June 18, 2008

Mr. Charles G. Pardee
Chief Nuclear Officer
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville IL 60555

SUBJECT: CLINTON POWER STATION
TI 2515/171 VERIFICATION OF SITE SPECIFIC IMPLEMENTATION OF B.5.b PHASE 2 AND 3 MITIGATING STRATEGIES
INSPECTION REPORT NO. 05000461/2008007(DRS)

Dear Mr. Pardee:

On May 23, 2008, the U.S. Nuclear Regulatory Commission (NRC) completed a team inspection at your Clinton Power Station. The enclosed report documents the results of the inspection, which were discussed on May 23, 2008, with Mr. F. Kearney and other members of your staff.

The inspection examined activities conducted under your license as they relate to the implementation of B.5.b Phase 2 and 3 mitigating strategies, your compliance with the Commission's rules and regulations, and with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and representative records, observations of activities, and interviews with personnel.

Based on the results of the inspection, there were no NRC-identified findings.

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Sincerely,

/RA/

Hironori Peterson, Chief
Operations Branch
Division of Reactor Safety

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

Nonpublic Enclosure: Inspection Report 05000461/2008007(DRS)
w/Attachment: Supplemental Information

cc w/encl: D. Nelson, NRR/DPR/PSPB
J. Klinger, State Liaison Officer
Illinois Emergency Management Agency

cc w/o encl: Site Vice President - Clinton Power Station
Plant Manager - Clinton Power Station
Regulatory Assurance Manager - Clinton Power Station
Chief Operating Officer and Senior Vice President
Senior Vice President - Midwest Operations
Senior Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Director - Licensing and Regulatory Affairs
Manager Licensing - Clinton, Dresden and Quad Cities
Associate General Counsel
Document Control Desk - Licensing
Assistant Attorney General
Chairman, Illinois Commerce Commission

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DATE	06/17/08		06/17/08		06/18/08			

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Letter to Charles G. Pardee from Hironori Peterson dated June 18, 2008.

SUBJECT: CLINTON POWER STATION TI 2515/171 VERIFICATION OF SITE SPECIFIC IMPLEMENTATION OF B.5.b PHASE 2 AND 3 MITIGATING STRATEGIES INSPECTION REPORT NO. 05000461/2008007(DRS)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	05000461/2008007(DRS)
Licensee:	AmerGen Energy Company, LLC
Facility:	Clinton Power Station
Location:	Clinton, Illinois
Dates:	May 19-23, 2008
Inspectors:	B. Palagi, RIII Lead Inspector D. Reeser RIII Inspector J. Bowen, NRR Inspector
Approved by:	H. Peterson, Chief Operations Branch Division of Reactor Safety

Enclosure

SUMMARY OF FINDINGS

IR 05000461/2008007(DRS); 05/19/08 - 05/23/08; Clinton Power Station; TI 2515/171 Verification of Site Specific Implementation of B.5.b Phase 2 & 3 Mitigating Strategies.

This report covered a one week announced inspection in accordance with Temporary Instruction (TI) 2515/171, Verification of Site Specific Implementation of B.5.b Phase 2 and 3 Mitigating Strategies. The inspection was conducted by two regional inspectors and one NRR inspector.

No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4; dated December 2006.

A. Inspector-Identified and Self-Revealed Findings

No findings were identified.

B. Licensee-Identified Violations

None

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Other (TI 2515/171)

Review of Temporary Instruction 2515/171, Verification of Site Specific Implementation of B.5.b. Phase 2 and 3 Mitigating Strategies, Revision 0

The objective of this Temporary Instruction (TI) was to verify that the commitments for implementing the Phase 2 and 3 strategies were completed by the licensee. The strategies for Boiling Water Reactors (BWRs), such as Clinton Power Station, are listed in Table 2 of the TI. Inspection of all strategies listed in Table 2 was necessary to complete this TI. The inspectors discussed the strategies with plant staff, reviewed documentation, and, where appropriate, performed plant walkdowns to evaluate whether the strategies had been implemented by the licensee as stated in their site specific submittals (ML071420301 and ML070170524) and the Safety Evaluation Report (SER) (ML072050483). For most strategies, this included verification that the strategy was feasible, procedures and/or guidance had been developed, training had been provided to plant staff, and required equipment had been identified and staged. Specific details of the inspection activities are described below for each strategy reviewed.

1. Program Reviews

a. Inspection Scope

Procedures: The inspectors examined and discussed with various plant personnel all of the station's established guidelines and implementing procedures for the B.5.b mitigation strategies. The inspectors assessed how the licensee coordinated and documented the interface/transition between existing off-normal and emergency operating procedures with the newly developed mitigation strategies. The inspectors selected a number of mitigation strategies and conducted plant walkdowns with operators to: examine the adequacy and completeness of the procedures; familiarity of the operators with the procedure objectives and specific guidance; staging and compatibility of equipment; and the practicality of the operator actions prescribed by the procedures, consistent with the postulated scenarios. The inspectors also examined the licensee's plans and guidance associated with coordination of expected Emergency Response Organization (ERO), fire brigade, and security guard force response coincident with implementation of the B.5.b mitigation strategies.

