June 30, 2005

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION
FIRE PROTECTION TRIENNIAL BASELINE INSPECTION
NRC INSPECTION REPORT 05000461/2005006(DRS)

Dear Mr. Crane:

On May 20, 2005, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Clinton Power Station. The enclosed report documents the inspection findings which were discussed on May 20, 2005, with Mr. R. Bement and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The team reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, no findings of significance were identified.

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document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Julio F. Lara, Chief
Engineering Branch 3
Division of Reactor Safety

Docket No. 50-461
License No. NPF-62

Enclosure: Inspection Report 05000461/2005006(DRS)
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Clinton Power Station
Plant Manager - Clinton Power Station
Regulatory Assurance Manager - Clinton Power Station
Chief Operating Officer
Senior Vice President - Nuclear Services
Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Manager Licensing - Clinton Power Station
Senior Counsel, Nuclear, Mid-West Regional Operating Group
Document Control Desk - Licensing

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DATE	06/23/05		06/29/05		06/30/05			

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	05000461/2005006(DRS)
Licensee:	Exelon Generation Company, LLC
Facility:	Clinton Power Station
Location:	Route 54 West Clinton, IL 61727
Dates:	May 2 through May 20, 2005
Inspectors:	Z. Falevits, Senior Reactor Inspector, Lead B. Jose, Reactor Inspector A. Klett, Reactor Inspector J. Robbins, Observer
Approved by:	J. Lara, Chief Engineering Branch 3 Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000461/2005006(DRS); 05/02/2005 - 05/20/2005; Clinton Power Station; Triennial Fire Protection Baseline Inspection.

This report covers an announced triennial fire protection baseline inspection. The inspection was conducted by Region III inspectors. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, “Significance Determination Process” (SDP). Findings for which the SDP does not apply may be “Green” or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, “Reactor Oversight Process,” Revision 3, dated July 2000.

A. Inspector-Identified and Self-Revealed Findings

Cornerstone: Initiating Events

No findings of significance were identified.

Cornerstone: Mitigating Systems

No findings of significance were identified.

B. Licensee-Identified Violations

No findings of significance were identified.

REPORT DETAILS

Summary of Plant Status

The unit operated at or near full power throughout the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events and Mitigating Systems

1R05 Fire Protection (71111.05)

The purpose of this inspection was to review the Clinton Power Station's (CPS's) Fire Protection Program (FPP) for selected risk-significant fire areas. Emphasis was placed on determining that the post-fire safe shutdown capability and the fire protection features were maintained free of fire damage to ensure that at least one post-fire safe shutdown success path was available. The inspection was performed in accordance with the Nuclear Regulatory Commission's (NRC's) regulatory oversight process using a risk-informed approach for selecting the fire areas and attributes to be inspected. The team used the CPS's Individual Plant Examination of External Events (IPEEE) to choose several risk-significant areas for detailed inspection and review. The fire zones chosen for review during this inspection were:

Fire Areas	Fire Zones	Description
F-1	F-1m	Fuel Building - General Access Area at Elevation 737'-0"
CB-5	CB-5a	Div. 3 Switchgear Room at Elev. 781'0"
CB-6	CB-6a	Main Control Room Complex at Elev. 800'0"

For each of these fire zones, the inspection focused on the fire protection features, the systems and equipment necessary to achieve and maintain safe shutdown conditions, determination of licensee commitments, and changes to the FPP.

.1 Systems Required to Achieve and Maintain Post-Fire Safe Shutdown

The guidelines established by Branch Technical Position (BTP), Chemical Engineering Branch (CMEB) 9.5-1, Section C.5.b, "Safe Shutdown Capability," Paragraph (1), required the licensee to provide fire protection features that were capable of limiting fire damage to structures, systems, and components (SSCs) important to safe shutdown. The SSCs that were necessary to achieve and maintain post-fire safe shutdown were required to be protected by fire protection features that were capable of limiting fire damage to the SSCs so that:

- one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) was free of fire damage; and

- systems necessary to achieve and maintain cold shutdown from either the control room or emergency control station(s) can be repaired within 72 hours.

General Description of Clinton's Safe Shutdown Paths and Capability

The licensee's safe shutdown methodology relied upon the identification of those components necessary and available to achieve and maintain hot shutdown conditions following a fire condition. Once identified for all plant areas, the licensee selected the components necessary to achieve and maintain the reactor in a hot shutdown condition which could be operated from the main control room or which could be operated locally and were not within the fire affected area. The methodology further identified those components necessary to achieve and maintain cold shutdown.

The licensee also identified an alternate or dedicated shutdown capability for fire conditions that affected the main control room and several other areas, including the auxiliary electric equipment room. For each of these areas, the licensee relied upon the operators' use of the remote shutdown panel to ensure that the reactor could be brought to and maintained in a hot shutdown status.

To direct the plant staffs' response to fire conditions throughout the plant, the licensee relied upon the operators' use of a single fire response operating procedure in conjunction with other non-fire specific plant procedures. The fire response operating procedure provided the main control room staff with information as to the possible impacts of a fire condition in each of the identified plant areas and those actions necessary to minimize the impacts of potential spurious equipment operations. Expected local equipment operations were also identified in the fire response operating procedure.

a. Inspection Scope

The team reviewed the plant systems required to achieve and maintain post-fire safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions for each fire zone selected for review. Specifically, the review was performed to determine the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and support system functions. This review included the CPS fire protection Safe Shutdown Analysis (SSA, USAR Appendix F) and the Fire Protection Evaluation Report (FPER, USAR Appendix E).

The team also reviewed the operators' ability to perform the necessary manual actions for achieving safe shutdown by reviewing procedures, the accessibility of safe shutdown equipment, and the available time for performing the actions.

The team reviewed the Updated Safety Analysis Report (USAR) and the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, technical specifications, safety evaluation reports, exemptions, and deviations) to determine the licensing basis.

b. Findings

No findings of significance were identified.

