UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 100 TO FACILITY OPERATING LICENSE NO. DPR-58

INDIANA AND MICHIGAN ELECTRIC COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-315

INTRODUCTION

By letter dated October 1, 1986, the Indiana and Michigan Electric Company, the licensee, submitted a proposed amendment to the Unit 1 Technical Specifications for an extension of certain surveillance requirements which could only be done with the plant shutdown. By letter dated October 31, 1986, the licensee submitted a second proposed amendment for an extension of certain surveillance requirements and for much of the same equipment, however, these surveillances could be done at power but with new and untried procedures. All of the surveillances have been done in the past with the unit shut down.

The reason for the requests is that the refueling cycle has been lengthened by a self-imposed limit of operation at 90% rated thermal power. This limit was implemented as a precautionary measure following discovery of abnormal degradation of steam generator tubes in D.C. Cook Unit 2. The licensee has requested that all the specified surveillances be extended until the next scheduled refueling outage currently scheduled for about May 1987.

EVALUATION

A. Extension Requests From October 1, 1986 Letter-Surveillances Require Shutdown

The staffs review is presented following item numbers from Attachment 1 to the licensee's October 1, 1986 letter.

1. Items 1, 2, 3, 5, 6 8, 11, 13, and a typographical correction.

Licensee requests permission to correct a typographical error on page 3/4 0.3. The phrase "Semiannually or every 5 months" is to be changed to "semiannually or every 6 months." Staff finds this change request uncontroversial and, therefore, acceptable.

Licensee requests permission to delay the Table 4.3.1 channel calibration for functional unit 11, currently scheduled for December 23, 1986, and for Units 14 and 15, scheduled for December 20, 1986. Since required 12 hour channel checks and monthly functional tests will provide a periodic indication of the functional units' operability, the staff finds the requested, one-time extension to be acceptable.

Licensee requests permission to delay the Table 4.3-2 required channel calibration of ESF functional units 5a, 6a and 7a. Each of these calibration efforts are currently scheduled to take place December 20, 1986. Each of the functional units is required to undergo a channel check once every 12 hours and a functional test once each month. Staff's view is that any potential adverse operating impact which could result from licensee's proposed extension will be surfaced during the required periodic surveillances and therefore, finds the one-time extension acceptable.

Licensee has requested a delay in the surveillance requirement for Table 4.3-7 instrument no. 5 and instrument no. 12. Each of these instruments is required to undergo monthly channel checks which will likely surface any failure which could occur during the extended surveillance interval. Therefore, the staff finds the licensee's requested, one-time extension, acceptable.

Licensee requests a delay in the 18 month testing interval for the Reactor Trip System and Engineered Safety Feature System response times (T/S Section 4.3.1.1.3 and 4.3.2.1.3, respectively). Since the requested delay is short, approximately 3 months beyond that which is allowed under T/S 4.02, and given the number of periodic surveillance requirements for the components of each of these systems, the staff finds the licensee's request for a one-time extension acceptable.

Licensee requests a 4 month surveillance extension of the channel calibration required for containment sump level instrumentation and a 3 month extension of the channel calibration requirement for the flow monitoring instrumentation (T/S Section 4.4.6.1.b). Since the requested extension is only slightly longer than that which is allowed under T/S Section 4.02 and since other methods are available for detecting primary coolant leakage, the staff finds this request acceptable.

Licensee requests a 4 month delay in the 18 month requirement which calls for the verification of the automatic isolation and interlock action of the Residual Heat Removal System from the Reactor Coolant System (T/S Sections 4.5.2.d.1 and 4.5.3.1). To meet the single failure criterion, all active component of the RHR System, including isolation valves, are duplicated. Therefore, any undetected failure which might result from the lengthening of the surveillance interval will likely be offset by this built in redundancy. Also, the general fail-safe design of the systems offers an additional level of protection. Therefore, the staff finds the licensee's request for one-time surveillance extension acceptable.

Licensee requests a 3 month extension of the required 18 month surveillance interval for each diesel generator in Modes 1, 2, 3 and 4 (T/S Section 4.8.1.1.2.b) and in Modes 4 and 5 (T/S Section 4.8.1.2). The request exceeds the allowable margin identified in T/S Section 4.02 by only three months. Furthermore, the required 31 day surveillance tests are likely to detect any failure which may occur during the extended interval.