Engineering Evaluations and Calculations: The inspectors reviewed the licensee's supporting engineering evaluations and calculations prepared as the basis that the available portable diesel-driven pump, piping, hose, and nozzle configurations used in the various mitigation strategies would provide the minimum required pressures and flows specified by the NEI 06-12 guidelines. The inspectors discussed these calculations and evaluations with the responsible engineers, independently reviewed the adequacy of

the calculations and engineering assumptions, and conducted field verifications to compare the assumed configurations with the as-found configurations.

Equipment: The inspectors evaluated the adequacy of installed and portable equipment staged explicitly for implementation of the mitigation strategies. The types of equipment examined included: existing outside fire water supply hydrants and hose stations; interior fire water supply piping and hose stations; portable diesel-driven pump and associated suction and discharge hoses, adapters, and tools; and equipment lockers. The inspectors review included field verification and inventory checks of standby and staged equipment. In addition, the inspectors evaluated the staging/storage locations of all B.5.b-related equipment to ensure the survivability and availability of equipment, with respect to the proximity (i.e., greater than 100 yards) to the postulated damage footprint. The inspectors also reviewed and discussed with responsible station personnel the results of any field testing of equipment performed to validate its applications in the postulated scenarios.

Modifications: Based upon discussions with responsible licensee representatives, no permanent plant modifications were made to support implementation of the B.5.b mitigation strategies.

Maintenance and Testing of Equipment: The inspectors reviewed licensee plans or existing programs for periodic maintenance and testing of the equipment specified for B.5.b applications to ensure continued reliability and minimum unavailability. The licensee is performing quarterly inventory of B.5.b equipment per site procedures CPS 3822.04C003, "Quarterly B.5.b. Fire Training Area Equipment Checklist," revision 1 and CPS 3822.04C006, "Quarterly OCA/NTD Fire Cage Checklist," Revision 0b. Various preventive maintenance testing and maintenance checks associated with B.5.b equipment, including annual testing with flow through the portable pump are under contract to be performed by the pump vendor (Godwin Pumps).

Training: The team examined the introductory and planned periodic/refresher training provided to the Operations Department staff most likely to be tasked with implementation of the B.5.b mitigation strategies. The team also reviewed the introductory and planned periodic training provided to the Emergency Response Organization (ERO). The team's review consisted of examination of training presentations and lecture notes, task to training matrices, tracer activity forms, attendance rosters as well as interviews with station personnel.

b. Findings

No findings of significance were identified.

2. Specific Strategy Assessment

NOTE: The Table numbers and Section numbers listed below for each strategy are those listed in NEI 06-12 for the given strategy.

2.2 SFP Internal Makeup (Table A.2-1): This strategy required a diverse means of SFP makeup with at least a concurrent makeup capability of 500 gpm beyond the normal SFP makeup capacity.

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns, where appropriate, the inspectors examined the following areas of interest: engineering basis to establish reasonable assurance that 500 gpm makeup could be provided via a diverse means; capacity of the water supplies used for SFP makeup; independence of the water makeup system power supplies; the feasibility of the strategy based upon the postulated plant conditions and accessibility of the SFP deck area; storage of required equipment, including tie-downs for flexible hoses and unmanned nozzles; compatibility of equipment connection devices and fittings with fixed plant equipment; adequacy of guidance provided in the plant procedure(s); and the adequacy of training provided to appropriate plant staff. The inspectors verified that guidance for SFP internal makeup was provided in site procedure CPS 4303.01P017, revision 1b, "Spent Fuel Pool Makeup from Fire Protection" Sections 1.1, "Spent Fuel Pool Approach," and 1.2, "Spent Fuel Submergence."

b. Findings

No findings of significance were identified.

2.3.1 SFP External Makeup (Table A.2-2): This strategy required the licensee to establish SFP makeup of at least 500 gpm using flexible hoses and a portable pump, capable of being manually deployed and delivering the minimum makeup flow (500 gpm) within 2 hours of the determination that this strategy was needed to cope with a significant breach in SFP integrity.

