U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION III

Report No. 50-295/81-09; 50-304/81-05

Docket No. 50-295/304 License No. DPR-39, DPR-48

Licensee: Commonwealth Edison Company
P. O. Box 767
Chicago, IL 60690

Facility Name: Zion Nuclear Power Station, Units 1 & 2

Inspection At: Zion, IL

Inspection Conducted: April 16, 1981 through May 29, 1981

Inspectors: J. E. Kohler 6-12-81

J. R. Waters 6-12-81

Approved By: D. W. Hayes, Chief
Reactor Projects Section 1B 6/18/81

Inspection Summary

Inspection on April 16-May 29, 1981 (Report No. 50-295/81-09; 50-304/81-05)
Areas Inspected: Routine unannounced resident inspection of licensee actions on previous items, reactor operations, operator logs, operational safety verification, monthly maintenance observation, monthly surveillance observation, LER follow-up, instrument inverter failures, loss of heat tracing channels, Unit 1 primary to secondary leakage, part 21 notification on volume control tank level, radiation chemistry foreman coverage, radioactive releases, diesel generator operability with less than twelve cylinders, TMI modifications, IE Bulletin followup. The inspection involved 404 hours onsite by two NRC inspectors including 41 hours on site during off shifts.
Results: Of the areas inspected, no items of noncompliance were identified.

1. Persons Contacted

K. Graesser, Station Superintendent
*L. Soth, Operating Assistant Superintendent
*G. Pliml, Administrative and Support Services Assistant Superintendent
E. Fuerst, Unit 1 Operating Engineer
*J. Gilmore, Unit 2 Operating Engineer
R. Budowle, Assistant Technical Staff Supervisor
D. Howard, Rad-Chem Supervisor
J. Marianyi, Operating Engineer
R. Shannon, ISI Co-ordinator
F. Ost, Health Physics Engineer
*B. Harl, Quality Assurance Engineer
*L. Pruett, Technical Staff Engineer
*B. Choate, Technical Staff Technician
B. Schramer, Rad-Chem Engineer

*Denotes those present at management exit of May 29, 1981.

2. Licensee Action on Previous Inspection Finding

(closed) Unresolved Item (295/80-17-05): Review of Radiation Monitors Taken Out of Service. The licensee was requested to analyse the effects of taking various radiation monitors out of service when these monitors had specific control functions. The licensee responded with a review of all existing radiation monitors that have control functions and the effect on plant safety if these monitors are out of service. In cases where the monitors are required to stop radioactive releases to the environment, these monitors must by procedure be in service during the release or the release must be terminated. Other monitors with control functions could be supplemented by shiftly grab samples or monitors that alert the operator of abnormal radioactive conditions. In these cases manual action would be taken by the operator.

This item is closed and no items of noncompliance were identified.

3. Summary of Operations

Unit 1

The unit was made critical April 16, 1981 following a ninety-one day refueling outage. After low power physics testing the turbine was latched April 18, 1981. Upon rolling the turbine up to 1800 rpm the No. 7 bearing failed. This was attributed to a loose nut on the coupling immediately adjacent to the bearing. The turbine was tripped in response to the bearing failure. While in hot standby the reactor tripped on April 18, 1981 due to low-low level in the 1B steam generator. The low-low level resulted from difficulty in controlling level at low power and small moderator temperature coefficient. Bearing repairs were completed and the unit was made critical and tied to the grid April 22, 1981.

Additional unscheduled shutdowns and load reductions were as follows:

a. On April 26, 1981 the unit tripped from 81% power on an OPΔT signal. Instrument mechanics had been resetting power range high flux trip points and in doing so induced an OPΔT trip signal by decreasing the OPΔT set point. The trip signal was reset but came back in a few seconds later. The mechanics moved on to another channel and once again the OPΔT set point was reduced by increasing the NI signal. Since the trip signal still remained from the first instrument the 2/4 logic for OPΔT was satisfied and the unit tripped. The unit was made critical and restored to the grid April 27, 1981.

b. Power was ramped down and the unit placed in hot standby May 2, 1981 for turbine balancing to correct high vibration readings. Numerous weight adjustments were required. The unit was restored to the grid May 5, 1981.

