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50-269	Oconee Nuclear Station, Unit 1, Duke Power Co.	05000269
50-270	Oconee Nuclear Station, Unit 2, Duke Power Co.	05000270
50-287	Oconee Nuclear Station, Unit 3, Duke Power Co.	05000287

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REID,R.W.	Operating Reactors Branch 4

SUBJECT: Forwards response to NRC requests for info re non-nuclear instrumentation/integrated control sys failures.Corrective actions should preclude recurrence of event similar to Crystal River.No OL mods necessary.

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MA

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WILLIAM O. PARKER, JR.
VICE PRESIDENT
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TELEPHONE: AREA 704
373-4083

March 12, 1980

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

Attention: Mr. R. W. Reid, Chief
Operating Reactors Branch No. 4

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287

Dear Sir:

Pursuant to a verbal request of the Staff on March 4, 1980, and as confirmed in writing by letter dated March 6, 1980, please find attached Duke Power Company's response to the information requested by March 12, 1980. Also enclosed in this letter are responses to Items 6 and 7, which were requested by the Staff by March 17, 1980.

As further detailed in the enclosed, the design of the Oconee systems are different than Crystal River. The PORV will fail closed on loss of power, the power supplies to the NNI/ICS are of different design, and the NNI/ICS is of a completely different design.

It is the position of Duke Power that this is not a B&W generic concern.

Based on the evaluation of the Crystal River - 3 event, and considering the Oconee design features, and the nature of similar events at Oconee, Duke Power concludes that the corrective actions recently implemented at Oconee for NNI power upset events provide adequate assurance that this type of event does not pose an undue risk to the health and safety of the public and that no modifications to the Oconee Operating License are deemed necessary.

Very truly yours,

William O. Parker, Jr

RLG:scs

Attachment

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WILLIAM O. PARKER, JR., being duly sworn, states that he is Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this document; and that all statements and matters set forth therein are true and correct to the best of his knowledge.

William O. Parker, Jr., Vice President

Subscribed and sworn to before me this 12th day of March, 1980.

Sue C. Sherrill
Notary Public

My Commission Expires:

September 20, 1984

1. <u>Summarize power upset events on NNI/ICS that have previously occurred at your plant.</u>

Based on a review of the Oconee incident data, eight events have been identified which involved NNI/ICS failures. The salient features of these events are summarized below.

A. <u>Loss of ICS Auto Power in Oconee 2</u>

On July 11, 1974, while Oconee 2 was operating at 80% FP, ICS auto power was lost. This event resulted in a reactor trip on low RCS pressure and subsequent ES-HPI actuation.

The ICS auto power is supplied from the 2KI circuit panel. ICS auto power was lost while an inspection of the 2KI circuit panel was being performed when the ICS auto power breaker (2KI-22) apparently pulled loose. The reactor tripped on low RC pressure approximately five seconds later and ES Channel 1 and 2 (HPI) actuated when RC pressure decreased below 1550 psig approximately 20 to 30 seconds after the loss of ICS auto power. Subsequent investigations were performed to help analyze the effects of the loss of ICS auto power at which time it was noted that the quench tank temperature, pressure, and level increased following the interruption. It was concluded that the PORV may have opened due to the transient on its controlling signal monitor when ICS auto power was lost.

Corrective action included the replacement of the loose 2KI-22 breaker and a modification to the PORV control circuitry to cause it to fail in a safe position on loss of ICS auto power.

B. <u>Loss of ICS Hand Power at Oconee 1</u>

On July 14, 1976, Oconee 1 was operating at 100% FP when ICS hand power was lost. The ICS began a low RC flow runback. However, the reactor tripped from 90% FP on high RC pressure.

The ICS hand power circuit breaker tripped when a portable test equipment unit was plugged into an electrical outlet in ICS cabinet #4 by station personnel troubleshooting the RCP seal return flow instrumentation. An electrical overload resulted which tripped the breaker. The ICS began a low RC flow unit runback but the reactor tripped on high RC pressure at 90% FP. A normal shutdown followed.

