Wisconsin Electric POWER COMPANY
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September 30, 1982

Mr. H. R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. NUCLEAR REGULATORY COMMISSION
Washington, D. C. 20555

Dear Mr. Denton:

DOCKET NOS. 50-266 AND 50-301
EMERGENCY SUPPORT CENTER
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

Attached is the additional information requested from your staff regarding the proposed modifications for the Point Beach Nuclear Plant Emergency Operations Facility.

Please feel free to contact us if there are any further questions.

Very truly yours,

Assistant Vice President

C. W. Fay

Attachment

Copies to NRC Resident Inspector
Incident Response Center,
Region III

A001

ATTACHMENT A

EMERGENCY OPERATIONS FACILITY
POINT BEACH NUCLEAR PLANT

This attachment is in addition to that information which was provided in our letter to Mr. H. R. Denton dated July 15, 1982 regarding our proposal to relocate a portion of the Emergency Operations Facility (EOF) functions for Point Beach Nuclear Plant (PBNP) to our corporate headquarters in Milwaukee. As described in our earlier submittals, our EOF is functionally divided into a Site Boundary Control Center (SBCC) and an Emergency Support Center (ESC). It is the latter that is proposed for relocation to Milwaukee. During a meeting with your staff on September 3, 1982, it was requested that we submit the following additional information:

A. COORDINATION OF OFF-SITE MONITORING

In the event of an accident, the State of Wisconsin Radiation Protection Section, the U. S. Department of Energy Radiological Assistance Team, and Point Beach Nuclear Plant survey teams will be performing environmental surveys in the vicinity of PBNP. The SBCC has been designated as the dispatch point for these teams, and immediate supervision and coordination of these teams will take place from this facility. The PBNP Health Physics Director is located at the SBCC and provides immediate supervision of the PBNP survey team. He has radio communication with the team in the field; sufficient equipment is provided at the SBCC to perform at least preliminary analysis of environmental samples collected by the teams. The overall management of Licensee monitoring is done by the RadCon/Waste Manager located at the ESC. Overall direction of Licensee response to any emergency or accident is the responsibility of the Emergency Support Manager located at the ESC. Plant data are displayed at both the ESC and SBCC. Meteorological and radiological calculations will be performed by computer at the ESC under the direction of the RadCon/Waste Manager. Site entry and/or exit will be controlled by PBNP security and health physics personnel located at the SBCC.

B. COMMUNICATIONS SYSTEMS

The communications systems available to the personnel at the ESC in Milwaukee are those normally available at our corporate headquarters. These include a sophisticated telephone centrex system which has dedicated tie lines to many areas of the State of Wisconsin, including eight lines to the plant site. Five of these lines are land lines. The remainder are microwave channels available for voice or digital information transmission. Microwave transmission is being considered as the primary means of digital communication for the data display system in the Milwaukee ESC. There is also a direct dedicated line from the Emergency News Center (ENC) in Two Rivers to corporate headquarters in Milwaukee. All of these lines are independent of local switching capability.

Currently being installed is a dedicated line similar to the health physics network between the ESC, the Technical Support Center (TSC), the Manitowoc County Emergency Operations Center, and the Kewaunee County Emergency Operations Center. This line is dedicated to communication of status updates to the various emergency operations centers.

The National Warning System (NAWAS) phone in the TSC connects the plant directly with all the following emergency response agencies:

1. Manitowoc County

2. Kewaunee County

3. Wisconsin Division of Emergency Government

4. Regional Office of Division of Emergency Government

5. National Weather Service - Green Bay

6. National Weather Service - Milwaukee

A second NAWAS phone will be installed in the new Milwaukee ESC, providing an additional communication channel with the plant and off-site agencies.

Initial notification of off-site agencies and escalation or de-escalation of emergency classifications will be made on the NAWAS phone. All other information transfer will be made using a regular or dedicated phone line.

The NRC Emergency Notification System will have an extension installed in both the SBCC and ESC. If recommended by NRC, the health physics network phone will also be installed at both locations.

Dedicated ringdown lines will be installed between the TSC, ESC, and SBCC. This system will provide direct communication capability between these emergency response facilities independent of the local telephone switching.