c. On May 9, 1981 the unit was again removed from the grid and placed in hot standby for turbine balancing. The weight adjustments were completed and the unit was restored to the grid the same day.

d. The licensee discovered both channels of heat tracing failed on a section of boron injection tank piping on May 27, 1981. (See paragraph 7 for details of the heat trace problem.) Power reduction from 100% was commenced in accordance with technical specifications limiting condition for operation. The heat tracing was replaced and the power reduction stopped at approximately 46%. The unit was subsequently returned to full power.

e. On May 28, 1981 the unit tripped from 100% power and the safety injection systems activated. This resulted from loss of an instrument bus coincident with tripped OPΔT and OTΔT channels due to instrument maintenance. (See paragraph 4 for details.) The unit was made critical and restored to the grid May 29, 1981.

Unit 2

The unit operated at power levels up to 93%. Reactor power was limited because of isolation of a low pressure feedwater heater string due to tube leakage.

One unscheduled reactor trip occurred: On May 7, 1981 the unit tripped from 92% power and the safety injection systems activated. This resulted from the loss of an instrument bus. (See paragraph 5 for details). The unit was made critical May 8, 1981 and restored to the grid May 9, 1981.

4. Zion Unit 1 Safety Injection

At approximately 0847 on May 28, 1981 Zion Unit 1 tripped from 100% power and a safety injection signal was experienced. The safety injection resulted in ECCS equipment starting and the injection of the Boron Injection

Tank. The safety injection was caused by high steam flow coincident with low steam line pressure. However, the low steam pressure indication was the direct result of the loss of an inverter to instrument bus 114. The reactor did not experience a pipe break and all vital system parameters remained nominal. Resident inspectors were in the control room during the recovery. The safety injection with boron injection tank injection was reset when vital parameters were verified to be normal.

The licensee investigated the cause of the reactor trip. The trip occurred before the safety injection and computer first out indicated over power Δ T and over temperature Δ T in two out of four loops. No nuclear safety parameters were exceeded. The cause of the over power Δ T and over temperature Δ T reactor signals being developed is as follows: Instrument mechanics were working in loop C inputing new 100% loop Δ T's based on the recent startup from refueling. In order to do this, bistables were tripped on loop C OPΔT channels. During this work in progress, the plant experienced a loss of instrument inverter supply to bus 114. Loss of the inverter developed OPΔT and OTΔT signals in another loop. The plant now had OPΔT and OTΔT signals in two out of four loops and experienced a reactor trip as designed. The inverter failure also developed low steam line pressure signals in two out of four loops.

The reactor trip caused the high steam flow alarm because the set point for high steam flow drops to a zero power setpoint immediately following the trip. Steam flow dropped off as a result of the trip but is always above the zero power setpoint initially. The high steam flow coincident with the low steam pressure from the inverter failure resulted in safety ejection. No water hammers or pipe damage were reported. (See paragraph 6, Instrument Bus Inverter Failures, for the specific areas receiving further station review.)

5. Zion Unit 2 Safety Injection

At approximately 1600 on May 7, 1981 Zion Unit 2 tripped from 92% power and a safety injection signal was experienced. The safety injection resulted in ECCS equipment starting and the injection of the Boron Injection Tank. The safety injection was caused by high steam flow coincident with low steam line pressure. However, the low steam pressure indication was the direct result of the loss of an inverter to instrument bus 213, two seconds before the safety injection. The reactor did not experience a pipe break and all vital system parameters remained nominal. Resident inspectors were in the control room during the recovery. The safety injection with boron injection tank was permitted to run for ten minutes before it was terminated. Pressurizer level reached 65%.

The licensee investigated the cause of the reactor trip. The trip occurred before the safety injection and computer first out indicated low steam generator level and a steam flow feed flow mismatch on A steam generator. It was determined that instrument bus 213 also fed some feedwater pump control circuits which caused the C feedpump to go to idle. When the feedpump went to idle, a steam flow feedflow mismatch resulted. The loss of instrument bus 213 also resulted

in tripping bistables for low steam generator A level. The net result was a reactor trip due to steam flow feed flow mismatch coincident with low steam level. The reactor trip caused the high steam flow alarm because the set point for high steam flow drops to 40% at zero power. Steam flow was dropping off as a result of the trip but is always above the zero power setpoint initially. The high steam flow coincident with the low steam pressure trip from the inverter failure resulted in a safety injection. No water hammers or pipe damage was reported. (See paragraph 6, Instrument Bus Inverter Failures, for the specific areas receiving further station review.