.2 Fire Protection of Safe Shutdown Capability

The guidelines established by BTP CMEB 9.5-1, Section C.5.b, "Safe Shutdown Capability," Paragraphs (2)(a) and (3), required separation of cables and equipment and associated circuits of redundant trains by a fire barrier having a 3-hour rating. If the guidelines cannot be met, then alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room, or zone under consideration should be provided.

a. Inspection Scope

For each of the selected fire zones, the team reviewed the licensee's SSA to ensure that at least one post-fire safe shutdown success path was available in the event of a fire in accordance with the criteria discussed above. This included a review of manual actions required to achieve and maintain hot shutdown conditions and to make the necessary repairs to reach cold shutdown within 72-hours. The team also reviewed procedures to determine whether or not adequate direction was provided to operators to perform these manual actions. Factors such as timing, access to the equipment, and the availability of procedures, were considered in the review.

The team also evaluated the adequacy of fire suppression and detection systems, fire area barriers, penetration seals, and fire doors to ensure that at least one train of safe shutdown equipment was free of fire damage. To accomplish this, the team examined the material condition and configuration of the installed fire detection and suppression systems, fire barriers, construction details, and supporting fire tests for the installed fire barriers. In addition, the team reviewed license documentation, such as deviations, detector placement drawings, fire hose station drawings, carbon dioxide pre-operational test reports, the FHA report, the SSA report, and National Fire Protection Association (NFPA) codes to verify that the fire barrier installations met license commitments.

b. Findings

No findings of significance were identified.

.3 Post-Fire Safe Shutdown Circuit Analysis

The guidelines established by BTP CMEB 9.5-1, Section C.5.b, "Safe Shutdown Capability," Paragraph (1), required that SSCs important to safe shutdown be provided

with fire protection features capable of limiting fire damage to ensure that one train of systems necessary to achieve and maintain hot shutdown conditions remained free of fire damage. Options for providing this level of fire protection were delineated in BTP CMEB 9.5-1, Section C.5.b, "Safe Shutdown Capability," Paragraph (2). Where the protection of systems whose function was required for hot shutdown did not satisfy BTP CMEB 9.5-1, Section C.5.b, Paragraph (2), an alternative or dedicated shutdown capability and its associated circuits, were required to be provided that was independent of the cables, systems, and components in the area. For such areas, BTP CMEB 9.5-1, Section C.5.c, "Alternative or Dedicated Shutdown Capability," Paragraph (3), specifically required the alternative or dedicated shutdown capability to be physically and electrically independent of the specific fire areas and capable of accommodating post-fire conditions where offsite power was available and where offsite power was not available for 72-hours.

a. Inspection Scope

On a sample bases, the team reviewed the adequacy of separation provided for the power, control, and instrumentation cabling of redundant trains of shutdown equipment. This inspection focused on the cabling of selected components in systems important for safe shutdown. The team's review also included a sampling of components whose inadvertent operation due to fire may adversely affect post-fire safe shutdown capability. The purpose of this review was to determine if a single exposure fire, in one of the fire areas selected for this inspection, could prevent the proper operation of both safe shutdown trains.

The team reviewed electrical coordination studies to ensure equipment needed to conduct post-fire safe shutdown activities would not be impacted by improper coordination. The team reviewed fuse/breaker coordination analysis for selected 4.16 kV, 480 Vac, vital 120 Vac, and 125 Vdc components required for post-fire safe shutdown. The purpose of this review was to verify that selective coordination exists between branch circuit protective devices (i.e., fuses, breakers) and the bus feeder protective devices to ensure that in the event of a fire-induced short circuit, the fault is isolated before the feeder device trips. In addition, a review of the licensee's fuse replacement procedure and an inspection of a sample of field installed fuses was conducted to determine if adequate administrative controls exist to prevent the inadvertent substitution of incorrectly sized fuses in critical circuits. Additionally, the team reviewed a sample of circuit breaker maintenance procedures and testing records to verify that circuit breakers for components required for post-fire safe shutdown were properly maintained in accordance with procedural requirements.

The team performed a review of the licensee's SSA, Safe Shutdown Equipment List (SSEL), post fire safe shutdown criteria and compliance assessment calculations, safe shutdown flow diagrams and Piping and Instrumentation (P&I) diagrams to determine whether the licensee had appropriately identified and analyzed the safety related and non-safety related cables associated with safe shutdown equipment located in the selected plant fire zones in accordance with the criteria discussed above. The team also reviewed cable routing for post-fire safe shutdown components to confirm that cables subject to fire damage in the selected fire areas were identified and adequately

addressed. The team also reviewed cable raceway drawings for a sample of components required for post-fire safe shutdown to verify that cables were routed as described in the cable routing matrices.

The team's review included the assessment of the licensee's electrical systems and electrical circuit analyses. The team evaluated a sample of safety and non-safety related cables for equipment in the selected fire zones to determine if the design requirements of Section III.G of 10 CFR Part 50, Appendix R were being met. This included evaluation of potential hot shorts, open circuits, or shorts to ground to ensure that they would not prevent implementation of safe shutdown. The team also focused on the adequacy of the systems to perform reactor pressure control, reactivity control, reactor coolant makeup, decay heat removal, process monitoring and support system functions.

b. Findings

Postulated Fire-Induced Circuit Failures Resulting in Potential Spurious Actuation of Division III High Pressure Core Spray (HPCS) Pump 1E22-C001 and Discharge Valve 1E22-F004:

Introduction: The team identified an Unresolved Item (URI) associated with potential fire-induced electrical circuit failures in the HPCS system. The team postulated a fire in the Division III switchgear room, located in Fire Zone CB-5a, which could result in fire-induced electrical circuit faults in the control cables and control logic of the HPCS pump and discharge valve. Such faults could potentially impair the capability to shut off the pump and stop it from continually injecting into the core.

Description: The team reviewed the methodology used by the licensee during the performance of Clinton's post-fire safe shutdown circuit analysis to determine if it was consistent with NRC Regulatory Issue Summary (RIS) 2004-003, Revision 1, "Risk-Informed Approach for Post-Fire Safe-Shutdown Circuit Inspections," issued on December 29, 2004. The team attempted to determine, based on available safe shutdown circuit analysis documentation (calculations, design drawings) used to perform the circuit analyses, if the licensee considered in their analysis circuit configuration failure scenarios such as multiple concurrent spurious component actuations due to fire induced cable shorts. The licensee stated that the fire induced cable failure mechanism was considered within the CPS Appendix R analysis, and therefore exceeded the RIS cable failure considerations. The team performed a sample review of post-fire safe shutdown circuit analysis, using the guidance and criteria provided in the RIS.

