

ILLINOIS POWER COMPANY



U-0549

L30-82(09-22)-6

500 SOUTH 27TH STREET, DECATUR, ILLINOIS 62525

September 22, 1982

Mr. Cecil O. Thomas, Chief
Standardization & Special Projects Branch
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Thomas:

Clinton Power Station Unit 1
Docket No. 50-461
SER Outstanding Issues - Status Sheets

The enclosed report provides status sheets for 11 of the remaining 16 SER outstanding issues on the Clinton Power Station Project. Each issue status sheet provides an issue description, NRC and IP positions, work completed and work needed sections. Covered in this submittal are our understandings of the status of outstanding issues #1, 2, 3, 6, 8, 10, 12, 13, 14, 15 and 18.

In summary, a review of the issues shows the following status:

- a. Issue No. 1 - Transportation Accidents
IP will conduct an actual survey of the material shipped via the nearby railroad line and reevaluate the risk analysis for NRC review.
- b. Issue No. 2 - Effects of Unit 2 Excavation
IP believes that this issue will be resolved by the information in FSAR Amendment 18 (Sept. 1982).
- c. Issue No. 3 - Seismic Analysis
IP expects that the information provided by letter U-0533 dated 8/26/82 resolves the staff concern on soil amplification of seismic vibration. The "ACRS recommended" program on seismic reevaluation is confirmatory in nature and status should be reflected as such in the SSER.
- d. Issue No. 6 - Steady-State Vibration Acceptance Criteria for BOP Piping
IP believes that the 80% limit on alternating stress intensity for BOP steady-state vibration is acceptable. The technical justification provided in IP letter U-0543 dated 9/15/82 should resolve the issue.

Boo1

e. Issue No. 8 - Preservice & Inservice Inspection Programs

The preservice pump testing program provided by IP letter U-0546 dated 9/17/82 should resolve the issue.

f. Issue No. 10 - Containment Issues

(10a) Containment Purge - IP intends to develop design alternatives and meet with NRC to discuss possible modifications to resolve the issue.

(10b) Containment Isolation - IP believes the information provided in FSAR Amendment 16 closes the issue.

(10c) Leakage Testing (Vent & Drain Valves)
Resolution of issue 10a is needed to fully resolve this issue. IP believes that the leakage integrity tests proposed by Staff, in addition to the type C tests of 10CFR50 Appendix J, are not needed. Technical justification for this position is provided in IP letter U-0544 dated 9/16/82.

(10d) Leakage Testing (Secondary Containment)
IP is committed to leakage testing of the secondary containment volume, as indicated in the position paper transmitted via the IP letter U-0544 dated 9/16/82 and believes this issue is closed.

(10e) Bypass Leakage - IP believes that this issue should be closed on the basis of the information provided in the position paper of IP letter U-0544 dated 9/16/82.

g. Issue No. 12 - Engineered Safety Features (ESF) Reset Controls

IP believes that this issue is closed by the information provided in IP letter U-0481 dated 5/17/82.

h. Issue No. 13 - Remote Shutdown System

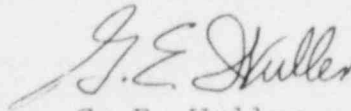
IP will conform to 10CFR50 Appendix R requirements. FSAR Amendment 19 (October 1982) will provide panel redesign information. IP will submit required information on Appendix R exceptions, penetrator seal materials and fire test reports.

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- i. Issue No. 14 - Capability for Safe Shutdown Following Loss of a Bus Supplying Power to Instruments and Controls
IP will provide the results of the review of IE Bulletin 79-29 for NRC review.
- j. Issue No. 15 - Effects of Control Systems Failures
IP will provide a review of IE Information Notice 79-22 for NRC review.
- k. Issue No. 18 - Emergency Plan
IP believes the information provided in IP letter U-0520 dated 7/22/82 resolves the issue.

Please let us hear from you soon if you have any questions or disagreements regarding the status of the above issues.

incerey,



G. E. Wuller
Supervisor - Licensing
Nuclear Station Engineering

GEW/TLR/lt/wp

Enclosure

cc: Mr. J. H. Williams, NRC Clinton Project Manager
Mr. H. H. Livermore, NRC Resident Inspector
Illinois Dept. of Nuclear Safety

CPS-SER
OUTSTANDING ISSUES
STATUS SHEETS

Clinton Power Station Unit 1
SER Outstanding Issues
Status Sheets

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DESCRIPTION

Transportation Accidents: Determine hazards associated with rail transportation of toxic and explosive materials via the Illinois Central Gulf Railroad Gilman Line (ICGRGL) near the CPS.

NRC POSITION*

R.G. 1.78 (Rev. 0) and R.G. 1.91 (Rev. 1) provide assumptions to be used in evaluating toxic and explosive hazardous events postulated to occur near nuclear power plants. The staff believes that an analysis of the transportation of such materials near the CPS (via the ICGRGL) is necessary to determine if such risks are high. R.G. 1.70 (Rev. 3) provides criteria to be used in determining the acceptable level of risk associated with these accidents. If the CPS analyses indicate an unacceptable level of risk for some of these events then the required actions would be:

- (1) Toxic Hazards: Control Room Habitability
 - (a) install detection instrumentation, isolation systems, filtration equipment, air supply equipment, and protective equipment as necessary;
 - (b) write emergency procedures to be initiated in the event of a hazardous material release near CPS.
- (2) Explosive Hazards: Show that the risk to the public is acceptability low on the basis of capability of the safety-related structures to withstand blast and missile effects associated with detonation of the hazardous cargo.

