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Docket No. 50-305

Mr. C. W. Giesler, Vice President
Nuclear Power
Wisconsin Public Service Corporation
Post Office Box 1200
Green Bay, Wisconsin 54305

Dear Mr. Giesler:

The Commission has issued the enclosed Exemption to the schedular requirements for the alternative shutdown system as set forth in 10 CFR Part 50 §48(c)(4). The Exemption extends the time requirement for completion of the system from the spring 1984 refueling outage to the spring 1987 refueling outage.

On October 7, 1982 we issued an exemption to the schedular requirements for the alternate shutdown system as set forth in 10 CFR Part 50 §48(c)(4) which extended the time requirements for completion of the system from the spring 1983 refueling outage to the the spring 1984 refueling outage. By letter dated September 7, 1983 you requested that the implementation schedule be extended from the spring 1984 refueling outage to the spring 1987 refueling outage. Your submittal provided background and support for your request which had been presented to the staff in a meeting on July 28, 1983.

We have concluded that your request for an extension constitutes a request for an exemption to 10 CFR Part 50 pursuant to §50.12 of 10 CFR Part 50 and have responded accordingly. Our conclusion is based on our enclosed Safety Evaluation.

The Exemption is being forwarded to the Office of the Federal Register for publication.

Sincerely,

Original signed by
Darrell G. Eisenhut

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Enclosures:
1. Exemption
2. Safety Evaluation

cc w/encl: See next page

DE:A/D:MCEB							
Johnston							
2/14/84							
DL:ORB-1	DL:ORB-1	DL:ORB-5	DL:ORB-1	DL:OR	OELD	DL:D	NRR
CParrish	McGrotenhuis	TWambach	SVarga	GLainas	W. SHIELDS ~~BBordenick~~	DEisenhut	HDenton
2/13/84	2/13/84	2/15/84	2/16/84	2/21/84	2/17/84	2/27/84	2/29/84

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F PDR

cc: Steven E. Keane, Esquire
Foley and Lardner
777 East Wisconsin Avenue
Milwaukee, Wisconsin 53202

Stanley LaCrosse, Chairman
Town of Carlton
Route 1
Kewaunee, Wisconsin 54216

Mr. Donald L. Quistroff, Chairman
Kewaunee County Board
Kewaunee County Courthouse
Kewaunee, Wisconsin 54216

Chairman
Public Service Commission of Wisconsin
Hill Farms State Office Building
Madison, Wisconsin 53702

Mr. Patrick Walsh
Assistant Attorney General
114 East, State Capitol
Madison, Wisconson 53702

U.S. Nuclear Regulatory Commission
Resident Inspectors Office
Route #1, Box 999
Kewaunee, Wisconsin 54216

Regional Radiation Representative
EPA Region V
230 South Dearborn Street
Chicago, Illinois 60604

James G. Keppler
Regional Administrator - Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	Docket No. 50-305
WISCONSIN PUBLIC SERVICE CORPORATION	)	
	)	
(Kewaunee Nuclear Power Plant)	)	

EXEMPTION

I.

The Wisconsin Public Service Corporation (the licensee) holds Operating License No. DPR-43, which authorizes operation of the Kewaunee Nuclear Power Plant (the facility). This license provides, among other things, that it is subject to all rules, regulations and Orders of the Commission now or hereafter in effect. The facility is a pressurized water reactor located in Kewaunee County, Wisconsin.

II.

Section III.L of Appendix R to 10 CFR Part 50 requires, among other things, that alternative or dedicated shutdown capability provided for a specific fire area shall be able to (a) achieve and maintain subcritical reactivity conditions in the reactor; (b) maintain reactor coolant inventory; (c) achieve and maintain hot standby conditions for a PWR; (d) achieve cold shutdown conditions within 72 hours; and (e) maintain cold shutdown conditions thereafter.

By letter dated December 22, 1981, the NRC staff transmitted a Fire Protection Safety Evaluation to the licensee for the facility informing the licensee that

its proposed design for fire protection of safe shutdown capability was in compliance with Sections III.G.3 and III.L of Appendix R with three exceptions. To achieve full compliance, the licensee was required to commit to resolution of these exceptions. The licensee responded on January 22, 1982 and made such commitments.

The December 22, 1981 letter also informed the licensee that the proposed design was an "alternative" system which was to be installed according to the applicable schedule in 10 CFR 50.48(c)(4). This portion of (c)(4) requires implementation before startup after the earliest of the following events commencing 180 days or more after NRC approval:

(1) The first refueling outage;

(2) Another planned outage that lasts for at least 60 days; or

(3) An unplanned outage that lasts for a least 120 days.

Our review of the licensee submittals indicated that the modifications proposed were of an extensive nature, numerous, and required a significant amount of new equipment. The licensee felt that the system modifications were extensive enough to be considered a dedicated system. The staff disagreed in that regard but did agree that the system was acceptable as an alternative shutdown system and that it met the requirements of Appendix R to 10 CFR 50.

In the submittal dated January 22, 1982 the licensee provided the justification for the schedule proposed and requested that the implementation schedule specified in 10 CFR 50.48(c)(4) for the proposed fire protection modification at

the Kewaunee Nuclear Power Plant be extended until the end of the refueling outage scheduled for the spring of 1984.

In a submittal dated August 4, 1982, the licensee confirmed information which had been presented to the staff in a meeting June 23, 1982 (See Meeting Summary dated June 24, 1982). This letter presented a detailed schedule of the work to be completed, and the complexity of the schedule. It also shows the effects of the enforcement of the NRC schedule, the most noticeable of which is the five and one half month additional down time required for the NRC required schedule. Based on our review, we concluded that the exemption should be granted. On October 7, 1982 an exemption was granted to extend the time requirement for completion of the system from the spring 1983 refueling outage to the spring 1984 refueling outage.

In a submittal dated September 7, 1983, the licensee confirmed information which had been presented to the staff in a meeting July 28, 1983 (See Meeting Summary dated September 16, 1983). This submittal provided a revised schedule based on information regarding the status of implementation in several areas including Engineering, Equipment Tie-ins and Restart Procedures, Impact on Plant Procedures, Impact on Plant Operation and Impact on Maintenance. Information regarding the Dose Commitments, Improvements to Safety and Licensing Considerations was also provided. The submittal requested an extension from the spring 1984 refueling outage to the spring 1987 outage.

We have reviewed the licensee's September 7, 1983 submittal in support of the extension of the schedule. The basis for the revised schedule is that the detailed design work done during the past year revealed much more work than could be visualized with the conceptual design on which the original schedule was based. This is supported by the amount of additional engineering work required. The added work falls into three categories:

(1) Unanticipated problems

(2) Improved design or installation methods

(3) Reduction of man-rem exposure.

This amounted to, among other things, over 800 engineering drawings being generated or revised. Examples of the scope of the changes found necessary were an increase in the number of electrical cables from 485 to 945 and an increase in the number of procedure changes from 250-350 to 600-1000. The latter would amount to 2 or 3 work package installations per week for a year, a severe overload for the operators of an operating plant.

The primary consideration must be the safety of the plant. As indicated above, the facility was in full compliance with the BTP prior to the issuance of Appendix R. The independent consultant who performed the facility Fire Protection Program Analysis did a comparison of the facility compliance with the BTP and found that of 2400 specific items, there were no items of non-compliance.

The fact that the facility has achieved and maintained a high level of safety in the area of fire protection is also evident in the recent SALP-3 rating of a category 1 in this area. The staff noted the "effective implementation of the Fire Protection Program" and "excellent housekeeping practice." The high level of safety achieved at the facility justifies the more orderly implementation schedule proposed herein.