The licensee documented in calculation IP-0532, "10 CFR Part 50, Appendix R, Compliance Assessment," that any and all spurious operations or failures shall be evaluated and that the spurious actuations or failures are not required at the time to be evaluated simultaneously except for high/low pressure interface components. However, the licensee stated that they did consider the potential for concurrent/simultaneous spurious actuations or failures in the Appendix R analysis for the ECCS system automatic initiation instrumentation logic network as well as the high/low pressure interface components.

The team noted that no documentation was available for review to demonstrate that the licensee had evaluated the potential fire induced electrical circuit failures scenarios, postulated by the team, in the HPCS logic control system. The team evaluated fire induced circuit failures in the HPCS system that could potentially impact safe shutdown. The team selected HPCS pump 1E22-C001 and pump discharge valve 1E22-F004 logic circuitry and associated control cables for evaluation. The team reviewed licensing and design basis documents and related operating, emergency and shutdown procedures. The team performed a circuit analysis and evaluation using the following design drawings to determine CPS's compliance with their licensing basis and the approved fire protection program:

- E02-1HP99, Sheet 110, "Schematic Diagram, High Pressure Core Spray (HP) HPCS Power Supply System (1E22-1070)," Revision H;
- E02-1HP99, Sheet 501, "Schematic Diagram, High Pressure Core Spray (HP) HPCS Suction Valve (1E22-F001) and HPCS Suct. Disc. Valve 1E22-F004," Revision J;
- E02-1AP03, "Electrical Loading Diagram," Revision AA;
- M05-1074, "P&ID High Pressure Core Spray (HP)," Revision AG;
- CPS-SSD-LOG-217, Sheet 1, "Division 3 Diesel Generator & Electrical Distribution Safe Shutdown Logic Diagram," Revision 2; and
- CPS-SSD-LOG-101, Sheet 1, "High Pressure Core Spray Safe Shutdown Logic Diagram," Revision 2.

The team conducted an evaluation of the impact of fire induced faults on HPCS system operation. The team postulated the following fire induced electrical faults, using guidance provided in the RIS, which could result in the HPCS discharge valve opening and the HPCS pump continually running and injecting water into the Reactor:

HPCS Discharge Valve 1E22-F004 (Control Cable 1HP11C (12/c)): One hot short in the opening control logic circuitry of the valve, and one short to ground in the closing control logic circuitry of the valve.

HPCS Pump 1E22-C001 (Control Cable 1HP08C (15/c)): One hot short in the breaker closing control logic circuitry of the HPCS pump which will close the pump breaker and start the pump, and two shorts to ground in the tripping circuitry of the pump control logic which will result in a blown fuse, and prevent tripping of the pump breaker. (Note that if the hot short stays in for 20 minutes then there is no need to postulate the faults in the tripping circuitry).

The team determined that no documented evidence was available to indicate that the licensee considered the potential hot shorts, shorts to ground and open circuits, postulated by the team, in the multiconductor control cables used in the control system of HPCS pump 1E22-C001 (15/c) and pump discharge valve 1E22-F004 (12/c).

On June 8, 2005, the licensee, RIII, and NRR fire protection staff members conducted a conference call to further discuss the concerns raised by the team. The NRC requested that the licensee evaluate the postulated scenarios provided by the team and determine if CPS can achieve and maintain safe shutdown in Fire-Zone CB-5a if HPCS injection

can not be stopped and if CPS is within their licensing basis considering the electrical faults and fire induced actuations of HPCS components. The licensee provided their response to the NRC on June 20, 2005. The licensee entered this issue in their corrective action program under CR 00343489, dated June 13, 2005. This issue is considered an unresolved item (URI) pending NRC review of the licensee's response to the issues raised by the team (URI 05000461/2005006-01).

.4 Alternative Shutdown Capability

The guidelines established by BTP CMEB 9.5-1, Section C.5.b, "Safe Shutdown Capability," Paragraph (1), required the licensee to provide fire protection features that were capable of limiting fire damage so that one train of systems necessary to achieve and maintain hot shutdown conditions remained free of fire damage. Specific design features for ensuring this capability were provided in BTP CMEB 9.5-1, Section C.5.b, Paragraph (2). Where compliance with the separation criteria of BTP CMEB 9.5-1, Section C.5.b, Paragraphs (1) and (2) could not be met, BTP CMEB 9.5-1, Section C.5.b, Paragraph (3) and Section C.5.c, required an alternative or dedicated shutdown capability be provided that was independent of the specific fire area under consideration. Additionally, alternative or dedicated shutdown capability must be able to achieve and maintain hot standby conditions and achieve cold shutdown conditions within 72-hours and maintain cold shutdown conditions thereafter. During the post-fire safe shutdown, the reactor coolant process variables must remain within those predicted for a loss of normal alternating current power, and the fission product boundary integrity must not be affected (i.e., no fuel clad damage, rupture of any primary coolant boundary, or rupture of the containment boundary).

a. Inspection Scope

The team reviewed the licensee's systems required to achieve safe shutdown to determine if the licensee had properly identified the components and systems necessary to achieve and maintain safe shutdown conditions in accordance with the criteria discussed above. The team focused on the adequacy of the systems to perform reactor pressure control, reactivity control, reactor coolant makeup, decay heat removal, process monitoring, and support system functions.

The team reviewed the electrical isolation capability of selected equipment needed for post-fire safe shutdown to ensure that such equipment could be operated from the alternate shutdown panel or locally, if needed. The team also reviewed surveillance test procedures and test records for the alternate shutdown panel control transfer switches and alternate power supplies, to ensure that functionality of the transfer switches and alternate power sources were adequately demonstrated. This was done to ensure that an alternate or dedicated shutdown capability was provided that was independent of the specific fire area under consideration and that was capable of limiting fire damage so that one train remained free of fire damage and must be able to achieve and maintain safe shutdown conditions.

b. Findings

No findings of significance were identified.

