DAIRYLAND POWER COOPERATIVE • 3200 EAST AVE. SO. • P.O. BOX 817 • LA CROSSE, WISCONSIN 54602-0817
OFFICE: (608) 788-4000
WEB SITE: www.dairynet.com

NRC Docket No. 50-409

TO: NRC Wash. CONTROLLED DISTRIBUTION NO. 53

FROM: LACBWR Plant Manager January 29, 2002

SUBJECT: Changes to LACBWR Controlling Documents

I. The following documents have been revised or issued new.

DECOMMISSIONING PLAN, revised December 2001

Instructions:

Remove and replace the following pages:

Title Page
5-27
6-6, 6-13, 6-17
7-3
8-3, 8-4, 8-10
9-2 thru 9-4

☒ The material listed above is transmitted herewith. Please verify receipt of all listed material, destroy superseded material, and sign below to acknowledge receipt.

☐ The material listed above has been placed in your binder.

☐ Please review listed material, notify your personnel of changes, and sign below to acknowledge your review and notification of personnel. [To be checked for supervisors for department specific procedures and LACBWR Technical Specifications.]

☐ The material listed above has been changed. [To be checked for supervisors when materials applicable to other departments are issued to them.]

/S/_____ DATE_____

Please return this notification to the LACBWR Secretary within ten (10) working days.

A001

LA CROSSE BOILING WATER REACTOR

(LACBWR)

D E C O M M I S S I O N I N G

P L A N

Revised
December 2001

DAIRYLAND POWER COOPERATIVE
LA CROSSE BOILING WATER REACTOR (LACBWR)
4601 State Road 35
Genoa, WI 54632-8846

5.2.25 Full-Flow Condensate Demineralizer System

The Full-Flow Condensate Demineralizer System consisted of three service tanks, each with one-half system capacity and arranged in parallel. Its purpose was to remove ionic impurities from the condensate system water before admitting it to the reactor. Each service tank was capable of delivering 700 gpm. With one of the three tanks on standby, the system was capable of delivering 1400 gpm to satisfy primary system requirements. The standby service tank was available for service whenever the effluent conductivity of the inservice tanks rose to an unacceptable level. Each of the three demineralizer tanks normally contained 45-50 ft^3 of pre-regenerated mixed resins with a cation/anion ratio of 2 to 1. The three service tanks were designed for 400 psig operation, and normal flow was supplied by the condensate pumps. A circulating pump was provided to circulate water through the standby demineralizer tank prior to placing it into service.

System Status

This system, except for six empty tanks located in the Full-Flow room, has been removed.

6.4.3 Technical Training

The following areas consist of a formal initial training program, followed by a recurring continuing training program.

6.4.3.1 The Health Physics Technician (HPT) Initial Training Program consists of the following topics:

a) Science Training

(1) Nuclear Theory

(2) Chemistry

(a) Non-radiological
(b) Radiochemistry

(3) Radiological Protection and Control (including surveys)

b) Systems Training

(1) Effluent Systems Sampling and Control

c) Emergency Plan Training

(1) Onsite Survey Team Member
(2) Nearsite Survey Team Member
(3) Duty HP
(4) Re-entry Team Members
(5) PASS Sampling
(6) Medical Emergency

d) Environmental Program

e) Waste Disposal

f) Personnel Monitoring, including Internal Deposition Counting

g) Respiratory Protection Program

h) Radiation Monitoring and Instrumentation

i) Administrative Requirements

j) First Aid Training

By the end of 1987, the decommissioning fund had accumulated to approximately $9,400,000. The decommissioning fund in the year 2000 was projected to reach $50 million (assumed equal to the original cost estimate), with the fund by the year 2010 at approximately $92,600,000 accrued.

The 1994 site-specific decommissioning cost study performed by Sargent & Lundy identified a need for increased funding. The Dairyland Power Cooperative Board of Directors authorized and approved an adjusted annual decommissioning accrual of $3 million with continued funding through 2010 to provide sufficient funding with commencement of decommissioning in 2019.

The cost study revision completed July 1998 placed the cost to complete decommissioning at $98.7 million in 1998 dollars. The annual decommissioning funding level required to meet the 2010 objective was $2.2 million. An adjustment to this level of funding was authorized by the Board of Directors.

