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May 30, 2015

AEP-NRC-2015-50
10 CFR 50.90

Docket Nos. 50-315

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Donald C. Cook Nuclear Plant Unit 1
Response to a Request for Additional Information Regarding the Emergency License Amendment Request to Extend the Allowed Outage Time for an Emergency Diesel Generator

References:

1. Letter from J. P. Gebbie, Indiana Michigan Power Company (I&M), to U. S. Nuclear Regulatory Commission (NRC), "Donald C. Cook Nuclear Plant Unit 1 , Emergency License Amendment Request to Extend the Allowed Outage Time for an Emergency Diesel," AEP-NRC-2015-49, dated May 28, 2015.

2. Email from A. W. Dietrich, NRC, to H. L. Kish, I&M, Request for Additional Information Electrical Engineering Branch of the Office of Nuclear Reactor Regulation Regarding an Emergency License Amendment Request for the Donald C. Cook Nuclear Plant, Unit 1, to Revise Technical Specification Section 3.8.1 to allow for a one time extension of the Completion Time, Indiana Michigan Power Company Docket No. 50-315, dated May 28, 2015.

This letter provides Indiana Michigan Power Company's (I&M), the licensee for Donald C. Cook Nuclear Plant Unit 1, response to a Request for Additional Information (RAI) by the U. S. Nuclear Regulatory Commission (NRC) Regarding an Emergency License Amendment Request to Extend the Allowed Outage Time for an Emergency Diesel Generator."

By Reference 1, I&M submitted a request for an emergency amendment to the Technical Specifications (TS) to Facility Operating License DPR-58. I&M proposed to change TS 3.8.1 to permit extending the B.5 Completion Time from 14 days to 65 days for an inoperable emergency diesel generator (EDG). The proposed amendment would also change the TS Surveillance Requirement 3.8.1.2 and 3.8.1.3 to extend the Surveillance Frequency (SF) from 31 days to 82 days, or within 3 days following the inoperable EDG being restored to service, and TS Surveillance Requirement 3.8.1.7 to extend the SF from 92 days to 145 days, or within 3 days following the inoperable EDG being restored to service. By Reference 2, the NRC transmitted RAIs (EEEB 1 and 2) regarding the proposed emergency license amendment request.

Enclosure 5 to Reference 1 contained 12 commitments based on the compensatory actions. Two of these commitments are being revised by this submittal. The first commitment to be revised

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stated that a "smaller diverse and flexible strategies (FLEX) DG will be brought to the plant protected area location to support Unit 1, with necessary cabling stowed nearby, to relatively quickly connect these diesels through established FLEX connections and procedures to provide an additional emergency operating power for a train of Unit 1's Containment DIS." CNP intends to modify the commitment to allow for the non-safety related diesel generator (NDG) operating at 480 volts to supply power to the Train B Distributed Ignition System in this case. The NDG is acceptable for use in this application because it is considered a separate event in the Probabilistic Risk Assessment model from the station blackout for which the NDG will be connected to the 4 kV safety bus. The second commitment to be revised stated that "These compensatory measures will be promulgated to the operating crews in an operations department standing order." A determination has been made to use a different station process for promulgating the compensatory measures to the operating crews.

This letter provides I&M's response to Reference 2. Enclosure 1 to this letter provides an affirmation statement. Enclosure 2 to this letter provides I&M's response to the NRC's RAI contained in Reference 2. Enclosure 3 to this letter contains new or revised regulatory commitments associated with this request.

Copies of this letter and its attachments are being transmitted to the Michigan Public Service Commission and Michigan Department of Environmental Quality, in accordance with the requirements of 10 CFR 50.91.

Should you have any questions, please contact Mr. Michael K. Scarpello, Regulatory Affairs Manager, at (269) 466-2649.

Sincerely,

Q. Shane Lies
Engineering Vice President

JMT/amp

Enclosures:

1. Affirmation
2. Response to Request for Additional Information Regarding One Time Emergency License Amendment Request to revise Technical Specification Section 3.8.1 to permit extending the Completion Time. (RAI-EEEB-1 and 2)
3. Regulatory Commitments

c: A. W. Dietrich, NRC, Washington, D.C.
J. T. King – MPSC
MDEQ – RMD/RPS
NRC Resident Inspector
C. D. Pederson, NRC Region III
A. J. Williamson, AEP Ft. Wayne, w/o enclosures

**Enclosure 1 to AEP-NRC-2015-50**

AFFIRMATION

I, Q. Shane Lies, being duly sworn, state that I am Engineering Vice President of Indiana Michigan Power Company (I&M), that I am authorized to sign and file this request with the U. S. Nuclear Regulatory Commission on behalf of I&M, and that the statements made and the matters set forth herein pertaining to I&M are true and correct to the best of my knowledge, information, and belief.

