, MI: As designated, Radiation Protection Manager responsibilities included implementation of the plant radiation safety plan, supervision of radiation safety supervisors and technicians, procedure development and review, development and implementation of the plant ALARA program and regulatory compliance.
1981 - 1982	Senior Health Physicist for Consumer Power Midland Energy Center, Midland, MI: Responsible for supervising the development of plant programs and procedures for emergency planning, radioactive materials control and environmental surveillance.

1980 - 1981	Associate faculty member of the University of Idaho, Idaho Falls, ID: Taught college level health physics classes as part of the University of Idaho/Idaho National Engineering Laboratory's education program.
1978 - 1979	Health Physicist for Allied Chemical Idaho Chemical Processing Plant, Idaho Falls, ID: Responsiblities at this nuclear fuels reprocessing plant included effluent monitoring, internal dosimetry and technical support for the operational health physics program.
1976 - 1978	Health Physics Technician for Harvard University, Cambridge, MA: A part-time position involving radiological surveys of biological research laboratories, instrument calibration and providing assistance in teaching basic radiation safety courses.


RADIATION PROTECTION ENGINEER
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Year Required

Figure C.4.5