Corrective actions consisted of removing the electrical outlet at the next unit outage.

C. <u>Loss of KI NNI Power Bus in Oconee 2</u>

On September 23, 1974, while Oconee 2 was operating at 95% FP, power to the KI NNI bus was lost for approximately one minute. This event caused a trip of both main feedwater pumps and subsequent reactor trip.

Power to the KI NNI bus was lost when the static transfer switch failed (due to a blown fuse) while the KI bus loads were being switched from

the normal source (KI inverter) to the backup source (regulated AC line). The loss of the KI bus power resulted in the loss of ICS power, which resulted in the trip of both major feedwater pumps, and consequently the reactor tripped on high pressure. Other I&C devices powered from the KI bus also became inoperable due to the power loss. Power was restored to the KI bus after one minute and 11 seconds by switching the static transfer switch back to the KI inverter.

As corrective action the static transfer switch fuse was replaced and the switch was successfully tested for its ability to transfer the source of power. Later the solid state static transfer switch card was replaced with a new card as a precautionary measure.

D. Short in Oconee 1 RCS Average Temperature Recorder

On December 14, 1978, while Oconee 1 was operating at 98% FP, a short in the power cable feeding the Reactor Coolant System (RCS) average temperature (T_{ave}) recorder occurred. This event caused a reactor trip and subsequent ES-HPI actuation resulting from a reduction in the RCS pressure caused by rapid feeding of an underfed steam generator.

The cable short occurred while attempting to investigate an incorrect alarm indication. The cable short caused a reduction (approximately 13°F) in the T_{ave} indication feeding the ICS, which attempted to restore the T_{ave} by withdrawing the regulating control rod group (Group 7). Consequently, the reactor power increased from 98% FP to 99% FP. The reactor tripped on the pressure-temperature trip function approximately seven minutes following the initiating malfunction. After the reactor trip, both main feedwater pumps tripped off due to high discharge pressure, and the emergency feedwater pump automatically started. However, one steam generator boiled dry due to what was suspected to be a malfunction in the emergency feedwater isolation valve. When feedwater flow was re-established into this dry steam generator by means of an alternate flow path, the RCS pressure dropped to the ES-HPI actuation setpoint of 1500 psig, thus initiating automatic HPI flow. Stable conditions were then re-established in the RCS.

Examination of the recorder power cable did not reveal any apparent causes for the short. The T_{ave} recorder power cables for all Oconee units were subsequently replaced. The emergency feedwater system currently in use utilizes a flow path independent of the isolation valve suspected of having malfunctioned during the course of this event.

A report on this incident was submitted to the NRC via Reportable Occurrence Report RO-269/78-27 (letter of W. O. Parker to J. P. O'Reilly, NRC/IE, dated January 15, 1979).

E. Loss of KI Bus Power to ICS at Oconee 1

On December 25, 1978, Oconee 1 was escalating in power following a reactor trip approximately 2 1/2 hours earlier. At about 10% FP, all ICS power was lost due to blown fuses in the ICS (KI) inverter. Both FW pumps tripped and the reactor subsequently tripped on high RCS pressure.

ICS power was lost during power escalation when the KI inverter fuses blew. Transfer to the regulated power supply did not occur due to a blown fuse in the static transfer switch. Immediately, the main FW pumps tripped and the EFW pump started, although the discharge pressure indication was 100 psig (normal range is 950-1000 psig). The reactor tripped on high pressure approximately one minute after the FW pumps tripped. When the EFW pump discharge pressure was increased, the level in the 1A OTSG was restored. However, apparent maloperation of FDW-47 allowed the 1B OTSG to boil dry. ICS power was restored by bypassing the inverter with AC power from the AC regulated power buses, both FW pumps were reset and restarted, and normal OTSG levels established.