The radio communications system will be modified to ensure communications with off-site personnel taking surveys. The radio system will use a UHF frequency with repeaters and will have a range of 20 miles. This radio system also will be used with pagers for plant staff augmentation and emergency response facility staff augmentation.

C. DATA ACQUISITION AND DISPLAY

A data acquisition system will be installed in the ESC and SBCC. Both units will have the capability of displaying plant process computer system (PPCS) information and safety assessment system (SAS) information. By using a simple menu procedure, any of a number of displays can be monitored for trends or real time information. Both units will have the capability of displaying the output from a meteorological dose projection model. A more detailed description of the system can be found in Attachment C to our letter to Mr. Denton of June 1, 1981. A copy of Attachment C is included herewith. Please note that CRT displays for the system will be available in both the ESC and the SBCC.

The description provided in Attachment C was written over a year ago before the contract for the new computer system was finalized. The functions the system performs are still the same as described in Attachment C, but the system configuration and data flow are slightly different as a result of ongoing engineering development. The output of the four multiplexers will be sent to all four Central Processing Units (CPU's) rather than just to the two SAS CPU's. All displays will be redundantly connected directly to their associated CPU pair instead of being connected in some cases to another display device. The SAS CPU's will handle only plant data associated with SAS functions. SAS-derived values will be passed on to the PPCS CPU's as new parameters. Data will originate in the multiplexers and the same data, time tagged, will be passed on to all four CPU's. The system will use this single source of data for all of the displays or calculations.

D. INTERFACE WITH STATE AND LOCAL AGENCIES

The interface between our emergency response organization and the off-site agencies is carried out using telephone communication. The State and counties also communicate using telephones. The two major coordination tasks which are carried out by the emergency response organizations of the State and the Licensee are the coordination of off-site survey or monitoring teams and the issuance of protective action recommendations. The actual coordination of the survey teams is done by using a common survey map with coded sectors. The dispatch of teams is accomplished from the SBCC using utility and state radio systems. Protective action recommendations are made by the Emergency Support Manager to the State Division of Emergency Government based on both Licensee and State Section of Radiation Protection recommendations. The counties implement protective actions under direction of the State. Any emergency status specifics are telephoned directly to the various emergency response centers.

E. LAYOUT OF MILWAUKEE ESC

The layout of the ESC in Milwaukee is as described in our July 15, 1982 letter to Mr. Denton. However, it should be noted that the segmented areas provided in our engineering offices are intended as ancillary private conference areas. The ESC itself consists of a single room as shown in Figure 1 of Attachment B. There is a large conference table located in the ESC with space for NRC personnel, State personnel, and the principal management personnel of our emergency response organization. The other space allocation outside the main ESC room is provided as private conference or working space. Actual emergency management will take place in the ESC room.

The main responsibilities for the ESC functions are, of course, assigned to the Emergency Support Manager and the RadCon/Waste Manager. However, because of the convenient Milwaukee location proposed for the ESC, other members of the emergency organization are available for following the accident and consultation, including the Emergency Director, the Radwaste Technical Support Coordinator, the Licensing Support Coordinator, the Administrative and Logistics Manager, and the Design, Construction, and Planning Manager. Upon the decision to activate the ESC, the ESC in the Milwaukee office would be staffed within 30 to 60 minutes.

After the initial response to the emergency and the initial response to the needs of off-site agencies, the ESC operations will transfer to the SBCC for continued recovery operations if required. The Emergency Support Manager and the RadCon/Waste Manager would transfer to the SBCC, while the engineering support staff would remain in Milwaukee.

F. SUMMARY

Since, to our knowledge, Tennessee Valley Authority (TVA) is the only other Licensee requesting approval of an ESC location beyond 20 miles, it may be pertinent to note certain differences. Whereas TVA needs to respond to several nuclear plant sites, we are only concerned with one; whereas TVA's response capabilities originate from several geographical locations, ours originate only from one, i.e., Milwaukee. These factors considerably simplify communications and logistics for us. In fact, our proposed ESC location in Milwaukee is identical to our normal mode of operation, thus having the considerable advantage of a built-in familiarity with the facilities for all personnel involved.