.5 Operational Implementation of Alternate Shutdown Capability

The guidelines established by BTP CMEB 9.5-1, Section C.5.c, “Alternative or Dedicated Shutdown Capability,” Paragraph (2)(d), required that the process monitoring function should be capable of providing direct readings of the process variables necessary to perform and control the functions necessary to achieve reactivity control, reactor coolant makeup, and decay heat removal.

a. Inspection Scope

The team performed a walkdown of a sample of the actions defined in Procedure CPS 4003-01, “Remote Shutdown,” which was the procedure for performing a plant alternative shutdown from outside the control room. The team verified that operators could reasonably be expected to perform the procedure actions within the identified applicable plant shutdown time requirements and that equipment labeling was consistent with the procedure.

The team performed a review of the licensee’s operating procedures, which augmented the post-fire safe shutdown procedures to determine if the licensee complied with the criteria discussed above. The review focused on ensuring that all required functions for post-fire safe shutdown and the corresponding equipment necessary to perform those functions were included in the procedures. The review also looked at operator training, as well as consistency between the operations shutdown procedures and any associated administrative controls.

The team’ reviews of the adequacy of communications and emergency lighting associated with these procedures are documented in Sections 1R05.6 and 1R05.7 of this report.

b. Findings

No findings of significance were identified.

.6 Communications

The guidelines established by BTP CMEB 9.5-1, Section C.5.g, "Lighting and Communication," Paragraph (4), required that a portable communications system be provided for use by the fire brigade and other operations personnel required to achieve safe plant shutdown. This system should not interfere with the communications capabilities of other plant personnel. Fixed repeaters installed to permit use of portable radio communication units should be protected from exposure to fire damage.

a. Inspection Scope

The team reviewed the adequacy of the communication systems to support plant personnel in the performance of alternative safe shutdown functions and fire brigade duties to determine compliance.

b. Findings

No findings of significance were identified.

.7 Emergency Lighting

The guidelines established by BTP CMEB 9.5-1, Section C.5.g, "Lighting and Communication," Paragraph (1), required that fixed self-contained lighting consisting of fluorescent or sealed-beam units with individual 8-hour minimum battery power supplies should be provided in areas that must be manned for safe shutdown and for access and egress routes to and from all fire zones.

a. Inspection Scope

The team performed a walkdown of selected fire zones and the access/egress routes to determine that adequate emergency lighting existed for performing necessary equipment operations in accordance with the criteria discussed above.

b. Findings

No findings of significance were identified.

.8 Cold Shutdown Repairs

The guidelines established by BTP CMEB 9.5-1, Section C.5.c, "Alternative or Dedicated Shutdown Capability," Paragraph (5), required that equipment and systems comprising the means to achieve and maintain cold shutdown conditions should not be damaged by fire; or the fire damage to such equipment and systems should be limited so that the systems can be made operable and cold shutdown achieved within 72-hours. Materials for such repairs shall be readily available onsite, and procedures shall be in effect to implement such repairs.

a. Inspection Scope

The team determined that the licensee did not require repair of any equipment to reach cold shutdown based on the safe shutdown methods used.

b. Findings

No findings of significance were identified.

.9 Fire Barriers and Fire Zone/Room Penetration Seals

The guidelines established by BTP CMEB 9.5-1, Section C.5.a, "Building Design," Paragraph (3), required that penetration seal designs be qualified by tests that are comparable to tests used to rate fire barriers.

a. Inspection Scope

The team reviewed the test reports for 3-hour rated barriers installed in the plant and performed visual inspections of selected barriers to ensure that the barrier installations were consistent with tested configuration in accordance with the criteria discussed above. In addition, the team reviewed the fire loading for selected areas to ensure that existing barriers would not be challenged by a potential fire.

The team walked down accessible portions of the selected fire areas to observe material condition and the adequacy of design of fire area boundaries, fire doors, and fire dampers. The team reviewed engineering evaluations, as well as surveillance and functional test procedures for selected items. The team also reviewed the licensee submittals and NRC safety evaluation reports (SERs) associated with fire protection features at Clinton. Additionally, the team reviewed the design and qualification testing of selected barriers and reviewed surveillance procedures for structural fire barriers and penetration seals. The team also selectively verified through review of installation records that material of an approved fire resistance rating has been used to fill the penetration opening. These reviews were performed to ensure that the passive fire barriers were properly maintained and met the licensing and design bases as described in the licensee submittals, NRC SERs, the fire hazards analysis (FHA), and the Clinton Updated Safety Analysis Report (USAR).

b. Findings

No findings of significance were identified.

.10 Fire Protection Systems, Features and Equipment

a. Inspection Scope

The guidelines established by BTP CMEB 9.5-1, required that fire protection systems, features, and equipment were designed in accordance with the following:

Fire Protection Systems, Features and Equipment	BTP CMEB 9.5-1 Section	BTP CMEB 9.5-1 Title
Fire Brigade Capabilities	C.3	Fire Brigade
Passive Fire Protection Features	C.5.a	Building Design
Fire Detection System	C.6.a	Fire Detection
Fire Suppression System	C.6.b	Fire Protection Water Supply Systems
	C.6.c	Water Sprinkler and Hose Standpipe Systems
Manual Fire Fighting Equipment	C.6.f and C.3	Portable Extinguishers and Fire Brigade

a. Inspection Scope

The team reviewed the material condition, operations lineup, operational effectiveness, and design of fire detection systems, fire suppression systems, manual fire fighting equipment, fire brigade capability, and passive fire protection features. The team reviewed deviations, detector placement drawings, fire hose station drawings, and fire hazard analysis reports to ensure that selected fire detection systems, sprinkler systems, portable fire extinguishers, and hose stations were installed in accordance with their design, and that their design was adequate given the current equipment layout and plant configuration.

b. Findings

No findings of significance were identified.