F. Loss of ICS Hand Power at Oconee 3

On May 3, 1979, while Oconee 3 was in cold shutdown, the ICS hand power breaker was found in a tripped condition. The problem was subsequently traced to a short in a pressurizer level recorder. There was no significant impact on station operations.

While investigating a loss of ICS hand power indication, the ICS hand power breaker in cabinet #4 was found in a tripped condition. Resetting the breaker resulted in a "generator field over voltage" statalarm in both Units 3 and 1. The generator voltage began oscillating on Unit 1. Reopening the breaker cleared the alarms and the voltage oscillations settled out. The problem was traced to a short in the pressurizer level recorder cord and plug between the AC and statalarm common.

Corrective actions included an immediate replacement of the problem wire bundle and plug and subsequent replacement of all plant recorder plug assemblies with an improved design assembly.

G. Loss of KI Bus Power in Oconee 3

On November 10, 1979, power to the KI NNI bus was lost immediately following a loss of feedwater transient. The ICS and the control room indications powered from the KI bus were rendered inoperable for a period of two minutes and 40 seconds until the KI bus power was restored by prompt operator action. The event resulted in primary system cooldown at a rate greater than 100°F/hr.

The transient began with a trip of the operating hotwell pumps due to a spurious condenser hotwell low level signal while the unit was operating at 99% FP. Reactor runback and subsequent reactor trip on high RCS pressure then occurred because of the reduction in feedwater flow. Approximately 20 seconds after the reactor trip, power to the KI NNI bus was lost when the KI inverter fuses blew and the static transfer switch failed to accomplish an automatic power transfer from the inverter source to the backup source. Following the loss of KI bus power, both main feedwater pumps tripped and all three emergency feedwater pumps automatically came on. During this transient, the steam generator pressure was lower than that necessary for maintaining a stable hot shutdown condition. The low steam pressure in the steam generators caused higher than normal boiling in the steam generators which resulted in the excessive cooldown of the primary system and low water level in the steam

generators. Approximately 10 minutes into the transient one train of hotwell and condensate booster pumps were started and the water level in the B steam generator increased rapidly. This overfeeding of the B steam generator aggravated the primary system cooldown. The primary system cooldown was terminated and stable RCS conditions were established approximately 30 minutes into the transient.

Several corrective actions were implemented to reduce the possibility of loss of power to the KI bus and to better cope with the event, should it occur. These corrective actions are described in Reportable Occurrence Report RO-287/79-13 (letter W. O. Parker to J. P. O'Reilly, NRC/IE, dated November 30, 1979) and further addressed in Items 2, 3, and 6 below.

H. ICS 3KI Inverter Malfunction at Oconee 3

On November 27, 1979 Oconee 3 was operating at 99% FP when the "ICS Inverter System Trouble" statalarm was received in the control room. The static transfer switch had functioned properly to provide continuous power to the ICS KI bus and there was no effect on unit operation.

Upon receipt of the "ICS Inverter System Trouble" statalarm, an investigation of the problem was initiated and revealed a faulty logic card and blown logic fuse associated with the 3KI inverter, which were replaced. The inverter was allowed to operate without load until the following day (November 28) to verify proper operation. At that time, the 3KI inverter was placed back in service. Later on the same day, 3KI output voltage oscillations were observed and resulted in a reactor runback to 85%. The ICS load was manually transferred to the AC line, ICS control returned to Auto, and reactor power increased to 100%. All of the 3KI inverter logic cards were replaced. The voltage oscillations were traced to a bad transistor in the circuitry for the 24 volt logic voltage on the oscillator board, which was repaired.

2. Specifically review the Crystal River event, and address your susceptibility to it in general.

The following items have been identified through a general review of the Crystal River events and the susceptibility of Oconee to similar events is indicated:

A. NNI (X) Power Supply Failure

By virtue of having an NNI/ICS system of a different design from Crystal River, the Oconee station is not subject to the same failure mode which precipitated the Crystal River incident. The particular voltage buffer card which failed at Crystal River is not used in the Oconee system.