A cost study update, prompted by significant changes in radioactive waste burial costs, as well as lessons learned on decontamination factors and methods, was prepared in November 2000. This update placed the cost to complete decommissioning at $79.2 million in year 2000 dollars. Cooperative management believes that the balance in the nuclear decommissioning funds, together with future expected investment income on such funds, will be sufficient to meet all future decommissioning costs.

The DPC Board of Directors remains committed to assuring that adequate funding will be available for the decommissioning of the LACBWR facility and is prepared to adjust the funding level for the LACBWR Decommissioning Plan, from time to time, and/or take such other actions as it deems necessary or appropriate to provide such assurance, based upon its review of the most recent decommissioning cost estimate and other relevant developments in this area.

Every five years during the SAFSTOR period, a review of the decommissioning cost estimate will be performed in order to assure adequate funds are available at the time final decommissioning is performed.

6.8 SPECIAL NUCLEAR MATERIAL (SNM) ACCOUNTABILITY

The LACBWR Accountability Representative is the person responsible for the custodial control of all SNM located at the LACBWR site and for the accounting of these materials. He is appointed in writing by the Dairyland Power Cooperative President & CEO.

6.9.2.6 Portable Fire Extinguishers and Other Fire Protection Equipment. An assortment of dry chemical, CO_2, and Halon portable fire extinguishers rated for Class A, B, and C fires are located throughout all areas of the LACBWR facility. These extinguishers provide the means to immediately respond to incipient stage fires. Spare fire extinguishers are located on the Turbine Building grade floor.

Portable smoke ejectors are provided for the removal of smoke and ventilation of spaces. Smoke ejectors are located in the Change Room, on the Turbine Building mezzanine floor, and in the Maintenance Shop.

Four outside hose cabinets contain necessary lengths and sizes of fire hose for use with the yard fire hydrants. These hose cabinets also contain hose spanner and hydrant wrenches, nozzles, gate valves, coupling gaskets, and ball-valve wye reducers.

Took kits are located in the Crib House outside fire cabinet and in the Maintenance Shop. Spare sprinkler heads and other sprinkler equipment is located in the Change Room locker. Rechargeable flashlights are wall-mounted in various locations and at entries to spaces. Portable radios are available at various locations and used for Fire Brigade communication.

6.9.2.7 The Fire Brigade is an integral part of the fire protection program. The Fire Brigade at LACBWR shall be organized and trained to perform incipient fire fighting duties. Personnel qualified to perform Operations Department duties and all LACBWR Security personnel shall be designated as Fire Brigade members and trained as such. Fire Brigade responsibilities shall be assigned to members of these groups while on duty.

The Fire Brigade shall be a minimum of two people at all times. The Duty Shift Supervisor (or his designee) shall respond to the fire scene as the Fire Brigade Leader. One member of the Security detail shall respond, as directed by the Fire Brigade Leader, and perform duties as the second Fire Brigade member.

The Control Room Operator shall communicate the status of fire detection system alarms or specific hazard information with the Fire Brigade, shall monitor and maintain fire header water pressure, and shall expeditiously summon outside fire service assistance as directed by the Fire Brigade Leader. The Control Room Operator shall use the page system to announce reports of fire, evacuation orders, and other information as requested by the Fire Brigade Leader.

6.9.2.8 Outside Fire Service Assistance. The LACBWR Fire Brigade is organized and trained as an incipient fire brigade. Fire Brigade Leaders are responsible for recognizing fire emergencies that progress beyond the limits of incipient stage fire fighting. Fire Brigade Leaders shall then immediately request assistance from outside fire services.

The LACBWR Emergency Plan contains a letter of agreement with the Genoa Fire Department. This letter of agreement states that the Genoa Fire Department is responsible for providing rescue and fire fighting support to LACBWR during emergencies. Upon request by the Genoa

such as surface texture, material type, contamination levels, and the tenacity with which the radioactive material clings to the contaminated surfaces.