Indiana Michigan Power Company

Q. Shane Lies
Engineering Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 30 DAY OF May, 2015

Notary Public

My Commission Expires 04-04-2018

DANIELLE BURGOYNE
Notary Public, State of Michigan
County of Berrien
My Commission Expires 04-04-2018
Acting in the County of Berrien

**Enclosure 2 to AEP-NRC-2015-50**

**Response to Request for Additional Information Regarding One Time Emergency License Amendment Request to revise Technical Specification Section 3.8.1 to permit extending the Completion Time. (RAI-EEEB-1 and 2)**

By letter dated May 28, 2015, Indiana Michigan Power Company (I&M), the licensee for Donald C. Cook Nuclear Plant (CNP) Unit 1, submitted a license amendment request (LAR) to revise the Appendix A Technical Specifications (TS) for Renewed Facility Operating License DPR-58. The proposed amendment would revise TS 3.8.1 to permit extending the Completion Time (CT) from 14 days to 65 days for an inoperable emergency diesel generator (EDG). The proposed amendment would also revise the TS Surveillance Requirement 3.8.1.2 and 3.8.1.3 to extend the Surveillance Frequency (SF) from 31 days to 82 days, or within 3 days following the inoperable EDG being restored to service, and TS Surveillance Requirement 3.8.1.7 to extend the SF from 92 days to 145 days, or within 3 days following the inoperable EDG being restored to service.

The U.S. Nuclear Regulatory Commission Electrical Engineering Branch has determined that the additional information below is needed to complete the review. By electronic mail dated May 28, 2015, the NRC transmitted a request for additional information (RAI) regarding the May 28, 2015, LAR. This enclosure provides I&M's response to the RAI.

ELECTRICAL ENGINEERING BRANCH (EEEB)