B. PORV and Pressurizer Spray Valves Maloperation

Due to the design of the Oconee system, the PORV and pressurizer spray valves will fail closed on the loss of ICS power.

C. Loss of Indication of Major Plant Parameters

Following the loss of the ICS inverters on Oconee 3 on November 10, 1979, an analysis was made of the need for assuring the availability of major plant parameters during a similar occurrence. As a result of this review, a pressurizer level transmitter on Oconee 3 was wired to a source independent of the ICS as were steam generator level transmitters. A similar modification has been performed on the pressurizer level transmitter on Unit 1. A change to the steam generator level transmitters was not required since a safety-related separate emergency feedwater system has been installed with level transmitters powered from another source. Unit 2 is now out for refueling and will be modified identically to Unit 1. Additionally, the new safety-related level transmitters will be installed on Unit 3 to provide further independent indication of steam generator level.

Emergency procedures were restructured and/or developed and implemented following the November 10 incident at Oconee to assure that the operator has information available on key parameters during a loss of ICS power and knows which parameters are correct during such an incident.

D. Integrated Control System Loss of 120VAC for 2 Seconds

Following the November 10 transient at Oconee 3, automatic transfer switches have been installed on Units 1 and 3 at Oconee to automatically transfer the NNI/ICS system to non-load shed power on a loss of the inverter/static switch power supply system. This transfer takes place in approximately 1.2 seconds. This modification will be completed on Oconee 2 during the current refueling outage.

E. Lack of Data

1. Events Recorder Degradation

The events recorders at the Oconee Nuclear Station are different design from those at Crystal River and are completely independent of the visual annunciator system.

2. Computer Overload

The computer installation at Oconee is vastly different from that at Crystal River, and in reviewing the circumstances of their loss of data during their incident, it does not appear that a similar problem exists at Oconee. Any computer system, including those at Oconee, can be affected in outputing information by the speed of the output device. At Oconee, we are currently upgrading the existing output typers to a newer faster matrix printer which has an output speed several times that of the existing units. It should be noted, however, that this is only a refinement in producing historical information since the operator's normal interface is through the control board-mounted computer driven CRT's which continue to provide the operator up-to-date reliable information (at 10 second intervals) independent of any backlog in output on the typers.

3. Transient Monitor

As an additional measure in assuring that data is available for analysis of unit trips and transients, each of the Oconee units has an independent "transient monitor" system which is used for the acquisition of data on key parameters. This system operates similar to a flight recorder. Upon the occurrence of a significant event (for example a reactor trip), the transient monitor continues to collect data for a predetermined period of time, after which one of the disk memory systems is write protected to secure the data. The other disk memory on the transient monitor system continues to record plant data even after the first disk is write protected. This additional data system at the Oconee station provides further assurance that sufficient data will be available for analysis of significant plant events.

F. Lack of Procedures and Operator Training for Loss of Instrument Power

The emergency procedures for loss of instrument power had been implemented at Oconee prior to the Crystal River event and all operators had been trained to recognize and respond to such events.

G. Inhibited Emergency Feedwater Pump Start/Reactor Trip on Loss of ICS/NNI Power

The emergency feedwater pump start logic and emergency feedwater control is completely independent of the integrated control system; therefore, the Oconee units are not subject to the same failure as Crystal River.

H. Lack of PORV Position Indication

PORV position indication have been installed on Oconee Unit 1, will be installed on Unit 2, during the current refueling outage, and will be installed on Unit 3 during the forthcoming outage to complete NUREG-0578 Category A modifications.