Finally, we note that little difference exists in communication or operational needs for an ESC located 1, 20, or 100 miles from the plant. In exercises and drills to date, we noted that the geographic location of the ESC was not of essential importance to its operation and, in fact, that ESC operation from corporate headquarters would be more timely, more familiar, and more effective than at an unfamiliar location 10-20 miles from the plant. As we explored this possibility further, we noted a considerable simplification of communications for the corporate headquarters location. The location of an ESC 10-20 miles away would require communications between the site, the ESC, and corporate headquarters. This is considerably simplified if the ESC and corporate headquarters are one and the same location.

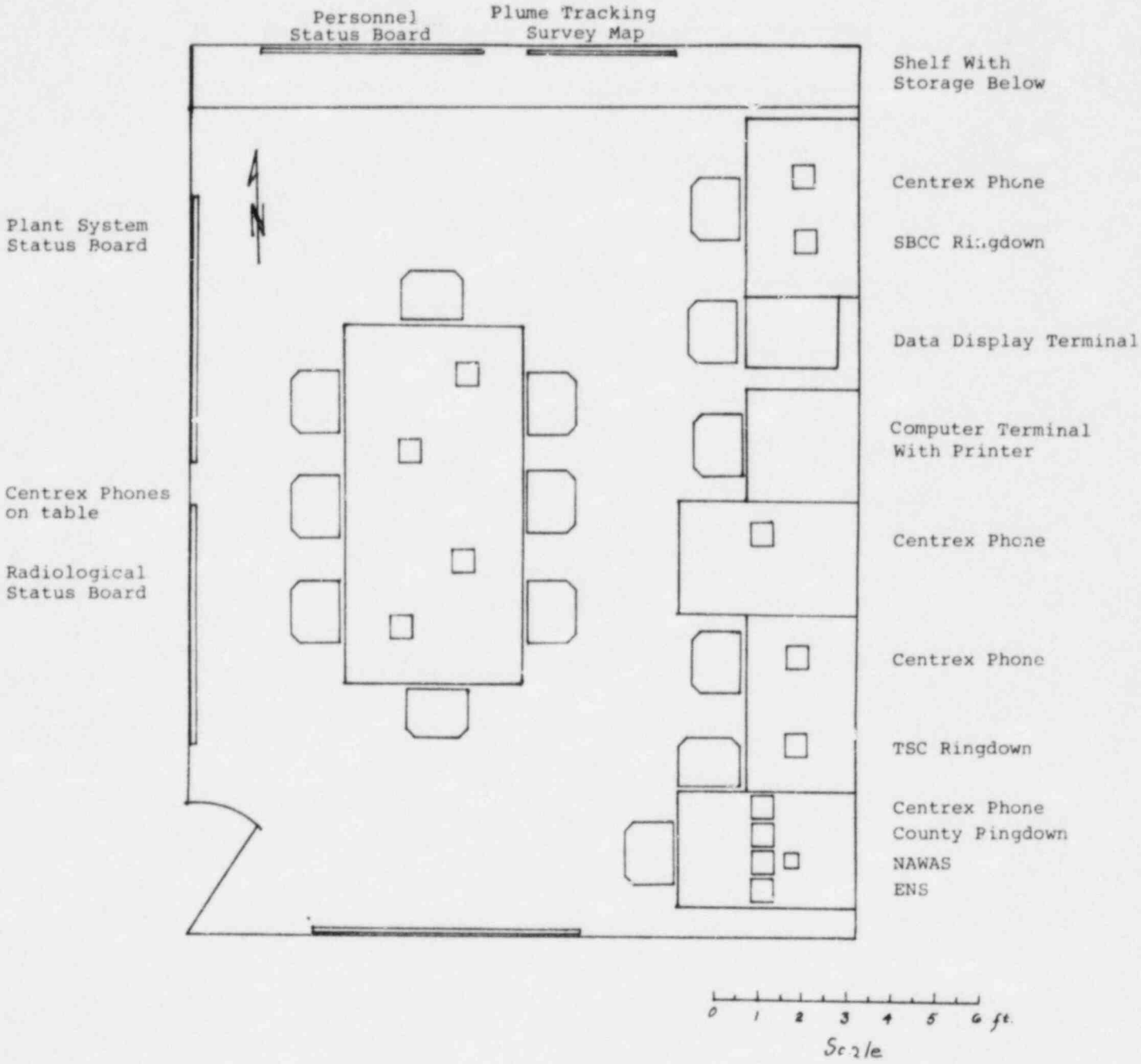
Our Emergency Plan requires that the Site Manager (Plant Manager) assume responsibilities for State communications, dose projections, and evacuation recommendations until the Emergency Support Manager and the RadCon/Waste Manager arrive to take over these ESC responsibilities. Locating the ESC in Milwaukee enables the Site Manager to turn over these responsibilities at a much earlier time (1/2-hour versus 2 hours) and assume his responsibilities for overseeing plant and TSC operations.

