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 GIESLER, C.W. Wisconsin Public Service Corp.
 RECIP. NAME RECIPIENT AFFILIATION
 DENTON, H.R. Office of Nuclear Reactor Regulation, Director

SUBJECT: Summarizes info presented at 820623 meeting re request that shutdown sys be considered dedicated rather than alternate. Schedule & scope of work encl.

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	NRR DE FEB 09		2	2	NRR/DL DIR		1	1
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WISCONSIN PUBLIC SERVICE CORPORATION


P.O. Box 1200, Green Bay, Wisconsin 54305

August 4, 1982

Dr. H. R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
10CFR50.48 and 10CFR50, Appendix R

- Reference:
1. Letter from E. R. Mathews (WPSC) to H. R. Denton (NRC) dated January 22, 1982
 2. WPSC - USNRC meeting in Washington on June 23, 1982

- Attachments:
1. Appendix R Implementation Schedule
 2. Components affected and cable summary sheet. Work completed as of June, 1982. Appendix R - Long lead time equipment.
 3. Modifications to meet safe shutdown requirements of Appendix R.

On December 22, 1981, we received the NRC staff's approval of our proposed modifications to the Kewaunee Nuclear Power Plant to comply with Appendix R to 10CFR50. Our letter of January 22, 1982, in responding to that approval, noted that our proposed shutdown system should be considered a "dedicated" rather than

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an "alternate" shutdown system as the staff had concluded. This designation is vital since the implementation schedule is radically different for the two categories; however, rather than contesting your conclusion, we requested an extension in the schedule to implement the requirements. To reiterate, our shutdown design should be considered a "dedicated" shutdown system since it will result in an independent control system dedicated to maintaining the plant in a safe, shutdown condition in the event of a control room evacuation.

Since our extension request, extensive discussions among our staffs have taken place, culminating in a meeting in your office on June 23, 1982. This letter is submitted at your request to summarize the information presented to you at that meeting. To aid you in this review the following attachments are included with this letter: Attachment 1 - the schedule, Attachment 2 - an outline of the scope of work involved on the project and Attachment 3 - a project work summary.

SCHEDULE

Attachment 1 lists our schedule of implementation dates for the proposed modifications as discussed at the meeting (Reference 2). The schedule provides the following information:

- 1) The "WPSC schedule" includes the following considerations: modification impact on the plant while it is operating, impact of the length of time our technical specifications will allow safety systems to be out of service, impact of operator training for the modifications, and procurement time for materials.
- 2) The "Improvements to Safety Schedule" shows a progression of continued improvement to fire-safety at the plant as work progresses in accordance with the WPSC schedule.

- 3) The "NRC schedule" for implementing the proposed modifications. Note that this schedule is based on an interpretation of the requirements of 10CFR50 Appendix R. This schedule would extend the Kewaunee Plant's 1983 scheduled refueling outage by 5 months.

The WPSC schedule indicates a final completion date for the proposed modifications during the KNPP refueling outage scheduled for the spring of 1984.

As you know, a major project of this nature has a considerable impact on the plant. For example, there are 440 electrical cables to be installed or rerouted, and 136 safety related components affected. Many new components must be ordered. Due to the stringent requirements and special design criteria associated with them, many of these new components have long procurement times (long lead times). Specifically, the pieces of equipment that require a long lead time are:

<u>Component</u>	<u>Estimated Lead Time</u>
1) Motor Control Center	6 months
2) Instrumentation Rack	6 months
3) Cable	6 1/2 months
4) Electrical Containment Penetrations	7 1/2 months
5) AC/DC Fuse Panel	7 1/2 months
6) Dedicated Shutdown Panel	10 months
7) Control Valve	12 months

Of this equipment, the critical component is the Dedicated Shutdown Panel. At this time, the best estimate for delivery of the dedicated shutdown panel is 40 weeks after the panel design is completed and purchase order placed. (This is an optimistic estimate when compared to a similar panel installed as a "TMI requirement" which had an actual delivery time of 71 weeks.)