TS 4.8.1.1.2.b. involves testing automatic valves in the essential services water (ESW) and by the TSs, the surveillance must be performed during shutdown. Because some of the ESW valves involve cooling water to the diesel generator, this testing is done in conjunction with the diesel generator testing of TS 4.8.1.1.2.b. TS 4.4.11.3 requires testing of the emergency power supply for the PORVs and their associated block valves and is also performed during shutdown in conjunction with TS 4.8.1.1.2.b as suggested by TS 4.4.11.3 because it involves cycling the PORVs and block valves.

The extension for both the ESW valves and the PORV emergency power supply is acceptable based on previous test results which do not indicate any reason to suspect the valves and circuitry would not pass the required surveillance. Also the 31 day surveillance of the diesel generators demonstrates operability of those ESW valves (remote manual operation) associated with the diesel generators and the pressurizer code safety valves provide overpressure protection for the primary system in the event the PORVs do not function.

Based on the above the staff concludes that the requested extension of the required 18 month surveillance interval for the diesel generator, ESW valves and PORV emergency power supply is acceptable.

Licensee requests an extension of the 18 month surveillance requirement for the N-train battery service test (T/S Section 4.8.2.5.2.d)for a period of approximately four months beyond that which is allowed under T/S Section 4.02. Any failure which may result from the lengthened interval will likely be identified during the weekly service checks required for each battery bank. Therefore, the staff finds licensee's one-time request acceptable.

2. Item 4 Snubber Tests

The surveillance requirements of TS 4.7.8 state that at least once per 18 months snubber functional testing is to be performed on a 10% sample of the total of each type of snubber in use in the plant. The surveillance due date is December 29, 1986, for the steam generator snubbers and February 17, 1987, for the small bore snubbers. The licensee is requesting an extension of the snubber testing surveillance deadline to the refueling outage currently scheduled to begin on May 23, 1987. The extension is being requested because both the steam generator snubbers and most of the remaining snubbers in the 10% sample are inaccessible during power operation, and TS 4.7.8.c requires testing to be performed with the reactor shut down.

In 1978, numerous small-bore snubbers manufactured by the Grinnell Co. were found to lock up at a rate higher than design specifications recommended due to the factory settings of lock-up and bleed rates. All the Grinnell small-bore snubbers were tested in 1978 and settings were adjusted as necessary. Since the 1978 test results, all Grinnell snubbers tested have been found operable. The requirement to test the large-bore steam generator snubbers was established in 1983 in conjunction with the new Technical Specifications. Six of the sixteen snubbers have been tested, and of the six tested, one failed to lock up in compression. The problem was not generic, and the snubber passed the subsequent retest in 1985.

Visual inspections of snubbers are not required until after the beginning of the next refueling outage. However, the surveillance history of visual inspections gives further support for the licensee's request. Visual inspections are performed on small-bore snubbers at least once per refueling period. Of the visual inspections that have been performed on the accessible and inaccessible snubbers, unsatisfactory findings have occurred in less than 1% of the total cumulative population. Visual inspections have been performed on the steam generator snubbers since 1975. These inspections are performed at least once per refueling cycle. No problem or potential problem has been revealed by these inspections.

On the basis of the history of D. C. Cook Unit 1 snubber testing and inspection results, there is high confidence in the operability of the D. C. Cook 1 snubbers and operation for approximately five additional months past the due date for snubber functional testing will not result in a significant decrease in plant safety. Therefore, plant shutdown to perform snubber functional testing at the due dates indicated above would be unwarranted and the licensee's requested extension is acceptable.

The licensee's submittal requested a one time extension in the snubber functional testing surveillance requirements. However, since the licensee intends to continue to operate at reduced power with extended refueling cycles, the licensee should address the long-term aspects of this problem. The licensee should perform additional snubber testing to achieve the same level of confidence of snubber operability as provided by the current TS. The snubber functional testing surveillance requirements should be revised by the upcoming refueling outage to increase the snubber testing sample size at least in proportion to the increase in the length of the refueling cycle beyond 18 months.

3. Item 5 - Containment Sump Instrumentation

The licensee's proposal to defer surveillance to the May 1987 refueling outage will delay the channel calibration of the containment sump level and flow monitoring instrumentation required by Technical Specification (TS) 4.4.6.1.b. The system is designed to provide early indication of RCS pressure boundary degradation. There are, however, a number of backup means available, including humidity monitors, containment atmosphere gaseous and particulate radioactivity monitoring channels, the containment water level instrumentation, and reactor coolant system inventory balances required by TS 4.4.6.2.1 every 72 hours. Furthermore, the present TS allows one of three specified leak detection systems to be inoperable for up to thirty days.