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns, where appropriate, the inspectors examined the following areas of interest: engineering basis to establish reasonable assurance that 500 gpm makeup could be provided for at least 12 hours using the portable diesel-driven pump; the basis that the portable pump and associated hose and adapters could reasonably be deployed within 2 hours after the decision was made to exercise this strategy; independence of the strategy from existing plant hardware or electrical power sources; reliability and availability of the water source; capacity of the water source (12 hours at 500 gpm); minimum of 12-hour fuel supply to the portable pump; connections and isolation capability of water source(s); storage

location of portable equipment with respect to damage foot print (i.e., greater than 100 yards); sufficient lengths of hose, necessary tools, and compatible equipment staged to support worst-case postulated conditions/configurations for this strategy; procedure adequacy; and operator training/familiarity with the strategy objectives and implementing procedure. The inspectors verified that guidance to provide external makeup to the SFP was provided in site procedure CPS 4303.01P017, revision 1b, "Spent Fuel Pool Makeup from Fire Protection" Sections 1.1, "Spent Fuel Pool Approach," and 1.2, "Spent Fuel Submergence." This mitigation strategy, like many others during this inspection, also relied on CPS 4303.01P008, "Emergency Fire Protection System Management," Revision 1 and CPC 4303.01F002, "Emergency Water Resource Management Guide," Revision 0. The implementing guidance for this strategy included steps to assist the licensee staff in determining whether the use of the external makeup strategy or the external spray strategy was appropriate.

b. Findings

No findings of significance were identified.

2.3.2 SFP External Spray (Table A.2-3): This strategy required the licensee to establish a minimum of 200 gpm effective flow to the SFP using one or more portable spray nozzles, supplied by a portable pump and a flexible fire hose configuration. This strategy must be capable of being manually deployed and delivering flow within 2 hours of the determination that the external spray strategy was needed.

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns, where appropriate, the inspectors examined the following areas of interest: the basis that the portable pump and associated hose and adapters for this SFP spray strategy could be reasonably deployed within 2 hours; the engineering basis or demonstration that a minimum of 200 gpm was delivered to the pool (accounting for spray pattern or over spray if using an oscillating nozzle); the reliability and availability of the water source; the capacity of the water source (i.e., 12 hours at 200 gpm); a minimum of 12 hours fuel supply to the portable pump; connections and isolation capability of water source(s); storage location of portable equipment with respect to the damage foot print (i.e., greater than 100 yards); sufficient lengths of hose, necessary tools, and compatible equipment staged to support worst-case postulated conditions/configurations for this strategy; procedure adequacy; operator training/familiarity with the strategy; and the licensee's plans to disperse spent fuel during refueling operations. The inspectors verified that guidance to provide external makeup to the SFP was provided in site procedure CPS 4303.01P017, revision 1b, "Spent Fuel Pool Makeup From Fire Protection" Sections 1.1, "Spent Fuel Pool Approach," and 1.3, "Spent Fuel Pool Spray." The implementing guidance for this strategy included steps to assist the licensee staff in determining whether the use of the external makeup strategy or the external spray strategy was appropriate.

b. Findings

No findings of significance were identified.

2.4 Additional Site-Specific SFP Makeup Strategies (Table A.2-4): From the site-specific Phase 2 SFP mitigation assessments documented in the Clinton Power Station May 16, 2007 submittal response (ML071420301) and reviewed by the staff (reference the Clinton Power Station Safety Evaluation Report (ML072050483) associated with License Amendment dated July 26, 2007), the licensee identified a number of strategies for providing makeup to the SFP that may be available following an event. For those viable strategies (capable of providing a substantial fraction of the 500 gpm makeup capacity, readily available, and accomplished with on-site equipment within the time available and conditions that could exist), the licensee made a determination as to which strategies would be "implemented" and which would be "listed" in site procedures or guidance.

a. Inspection Scope

Through discussions with plant staff and review of documentation, the inspectors verified that the licensee had developed implementing procedures for the viable SFP makeup strategies identified in their May 16, 2007, submittal information response. The inspectors verified that the licensee had prepared procedures to implement the strategies designated "implement" in Table A.2-4. These procedures included the following:

Develop a procedure for pumping suppression pool water to the Spent Fuel Pool utilizing RHR Pump A and piping associated with the Spent Fuel Pool Cooling Assist mode of operation.	CPC 4303.01P003, Revision 1
Develop procedures for draining water from the upper containment pools to the spent fuel pool utilizing 1) the IFTS tube, and 2) the reactor cavity bottom drain.	CPC 4303.01P002, Revision 1
Utilize hydrant houses south of the plant to provide Spent Fuel Pool makeup water.	CPC 4303.01P014, Revision 0a
Develop a strategy to use readily available damage control measures to facilitate stopping or slowing down a Spent Fuel Pool leak.	CPC 4303.01F001, Revision 0
Develop a strategy to use a fire truck and monitor nozzle to pump water from the truck bay to the Spent Fuel Pool.	CPC 4303.01P017, Revision 1b
Update existing MOUs with nearby agencies, or establish new ones, that specifically include assistance for providing Spent Fuel Pool Cooling, as well as providing spray scrubbing to Fuel Building effluent to reduce the potential of fission product release.	MOUs with the City of Clinton, Archer Daniel Midland, and the Fire Protection Districts of Hickory Point, Kenney, Maroa Countryside, Farmers City, and Kenney.

The inspectors verified that there were no strategies designated in Table A.2-4 as "list."

b. Findings

No findings of significance were identified.