The lead time includes time for testing the panel to the requirements of IEEE 344-1975. It should be noted that elimination of this testing would save only

one to two months and in our opinion is not advisable. Finally, a complicating scheduling factor when dealing with long lead time equipment is the dependence of other work on that equipment. For example, of the 136 safety related components that will be affected, 71 require the dedicated shutdown panel to be installed in order to complete the appropriate terminations and perform final system checkout.

These long procurement times are relatively inflexible and are the primary reason for our proposed implementation schedule. The WPSC schedule shown on attachment 1 has taken these lead times into consideration. The NRC schedule would also be limited by these lead times.

Our consulting engineer, Fluor Power Services, is pursuing all available measures to assure these delivery schedules are met and where possible improved. These measures include advance notification of vendors where competitive bids will not be required, issuance of letters of intent to successful bidders to initiate work in advance of the purchase order and confirmed specifications, and combining our equipment orders with other utility orders where the material is similar. Fluor is also pursuing authorization of shop overtime and use of bonus payments as a means of expediting delivery.

There are other practical constraints in attempting to accelerate this schedule. One obvious constraint is the number of contract people that can be properly supervised by WPSC personnel, and similarly, the number of people that can actually work in a confined area. Increasing the labor force beyond a practical level will result in reduced efficiency (too segregated installation practices with mountainous coordination problems), which may lead to potential safety problems.

Another constraint is the amount of work that can safely be undertaken at any given time. By procedure, all work performed on safety related equipment must first be approved by the shift supervisor. Consistent with his responsibility to maintain control and not compromise the safety of the overall operation of the plant, the shift supervisor will review each work request, supporting documentation, and associated technical specifications. There is a limit to the amount of work that can be performed in a safe manner and channelled through the shift supervisor at any given point in time.

Certain equipment can be worked on only during specific modes of operation. For example, some equipment is available only during shutdown conditions, while others are available only during cooldown. Additionally, the Kewaunee Technical Specifications limit the amount of time during which safeguards equipment can be out of service. It has been the practice of our plant management to allow safeguards equipment to be taken out of service only for essential maintenance or required surveillance. Because of the magnitude of the work involved for the Appendix R modifications, we have determined that it will be necessary to deviate from this practice (albeit, reluctantly) and allow equipment to be out of service for modification purposes. This will be done only to the extent allowed by technical specifications and only if plant operation will continue in a safe manner while the equipment is out of service and the modification work is performed.

In regards to operations and training, a significant amount of time will be required for operators to comprehend all of the proposed changes. Drawings will have to be changed, new procedures issued and in some cases, the physical location of equipment will be changed. Training associated with implementing all these changes must be considered and closely scrutinized in order to prevent

a degradation of safety. The implementation schedule we have developed minimizes the impact of these changes on the operations and training departments.

In addition, other major plant modifications are currently in the design process and will be installed in the same outages as the Appendix R modifications. Many of the same plant areas, cables and equipment are affected by these modifications resulting in multiple engineering modifications being performed on the same drawings for different Design Changes. This situation requires extensive coordination between projects so that the same terminal blocks (for example) are not used by two different projects. This places a practical limit on how far one design can progress without being approved by the other design team.

The schedules shown on Attachment 1 are intended to graphically indicate our proposed completion date for these modifications and the severe impact on plant operation if we are forced to an accelerated schedule. Accordingly, we have used construction milestones to describe the schedule. You will note that the first milestone occurs during November of 1982. However, considerable time and money has already been spent on our part in responding to your requirements and making other necessary preparations as noted below:

January, 1981	Appointed a Fire Marshal.
March 19, 1981	Responded to the requirements of paragraph (c)(5) of 10CFR50.48.
April, 1981	Created the plant staff position of Fire Protection Specialist
April 9, 1981	Provided the design description of our proposed method to provide dedicated shutdown capability at the Kewaunee Plant
May 19, 1981	Provided the information requested in Enclosure 1 of Generic Letter 81-12 dated February 20, 1981.
June 19, 1981	Provided the final set of information requested in Generic Letter 81-12 dated February 20, 1981.