*References

- (1) NUREG-0853, "Safety Evaluation Report Related to the Operation of Clinton Power Station, Unit 1", Docket No. 50-461, Section 2.2; February 1982.
- (2) R.G. 1.70 (Rev. 3), "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants", Section 2.2.3.1, Page 2-7; November 1978.
- (3) R.G. 1.78 (Rev. 0), "Assumptions for Evaluating the Habitability of a Nuclear Power Plant Control Room during a Postulated Hazardous Chemical Release"; June 1974.
- (4) R.G. 1.91 (Rev. 1), "Evaluations of Explosions Postulated to Occur on Transportation Routes Near Nuclear Power Plants"; February 1978.

IP POSITION

IP believes that the transportation of toxic and/or explosive hazards material via the ICGRGL near CPS does not pose a significant risk to the safe operation of the plant. IP believes that the criteria of R.G. 1.70 (Rev. 3) have been met for CPS. Toxic chemical detectors for the control room HVAC system and protective measures against explosive hazards are therefore not warranted.

WORK COMPLETED

- (1) IP/CPS Risk Analysis provided via U-0494, dated 5/28/82, to NRC.
- (2) NRC review completed-Problems discussed via telecon given in Y-8293, dated 8/18/82 are as follows:
 - (a) Probability of car rupture on ICGR (2×10^{-10} ruptures/car-mile, is too small to believe (as compared to the National average, 8×10^{-7} ruptures/car-mile). Suggested IPC misused the "7900 mile" figure. Suggested IP use an "average shipment distance" for the five chemicals of concern.
 - (b) NRC had some trouble understanding the methodology used in the explosive hazards section of the report.
- (3) Per IP Record of Coordination Y-8398, dated 9/8/82, a meeting with ICGR officials on 9/1/82 and a subsequent telecon on 9/7/82 is discussed:
9/1/82 Mtg.
Some information on average shipment lengths, recorded rupture data, and hazardous material railcar shipment frequencies was provided to IP by ICGR. Timetables for obtaining additional information were discussed.
9/7/82 Telecon
Following the 9/1/82 mtg. it was decided that an actual survey of shipments of materials via ICGRGL was required. A telecon was held with ICGR and it was noted that information recorded on shipment "way bills" could be obtained that would provide the needed survey data. A financial agreement between IP and ICGR would be required.
- (4) S&L has recalculated the "9.7 mile" figure used from the R.G. 1.78 (Rev. 0) "5 mile" toxic evaluation boundary for each of the 5 chemicals of concern. These new values were based on toxicity levels resulting in dangerous concentrations in the control room within $\frac{1}{2}$ -hour. A significant reduction in value over the "9.7 mile" previous figure has been achieved for each chemical.

WORK NEEDED

- [9/17/82] (1) Write ICGR to establish a working agreement to obtain survey data (suggested survey length is 6-8 months).
- (2) As survey data becomes available, reevaluate and revise U-0494 risk analysis accordingly.
- [12/22/82] (3) Submit new information to NRC to close-out issue as data becomes available.

Issue
#2

DESCRIPTION

Effects of Unit 2 Excavation: The Unit 2 open excavation could cause problems related to ponding of water against the walls of Unit 1 that are exposed below plant grade.

NRC POSITION*

Amendment 14 of the CPS-FSAR (Section 2.5.4.14.1) provided the NRC with IP's proposed plan to resolve the issue.

Per a telecon, on 9/9/82, the staff has the following remaining concerns:

- (a) Flow of PMP rainwater into the Unit 2 excavation will not exceed 730' elevation.
- (b) Exterior walls can withstand the 730' hydrostatic head along with an SSE.
- (c) All openings below 730' in the exterior wall adjacent to the Unit 2 excavation will be closed and waterproofed.

*References

- (1) NUREG-0853, CPS-SER, Sections 2.4.2.2, 2.4.6, 2.4.8, 2.6.3.3, 2.6.3.7; February 1982.
- (2) NUREG-0853, CPS-SSER #1, Sections 2.4, 2.6; July 1982.
- (3) CPS-FSAR, Amendment 14, Sections 2.5.4.14.4 and 2.4.13.4; dated March 1982.

IP POSITION

IP will provide the information requested in item (a)-(c) above.

WORK COMPLETED

- (1) Proposed plan to resolve issue provided in FSAR, Amendment #14, dated March 1982.
- (2) In IPC Letter U-0379, dated December 3, 1981 - transmitted response to NRC questions on settlement of Unit 1 due to Unit 2 excavation.

- (3) NRC telecon discussed in Y-8266, dated 8/12/82.
 - (a) Status is "partially" closed.
 - (b) Some unresolved matters regarding hydrology of the open excavation-to be determined later.
- (4) IP telecon with NRC (Y-8384), on 8/27/82, indicated additional concerns.
- (5) IP telecon with NRC (Y-8415), on 9/9/82, clarified 8/27/82 telecon concerns and are now described as items (a)-(c) in the "NRC Position".

WORK NEEDED

- [9/30/82] (1) Provide the NRC with additional requested information (described in items (a)-(c) in "NRC Position"), by September FSAR Amendment.
- [10/15/82] (2) Issue to be closed-out.

DESCRIPTION

Seismic Analysis: Determine the adequacy of the CPS seismic design to withstand a design basis earthquake (DBE) of intensity $I_{MM}=VII$ with the corresponding free-field vibratory ground motion of 0.25g acceleration anchored to the R.G. 1.60 standard response spectrum.

