



**Consumers
Power**

**POWERING
MICHIGAN'S PROGRESS**

Palisades Nuclear Plant: 27780 Blue Star Memorial Highway, Covert, MI 49043

G B Slade
General Manager

April 30, 1992

Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 - PALISADES PLANT - PROGRAM PLAN FOR THE ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

As a result of recent deficiencies that have been discovered with implementation of the Equipment Qualification (EQ) rule at the Palisades plant, a meeting was held with the NRC Region representatives on March 11, 1992 at the Glen Ellyn offices. At this meeting Consumers Power Company representatives discussed each of the recently identified EQ equipment discrepancies including their resolution status. A recent history of EQ program activities were also discussed. At the end of the meeting Consumers outlined a plan to review the Palisades total EQ program and committed to submit the plan for this program to the NRC by April 30, 1992. Attached to this letter is the EQ program plan for the Palisades Plant. The program plan includes those design engineering, maintenance, administrative and training activities that are considered necessary to enhance the Palisades EQ program.

Gerald B Slade
General Manager

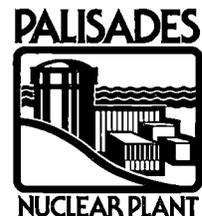
CC Administrator Region III, USNRC
NRC Resident Inspector - Palisades

Attachment

073031

9205070170 920420
PDR ADDCK 05000255
P PDR

A CMS ENERGY COMPANY



ADD 1/1

ATTACHMENT 1

Consumers Power Company
Palisades Plant
Docket 50-255

PROGRAM PLAN FOR THE ENVIRONMENTAL QUALIFICATION
OF ELECTRICAL EQUIPMENT

April 30, 1992

8 Pages

PALISADES NUCLEAR PLANT

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT (EQ) PROGRAM PLAN

April 30, 1992

1.0 HISTORICAL PERSPECTIVE

The construction permit for the Palisades Plant was issued in 1967, and the operating license in 1972. During that time the first nuclear standard, IEEE-279-1968, was published establishing the concept of redundancy in safeguards systems. It also mentioned equipment qualification, but gave little guidance on the subject. Palisades, like other plants of its vintage, elected to use "high grade" commercial equipment in its safeguards systems, and equipment qualification procedures were based on the knowledge available at the time. Safeguards system equipment in containment, notably the safety injection system valves, were qualified by test and analysis to conditions expected during an accident.

With the issuance of 10 CFR 50.49 in 1983 (hereafter called the EQ rule) Palisades was required to establish a formal EQ program. The program is required to address electrical equipment that is important to safety in a loss of coolant or high energy line break accident, and that is located in an area of the plant that will be subject to a harsh environment as a result of the accident. Qualification files are to be established that demonstrate the equipment will be able to perform its safety function in the harsh environment. The EQ rule provides specific guidance on qualification procedures that must be employed in order to qualify the equipment.

In addition to electrical equipment important to safety, the rule also requires qualification of non-safety related electrical equipment whose failure in the accident environment may prevent safety-related equipment from performing its safety function, and of certain accident monitoring instrumentation as defined in Regulatory Guide 1.97.

In response to the EQ rule, Consumers Power Company submitted a summary of the design basis events which were considered in the selection of the safety-related electrical equipment that were required to be environmentally qualified. The method of selection of the nonsafety-related electrical equipment that was required to be qualified was also described. The NRC published its safety evaluation report on the Palisades EQ program on January 31, 1985. In addition to reviewing the selection of electrical equipment within the scope of the EQ rule, the SER also evaluated the

justifications for continued operation provided by CPCo for equipment which was not yet fully qualified in accordance with the rule. Full compliance with the EQ rule was required by November 30, 1985. Full compliance could not be achieved by November 30, 1985 and the Palisades Plant was shut down at that time to complete the remaining equipment changes and qualification activities required by the EQ rule.

Following November 30, 1985 regulatory inspection was placed on assuring equipment qualification to the requirements of the rule as well as maintenance of qualification. An NRC inspection in 1986 identified several weaknesses in equipment qualification and qualification documentation. In response, CPCo refocused its efforts on the electrical equipment qualification files and equipment qualification. Additional equipment were replaced and the qualification files were upgraded to meet the expectations of the EQ rule.

Following our equipment and qualification file upgrades, CPCo focused efforts on maintenance of equipment qualification. In 1987, administrative procedures were developed to control the equipment qualification environments list, the equipment list, and the detailed qualification records. These procedures also served to formally convey the equipment qualification requirements to procurement, maintenance and the design change processes. In addition, plant engineers, maintenance personnel and management staff were trained to the requirements of equipment qualification, and the equipment data base was updated to identify equipment included in the EQ program.