October 27, 1981	Finished installing new emergency lighting batteries having a full 8 hour lighting capacity in accordance with paragraph J of Appendix R to 10CFR50.
December 22, 1981	Received USNRC Safety Evaluation Report and Approval. (WPSC was the first company to receive this approval)
January 22, 1982	Requested extension for implementing schedule and submitted modified design for implementing USNRC requested additions
February 22, 1982	Initiated letter of intent to Fluor Power Services and started final engineering
April 8, 1982	Received WPSC Board of Directors Approval
April 12, 1982	Presented conceptual design to Plant Operations and Review Committee
May 15, 1982	Completed installation of the Reactor Coolant Pump Oil Collection System in accordance with paragraph O of Appendix R to 10CFR50.
June, 1982	Applied for approval from the Public Service Commission of Wisconsin
June 23, 1982	WPSC - USNRC meeting in Bethesda, Washington to discuss schedule

It is important to note that prior to January 1982, the WPSC staff was occupied in completion of TMI related tasks and the corresponding completion of "as built" drawing for these modifications. Many of these drawings are required for the Appendix R work and were simply not available for use by Fluor Power Services until February 1982. This limited the amount of work that could be undertaken up until this time.

Nevertheless, the accumulation of this work at the present time represents approximately 25% of the engineering for the project and will be about 20% of total project engineering cost. Seven of the major engineering specifications have been completed and we are in the process of obtaining bids for these items. In addition, all other modifications required by Appendix R, specifically the

8 hour battery capacity for emergency lighting (Section III.J) and, reactor coolant pump oil collection system (Section III.O) have been installed.

In addition to the modifications associated with Appendix R, there has been a number of other major plant projects in progress which are directly in response to NRC or other requirements. These projects include:

- 1) Emergency Preparedness
- 2) NUREG 0737 requirements
- 3) Environmental Qualification of Electrical Equipment
- 4) Replacement of the Kewaunee Plant Process Computer
- 5) Normal Refueling Shutdown Activities
- 6) Design and construction of a new warehouse facility

The activities in regard to environmental qualification of electrical equipment, emergency preparedness, replacing the plant process computer, and construction of a new warehouse facility, will continue at a high level for the next one to two years. Additionally, there will be several more major projects added to this list over the next two years. These include:

- 1) Ten-year In-service Inspection Requirements

This project involves removing the lower core barrel from the reactor and removing a reactor coolant pump, for inspection purposes. Both of these projects are high exposure jobs and constitute a time when all other work inside containment is halted. The time required for removal and reinstallation will be about two days apiece. The reactor coolant pump inspection will be performed during the 1983 refueling outage, and the lower core barrel inspection will be performed during the 1984 refueling outage.

- 2) Integrated Leak Rate Testing

During the ten-year inspection, 10CFR50 Appendix J requires a "Type A" containment integrated leak rate test be performed. A "Type A" test requires the containment vessel be pressurized to 46 psig and held for a 24-hour test period. This sequence of events requires five consecutive days where no access to containment is allowed.

3) Non-safeguards Containment Cooling Modifications

This modification provides for additional cooling inside containment during refueling outages. Specifically, this modification involves rerouting service water piping inside containment. Plans are to make these piping modifications at the same time the Appendix R modifications are done.

Each of these items is necessary in that it is in response to existing regulation or it will provide a significant improvement in plant operation or performance. Our proposed implementation schedule for the Appendix R fire protection requirements has taken these other projects into consideration. Projects 1 and 2 severely limit the amount of work that can be performed inside containment during the 1984 refueling outage. The containment cooling modification (project 3) is scheduled for the 1983 refueling outage. This project is closely associated with the Appendix R modifications. With this in mind we have scheduled the Appendix R containment work for the 1983 refueling outage and the dedicated shutdown panel for the 1984 refueling outage.

A final consideration that must be taken into account is the cost of this project. We have estimated that a total of 125,000 craft manhours are required to complete the installation phase of the project. This does not include additional training for operations and maintenance personnel and development of new procedures and testing.

We have estimated the following project costs based on the USNRC schedule vs. WPSC schedule:

	<u>USNRC</u>	<u>WPSC</u>
Engineering and Construction Cost	\$5.4 million	\$5.4 million
Increased cost due to short time period for equipment procurement and additional engineering and construction cost.	1.25 million	----
Replacement power cost due to 5 month extension of the 1983 refueling outage.	12 million	----
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	\$18.65 million	\$5.4 million

Note the additional cost (approximately \$13,250,000) associated with the USNRC schedule. In our opinion, the "USNRC schedule" does not provide an increase in safety commensurate with the financial penalty that would be incurred in connection with it.