3. Set forth the information presented by each licensee in the meeting on March 4.

The exact failure mode experienced at Crystal River is not possible on the Oconee units since the NNI/ICS system design is not identical on the two stations. Crystal River has a Bailey 820 NNI/ICS system; whereas, Oconee has an older vintage 721 system. One of the major differences between these two systems is the fact that the 721 system does not have the 24 volt "X" and "Y" supplies; but instead, receives AC power to each individual module from a common bus. Also, in the Oconee 721 system, the NNI/ICS system is one integrated system instead of distinct separate systems as those at Crystal River. Due to these inherent differences in systems design, the Oconee systems are not subject to the same failure mode as the Crystal River ICS/NNI systems.

In considering the loss of instrument power incident at Crystal River, the most probable similar event at the Oconee station is a total loss of all AC power to the ICS/NNI system. An event such as this did occur on November 10, 1979 on Oconee Unit 3 and a report on that event has been submitted. In analyzing the November 10 loss of power to the ICS/NNI system, Duke Power Company has taken specific action to reduce the possibility of a future similar occurrence and to mitigate the consequences of a similar failure should it occur. Specific actions taken are as follows:

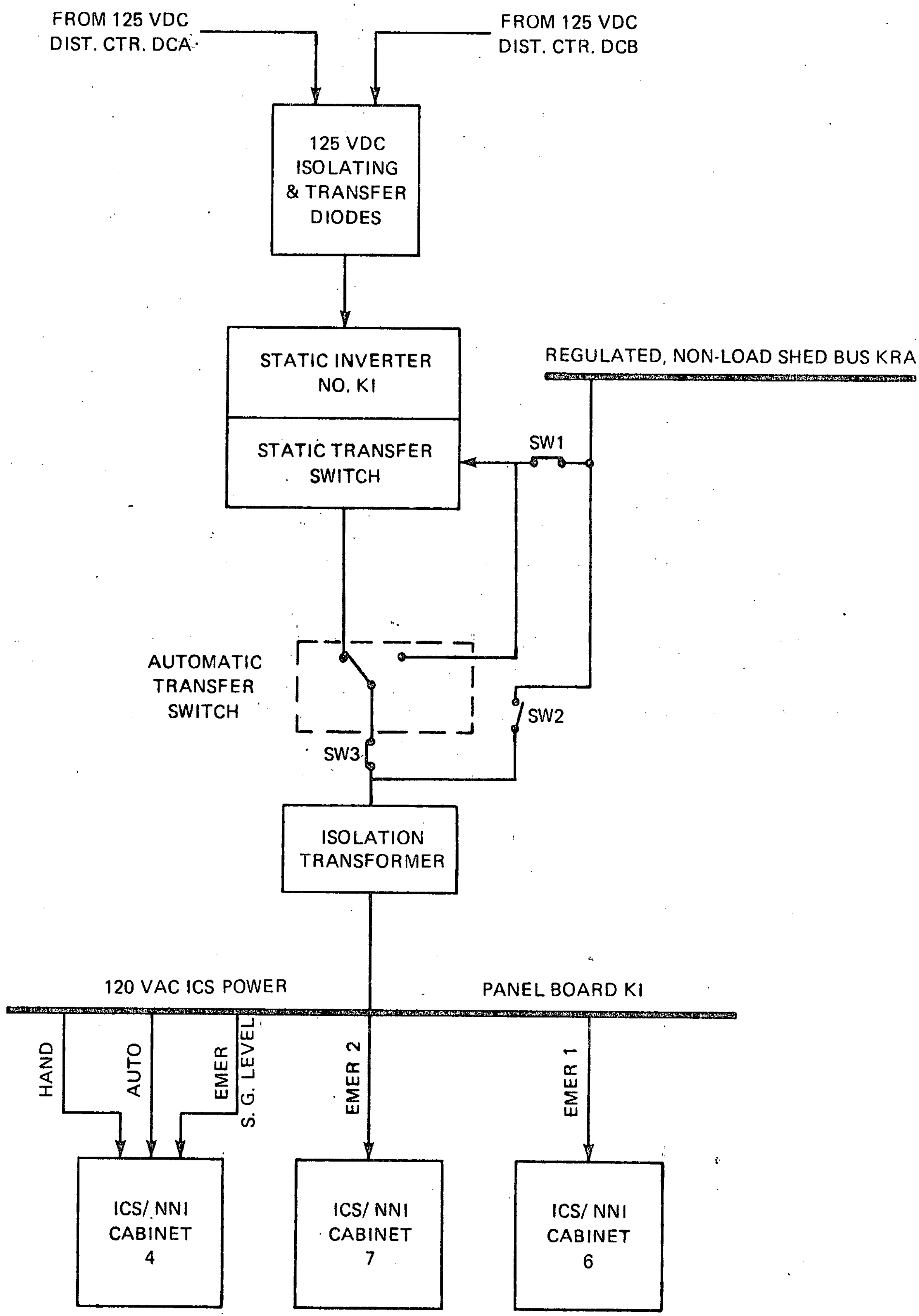
A. Improved Reliability of AC Supply to the Integrated Control System