NRC POSITION*

(1) SSER #1 (Section 3.7.1):
"The site-specific horizontal spectra are higher than FSAR design-basis spectra in some frequency ranges. These site-specific spectra are roughly equivalent to a seismic event of 0.20 g anchored to the Regulatory Guide 1.60 spectra at the foundation level in the free field. The applicant has developed a synthetic time-history motion whose spectra envelop the site-specific spectra at all frequencies of interest. The vertical site-specific spectra used are also equivalent to a seismic event of 0.20 g anchored to the Regulatory Guide 1.60 spectra.

The applicant has evaluated plant-complex structures and the circulating water screenhouse using the synthetic time history. In these analyses, the applicant used the soil-spring approach to account for soil-structure interaction effects (see Section 3.7.2). The results of the analyses indicate that for plant-complex structures, the increase in the forces in the structural components ranges between 0% and 16% of the design-basis forces, with an average increase of approximately 10%. For the circulating water screenhouse, the new forces are lower than the design-basis forces in the majority of cases. For walls where the soil-spring are larger, the increase is less than 10%.

The field material test reports indicate that the actual strength for material used at the Clinton plant is approximately 17% higher than the minimum specified values. This provides an additional 17% load-carrying capacity, fully compensating for the increase in forces resulting from the new seismic input. Thus, in general, all stresses are within design-basis allowables when the allowables are based on the actual mean yield strength derived from field test reports.

Based on the above and contingent on the staff's acceptance of the site-specific spectra, this matter is considered fully resolved."

(2) SSER #1 (Section 3.7.2):

The staff's position on the soil-structure interaction analysis was described in the SER. This position requires that the soil-structure interaction analysis should include both elastic half-space and finite-element approaches for all Category I structures founded on the soil. The applicant has used only the finite-element method to perform soil-structure interaction analysis.

To comply with the above position of the staff, the applicant conducted the soil-structure interaction analysis using the soil-spring approach and the site-specific seismic input discussed in Section 3.7.1 of this report. The soil-spring method used by the applicant consists of representation of the soil media by a visio-elastic layered half space. The soil-spring and dashpot constants are obtained in terms of frequency-dependent impedance functions. The applicant also has considered appropriate variation in soil properties used in this analysis to account for uncertainties. The staff finds that the approach used by the applicant is acceptable and is similar to those used in the evaluation of some of the recent operating-license applications.

The results of this analysis are discussed in Section 3.7.1. On the basis of these results, it can be concluded that the applicant has complied with the staff's position on soil-structure interaction analysis. Contingent on the staff's acceptance of site-specific spectra, this matter is considered fully resolved."

(3) SSER #1 (Section 22)

The Committee (ACRS) recommended that specific attention be given to the seismic capability of the emergency ac power supplies, the dc power supplies, and the small components such as actuators and instrument lines that are part of the decay heat removal system. By letter dated May 19, 1982, the applicant submitted a proposed program to address the Committee's recommendations.

*References

- (1) CPS-SER, Sections 2.5.2, 3.7.1 & 3.7.2; dated February 1982.
- (2) CPS-SSER #1, Sections 3.7.1, 3.7.2, & 22; dated July 1982.
- (3) R.G. 1.60 (Rev. 1), "Design Response Spectra for Seismic Design of Nuclear Power Plants", December 1973.

IP POSITION

- (1) & (2) - IP agrees that final resolution of these issues will depend upon Staff review and acceptance of the site-specific spectra.
- (3) - IP believes that the recommendations of the ACRS regarding seismic capability of various power supplies and the decay heat removal system are being addressed adequately in the proposed program described in the IPC Letter U-0484, dated 5/19/82. NRC Letter from Bernard to Wuller, dated 7/22/82, stated general Staff acceptance of the IP proposed program. This issue should be classified as "confirmatory".

WORK COMPLETED

- (1) & (2) - NRC internal memo, dated 3/2/82, states Staff Position.
- (1) & (2) - IPC Letter U-0488, dated 5/24/82 transmitted CPS Site-Specific Response Spectra.
- (1) & (2) - NRC Letter from Bernard to Wuller, dated 7/15/82 indicated that Staff has problems associated with:
 - (a) effects of soil amplification based upon "random vibration analysis" which differs significantly from the conventional "layered soil dynamic analysis".
 - (b) IPC must provide concise and definitive information on computation of the amplification factors and a discussion of methods used to test results of this approach against observed data.
- (1) & (2) - IPC Letter U-0533, dated 8/26/82, provided Staff with verification of figures 33, 34, and 35 of the CPS site-specific Response Spectra per verbal NRC request on 7/23/82 (concerns soil amplification of seismic vibration).
- (3) - Phase 1 of the seismic investigation program, concerning design and analysis of small-bore piping supports, is nearly complete. Phases 2 & 3, concerning field inspection and component analysis, are to commence 10/1/82.

WORK NEEDED

- [9/30/82] (1) Call or meet with NRC Staff to verify that CPS site-specific Response Spectra are adequate to close issue.
- [9/30/82] (2) Convert "ACRS recommended" program to "Confirmatory" status in SSER; pending program completion.
- [3/1/83] (3) Complete Phases 2 & 3 of investigation program and submit final report to NRC.

DESCRIPTION

Steady-State Vibration Acceptance Criteria for BOP Piping: Review the criteria and analyses employed to ensure the structural integrity and functionability of BOP piping systems, mechanical equipment, and their supports under vibratory loadings.