The "Improvements to Safety" schedule on Attachment 1 shows the progression of improvements to fire safety that will occur at the plant in the course of implementing our proposed modifications. For example, during the scheduled 1983 refueling outage, new fire walls will be constructed in the auxiliary building which will reduce the amount of damage that a given fire could cause. Additionally, many fire-related improvements will be completed in the containment, again reducing the damage that a fire could cause. As shown on the schedule, this progression of improvements continues throughout 1983. The implementation schedule imposed by 10CFR50.48 is arbitrary in that it does not take such improvements to safety into consideration. If these safety improvements (which are over and above the current acceptable levels of fire safety at the plant) are taken into consideration, the schedule we have proposed is rational and justified. Indeed, it is irrational to impose a shutdown on a single nuclear power plant based on an arbitrary schedule only because that utility responded to your original requirements in a timely fashion. This becomes

especially evident on the realization that other plants would still be allowed to operate during the same time period while potentially at an even lower level of fire safety than at the Kewaunee Plant today.

It is our understanding that the Commission intended that the utility industry accept some risk in proceeding with work on Appendix R modifications prior to staff approval of licensee proposals. The Commission's justification for this intent was a perceived lethargic response from the industry in regard to implementing the fire protection requirements of Branch Technical Position (BTP) 9.5.1. Based on this reasoning, the Commission approved the implementation schedules of 10CFR50.48, which are very short in consideration of the amount of work which is required by the regulation.

It should be noted that the Commission's reasoning does not apply to Wisconsin Public Service Corporation. First, WPSC cannot be considered as part of that group in the industry that responded slowly to your original fire protection requirements. While it is true that we have protested those items that in our opinion do not provide any additional safety to the plant, we have responded promptly and in good faith to implement your requirements. Mr. Eisenhut's letter dated November 25, 1980 to All Power Reactor Licensees With Plants Licensed Prior To January 1, 1979, informed the licensees of the new Appendix R. Enclosure 2 of that letter noted that the Kewaunee Nuclear Power Plant had no open items with respect to the NRC's previous fire protection requirements. Similarly, while many in the industry delayed in responding to the new fire protection requirements (the response was due March 19, 1981) we responded promptly and ultimately became the first licensee with an approved Safety Evaluation Report on the new requirements. Ironically, it appears that our good faith

efforts in responding promptly have indirectly penalized us since many utilities have effectively obtained additional time by delaying their initial response.

Secondly, the Commission's intent that we proceed at risk with respect to the new fire protection requirements has been fulfilled. As noted above, we have proceeded with the conceptual design and other engineering work on this project prior to the staff's approval and, as yet, without the approval of the Public Service Commission of Wisconsin. Even though the amount of work that could be undertaken was limited due to the unavailability of drawings, it is expected to account for more than 20% of the total project engineering cost (based on our proposed schedule). However, our activities undertaken at risk have been tempered by our experience in implementing other NRC requirements.

For example, we proceeded promptly and rapidly to perform the modification and develop the controls necessary to implement the security regulations of 10CFR73. In so doing, we became one of the first plants in the industry to have an operational security system which met your requirements. However, in order to meet rigid deadlines, we had to purchase equipment that was newly designed and relatively untested. Consequently, we have been beleaguered with minor problems as we debug the system in an operational mode.

In another area, emergency preparedness, we spent thousands of dollars renovating an existing building to create our Emergency Operations Facility (EOF) in accordance with the NRC's original guidance after TMI. We began this work in the fall of 1979, promptly after the guidance was issued. After completion of the EOF your guidance changed, rendering our existing EOF "unacceptable."

The issue of Equipment Qualification has provided a similar experience with respect to changing requirements. Based on an order requiring that all equipment be qualified by June 30, 1982, we proceeded for two years on an expedited basis to document, replace and relocate equipment. Expediting this work proved very costly in terms of engineering, premium time and over-time costs, however, on June 29, 1982, (hours before the deadline) the Commission suspended the deadline. While we concur with the Commission's reasoning and actions in extending the deadline, we note that a significant savings could have been realized if the deadline had been suspended earlier.