The ICS/NNI system at Oconee is powered from a dedicated static inverter system which receives a DC input from the vital instrumentation and control batteries and a backup AC input from a regulated non-load shed bus. (Refer to the attached Figure 1.) On November 10, the static switch on the output of the inverter system failed preventing either the inverter source or the backup source from feeding the integrated control system. In this particular instance, power was restored by manually switching the backup source to panel 3KI. This was accomplished by the operator such that the ICS system was without power for approximately 2 1/2 minutes. To eliminate the need for a manual transfer and to improve the integrity of this AC supply, an automatic transfer switch has been added such that on an inverter or static switch failure, the inverter static switch system will be bypassed and regulated non-load shed power supplied to panel board 3KI through the automatic power transfer switch. This automatic transfer takes place in less than 1.2 seconds and eliminates the need for manual transfer.

B. Separate Power Supply for Transmitters

As a result of our review of the November 10 incident, we have moved a pressurizer level transmitter on both Units 1 and 3 from the ICS power supply to another reliable source to assure the operator has this information available in any future incident. This modification is being performed on Unit 2 during the current refueling outage. A similar modification was made to a steam generator level transmitter on each steam generator on Unit 3 until the new transmitters are installed on that unit as part of the emergency feedwater system upgrade. This is expected to be completed during the forthcoming Unit 3 outage. The new independent

FIGURE 1
OCONEE NUCLEAR STATION
TYPICAL ICS/NNI AC SUPPLY



steam generator level transmitters were installed on Unit 1 as part of the emergency feedwater system upgrade during the recent refueling outage and will be installed on Unit 2 during the current refueling outage. The addition of the independent steam generator level transmitters and supplying a pressurizer level transmitter on each unit with power from a source other than the panel board 3KI will assure that the operator has full and complete information available during any future loss of ICS power. In addition, a "display group" has been defined on the plant operator aid computer such that on a loss of ICS power, the operator may quickly have full and complete information on all key primary and secondary system parameters required to manage the plant during the incident by indexing two pushbuttons on the computer panel on the control boards.

C. Emergency Procedures

As immediate corrective action following the November 10 incident, all shift operating personnel were instructed on manual transfer of ICS power and reviewed the appropriate alarm procedures covering this event. (Note that the automatic transfer switch was installed on Unit 3 prior to the unit returning from service following the November 10 outage and was subsequently installed on Unit 1 during its refueling outage. The automatic power transfer will be added to Unit 2 during the current refueling outage.) Further corrective action included the issuance of a new emergency procedure covering the loss of the KI bus supplying power to the integrated control system. This emergency procedure identifies the symptoms characterizing this event and immediate automatic action which will take place and manual action to be executed by the operator in such an event. Further, the emergency procedure identifies all instrumentation and control affected by the loss of power and enumerates the state in which the device will fail on such an event. The emergency procedure also includes the designation of alternate sources of information on key plant parameters if the computer system is also unavailable at this time, thus assuring the operator can obtain this information independent of the ICS power supply and computer failures.