In 1989, an independent contractor review of the EQ program was commissioned. Commissioning such a review was considered prudent since previous engineering reviews, conducted between 1986 and 1989, uncovered problems within design engineering in general, and with the EQ program in particular. Furthermore, all EQ program reviews during this period were of limited scope in that the environmental qualification environments and equipment lists were assumed to be accurate and comprehensive. These reviews focused primarily upon the adequacy of qualification documentation files and the quality of the EQ maintenance program. The independent contractor review included a comprehensive investigation of the program documentation and administrative controls for maintenance of equipment qualification. A detailed review of the equipment included in the EQ program was also included. The report on program documentation and administration was received in January, 1990 and CPCo's response to the report was prepared in about September 1990. The report on the EQ equipment list was received in December 1990 and is discussed in more detail below.

Also in 1990, several pieces of electrical equipment which were not in the EQ program were identified by CPCo as requiring qualification in accordance with the EQ rule. These deficiencies were identified through our ongoing efforts to reconstitute the plant design basis.

The independent contractor's report on the EQ equipment list identified a number of possible deficiencies in the EQ equipment list as well as in the plant's equipment data base. The equipment data base is utilized by plant personnel in the conduct of engineering and maintenance activities for the plant. The equipment data base identifies each piece of equipment in the plant and includes numerous engineering data. With respect to electrical equipment qualification, the equipment data base identifies the quality classification of the equipment, i.e. safety-related or nonsafety-related, as well as the location of the equipment and whether it is part of the EQ program. Our initial review of the contractor's report shortly after it was received did not identify any immediate concerns with compliance with the EQ rule. The possible deficiencies in the EQ equipment list were determined to be related to primarily to deficiencies in the plant's equipment data base which the contractor used as the basis for his review rather than actual equipment qualification deficiencies. On this basis the resolution of the issues raised by the contractor's report was judged to be of lessor priority than other work, and therefore was deferred.

The detailed review of the contractor's report on the EQ equipment list commenced in November, 1991. In January, 1992 the first deficiency in the EQ equipment list was found when an instrument requiring qualification was identified. In February, 1992 it was determined that the electrical equipment associated with the main steam line isolation valves were not environmentally qualified and this discovery ultimately lead to the decision to shut down the plant in order to modify this EQ equipment. Further reviews of the contractor's report in February and early March, 1992 identified 4 other pieces of EQ equipment that were not on the EQ equipment list and not appropriately qualified in accordance with the EQ rule. The deficiencies included safety-related equipment not qualified (3 items) and accident monitoring instruments not qualified (3 items). A lack of qualification of nonsafety-related equipment contributed to two of the three safety-related equipment deficiencies.

Also in March 1992, unqualified electrical connections were discovered in several accident monitoring instrument loops by plant operations personnel during a general walkdown. As a result of this discovery, a review was performed of the electrical connections in the circuit of each piece of EQ equipment to assure its

qualification, and a number of additional unqualified connections were identified.

In summary, a number of EQ program deficiencies have been recently identified through various self-initiated reviews of the program. These deficiencies may be categorized as follows:

1. Safety-related equipment not qualified in accordance with the EQ rule. This includes both unqualified safety-related equipment as well as unqualified nonsafety-related equipment whose failure in the accident environment could prevent accomplishment of the safety-related equipment safety function.
2. Accident monitoring instrumentation not qualified in accordance with the EQ rule.
3. Electrical connections not qualified in accordance with the EQ rule.

2.0 SCOPE AND OBJECTIVES

The scope of the EQ program plan includes those design engineering, maintenance, administrative and training activities that are considered necessary and prudent to enhance the Palisades EQ program and to assure compliance with the NRC EQ rule. The five elements of the plan are based on the weaknesses noted in the various reviews of the EQ program.

The primary objective of this program plan is to assure nuclear power plant safety through better compliance with regulatory requirements. A secondary objective is to improve the implementation efficiencies of the Palisades EQ program in order to reduce overall maintenance and engineering costs.

3.0 PLAN

The program plan is divided into five areas or tasks: design basis events, EQ program documentation, EQ equipment maintenance, EQ equipment condition monitoring, and personnel training.

3.1 Design Basis Events

Current and historical EQ design basis documents will be researched to compile a comprehensive EQ design basis document which will define the bases for the qualification of electrical equipment on a room by room basis. The EQ design basis document will provide the room environmental conditions and the equipment that must be qualified, and provide the justification for each. Any deficiencies in the EQ equipment list identified as a result of this task will be addressed in accordance with CPCo's corrective action system.