Most recently, the requirements related to the "Lessons Learned" from the accident at Three Mile Island have provided an example of "moving targets." Many of the requirements of NUREG 0578 were changed in September 1980, when the former were "clarified" by NUREG 0737. To the staff's credit, most of these changes were rectified in response to the industry protests following preliminary issuance of NUREG 0737. However, some of the changes were left intact in the final issuance of NUREG 0737, causing difficulty in meeting the requirements. Indeed, in recent correspondence from the staff requesting additional information on our High Radiation Sample Panel, it appears that you are expecting more than the requirements of NUREG 0737.

Finally, your Fire Protection requirements provide the most vivid example of the difficulties encountered in trying to implement changing requirements.

For example, in trying to comply with BTP 9.5.1.D.1.a we installed a reactor coolant pump foam fire suppression system. The foam suppression system was installed due to economic concerns, and it was not necessary for fire-related safe shutdown of the reactor. This was reported in the WPSC Fire Protection

Analysis, which concluded that the ability to perform a fire-related shutdown would be maintained without the foam suppression system. Nevertheless, installation of this system was required through Amendment No. 23 to the Facility Operating License which states in paragraph 2.C.3 that "The Licensee is required to complete the modifications identified in paragraphs 3.1.1 through 3.1.28 of the Fire Protection Safety Evaluation Report. Paragraph 3.1.3 of this report specifically identifies the reactor coolant pump foam suppression system as one of the referenced modifications. However, with Appendix R to 10CFR50 the foam suppression system was no longer acceptable in lieu of a new requirement mandating installation of an oil collection system on reactor coolant pumps.

Even the final Appendix R was changed considerably from the version that was published for comment. Based upon the possibility of further changes as a result of the legal action which was undertaken by several utilities in response to the promulgation of Appendix R, the potential changes to our proposal as a result of the staff review, and our experiences as noted above, it would have been unwarranted to accept any more risk than we have on this project.

In summary, on January 22, 1982 we requested that the implementation schedule for our proposed modifications to satisfy Appendix R to 10CFR50 be extended one year until the end of our scheduled 1984 refueling outage. Our letter summarized the general reasons for that request. On June 23, 1982, we met with members of your staff to discuss in more detail an extension to the schedule and the justifications for it. This letter has provided a summary of the information presented at that meeting.

Therefore, based on the schedular, economical, practical and safety considerations discussed in this letter and our January 22, 1982 letter, we