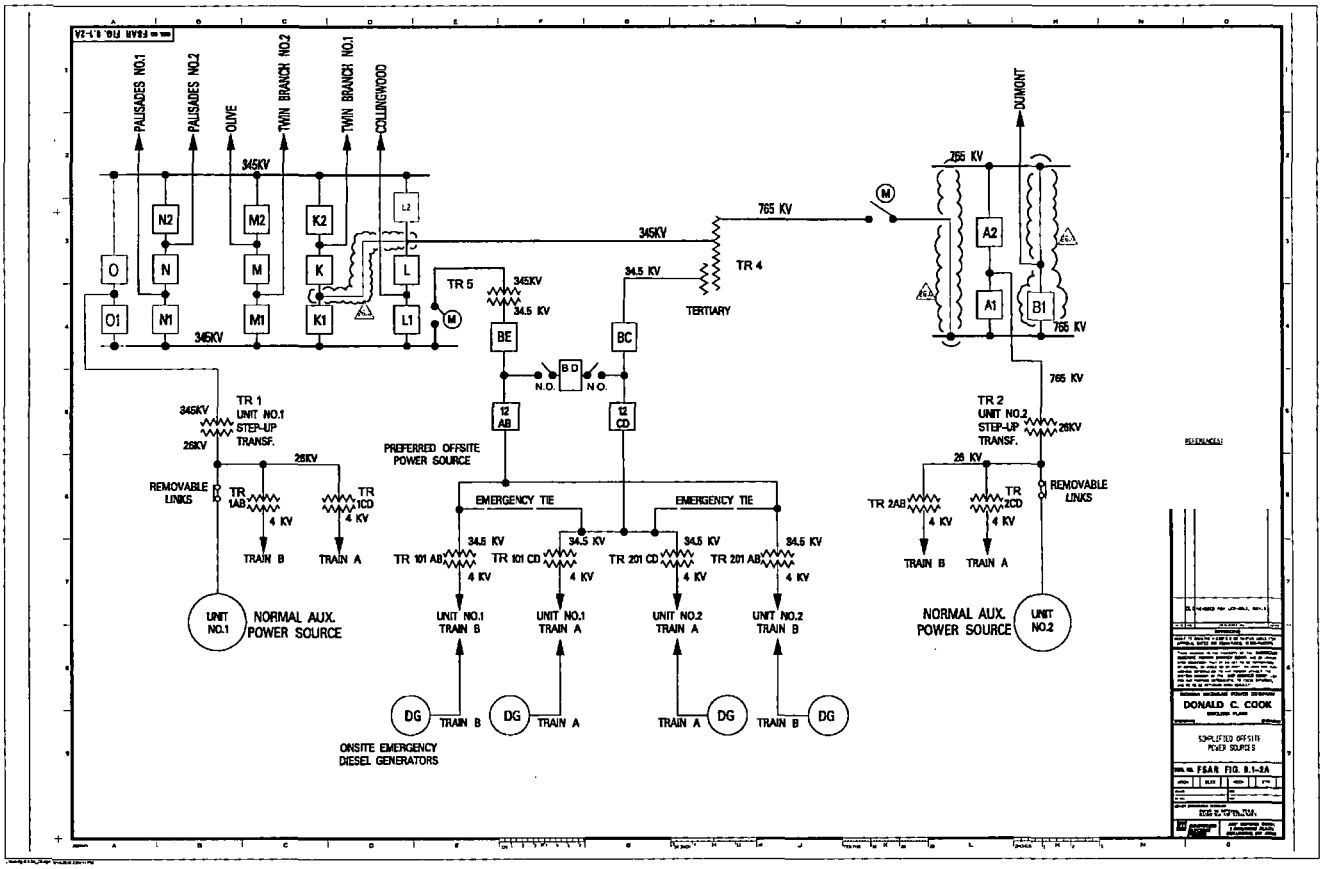
RAI-EEEB-1

*Please discuss in detail how CNP Unit 1 mitigates the consequences of the following events when plant is operating with one EDG in maintenance for 65 days. Please identify all additional power sources that are available and will be credited for mitigating the events described below for the duration of the extended outage including the operating procedures in place and the operator training completed. Please identify the capacity of the power sources, their alignment and the actual loads required to be connected, including the fuel oil requirement and storage for 65 days.*

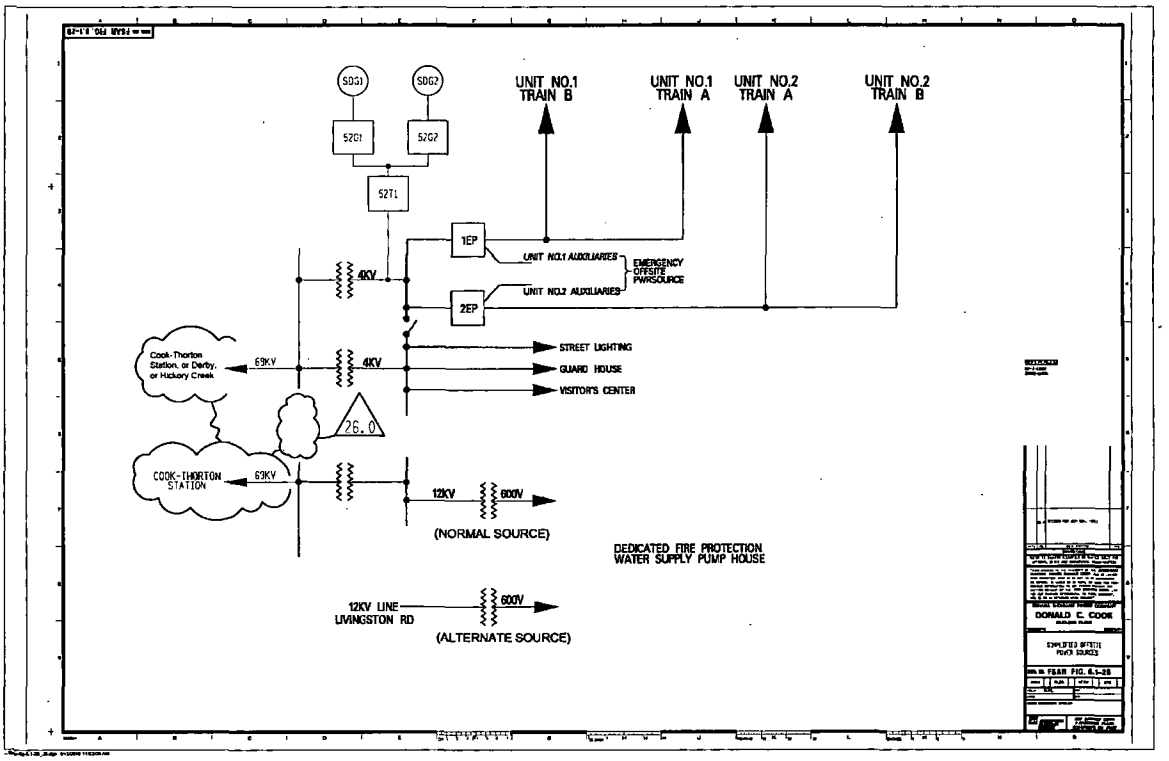
*a. Loss of offsite power (LOOP)*
*b. Station Blackout*
*c. LOOP with LOCA and a single failure of the operable EDG*

Description of power to 4kV Safety Buses

FSAR Figure 8.1-2-2A:



FSAR Figure 8.1-2-2B:




Description of the 4160 Volt System

Unit auxiliary power is distributed from the 4160 volt switchgear which is energized from the main generator through unit auxiliary transformers TR1AB and TR1CD during normal operation, and from Preferred Offsite Power Source reserve auxiliary transformers (RATs) TR101AB and TR101CD during start-up or shutdown operations. The 4160 volt system is duplicated for Unit 2.

During shutdown and outage conditions (Modes 5, 6, and defueled), the 4160 volt buses are capable of being energized from the offsite source through the main power transformer and the unit auxiliary transformers. The electrical configuration is the same as for on-line power operation except that the generator is off-line and the generator disconnect links are removed to prevent "motoring" of the generator. This configuration is referred to as "backfeed".