6. Instrument Bus Inverter Failures

During this inspection interval, each of the units experienced an instrument inverter failure which led, in both cases, to a reactor trip and safety injection. Both inverter failures were caused by transformer failures internal to the inverter.

Following each event, a station review was conducted prior to start up in order to address the actual plant response and the underlying cause of the event. Based on this review, it was concluded that four specific items would be investigated in detail in order to determine whether any plant modifications would be appropriate:

a. Performance of the inverters, particularly the Sola Transformers which are part of the inverters.

b. The safeguards logic which has two separate loop low steam pressure bistables on each of the four inverters.

c. Instrument bus power for the feedwater pump control circuits.

d. NRC criteria regarding automatic switchover to dirty power following failure of an inverter.

This item is designated Open Item 295/81-09-01, 304/81-05-01.

7. Loss of Two Channels of Heat Trace

While operating at 100% power on May 27, 1981 Zion Unit 1 entered a limiting condition for operation when technicians trouble shooting an alarm signaling a failure in one of two redundant heat tracing circuits of the Boron Injection Tank piping, discovered that the redundant heat trace circuit, while not alarmed, was drawing insufficient current to be considered operable. Since both circuits were inoperable, the plant was required to be in a hot shutdown condition within four hours of discovery. Realistically this meant beginning a power reduction of about 1% per minute within two hours of discovery so that the plant can be brought off line without being tripped.

While technicians reported with reasonable confidence that at least one heat trace circuit could be made operable within four hours so that a total plant

shutdown could be avoided, the plant reduced load to 46% during the first four hours of the shutdown.

Subsequently the shutdown was stopped at plus three hours into the event because the heat trace was repaired, and a power ascent ion was begun.

No items of noncompliance were identified.

8. Unit 1 Primary to Secondary Leakage

Primary to secondary leakage was discovered on the 1B and 1C steam generators prior to the Unit 1 refueling outage. Eddy current testing was performed and tubes were plugged in the 1B and 1C steam generators. Inspection Reports 50-295/81-01 and 50-304/81-01 Section 5 provides details of these evolutions. Since the return of Unit 1 to power operation on April 23, 1981, primary to secondary leakage has again been seen on the 1B steam generator. By securing blowdown and monitoring build up rate of Iodine-131 in the steam generator, the licensee is able to calculate the leak rate as follows:

5-12-81	4.2 gal/day
5-15-81	14.6 gal/day
5-21-31	32.2 gal/day
5-26-81	24.5 gal/day
6-2-81	14.6 gal/day

The pre-outage leak rate was calculated to be 45 gal/day and the technical specification limit is 500 gal/day. The equilibrium gross activity with continuous blowdown is between 10-5 and 10-6 uci/ml. No detectable activity has been found down stream of the blow down demineralizers or in the condensate systems. The licensee is continuing to monitor the leak rate and barring any significant increase plans no further action until the next Unit 1 refueling outage during March of 1982.

No items of noncompliance were identified.

9. Part 21 Notification on Volume Control Tank Level

On May 21, 1981 Inspection and Enforcement Headquarters was notified of a potential for adverse control and protection system interaction in certain Westinghouse plants. In the absence of proper operator action, a single random failure in the volume control tank (VCT) level control system could adversely affect the high head safety injection system for certain Westinghouse designed plants. A failure of the VCT level control system could:

a. Cause the letdown flow to be diverted to the liquid holdup tank.

b. Cause the VCT liquid inventory to decrease due to normal charging flow without any makeup to the VCT via letdown.

Without operator intervention, the VCT could empty causing the operating centrifugal charging pump (high head safety injection system pump) to be damaged due to loss of suction fluid. Upon a certain set of postulated conditions, the adverse interaction could lead to a system not meeting the single failure criterion.