NRC POSITION*

For the BOP piping, IP proposed to use 80% of the alternating stress intensity, S_a , at 10^6 cycles, as defined in the ASME Code, App. I, Figures I-9.1 and I-9.2. Because of the limited availability of high-cycle fatigue test data (greater than 10^6 cycles), the Staff has not determined if an acceptable level of safety exists. Technical justification for use of this value is needed.

*References

- (1) CPS-SER, Section 3.9.2; dated February 1982.
- (2) ANSI/ASME OM-3-1981, "Requirements for Preoperational and Initial Startup Vibration Testing of Nuclear Power Plant Piping Systems"; 1981.

IPC POSITION

IP believes that the 80% limit on alternating stress intensity for BOP steady-state vibration is acceptable. Technical justification for this position was provided in IP Letter U-0543, dated 9/15/82. The technical justification will be provided as an Amendment to the appropriate section of the CPS-FSAR. It is IP's position that this issue can now be closed.

WORK COMPLETED

- (1) IP Record of Coordination, dated 4/14/82, indicates that the ASME committee approved the 80% limit. However the NRC members voted "NO" on this.
- (2) IP Letter U-0477, dated 5/10/82, transmitted to NRC Staff the ASME Standard, OM-3 showing use of the 80% limit.
- (3) NRC Letter from Carter to Wuller, dated 6/29/82, stated the Staff does not accept our use of the 80% limit for CPS. The Staff requires further technical justification.
- (4) Memo from Rodabaugh (NRC Consultant) to Ranjan (NRC), dated 7/6/82, indicates that ASME OM-3 criteria is acceptable/conservative.

(5) IP Letter U-0543, dated 9/15/82, transmitted technical justification to the staff on acceptance of the 80% limit.

WORK NEEDED

- [9/22/82] (1) Call/Meet with NRC to discuss issue & status of work.
- [10/30/82] (2) Revise U-0543 CPS-FSAR to reflect information contained in IP letter for October amendment.
- [11/1/82] (3) Issue to be Closed-Out.

DESCRIPTION

Preservice & Inservice Inspection Programs: The applicant must submit for review the proposed programs for preservice and inservice inspections/testing of pumps and valves.

NRC POSITION*

- (1) With regards to the Preservice Inspection (PSI) Program for the CPS, the only remaining open item is a submittal due from IP on PSI for pumps.
- (2) The initial inservice inspection program has been submitted by the applicant. The staff will evaluate the program after the applicable ASME Code Edition and Addenda can be determined based on 10 CFR 50.55a(b), but before the first refueling outage when inservice inspection commences.

*References

- (1) CPS-SER, Sections 3.9, 5.2.4 & 6.6; February 1982.
- (2) CPS-SSER #1, Sections 5.2.4 & 6.6; July 1982.
- (3) Latest Edition & Addenda of Section XI of the ASME Code in effect 12 months prior to the date of issuance of the operating license.
- (4) 10 CFR 50.55a(b).

IP POSITION

- (1) IP will provide a formal submittal on the PSI program for pumps at CPS.
- (2) With regards to the ISI Program, IP believes that this should not be an open item since our program will not be submitted until before the first refueling outage. Classification of this portion of the issue as a License Condition would seem more appropriate.

WORK COMPLETED

- (1) IP Letter U-0422, dated 2/23/82, transmitted to NRC IP's proposed PSI program for valves.
- (2) Responses to Q250.1 and Q250.2 in FSAR Amend. 15 (April, 1982)-pages Q&R 5-14 through Q&R 5-17.
- (3) IP Letter U-0500, dated 6/11/82, transmitted to NRC changes to PSI program and three Southwest Research Institute nondestructive testing procedures.
- (4) IP Letter U-0512, dated 6/28/82, transmitted to NRC IP proposed action to substitute a limited amount of volumetric examinations for non-exempt Class 2 piping welds in Engineered Safety Feature Systems.

WORK NEEDED

- [9/24/82] (1) Provide NRC : submittal regarding CPS PSI
Program for pumps.
[11/1/82] (2) Issue to be closed.

DESCRIPTION

(10a) Containment Purge: The design and intended use of the Containment HVAC systems is not acceptable to the NRC.

NRC POSITION*

The design of the containment purge and ventilation system consists of both 36-in. and 4-in. lines. The applicant has proposed to use the 36-in. line for ventilation or purging during normal plant operating conditions, and the 4-in. bypass line for post-LOCA conditions when the standby gas treatment system or drywell purge system may be used as backup to the hydrogen recombiners. The staff has reviewed the design of the containment purge system based on the criteria specified in BTP CSB 6-4, "Containment Purging During Normal Plant Operation", and finds that the continuous use of the 36-in. line does not meet the guidelines of BTP CSB 6-4. The staff believes that purging should be minimized during normal reactor operation and should not be relied on for temperature and humidity control. Therefore, the staff required the applicant to provide a realistic estimate of the number of hours per year that purging is expected through each purge valve, and a justification for this use.

*References

- (1) CPS-SER, Section 6.2.4.1; February 1982.
- (2) Branch Technical Position CSB 6-4, "Containment Purging During Normal Plant Operation", Rev. 2; July 1981.

IP POSITION

IP believes the intended use of the CPS HVAC Systems, as designed, should be acceptable. However, IP has committed to investigate preliminary design modifications similar to those designs found acceptable on the Grand Gulf Nuclear Station (GGNS) project. These design alternatives basically encompass 1,000 hrs/year intermittent purging with the 36" lines and continuous purging with small (approximately 8") lines. In addition, IP will provide operational data to the Staff to justify such use of the containment HVAC during normal operations, as such data becomes available following startup.