The high level of fire safety through compliance with the BTP is in no way degraded through the implementation of Appendix R, but in fact, is continually improved. For example, by late 1984 there will be only three fire areas in the plant not in full compliance with Section III.L of Appendix R. (It is worthy to note that the facility was in full compliance with the other applicable requirements of Appendix R by November of 1981, specifically Sections III.J and III.O.) These three areas are the Control Room, Relay Room, and Fire Area TU-95, which contains the Auxiliary Feedwater (Shutdown) Panel, and the auxiliary feedwater pumps. These areas are already fire-safe, due to their design, fire detection and suppression features, and frequency of personnel access. For example, all cable utilized in these areas and throughout the Kewaunee plant is fire-retardant. This, complemented by the administrative controls, reduces the "fire loading" to a minimum.[1] The Control Room is continuously occupied by operations personnel, and the Relay Room, located directly below the Control Room, is frequently inspected by plant staff (currently once each hour). Fire Area TU-95 is also frequently inspected by the plant staff (twice

[1]Kewaunee Nuclear Power Plant Fire Protection Program Analysis, April 30, 1977, submitted to Edson G. Case (NRC) on May 2, 1977.

per eight-hour shift). The Control Room is equipped with 15 ionization detectors, one smoke detector, three 20-lb CO_2 fire extinguishers, and two 2.5-gallon pressurized water fire extinguishers. The Relay Room is equipped with 17 ionization detectors, a Low Pressure CO_2 System, and one 20-lb CO_2 fire extinguisher. Fire Area TU-95 is equipped with six ionization detectors, one fire hose station, and one CO_2 hose station. These features combine to reduce the probability of a debilitating fire in these areas to an acceptably small value.

In submittals dated December 28, 1983 and January 25, 1984, the licensee proposed compensatory measures for the Control Room, Relay Room and Fire Area TU-95 which provide post-fire safe shutdown capability. These measures include upgrading the present alternative shutdown capability by providing additional instrumentation, revising the shutdown procedure, isolating one auxiliary feedwater pump, and having available one charging pump independent of area TU-95. These measures are discussed in the Safety Evaluation enclosed.

By the fall of 1984, there will be further improvement in the fire safety of the facility. From this point until completion of the project, each task completed will result in a commensurate increase in fire safety by reducing the possibility through physical separation that a localized fire could affect both trains of safe shutdown equipment. This represents a continual improvement in plant safety until completion of the project.

However, to preserve the current operational safety of the facility, this extension is required. This is evident in light of the impact of the Appendix R

work on the technical specification requirements. It is worthy to note that if this work is to be completed in accordance with the current schedular requirements, the plant would be placed in one Limiting Condition for Operation (LCO)[2] after another until the scheduled shutdown to get as much work as possible completed. This would, in effect, be equivalent to operating with one train of safeguards disabled for the entire cycle. This may meet the letter of the technical specifications, but it certainly does not meet their intent. Even if this work were performed during operation, a significant extension of the next scheduled outage would be required to complete the Appendix R work.

The importance of maintaining operational safety has been recently emphasized by the NRC. In 1981, the Performance Appraisal Team emphasized the importance of evaluating the "adverse impact caused by the performance of the modification on the operating facility.[3] More recently, in SECY-83-41, the staff has stated:

> "Fire prevention and suppression systems are, of course, desirable. However, they must not assume such importance that they jeopardize safety concerns."

In light of the staff position and the supporting information presented in the licensee submittal, the proposed extension is justifiable from the standpoint of safety.

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[2]Limiting Conditions for Operation (LCO) are those restrictions on reactor operation, resulting from equipment performance capability, that must be enforced to ensure safe operation of the facility.

[3]Inspection Report 50-305/81-27, John Taylor, NRC, to E. R. Mathews, WPSC, dated March 16, 1982.

This schedule is also consistent with recent Commission policy on "integrated scheduling."[4] It allows for dramatic improvements in other areas of the plant while continually improving fire safety. Examples of these other improvements are the Safety Assessment System which is coupled with a new plant process computer, upgrade of the core exit thermocouples, and reactor vessel level instrumentation. These three projects are competing directly with Appendix R for licensee resources.

Installation of the Safety Assessment System (SAS) and new plant process computer are currently scheduled to begin this fall and continue through the 1984 refueling outage.[5] In addition to complying with NRC TMI Action Plan requirements, this equipment will also play a vital role in the licensee's programs to implement NRC requirements issued as a result of the Salem reactor trip breaker event.[6] The SAS will provide new capability to the operator to assess plant status, including trending; the new plant process computer will provide improved data processing, including improved post-trip review capability.

The core exit thermocouple upgrade and installation of reactor vessel level instrumentation projects are part of the licensee's program to comply with the staff Inadequate Core Cooling Instrumentation requirements, and are scheduled

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[4]Generic Letter 83-20, D. G. Eisenhut (NRC) to all Operating Reactor Licensees, et al.

[5]Letter from C. W. Giesler (WPSC) to D. G. Eisenhut (NRC), dated April 15, 1983.

[6]Generic Letter 83-28, D. G. Eisenhut (NRC) to all Licensees, dated July 8, 1983.

for 1985 and 1986, respectively.[7] Some work on each of these projects will be performed during the 1984 outage, as well.

The schedule also provides for smoother management of internal resources for implementation of other regulatory requirements such as Integrated Leak Rate Testing and Inservice Inspection (especially the Reactor Vessel Examination). Finally, the proposed schedule also provides work load leveling which enables the licensee to continue to perform the considerable amount of routine work that must also be done, including about 150 design changes per year and the several thousand tasks that are done each refueling. It is estimated that about 39 personnel would be involved full time with Appendix R modifications during normal plant operations and about 77 personnel would be involved during refueling outages. These personnel would be in addition to a plant staff of 203 personnel during operations and 333 to 393 during refueling outages.

Finally, because of good faith efforts, the licensee continues to lead much of the industry in implementation of the Appendix R requirements. The licensee had the first approved Safety Evaluation. The final design will require essentially no "operator action" to achieve and maintain hot shutdown, and only minimal operator action to achieve cold shutdown. Additionally, containment entry will not be required. It is significant to note that the licensee design did not require any exemptions from the technical requirements of Appendix R.

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[7]Letter from C. W. Giesler (WPSC) to D. G. Eisenhut (NRC), dated March 9, 1983.

Based on the above considerations and the related Safety Evaluation, we find that the licensee has completed a substantial part of the fire protection features at the Kewaunee plant in conformance with the requirements of the Fire Protection Rule and is applying significant effort to complete the remaining modifications necessary for strict conformance with Sections III.G and III.L of Appendix R to 10 CFR 50. We find that because of the already completed upgrading of the facility fire protection features, there is no undue risk to the health and safety of the public involved with continued operation until the completion of this implementation during the spring 1987 refueling outage.

III.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, an exemption is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest and therefore grants an exemption from the schedular requirements of 10 CFR 50.48(c)(4) until prior to startup from the fifth refueling outage commencing more than 180 days after December 1981, (the date of approval for the modifications), or spring 1987 refueling outage.

The NRC staff has determined that the granting of this exemption will not result in any significant environmental impact and that pursuant to 10 CFR 51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with this action.

For further details with respect to this action see (1) the licensee's request dated September 7, 1983, and (2) the related Safety Evaluation dated February 29, 1984 which are available for public inspection at the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C. and at the Kewaunee Public Library, 822 Juneau Street, Kewaunee, Wisconsin 54216.