In analyzing the plant and control system's response during the Crystal River event, there appear to be severla control actions of concern to all licensees independent of control system design. Of specific concern is the fact that the PORV came open on the loss of power at Crystal River III and the pressurizer spray valve stroked open during that event. Also, Crystal River personnel identified a problem in which the emergency feedwater system and the anticipatory reactor trip might not be initiated on loss of instrument and control power. The following documents our findings in examination of the Oconee systems relative to these possible failure states:

A. PORV

On a loss of ICS power, the PORV on all of the Oconee units will fail closed, regardless of the initial state of the valve.

B. Pressurizer Spray Valve

On loss of ICS power, the valve fails closed regardless of the initial state of the valve.

C. Emergency Feedwater Initiation

On loss of ICS power to the Oconee system, both main feedwater pumps are tripped due to failsafe design of the emergency high high steam generator level contacts. These contacts fail in the closed mode and directly actuate the trip solenoids on the main feedwater pump trubines and thus this trip is not dependent on ICS power for operation. Upon loss of both main FDW pumps, the anticipatory reactor trip is initiated. The emergency feedwater pump start logic at Oconee is completely independent of ICS power and upon an indication of loss of the main feedwater pumps, automatically starts both motor-driven and the steam-driven emergency feedwater pumps. (This logic is based upon both hydraulic fluid pressure in the main feedwater pump turbines and discharge pressure to determine the loss of the main feedwater pump.)

Thus, in considering the failsafe status of the above devices at Oconee, and the design difference between the Oconee emergency feedwater system and that at Crystal River, we find that the PORV and pressurizer spray valve on the Oconee units will fail closed on loss of ICS power and operation of the emergency feedwater system will not be inhibited as a result of the loss of ICS power.

4. Address information available to the operator following various NNI/ICS power upset events, including:

   - how the operator determines which information is reliable
   - what information is needed for cold shutdown.

Following the November event at Unit 3, a procedure was developed to address loss of ICS power. This procedure provides specific information as to what indications are reliable and what information is needed for cold shutdown.

The list of information needed for cold shutdown is contained in our response to IE Bulletin 79-27 which was submitted by W. O. Parker's letter dated March 7, 1980 to J. P. O'Reilly, Director, Region II.

5. <u>Address the feasibility of performing a test to verify remaining information following various NNI/ICS power upsets.</u>

The feasibility of performing a test on the Oconee system to verify information availability during various NNI/ICS power upsets has been investigated. The most meaningful and productive test is to confirm that the information contained in the Emergency Procedure covering the various possibilities of loss of power is accurate. This test would be conducted during an extended cold shutdown (e.g. refueling outage), and would consist of opening the AC breakers to the ICS/NNI system to simulate potential failure modes in that supply and:

a. Confirm the accuracy of the indications (i.e. alarms) of power failure available to the operator.

b. Verify the remaining information available to the operator was in accordance with the information availability indicated in the Emergency Procedure for various combinations of power failure.

In the event the NRC desires that this type of test be performed at Oconee, Duke requests that this request be made promptly. It is expected that several weeks will be required to prepare and properly review the test procedure prior to performing the test.

6. Address each Crystal River proposed fix - applicability to your plant - proposed action.

   A. Immediate "Fixes" at Crystal River

      1. Perform a thorough testing of the NNI "X" system - This step is being taken by Crystal River in order to identify the source of their initial problem and hence does not apply to our units.

      2. Modify the PORV to include an NNI power failure from opening the valve and to assure that the PORV closes on any power failure - No action is necessary on the Oconee units as our PORV responds properly on loss of power.

      3. Modify pressurizer spray valve deficiency - This fix does not apply to Oconee since the Oconee design is fail safe for loss of power (i.e. spray valve closes and remains closed on loss of power).