WORK COMPLETED

- (1) Per IP Letter U-0431, dated March 10, 1982, a Position Paper describing the CPS Vent/Purge System, design bases, reasons for use, description of 36" valves, and valve qualification program, was submitted.
- (2) A meeting was held with the Staff on 7/20/82 which presented IP's position & a justification for how we proposed to use our system. This meeting concluded:
 - (a) IP will consider the GGNS Approach; i.e. 1,000 hrs purging with large lines & continuous purge with small line.
 - (b) IP will submit containment occupancy level information and provide NRC with operational data in support of these figures. (Submitted via IP Letter U-0534 dated 8/25/82).
- (3) S&L was authorized (per IP Letter S-3445, dated 7/29/82) to prepare preliminary design alternatives.
- (4) IP Letter Y-8249, dated 8/6/82 provided S&L with guidance on these design alternatives.
- (5) TMI Activities meeting held with S&L on 8/11/82 to discuss this item. S&L to complete design alternatives investigation and have recommendations out by 9/20/82.

WORK NEEDED

- [9/20/82] (1) Meet with S&L to discuss design alternatives.
[10/6/82] (2) Meet with NRC to discuss possible alternative modification.
[11/1/82] (3) Issue to be closed.

DESCRIPTION

(10b)Containment Isolation: Provide justification for any deviations from the provisions of GDC 55, 56, or 57 regarding containment isolation.

NRC POSTITION*

The containment isolation provisions for the lines penetrating containment should conform to the requirements of GDC 55, 56, or 57, as appropriate. As provided by GSC55 and 56, there are isolation provisions of containment penetrations that do not have to satisfy the explicit requirements of the GDC but can be acceptable on some other defined basis. However, the applicant has not justified the design deviation from the explicit requirements of the GDC. The staff will require the applicant to provide this justification.

*References

- (1) CPS-SER, Section 6.2.4; February 1982.
- (2) CPS-FSAR, Table 6.2-47, Amendment #16; dated May 1982.

IP POSITION

IP has responded, via Amendment #16 to the CPS-FSAR and an informal response, to all questions/concerns from the Staff regarding this issue. IP believes that CPS conforms to the requirements contained in GDC 55, 56 and 57 as appropriate. IP therefore believes this issue to be closed.

WORK COMPLETED

- (1) Revision/Amendment #16, dated May 1982 of FSAR transmitted changes to FSAR table 6.2-47 on containment isolation provisions.
- (2) An informal response to L. Ruth's (NRC reviewer) informal questions on previous revision to this table provided by D. L. Holtzschler on June 8, 1982.

WORK NEEDED

- [9/22/82] (1) Call/Meet NRC Staff to determine status of NRC review.
- [9/27/82] (2) Issue to be closed-out.

DESCRIPTION

(10c) Containment Leakage Testing (Vent & Drain Valves): Containment vent/purge isolation valves leakage integrity tests, in addition to the Type C tests, are required.

NRC POSITION*

As a result of numerous reports on the unsatisfactory performance of resilient seats in butterfly-type isolation valves because of seal deterioration, periodic leakage integrity tests of the 4-in. and 36-in. butterfly isolation valves in the purge system are necessary. Therefore, the applicant should propose a technical specification for testing the valves in accordance with the following testing frequency:

The leakage integrity tests of the isolation valves in the containment purge/vent lines shall be conducted at least once every three months for active valves and once every six months for inactive valves.

These tests need not be conducted with the precision required of the type C leakage tests in 10CFR50 App. J but would be required to be performed in addition to such tests.

*References

- (1) CPS-SER, Section 6.2.4.1; February 1982.
- (2) 10CFR50, Appendix J, "Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors".

IP POSITION

IP believes that such leakage tests are not needed. The seating/sealing mechanism for the CPS 36" Butterfly vent valves is unique in the industry. The primary sealing ring is made of an inert, low-friction, wear resistant material called TEFZEL (a teflon compound). In addition, a backing O-ring made from BUNA-N or VITON is used to preload the sealing ring against the valve disc, which affords a static seal. System pressure creates a piston action on the sealing ring and thus accomplishes a dynamic seal. IP believes this sealing mechanism is resistant to temperature and corrosion deterioration, and as such, these leakage tests are not required. The CPS 4" Bypass isolation valves on the Containment HVAC System are motor operated gate valves. The type of resilient seat degradation mentioned for butterfly valves therefore does not apply.

In addition, the design and intended use(s) of the CPS Vent/Purge system may change due to Open Issue 10A. Thus, this issue cannot be fully discussed until such time as Issue 10A is resolved.

WORK NEEDED

- [9/21/82] (1) Prepare position paper on this issue and transmit to the Staff.
- [11/1/82] (2) Close-out Issue.

DESCRIPTION

(10d) Containment Leakage Testing (Secondary-Containment):

Leakage testing of the secondary containment volumes to verify the 194-sec. draw down time is required.

NRC POSITION*

In calculating the offsite radiological consequences of this pressure transient, the applicant did not assume that the period of time during which the pressure is greater than -0.25 in. water gauge in the secondary containment is a period of direct outleakage. This matter is under review.

The staff also will require the applicant to commit to leakage testing of the secondary containment volumes to verify the 194-sec blowdown [drawdown] time to reestablish a -0.25 in. of water gauge pressure. The staff will report on the resolution of this matter in a supplement to this report.

*References

- (1) CPS-SER, Section 6.2.2; February 1982.