Transfer of personnel (primarily the Emergency Support Manager and the RadCon/Waste Manager) from Milwaukee to the site is best done when it is naturally required, i.e., after the initial flurry of activity has died down and either a long-term accident is in hand or recovery is underway. This transfer can be done by automobile or helicopter, as appropriate to prevailing conditions.

We are convinced that the Milwaukee location for our ESC will enable us to respond more expeditiously and effectively to any accident that might occur. Our proposal is consistent with and analogous to the State of Wisconsin response to any emergency, wherein overall management and direction occurs at a distant location (Division of Emergency Government headquarters in Madison, Wisconsin) with local supervision of field teams linked by an effective communication system.

ATTACHMENT B

Figure-1 ESC Floor Layout



ATTACHMENT "C"

POINT BEACH NUCLEAR PLANT
DATA DISPLAY AND SAFETY PARAMETER DISPLAY SYSTEMS

1.0 SAFETY ASSESSMENT SYSTEM CONCEPTUAL DESIGN DESCRIPTION

1.1 GENERAL CONSIDERATIONS

The Safety Assessment System (SAS) meets the requirements of the Safety Parameter Display System (SPDS). This section describes that portion of the SAS which meets the SPDS requirements of NUREG-0696. It provides a centralized, flexible, computer-based data and display system to assist control room personnel in evaluating the safety status of the plant. This assistance is accomplished by providing the operators and the Technical Support Center a high-level graphical display containing a minimum set of key plant parameters representative of the plant safety status. More detailed plant information is provided by several secondary displays. All graphical displays are presented to the control room operator on a high resolution multiple-color CRT.

All data displayed by the SAS is validated by comparing redundant sensors, checking the value against reasonable limits, calculcating rates of change, and/or checking temperature versus pressure curves.

All displays of the SAS have been carefully designed by persons with plant operating experience and evaluated against human factors design criteria. The concepts used in the SAS design will be verified using data recorded from a similar power plant simulator. The intent of the SAS is to present to the control room personnel a few easily understandable displays which use color coding and pattern recognition techniques to indicate off-normal values. These displays are updated and validated on an essentially real-time basis.

The SAS will be operable during normal and abnormal plant operating conditions. The SAS will operate during all SPDS required modes of plant operation. The "Normal Operation" mode will encompass all plant conditions at or above normal operating pressure and temperature. When the reactor coolant system is intentionally cooled below normal operating values, the operator will select the Heatup-Cooldown mode which alters the limit checking algorithm for the key parameters. An additional mode may be provided to address concerns of cold shutdown plant conditions.

1.2 DISPLAY HARDWARE LOCATIONS AND OPERATION

The SPDS portion of the SAS may be implemented on a single CRT located in a central location of the control room visible to the control room operator and the Senior Reactor Operator. This CRT contains the high-level display from which the overall safety status of the plant may be assessed. A dedicated function button panel allows operator selection of several predetermined second level (trend) displays at any time.

The SAS has been designed such that control room personnel can utilize its features without requiring additional operations personnel.

The SAS displays will be provided to the Technical Support Center. Refer to Figure C.1 for the configuration of the SAS and the data display system for the control room and the TSC.

1.3 DISPLAY CONTENTS

The primary display consists of bar graphs of selected parameter values, digital status indicators for important safety system parameters and digital values. The parameters indicated by bar graphs and digital values include: RCS pressure, RCS temperature, pressurizer level, steam generator levels and steam generator pressures. Status indicators are provided for containment environment and secondary system radiation. Reactor vessel level (if available), core exit temperature, amount of subcooling and containment radiation are indicated by digital values.