.11 Compensatory Measures

a. Inspection Scope

The team conducted a review to determine that adequate compensatory measures were put in place by the licensee for out-of-service, degraded or inoperable fire protection and post-fire safe shutdown equipment, systems, or features. The team also reviewed the adequacy of short term compensatory measures to compensate for a degraded function or feature until appropriate corrective actions were taken.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems (71152)

The guidelines established by BTP CMEB 9.5-1, Section C.4, "Quality Assurance [QA] Program," Paragraph H, required that measures should be established to ensure that conditions adverse to fire protection, such as failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible material and nonconformance, are promptly identified, reported, and corrected.

a. Inspection Scope

The team reviewed a selected sample of corrective action documents to assess whether or not the licensee was identifying issues related to fire protection at an appropriate threshold and entering them in the corrective action program for resolution. The team reviewed condition reports, work orders, design packages, and fire protection system non-conformance documents. The team also evaluated the effectiveness of the corrective actions for the identified issues.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting

The team presented the inspection results to Mr. R. S. Bement and other members of licensee management at the conclusion of the inspection on May 20, 2005, and during a subsequent telephone call with licensee representatives on June 29, 2005. The team asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

R. Bement, Site Vice President
M. McDowell, Plant Manager
J. Cunningham, Work Management Director
R. Frantz, Regulatory Assurance Representative
M. Hiter, Access Control Supervisor
W. Iliff, Regulatory Assurance Director
J. Domitrovich, Maintenance Director
D. Schavey, Operations Director
T. Marini, Nuclear Oversight Manager (Acting)
R. Weber, Sr. Manager Design Engineering
K. Scott, Sr. Manager Plant Engineering
C. Pragman, Corporate Fire Protection Engineer,

Nuclear Regulatory Commission
R. Caniano, Deputy Division Director, Division of Reactor Safety
D. Tharp, Resident Inspector
B. Dixon, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000461/2005006-01	URI	Evaluation of Fire Induced Circuit Failures in HPCS System Control Logic (Section 1R05.3)

Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC team reviewed the documents in their entirety but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

CALCULATIONS

Number	Description or Title	Date or Revision
IP-M-0456	Impact of IE IN 92-18 on CPS Motor Operated Valves (MOVs)	0
IP-M-0471	Clinton Power Station Post Fire Safe Shutdown Criteria (and Attachments)	2 (Vol. A-E)
IP-M-0532	Appendix R Safe Shutdown Emergency Lighting Design Criteria	0, A and B
19-AI-62	Coordination of Breakers in Distribution Panels with Breakers for Distribution Panels	1 (Vol. A-N)
19-AI-81	CPS Appendix R Safe Shutdown Component Circuit Analysis	1 (Vol. A-G and various attachments)
19-AN-09	4160V DIV 3 Bus 1C1 Motor Relay Settings	1, Vol. B
19-AN-04	480V ESF Switchgear Breakers and Associated Upstream Relay Setting	12, Vol. C
01FP14	Effects of Manual or Automatic Actuations of the Fire Suppression Systems on Zones Containing Safe Shutdown Equipment	1

CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED DURING INSPECTION

Number	Description or Title	Date or Revision
00327729	800" CB Computer Room House Keeping is Degraded	April 21, 2005
00329459	USAR Appendix F Table 1.6-2 Has Incorrect Information	April 22, 2005
00331438	CPS 3309.01 Has Editorial Error	May 3, 2005
00331936	Completed Fire Protection Surveillance 9601.01C001 Lost	May 4, 2005
00332068	Fire Brigade (FB) Found Not Charging in the FB Cage	May 5, 2005
00332262	NRC-identified Error in Calculation 01FP14 for Zone CB-5A	May 5, 2005
00334476	USAR Appendix E Drawing Shows Valve in Wrong Position	May 6, 2005
00334927	Enhancement On USAR Description of Fire Protection Lighting	May 13, 2005
00335528	CR Descriptions Reference Wrong Procedure	May 16, 2005
00335690	CPS 9337.81 References Wrong NFPA Code for Fire Protection Detection	May 16, 2005

CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED DURING INSPECTION

Number	Description or Title	Date or Revision
00335943	3507.01M001 Pg. 42 0f 180 Contains a Typo for Circuit 16	May 17, 2005
00336065	Calc. IP-M-0471, R/2, Vol. A Error for 1B21-F032A/B Power	May 17, 2005
00336406	Calculation IP-M-0471, Attachment 16 Error for 1E22-F006	May 18, 2005
00336754	USAR Appendix F, Table 1.8-2 Error for 1E12-F051A/B	May 19, 2005
00336777	CPS 3309.01 References Precaution Step That Does Not Exist	May 19, 2005
00336789	9080.21 Test Results Not Filled Out On Cover Sheet	May 19, 2005
00343489	NRC FP Question on Spurious Actuation of HPCS Due to Fire	June 13, 2005

CORRECTIVE ACTION PROGRAM DOCUMENTS (CRs) ISSUED PRIOR TO INSPECTION

Number	Description or Title	Date or Revision
00092323	Apparent Failure to Include Breakers for Appendix R Tests	January 25, 2002
00092428	Review Manual Actions for Draft Procedure CPS 3213.04	January 25, 2002
00164874	NOS ID' Safe Shutdown Emergency Light Failures During FP Audit	June 25, 2003
00165145	NOS ID Surveillance Retrievability issues	June 26, 2003
00165146	NOS ID Appendix R Fire Related Barrier Cable Penetration Issue	June 26, 2003
00165148	NOS ID Fire Seal Identified with Damage	June 26, 2003
00166068	Inadequate Implementation of RM-AA-101, Interim Records Storage	July 2, 2003
00166515	Completed Quality Records Not Vaulted per Walkdown Schedule	July 7, 2003
00205058	'A' Fire Pump High Jacket Water Temperature	March 1, 2004
00223966	Halon Below Minimum Spec	May 26, 2004
00227098	Ion Detectors Requires Repair/Replacement	June 9, 2004
00228089	Flow Switch Failed to Reset	June 13, 2004
00229404	Oil Weeps From New Head Gaskets	June 17, 2004
00234098	Smoke Detector Has Incorrect Device ID	July 6, 2004
00234396	Smoke Detector 23-10 Has Broken Base	July 7, 2004
00231326	Smoke Detector Failure	June 24, 2004
00249951	Event Review Shows Fire Protection (FP) Functional Failure	September 3, 2004
00251975	0FS-FP028 Flow Switch Would Not Alarm During 3822.01C004	September 11, 2004
00251977	0FS-FP030, Flow Switch Alarm Would Not Reset	September 11, 2004