FOR THE NUCLEAR REGULATORY COMMISSION

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland
this 29th day of February 1984

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION SUPPORTING A SPECIFIC EXEMPTION TO 10 CFR PART 50 §48(c)(4) RELATED TO THE APPENDIX R ALTERNATE SHUTDOWN SCHEDULE FOR KEWAUNEE NUCLEAR POWER PLANT DOCKET NO. 50-305

I Introduction

By letter dated September 7, 1983, Wisconsin Public Service Company (the licensee) submitted a request for a schedular exemption to Appendix R to 10 CFR Part 50 §48(c)(4). The exemption would extend the time for completion of the alternate shutdown system for the Kewaunee Nuclear Power Plant (the facility) from the 1984 refueling outage until the 1987 refueling outage.

II Background

By letter dated December 22, 1981, the NRC staff transmitted a Fire Protection Safety Evaluation to the licensee for the facility informing the licensee that their proposed design for fire protection of safe shutdown capability was in compliance with Items III.G.3 and III.L of Appendix R with three exceptions. To achieve full compliance, the licensee was required to commit to resolution of these exceptions. The licensee responded on January 22, 1982 and made such commitments.

The December 22, 1981 letter also informed the licensee that the proposed design was an "alternative" system which was to be installed according to the applicable schedule in 10 CFR 50.48(c)(3). This regulation requires implementation before startup after the earliest of the following events commencing 180 days or more after NRC approval:

(1) The first refueling outage
(2) Another planned outage that lasts for at least 60 days
(3) An unplanned outage that lasts for at least 120 days

Our review of the licensee submittals indicated that the modifications proposed were of an extensive nature, numerous, and required a significant amount of new equipment. The licensee felt that the system modifications were extensive enough to be considered a dedicated system. The staff disagreed in that regard but did agree that the system was acceptable as an alternative shutdown system and that it met the requirements of Appendix R to 10 CFR 50.

In the submittal dated January 22, 1982, the licensee provided the justification for the schedule proposed and requested that the implementation schedule specified in 10 CFR 50.48(c)(4) for the proposed fire protection modification at the Kewaunee Nuclear Power Plant be extended until the end of the refueling outage scheduled for the spring of 1984.

Prior to the issuance of Appendix R, the Kewaunee facility had been reviewed against the criteria of Appendix A to the Branch Technical Position APCSB 9.5-1 (the BTP). The BTP was developed to resolve the lessons learned from the fire

at the Browns Ferry Nuclear Plant. It is broader in scope than Appendix R, forms the nucleus of the criteria developed further in Appendix R and in its present, revised form constitutes the section of the Standard Review Plan used for the review of applications for construction permits and operating licenses of new plants. The review was completed by the NRC staff and its fire protection consultants and a Fire Protection Safety Evaluation (FPSE) was issued on December 12, 1978. A few items remained unresolved. Further discourse between the licensee and the NRC staff resulted in resolution of these items as documented in a supplement to the FPSE issued on February 13, 1981. The FPSE and its supplement supported the issuance of an amendment to the operating license of the Kewaunee facility on December 12, 1978 which required modifications to be made to plant physical features, systems, and administrative controls to meet the criteria of the BTP. All of these modifications had been completed prior to the exemption request of January 22, 1982.

In addition, our review of the facility against the criteria of Appendix A to the BTP concluded that adequate instrumentation and procedures were provided for use in effecting safe shutdown independent of equipment and cabling in the relay and control room. This capability was to be available during the period of exemption. Requirements of Section III.L of Appendix R to 10 CFR 50 include additional measures such as the separation of cables and equipment. Some of these were to be completed by the refueling outage of 1983, others were not, however, the shutdown capability approved for the Appendix A to BTP 9.5-1 review was available during that exemption period. Therefore, the Kewaunee facility had been upgraded to a high degree of fire protection already and the extensive modification involved in that request for additional time was to incorporate the differences between what was previously approved and the specific requirements of Sections III.G and III.L to Appendix R of 10 CFR 50.

In a submittal dated August 4, 1982, the licensee confirmed information which had been presented to the staff in a meeting June 23, 1982 (see Meeting Summary dated June 24, 1982). This letter presented a detailed schedule of the work to be completed, and the complexity of the schedule. It also shows the effects of the enforcement of the NRC schedule, the most noticeable of which is the five and one half month additional down time required for the NRC required schedule. Based on our review, we concluded that the exemption should be granted. On October 7, 1982 an exemption was granted to extend the time requirement for completion of the system from the spring 1983 refueling outage to the spring 1984 refueling outage.

In the submittal dated September 7, 1983, the licensee confirmed information which had been presented to the staff in a meeting July 28, 1983 (see Meeting Summary dated September 16, 1983). This submittal provided a revised schedule based on information regarding the status of implementation in several areas including Engineering, Equipment Tie-ins and Restart Procedures, Impact on Plant Procedures, Impact on Plant Operation, and Impact on Maintenance. Information regarding the Dose Commitments, Improvements to Safety, and Licensing Considerations was also provided. The submittal requested an extension from the spring 1984 refueling outage to the spring 1987 outage.

III Evaluation

We have reviewed the licensee submittal dated September 7, 1983 in each of the areas mentioned above. We will evaluate each area separately. However, the

first consideration must be the safety operation of the facility. As indicated above, the facility was in full compliance with the BTP prior to the issuance of Appendix R. The independent consultant who performed the facility Fire Protection Program Analysis did a comparison of the facility compliance with the BTP and found that of 2400 specific items, there were no items of non-compliance.

The importance of maintaining operational safety has been recently emphasized by the NRC. In 1981, the Performance Appraisal Team emphasized the importance of evaluating the "adverse impact caused by the performance of the modification on the operating facility.[1] More recently, in SECY-83-41, the staff has stated:

> Fire prevention and suppression systems are, of course, desirable. However, they must not assume such importance that they jeopardize safety concerns.

A. ENGINEERING

The scope of the engineering effort required to implement the Appendix R fire protection requirements has continuously expanded throughout the design phases of this work. Estimates were originally based on the preliminary design work which was performed to demonstrate equipment/system separation for the Appendix R compliance. Detailed engineering began in March, 1982, following approval of the proposed compliance scheme.

Implementation of the Kewaunee plant modifications required a significant engineering effort. The number of engineering drawings which were generated or revised has now exceeded 800 drawings. These drawings do not represent the total number of engineering documents which required revision. In addition to drawings, the plant instrument lists, valve lists, component lists and cable routing lists require updating. Since these lists are construction documents they also require the same levels of Quality Assurance as the drawings.

Due to the extensive nature of the modification, much of the design effort could not be accurately predicted early in the project. The quantities of electric cable modification to be used as part of Appendix R has grown from 485 to 945. Since a major portion of the Appendix R modifications involve the rerouting of cables, the comparative numbers of cables indicates the increase in effort between the August, 1982 estimates and what is currently known.

Engineering progress estimates have changed from August, 1982 when it was estimated that the engineering effort would be 90% complete in January, 1983 and 100% complete in February, 1983. The 90% complete point was not reached until June, 1983 and the completion of engineering is not expected until January, 1984. Engineering schedule delays generally fall into three categories:

1) Design changes due to unanticipated problems.
2) Design changes to improve design or installation methods.
3) Design changes to reduce Man-Rem exposure.

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[1]Inspection Report 50-305/81-27, John Taylor, NRC, to E. R. Mathews, WPSC, dated March 16, 1982.

Seventy-four engineering scope changes were identified since the June 21, 1982 NRC meeting on schedule extension.

The following two examples of changes are given in the September 16, 1983 submittal:

DIESEL GENERATOR ROOM VENTILATION AIR OUTLET

The implementation of the Appendix R requirements necessitated the modification of the ventilation air paths from the diesel generator rooms. In the present design both diesel rooms discharge vent air to a common tunnel. This tunnel also contains the electric cabling which runs between the plant and the screenhouse. In order to separate trains, an underground duct bank is to be installed between diesel generator room 1B and the screenhouse.