Based on the number of backup means available for leak detection, plus the fact that if calibration changes were to incapacitate the containment sump instrumentation it would be readily apparent as a large increase or decrease in leak rate indication, the staff concludes that the delay in calibration is acceptable.

4. Item 7 - Divider Barrier Seal and Inspection

The licensee's proposal to defer surveillance to the May 1987 refueling outage will delay the testing and inspection of the divider barrier seal as required TS 4.6.5.9. The divider barrier seal serves to limit ice condenser bypass leakage from the lower to the upper compartment in the event of an accident. The seal is a passive component that is not accessible during power operation.

The licensee has reviewed recent surveillance test results which indicate that the seal is in excellent condition. Based on the passive nature of the seal, and given the history of seal performance, the staff concludes that a delay of the test and inspection until the next refueling outage will not significantly impact the ability of the seal to perform its safety function, and is, therefore, acceptable.

5. Item 9 - Containment Sump Inspection

The licensee's proposal to defer surveillance to the May 1987 refueling outage will delay the visual inspection of the containment sump and its associated subsystem subsystem inlets, required by TS 4.5.2.d.2 and TS 4.5.3.1 which references TS 4.5.2.

The licensee's records indicate that no evidence of structural distress, or corrosion of sump components, has been detected to date and, therefore, the licensee does not expect that any will be found prior to the next inspection. Furthermore, visual inspections of the sump areas were made during the required containment tours after the May and July 1986 plant trips and no debris was discovered. Loose articles that may have the potential to become sump debris are kept fastened down inside containment, and plant procedures require housekeeping inspection whenever the containment is entered during power operation.

Based on the above, the staff has reasonable assurance that the sump will be free of debris which could clog it, and that the sump's components will be sufficiently free of corrosion and structural distress until the next scheduled refueling outage. The staff, therefore, concludes that the delay of inspection of the containment sump until the next refueling outage is acceptable.

6. Item 10 - Reactor Coolant Pump Spray/Sprinkler System

The licensee's proposal to defer surveillance to the May 1987 refueling outage will delay the reactor coolant pump (RCP) spray/sprinkler system testing and inspection required by TS 4.7.9.2.b. Since the RCP spray/sprinkler system was installed, it has not failed a surveillance test from the standpoint of being incapable of performing its intended safety function which is fire suppression. There is also manual fire fighting capability in the unlikely event of spray/-sprinkler system failure. Based on the past surveillance history of the installed system and the manual backup fire fighting capability, the staff concludes that the proposed change to delay the surveillance to the next refueling outage is acceptable.

7. Item 12 - Auxiliary Feedwater Pump Testing

The licensee's proposal to defer surveillance to the May 1987 refueling outage will delay certain auxiliary feedwater pump (AFW) tests required by TS 4.7.1.-2.b. TS 4.7.1.2.b requires testing to demonstrate that the motor and turbine driven AFW pumps start and that the associated automatic valves actuate to their correct position upon receipt of certain signals. Although the tests, per se, will be delayed, in practice the essential portions of the TS (i.e., startup of the pumps when required and movement of the valves to their correct positions) have occured several times via actual signals. Prior testing experience has also indicated no significant problems. Due to the long dry out time of Westinghouse steam generators, there is a good likelihood of manual initiation of the AFW system if it failed to automatically initiate. Also, the pumps themselves are manually tested monthly.

Based on the successful, actual automatic AFW initiations that have occured (most recently July 1986), the excellent surveillance history for the equipment and the capability for manual initiation of the AFW system, the staff concludes that the proposed delay in testing to the next refueling outage is acceptable.

Each of the above referenced specifications will include a reference to a new specification (TS 4.0.6) which states that those surveillances which must be performed on or before July 31, 1987, and are designated as 18-month surveillances, may be delayed until the end of the cycle 9-10 refueling outage (currently scheduled to begin during the second quarter of 1987).

Based on a review of each of the items described above, the staff concludes that the proposed changes are acceptable.