CORRECTIVE ACTION PROGRAM DOCUMENTS (CRs) ISSUED PRIOR TO INSPECTION

Number	Description or Title	Date or Revision
00252047	Flow Switch for 0FP630 Failed to Actuate	September 11, 2004
00252051	Flow Switch 0FS-FP026 Failed to Actuate	September 11, 2004
00274393	Fire Protection Flow Switch Failed to Actuate	November 17, 2004
00274394	Fire Protection Flow Switch Failed to Actuate	November 17, 2004
00257842	Damaged Sealtight	September 24, 2004
00277726	C1R10 Design and Scope Add Needed to Resolve TMOD 352354	November 30, 2004
00285367	1H13-U703 Halon Panel in Alarm Frequently	December 23, 2004
00291079	H13-U704 Panel Spurious Alarm	January 15, 2005
00291330	Multiple Halon Panel Alarms in the Main Control Room	January 16, 2005
00296531	Fire Safe Shutdown Training is Not Re-Occurring	February 1, 2005
00307519	FASA Enhancements	February 4, 2005
00314396	FSSD Offsite Power Analysis is Not Maintained or Complete	March 18, 2005
00314591	PCS Phone Use As Communications For Post-Fire Safe Shutdown	March 18, 2005
00318622	FP FASA Recommendation: Improve Detail For HPCS Termination	March 29, 2005

DRAWINGS

Number	Description or Title	Date or Revision
ASP-10	Automatic Sprinkler Corporation of America Drawing Showing Suppression System in Rail Road Bay, Fuel Bldg. System 11	24
CPS-SSD-FD-101	High Pressure Core Spray (HP) Safe Shutdown Flow Diagram	0
CPS-SSD-LOG-003	Appendix R Safe Shutdown Logic Diagram	2
EO2-1AP03	Electrical Loading Diagram	AA
E02-1AP99 , Sh. 13	Schematic Diagram, 4160 V Bus 1A1 DG Feed Breaker 252-DG1KA	AE
E02-1AP99, Sh. 23	Schematic Diagram, 4160 V Feed BKR 252-AT1AA1	K
E02-1DG99, Sh. 10	Schematic Diagram, DG 1A Control Part 3	W
E02-1DG99 , Sh. 11	Schematic Diagram, DG 1A Control Part 4	S
E02-1FP99, Sh.101	Schematic Diagram, Fire Protection and Detection Systems	D
E02-1FP99, Sh. 102	Schematic Diagram, Fire Protection and Detection Systems	F
E02-1FP99, Sh. 103	Schematic Diagram, Fire Protection and Detection Systems	D

DRAWINGS

Number	Description or Title	Date or Revision
E02-1FP99, Sh. 104	Schematic Diagram, Fire Protection and Detection Systems	E
E02-1FP99, Sh. 105	Schematic Diagram, Fire Protection and Detection Systems	D
E02-1FP99, Sh. 106	Schematic Diagram, Fire Protection and Detection Systems	D
E02-1FP99, Sh. 107	Schematic Diagram, Fire Protection and Detection Systems	D
E02-1FP99, Sh. 108	Schematic Diagram, Fire Protection and Detection Systems	C
EO2-1HP99, Sh.110	Schematic Diagram HPCS Power Supply System (1E22-1070)	H
EO2-1HP99, Sh.501	Schematic Diagram HPCS Suct Valve (1E22-F001) and HPCS Pump Disch Valve (1E22-F004)	J
EO2-1HP99, Sh.503	Schematic Diagram HPCS Min Flow Vlv (1E22-F012) and HPCS Suct Vlv (1E22-F015)	H
E02-1RS99, Sh. 3	Schematic Diagram, Remote Shutdown System Transfer Switches	G
E02-1RS99, Sh.101	S/D Remote Shutdown System (RS) 1C61-1050	U
E02-1SX99, Sh.19	Schematic Diagram, Div. 1 Cross Tie Vlv 1SX011A and Div. 1 Fuel Pool Make up Inlet Vlv 1SX016A	U
E02-1SX99, Sh. 43	Schematic Diagram, RHR Heat Exchanger 1A and 1B, Demin. Water Inlet Valves	M
E03-1DC13E	External Wiring Diagram 125V DC MCC 1A (1DC13E)	R
E03-1DC14E	External Wiring Diagram 125V DC MCC 1B (1DC14E)	K
E03-1E22-S004, sh. 8	Internal-External Wiring Diagram 4.16kV Bus 1C1 (1E22-S004), Units 104,105,106	
E03-1C61-P001	External Wiring Diagram Remote Shutdown Panel 1C61-P001D	W
E03-1C61-P001 Sh. 6	External Wiring Diagram Remote Shutdown Panel 1C61-P001C,	AA
M28-1001-03A-BC	Fuel Bldg. EL. 737, Area 3, Walls and Floors - Barrier Classification	C
E28-1001-02A-EI	Electrical Installation Fuel Bldg., EL. 737, Area 2	N
E28-1001-03A-EI	Electrical Installation Fuel Bldg., EL.737', Area 3	V
E28-1001-06A-EI	Electrical Installation fuel Bldg. EL. 737, Area 6	K
E30-1004-01A-FP	Fire Detection System Control Bldg. EL. 800, Area 1	C
E30-1004-02A-FP	Fire Detection System Control Bldg. EL. 800, Area 2	B
E30-1004-04A-FP	Fire Detection System Control Bldg. EL. 800, Area 4	D
E30-1004-05A-FP	Fire Detection System Control Bldg. EL. 800, Area 5	C
E30-1003-05A-FP	Fire Detection System Control Bldg. EL. 762, Area 5	A
E30-1003-04A-FP	Fire Detection System Control Bldg. EL. 762, Area 4	A
M28-1001-02A-BC	Fuel Building Ground FLR Plan - EL 737'-0" Area-2 Walls and Floors - Barrier Classification	D