EXCESS LETDOWN FLOW CONTROL VALVE

During the conceptual design engineering it was decided that the air operated excess letdown flow control valve would have to be replaced with a motor operated valve because the availability of instrument air inside containment could not be assured following a fire. To solve problems encountered, a design change to operate the valve by bleeding air in and out of the valve diaphragm operator using solenoid valves, adjustable bleed orifices and an accumulator was instituted.

Significant engineering schedule delays also occurred in equipment procurement activities. Thirty-seven engineering specifications were prepared, of which approximately 75% were for safety-related equipment. A comparative display of the purchase order and delivery date changes between August, 1982 and July, 1983 is given in the September 16, 1983 submittal. In August, 1982, it was anticipated that all equipment would be available on site in time for the Spring 1983 refueling outage. The one exception being the dedicated shutdown panel (DSP). The DSP delivery was not expected until September 1983 due to the extensive engineering that must be completed before a panel of this nature can be sufficiently specified.

Delays in the original procurement schedule occurred primarily for the following reasons:

1) There has been a lack of nuclear equipment vendors, and a decreasing number of manufacturers remaining in the nuclear equipment business. The extensive costs of maintaining quality assurance programs, 10CFR21 regulations and the diminishing number of orders has made the nuclear power industry unprofitable for many companies. Orders for small quantities are particularly difficult to fill.

2) Available vendors were not on the Fluor approved bidders list or their quality assurance programs had not been reviewed or approved. Much of the type of equipment required for the Appendix R modifications had not been recently procured by Fluor for other nuclear plant retrofit projects, consequently we had not had cause to deal with these suppliers and it was necessary to perform commercial and quality assurance audits before a purchase order could be written.

3) Due to the uniqueness of the required equipment and the lack of competing vendors, competitive prices were not always available. Since the Public Service Commission - Wisconsin requires documentation of cost control by competitive bid, it was necessary to locate and qualify several vendors for each order or to independently justify a single source bid by performing a cost evaluation.

4) Engineering design changes often resulted in equipment specification changes.

5) To reduce costs and delivery lead times, equipment with existing environmental and seismic qualification (generic or from a previous order for another plant) was selected to the maximum extent possible. These qualification documents had to be evaluated to establish compatibiilty with the Kewaunee Plant requirements.

Resolution of the above considerations resulted in delayed purchase order issuing and, consequently, delays in manufacturing cycles, design activities which required vendor data input and, of course, delivery.

Documentation delays are the direct result of the before mentioned delays in issuing purchase orders and the inability of vendors to meet scheduled submittal dates. Documentation delays affect not only engineering schedules but also equipment installation since quality assurance requirements prevent the installation of equipment without complete documentation records.

B. EQUIPMENT TIE-INS AND RETESTS

Equipment tie-ins and retests, unlike some construction activities, have a direct impact on plant operation. This impact places the plant in a Technical Specification Limiting Condition for Operation (LCO), removes from service a nonredundant piece of equipment or requires a plant shutdown for the retest. This is so because the inherent requirements of the rule preclude the use of non-essential equipment.

The modifications for Appendix R interface with most of the existing safeguards logic. While the number of actual changes to the logic are few, the addition of new switches in the logic chain or the physical relocation of a piece of safeguards equipment mandates a retest of all the affected logic. The retests in most cases cannot be conducted while the plant is operating. When shutdown, the tie-ins and retests must be carefully scheduled to avoid conflicts with the Technical Specifications for refueling, containment integrity, systems required to maintain safe shutdown or other outage work.

The review requirements for the retest procedures are extensive. All drawings associated with the modification must be rechecked in detail to ensure that:

1. Each item affected by the modification is retested.
2. Each component affected by the retest is identified.
3. The safeguards logic has not been modified or changed.
4. The initial conditions correctly identify the required plant conditions for the test.

Completion of the tie-ins and retests during the schedule envelope is vital as the equipment is required to be returned to service following the test.

To date 13 retests out of 148 have been completed. Of the remaining tie-ins and retests, 14 have the potential to be completed with the plant in operation and not remove a required component from service or place the plant in a limiting condition for operation. The Plant Operating Review Committee (PORC) must review each retest and concur. An additional 17 retests have the potential to be worked with the plant in operation but would place the plant in a Limiting Condition for Operation. The same PORC concurrence is required for the additional 17 tests; however, it is not likely that PORC would approve placing the plant in an LCO for modification work.

Currently three engineers are available to conduct the electrical retests. The review by the test engineer takes from 2 days to 1 week, depending on the length and complexity of the test. Each test must then be submitted to the members of PORC for review prior to being placed on the PORC agenda. The PORC review requires from one to three weeks, depending upon the length and complexity of the procedure and the individual workload of the PORC members. It should be noted that PORC is comprised of plant department heads and senior plant staff members, and each member has the normal workload associated with his position.

It is projected that the 1984 refueling outage would require an extension of 250-300 days to complete this project under the existing schedule. Completion of the project during a continuous outage would still require expedited reviews and procedure revisions. Any enhancements to safety gained by compliance to Appendix R could be negated by the overall effect of an expedited review process. Therefore, a schedule extension is necessary to insure that the Appendix R modifications provide the overall enhancement to safety intended by the rule.

The actual retests and tie-ins during each outage will require 25 to 40 personnel on a full-time basis. The schedule places each group of tie-ins to be worked during an outage in a common time block. This is done to identify to the plant the projected Appendix R work. The plant then schedules this work with the other projected outage work to provide an overall refueling schedule. As a practical matter, most Appendix R tie-ins cannot be worked concurrent with each other.

C. IMPACT ON PLANT PROCEDURES

The plant modifications associated with the Appendix R requirements differ considerably from those plant modifications associated with TMI. The majority of plant modifications associated with TMI were capable of being done independent of plant operations: that is, the engineering, prefabrication, and installation were done without affecting plant safety systems. This means the modifications were not tied to a refueling outage, and were in fact done during plant operations. The majority of the Appendix R modifications deal with safety systems and safeguards components and almost all of this equipment has Technical Specification requirements already established. Therefore, the modifications cannot be done independent of plant operations and must be tied to a refueling outage. Also since the Appendix R modifications are dealing with safety systems, upon completion of the modification the associated operating procedures must also be completed prior to placing equipment into service. Depending on the safeguards

components, there may be numerous surveillance procedures that require revising or even drafting of new procedures.

The process of revising or drafting new procedures for any modification begins with the department head at the plant. He or somebody he assigns must become familiar with the change; how it works, operates, understand the logic, etc. This may take a day, a week, a month, or longer depending on the magnitude, complexity and the time the person can spare from his normal duties. The hour-glass effect occurs because it is this same person who must sit in on PORC meetings and judge the safety significance of the modification, the adequacy of the installation and test procedures and the effect on the plant; such as what prerequisites and plant conditions must be established prior to performing the modification.

Procedure development cannot begin until sometime after the final design is complete, all updated drawings are issued, and installation and retest procedures are in place. If procedures are developed prior to final installation, a second iteration must be made to ensure all field changes and unforeseeable problems have been properly taken into account in the procedure draft. To date, it has been shown that final design engineering is about 85% complete, final drawing release is about 60% complete, installation and retest procedures are about 20% complete; thus, at best, procedure revisions can begin on only 20% of the Appendix R modifications at this time. To date, we estimate only 0.5% of procedure work is complete.

To determine the extent of the effect of Appendix R on plant procedures, several methods of estimating were used. The first method looked at the list of affected equipment for Appendix R. Then this list was cross referenced to the indices of Operating, Surveillance, Preventative Maintenance, and Instrument and Control procedures. From this check, it was estimated that 250 to 350 plant procedures would be affected and need revision.

