Consumers Power
POWERING MICHIGAN'S PROGRESS
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April 18, 1986

US Nuclear Regulatory Commission
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DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT -
REPORT OF OVEREXPOSURE FOR MARCH 1984 DIVER INCIDENT

Pursuant to 10CFR20.405(a)(1) & (2) and 10CFR20.405(d) the two attachments to this letter are being submitted as a compilation of information previously submitted either formally or informally pertaining to the unplanned exposure of a diver at the Palisades Plant in March of 1984. This event was documented by IE Inspection Report 50-255/84-06 dated July 11, 1984. Our response, dated August 15, 1984 which address 10CFR20.405(a)(1) and 10CFR20.405(d) is contained in this submittal as Attachment II. The information needed to address 10CFR20.405(a)(2) is given in Attachment I. Since this information constitutes a personnel file, it is requested that Attachment I be withheld from the NRC Public Document Room per 10CFR2.790.

Brian D Johnson
Staff Licensing Engineer

CC Administrator, Region III, USNRC
NRC Resident Inspector - Palisades

Attachments

I+15

OC0486-0078-NL04

ATTACHMENT II

Consumers Power Company
Palisades Plant
Docket 50-255

RESPONSE TO IE INSPECTION REPORT 84-06
DATED AUGUST 15, 1984

April 18, 1986

6 Pages

IC0785-0078-NL04

Consumers Power Company

General Offices: 1945 West Parnall Road, Jackson, MI 49201 • (517) 788-0550

August 15, 1984

James G Keppler, Administrator
Region III
US Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

DOCKET 50-255 - LICENSE DPR-20 -
PALISADES PLANT - RESPONSE TO IE INSPECTION REPORT 84-06

IE Inspection Report 50-255/84-06 dated July 11, 1984 identified four items of noncompliance. These items were discussed with your staff in an enforcement conference held on April 27, 1984. A telephone conversation between PCLovendale of your staff and TCBordine of Consumers Power Company on August 10, 1984 extended the response date for these items to August 17, 1984. The following is our response to the items:

Noncompliance (50-255/84-06-05)

10 CFR 20.101(b) states in part that during any calendar quarter total occupational dose to the whole body of an individual shall not exceed 3 rems. "Dose to the whole body" is deemed to include any dose to the whole body, gonads, active blood-forming organs, head and trunk, or lens of eye.

Contrary to the above, an individual who worked as a diver in the refueling cavity during the first calendar quarter in 1984 received a dose of about 4.5 rems to the right leg above the knee, a portion of the body covered by the whole body dose limit of 3 rems per quarter.

Corrective Action Taken and Results Achieved

During a routine check of the diver's dosimetry between work periods a high exposure was determined. At that time a radiological Stop Work Order was issued by the Duty Health Physicist. An investigation team, designated by the Plant Manager, conducted a thorough review of the incident and its precursors. In a formal written report, the investigation team concluded:

1. Management controls for radiological work failed. Health Physics planning had been performed, particularly with respect to dosimetry; however, it was not comprehensive, and was not integrated into the maintenance planning, as would have been appropriate.

2. A failure occurred at the technician level to properly communicate several pieces of critical survey information, both between shifts and to their supervision. These survey results, significantly at odds with the prejob survey, failed to trigger either a halt to the work or a review of the Radiation Work Permit controls as required by procedures.

3. Insufficient time was applied to analyzing the risks associated with the unexpected repair work to the fuel transfer equipment. The presence of highly mobile, high specific activity crud from fuel handling was not recognized. Other high radiation area work (eg, entry under the reactor vessel for cleaning) going on during the same period diluted the ALARA planning resources. The need for Radiation Protection Management to carefully monitor and, if necessary, limit the quantity of high risk radiation work proceeding simultaneously is a principal lesson reinforced by this incident.

The investigation report developed extensive remedial and permanent corrective actions. The diving work was permitted to proceed only after a detailed Radiological Work Plan was developed, which included partial decontamination of the work area and coverage by a dedicated health physics technician team under an experienced senior technician and closely supervised by the Duty Health Physicist. The work was completed under this plan, with an additional dose commitment of less than 100 mrem.

As discussed in the NRC inspection report, a technical evaluation of the extensive dosimetry information available, including consideration of the age of the individual involved, led to a conservatively estimated whole body dose assignment to the diver of 1630 mrem. As a result of the NRC determination expressed in this item of noncompliance, a revised Termination Report has been forwarded to the individual. In that report, we have explained the circumstances of the change and indicated what actions he should take to notify any subsequent employers. We have expressed our willingness to meet with him and assist him, if needed.

Corrective Action to be Taken to Avoid Further Noncompliance

As discussed at the enforcement conference held on April 27, 1984, actions taken to prevent recurrence of unwarranted exposures of this nature are as follows:

1. A formal Radiation Work Plan, incorporating the generic precautions for any radiological diving work, has been promulgated.

2. A policy has been established whereby work in high radiation areas ≥1R/hr requires the presence of an experienced Health Physics management person on site. Exceptions to this policy must be approved by the Radiation Protection Manager.

3. New, more reliable underwater survey equipment has been procured. In future diving work, a minimum of two underwater survey instruments will be used, one always in immediate proximity to the diver.

4. Detailed reviews of the incident were conducted by the Radiation Protection Manager for all health physics technicians and, independently, with their supervisors, on all aspects of the investigation and the noncompliances identified in the NRC inspection report. Particular emphasis was given to procedural compliance and awareness to changing radiological conditions including initiating or altering actions based on the changing conditions and resisting the momentum of any job if time is needed to properly resolve problems.