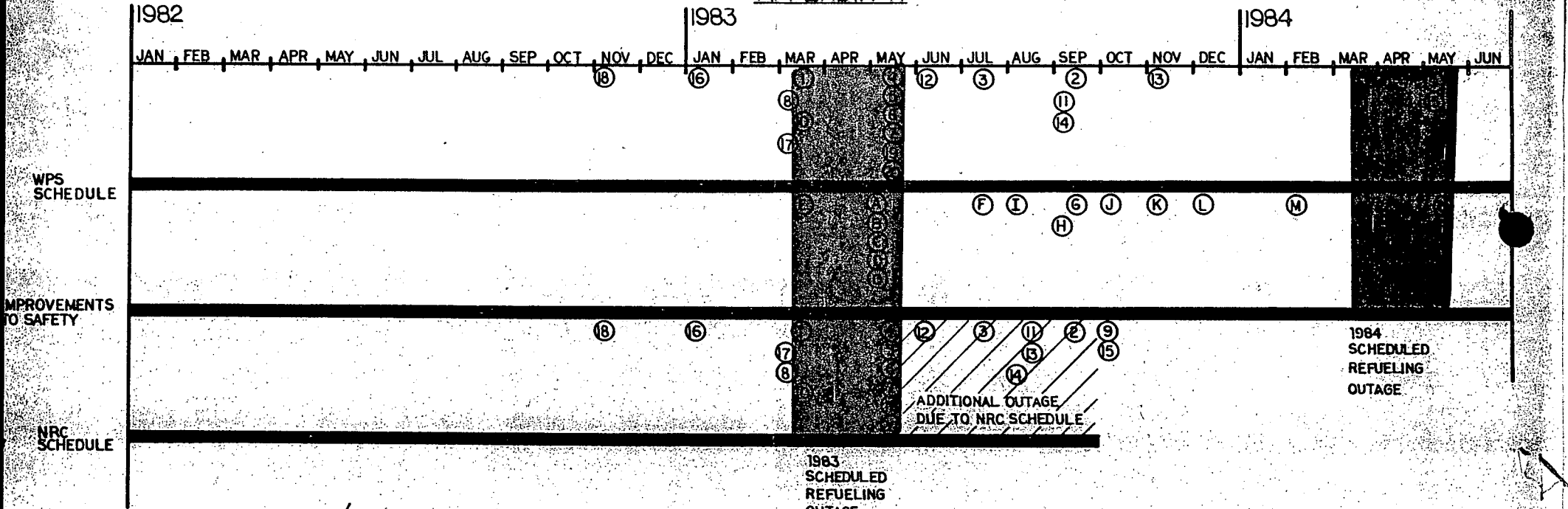
reiterate our request for an exemption from the requirements of 10CFR50.48(c)(3). Specifically, we request that the implementation schedule for the "alternate shutdown system" (as interpreted by the staff; note that we feel this is a dedicated system) as described in our letters of March 19, April 9, May 19, June 19, 1981 and January 22, 1982, be extended until the end of our scheduled refueling outage in 1984. We request your prompt consideration of this exemption, and would welcome the opportunity to meet with you either in your offices or in a public hearing, if appropriate, to provide further clarification of our request.

Very truly yours,



C. W. Giesler
Vice President Nuclear Power

APPENDIX R



WPS/NRC SCHEDULE

- | | |
|----------------------------|-------------------------------|
| ① AUXILIARY BUILDING WALLS | ⑪ AC/DC FUSE PANELS |
| ② TURBINE BUILDING WALLS | ⑫ FOXBORO ON SITE |
| ③ SCREENHOUSE WALLS | ⑬ FOXBORO RACKS |
| ④ CONTAINMENT HEAT SHIELDS | ⑭ DSP ON SITE |
| ⑤ CONTAINMENT SPRINKLER | ⑮ DEDICATED SHUT DOWN PANEL |
| ⑥ CONTAINMENT PENETRATION | ⑯ TRAY ON SITE |
| ⑦ MOTOR CONTROL CENTER | ⑰ CABLE TRAY |
| ⑧ CABLE ON SITE | ⑱ SCREENHOUSE ELECTRICAL DUCT |
| ⑨ REROUTE CABLES | ⑲ S.S. INSTRUMENTATION TUBING |
| ⑩ AC/DC PANEL ON SITE | ⑳ SERVICE WATER PIPING |

1983
SCHEDULED
REFUELING
OUTAGE

IMPROVEMENTS TO SAFETY

- | | |
|--------------------------------------|--|
| Ⓐ FIRE SUPPRESSION SPRAY-CONTAINMENT | Ⓘ RHR PUMPS BACKUP POWER AVAILABLE |
| Ⓑ DIESEL GENERATORS SEPARATED | Ⓝ CHARGING PUMPS POWER SEPARATED |
| Ⓒ RADIANT ENERGY SHIELDS-CONTAINMENT | Ⓚ AFW PUMPS POWER SEPARATED |
| Ⓓ PRZ HEATERS POWER SEPARATED | Ⓛ SI PUMPS POWER SEPARATED |
| Ⓔ FIRE WALL - AUXILIARY BUILDING | Ⓜ CONTAINMENT FAN COIL UNITS POWER SEPARATED |
| Ⓕ FIRE WALL - SCREEN HOUSE | Ⓝ CCW PUMPS POWER SEPARATED |
| Ⓖ FIRE WALL - TURBINE BUILDING | Ⓞ ONE TRAIN OF INSTRUMENT AIR TUBING SEPARATED |
| Ⓗ SCREEN HOUSE POWER SEPARATED | Ⓟ DEDICATED SHUTDOWN PANEL |