The second method was to take three of the close to 200 modification packages that were completed with installation and retest procedures already drafted, and review the package in detail to determine the affected plant procedures. Each modification package affects no less than three plant procedures and more likely will affect four or five procedures each. With approximately 200 modification packages, this figures to 600 to 1000 procedure revisions required. The difference between the two estimates is that the first method of estimation did not tell how many procedures would be affected two or more times. Since all the modification packages cannot be completed at once, it will be necessary to revise and issue some procedures multiple times as new changes are implemented. An hour-glass effect occurs when all of this work is pushed through the same responsible people. Extending the Appendix R implementation schedule to the 1987 refueling outage will result in an increased assurance that the changes will be performed in a safe manner by allowing for a more orderly review of procedures by appropriate plant personnel.

D. IMPACT ON PLANT OPERATIONS

For the Appendix R modifications there are approximately 200 installation work packages. From the operations standpoint, each one of these work packages is considered a separate modification to the operation of the Kewaunee Plant. There are approximately 800 drawing modifications. If this were to account

for multiple drawing changes, the number of changes approaches 1500-2000. To put this in perspective, the Kewaunee Nuclear Plant was built with approximately 5000 drawings. The Appendix R modifications will modify approximately 20% of the Kewaunee Plant drawings, 945 new cables will be pulled. The problem this presents to the Operations Department is keeping the operator informed of all these changes in a complete and timely manner.

It is estimated by the licensee that to complete all the Appendix R modifications under the existing schedule would require an extension to the 1984 refueling outage by 250-300 days. This would require that approximately three work packages be installed each week. With the completion of each work package, the following information must be current for the Operator to safely operate the Plant:

1. Operating Procedures (1-3 per installation)
2. Retrieval Lists (i.e., instrument, valve, component, cable routing, etc.)
3. Motor Control Center (MCC) Information
4. Alarm Response Procedures
5. Operator requalification training
6. Modification information to operator
7. System descriptions
8. Logic and flow drawings
9. Wiring and schematic drawings

Three work package installations per week for one year is a severe overload for the Operator. The Operator would quickly approach the point where he is not sure of what has been modified, and would have difficulty safely operating the Plant. The argument to assign more people to the project is an argument to overload the operator.

The extension of the installation schedule to the 1987 refueling outage will permit planning for a specific number of changes each refueling. Granting this extension will allow the Operations Department to carefully review each change and provide the operator with the necessary training, procedures, retrieval lists, and drawings at the time the installation is complete.

E. CONSTRUCTION ACTIVITIES

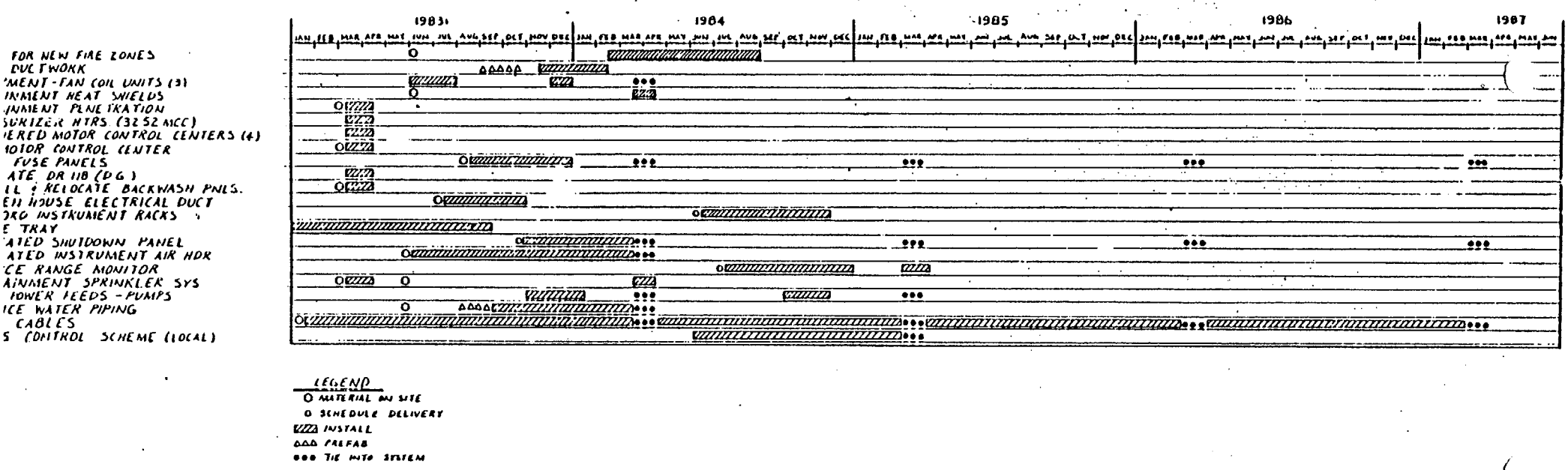
This is an update on construction activities completed to date and what is planned for the remaining months in 1983 and 1984. Also, the project schedule for 1984 through 1987 is updated (see figure 1).

The Appendix R project has been divided into 27 major activities or milestones. During 1983, seven of the 22 milestones have been completed and one more will be completed (electrical screenhouse duct) by October, 1983. Another five activities have been started.

1) Containment Penetration - complete
2) Pressurizer Heaters - complete
3) Repowered Motor Control Centers - complete
4) Install New Motor Control Center - complete
5) Relocated Diesel Generator Panel - complete
6) Relocate Screenhouse Backwash Panel - complete

Figure 1

APPENDIX R CONSTRUCTION SCHEDULE



LEGEND
- O MATERIAL ON SITE
- o SCHEDULE DELIVERY
- INSTALL
- △△△ PREFAB
- ●●● TIE INTO SYSTEM

7) Cable Tray - 99% complete
8) Screenhouse Electrical Duct - complete October, 1983
9) Dedicated Instrument Air Header - started
10) Containment Sprinkler System - started
11) Service Water Piping - started
12) Pull Cable - started
13) Equipment Fan Coils - started

During 1984, another seven activities will be completed which will be all mechanical work, including the fire walls, for a total of 15 activities. These are:

1) Fire Walls
2) HVAC Ductwork
3) Equipment Fan Coils
4) Containment Heat Shield
5) Dedicated Instrument Air Header
6) Containment Sprinkler System
7) Service Water Piping

The remaining seven activities will be spread through 1985 to 1987. Although only seven activities remain to be completed, this accounts for 50% of the total project. Therefore, a considerable amount of work remains to be completed.

1) AC/DC Fuse Panel
2) Instrument Racks
3) Dedicated Shutdown Panel
4) Source Range Monitor
5) Power Feeds - Pumps
6) Pull Cables
7) Bus 5 Local Control

This is being spread over the years 1985-87 because only a limited number of tie-ins can be completed per refueling. The licensee will continue to pull cable between outages and perform the tie-ins and retests during each outage and will do the maximum number of tie-ins and retests each refueling outage 1984 through 1987.

F. IMPACT ON MAINTENANCE

Past practice at the Kewaunee Nuclear Plant has been to apply the philosophy that the long-term benefits gained by using a limited number of experienced contract personnel outweigh the short-term benefits of using large numbers of relatively inexperienced personnel. In support of this philosophy, there are the following facts: 1) Better control of the jobs can be maintained with a limited number of contract personnel; hence more efficient use of manpower; 2) Generally the people selected to remain on the job are the most experienced and therefore have better qualifications. Termination of everyone at the end of a big job and with rehire at a later date, in accordance with the union labor agreement, would result in getting many inexperienced workers. 3) By not terminating and rehiring a large contract force, the initial paperwork and training involved with pre-employment is eliminated; 4) With contract personnel onsite for a longer period of time, they learn the plant and also the steps

necessary to accomplish the work; 5) With an extended schedule, problems associated with installation can be resolved during the pre-fabrication phase.