2.5 SFP Leakage Control Strategies (Table A.2-5): This item identified, for the Emergency Response Organization, the on-site resources that could be used to reduce or stop leakage from a damaged SFP.

a. Inspection Scope

Through discussions with plant staff and review of documentation, the inspectors verified that the licensee had identified the types and locations of materials available onsite which could be used to reduce or stop leakage from a damaged spent fuel pool. The inspectors verified that guidance for SFP leakage control strategies was provided in site procedure CPC 4303.01F001, "Extensive Damage Mitigation Guide," Revision 0.

b. Findings

No findings of significance were identified.

3.2.2 Off-site and On-site Communications (Table A.3-1): The objective of this strategy was to improve the initial response of the available operational resources and enhance the capability for those resources to communicate with off site resources.

a. Inspection Scope

Through discussions with plant staff, security and review of documentation, the inspectors verified that the licensee had the ability for onsite and offsite communications with the normal means lost using diverse communication methods/systems. The team reviewed these communication resources and verified they were in place, being maintained, and that the staff was familiar with their operation. The team verified that procedures had been developed and training provided to address mustering the available plant staff, reestablishing communications, and coordinating operations and security personnel immediately following a large fire or explosion. This guidance was provided in site procedure CPC 4303.01, "Extensive Damage Mitigation Guide," Revision 3 including Attachment 2, "Communication Assessment for Damage to Key Structures," and Attachment 3, "Communication Capabilities."

b. Findings

No findings of significance were identified.

3.2.3 Notifications/ERO Activation (Table A.3-1): Potential damage to the command and control structure makes early notification and callout of the Emergency Response

Organization of significant importance. This strategy was intended to provide enhanced level of assurance that the proper notifications of the ERO occur and in a timely manner, in spite of the potential plant conditions.

a. Inspection Scope

Through discussions with plant staff and review of documentation, the inspectors verified that the licensee had developed plans or a process for establishing the command and control structure prior to the arrival of offsite resources and for making appropriate offsite notifications of the ERO and ERO callout in the event the control room or control room staff were substantially affected. This guidance was provided in site procedures CPC 4303.01, "Extensive Damage Mitigation Guide," Revision 3 and CPS 4303.01P018, "ERO Activation During Extreme Damage Event," Revision 0. Training had been provided to appropriate plant staff.

b. Findings

No findings of significance were identified.

3.2.4 Initial Operational Response Actions (Table A.3-1): Early actions to assure core cooling can minimize the potential for core damage or can assist in significantly delaying damage timelines. Given the potential limited onsite resources, it was important for the plant staff to focus on the key actions that may be able to prevent or delay a radiological release.

a. Inspection Scope

Through discussions with plant staff and review of documentation, the inspectors verified that a procedure and guidance had been developed which described the specific entry conditions for initial operational response actions. Guidance was provided in site procedure CPC 4303.01, "Extensive Damage Mitigation Guide," Revision 3 for initial actions for responding to an extreme damaging event causing loss of the Control Room command and control function. Other actions include procedure CPC 4303.01P020, "Emergency Confirmation of Reactor Scram," Revision 0. Training had been developed and provided to plant staff.

b. Findings

No findings of significance were identified.

3.2.5 Initial Damage Assessment (Table A.3-1): Under the postulated conditions, normal instrumentation may not be available. This strategy used available resources to perform an assessment of the plant and equipment conditions in order to assist the arriving ERO personnel in decision-making and implementation of appropriate/available mitigation strategies in a timely manner.

a. Inspection Scope

Through discussions with plant staff and review of documentation, the team verified that the licensee had developed guidance for the available onsite staff to perform an assessment of plant structures and equipment conditions following the event. The team also verified training has been developed and provided to the plant staff. Guidance was provided in site procedure CPC 4303.01, "Extensive Damage Mitigation Guide," Revision 3 including Attachment 1, "Damage Assessment of Key Structures,"

b. Findings

No findings of significance were identified.

3.4.1 Manual Operation of RCIC (Table A.5-1): This strategy provided a power-independent means to provide core cooling and prevent core damage.

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns, where appropriate, the inspectors evaluated whether the Reactor Core Isolation Cooling (RCIC) system could be operated manually without AC or DC power available. The inspectors verified that guidance to operate RCIC manually without onsite or offsite AC or DC power was provided in site procedure CPS 4303.01P013, "RCIC Manual Operation Without DC Control Power," Revision 0. The inspectors also verified that the instrumentation available to the operators to control the RCIC system (i.e., maintain reactor vessel level) were provided in site procedure CPC 4303.01P015, "Emergency RPV Level and Pressure Determination," Revision 0. The inspectors also verified training had been developed and provided to the appropriate plant staff.

b. Findings

No findings of significance were identified.

3.4.2 DC Power Supplies to Allow Depressurization of RPV and Injection with Portable Pump (Table A.5-2): This strategy provided a means to depressurize the reactor pressure vessel (RPV) using portable DC power supplies and provide makeup with low pressure systems or a portable powered pump.