The 4160 volt switchgear is arranged in eight bus sections. Buses 1A, 1B, 1C, 1D, T11A, and T11D each have a capacity of 2000 amperes. Buses T11B and T11C, which serve only transformers TR11B and TR11C, have a capacity of 1200 amperes. Motors 400 hp or larger operate from the 4160 volt buses. All feeder and motor circuits are protected by:

a. Overcurrent relays which trip the associated breaker in the event of a sustained overload or fault.

b. Instantaneous relays for ground fault and motor cable faults.

During start-up, the total unit power demand is supplied from the Preferred Offsite Power Source via RATs TR101AB and TR101CD. This source may also be used to supply all or part of the unit auxiliary load when the unit is on line. However, the auxiliary load is normally transferred to unit auxiliary transformers TR1AB and TR1CD, after the turbine generator has been synchronized and connected to the system. The transfer of load from the preferred offsite power source to the unit auxiliary transformers of load from the preferred offsite power source to the unit auxiliary transformers is effected without a power interruption, by momentarily feeding the 4160 volt switchgear from both the reserve and unit transformers. Once the transfer is complete, each turbine-generator supplies its own auxiliaries. During a planned shutdown, this process is reversed and the auxiliary load is transferred to the Preferred Offsite Power Source before the generator is disconnected from the system. A trip of the unit automatically trips the normal source breakers (unit auxiliary transformers) and transfers the auxiliary loads to the preferred offsite power source.

The 4160 volt buses (T11A, T11B, T11C, and T11D) may also be fed from a 4160 volt diesel generator, to supply power to the engineered safety features and other necessary equipment in the event of a LOOP. There are two diesel generators associated with each unit. Each diesel generator is connected to two 4160 volt buses, one to buses T11A and T11B and one to buses T11C and T11D. Upon loss-of-power to a 4160 volt bus, the associated diesel generator starts automatically. The circuit breaker, which normally supplies power to that bus from the main 4160 volt bus, is tripped. A 4160 volt circuit breaker in each bus is automatically closed when each diesel generator's voltage and speed approach rated values, and re-energizes the bus. The continuous service rating of each DG is 3500 kW. The diesel generators will then supply all equipment which must operate under emergency conditions (accident loads). The accident loads consist of the following:

- Centrifugal Charging pump (CCP)
- Safety Injection (SI) pump
- Residual Heat Removal pump
- Component Cooling Water (CCW) pump
- Essential Service Water (ESW) pump
- Motor-driven Auxiliary Feedwater pump (MDAFP)
- Containment Spray pump
- Non-Essential Service Water (NESW) pump
- Safety-related 600 volt alternating current (VAC) block loads

The fuel capacity for the EDGs is always maintained greater than 46,000 gallon per unit in accordance with CNP's TSs. This is enough fuel to operate one EDG in each unit at rated load for seven days.

The alternate offsite power source (alternately referred to as EP) has been provided by a 69 kV line that is fed from two separate transmission lines, Bridgman and Derby. This bus feeds the 69/4160 kV transformer TR12EP-1 and the 4160 volt main bus cables are run underground to connect to buses T11A, T11B, T11C, T11D, and T21A, T21B, T21C, and T21D. This

transformer has been sized to provide necessary capacity to operate one train of the engineered safeguards equipment in one unit while supplying one train of safe shutdown power in the other. The breakers which connect this source to the 4160 volt bus are manually operated and interlocked to prevent parallel operation with any other 4160 volt source.

Another alternate on-site power source is available if the EDGs fail to start. This alternate power source is from the non-safety related Supplemental Diesel Generators (SDGs). There are two SDGs (2250/4500 kW total) that operate in parallel to supply power to maintain reactor coolant system inventory control. The SDGs have a combined continuous capacity rating of 4500 kW which exceeds the 3500 kW continuous capacity rating of any single EDG. The SDG capacity is sufficient to power at least one train of vital equipment needed to ensure that safe shutdown condition following a station blackout (SBO) can be maintained. A single train of SBO loads requires slightly less than 55 percent of the combined capacity of the two SDGs. The major electrical loads for SBO recovery (safe shutdown loads) include:

- CCP
- CCW pump
- ESW pump
- MDAFP
- NESW pump
- Safety-related 600 VAC block loads.

The SDGs will start automatically upon a sustained loss of voltage on 4160 volt Bus 1. Bus 1 is then available for the operator to manually load to any of the safety related 4160 volt Buses.

The fuel capacity for the SDGs is always maintained greater than 2200 gallons per CNP's Technical Requirements Manual. This capacity is verified by periodic surveillance (shiftly performance while using the SDGs to support extended EDG allowed outage time (AOT)). This minimum acceptable level constitutes enough fuel to operate for 24 hours at design loading. To supplement the on-board fuel storage, fuel may be used from the previously-mentioned EDG fuel oil storage tanks (FOST). The capacity of the EDG FOST is enough to provide approximately 18 days of SDG operation at the design load referenced above. Equipment is available to transfer fuel from the EDG FOST for long-term operation to support the 65-day extended AOT. Training has been conducted for site fire brigade personnel on the use of this fuel transfer equipment based on the implementation of FLEX strategies for beyond design basis external events.