In addition, there is a message area which will be used to indicate that an appropriate secondary display provides further information in case an off-normal value is detected or an event is occurring.

Each of the bar graphs indicates wide-range values. If a parameter's value is outside the normal range, the bar color will turn red. Arrows next to the bar will indicate the trend direction (increasing or decreasing) based on data smoothing algorithms.

During normal operation, the message area will be used to display average power, reactor core average temperature, data, time, and unit. These messages may be displaced by higher priority messages as required.

Secondary displays may be selected by the operator. Trend graph groups of selected parameters, showing the last thirty minutes of plant operation are available. These trend groupings were chosen to keep like parameters or related parameters on one display "page".

1.4 HUMAN FACTORS CONSIDERATIONS

Human factors engineering and industrial design techniques have been effectively combined to establish man-machine interface design requirements, maximize system effectiveness, reduce training and skill demands, and minimize operator error.

The CRT color graphic formats and functional key board designs have been developed through an interdiscipliancy team of senior operational, human factors, industrial design and computer interface personnel.

Minimum use of color combined with simplified format throughout the CRT presentation have key design features to provide both normal and off-normal pattern recognition. The operator, who is the end user, has been directly involved from the conception to insure that man-machine interface goals of SAS have been satisfied. Human factor engineering standards and testing verification have been used which are consistent with accepted practices.

1.5 VALIDATION AND VERIFICATION

The SAS is implemented on a digital computer system which includes a peripheral display generator computer for color graphic displays. The software that controls the sensor data validation, key parameter construction, and display formats has been developed under strict quality assurance procedures. The original development of the SAS software began with a functional specification that was developed over a period of 18 months by a technical committee comprised of members from a number of utilities and consultants. These functional specifications are transformed into a design specification. Reviews of the design specification will assure conformance of the SPDS portion of the SAS to those functions discussed in NUREG-0696. The basis for selection of the primary display parameters will be a part of the final project documentation.

During the course of software development, a set of static test cases will be developed which test the key features of each software module. Furthermore, static system test cases will be developed and used to verify the correct operability of the total system. A set of dynamic test cases will be generated by recording nuclear plant simulator data on magnetic tape from a number of different plant transients which test the dynamic behavior of the system under "real" conditions. A design review that compares these test results to the original functional and design specifications will be performed. A selected number of the static test cases will be "frozen" such that they could be used to verify future changes to the software. In summary, verification and validation was addressed and designed into the SAS software from the beginning to provide a highly reliable product and a mechanism for identifying and controlling future changes.

2.0 SYSTEM CONFIGURATION

2.1 GENERAL

The Data Display and SPDS configuration is shown in Figure C.1. The system consists of four input multiplexers, two SAS computers, two Plant Process Computer Systems (PPCS), control room displays, TSC displays and computer room equipment. The overall system has been carefully designed to provide a highly reliable system using a common data base.

2.2 DATA ACQUISITION SYSTEM

The Data Acquisition System consists of four multiplexer input units which collect analog and digital information from both units and sends this information to the computers as indicated in Figure C.1. Each multiplexer will be supplied by a different IE power supply. The input signals will be separated such that their power supplies will match or be similar to the multiplexer power supply. Thus, a power supply failure should not reduce the data input by more than one redundant channel of sensors. The multiplexers will be seismically qualified. Input signals coming from safety systems will be isolated by an isolation device prior to connection to the multiplexer.

2.3 SAS COMPUTERS

Dual SAS computers are provided and each computer receives inputs from all four MUXs. Plant data from other sources, such as radiological monitor system (RMS) and meteorological data (MET), is also received by each SAS computer. This results in each SAS computer receiving the total input data base for both units. For both units, each SAS computer organizes the data base, performs its SAS functions, sends the appropriate data to the SAS display CRTs, and passes the total data base on to the PPCS computers. The SAS functions include redundant parameter verification and averaging, derivation of the historical data base for the SAS (SPDS) trend displays and derivation of the parameter attributes for the SAS (SPDS) displays. The SAS computers will utilize only core resident memory such that seismic qualification may be feasible. Each computer will be powered by an IE power supply.