ATTACHMENT 2

LETTER FROM C.W. GIESLER TO DR. H.R. DENTON
DATED AUGUST 4, 1982

1. SAFETY RELATED COMPONENTS AFFECTED. ^o	136
2. COMPONENTS THAT CAN BE INSTALLED AND TESTED PRIOR TO 1983 REFUELING (AFTER TRAY & CABLE INSTALLATION)	30
3. COMPONENTS THAT CAN BE INSTALLED DURING REFUELING (ELEVEN (11) OF THESE REQUIRE SHUTDOWN PANEL)	24
4. COMPONENTS THAT MUST BE INSTALLED AND TESTED DURING COOLDOWN (THREE (3) OF THESE REQUIRE SHUTDOWN PANEL)	5
5. OF APPROXIMATELY (90) COMPONENTS TO BE INSTALLED AFTER 1983 REFUELING, SEVENTY ONE (71) OF THESE REQUIRE SHUTDOWN PANEL INSTALLATION.	
6. CABLE SUMMARY	
NEW POWER CABLES	50
NEW CONTROL CABLES	367
REROUTING & REUSING CABLES	<u>23</u>
TOTAL	440

Work Completed as of June 1982

NRC approval December 22, 1981

Board of Directors approval April 8, 1982

Plant Operating Review Committee approval April 12, 1982

Public Service Commission of Wisconsin approval applied - June 1982

Initiated Letter of Intent to Fluor Power Consulting Engineers
February 22, 1982

Number of Specifications Complete - Seven major specifications
complete and in process of obtaining bids

% Engineering Complete 25% June 1982

Appendix R - Long Lead Time Equipment

(After Purchase Order is initiated)

Motor Control Center	6 months
Instrumentation Racks	6 months
Cable	6½ months
Electrical Containment Penetration	7½ months
AC/DC Fuse Panel	7½ months
Dedicated Shutdown Panel	10 months
Control Valve	12 months

ATTACHMENT 3

LETTER FROM C.W. GIESLER TO DR. H.R. DENTON
DATED AUGUST 4, 1982

Dr. H. R. Denton
August 4, 1982
Attachment 3, page 1

MODIFICATIONS TO MEET
SAFE SHUTDOWN REQUIREMENTS OF APPENDIX R

CHANGES REQUIRED

CONTAINMENT

AUXILIARY BUILDING

TURBINE BUILDING

SCREENHOUSE

TECHNICAL SUPPORT CENTER

CONTAINMENT

REPOWER FAN COOLERS

INSTALL SPRINKLER SYSTEM

INSTALL REFLECTIVE HEAT SHIELDS

REROUTE CABLE

NEW PENETRATION

AUXILIARY BUILDING

ADD 3 FIREWALL @ EL. 586' (BETWEEN CHARGING PUMPS & SAFETY
INSPECTION PUMPS)

FIRE BARRIER TO MEZZANINE FLOOR (MISCELLANEOUS ELECTRICAL
WIRE)

ADD FIREWALLS @ EL. 606' (COMPONENT COOLING WATER)

REROUTE CABLE

ADD NEW MOTOR CONTROL CENTERS

AREA COOLERS

RELOCATE SOLENOID VALVES

TURBINE BUILDING (SAFEGUARD AISLE)

NEW FIREWALLS @ EL. 586' (AUXILIARY FEED WATER & ELECTRICAL
SYSTEM)