It was determined by the station that the operator has various additional annunciators to warn him/her of a failure of VCT level controller. These alarms were determined to be sufficient to ensure that manual operator action would be taken:

Type of Plant Alarms

High VCT Level

Low VCT Level

Full Letdown Flow Divert

Refueling Water Transfer

Automatic Makeup Start in VCT

Low-Low VCT Level

Low Charging Flow

Low RCP Seal Injection Flow

High Temperatures

Low Pressurizer Level

Operator action is acceptable unless a generic position to the contrary is obtained from NRC Inspection Enforcement Headquarters.

No items of noncompliance were identified.

10. Radiation Chemistry Foreman Round the Clock Coverage

The licensee committed in response to Inspection Reports 50/295/80-05, 50-304/80-04 to provide radiation chemistry foreman on each shift. This

commitment has been modified because the need for foreman coverage between midnigh. and six A.M. has been re-evaluated. Due to changes in staffing policy, the licensee can guarantee that radiation chemistry technicians meet the applicable ANSI 18.1 requirements for experience and training during periods of time when no foreman coverage exists (ANSI 18.1, 1971).

No items of noncompliance were identified.

11. Radioactive Release

a. Release of May 7, 1981

During recovery from the safety injection of May 7, 1981 (see paragraph 5) it was necessary to divert large quantities of coolant to the hold up tanks. The divert was required to reduce pressurizer level and dilute the RCS back to the concentration required for start up. During the divert the liberated gases escaped from the waste gas system and were released via the auxiliary building vent stack. The total activity released was 1.54 curies and the maximum instantaneous release rate was 1.6% of the technical specifications limit.

No items of noncompliance were identified.

b. Release of April 27, 1981

At approximately 11:00 A.M. April 27, 1981, the inspector observed an increasing trend on the recorder for O-R-14, the auxiliary building vent gaseous activity monitor. The operators were notified and commenced efforts to determine the source. The increase continued and approximately one hour later O-R-14 reached its alarm point of 10E4 cpm. While checking various other potential sources, the waste gas analyser was de-energized closing the thirteen solenoid inlet isolation valves. Approximately twenty minutes later the O-R-14 trend started decreasing. By 1:45 P.M. the O-R-14 reading was back to normal. Subsequent investigation showed that a trap on the waste gas analyser drain line designed to allow only water to pass to the auxiliary building equipment drain tank was allowing gas flow also. The auxiliary building equipment drain tank is vented to the auxiliary building vent header. The licensee calculated that the total release was five curies and the maximum instantaneous release rate was 4.5% of the technical specifications limit.

No items of noncompliance were identified.

c. Spread of Contamination Off Site

On April 14, 1981 a contractor employee became contaminated on his hands (50,000 cpm right, 25,000 cpm left) while working on a boric acid evaporator. His hands were decontaminated except that 400 cpm remained on his right thumb which could not be removed. He was issued a glove for that hand

and allowed to leave the site with the intention that he would be rechecked the following day to see if he had "sweated it out". In the process of leaving the site he set off the portal activity monitor but it was assumed to be caused by the 400 cpm on his thumb. When he was rechecked the next day it was discovered that he had 12,000-13,000 cpm on his clothes (the same clothes he had worn the previous day.)

Surveys performed by the licensee showed contamination in his car (13,000 cpm max), house (700 cpm max), and friend's car (3,000 cpm max). Surveys of his friend's house showed no contamination. The house and cars were decontaminated by licensee personnel. This matter is discussed further in IE Inspection Report Nos. 50-295/81-15 and 50-304/81-11. No items of noncompliance were identified.

12. Diesel Generator Operability with Less Than Twelve Cylinders

During a review of station deficiency reports the inspector found DVR-22-1-81-3 which documented an occurrence where one cylinder of the 1A diesel generator was inoperable due to a broken rocker arm and bent push rods. The occurrence was classified nonreportable. The licensee's position is that the diesel was operable since:

a. The malfunction could not have affected other cylinders

b. The diesel was carrying rated load with the cylinder inoperable and is designed to do so with two inoperable cylinders.

The licensee is attempting to obtain documentation from the vendor of the diesel's capability with less than all cylinders operable.

Resolution as to diesel operability with less than twelve operable cylinders is designated as Open Item 295/81-09-02, 304/81-05-02.