2.4 PLANT PROCESS COMPUTER SYSTEM

Dual PPCS computers are provided and each computer is capable of receiving the total two-unit data base from each SAS computer. For both units, each PPCS computer will perform its normal plant process computer functions and the data handling for display in the control room and TSC. The total computer system data base will be available to the control room and the TSC. This includes the Regulatory Guide 1.97 parameters except as described in Section 3.0 of Attachment "C". The PPCS will not be seismically designed because it uses rotating memory but it is likely that data may not be lost during a seismic event because the data is stored in core resident memory before transfer for longer term storage on disk or tape. The PPCS computers will be powered by IE power sources.

2.5 CONTROL ROOM DISPLAYS

Each unit will have at least one SAS (SPDS) display CRT. Each SAS CRT is capable of receiving input from either SAS computer as shown in Figure C.1. Only the limited number of SAS displays will be shown on the SAS CRTs.

Each unit will have two PPCS display CRTs. Each master PPCS CRT is capable of receiving input from either PPCS computer as shown in Figure C.1. These CRTs will have the capability to display all of the plant process computer functions and the total data base.

A line printer associated with each unit is provided in the control room.

2.6 TECHNICAL SUPPORT CENTER DISPLAYS

A single SAS display CRT is provided in the TSC. It is capable of being connected to either unit's master SAS CRT and can display either unit's SAS displays quickly. The TSC can select its own SAS display but it will be chosen from the same set of displays available in the control room.

Two master PPCS display CRTs are provided in the TSC. Each CRT is capable of being connected to either PPCS computer. These CRTs will have the same capability as the control room CRTs for displaying all of the plant process computer functions and the total data base.

A line printer similar to that in the control room will be provided in the TSC.

2.7 COMPUTER ROOM EQUIPMENT

The equipment located in the computer room is shown in Figure C.1.

2.8 AVAILABILITY ANALYSIS

A detailed availability analysis will be performed to verify that the availability goal of NUREG-0696 is met.

2.9 NUCLEAR DATA LINK (NDL)

No provisions for a NDL are being provided. Transmittal of information to NRC headquarters via the NDL need not be real time as suggested by NUREG-0696, as no "real time" management function exists. This information transmittal will be limited to dedicated voice communication links.

2.10 SEISMICALLY QUALIFIED SPDS AND CONCENTRATED (SEISMIC) BACKUP

The function of the SPDS does not warrant seismic qualification because of the low probability of a seismic event concurrent with the need for the SPDS function, given the availability of seismically qualified displays for key safety parameters in the control room. Further, a separate additional concentrated display is not required as a backup for a non-seismic SPDS and is conceptually contrary to good human engineering practices.

Indicators are available and with proper training of the operators they are adequate for controlling the plant under all conditions. Future control room reviews will identify human factors deficiencies in the control room and improvements will be made as required. The requirement to install separate additional seismic displays compounds the human factors problem and is also in conflict with the design criteria of Regulatory Guide 1.97 which encourages that the operator use normal operating displays during accidents. This use of existing displays is most desirable since the operator will always get information to perform critical and normal operating functions from the same location. The SPDS, by definition, is intended to concentrate a minimum set of plant parameters to aid the operator in the rapid detection of abnormal operating events. However, it is reasonable to use the normal displays as a backup for this purpose.

The existing instrumentation in a well human engineered control room can fulfill the functions required for the SPDS backup. The ongoing control room reviews to improve human factors considerations will assure

that the requested functions for an SPDS backup will be satisfied by the existing control room displays. A separate concentrated seismically qualified backup SPDS in the control room is unnecessary, and should not be required.