DRAWINGS

Number	Description or Title	Date or Revision
M28-1001-04A-BC	Fuel Building Ground FLR Plan - EL 737'-0" Area-4 Walls and Floors - Barrier Classification	D
M28-1001-04A-BC	Fuel Building Ground FLR Plan - EL 737'-0" Area-5 Walls and Floors - Barrier Classification	D
MO1-1109 Sh.3	General Arrangement Control BLDG Floor Plan EL. 781'-0"	D
MO5-1074	P&ID High Pressure Core Spray (HP)	AG
MO5-1002,Sheet 1and 6	P&ID Main Steam (MS)	U, K
MO5-1005,Sh. 1	P&ID Reactor Feed Water (FW)	AC
MO5-1052,Sh.1 and 2	P&ID Shutdown Service Water (SX)	AT, AL, AH
MO5-1072,Sh. 2	P&ID Reactor Recirculation (RR)	AF
MO5-1075,Sh. 1,2,3 and 4	P&ID Residual Heat Removal	AW, AK, AF, AE
MO5-1079,Sh. 1-2	P&ID Reactor Core Isolation Cooling (RCIC)	AG, AH
CPS-SSD-FD-001	Table of Contents Safe Shutdown Flow Diagram	0
CPS-SSD-FD-101	High Pressure Core Spray (HP) Safe Shutdown Flow Diagram	0
CPS-SSD-FD-102,Sheets 1-2	Reactor Core Isolation Cooling (RCIC) Safe Shutdown Flow Diagram	0
CPS-SSD-FD-103A	Residual Heat Removal System - Train A - Supp. Pool Cooling Safe Shutdown Flow Diagram	0
CPS-SSD-FD-103B	Residual Heat Removal System - Train A - Normal Shutdown Cooling Safe Shutdown Flow Diagram	0
CPS-SSD-FD-103C	Residual Heat Removal System - Train A - Alternate Shutdown Cooling Safe Shutdown Flow Diagram	0
CPS-SSD-LOG-101, Sh. 1	HPCS Safe Shutdown Logic Diagram	2
CPS-SSD-LOG-217, Sh. 1	Div. 3 DG A Electrical Distribution Safe Shutdown Logic Diagram	2
P435-PC-5678-RW, Shts. 6,15,16, 17,19,20,21,22,23	Fuel Bldg. Detection Drawing by Pyrotronics	1
Brand FP svcs Dwg. 104, Sh. 1	Typical detail for 12" SF-150 NH, Pipe/Sleeve Through Barrier	6
Brand FP svcs Dwg. 112, Sh. 1	Typical detail for 12" SF-150 NH, for Cable Through Fire/radiation Barrier	5
Brand FP svcs Dwg. 101, Sh. 1	Typical detail for 12" SF-20 Silicon Foam Pipe/sleeve Through Barrier	5

GL 86-10 EVALUATIONS

Number	Description or Title	Date or Revision
2001-10-01	86-10 Evaluation for the Elimination of 1E51-F095 Vlv	November 7, 2001
2001-10-02	86-10 Evaluation for the Impact of EC 332051 on Calc. IP-M-0177	October 30, 2001
2001-10-03	86-10 Evaluation for the Impact of EC332120 on Calc. IP-M-0177	October 31, 2001
2001-12-02	86-10 Evaluation for the Impact of EC 333457 on Calc. IP-M-0177	December 20, 2001
2002-11-01	86-10 Evaluation for the Impact of USAR Change 10-128	November 20, 2002
2002-11-02	CPS Fire Protection Program NFPA Code Conformance Evaluation	November 20, 2002
2001-11-01	86-10 Evaluation for the Impact of EC 333260 on Calc. IP-M-0177	November 2, 2001

MISCELLANEOUS

Number	Description or Title	Date or Revision
OP-CL-101-102-1001	CPS Minimum On-Shift Staffing Functions	1
	CRS Turnover Checklist (Shift Roster)	May 3, 2005
	Cable Tabulation - Main File (S101-1); Pages CM 34 to 37, 70-82	December 15, 2004
LS-MW-107-1001	(USAR) Change Request Form: Fire Protection System Clarifications After Inspection	January 17, 2005
NFPA 72E	Standard on Automatic Fire Detectors	1990 Edition
	NFPA Code Conformance Evaluation, Clinton Power Station	Revision 18
ECN 31344	Engineering Change Notice	February 1, 1999
NRC	NRC Regulatory Issue Summary “Risk-Informed	Revision 1
RIS 2004-003	Approach for Post-Fire Safe-Shutdown Circuit Inspections”	December 29, 2004
FASA 284480	Focused Self-Assessment in Preparation for NRC Triennial Fire Protection Inspection	April 4, 2005
NOSAPA-CL-05-1Q	Control of Transient Combustible Material	March 1, 2005
NOSPA-CL-05-1Q	Fire Protection Equipment Material Condition	March 22, 2005
IPEEE Sec. 4.6	Analysis of Plant Systems, Sequences, and Plant Response	
ACE, AR00166068	Apparent Cause Evaluation	September 18, 2003
	Open Impairment List	April 12, 2005
CN87011	Remote Shutdown Training Lesson Plan	2
LP85433	Remote Shutdown Panel Training Lesson Plan	4

MISCELLANEOUS

Number	Description or Title	Date or Revision
	Fire Safe Shutdown Training From CPS 1893.04 Appendix A, B, C	Jan - March 2005
EOP-8	EOP Technical Bases for Secondary Containment Control	4
NPF-62	Facility operating License, Clinton Power Station U-1	April 17, 1987
USAR Appendix E	Section 3.5.1, Fire Hazards Analysis for Fire Area F-1	January 2005
USAR Appendix F	Section 1.0, Safe Shutdown Analysis	January 2005
USAR Appendix F	Section 4.2, Deviations	January 2005
USAR change 2004-013	Various Changes to FPER (USAR App. E)	June 9, 2004
USAR change 10-021	Revision to App. E to Address Deviation for Large Partitioned Penetration Seals	March 27, 2001
USAR change 9-300	Update to USAR App. E to Remove Inconsistencies with App. F	October 2, 2000
Operational Requirements Manual (ORM)	Section 6.8, Procedures and Programs	September 2004
EE-00-148	Engineering Evaluation of Fire Detector Testing Frequency	Revision 0
ECN 29595	Deletion of Steam Condensing Mode of RHR (Div. 1)	May 20, 1996
ECN 29596	Deletion of Steam Condensing Mode of RHR (Div. 2)	May 20, 1996