13. Unit 1 TMI Modifications and Technical Specifications

Modifications to the Unit 1 sampling system which were required because of requirements contained in NUREG-0737 necessitated the installation of automatic sampling system valves in place of the existing manual valves. The theory is that during a radiological emergency, prohibitively high radiation field may make manual sample system valves inaccessible.

The licensee has made the following valve changes:

Removed	Replaced by
1PR0020	1SOV-PR26A 1SOV-PR25A
1PR0008	1SOV-PR26B 1SOV-PR25B

1PR0016	ISOV-PR26C ISOV-PR25C
1PR0012	ISOV-PR26D ISOV-PR25D

Unfortunately, the valves removed are referenced in the technical specifications while new valves are not. The licensee has submitted a technical specification change to reference the new valves but the revision has not been received at the station. In effect, work was begun on a system before the technical specifications were issued.

The inspector determined that all procedures referencing the old valves had been revised to reflect the new valves. These procedures are as follows:

PT-10

RP-1610-7

SOI-18-APP-A-1

ZEP

GOP

Drawing will be revised when the modification is closed out.

This item is open pending NRC issuance of revised technical specifications and is denoted (295/81-09-03, 304/81-05-03).

14. Operational Safety Verification

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the months of April and May. The inspector verified the operability of selected emergency systems, reviewed tagout records and verified proper return to service of affected components. Tours of the auxiliary building and turbine building were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations and to verify that maintenance requests had been initiated for equipment in need of maintenance. The inspector by observation and direct interview verified that the physical security plan was being implemented in accordance with the station security plan.

The inspector observed plant housekeeping/cleanliness conditions and verified implementation of radiation protection controls. During the month of May, the inspector walked down the accessible portions of the auxiliary feed system to verify operability. The inspector also witnessed portions of the radioactive waste system controls associated with radwaste shipments and barreling.

These reviews and observations were conducted to verify that facility operations were in conformance with the requirements established under technical specifications, 10 CFR, and administrative procedures.

15. Monthly Maintenance Observation

Station maintenance activities of safety related systems and components listed below were observed/reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides and industry codes or standards and in conformance with technical specifications.

The following items were considered during this review: The limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and, fire prevention controls were implemented.

Work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety related equipment maintenance which may affect system performance. Maintenance activities were observed on the "0" diesel generator.

Following completion of maintenance, the inspector verified that the "0" diesel generator had been returned to service properly.

16. Monthly Surveillance Observation

The inspector reviewed technical specifications requiring surveillance testing on the diesel generators and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that test results conformed with technical specifications and procedure requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

17. Licensee Event Reports Followup

Through direct observations, discussions with licensee personnel, and review of records, the following event reports were reviewed to determine that reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with technical specifications:

LER NO.	UNIT 1
81-19	Failure of ORT-PR-25
81-11	ORT-PR-17 Found Out of Service

LER NO.	UNIT 1
81-12	Snubbers Failed Functional Test
81-13	Standby Instrument Air Compressor Failed to Start
81-14	Standby Instrument Air Compressor Failed to Start
81-15	Failure of GRE-0005
81-16	Failure of RHR Mini-flow Valve
81-17	Failure of Heat Trace Circuit Breaker
81-18	Failure of Heat Trace
81-19	Failure of ORT-PR-25
81-10	Out of Specifications Boric Acid Concentration

LER NO.	UNIT 2
81-04	Trip of "O" Diesel Generator
81-05	Water in "O" Diesel Generator Lube Oil
81-06	Class I Pipe Tunnel Rad Monitor

18. IE Bulletin Followup

For the IE Bulletin listed below the inspector verified that the written response was within the time period stated in the bulletin, that the written response included the information required to be reported, that the written response included adequate corrective action commitments based on information presentation in the bulletin and the licensee's response, that licensee management forwarded copies of the written response to the appropriate onsite management representatives, that information discussed in the licensee's written response was accurate, and that corrective action taken by the licensee was as described in the written response:

IEB NO.	
81-02	Failure of Gate Type Valves to Close Against Differential Pressure

19. Three Mile Island Requirements

The inspector reviewed the licensee's implementation of Three Mile Island lessons learned requirements contained in NUREG-0737. These requirements were inspected in November 1980, March 1981 and June 1981. Variances dis-

covered between NUREG positions and Zion Station field implementation were identified to NRC management. The following is a summary of the items inspected. No items of noncompliance were identified.