3.2 EQ Program Documentation

The following reviews will be completed in order to assure that the EQ program documentation is accurate and complete. These reviews are in addition to those reviews that were completed during the 1992 refueling outage in response to deficiencies identified during the outage. The following reviews of EQ program documentation were completed during the 1992 refueling outage:

1. The independent contractor report on the EQ equipment list was reviewed for electrical equipment qualification deficiencies. The deficiencies found are being addressed in accordance with CPCo's corrective action system. Numerous deficiencies in the plant equipment data base and design documentation were also noted. These deficiencies will be addressed in Section 3.2.2 of this plan.
2. The review of the independent contractor report on the EQ equipment list indicated a possible generic EQ deficiency for certain accident monitoring instrumentation. As a result, all Regulatory Guide 1.97, Category 2 instrumentation was reviewed to assure compliance with the EQ rule.
3. During the outage, plant operations personnel identified several unqualified electrical connections in circuits for EQ equipment. As a result, our Nuclear Performance Assessment Department performed a review of the EQ program, including a review of electrical connections in the circuit of each piece of EQ equipment to verify their qualification, and any unqualified connections were replaced prior to startup from the 1992 refueling outage..

Further reviews of EQ program documentation are planned and include the following:

3.2.1 Equipment added to EQ equipment list after original EQ equipment walkdowns

Reviews to date indicate that engineering reviews of equipment added to the EQ equipment list after the original EQ list was prepared were less rigorous than the reviews performed for the equipment on the original EQ list. Consequently circuit electrical connections may not have been adequately reviewed and effects of nonsafety-related equipment on safety-related equipment may not have been adequately evaluated. To address this potential weakness, thorough engineering reviews, and if deemed necessary, equipment walkdowns will be conducted for all equipment added to the EQ equipment

list after the original list was prepared. EQ program documentation will be updated as required based on this review.

3.2.2 Resolution of contractor report comments on equipment data base and EQ documentation

The documentation issues raised by the contractor report on the EQ equipment list will be addressed and EQ documentation will be updated as required. As part of this effort, equipment data base information relevant to the EQ program will be verified and corrected for each piece of EQ equipment. The reviews of the contractor report that were completed during the 1992 refueling outage give high confidence that no further equipment qualification deficiencies will be identified as a result of this effort. This is a documentation correction effort only.

3.2.3 EQ equipment list additions or deletions as a result of the design basis events task

Any changes to the EQ equipment list as a result of the Design Basis Events task will be appropriately reflected in EQ program documentation including the equipment database.

3.2.4 Consolidation of EQ equipment qualification files

Presently there are approximately 130 EQ equipment qualification files in the Palisades Document Control Center. It is judged that the number of files can be reduced by about half by consolidating like equipment with the same qualification requirements into the same file. This should greatly reduce the engineering effort required to maintain the files current.

3.3 EQ Equipment Maintenance

Our own assessment of the Palisades EQ maintenance program indicates that the program is unnecessarily complicated and burdensome on the maintenance planners and procurement engineers. This assessment has been corroborated through independent assessment by an EQ consultant. Unnecessary maintenance is required by our current EQ maintenance program and installation procedures for certain key pieces of EQ equipment do not exist. The following activities are planned to address the weaknesses in the EQ maintenance program:

3.3.1 Review and update EQ maintenance requirements

Current EQ maintenance requirements will be reviewed and updated as required to comply with vendor recommendations and eliminate unnecessary maintenance.

3.3.2 Develop EQ installation procedures

Installation procedures will be developed for certain key pieces of EQ equipment to assure installation meets vendor recommendations and qualification requirements.

3.3.3 Incorporate EQ maintenance requirements in equipment data base

EQ maintenance requirements will be incorporated into the equipment data base to help streamline maintenance planning and provide added assurance that EQ maintenance requirements are followed when performing corrective maintenance.

3.4 EQ Equipment Condition Monitoring

In addition to planned maintenance and replacement of EQ equipment, equipment condition monitoring is a key aspect of maintaining qualification. The following activities are planned to enhance our EQ equipment condition monitoring program.

Specific plant areas and sample EQ equipment will be monitored for environmental conditions and performance. Equipment performance goals will also be established. Planned maintenance and replacements and equipment performance goals will be adjusted based on the condition monitoring program results.

3.5 Personnel Training

Personnel training on EQ is a recognized weakness as a result of internal deviation reports and external audits and inspections. To address this weakness the following activities are planned.

The EPRI training course entitled "Maintaining Equipment Qualification" has been purchased as well as the services of the author to provide training to appropriate plant personnel. The author has conducted a pretraining site inspection and interviews to assess training needs and to gather data for customizing the course to Palisades site specifics. Training will be provided to management, engineering, procurement, planning and maintenance personnel.

4.0 SCHEDULE

Implementation of this EQ program plan is expected to occur over an 18 to 30 month period. A preliminary implementation schedule is provided in Attachment 1.

