Exelon Generation.

Order No. EA-12-049

RS-13-021

February 28, 2013

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

LaSalle County Station, Units 1 and 2
Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Subject: Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)

References:

1. NRC Order Number EA-12-049, "Issuance of Order to Modify Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events" dated March 12, 2012
2. NRC Interim Staff Guidance JLD-ISG-2012-01, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," Revision 0, dated August 29, 2012
3. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August, 2012
4. Exelon Generation Company, LLC's Initial Status Report in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049), dated October 25, 2012

On March 12, 2012, the Nuclear Regulatory Commission ("NRC" or "Commission") issued an order (Reference 1) to Exelon Generation Company, LLC (EGC). Reference 1 was immediately effective and directs EGC to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

Reference 1 requires submission of an Overall Integrated Plan by February 28, 2013. The NRC Interim Staff Guidance (ISG) (Reference 2) was issued August 29, 2012 which endorses industry guidance document NEI 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 3 provides direction regarding the content of this Overall Integrated Plan.

Reference 4 provided the EGC initial status report regarding mitigation strategies, as required by Reference 1.

The purpose of this letter is to provide the Overall Integrated Plan pursuant to Section IV, Condition C.1, of Reference 1. This letter confirms EGC has received Reference 2 and has an Overall Integrated Plan developed in accordance with the guidance for defining and deploying strategies that will enhance the ability to cope with conditions resulting from beyond-design-basis external events.

The information in the enclosure provides the LaSalle County Station, Units 1 and 2 Overall Integrated Plan for mitigation strategies pursuant to Reference 3. The enclosed Integrated Plan is based on conceptual design information. Final design details and associated procedure guidance, as well as any revisions to the information contained in the Enclosure, will be provided in the 6-month Integrated Plan updates required by Reference 1.

This letter contains no new regulatory commitments. If you have any questions regarding this report, please contact David P. Helker at 610-765-5525.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 28th day of February 2013.

Respectfully submitted,

Glen T. Kaegi

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Director - Licensing & Regulatory Affairs
Exelon Generation Company, LLC

Enclosure:

1. LaSalle County Station, Units 1 and 2 Mitigation Strategies (MS) Overall Integrated Plan

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Enclosure 1

LaSalle County Station, Units 1 and 2

Mitigation Strategies (MS)

Overall Integrated Plan

(70 pages)

General Integrated Plan Elements BWR	
Site: LaSalle County Station (LSCS)	
Determine Applicable Extreme External Hazard **Ref: NEI 12-06 section 4.0 -9.0** **JLD-ISG-2012-01 section 1.0**	*Input the hazards applicable to the site; seismic, external flood, high winds, snow, ice, cold, high temps.* *Describe how NEI 12-06 sections 5 – 9 were applied and the basis for why the plant screened out for certain hazards.* Seismic events; severe storms with high winds; snow, ice and extreme cold; and high temperatures were determined to be applicable Extreme External Hazards for LaSalle County Station (LSCS) per the guidance of NEI 12-06 and are as follows: The LaSalle County Station, Units 1 and 2 (LSCS) is located in Brookfield Township of LaSalle County in northeastern Illinois. The Illinois River is 5 miles north of the site. The midpoint of the approximate centerline between the two reactors in the Universal Transverse Mercator Coordinate System is 4,567,200 meters north and 360,200 meters east, which corresponds to 41°14'44" north latitude and 88°40'06" west longitude. The site is subject to typical continental meteorology characterized by high variability and a wide range of temperature extremes. Precipitation at LSCS site area averages approximately 34 inches annually. This includes an annual average of 27 inches of snow. At Peoria, the data show thunderstorms occur on an average of 49 days per year for the period 1944-1976. In the LSCS area, winds are from the south or southwest during the summer months and from the west for five months of winter. The probability of tornado occurrence at the site is 0.0016 for any given year, which converts to a recurrence interval of 625 years. <u>Seismic Hazard Assessment</u>: Per the Updated Final Safety Analysis Report (UFSAR) Section 3.7 (Reference 1) the seismic criteria for LaSalle County Nuclear Station (LSCS) include two design basis earthquake spectra: Operating Basis Earthquake (OBE) and the Safe Shutdown Earthquake (SSE). The maximum horizontal ground acceleration at the free field foundation level, corresponding to above site response spectra, is 20%