B. Entension Request from October 31, 1986 Letter--Surveillance Untried at Power

The licensee's letter dated October 1, 1986 as evaluated above under A, includes some of the same equipment as evaluated here but differs in that the requirements under A can only be done at shutdown and those surveillances under B could be done at power but with new, untried procedures. The use of extensive new procedures is likely to cause an unwarranted reactor trip or transient. This would increase the risk to the public which is not considered offset by the benefits of requiring the surveillance during the short period of the requested extension. In addition, the staff's safety evaluation conducted under A above concluded that all temporary requests for extension were acceptable. Therefore, this review under B will consider only those items which are unique to the October 31st letter.

1. Licensee requests an extension of surveillance intervals for Table 4.3-1 channel calibration of instruments designated as functional units 7,8,9, and 10 (interval extensions for unit nos. 11, 14 and 15 were reviewed under A above). The requested extensions range from one to about five months longer than the maximum extension allowed under TS Section 4.02. Since 12 hour channel checks and monthly functional tests are required to be performed for each functional unit, periodic indication of each unit's operability is available. The staff's view is that significant calibration problems which occur during the one-time extension of the surveillance interval will likely surface during the units' periodic testing requirements. Therefore, the staff finds the licensee's request acceptable.

2. Licensee requests permission to delay, for periods ranging from one to five months longer than the maximum extension allowed under TS Section 4.02, the Table 4.3-2 required channel calibration of functional units 1.c, 1.d, 1.e, 1.f, 2.c, 3.b.3, 4.c, 4.d, 6.b, 8.a, and 8.b (Units 5a, 6a, and 7a were reviewed and approved under A above). Since 12 hour channel checks and monthly functional checks are required to be performed for each functional unit, periodic indication of each unit's operability is available. The staff's view is that any significant calibration problems which occur during licensee's proposed one-time extensions will likely be detected during the required, periodic surveillances. Therefore, the staff finds the extension request acceptable.

3. Licensee requests a four month delay in the testing of the P-11 and P-12 interlocks. The extension is requested because the total interlock function is tested during the delta T/Tavg and pressurizer pressure channel calibrations for which surveillance interval extensions were approved above. Since the P-11 and P-12 interlocks undergo functional surveillance during the monthly automatic actuation logic test, the staff's view is that any operating irregularity which results from this one-time extension, will likely be detected during these monthly tests. Therefore, the staff finds the licensee's extension requests acceptable.

4. Licensee requests an extension of the surveillance interval channel calibration requirement for Table 4.3-6 functional units 2, 3, and 5. Extensions of 5 months are requested for units 5 and 3 and a one month extension is requested for unit no. 2. Each functional unit is required to undergo monthly channel checks. These routine checks should provide sufficient indication of any significant calibration problems with the functional units during the extended interval to allow appropriate corrective action. Therefore, the staff finds licensee's request for a one-time extension to be acceptable.

5. Licensee has requested a delay of approximately five months in the surveillance requirements for Table 4.3-7 instruments 1, 6, and 7 (a surveillance extension was granted for channel calibration of instrument no. 5 under A above). Each of these instruments is required to undergo monthly channel checks which will likely indicate any significant calibration problems resulting during the one-time surveillance extension. Therefore, the staff finds the licensee's requested, one-time extension acceptable.

6. Licensee requests a one month delay in the channel calibration of the power operated relief valve (PORV), TS Section 4.4.11.1.b. Since the requested extension is relatively short and since the PORV's are required to undergo channel functional testing at least once per 31 days, it is unlikely that any adverse impact on safety will result from this one-time interval extension. Therefore, the staff finds the licensee's request acceptable.

As in section A above each of the above referenced specifications will include a reference to a new specification (TS 4.0.6) which states that those surveillances which must be performed on or before July 31, 1987, and are designated as 18-month surveillances, may be delayed until the end of the cycle 9-10 refueling outage (currently scheduled to begin during the second quarter of 1987).

Based on a review of each of the items described above, the staff concludes that the proposed changes are acceptable.

Technical Specifications

The licensee has proposed changes to the Technical Specifications to cover surveillances which occur over a period of time. The first change must be in effect for the first test which would have occurred on December 20, 1986. Since the time of other tests vary after that date, the actual revisions by the licensee to Technical Specifications may also vary. The amendment will be conditioned, however, so that all revisions to the Technical Specifications will be in place within 45 days of receipt of this amendment.

ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of the facilities' components located within the restricted areas as defined in 10 CFR 20. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR Sec 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations, and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

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