      4. Provide positive indication of the PORV and safety valves - This has been done on Oconee 1, will be accomplished during the current refueling outage of Oconee 2 and will be accomplished on Oconee 3 during the upcoming outage to complete NUREG-0578 Category A modifications.

      5. Establish procedural controls for selectable sources of indications and back that up by appropriate surveillance procedures to assure that the indications are properly selected - Emergency indications are separate from ICS/NNI power sources. Upon loss of power, these indications are not affected by the selector switch positions.

      6. Train all operators to the appropriate response to NNI power failures - This has been accomplished and appropriate emergency procedures have been developed to cover NNI power failures.

      7. Move 120 volt AC ICS power to the vital bus from the unregulated voltage source - The Oconee system is supplied from a static inverter system which receives power from the vital batteries and backup power from a regulated non-load shed source. Additionally, an automatic transfer switch is provided such that regulated non-load shed power is applied to the bus on loss of the total inverter system. As such, the Oconee system in its current state exceeds the intent of this fix at Crystal River.

      8. Determine and fix the cause of the events recorder failure - Not applicable since it addresses a specific failure problem at Crystal River.

      9. Establish a surveillance program on the transient monitor system - This program is currently being developed and procedures will be completed by July 1, 1980.

10. Determine the appropriate indicators required of major plant parameters during various modes of loss of ICS/NNI power - This was done at Oconee following the Unit 3 event in November and prior to the Crystal River event, and these lists are included as part of the emergency procedure addressing loss of ICS/NNI power.

B. Items to be Completed During the Next Refueling Outage

1. Install indicating lights on all vital bus fuses - Not applicable to Oconee due to design difference in our power supplies.

2. Provide a method of quick access to the fuses - See #1 above.

3. Modify the emergency feedwater pump automatic start feature and reactor trip feature such that a power failure will not prevent initiation - This problem does not exist in the Oconee design and the emergency feedwater pump start/reactor trip circuit is independent of the ICS.

C. Corrective Actions Proposed for Longer Term Solution

1. Investigate and upgrade NNI capabilities including remote shutdown panel - To be investigated at Oconee and upgraded where required.

2. Upgrade control grade loss of main feedwater pump circuitry to safety grade - The control grade reactor trip upon loss of both main feedwater pumps is being upgraded to safety grade at Oconee. (Reference W. O. Parker's October 5, 1979 letter to H. R. Denton and R. H. Reid's December 20, 1979 letter to W. O. Parker for commitments and approval).

3. Provide an automatic transfer of AC supply to inverters and backup AC supplies - This feature already exists in the Oconee ICS/NNI power supply.

4. Replace the computer main frame with a new state of the art computer - The problems that existed with the computer system at Crystal River do not exist in the Oconee system since the information provided to the operator is through CRT's and not subject to backlog on a plant transient. Further to insure that historical records are adequate, faster matrix printers (which are 8 times faster than the existing printers) are now being installed to replace the existing typers on the Oconee computer system. Also, an independent transient monitor exists at Oconee to back up data available from the events recorder and computer systems.

5. Provide a backup information system in the technical support center - The need for additional information systems to supplement the existing data systems is being incorporated into our review of and plans for the TSC.

6. Investigate the feasibility of putting closed circuit television and open microphones in the control rooms - We feel that this measure is undesirable and unwarranted. Specifically, it is our position that the Oconee station has adequate data gathering and recording systems to allow analysis of incidents and measures of this nature are not required. Further, we do not feel that a video surveillance/recording system can provide any significant information in the analysis of plant incidents.

7. <u>Expand your review under IE Bulletin 79-27 to include the implications of the CR-3 event. Inform us of your schedule for completion of this expanded review as discussed March 4, 1980.</u>

Duke is continuing the review required by IE Bulletin 79-27 in light of the Crystal River transient. Further modifications to minimize required operator actions away from the Control Room may be identified. This extensive review is expected to take several weeks to complete. A partial report of the results of our review will be provided by March 31, 1980. Followup reports will be provided as available.