5. The lessons learned from this event have been promulgated to other plant departments and, as appropriate, throughout the company. Particularly, these lessons are being incorporated in both the ALARA and Chemistry/ Health Physics Technician training courses.

6. A formal Radiation Work Plan has been developed for decontamination of the fuel handling upender tilt pits.

7. As part of the Refueling Outage Health Physics Report, a post-job review of all work on fuel handling equipment has been performed. Action items to incorporate ALARA precautions in future planning have been identified.

Date When Full Compliance Will be Achieved

Full compliance has been achieved. The above stated actions are complete.

Noncompliance (50-255/84-06-02)

Technical Specification 6.12 requires that any individual entering a high radiation area be provided with a dose rate monitoring device, or be provided with a dose rate integrating device which alarms at a preset dose (surveyed areas only), or be accompanied by an individual qualified in radiation protection procedures who is equipped with a dose rate monitoring device, who provides positive control over activities, and who performs periodic surveys as specified by the radiation work permit.

Contrary to the above, on March 18, 1984, a diver made three entries into the refueling cavity tilt machine area, a high radiation area, without being provided with a dose rate monitoring device or a dose rate integrating device or without being accompanied by an individual qualified in radiation protection who was equipped with a dose rate monitoring device and who provided the required controls and monitoring.

Corrective Actions Taken and Results Achieved

In the investigation of this incident, it was determined that, although no dives occurred without a workable survey instrument in the water, the technicians providing coverage for the job did not employ the instruments in direct proximity to the diver as required to meet the procedural and Technical Specifications requirements. This deficiency was corrected in the detailed

plan for the resumption of repair work. The work was completed in full compliance with survey requirements.

Corrective Actions Taken to Avoid Further Noncompliance

In the review of this incident with the health physics staff, special emphasis was placed on the need for representative surveys under all circumstances where a high radiation area may exist. Techniques to deal with the additional complications posed by surveying underwater were discussed. IE Information Notice 82-31 was again reviewed and the requirement for use of a minimum of two underwater survey instruments has been implemented.

Date When Full Compliance Will be Achieved

Full compliance has been achieved.

Noncompliance (50-255/84-06-04)

Technical Specification 6.11 states that procedures for personal radiation protection shall be prepared consistent with 10 CFR Part 20 and shall be approved, maintained, and adhered to for all operations involving personal radiation exposure.

1. Procedure No 7.02, "ALARA Program", requires that an ALARA review be conducted if, among other things, a potential exists for individual exposure to general area radiation levels greater than 1000 mrems/hour; an individual is expected to exceed 1500 mrems whole body dose for a given task in a calendar year; or loose surface contamination exceeds 100,000 dpm/100cm^2.

Contrary to the above, no ALARA review was conducted of the refueling cavity tilt machine repair job even though surveys and dose estimates indicated that dose rates might exceed 1000 mrem/hour, that the diver's whole body dose was expected to exceed 1500 mrems for the job, and that contamination levels (dry) exceeded 100,000 dpm/100 cm^3(SIC).

2. Procedure No 7.03, "Radiation Work Permit", requires that a job be secured (stopped) if unplanned changes in working conditions occur which might invalidate the basis for an applicable radiation work permit.

Contrary to the above, the refueling cavity tilt machine repair job was not stopped even though radiation levels in the work area as high as seven times greater than those identified on the radiation work permit were identified.

3. Procedure No HP 2.14, "Radiological Survey Requirements", states that radiation work permits shall include applicable requirements for continuous, intermittent, and/or pre-job and post-job surveys.

Contrary to the above, the radiation work permit written for the refueling cavity tilt machine repair job did not contain any survey requirements.

Surveys conducted during the diving operation were not sufficient to identify the existing radiological conditions.

Corrective Action Taken and Results Achieved.

A detailed ALARA review was performed prior to lifting the "Stop Work" order on repair of the fuel handling equipment. All requirements of Administrative Procedures 7.02, 7.03 and Health Physics Procedure HP 2.14 were complied with.

Corrective Action to be Taken to Avoid Future Noncompliance

In the reviews of the incident, health physics personnel were instructed in the appropriate procedural requirements. The Training Department has been provided with full details of the event to be used for future Technician and ALARA training with emphasis on underwater procedures and the importance of ALARA reviews.

Date When Full Compliance Will be Achieved

Full Compliance has been achieved.

Noncompliance (50-255/84-06-01)

10 CFR 20.401 requires that records be maintained of surveys made by the licensee to determine compliance with NRC regulations.

Contrary to the above, no records were maintained of radiation surveys conducted on March 18, 1984, to assess the underwater radiation hazards present in the refueling cavity tilt machine area.

Corrective Action Taken and Results Achieved

Individuals who failed to properly document surveys were counselled on the importance of this basic technician responsibility. The cause and effect relationship between undocumented surveys and the eventual diver overexposure was stressed to these personnel.

Corrective Action to be Taken to Avoid Future Noncompliance

The significance of this noncompliance was addressed to health physics personnel in the reviews of the entire incident. The Training Department has been provided similar information to be included in future Technician and ALARA training courses.

Date When Full Compliance Will be Achieved

Full compliance has been achieved.

David J VandeWalle (Signed)

David J VandeWalle
Director, Nuclear Licensing

CC Director, Office of Nuclear Reactor Regulation
Director, Office of Inspection and Enforcement
NRC Resident Inspector - Palisades