As a mitigating measure, for the duration of the extended repairs to the Unit 1 AB EDG, CNP will pre-stage a temporary non-safety related diesel generator (NDG) capable of supplying power to the Train B 4160 volt Emergency bus T11A. This NDG will be connected to the bus in the event of a LOOP coincident with failure of the Train A (CD) EDG. The NDG continuous rated capacity is 1825 kW which is adequate to provide power to one train of the following loads:

- CCP
- CCW Pump
- ESW Pump

- N-Train Battery Charger

These loads consist of one train of equipment required to maintain the affected unit in a safe and stable state through RCS inventory control and decay heat removal for a 24-hour period. The fuel capacity for the compensatory NDG is approximately 1150 gallons, which provides enough fuel to operate for 11 hours, powering the loads mentioned above. Beyond this installed storage capacity, fuel may be used from the emergency diesel generator FOST. The capacity of the EDG FOSTs is enough to provide approximately 18 days of NDG operation at required load. Equipment is available to transfer fuel from the EDG FOST for long-term operation to support the 65-day extended AOT. Training has been conducted for site fire brigade personnel on the use of this fuel transfer equipment.

A new procedure for operation of the NDG will be created for use by Operations department personnel. Field operators who will be expected to start and stop the NDG as well as perform shiftly operator rounds to confirm its availability will complete demonstration training prior to their next scheduled shift after entering the period of extended AOT for the 1AB EDG. Licensed operator training needs were reviewed as a result of this new equipment. Since the strategies contained in the loss of all AC power scenarios were not significantly altered and no new licensed operator tasks were identified, licensed operator crews will be trained via a crew noteworthy supplement prior to assuming licensed duties following entry into the extended AOT. Additional qualified electrical staff will be dedicated for connection of the NDG generator output to the 4 kV safety buses using a pre-approved work order task. Walk-through training for these electrical personnel will be provided prior to performing these duties.

Response to RAI-EEEB-1a

Event mitigation

With Unit 1 initially in normal power operation, the LOOP will prompt an automatic reactor trip on RCP Bus Undervoltage and will automatically start the OPERABLE Unit 1 CD Emergency Diesel Generator (DG1CD) in response to Undervoltage on safety-related bus T11D. Operator response to these conditions is to enter procedure 1-OHP-4023-E-0, Reactor Trip or SI. Steps 1 and 2 check for Reactor Trip and Turbine Trip, respectively, which for the postulated event, may be assumed to have occurred without complication. At Step 3.a in the procedure, the control room crew is prompted to check power to AC Emergency Buses T11A OR T11D. The response of the OPERABLE DG1CD will satisfy this requirement by automatically starting and connecting to bus T11D. Step 3.b prompts the control room crew to check ALL AC emergency buses ENERGIZED, including buses T11A, T11B, T11C, and T11D. Due to unavailability of DG1AB, this check will not be fully satisfied. Only buses T11C and T11D will be energized. Due to this condition, the Operator is directed to the "Response Not Obtained" (RNO) step which directs the operator as follows: "WHEN time permits, THEN try to restore power to de-energized AC emergency bus(es) using SUP-012, "Restoring DG Power," OR SUP-009, "Restoration of 4KV Power from EP." The control room crew is then directed to continue with Step 4 of E-0. Step 4 checks the status of SI, which for this event would not be actuated. The Step 4 RNO requires the operator to check if SI is required (is not required for this event), then to reduce Auxiliary Feedwater (AFW) to specified values and transition to ES-0.1, "Reactor Trip Response," Step 1. ES-0.1 provides instructions to stabilize and control the plant following a

Reactor Trip without a SI. Step 4 of the procedure checks the status of charging to the RCS. Due to the LOOP, the manual restarting of the East CCP is necessary as directed by RNO Step 4.a. This supports restoration of normal Pressurizer level control. The Train A buses T11C and T11D, energized via DG1CD, enables the normal automatic response of Train A Engineered Safeguards Features loads including the East MDAFP, the East CCW pump, the East ESW pump, and the North NESW pump. Step 8 of ES-0.1 checks whether plant AC buses are energized by offsite power. The RNO step directs the operator to procedure SUP-002, "Restoration of Reserve Power to 4KV Buses, and SUP-009, "Restoration of 4KV Power from EP."

Power Sources Available

In the event of a LOOP event, the following AC source is available and credited in the accident analysis:

1 EDG with a capacity of 3500kW. The EDG will automatically start and is capable of powering all accident loads for Train A.

The following additional sources are also available:

2 SDGs with a capacity of 2250kW each. These generators are started in automatic on loss of voltage to the alternate off-site power source. They are capable of supplying one train of accident loads in one unit.