IP POSITION

IP is committed to leakage testing of the secondary containment volume via CPS Technical Specifications, Section 4.6.6.1c, which states:

"At least once per 18 months:

Verifying that one standby gas treatment (SGTS) subsystem will draw down the secondary containment to greater than or equal to -0.25 inches of vacuum water gauge (with respect to atmospheric pressure) in less than or equal to 194 seconds".

In addition, the CPS-FSAR, pages 6.2-92 14.2-68, and 14.2-69 describe the preoperational test on the SGTS. Part of the objective of this test is to verify the 194-sec. drawdown time.

Thus, IP is committed to performing this test as stated above and IP believes this issue is closed.

WORK NEEDED

- [9/21/82] (1) Prepare position paper on this issue and transmit to the Staff.
- [10/8/82] (2) Issue to be Closed-Out.

DESCRIPTION

(10e) Containment Bypass Leakage: IP proposes a 12% bypass leakage fraction. The Staff requires that the CPS Technical Specifications limit the bypass fraction to no more than 4% of the containment leakage.

NRC POSITION*

The staff has evaluated the control room doses following a postulated loss-of-coolant accident according to SRP Section 6.4. Although the resultant whole-body doses are within the guidelines of GDC 19, the thyroid dose resulting from radioactive iodine exceeds the dose guidelines. The applicant will, therefore, either be required to modify the habitability systems or reduce the containment bypass fraction as indicated in Section 15.3.1 of this report in such a manner that the estimated doses are brought within the lines.

Computed potential thyroid doses are predominantly dependent upon the assumed distribution of containment leakage between the bypass and ESF-filtered path-ways. This distribution is taken to be the same as the proposed upper limit for the leakage tests required to be performed periodically under the Technical Specifications of the plant license. When applying for a construction permit, the applicant had proposed Technical Specification limits of 0.5 percent per day for the containment leak rate, of which less than 5 percent would be bypass. In the FSAR, however, a limiting containment leak rate of 0.65 percent per day and 12-percent bypass was proposed. This proposed change approximately tripled the computed thyroid doses for this accident. In addition, a period of 194 sec has been computed by the applicant between the isolation of the normal secondary containment ventilation system and the reestablishment of subatmospheric pressure within the secondary containment by the SGTS. Under the provisions of SRP Sections 6.2.3 and 15.6.5, Appendix A, all leakage from the primary containment during this period is considered as bypassing the SGTS. Because of these sources of bypass leakage, the doses computed for the applicant's proposed Technical Specifications exceed the staff guidelines. The staff will, accordingly, require Technical Specifications to the operating license which limit the bypass leakage fraction to no more than 4 percent of the containment leakage.

*References

- (1) CPS-SER, Sections 6.4 & 15.3; February 1982.
- (2) Standard Review Plan, NUREG-0800 (Rev. 2), Section 6.4, "Control Room Habitability System"; July 1981.

IP POSITION

IP believes that a 12% bypass leakage fraction is acceptable. The control room doses have been reevaluated (using 12% bypass) as described in the CPS-SER #1, acceptable with regards to the requirements of GDC 19 and the SRP Section 6.4.

A major source contributor to the bypass leakage source term is the MSIV-Leakage Control System (LCS) discharge. The original CPS design had the exhaust from the MSIV-LCS routed into an RHR cubicle. THE SGTS would then take suction from this cubicle. IP has modified the design such that the MSIV-LCS exhaust is now routed to suction header of the SGTS directly, via a hard-piped connection, thus eliminating this source term from the secondary containment.

Finally, the offsite doses have been shown to be in conformance with the 10CFR100 requirements via IP letter U-0415, dated 2/23/82.

WORK COMPLETED

- (1) Per IP letter U-0415, dated 2/23/82, the IP position was transmitted to the Staff.
- (2) NRC responded via the letter from Miller to Wuller, dated 3/15/82. The letter said that 11% bypass fraction was unacceptable based upon:
 - (a) Amount of bypass was limited by control room doses, which at that time via staff calculations, showed thyroid doses greater than GDC 19 criteria.
 - (b) MSIV-LCS leakage not believed to have been properly treated.
- (3) Open Issue #11-Control Room Doses has been resolved. IP internal memo Y-7885, dated 4/23/82 indicates that the staff has reevaluated the CPS Control Room Doses (at 12% bypass), with due credit taken for the iodine removal capability (70%) of the HVAC recirculation filter units, and finds that IP complies with the GDC 19 criteria.
- (4) S&L drawing MO5-1070 (Rev. G) has been changed to indicate that the MSIV-LCS leakage is hardpiped directly to the SGTS.

WORK NEEDED

- [9/17/82] (1) Change drawing MO5-1070 (Rev. G) in FSAR figure 6.7-1 to reflect change in item (4) above.
- [9/20/82] (2) Prepare position paper and send to Staff on this issue.
- [11/1/82] (3) Issue to be closed-out.

DESCRIPTION

Engineered Safety Features (ESF) Reset Controls:
Automatic reset of safety systems logic following the return to normal of the initiating signal must be reviewed in accordance with IE Bulletin 80-06.

NRC POSITION*

As was done for operating reactors through IE Bulletin 80-06, the staff requested the the applicant review all safety equipment to determine which, if any, safety functions might be unavailable after reset as well as what changes would be implemented to correct any problems. The applicant has not completed the review of this item. A draft response regarding the NSSS scope of supply has been received; however, some questions exist regarding certain isolation valves which will reopen upon a reset. The applicant has been asked to justify each case where safety-related equipment changes position upon an ESF reset. The applicant has committed to provide the results of his review at least 4 months before expected fuel loading and to implement any design modifications found necessary as a result of the review.