PRE-FIRE PLANS

Number	Description or Title	Date or Revision
CPS 1893.04M353	781 Control: Div 3 Switchgear and Battery Room (CB-5a, b) PreFire Plan	5
CPS 1893.04M364	800 Control: Main Control Room (CB-6a) PreFire Plan	2a
CPS 1893.04M410	737' Fuel: Grade Level (F-1j, k, m, n, o, p) PreFire Plan	3

PROCEDURES

Number	Description or Title	Date or Revision
CC-AA-309	Control of Design Analyses	4
CC-AA-311	Drawing Creation and Revision	4
OP-AA-201	Fire Protection Program	4
CPS 1893.04	Fire Fighting	10
CPS 1893.06	Fire Protection Maintenance and Testing Program	10
CPS 3002.01	Heat up and Pressurization	27a
CPS 3309.01	High Pressure Core Spray	14e
CPS 3309.01E001	High Pressure Core Spray Electrical Lineup	7

PROCEDURES

Number	Description or Title	Date or Revision
CPS 3312.01V001	Residual Heat Removal Valve Line up	13
CPS 3822.16	Safe Shutdown Pathway Emergency Lighting Functional Test	9a
CPS 3822.16C001	Safe Shutdown Pathway Emergency Lighting Functional Test Checklist	12a
CPS 3822.16C002	Hand-Held Emergency Lighting Functional Test Checklist	1a
CPS 3822.17	Emergency Lighting Battery Pack Verification and Testing	13a
CPS 3822.17C001	Safe Shutdown Emergency Light Checklist (Group 1)	11a
CPS 3822.17C006	Safe Shutdown Hand-Held Emergency Light Checklist (Group 6)	2a
CPS 4003.01	Remote Shutdown (RS)	13a
CPS 4003.01C001	RSP - Pressure Control	0
CPS 4003.01C002	RSP - RCIC Operation	2a
CPS 4003.01C003	RSP - RCIC Alarm Light Responses	1
CPS 4003.01C004	RSP - Diesel Generator 1A Operation	0
CPS 4003.01C006	RSP - Div 1 LPCI Operation	0
CPS 4003.01C008	RSP - Div 1 Shutdown Cooling Operation	1a
CPS 4406.01	EOP-8 Secondary Containment Control	26
CPS 8410.04	Molded case Ckt Breaker/Bucket Component Functional Testing and Maintenance	December 28, 2004
CPS 9027.01	RSP Operability Check (change 30a)	March 25, 2002
CPS 9027.01C007	RSP Operability - SX Checklist	December 9, 2003
CPS 9061.11	Div 1 SRV/IA Tests	February 21, 2004
CPS 9071.03	Fire Protection Water System Valve Cycling-testable Valves	25a
CPS 9071.19C001	Fire Protection Valve Line up Checklist (Safety-related)	31b
CPS 9071.19C002	Fire Protection Valve Line up Checklist (Non-safety-related)	29c
CPS 9337.81	Fire Detector Channel Functional	34a
CPS 9601.01	Fire Rated Assemblies and Penetration Sealing Devices	27b
CPS 9601.06	Fire Door and Secondary Containment Doors Inspections	28b
CPS 9601.10C001	Fire Protection Sprinkler System Visual Inspection Checklist for Safety-related Systems	22a
CPS 9080.21	Diesel Generator 1A - ECCS Integrated	February 12, 2004
OP-CL-101-102-1001	CPS Minimum On-Shift Staffing Functions	1
CPS operations department policy No. 18	Guidance for Identification, Establishment and Maintenance of Protected Equipment	January 10, 2005
EE-01.00	Safe Shutdown Cable Selection	October 14, 1998

Number	Description or Title	Date or Revision
00652832	Perform CPS 3822.05 Semi Annual Halon Functional	April 23, 2004
00609356	Perform CPS 3822.17C001 Battery Discharge Test	August 2, 2004
00147481	Ion Detector Requires Repair/Replacement	March 24, 2005
00149619	Smoke Detector Has Incorrect ID	July 7, 2004
00149739	Smoke Detector 23-10 Has Broken Base	July 8, 2004
00448840	Smoke Detector Failure	November 18, 2004
00734988	0FS-FP030, Flow Switch Alarm Would Not Reset	April 22, 2005
00742065	Repair Damaged Sealtight	October 4, 2004
00155159	Flow Switch 0FS-FP026 Failed to Actuate	September 14, 2004
00161249	Fire Protection Flow Switch Failed to Actuate	November 18, 2004
00161248	Fire Protection Flow Switch Failed to Actuate	November 18, 2004
00147691	Flow Switch Failed to Reset	June 14, 2004

LIST OF ACRONYMS USED

AC or ac	Alternating Current
ADAMS	Agency-Wide Document Access and Management System
BTP	Branch Technical Position
CFR	Code of Federal Regulations
CMEB	Chemical Engineering Branch
CPS	Clinton Power Station
CR	Control Room
DC or dc	Direct Current
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling System
FPP	Fire Protection Program
FPER	Fire Protection Evaluation Report
HPCS	High Pressure Core Spray
IMC	Inspection Manual Chapter
IPEEE	Individual Plant Examination of External Events
IR	Inspection Report or Issue Report
MCB	Main Control Board
MCC	Motor Control Center
MOV	Motor Operated Valve
NFPA	National Fire Protection Association
NRC	U. S. Nuclear Regulatory Commission
S/D	Schematic Diagram
SDP	Significance Determination Process
SSA	Safe Shutdown Analysis (SSA)
SSCs	Structures, Systems, and Components
SSEL	Safe Shutdown Equipment List
USAR	Updated Safety Analysis Report
V or v	Volt
W/D	Wiring Diagram