1.A.1.1 Shift Technical Advisor - on Duty

Inspector reviewed implementing procedure ZAP 1-51-1. The following variance was noted: The STA at Zion is a SRO position that involves routine and emergency functions. Routine activities involve control room supervision equivalent to a SRO licensed shift foreman. Emergency activities involve being the technical advisor to the shift. NRR has been made aware of the Zion STA job descriptions in previous correspondence.

1.A.1.2 Shift Supervisor Responsibilities

Inspector reviewed implementing procedure ZAP 1-51-1 specifying the management and safe operation function of the shift engineer. No variances with TAP requirement was noted.

1.A.1.3 Shift Manning - Overtime Limits Specified

Inspector reviewed ZAP 10-52-3, "Shift Manning Relief and Turnover" which endorses the NRC guidelines. The inspector noted the following variances:

(1) CeCo guidelines only apply to NRC licensed individuals on shift work who have the control room as their duty station.

(2) The existing union collective bargaining agreement conflicts with the NRC overtime limits.

(3) The station disagrees with the guidelines requiring a break of at least 12 hours between work periods.

I.C.I Short Term Accident and Procedures Review

No variances were noted

I.C.2. Shift Relief Turnover Procedures

Inspector reviewed implementing procedure ZAP 10-52-3 specifying turnover sheets for shift engineer, radwaste foreman, nuclear station operator and center desk equipment operator. No variances were noted.

I.C.3 Shift Supervisor Responsibilities

Inspector reviewed ZAP 1-51-1, "Station Organization". No variances were noted.

I.C.4 Control Room Access

Inspector reviewed implementing procedure ZAP 5-51-8. No variances were identified.

I.C.5 Feedback of Operating Experience

Inspector reviewed ZAP 2-52-3. No variances were noted.

I.C.6 Verify Correctness of Operating Activities

Inspector reviewed ZAP 1-51-1, "Station Organization", and ZAP 10-52-3, "Shift Manning Relief and Turnover". The station has taken steps to include SRO shift foreman independent verification of all periodic testing (surveillance) that is related to safety. The station has taken steps to include jumper and lifted leads under independent verification.

II.B.3 Post Accident-Sampling and
III.D.3.1.3 In Plant Radiation Monitoring

The inspectors reviewed ZCP-500, ACP-123A, ACP-123B, RP 1740-1, and RP 1740-3. These procedures were also reviewed by the Health Physics Appraisal Team (IE Inspection Report Nos. 50-295/80-05 and 50-304/80-04). The following variances were identified during the Health Physics Appraisal. Corrective actions for these variances will be reviewed by regional radiation protection specialists. No further variances were identified by the inspectors.

(1) Containment sample line RE 11/12 has a low point and could fill with water in the event of a steam environment in containment.

(2) Procedure ZCP-500 does not contain precautions or limitations on containment sampling in the event of a positive pressure in containment.

(3) Procedures for use of a lead cask and dumbwaiter for sample movement appear to need improvement.

(4) Procedures RP 1740-1 and RP 1740-3 fail to warn against purging charcoal canisters in the counting room.

The licensee has received on site two SAM-2 Stabilized Assay Meters for measure of high level radioactive samples. The SAM-2's are calibrated and a procedure is written for their use. Silver Zeolite Cartridges are on site. No variances were identified.

II.D.3 Valve Position Indication Relief Valve and Safety Valves

Inspector reviewed annuciator location 10A "Pressurizer Safety Valve, PORV Open". The system relies on accoustic monitoring of flow through safety and relief valves. Control room operators demonstrated that alarm is operable by injecting a test signal and verifying alarm annunciated. No variances were noted.

Inspector verified through review of design documents that PORV position indication is powered from a vital bus.

Inspector verified that PORV block valves are operable during normal operation. PORV block valves are opened for low temperature over pressure protection of the RCS.

II.E.1.2. Auxiliary Feed System Initiation and Flow

The licensee has responded to NRC in a letter dated December 14, 1979 that the flow indication for the AFWS was not safety grade and that no modifications were planned.