The applicant must provide the results of his review to determine whether or not all NSSS and BOP safety-related equipment will remain in its emergency mode following the reset of an ESF actuation signal. Justification must be provided for all exceptions.

*References

- (1) CPS-SER, Section 7.3.3.7; dated February 1982.
- (2) IE Bulletin 80-06, "Engineered Safety Features (ESF) Reset Controls"; March 13, 1980.

IP POSITION

IP believes that this issue is closed. No additional information is to be provided.

WORK COMPLETED

- (1) IP Letter U-0355, dated 12/1/81 transmitted information to staff on CPS NSSS systems features.
- (2) IP Letter U-0481, dated 5/17/82 transmitted information to Staff on CPS BOP systems features.
- (3) This issue believed to be closed by IP.

WORK NEEDED

- [9/22/82] (1) Meet/Call NRC to discuss status of NRC review.
- [9/27/82] (2) Issue to be closed.

DESCRIPTION

To comply with GDC 19, "Control Room", the Remote Shutdown System (RSS) design should provide redundant safety-grade capability to achieve and maintain hot shutdown from a location or locations remote from the control room, assuming no fire damage to any required systems and equipment and assuming no accident has occurred. Credit may be taken for manual actuation (exclusive of continuous control) of systems from locations that are reasonably accessible from the remote shutdown panel. Credit may not be taken for manual actions involving jumpering, rewiring, or disconnecting circuits. The design should provide redundant safety-grade capability for attaining subsequent cold shutdown through the use of suitable procedures.

NRC POSITION*

The Clinton design provides only for the transfer of Division 1 systems to the remote shutdown panel. It appears that given a loss of Division 1 power, sufficient instrumentation and controls would not be available to attain a shutdown condition from outside the control room from a single remote location. The applicant believes that the installed RSS complies with GDC 19 and that no design modifications are required. The staff is pursuing resolution of this item with the applicant.

The staff is concerned that the instrumentation and controls provided at the remote shutdown panel do not provide redundant safety grade capability to achieve and maintain hot shutdown from a location remote from the control room. The resolution of this issue will be addressed in a supplement to this report.

The applicant has not provided an analysis of the safe shutdown capability. The staff will require the applicant to meet the fire protection technical requirements for safe shutdown contained in Sections III.G and III.L of Appendix R to 10 CFR 50.

*References

- (1) CPS-SER, Sections 7.4.3.1 & 9.5.5; dated February 1981.
- (2) 10CFR50, Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979".

IP POSITION

- (1) IP will conform to Appendix R requirements.
- (2) Some panel redesign will be required. The October FSAR Amendment will formally address these design changes.

WORK COMPLETED

- (1) IPC Letter U-0369, dated 12/2/81, transmitted IPC positions on compliance with GDC 19, App. K, App. R, and capability to attain cold shutdown.
- (2) At the meeting held 3/30/82 at CPS with NRC, agreement was reached on what was needed for Appendix R conformance.
- (3) NRC positions on Fire Protection received on 4/13/82.
- (4) At the meeting Mtg. held on 7/13/82 at CPS with NRC discussion was held on the Safe Shutdown analysis for Fire Protection. Conclusions were:
 - a. Provide list of all cables in zone F.2.7 and purpose of each cable. NSLD (CML)
 - b. Assurances that RCIC equipment in fire zone A.1.4 will be qualified for 72 hours following a fire in fire zone A.1.1. PMD (GDS)
 - c. Assurances that cable will be available on site at all times to replace Division 2 cable required for safe cold shutdown in the event of a fire in zone A.4.6. IPC
 - d. Provide the MSIV's positions when shutting down from the control panel. IPC
 - e. Update the Safe Shutdown Report. NSLD (CML)
- (5) Conference call was held with NRC on 5/18/82 to clarify issues. IP commits to providing NRC the following information:
 - a. IP will provide a formal submittal addressing the items committed to during the 7/13/82 meeting on App. R conformance at CPS.
 - b. IP will provide a list of exceptions on App. R compliance at CPS.
- (6) Information regarding penetration seal materials and fire test reports will also be provided.

WORK NEEDED

[10/30/82] (1) Submit panel redesign information in October FSAR Amendment.

[10/18/82] (2) Submit required information on Appendix R exceptions.

Issue
#14

DESCRIPTION
Capability for Safe Shutdown Following Loss of a Bus
Supplying Power to Instruments and Controls:
Address I.E. Bulletin 79-27 for CPS.

NRC POSITION*

The staff requested that the applicant review the adequacy of emergency operating procedures to be used to obtain safe shutdown upon loss of any Class 1E or non-Class 1E bus supplying power to safety-or nonsafety-related instruments and controls. This issue was addressed for operating reactors through I.E. Bulletin 79-27. The applicant has not completed the review for this item. The applicant has committed to provide the results of the review at least 4 months before expected fuel loading, and to implement any design modifications found necessary as a result of the review.

The applicant must provide the results of the review for the staff to determine whether the ability to achieve cold shutdown is impaired given the loss of any bus supplying power to plant instruments and controls.

*References

- (1) CPS-SER, Section 7.4.3.2; February 1982.
- (2) I.E. Bulletin 79-27, "Loss of Non-Class-1E Instrumentation and Control Power System Bus During Operation"; Nov. 30, 1979.