1 NDG with a capacity of 1825kW aligned in standby and manually connected to safety bus in approximately two hours upon a LOOP with neither SDG available. This generator is capable of powering one charging pump, one CCW pump, one ESW pump and an N-Train Battery charger for operation of the Turbine-Driven Auxiliary Feedwater Pump (TDAFP).

The fuel consumption and storage capacity for these sources is as described above.

Operating Procedures in Place

1-OHP-4023-E-0 (Reactor Trip or SI)
1-OHP-4023-ES-0-1 (Reactor Trip Response) – Train A powered from DG1CD, Train B would be powered from Emergency Power (EP) or SDGs manually aligned per 1-OHP-4023-SUP-009 (RESTORATION OF 4KV POWER FROM EP).

Training Completed

Licensed Operator Continuing Training on Loss of AC power and SBO, both with and without a loss of coolant accident (LOCA), in the classroom and in the simulator is conducted every 2 years. Period 37 was two years ago (2013). Manually starting and placing SDGs in service is a task required every 4 years and has been trained on in periods 35/37/38 (2011/2013/2014). With the additions to FLEX and ELAP strategies, I&M completed an additional round of training for LOOP with LOCA in period 39 (2014). This training includes a simulator evaluation and written exam on these topics.

Response to RAI-EEEB-1b

Event mitigation

With Unit 1 initially in normal power operation, the LOOP will prompt an automatic reactor trip on RCP Bus Undervoltage and will automatically signal the start of the OPERABLE DG1CD in response to Undervoltage on safety-related bus T11D. SBO conditions will exist as a result of the failure of DG1CD to start or to load. Operator response to these conditions is to enter procedure 1-OHP-4023-E-0, Reactor Trip or SI. Steps 1 and 2 check for Reactor Trip and Turbine Trip, respectively, which for the postulated event, may be assumed to have occurred without complication. At Step 3.a in the procedure, the control room crew is prompted to check power to AC Emergency Buses T11A OR T11D. With DG1AB out of service and the postulated failure of DG1CD, the Step 3.a RNO directs the operator to transition to ECA-0.0, "Loss of All AC Power," Step 1. Steps 1 and 2 of ECA-0.0, respectively, re-check that the reactor and turbine are tripped. Step 3 checks RCS isolation to maintain RCS pressure and to minimize the loss of RCS inventory. Step 4 establishes required flow to the Steam Generators for core cooling. Under SBO conditions, the TDAFP will automatically start and supply the required flow. The Step 4 RNO calls for manual action by the operator to ensure required flow is being delivered. For the postulated event, it is permissible to assume the RNO steps are not required. Step 5 of ECA-0.0 directs the operator to attempt restoration of power to any AC Emergency Bus by manually starting any available non-running EDG. In this case, an attempt would be made to manually start and load DG1CD. If successful, a transition is made to the appropriate recovery procedure. For this scenario, it is assumed that efforts to start/load DG1CD are unsuccessful. This leads the operator to Step 5 RNO. This RNO step checks the status of the EP Supply. EP is normally supplied from an offsite 69KV source. The plant's two SDGs located in CNP's Owner Controlled Area provide a backup means of energizing the EP supply. The NDG added to provide additional defense in depth to the reliability of the EP supply as part of Reference 1of the letter, may also be assumed available to provide power to the Emergency Buses.

ECA-0.0 Attachment D, "Rapid Restoration of AC Emergency Bus(es) Using EP." This procedure starts by taking further actions to limit the loss of inventory from the RCS by isolating the Reactor Coolant Pump seals. The EMERGENCY TRIP pushbutton is depressed for any running EDG. In this scenario, this action would be needed if DG1CD started but failed to load buses T11C and T11D. The RCP seal water return line is isolated in Attachment D, Step 1. Step 2 selects an AC bus for energization and then prepares the bus to be re-energized by locking out the major pump loads on the selected bus, and checking the status of load conservation logic. The remaining steps in Attachment D direct restoration of power to each of the 4KV Emergency Buses.

If unsuccessful in restoring power to the Emergency Buses from EP or from an EDG, ECA-0.0 proceeds to take actions to cope with the loss of AC which consists mainly of limiting the loss of RCS inventory and removing heat from the RCS via the TDAFP. The extended loss of all AC leads to implementation of FLEX ELAP strategies.

Power Sources Available

In the event of an SBO, the following sources will be available but not credited:

2 SDGs with a capacity of 2250kW each. These generators are started in automatic on loss of voltage to the alternate off-site power source. They are capable of supplying one train of accident loads in one unit.

1 NDG with a capacity of 1825kW aligned in standby and manually connected to safety bus in approximately two hours upon a loss of off-site power with neither SDG available. This generator is capable of powering one charging pump, one component cooling pump, one ESW pump and an N-Train Battery charger for TDAFP operation for Train B.

The fuel consumption and storage capacity for these sources is as described above.