Surface areas are primarily decontaminated using hand wiping, wet mopping, and wet vacuuming techniques. Detergents and other mild chemicals may be used with any of these techniques. The residual water cleaning solutions are collected by floor drains and processed through the liquid waste system. Most areas are routinely decontaminated to levels below 2000 dpm/ft^2 (about 500 dpm/100 cm^2). Many areas are maintained below the Lower Limit of Detection (LLD). Efforts will be made to maintain all accessible areas in the plant as free of surface contamination as is reasonably achievable.

Small tools and components will be periodically decontaminated by wiping with cleaning agents, steam cleaning, abrasive blasting, dishwasher, ultrasonic cleaning, electropolishing or other methods. Some unused equipment may be decontaminated as a prior step to removal for disposal as commercial or radioactive solid waste. Some unused equipment may be decontaminated prior to continued use in unrestricted areas.

Larger systems and components in accessible areas may be decontaminated using hydrolazers, abrasives, chemicals or other methods, after appropriate ALARA and economic evaluations are conducted.

7.3.2 Removal of Unused Equipment During SAFSTOR

During the SAFSTOR period, some equipment and plant components will no longer be considered useful or necessary to maintain the plant in the SAFSTOR condition. Some equipment located in unrestricted areas may be transferred directly for use at another location or disposed of as commercial solid waste.

Some unused equipment or components located within restricted areas, which have not previously been used for applications involving radioactive materials will be thoroughly surveyed and documented as having no detectable radioactive material (less than LLD) prior to transfer to another user or disposal as commercial solid waste.

Other unused equipment or plant system components which have previously been used for applications involving radioactive materials may be removed, thoroughly surveyed and transferred to another licensed user, or disposed of as low level solid radioactive waste material. Some equipment may be decontaminated and will be surveyed to verify that it contains no detectable radioactive material (less than LLD), prior to transfer to an unlicensed user, or for disposal as commercial solid waste.

Removal of plant equipment will be performed only after review. A 10 CFR 50.59 review will be conducted prior to dismantling any system.

b) Yearly Administrative Limit

Administratively, personnel will be limited to a total effective dose equivalent being equal to 5 Rem per calendar year of whole body radiation. Every effort will be made to equalize exposures of all personnel in accordance with ALARA principles.

8.3 RADIATION PROTECTION PROGRAM

The radiation protection program that will be utilized during the SAFSTOR period will be an extension of the program that was used during the period of reactor operations at LACBWR. This program is in compliance with the requirements of 10 CFR 20. Implementation of the radiation protection program will be done at LACBWR through Health and Safety procedures. The following section describes the radiation protection program.

8.3.1 Personnel Monitoring

To ensure that the radiation exposure limits of 10 CFR 20 are not exceeded, a personnel radiation exposure monitoring system will be maintained. Two basic means shall be used to evaluate each individual's radiation exposure:

a) Badges - to give integrated dose measurements over relatively long periods of time.

b) Self-Reading Dosimeters - to give interim indication of accumulated doses.

Badges and self-reading dosimeters will be worn by all plant personnel entering the radiological controlled area. They will be worn at or above the waist and on the front of the body, unless the Health and Safety management specifies that the badges be worn differently. Extremity dosimetry will be worn by all personnel when conditions exist that could cause a significantly higher than whole body dose to be received by a worker's extremities.

Long-term visitors expecting to receive a radiation exposure of 50 mRem will be issued badges and dosimeters and will be monitored in the same manner as the regular plant personnel.

Casual and short-term visitors (those for whom exposures are expected to be insignificant) will be issued pocket dosimeters only.

Badge records received from the badge processor will be evaluated and maintained. Periodic quality testing of badges and pocket dosimeters will be conducted.

Bioassays will be performed in accordance with the requirements of 10 CFR 20.1204 and in conformance to the recommendations of Regulatory Guide 8.26, "Application of Bioassay for Fission and Activation Products," and Regulatory Guide 8.32, "Criteria for Establishing a Tritium Bioassay Program."

The LACBWR internal deposition counter will be used to detect any internal contamination for:

a) All new employees who will routinely work with radioactive material.

b) Any individual suspected of having received any internal deposition.

c) Upon termination of any employee who worked with radioactive material.

If it is determined that any employee has a significant internal deposition of any isotope, he may be required to submit a urine and/or fecal specimen.

All personnel leaving a restricted area will be required to conduct a personnel contamination survey using the contamination detection instrument provided at the exit.