IP POSITION

IP commits to provide a review of I.E. Bulletin 79-27 as described above.

WORK COMPLETED

- (1) Requisition No. CL1-3, dated 4/6/82 and Purchase Order OCN #9 B-89276, dated 4/27/82 authorized Quadrex to perform work.
- (2) Key diagrams and schematics issued to Quadrex during June-August.
- (3) Conference call with Quadrex on 9/2/82 indicated overall task (79-27 & 79-22) is 75% complete. Approximately 3½ man-weeks required to complete.
- (4) Last set of required EO2/EO3 drawings sent during week of 9/6/82.

WORK NEEDED

- [10/20/82] (1) Complete work, review, and issue report to NRC to review so issue can be closed.

DESCRIPTION

Effects of Control Systems Failures: Address I.E.
Information Notice 79-22 for CPS.

NRC POSITION*

The staff requested that the applicant identify any power sources, sensors, or sensor impulse lines which provide power or signals to two or more control systems and demonstrate that failures of these power sources, sensors, or sensor impulse lines will not result in consequences outside the bounds of the Section 15 analyses or beyond the capability of operators or safety systems.

In addition, the applicant was requested to review the designs to determine whether harsh environments associated with high-energy line breaks might cause control system malfunctions resulting in consequences more severe than those analyzed in Section 15 or beyond the capability of operators or safety systems. This was addressed by I.E. Information Notice 79-22 issued September 19, 1979.

*References

- (1) CPS-SER, Section 7.7.3.1; February 1982.
- (2) I.E. Information Notice 79-22, "Qualification of Control Systems"; September 14, 1979.

IP POSITION

IP commits to provide a review of I.E. Information Notice 79-22 as described above.

WORK COMPLETED

- (1) Requisition No. CL1-3, dated 4/6/82 and Purchase Order OCN #9 B-89276, dated 4/27/82 authorized Quadrex to perform work.
- (2) Key diagrams and schematics issued to Quadrex during June-August.
- (3) Conference call with Quadrex on 9/2/82 indicated overall task (79-27 & 79-22) is 75% complete. Approximately 3½ man-weeks required to complete.
- (4) Last set of required EO2/EO3 drawings sent during week of 9/6/82.

WORK NEEDED

[10/20/82] (1) Complete work, review, and issue to NRC to review so issue can be closed.

DESCRIPTION

Emergency Plan: NRC will determine the adequacy of the applicant's emergency response plans with respect to the standards listed in Section 50.47(b) of 10 CFR 50, the requirements of Appendix E to 10 CFR 50, and the guidance contained in NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," dated November 1980.

NRC Position*

On the basis of its review against the criteria in NUREG-0654, Revision 1, the staff concludes that providing the items identified are accomplished, the Clinton Power Station Emergency Plan will provide an adequate planning basis for an acceptable state of emergency preparedness and will meet the requirements of 10 CFR 50 and Appendix E.

The following actions must be taken:

- (1) The applicant must specify by title the person who will function as the EOF Director and shall revise Table 4-1 to include the position of EOF Director.
- (2) The public prompt notification system design shall be completed and the system installed.
- (3) The description of the meteorological instrumentation (as discussed in Section 13.3.2.8) must be improved to demonstrate that the instrumentation will meet the criteria of Appendix 2 to NUREG-0654, including the capability for remote interrogation.

*References

- (1) Clinton Power Station Safety Evaluation Report, (CPS-SER), Section 13.3; February 1982.
- (2) CPS-SSER #1, Section 13.3; July 1982.

IP POSITION

IP has responded to these remaining concerns via IP Letter U-0520, dated 7/22/82. As indicated in this letter the following commitments will be incorporated into Chapter 13 of the CPS-FSAR:

- 1) The responsibility for directing the Emergency Operations Facility (EOF) and acting as the Illinois Power Company spokesman at that facility is assigned to the Recovery Manager who is identified in the Emergency Plan. In order that the function of EOF director can be filled within 60 minutes the Supervisor-Technical will assume the function on an interim basis until the Recovery Manager arrives.
- 2) The Public Prompt Warning System will be designed and installed prior to issuance of the operating license.
- 3) Subject to the following exceptions and clarifications, the Clinton Power Station will comply with NUREG-0654, Revision 1, Appendix 2:
 - a) Dose assessment will be provided by the CPS Report Generator software (Class A model). This system will provide dose assessment throughout both the plume exposure pathway and the ingestion exposure pathway. No Class B model will be provided.
 - b) IP has provided in their design of the meteorological system a location where signals for wind speed/direction, temperature, etc. from both the primary and the backup tower are available.

The referenced location is either on 781' elevation of the control building or the Nuclear Data report generator.

IP believes that this information adequately responds to the Staff's concerns, such that this issue can be closed.

WORK COMPLETED

- (1) NRC Letter, dated 1/7/82, from J. R. Miller to G. E. Wuller, transmitted to IP Staff comments/concerns on the CPS Emergency Plan.
- (2) IP Letter CPS-600-82, dated 2/9/82, from T. F. Plunkett to J. R. Miller, provided the IP responses to Item (1) above.
- (3) Amendment #16 to the CPS-FSAR docketed the Item (2) responses.
- (4) IP Letter U-0520, dated 7/22/82, provided to the NRC, IP's responses to additional Staff concerns (as shown in "IP Position").

WORK NEEDED

- | | |
|-----------|--|
| [10/1/82] | (1) Call/Meet NRC to determine if information provided is adequate to close issue. |
| [11/1/82] | (2) Issue to be closed-out. |