An extended schedule greatly aids the scheduling process. Besides all the activities associated with Appendix R there are an additional 5000 refueling activities and 150 design changes to be scheduled. In addition, the 1984 through 1986 outages will be further complicated by the following activities:

Integrated Leak Rate Testing
Plant Process Computer Replacement
In-Service Inspection
Reactor Vessel Level Instrumentation Installation
Core Exit Thermocouple Upgrade
Containment Fan Coil Unit Ductwork Modification
Containment Cooling Modifications
Pressurizer Safety Relief Valve Piping

With all these activities in progress, coordination between the various departments involved must be maintained.

G. DOSE COMMITMENT PRESENTATION (ALARA)

The dose commitment for the Appendix R modifications was estimated assuming the work was performed continuously with a target date of 1987. The effects of schedule compression on dose commitment was estimated.

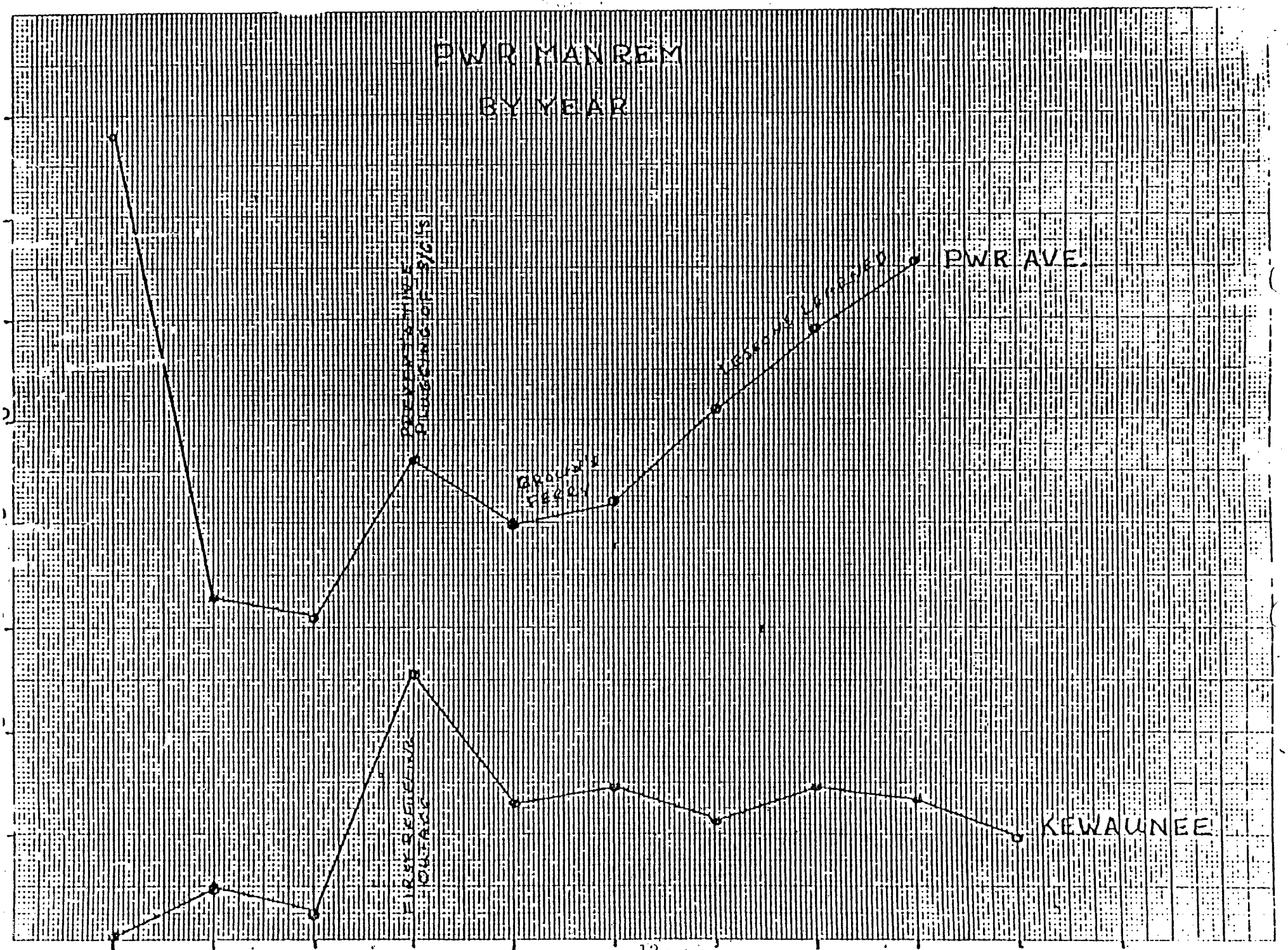
The project was divided into 232 separate tasks in four major areas. Manhour estimates for each task were obtained and broken down to account for work in different exposure rate areas. The physical work locations for each task were identified on HP Survey sheets and work area dose rates determined from recent surveys. The expected exposure for each task was tabulated and all tasks summed for a dose assessment. Tasks which show zero dose are ones where work was entirely in the Clean Area. The dose commitment for each of the major areas was determined to arrive at a total commitment for the Appendix R project.

The facility's low annual exposure is shown in relationship to the rest of the operating PWRs in Figure 2. The increase in PWR average annual man-rem exposure between 1975 and 1981 can be attributed in part to the effects of preventative plugging of steam generators in 1976, the Browns Ferry modifications (BTP 9.5-1) in 1977 and 1978, and TMI Lessons Learned through 1981, as indicated in latest industry data available from NUREG-0713. The man-rem exposure at the facility through this period was essentially stable or declining even though this facility was timely in installing TMI fixes. The reason for this is the philosophy of utilizing smaller and stable work crews on a year-round basis. The longer a person is at a specific plant, the more efficient he becomes in accomplishing his tasks with minimum exposure.

H. IMPROVEMENTS TO SAFETY (Fire Protection During the Proposed Schedule Extension)

By letters dated December 28, 1983, and January 25, 1984, the licensee proposed interim compensatory measures which would form an interim post-fire shutdown capability in response to NRC positions expressed in NRC letter dated December 7, 1983.

Figure 2



These positions were:

1. The licensee shall have the capability of providing instrumentation for the following parameters utilizing only on site personnel: reactor coolant system pressure, reactor coolant hot leg and cold leg temperatures, pressurizer level, steam generator pressure and level, and neutron flux. The instrumentation must be available within 30 minutes of the time of evacuation of the control room.

2. The licensee must provide the capability of opening all security doors independent of the control room.

3. All actions necessary to achieve shutdown must be identified and the person performing the action be clearly delineated in the procedure E-0-06, Control Room Inaccessibility.

4. A continuous fire watch should be provided in fire area TU-95, or modifications which would provide passive fire protection (such as the dedicated shutdown panel, or an automatic fire suppression system coupled with a partial fire barrier) in this area should be completed.

Post-fire shutdown capability presently exists for the control room and the relay room. While this alternative shutdown capability does not fully comply with the requirements of Appendix R, it does meet the requirements of Appendix A to the Branch Technical Position 9.5-1 as concluded in the staff's safety evaluation report dated December 12, 1978. The alternative shutdown capability utilizes the auxiliary feedwater control panel located in area TU-95, local start of the diesel generators and safety-injection pumps at various break locations, and installation of instrumentation for monitoring shutdown. Cold shutdown is achieved by manually operating breakers and valves. The installation of instrumentation for reactor coolant system pressure and pressurizer level indication, and the monitoring of steam generator level (the indication for which is located inside containment) requires additional personnel beyond the present minimum shift capability. Only steam generator pressure indication is currently available without repairs.