FOXBORO RACK

DEDICATED SHUTDOWN PANEL

FUSE PANEL

AREA COOLERS

REROUTE CABLE

SCREENHOUSE

NEW FIREWALLS

NEW BACKWASH CONTROL PANELS

REROUTE CABLE

NEW DUCT BANK FROM TURBINE BUILDING

HVAC MODIFICATIONS

MISSILE SHIELDS ON ROOF

Dr. H. R. Denton
August 4, 1982
Attachment 3, page 6

TECHNICAL SUPPORT CENTER

NEW TYPE IE CABLE RUN

SECURITY MODIFICATIONS

NEW EQUIPMENT

SOLENOID VALVES

CONTROL VALVES

FAN COIL UNITS

AIR ACCUMULATORS

FIRE PROTECTION SYSTEM

PIPE

STEAM EXCLUSION DAMPERS

FIRE DOORS

RADIANT ENERGY SHIELDS

STEEL

CONTAINMENT PENETRATION

MOTOR CONTROL CENTERS

AC/DC FUSE PANEL

TRAY

CABLE

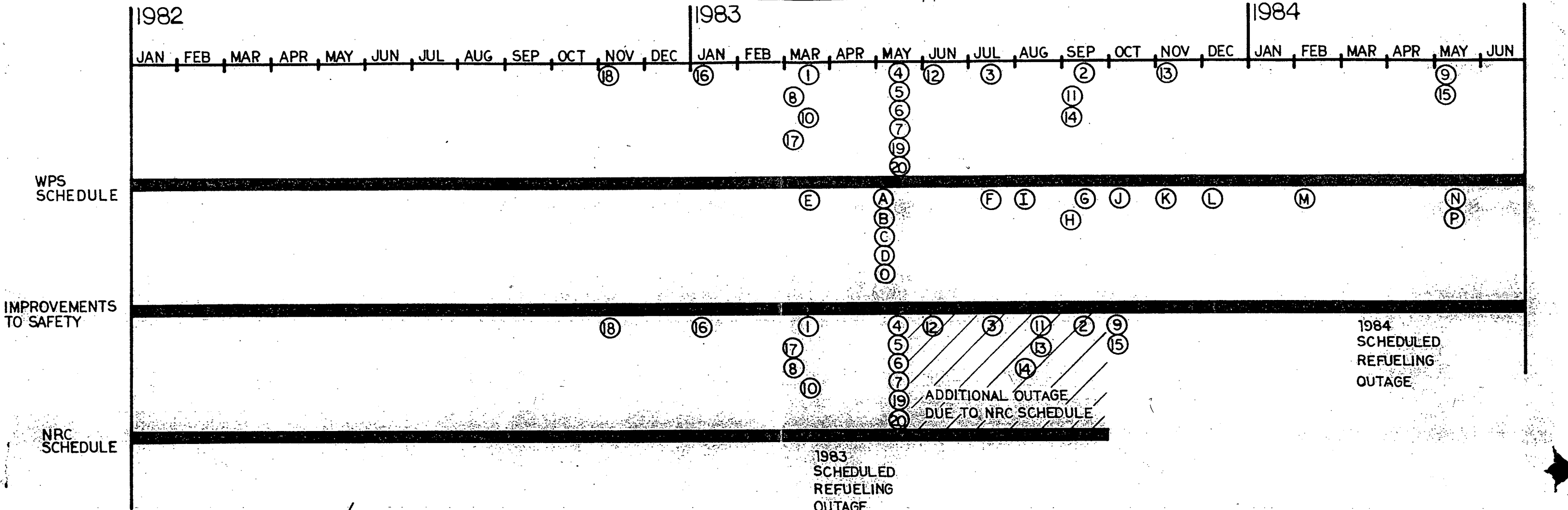
DEDICATED SHUTDOWN PANEL

BACKWASH PANELS

FOXBORO RACK

SOURCE RANGE MONITORS

APPENDIX R



WPS/NRC SCHEDULE

- | | |
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| ⑧ CABLE ON SITE | ⑱ SCREENHOUSE ELECTRICAL DUCT |
| ⑨ REROUTE CABLES | ⑲ S.S. INSTRUMENTATION TUBING |
| ⑩ AC/DC PANEL ON SITE | ⑳ SERVICE WATER PIPING |

1983
 SCHEDULED
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| Ⓔ FIRE WALL - AUXILIARY BUILDING | Ⓜ CONTAINMENT FAN COIL UNITS POWER SEPARATED |
| Ⓕ FIRE WALL - SCREEN HOUSE | Ⓝ CCW PUMPS POWER SEPARATED |
| Ⓖ FIRE WALL - TURBINE BUILDING | Ⓞ ONE TRAIN OF INSTRUMENT AIR TUBING SEPARATED |
| Ⓗ SCREEN HOUSE POWER SEPARATED | Ⓟ DEDICATED SHUTDOWN PANEL |