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns, where appropriate, the inspectors evaluated the licensee's strategy to open safety relief valves by energizing solenoid(s) with a portable 125 VDC power supply at the remote shutdown panel or the containment electrical penetrations within the Aux Building. The team reviewed the licensee's procedure and equipment available to inject into the RPV

with a portable pump following depressurization, including the engineering basis to support the pump's capability to inject at a rate of 300 gpm for a period of 12 hours. The inspectors verified that guidance to allow depressurization of the RPV and injection with a portable pump was provided in site procedures CPS 4303.01P004, "SRV Operation with External DC Power," Revision 2a, CPS 4303.01P007, "Emergency RPV Makeup from Fire Protection" Revision 2 and CPS 4303.01P008, "Emergency Fire Protection System Management," Revision 1. The inspectors also verified training had been developed and provided to the appropriate plant staff.

b. Findings

No findings of significance were identified.

3.4.3 Utilize Feedwater and Condensate (Table A.5-3). All BWRs should already have a strategy in their Emergency Operating Procedures (EOPs) to provide makeup to the RPV from a source external to the Reactor Building.

a. Inspection Scope

Through discussions with plant staff and review of documentation, the inspectors reviewed the licensee's normal, off-normal, and EOPs to verify the operations staff use of the feedwater and condensate system following unit shutdown.

b. Findings

No findings of significance were identified.

3.4.4 Makeup to Hotwell (Table A.5-4). This strategy provided a high volume makeup source to the hotwell in order to supply feedwater/condensate for long term operation. This could utilize the portable pump, the fire protection system, or other existing sources. Makeup using clean water was preferable but not required. Unlike most other strategies, it can be assumed that AC and DC power were available and that there was access to the condenser.

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns, where appropriate, the inspectors evaluated whether an engineering basis had been established which provided reasonable assurance that a make-up flow of at least 300 gpm could be provided to the hotwell for a period of 12 hours, via the specified sources. The inspectors also verified that the necessary connection devices and fittings were compatible with plant fittings, and that a procedure had been developed for implementing this strategy. The inspectors verified that guidance to makeup to the hotwell was provided in site procedure CPS 4303.01P012, "Emergency Hotwell Makeup," Revision 1. The inspectors also verified training had been developed and provided to the appropriate plant staff.

b. Findings

No findings of significance were identified.

3.4.5 Makeup to RCIC Tank (Table A.5-5): In the event normal makeup to the RCIC Storage Tank is lost, this strategy provided an alternative large volume makeup source to the RCIC Storage Tank to support long term operation of RCIC. This strategy could utilize the portable pump, the fire protection system or other existing sources. Makeup using clean water was preferable but not required. It was assumed that there was no onsite or offsite AC or DC power (LIPD), but that areas around the RCIC Storage Tank would be accessible.

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns, where appropriate, the inspectors evaluated whether an engineering basis had been established which provided reasonable assurance that a makeup flow of at least 300 gpm could be provided to the RCIC Storage Tank for a period of 12 hours, via the specified sources. The team also verified that the necessary connection devices and fittings were compatible with plant fittings, and that a procedure had been developed for implementing this strategy. The inspectors verified that guidance to makeup to the RCIC Storage Tank was provided in site procedures CPC 4304.01P016, "Emergency RCIC Tank Makeup from Fire Protection" revision 0 and CPS 4303.01P008, "Emergency Fire Protection System Management," Revision 1. The team also verified training had been developed and provided to the appropriate plant staff.

b. Findings

No findings of significance were identified.

3.4.6 Maximize Control Rod Drive Flow (Table A.5-6). This strategy provided a means to makeup to the RPV from a source independent of emergency core cooling system (ECCS). All BWRs currently include this strategy in EOPs. However, guidance to maximize CRD flow by starting the second pump, operating additional flow control paths, and bypassing filters should be verified. This strategy assumed that the CRD pumps and valves were accessible.

a. Inspection Scope

Through discussions with plant staff and review of documentation, and plant walkdowns, where appropriate, the inspectors verified that procedures were in place to ensure the early maximizing of CRD flow from a postulated event. The inspectors verified that guidance to maximize CRD flow was provided in site procedure EOP-1, "RPV Control." The inspectors also verified training had been developed and provided to the appropriate plant staff.

b. Findings

No findings of significance were identified.

3.4.7 Procedure to Isolate RWCU (Table A.5-7). All BWRs should already include this strategy in their EOPs.

a. Inspection Scope

Through discussions with plant staff and review of documentation, and plant walkdowns, where appropriate, the inspectors verified that procedures were in place to ensure the early isolation of the RWCU system to minimize the potential for RPV inventory losses from a postulated event. The inspectors verified that guidance to isolate Reactor Water Clean Up (RWCU) was provided in the station's imminent threat procedure. The inspectors also verified training had been developed and provided to appropriate plant staff.

b. Findings

No findings of significance were identified.