Operating Procedures in Place

1-OHP-4023-ECA-0-0 (Loss of All AC Power)

1-OHP-4023-ECA-0-0 Attachment D (Rapid Restoration Of AC Emergency Bus(es) Using EP) – if EP available OR SDGs load to EP bus (whether automatically or using Transfer to Emergency)

1-OHP-4023-SUP-009 (RESTORATION OF 4KV POWER FROM EP):
- Attachments A – D (Energize T11A – D from EP)
- Attachment I (Restoration Of EP Bus Using SDGs)
- Attachment J (Single SDG Restoration of EP Bus Power to Train A)
- Attachment K (Single SDG Restoration of EP Bus Power to Train B)
- *FUTURE* Attachment M (Temporary Power to T11A)
- *FUTURE* Attachment N (Temporary Power to T11B)
- *FUTURE* Attachment O (Temporary Power to Train B)

1-OHP-4023-SUP-012 (Restoring DG Power)

1-OHP-4023-ECA-0-1 (Loss of All AC Power Recovery Without SI Required) – Will not be performed with only a single SDG or Temporary Power supplied to T bus

1-OHP-4023-ECA-0-2 (Loss of All AC Power Recovery With SI Required) – Will not be performed with only a single SDG or Temporary Power supplied to T bus

Notes:

(1) Extended Loss of All AC Power (ELAP) response is contained within 1-OHP-4023-ECA-0-0 (Loss of All AC Power) if Loss of AC power is expected to exceed 4 hours. FLEX Support Guidelines (FSG) were not used for describing the procedure flowpath, but they are available and implemented if ELAP declared.
(2) *FUTURE* denotes procedure revisions above in progress for installation of the NDG which will be in place prior to entry into the extended 1AB EDG AOT of 65 days.

Training Completed

Licensed Operator Continuing Training on Loss of AC power and SBO both with and without a LOCA, in the classroom and in the simulator is conducted every 2 years. Period 37 was two years ago (2013). Manually starting and placing SDGs in service is a task required every 4 years but has been trained on in periods 35/37/38 (2011/2013/2014). With the additions to FLEX and ELAP strategies, I&M completed training for LOOP with LOCA in period 39 (2014). This training includes a simulator evaluation and written exam on these topics.

Response to RAI-EEEB-1c

A LOCA concurrent with a LOOP and a single failure of the only operable EDG (i.e. an SBO coincident with a LOCA) is beyond the plant design basis.

Event mitigation

Even though this event is beyond the plant design basis, existing procedures would address this unlikely event. Operators would enter ECA-0.0, Station Blackout, and perform the associated actions. ECA-0.0 directs actions to minimize RCS inventory loss, ensure secondary heat sink, and restore a source of AC power. The SDG would be used if available to restore AC power to one train of safety related loads. If neither SDG was available, then the NDG would be used to restore power to aid in mitigating the event. The success in these strategies in preventing core damage would depend on the size of the RCS LOCA and the power source restored.

Although neither the SDGs nor the NDG is designed to mitigate a LOCA coincident with an SBO, the SBO recovery procedures do consider the possible recovery from an SBO with a loss of RCS sub-cooling, as likely would be the case during a LOCA coincident with an SBO. If the SDGs were available or another power source was restored that is capable of powering a full safety train of equipment (e.g. offsite power or an EDG), then the loss of AC power recovery procedures would be entered. In the case described, the operators would enter ECA-0.2, Loss of all AC Power Recovery with SI Required. ECA 0.2 manually ensures equipment alignment and loads the necessary loads onto the safety busses, including all Emergency Core Cooling System (ECCS) pumps.

If SDG power is restored at less than full capability (i.e. only one of two SDGs is powering the safety bus), then the single SDG is loaded onto the safety busses and a single Charging Pump (high head ECCS) is started along with the necessary loads to provide ancillary support for RCS inventory makeup requirements, e.g. pump cooling water, control air, etc.

If NDG power is restored, then the NDG is loaded onto the safety busses and a single charging pump (high head ECCS) is started along with the necessary loads to provide ancillary support for RCS inventory makeup requirements, e.g. pump cooling water, control air, etc.

If the above strategies are unsuccessful at preventing core damage then the operators will transition from ECA-0.0, Station Blackout, to the Severe Accident Mitigation Guidelines (SAMG). The SAMGs contain steps to protect the remaining fission product barriers (e.g. containment) and to minimize any release to the public.

Power Sources Available

In the event of an SBO with a LOCA, the following sources will be available:

2 SDGs with a capacity of 2250kW each. These generators are started in automatic on loss of voltage to the alternate off-site power source. They are capable of supplying one train of accident loads in one unit.

1 NDG with a capacity of 1825kW aligned in standby and manually connected to safety bus in approximately two hours upon a LOOP with neither SDG available. This generator is capable of powering one charging pump, one CCW pump, one ESW pump and an N-Train Battery charger for TDAFP operation for Train B.

The fuel consumption and storage capacity for these sources is as described above.