In response to our concern regarding instrumentation, the licensee committed to upgrade the present alternative shutdown capability by providing the following instrumentation on the dedicated shutdown panel: reactor coolant system pressure, reactor coolant system hot and cold leg temperatures, pressurizer level, and steam generator pressure and level. The shutdown margin can be verified by sampling of the reactor coolant for boron concentration. The instrumentation on the dedicated panel will be electrically and physically independent of the control room and the relay room. This instrumentation will be installed prior to startup from the spring 1984 refueling outage and is part of the final alternative shutdown modifications.

The licensee has committed to provide the capability of opening all security doors independent of the control room.

The licensee presently has a shutdown procedure (E-0-06, "Control Room Inaccessibility") for utilizing the alternative shutdown capability. The shutdown procedure outlines the operator actions to be performed in the control room, the safety injection pump room, the diesel generator area, the auxiliary

feedwater pump area and other plant areas. The shutdown procedure utilizes three members of the operation staff. The licensee has committed to revise the shutdown procedures to identify all actions necessary to achieve shutdown and to clearly delineate the person responsible for performing each action.

Post-fire shutdown capability presently does not exist for fire area TU-95; however, the licensee has committed to make a number of modifications to provide an interim post-fire shutdown capability. The modifications will be completed prior to startup from the spring 1984 refueling outage. The modifications are:

1. A three-hour fire rated wall will be erected which will completely isolate 1A auxiliary feedwater pump from the remainder of fire area TU-95.

2. The power supply cable to the 1A auxiliary feedwater pump and the associated lube oil pump will be re-routed through an area which is independent of the air compressor and pump room (TU-95).

3. The power supply cable and the control power cable for the associated flow control valve and isolation valve will be rerouted.

Therefore, the interim post-fire shutdown capability will utilize the auxiliary feedwater system, the charging system and the diesel generators. The power cables for one charging pump were rerouted independent of area TU-95 during the previous refueling outage. The diesel generators are independent of area TU-95. Post-fire shutdown will be controlled for the control room supplemented by local operator actions and monitored from control room instrumentation. Cold shutdown would be achieved utilizing control room functions supplemented by local operation of breakers and valves. A fire within TU-95 will not affect safe shutdown because an undamaged shutdown capability will be available in other fire areas.

Based on the above, we conclude that the licensee has provided acceptable interim post-fire safe shutdown capability for the control room, the relay room, and area TU-95 to permit granting the schedular extension.

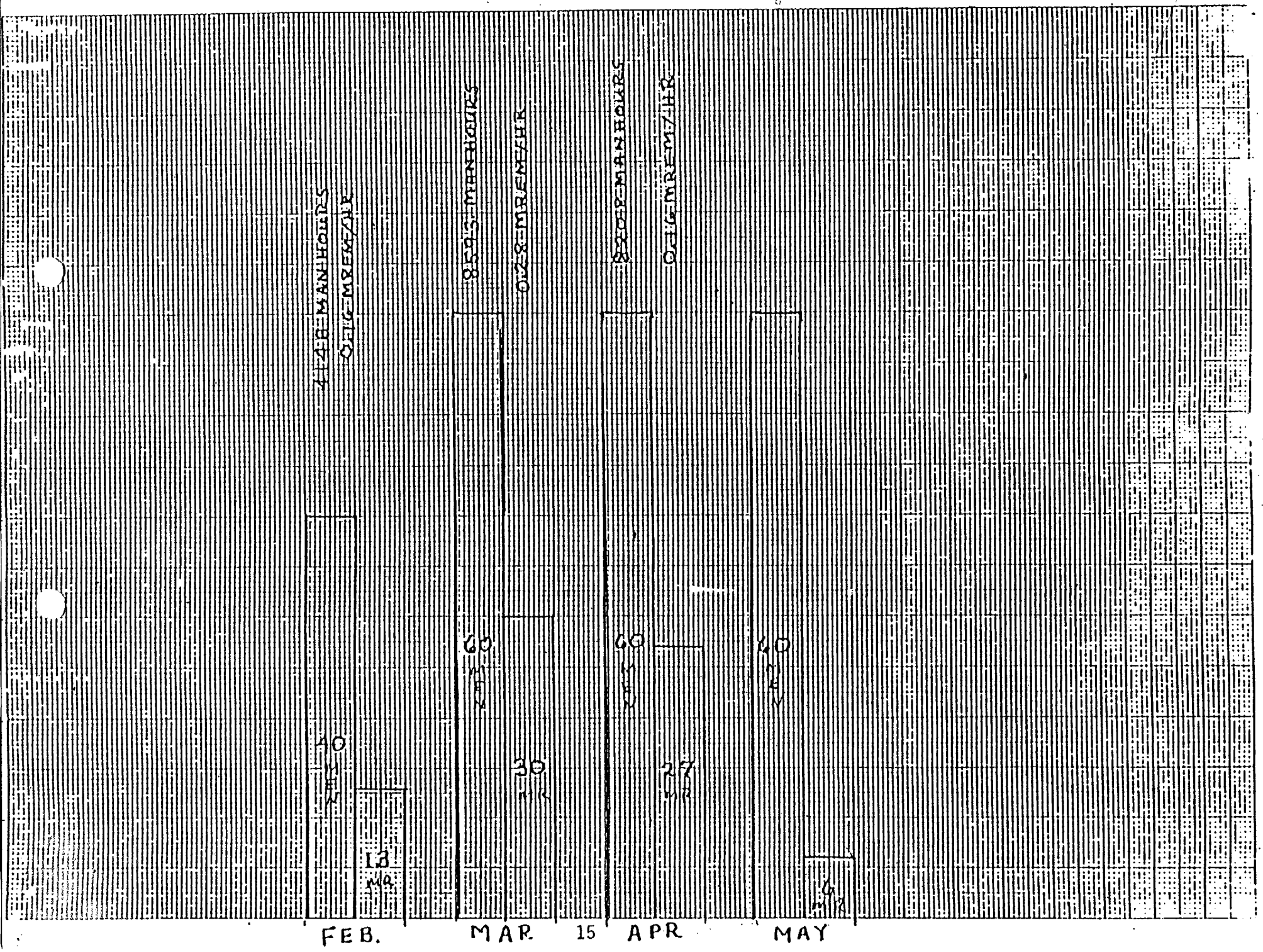
I. APPENDIX R LICENSING CONSIDERATIONS

Appendix R to 10 CFR 50 and 10 CFR 50.48 were published in the Federal Register on November 19, 1980. At that time there was considerable discussion on whether or not it should be "backfit" to operating plants. The primary argument against backfitting was that many plants had already achieved an acceptable level of fire safety through compliance with Appendix A to Branch Technical Position (BTP) 9.5-1.

The fact that Kewaunee has achieved and maintained a high level of safety in the area of fire protection is also evident in the recent SALP-3 rating of a category 1 in this area. The NRC noted the "effective implementation of the Fire Protection Program" and "excellent housekeeping practice."

The high level of safety achieved at the facility, coupled with the fact that the Appendix R requirements are intended only to increase this previously accepted level, justifies the more orderly implementation schedule proposed herein.

Figure 3



The licensee has moved ahead rapidly in implementation of the Appendix R requirements. The licensee provided the NRC with an acceptable response to the rule in a reasonable time frame. This was done even though the Commission guidance was not received by WPS until February 27, 1981, only 18 days before the due date for submitting the Appendix R conceptual design plan.