The AFWS flow indication is powered through inverters which receive power from station batteries as well as a dirty feed for back up. The battery charges receive emergency power from the diesel generators.

II.E.3.1 Emergency Power for Pressurizer Heaters

No variances were noted. The inspector reviewed changes made to the following Emergency Operating Procedures to remind the operator to check to restore pressurizer heaters involving transients where pressurizer level is lost:

EOP-9 LOCA

EOP-10 Steam Generator Tube Rupture

EOP-7 Station Blackout

EOP-8 Main Steam Feedline Break
(Procedure changes will be made to include the reminder to restore pressurizer heaters)

II.E.4.1 Recombiner Procedures Reviews and Upgrade

Inspector reviewed SOI-9 section 4.6 for revised recombiner procedures. Procedures are in place.

II.E.4.2 Isolation Dependability

Diverse containment isolation is provided through SI signal which has diverse inputs. Diverse parameters are used for MSIV closure. No variances noted.

The inspector reviewed licensee justification submitted to NRR for non-essential systems that are not isolated.

The inspector reviewed the licensee commitments made to dedicate a person to close manually open valves after an accident. NRC Safety Evaluation Report (SER) of February 28, 1980 describing the status of the licensee's compliance with TMI-2 lessons learned requirements state that the licensee will delegate an individual to close such manually open valves in the event of an emergency or when operation is complete.

The inspector's review determined that the licensee's actual commitment is at variance with the SER document. Manual and throttle valves in this category are in the RCP seal injection lines. These valves are located in the pipe chase. The licensee has committed and documented in EOP page 14 to isolate these valves manually and initiate isolation seal water if radiation levels in the pipe chase permit operator entrance.

Inspector reviewed jumper and lifted lead log which documents modifications made to ensure prevention of automatic reopening of containment isolation valves upon rest of isolation signal. No variances were noted.

II.E.4.2.(5a) Containment Pressure Setpoint

The licensee has not determined that any setpoint changes are required.

II.F.2 Instrumentation to Detect Inadequate Core Cooling

Inspector reviewed installed subcooling meters on both Unit 1 and Unit 2.

Inspector reviewed EOP-9 Appendix B which describes use of subcooling meters. No variances were noted.

EOP-9 includes references on how to compute subcooling if monitor fails.

II.G.1 Power Supplies for Pressurizer Relief Valves

Pressurizer level instrument channels are powered independently through inverters from the station batteries with a dirty power backup. No variances were noted.

Power supplies for PORV solenoids are energized from safety related power sources. Associated block valve is powered from a safety related power supply different from the PORV solenoids. Plant has modification pending which has not been completed which would further diversify power supplies of PORV and its associated block valves. No variances noted.

II.K.3.9 PID Controller

No variances were noted by the inspector.

III.A.1.2 Upgrade Emergency Support Facilities

Inspector reviewed EPIP-300-3. This procedure describes closed off area in meeting room as interim TSC. TSC was inspected for presence of telephone communications.

Inspector witnessed startup and operation of PING-1, particulate iodine and noble gas monitor outside OTSC. No variances were noted.

Onsite Operational Support Center

Inspector reviewed EPIP-300-4 which designates lunchroom as Interim Onsite Operational Support Center.

III.D.1.1 Primary Coolant Outside Containment

Inspector reviewed ZAP 10-52-4 which establishes a leak reduction program. No variances were noted.

*ZCP500 "Post Accident Sampling and Analysis (Containment and Reactor Coolant)"
*ZCP123A "Hydrogen Analysis of Gas Samples"
*RP1740-1 "Monitoring High Activity Releases During an Accident"
*RP1740-3 "Radioactive Samplings Under Accident Conditions"
*ZCP23A "Boron Analysis of Gas Samples"

20. Meetings and Offsite Functions

The inspectors attended the following offsite functions during the inspection period:

May 5, 1981	Meeting with Mayor Spencer, Zion, Illinois
May 13-14, 22, 1981	OIE Region III Office

21. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance or deviations. Three unresolved items were disclosed during this inspection.

22. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) throughout the month and at the conclusion of the inspection on May 29, 1981 and summarized the scope and findings of the inspection activities.

The licensee acknowledged the inspector's comments.