8.3.2 Respiratory Protection Program

A respiratory protection program will be maintained during the SAFSTOR period.

The Health and Safety Supervisor is responsible for the Respiratory Program at LACBWR. The Health and Safety Supervisor or designated alternate will evaluate the total job hazard, recommend engineering controls if appropriate, specify respiratory protection if control cannot be otherwise obtained and forbid the use of respirators if conditions warrant. The Health and Safety Department is responsible for the selection, care, and maintenance of all respiratory protection equipment that falls under the scope of the respiratory protection program.

The acceptable manner for limiting the internal exposure of personnel is to control radioactivity concentration in the air breathing zones. Whenever possible, this will be accomplished by the application of engineering control measures such as containment, decontamination, special ventilation equipment and design. The use of personal respiratory protective equipment as a primary control is undesirable and is acceptable only on a non-routine basis or in an emergency situation.

Equipment such as hoods, blowers, and filtered exhaust systems will be used to provide controls for routine operations and, whenever possible, for non-routine operations. In some cases, such controls may be inadequate or impractical and the use of protective breathing apparatus will be approved on a short-term basis.

8.6.1 Resin

Spent resin will be transferred to the spent resin receiving tank where it will be held until there is a sufficient quantity available for shipment to an approved processing facility. The resin will be transferred to an approved shipping container where it will be dewatered and made ready for shipment.

8.6.2 Dry Active Waste (DAW)

Any material used within the restricted area will be considered radioactive and will be disposed of as DAW, unless it can be demonstrated to be within established releasable limits. The generation of this material will be maintained as low as possible to reduce the total waste volume generated onsite. The material generated will be placed into approved shipping containers.

Disposal of all radioactive waste will be in accordance with all pertaining guidelines.

8.7 RECORDS

Records generated in the performance of the radiation protection program will be maintained as required to provide the necessary documentation of the program. These records will be maintained in a designated storage area.

8.8 INDUSTRIAL HEALTH AND SAFETY

LACBWR will continue to participate in Dairyland Power Cooperative's industrial safety program as prescribed by the DPC Safety Department. These programs will include:

a) Accident prevention
b) Hazardous waste management and control
c) Asbestos control
d) Hearing conservation

The assumptions used in evaluating this event during SAFSTOR were similar to those used in the FESW reracking analyses.[1,2] The fuel inventory calculated for October 1987 was used. The only significant gaseous fission product available for release is Kr-85. The plenum or gap Kr-85 represents about 15% (215.7 Curies) of the total Kr-85 in the fuel assembly. However, for conservatism and commensurate with Reference 1, 30% of the total Kr-85 activity, or 431.4 Curies, is assumed to be released in this accident scenario. (Due to decay, as of October 2001 only 40.5% of the Kr-85 activity remains - 174.7 Curies.)

No credit was taken for decontamination in the FESW water or for containment integrity, so all the activity was assumed to be released into the environment. Meteorologically stable conditions at the Exclusion Area Boundary (1109 ft, 338m) were assumed, with a release duration of 2 hours commensurate with 10 CFR 100 and Regulatory Guides 1.24 and 1.25.

A stack release would be the most probable, but a ground release is not impossible given certain conditions. Therefore, offsite doses were calculated for 3 cases. The first is at the worst receptor location for an elevated release, which is 500m E of the Containment Building. The next case is the dose due to a ground level release at the Exclusion Area Boundary. The maximum offsite dose at the Emergency Planning Zone boundary[3] for a ground level release is also calculated. Adverse meteorology is assumed for all cases.

Elevated Release

Average Kr-85 Release Rate

$$\frac{431.4 \text{ Curies}}{2 \text{ hrs.} \times 3600 \text{ sec/hr}} = 6.00 \text{ E-2 Ci/sec}$$

Worst Case $\frac{X}{Q}$ for 0-2 hours at 500m E = 2.3 E-4 sec/m^3

Kr-85 average concentration at 500m E

6.00 E-2 Ci/sec x 2.3 E-4 sec/m^3 = 1.38 E-5 Ci/m^3

Immersion Dose Conversion at 500m E

Kr-85 Gamma Whole Body Dose Factor (Regulatory Guide 1.109)

$$1.61 \text{ E+1} \frac{\text{mRem/yr}}{\mu\text{Ci/m}^3} \times 10^6 \frac{\mu\text{Ci}}{\text{Ci}} \times 1.142 \text{ E-4} \frac{\text{yr}}{\text{hr}} = 1{,}839 \frac{\text{mRem/hr}}{\text{Ci/m}^3}$$