3.0 REGULATORY GUIDE 1.97 PARAMETERS

Revision 2* of Regulatory Guide 1.97 (R. G. 1.97) dated December 1980 was issued by the NRC Staff to provide guidance on the instrumentation parameters to be displayed in the control room to assess plant and environs conditions during and following a design basis accident. R. G. 1.97 represents one acceptable way to meet General Design Criteria 13, 19, and 64 of Appendix A of 10 CFR 50. R. G. 1.97 states, however, that "Regulatory Guides are not substitutes for regulations and compliance with them is not required." NUREG-0696, which references R. G. 1.97, was issued to licensees as an enclosure to NRC Generic Letter No. 17 dated March 5, 1981. The Generic Letter states that NUREG-0696 "provides general guidance only, is an acceptable way to meet the NRC rules and regulations, and that compliance with NUREG-0696 is not a requirement." NUREG-0696 states that "the minimum data set that shall be available for display and use in the TSC and EOF shall include . . . Type A, B, C, D, and E variables specified in R. G. 1.97." It continues that "acquisition and transmission of . . . variables to the TSC and EOF need not meet the Regulatory Guide design and qualification criteria for display of that data in the control room."

Wisconsin Electric does not believe that implementation of R. G. 1.97 for control room, TSC and EOF displays is mandatory. We have, however, conducted a detailed evaluation of the R. G. 1.97 instrumentation design and qualification criteria as compared to the Point Beach Nuclear Plant design. A number of instruments are being added or upgraded to meet the requirements of the TMI Action Plan or IE Bulletin 7901B. The R. G. 1.97 design criteria are being factored into these additions and upgrades. In addition, several instruments are being added or upgraded strictly to meet the objectives ofR. G. 1.97.

Wisconsin Electric takes exception to a number of the R. G. 1.97 design criteria. The reasons include the adequacy of the present design, unavailability of reliable, qualified equipment, and/or the lack of a safety function requirement for that instrument in the Point Beach Nuclear Plant design. The present instrumentation already meets the requirements of General Design Criteria 13, 19 and 64. Wisconsin Electric does not intend to upgrade the following instrumentation for the reasons given:

VARIABLE	DISCREPANCIES	JUSTIFICATION
1. Neutron Flux (Source and Intermediate Range)	Seismic and Environmental Qualification	Boron Sampling and Rod Position Indication Adequate; Qualified System Not Available
2. RCS Soluable Boron Content	No Instrumentation Installed	Boron Sampling and Rod Position Adequate; Qualified System Not Available
3. Containment Isolation Valve Position	Seismic and Environmental Qualification (Outside Containment Only); Single Failure Criteria	Mild Environments Only; Seismic Will Be Addressed Later; Redundant Valves Provide Redundancy
4. RCS Radioactivity Concentration	No Instrumentation Installed	RCS Samples Adequate; Qualified System Not Available
5. Pressurizer Heater Status	No Electric Current; Meter Installed	Breaker Position Adequate; Pzr. Temp. and Press. Are Backups
6. Quench Tank (Pzr. Relief Tank) Temperature	Range	Required Range Physically Unrealistic
7. Heat Removal by Containment Fan Coolers	Seismic and Environmental Qualification	Containment Temperature will be Qualified and Is Adequate
8. CVCS Makeup (Charging) Flow	Environmental Qualification	Not Safety-Related
9. CVCS Letdown Flow	Environmental Qualification	Not Safety-Related
10. Volume Control Tank Level	Environmental Qualification	Not Safety-Related
11. Status of Standby Power Sources	Seismic and Environmental Qualification	Mild Environments Only; Seismic Will Be Addressed Later; Numerous Indications Available for Backup
12. Radiation Exposure Rate (Inside Building)	Range (Some Areas); No Instrumentation Installed (Some Areas); Environmental Qualification	Portable Survey Meters Are Primary Source of Data and are Adequate

VARIABLE	DISCREPANCIES	JUSTIFICATION
13. Airborne Radioactive Material Released from Plant (Noble Gas Radioactivity)	Seismic and Environmental Qualification	Portable Sampling and Onsite Analysis is Adequate Backup; Qualified System Not Available
14. Environs Radiation Exposure Meters	No Instrumentation Installed	Portable Survey Meters Are Primary Source of Data; TLDs Are Backup
15. Primary Coolant Sampling	Gross Activity Range; Dissolve Oxygen; Onsite Analyses Capability for Chlorides	Activity Range Adequate for PBNP; Oxygen and Chlorides Not Required for Safety
16. Containment Air Sampling	Oxygen Content	Oxygen Not Required for Safety

FIGURE C.1

DATA DISPLAY AND SAFETY ASSESSMENT SYSTEM CONFIGURATION