However, the requested information was provided in three submittals between March and July, 1981, resulting in the licensee being the first to have an approved plan - on December 22, 1981. WPS immediately recognized the schedular problems associated with implementation of these modifications and asked for an extension in the completion dates on January 22, 1982. The proposed schedule at that time called for a one-year extension, based on the conceptual design, the assumption that a large amount of the work could be done while the plant was operating and the determination of the licensee to give the project their best effort. The original extension request was followed by a meeting in Bethesda on June 23, 1982, and a letter on August 4, 1982. On October 7, 1982, the extension was granted.

In the letter granting the extension, the staff noted that the schedular extension was justified for many reasons, including:

- material procurement difficulties
- interdependence of other work
- practical constraints of a limited workforce
- the significant amount of time required to update procedures and drawings

These reasons still apply. Indeed, based on what has been experienced in the past year while proceeding with the Appendix R work, it is apparent that the significance of these items was underestimated. Accordingly, the staff conclusion;

> "because of the already completed upgrading of these facilities there is no undue risk to the health and safety of the public involved with continued operation until the completion of this implementation during the Spring 1984 refueling outage[2]"

is equally applicable to an extended schedule calling for completion during the Spring 1987 refueling outage.

As the above referenced exemption and we have noted, the licensee has already achieved a high level of fire safety through compliance with the BTP. This level of safety is in no way degraded through the implementation of Appendix R, but in fact, is continually improved. For example, by later 1984 there will be only three fire areas in the plant not in full compliance with criterion III.L of Appendix R. (It is worthy to note that the facility was in full compliance

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[2]Letter from D. G. Eisenhut (NRC) to C. W. Giesler (WPSC), dated October 7, 1982; page 8 of attachment entitled "Exemption."

with all other applicable requirements of Appendix R by November of 1981, specifically Criteria III.J and III.O.)

These three areas are the Control Room, Relay Room, and Fire Area TU-95, which contains the Auxiliary Feedwater (Shutdown) Panel and the auxiliary feedwater pumps. These areas are already fire-safe, due to their design, fire detection and suppression features, and frequency of personnel access. For example, all cable utilized in these areas and throughout the Kewaunee plant is fire-retardant. This, complemented by our administrative controls, reduces the "fire loading" to a minimum.[3] The Control Room is continuously occupied by operations personnel, and the Relay Room, located directly below the Control Room, is frequently inspected by plant staff (currently once each hour). Fire Area TU-95 is also frequently inspected by the plant staff (twice per eight-hour shift). The Control Room is equipped with 15 ionization detectors, one smoke detector, three 20 lb. CO_2 fire extinguishers, and two 2.5-gallon pressurized water fire extinguishers. The Relay Room is equipped with 17 ionization detectors, a Low Pressure CO_2 System, and one 20 lb. CO_2 fire extinguisher. Fire Area TU-95 is equipped with 6 ionization detectors, one fire hose station, and one CO_2 hose station. In addition, compensatory measures have been proposed for these three areas as discussed in Section H.

By the fall of 1984, there will be a dramatic improvement in the fire safety of the facility. From this point until completion of the project, each task completed will result in a commensurate increase in fire safety by reducing the possibility that a localized fire would affect both the dedicated or alternate train of the subject equipment. This represents a continual improvement in plant safety until completion of the project.

However, in order to preserve the current operational safety of the facility, this extension is required. This is evident in light of the impact of the Appendix R work on our technical specification requirements. It is worthy to repeat that if this work is to be completed in accordance with our current schedular requirements, the plant would be placed in one LCO[4] after another until the scheduled shutdown in order to get as much work as possible completed. This would, in effect, be equivalent to operating with one train of safeguards disabled for the entire cycle. This may meet the letter of the technical specifications, but it certainly does not meet their intent. Even if this work were performed during operation, a significant extension of the next scheduled outage would be required to complete the Appendix R work.

The importance of maintaining operational safety has been recently emphasized by the staff. In 1981, the Performance Appraisal Team emphasized the importance

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[3]Kewaunee Nuclear Power Plant Fire Protection Program Analysis, April 30, 1977, submitted to Edson G. Case (NRC) on May 2, 1977.

[4]Limiting Conditions for Operation are those restrictions on reactor operation, resulting from equipment performance capability, that must be enforced to ensure safe operation of the facility. Generally, should one of these conditions be exceeded certain actions, as prescribed by the Technical Specifications for the facility, must be taken. If the system cannot be restored to normal status within a specified time the reactor must be placed in a shutdown status.

of evaluating the "adverse impact caused by the performance of the modification on the operating facility."[5] More recently, in SECY-83-41, the staff stated:

> "Fire prevention and suppression systems are, of course, desirable. However, they must not assume such importance that they jeopardize safety concerns."

In light of the above positions and the information presented in this submittal, the proposed extension is justifiable from the standpoint of safety.

This schedule is also consistent with recent Commission policy on "integrated scheduling."[6] It allows for dramatic improvements in other areas of the plant while continually improving fire safety. Examples of these other improvements are the Safety Assessment System which is coupled with a new plant process computer, upgrade of the core exit thermocouples, and reactor vessel level instrumentation. These three projects are competing directly with Appendix R for company resources.

Installation of the Safety Assessment System (SAS) and new plant process computer is currently scheduled to begin this fall and continue through the 1984 refueling outage.[7] In addition to complying with NRC TMI Action Plan requirements, this equipment will also play a vital role in the programs to implement NRC requirements issued as a result of the Salem reactor trip breaker event.[8] The SAS will provide new capability to the operator to assess plant status, including trending; the new plant process computer will provide improved data processing, including improved post-trip review capability.

The core exit thermocouple upgrade and installation of reactor vessel level instrumentation projects are part of our program to comply with the staff Inadequate Core Cooling Instrumentation requirements, and are scheduled for 1985 and 1986, respectively.[9] Some work on each of these projects will be performed during the 1984 outage, as well.

The schedule also provides for smoother management of internal resources for implementation of other regulatory requirements such as Integrated Leak Rate Testing and Inservice Inspection (especially the Reactor Vessel Exam). Finally, the schedule also provides load leveling which enables the licensee to continue to perform the considerable amount of routine work that must also be done, including about 150 design changes per year and the several thousand tasks that are done each refueling.

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[5]Inspection Report 50-305/81-27, John Taylor, NRC to E. R. Mathews, WPSC, dated March 16, 1982.

[6]Generic Letter 83-20, D. G. Eisenhut (NRC) to all Operating Reactor Licensees, et al.

[7]Letter from C. W. Giesler (WPCS) to D. G. Eisenhut (NRC), dated April 15, 1983.

[8]Generic Letter 83-28, D. G. Eisenhut (NRC) to all Licensees, dated July 8, 1983.

[9]Letter from C. W. Giesler (WPSC) to D. G. Eisenhut (NRC), dated March 9, 1983.

The licensee continues to lead much of the industry in implementation of the Appendix R requirements. The final design will be superior in that it will require essentially no "operator action" to achieve and maintain hot shutdown, and only minimal operator action to achieve cold shutdown. Additionally, containment entry will not be required. This design did not require any exemptions from the technical requirements of Appendix R.

This design is more complex and complete than the minimum required by Appendix R, and as a result will require substantially more time to complete. Even considering this, it is likely that the licensee will be one of the first to complete Appendix R modifications. Lack of an additional extension would result in severe economic impact on the customers due to an extended outage.

In summary, the proposed schedule extension to implement the requirements of item III.L of Appendix R to 10 CFR 50 is justified for many reasons. These include the already high level of fire safety achieved at the Kewaunee Plant, the continual improvements in this level of safety that will occur as the modifications are implemented, the compensatory measures taken, the need to extend the schedule to maintain an appropriate level of operational safety, and the improvements in other areas of safety and operation that can be accomplished by integrating all regulatory and non-regulatory work.

Contributors:
M. Grotenhuis
N. Fiorvante
D. Kubicki
D. Neighbors

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