3.4.8 Manually Open Containment Vent Lines (Table A.5-8). This strategy provided a power-independent means to remove heat from containment by locally opening containment vent pathways. The strategy assumed there was no onsite air supply or on-site/off-site AC or DC power available.

a. Inspection Scope

Through discussions with plant staff and review of documentation, and plant walkdowns, where appropriate, the inspectors evaluated the licensee's strategy to manually open, and if necessary close, containment isolation valves without the availability of onsite AC or DC power or plant supplied instrument air. The inspectors verified the proper storage/staging of the equipment used to implement the strategy and reviewed the adequacy of the procedure developed for this strategy. The inspectors verified that guidance to manually open containment vent lines was provided in site procedure CPC 4303.01P001, "Containment Venting Without AC Power Available," Revision 2a. The team also verified training had been developed and provided to the appropriate plant staff.

b. Findings

No findings of significance were identified.

3.4.9 Inject Water into the Drywell (Table A.5-9). This strategy used a portable pump or other existing portable pumping resources to inject water into the drywell to provide cooling of

the core debris and scrubbing of fission products. A loss of onsite and offsite AC or DC power was assumed. Access to the Reactor Building and the capability to operate RCIC was assumed, including credit for additional time to implement this strategy. The flow may be directly to the drywell (e.g., via drywell spray) or routed through the (assumed failed) reactor pressure vessel (e.g., via ECCS systems) or via any other system capable of delivering water to the drywell.

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walkdowns, where appropriate, the inspectors evaluated the licensee's strategy for injecting water into the drywell using the portable pump. The inspectors verified that an implementing procedure and an engineering basis was established to provide assurance that at least 300 gpm could be provided for a period of 12 hours, and that pump discharge pressure would overcome drywell design pressure. The inspectors also reviewed the compatibility of equipment connection devices, and fittings with plant hardware. The inspectors verified that guidance to inject water into the drywell was provided in site procedures CPS 4303.01P014, "Emergency Drywell Flooding From Fire Protection," Revision 0a and CPS 4303.01P008, "Emergency Fire Protection System Management," Revision 1. The inspectors also verified training had been developed and provided to the appropriate plant staff.

b. Findings

No findings of significance were identified.

3.4.10 Portable Sprays (Table A.5-10): This strategy used portable sprays to reduce the magnitude of any fission product releases by spraying the release point of affected plant structures. The Fire Protection System may be used as the water supply for the portable pump.

a. Inspection Scope

Through discussions with plant staff and review of documentation, the inspectors evaluated the licensee's strategy to minimize the magnitude of any fission product release by spraying the release point with a portable spray system. The inspectors verified the spray delivery system was capable of providing 200 gpm with the Hickory Point Fire Department ladder truck and installed monitor nozzle, alone, or in conjunction with an unmanned monitor nozzle installed on an adjacent building roof spraying on the release point. The team verified the adequacy of the implementing procedure and that the licensee had a Memorandum of Understanding (MOU) regarding this strategy with various local fire departments. The inspectors verified that guidance for portable sprays was provided in site procedures CPS 4303.01P011, "Spray Scrubbing and Control of Radioactive Material Runoff," Revision 1 and CPS 4303.01P008, "Emergency Fire Protection System Management," Revision 1. The inspectors also verified training had been developed and provided to the appropriate plant staff.

b. Findings

No findings of significance were identified.

3.5 Disposition of Site-Specific Enhancement Strategies (Table A.6-1): The readily available measures and candidate enhancement strategies were documented by the licensee in the Clinton Power Station May 16, 2007 submittal response (ML071420301) and reviewed by the staff (reference the Clinton Power Station Safety Evaluation Report associated with License Amendment dated July 26, 2007). The licensee made a determination as to which strategies would be "implemented" and which would be "listed" in site procedures or guidance.

a. Inspection Scope

Through discussions with plant staff and review of documentation, the inspectors verified that the licensee had prepared procedures to implement the strategies designated "implement" in Table A.6-1. These strategies and where they were implemented included the following:

Develop procedures and pre-stage equipment to provide an alternate means of powering (480 VAC) the condensate transfer (CY) pumps and supply RCS makeup through the emergency core cooling systems (ECCS) to flush water lines.	CPS 4303.01P005, Revision 2, Emergency RPV Makeup from Cycled Condensate System
Develop procedure and pre-stage equipment to cross-connect SX to the HPCS system for RPV injection (200 gpm vs. 300 gpm needed). RCS depressurization needed.	List (Flow limited to 75 gpm) the Intent of strategy is met using CPS 4303.01p007 (see report Section 3.4.2)
Develop procedures and pre-stage equipment to re-power the Division 2 hydrogen igniters from portable/alternate power source.	CPS 4303.01P019, Revision 1, Hydrogen Igniter Operation with External AC Power
Develop procedures and pre-stage equipment to re-power the Division 2 hydrogen mixer from portable/alternate power source.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedures and pre-stage equipment to cross-connect firewater through SX and WS to RHR B containment spray (CS) mode.	CPS 4303.01P026, Revision 0, Emergency Containment Spray Makeup From Fire Protection
Develop procedures and pre-stage equipment to vent containment from the upper to the lower SFP through the fuel pool cooling and purification (FC) system.	CPS 4303.01P001, Revision 2a, Containment Venting Without AC Power Available
Develop procedures and pre-stage equipment to provide a connection to fill the suppression pool (SP) with firewater.	CPS 4303.01P014, Revision 0a, Emergency Drywell Flooding From Fire Protection