Whole Body Dose at 500m E

$$1839 \frac{\text{mRem/hr}}{\text{Ci/m}^3} \times 1.38 \text{ E-5 Ci/m}^3 \times 2 \text{ hr} = 0.05 \text{ mRem (as of 10/01 = 0.02 mRem)}$$

Kr-85 Beta/Gamma Skin Dose Factor (Regulatory Guide 1.109)

$$1.34\ E{+}3\ \frac{mRem/yr}{\mu Ci/m^3} \times \frac{10^6 \mu Ci}{Ci} \times 1.142\ E{-}4\ \frac{yr}{hr} = 1.53\ E5\ \frac{mRem/hr}{Ci/m^3}$$

Skin Dose at 500m E

$$1.53\ E5\ \frac{mRem/hr}{Ci/m^3} \times 1.38\ E{-}5\ Ci/m^3 \times 2\ hr = 4.2\ mRem\ (as\ of\ 10/01 = 1.7\ mRem)$$

Ground Level Release at EAB

Worst Case $\frac{X}{Q}$ for 2 hrs at 338m NE or 338m SSE, using Regulatory Guide 1.25

$$2.2\ E{-}3\ \frac{sec}{m^3}$$

Whole Body Dose at 338m	Skin Dose at 338m
10/87 = 0.49 mRem	10/87 = 40.4 mRem
10/01 = 0.20 mRem	10/01 = 16.4 mRem

Ground Level Release at Emergency Planning Zone Boundary

Worst Case $\frac{X}{Q}$ for 2 hrs at 100m E

$$1.02\ E{-}2\ \frac{sec}{m^3}$$

Whole Body Dose at 100m E	Skin Dose at 100m E
10/87 = 2.25 mRem	10/87 = 187 mRem
10/01 = 0.91 mRem	10/01 = 75.7 mRem

As can be seen, the estimated maximum whole body dose is more than a factor of 11,000 below the 10 CFR 100 dose limit of 25 Rem (25,000 mRem) to the whole body within a 2-hour period.

9.3 SHIPPING CASK OR HEAVY LOAD DROP INTO FESW

This accident postulates a shipping cask or other heavy load falling into the Fuel Element Storage Well. Reference 1 stated that extensive local rack deformation and fuel damage would occur during a cask drop accident, but with an additional plate (installed during the reracking) in place, a dropped cask would not damage the pool liner or floor sufficiently to adversely affect the leak- tight integrity of the storage well (i.e., would not cause excessive water leakage from the FESW).

For this accident, it is postulated that all 333 spent fuel assemblies located in the FESW are damaged. The cladding of all the fuel pins ruptures. The same assumptions used in the Spent Fuel Handling Accident (Section 9.2) are used here. A total of 35,760 Curies of Kr-85 is released within the 2-hour period. The doses calculated are as follows. (Due to decay, as of Oct. 2001 only 40.5% of the Kr-85 activity remains – 14,483 Curies.)

Elevated Release

Whole Body Dose at 500m E	Skin Dose at 500m E
10/87 = 4.2 mRem	10/87 = 350 mRem
10/01 = 1.7 mRem	10/01 = 141.8 mRem

Ground Level Release at EAB

Whole Body Dose at 338m	Skin Dose at 338m
10/87 = 40.2 mRem	10/87 = 3.34 Rem
10/01 = 16.3 mRem	10/01 = 1.35 Rem

Ground Level Release at Emergency Planning Zone Boundary

Whole Body Dose at 100m E	Skin Dose at 100m E
10/87 = 186 mRem	10/87 = 15.6 Rem
10/01 = 75.3 mRem	10/01 = 6.3 Rem

As can be seen, the estimated offsite doses for the cask drop accident are below the 10 CFR 100 limits. The postulated maximum whole body dose is more than a factor of 100 below the 10 CFR 100 limit of 25 Rem (25,000 mRem).