Operating Procedures in Place

The same procedures as stated in response to RAI-EEEB-1.b (SBO), with exception of 1-OHP-4023-SUP-012, apply to this scenario.

If both SDGs supply power to one train then 1-OHP-4023-ECA-0-2 (Loss of All AC Power Recovery with SI Required) is used.

If only one SDG or NDG is supplied to one train, then 1-OHP-4023-ECA-0-0 (Loss of All AC Power) is not exited until another power source is restored.

If the five highest core exit thermocouples exceed 1200F, then SACRG-1, SAMG Control Room Guide - Initial Response, Step 1 is entered.

**Notes:**

(1) Extended Loss of All AC Power (ELAP) response is contained within 1-OHP-4023-ECA-0-0 (Loss of All AC Power) if Loss of AC power is expected to exceed 4 hours. FLEX Support Guidelines (FSG) were not used for describing the procedure flowpath, but they are available and implemented if ELAP declared.

Training Completed

Licensed Operator Continuing Training on Loss of AC power and SBO both with and without a LOCA, in the classroom and in the simulator, is conducted every 2 years. Period 37 was two years ago (2013). Manually starting and placing SDGs in service is a task required every 4 years but has been trained on in periods 35/37/38 (2011/2013/2014). With the additions to FLEX and ELAP strategies, I&M completed training for LOOP with LOCA in period 39 (2014). This training includes a simulator evaluation and written exam on these topics.

RAI-EEEB-2

*For question 1c, please describe how CNP Unit 1 meets the following regulatory requirements.*

*a. 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors."*
*b. Plant Specific Design Criterion (PSDC) 39 and/or 10 CFR 50, Appendix, General Design Criterion 17, "Electric Power System."*

Response to RAI-EEEB-2a

10 CFR 50.46 states that the provided Emergency Core Cooling System (ECCS) "must be designed so that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth in paragraph (b) of this section." CNP is proposing no change to the ECCS or emergency power system design. Therefore, compliance with the requirements of 10 CFR 50.46 will be unaffected by the requested extension of the EDG AOT.

As discussed previously, a LOCA concurrent with a LOOP and a single failure of the only operable EDG is beyond the plant design bases. Consistent with a single failure of the only operable EDG while in the existing TS AOT of 14 days, there is no evaluation documenting that the criteria set forth in 10 CFR 50.46 paragraph (b) would be met for this beyond design bases event.

Response to RAI-EEEB-2b

As described in Section 1.4 of the CNP Updated Final Safety Analysis Report (UFSAR), CNP was designed and licensed to plant specific design criteria (PSDC) rather than the General Design Criteria (GDC) in Appendix A to 10 CFR 50. The GDC in 10 CFR 50 Appendix A differ both in numbering and content from the PSDC adopted for CNP. The applicable design criteria for CNP is Plant Specific Design Criterion (PSDC) 39.

The following is an excerpt from NRC Inspection Manual, Manual Chapter 0326, Operability Determination & Functionality Assessments for Conditions Adverse to Quality or Safety, which discusses the relationship between GDC and Technical Specifications:

> "Required actions and completion times of the TSs illustrate the relationship between the GDC and the TSs. For example, the GDC may require redundancy of function for safety systems. This is normally accomplished by incorporating at least two redundant trains into the design of the safety systems. The TSs typically allows a facility to continue to operate for a specified time with only one train of a two-train safety system operable. In that case, the GDC are met because the system design provides the necessary redundancy. The TSs permit the operation of the system with only a single train based on an evaluation of the protection provided by the unique system lineup for the specified period."

CNP Unit 1 currently meets, and will continue to meet, the requirements of the TSs for Unit 1 which reflects the plant design that satisfies the PSDC and has an allowance to continue to operate for a specified period of time with only one train of a two-train system operable.

**Enclosure 3 to AEP-NRC-2015-50**

REVISED REGULATORY COMMITMENTS

The following table identifies an action committed to by Indiana Michigan Power Company (I&M) in this document. Any other actions discussed in this submittal represent intended or planned actions by I&M. They are described to the U. S. Nuclear Regulatory Commission (NRC) for the NRC's information and are not regulatory commitments. All commitments discussed in this table are one-time commitments.

| **Commitment** | **Scheduled Completion Date**<br><br>(if applicable) |
|---|---|
| The non-safety related diesel generator being provided to restore power to the 4 kV safety buses will also be operated at 480 volts as required to supply readily available power to Unit 1 Containment Distributed Ignition System. The necessary cabling and procedures will be pre-staged to quickly connect the diesel through established FLEX connections external to the plant. The FLEX equipment stored within the plant and established FLEX procedures will be used to make a rapid connection within the plant. | Prior to entering the period of extended AOT and maintained for the duration of the extended AOT. |
| These compensatory measures will be promulgated to the operating crews in accordance with the CNP procedure, 12-OHP-2110-CCA-001 "Compensatory Measures and Contingency Actions". | Prior to entering the period of extended AOT and maintained for the duration of the extended AOT. |