Develop procedures and pre-stage equipment to provide an external spray to scrub effluent.	CPS 4303.01P011, Revision 1, Spray Scrubbing and Control of Radioactive Material Runoff
Develop procedures and pre-stage equipment to provide alternate 480 V ac power to the RPV head vent motor operated valves for depressurization.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedures and pre-stage equipment to allow use of the auxiliary boiler feed pumps to provide makeup to the RCS. RCS depressurization needed.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedures and pre-stage equipment to provide an alternate means of powering the turbine bypass to depressurize the RCS through the main steam isolation valve bypass line.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedure and pre-stage equipment to align the condensate pump discharge, the CY system, or the demineralized water system, to the CRD suction header.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedures and pre-stage equipment to re-power the Division 2 hydrogen mixer from portable /alternate power source.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedures and pre-stage equipment to vent containment through the integrated leak rate test (ILRT) pathway.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedures and pre-stage equipment to vent containment through hydrogen purge line to standby gas treatment system.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedures and pre-stage equipment to cross-connect from the condensate storage tank (CST) through HPCS and RCIC to the damage (drained) SP to provide SP cooling.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies
Develop procedures and pre-stage equipment to provide an alternate means of powering the standby liquid control pumps to provide high pressure flow to the reactor pressure vessel.	CPS 4303.01P029, Revision 0, Additional Extensive Damage Mitigating Strategies

The inspectors verified that the licensee had provided training had been developed and provided to appropriate plant staff.

b. Findings

No findings of significance were identified.

4OA6 Meetings

.1 Exit Meeting

On May 23, 2008, the inspectors presented the preliminary inspection results to Mr. F. Kearney and other Clinton Power Station personnel. The inspectors stated that they had reviewed proprietary and confidential information during the inspection but that the information would not be included in the cover letter of the inspection report. However, the details of the report would be included in an Enclosure that would be handled as Official Use Only-Security-Related Information that would be withheld from public disclosure.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
F. Kearney, Site Vice President
C. Williamson, Security Manager
S. Gackstetter, Regulatory Assurance Manager
J. Rappeport, Chemistry Manager
R. Weber, Sr. Manager Design Engineering
T. Charles, Operations Superintendent
J. Conner, Operations Director
J. Ellis, Work Management Director
R. Peak, Site Engineering Director
C. VanDenburgh, Nuclear Oversight Manager
S. Deal, Fire Marshal
R. Frantz, Regulatory Assurance
S. Lakebrink, Engineering
P. Ryan, Operations
D. Helker, Fleet B.5.b Project Manager
G. Mosley, Operations Support/Services Manager
J. Waddell, Security
R. Zacholski, Operations Support Manager
J. Lindsey, Training Director
T. Jennings, Training
M. Otten, Training

Nuclear Regulatory Commission
B. Dickson, Senior Resident Inspector
B. Kemker, Senior Resident Inspector
D. Lords, Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened, Closed, and 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 inspectors 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.

Inspection Procedure TI 2515/171

CALCULATIONS

Number	Description or Title	Date or Revision
EC 364303	Clinton Power Station B.5.b Evaluation Details including associated attachments	0

CORRECTIVE ACTION PROGRAM DOCUMENTS ISSUED AS A RESULT OF INSPECTION

Number	Description or Title	Date or Revision
00778397	B.5.b Procedure/Process Enhancements	May 22, 2008

CORRECTIVE ACTION PROGRAM DOCUMENTS REVIEWED

Number	Description or Title	Date or Revision
00706514	Track Corporate on preventive maintenance for B.5.b equipment	December 3, 2007

MEMORANDUMS

Number	Description or Title	Date or Revision
	Memorandum of Understanding with Archer Daniels Midland	August 30, 2005
	Memorandum of Understanding with Hickory Point Fire Protection District	April 10, 2006
	Memorandum of Understanding with Maroa Countryside Fire Protection District	August 9, 2005
	Agreement to Furnish Fire Protection with Farmer City, Illinois	December 11, 2006
	Agreement to Furnish Fire Protection with The Fire Protection District of Kenney, Illinois	April 27, 2005
00433182	Contract with the City of Clinton to Furnish Fire Protection	March 27, 2008

MISCELLANEOUS LETTERS

Number	Description or Title	Date or Revision
ML071420301	Letter from AmerGen Energy Company, LLC/Exelon Generation Company, LLC to NRC; Response Providing Information Regarding Implementation Details for the B.5.b Phases 2 and 3 Mitigation Strategies, including Responses to Request for Additional Information	May 16, 2007
ML072050005	Letter from NRC to AmerGen Energy Company, LLC – Clinton Power Station, Unit No. 1 - Conforming License Amendment to Incorporate the Mitigation Strategies Required by Section B.5.b of Commission Order EA-02-026 and the Radiological Protection Mitigation Strategies Required by Commission Order EA-06-137	July 26, 2007

PROCEDURES

Number	Description or Title	Date or Revision
CPS 3822.04C003	Quarterly B.5.b Fire Training Area Equipment Checklist	1
CPS 3822.04C006	Quarterly OCA/NTD Fire Cage Checklist	0b
CPS 4303.01	Extensive Damage Mitigation Guide	3
CPS 4303.01F001	Extensive Damage Mitigation Guide	0
CPS 4303.01F002	Emergency Water Resource Management Guide	0
CPC 4303.01P001	Containment Venting without AC Power Available	2a
CPC 4303.01P002	Spent Fuel Pool Makeup from Containment Pool	1
CPC 4303.01P003	Spent Fuel Pool Makeup from Suppression Pool	1
CPS 4303.01P004	SRV Operation with External DC Power	2a
CPS 4303.01P005	Emergency RPV Makeup from Cycled Condensate System	2
CPS 4303.01P006	Emergency RPV Makeup from Makeup Condensate System	2
CPS 4303.01P007	Emergency RPV Makeup from Fire Protection	2
CPS 4303.01P008	Emergency Fire Protection System Management	1

CPS 4303.01P009	Aligning External Power for CY and MC Pump Operation	1
CPS 4303.01P010	Emergency Makeup to The CY Tank	1
CPS 4303.01P011	Spray Scrubbing and Control of Radioactive Material Runoff	1
CPS 4303.01P012	Emergency Hotwell Makeup	1
CPS 4303.01P013	RCIC Manual Operation without DC Control Power	0
CPS 4303.01P014	Emergency Drywell Flooding from Fire Protection	0a
CPC 4303.01P015	Emergency RPV Level and Pressure Determination	0
CPC 4304.01P016	Emergency RCIC Tank Makeup from Fire Protection	0
CPS 4303.01P017	Spent Fuel Pool Makeup from Fire Protection	1b
CPS 4303.01P018	ERO Activation during Extreme Damage Event	0
CPS 4303.01P019	Hydrogen Igniter Operation with External AC Power	1
CPC 4303.01P020	Emergency Confirmation of Reactor Scram	0
CPC 4303.01P021	Invocation of 50.54(x) During an Extreme Damage Event	0
CPC 4303.01P022	DC Power Strategies	0
CPC 4303.01P023	Cross-Connecting Div 3 DG to Div 1(2) ECCS Electrical Busses	0
CPC 4303.01P024	Manual Start of an Emergency DG with Loss of DC Power	0
CPC 4303.01P026	Emergency Containment Spray Makeup From Fire Protection	0
CPC 4303.01P029	Additional Extensive Damage Mitigation Strategies	0
CPC 4303.01P030	Portable John Deere B.5.b Diesel Fire Pump Operation	0a
EOP-1	RPV Control	

TRAINING

Number	Description or Title	Date or Revision
DB430301	Exelon Nuclear Document Based Instruction Guide: Extensive Damage Mitigation Guide	April 22, 2007
LP ID: NRC-B5B-P1	Exelon Nuclear Emergency Preparedness Training: NRC B.5.B Phase 1 – EP Actions	2
EP-LP-G-17	Exelon Nuclear Emergency Preparedness	0

	Training; ERO Training Overview, Large Accelerant Fires	
TQ-AA-113	Exelon Nuclear ERO Training and Qualification	10
Tracer Activity # 2007-09-0113A	EO–I Evaluate/revise NLO TPD; incorporates AOVs and Extensive Damage Mitigation DB-430301	September 26, 2007

LIST OF ACRONYMS USED

AC	Alternating Current
AOP	Abnormal Operating Procedure
ARP	Alarm Response Procedure
BWR	Boiling Water Reactor
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CRD	Control Rod Drive
CST	Condensate Storage Tank
DC	Direct Current
DRS	Division of Reactor Safety
EDMG	Extensive Damage Mitigation Guideline
EFT	Effluent Filtration Train
EOP	Emergency Operating Procedure
ERO	Emergency Response Organization
gpm	Gallons Per Minute
LP	Lesson Plan
LPCI	Low Pressure Coolant Injection
mA	Milliamp
MOU	Memorandum of Understanding
MOV	Motor Operated Valve
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
P&ID	Piping and Instrumentation Diagram
RHR	Residual Heat Removal
RWCU	Reactor Water Cleanup
SAMG	Severe Accident Management Guideline
SER	Safety Evaluation Report
SFP	Spent Fuel Pool
SRV	Safety Relief Valve
TI	Temporary Instruction
VDC	Volts Direct Current