	gravity for SSE and 10% gravity for OBE. These values constitute the design basis of LSCS. Per Reference 2, all sites will consider the seismic hazard. <u>External Flood Assessment:</u> Per the LaSalle Updated Final Safety Analysis Report (UFSAR) Section 2.4: Since there are no large bodies of water in the immediate vicinity of the site, surges, seiches, and tsunami floods are not relevant. A review of the literature has revealed no major dam failures affecting the surrounding region. Of the following flood events considered, Item 3 is the controlling event: (1) a postulated probable maximum flood (PMF) in the Illinois River, (2) a probable maximum precipitation (PMP) with antecedent standard project storm (SPS) on the cooling lake and its drainage area, and (3) a local PMP at the plant site. The station site is "floodproof" or "dry" with regard to a postulated PMF in the Illinois River, since the plant floor at elevation 710.5 feet MSL is 188 feet higher than the probable maximum flood plus wave runup elevation of 522.5 feet MSL obtained by superimposing the maximum (1%) wave characteristics of sustained 40-mph overland winds on the probable maximum water level. Safety-related structures at the plant site are similarly unaffected by wave runup due to winds coincident with a postulated probable maximum water level in the cooling lake. In the hydrologic design of the 2058-acre cooling lake, a standard project storm (SPS) is postulated to occur prior to the probable maximum precipitation (PMP), with three rainless days between them. The freeboard and riprap requirements for the peripheral dike are determined by superimposing significant wave characteristics of sustained 40-mph overland winds on the probable maximum water level in the lake. Wave runup elevation at the plant site is obtained by superimposing the maximum (1%) wave characteristics of sustained 40-mph overland winds on the probable maximum water level in the lake. Safety-related facilities at the plant site are unaffected by the probable maximum water level in the lake with coincident wind wave activity. A conservative estimate of the water surface elevation near the plant buildings due to local intense precipitation at the plant area would 710.3 feet. These elevations are below the

	plant grade elevation and would not cause flooding to the plant buildings. Therefore, the LSCS site is "floodproof" or "dry" and the External Flood Hazard is not applicable. High Wind Hazard Assessment: LSCS is not susceptible to hurricanes due to location (Reference Figure 7-1 of NEI 12-06). Figure 7-2 from the NEI FLEX implementation Guide (Reference 2) was used for this assessment. It was determined that LSCS site is in Region 1 and will have winds exceeding 200 mph. Therefore, the high wind hazard is applicable to LSCS. Snow, Ice and Extreme Cold Assessment. Figure 8-1 from NEI FLEX implementation Guide (Reference 2) was used for this assessment. Also, Figure 8-2, "Maximum Ice Storm Severity Maps [Ref. 16]," shows LSCS in a Ice Severity Level 5 zone. Therefore, snow, ice and extreme cold are applicable to LSCS. Extreme High Temperature Assessment: NEI 12-06 states that all sites must consider high temperatures. Extreme drought and high temperature events are slow meteorological evolutions. References 1. LaSalle County Power Station Updated Final Safety Analysis Report (UFSAR), Revision 19, April 2012 2. "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide", NEI 12-06, Revision 0, August 2012
Key Site assumptions to implement NEI 12-06 strategies. **Ref: NEI 12-06 section 3.2.1**	The key assumptions associated with implementation of the FLEX strategies at LaSalle County Station are: • BWROG EOP Revision EPG/SAG Rev.3, containing items such as guidance to allow early venting and to maintain steam driven injection equipment available during emergency depressurization, is approved and implemented in time to support the compliance date. • Flood and seismic re-evaluations pursuant to the 10 CFR 50.54(f) letter of March 12, 2012 are not completed and therefore not assumed in this

	submittal. As the re-evaluations are completed, appropriate issues will be entered into the corrective action system and addressed on a schedule commensurate with other licensing bases changes. • Additional staff resources are assumed to begin arriving at hour six (6) and fully staffed by 24 hours. • DC systems are available. • AC and DC distribution systems are available. • Plant initial response is the same as Station Black Out (SBO). • No additional single failures of any SSC are assumed (beyond the initial failures that define the ELAP/LUHS scenario in NEI 12-06). • Primary and secondary storage locations have not been selected; once locations are finalized implementation routes will be defined. • Storage locations will be chosen in order to support the event timeline. • This plan defines strategies capable of mitigating a simultaneous loss of all alternating current (ac) power and loss of normal access to the ultimate heat sink resulting from a beyond-design-basis event by providing adequate capability to maintain or restore core cooling, containment, and SFP cooling capabilities at all units on a site. Though specific strategies are being developed, due to the inability to anticipate all possible scenarios, the strategies are also diverse and flexible to encompass a wide range of possible conditions. These pre-planned strategies developed to protect the public health and safety will be incorporated into the unit emergency operating procedures in accordance with established EOP change processes, and their impact to the design basis capabilities of the unit evaluated under 10 CFR 50.59. The plant Technical Specifications contain the limiting conditions for normal unit operations to ensure that design safety features are available to respond to a design basis accident and direct the required actions to be taken when the limiting conditions are not met. The result of the beyond-design-basis event may place the plant in a condition where it cannot comply with certain Technical Specifications, and, as such, may warrant invocation of 10 CFR 50.54(x) and/or 10 CFR 73.55(p). • Maximum environmental room temperatures for habitability or equipment availability is based on NUMARC 87-00 (Reference 1) guidance if other

	design basis information or industry guidance is not available. References: 1. NUMARC 87-00, "Guidelines and Technical Bases for NUMARC Initiatives Addressing Station Blackout at Light Water Reactors," Rev. 1
Extent to which the guidance, JLD-ISG-2012-01 and NEI 12-06, are being followed. Identify any deviations to JLD-ISG-2012-01 and NEI 12-06. **Ref: JLD-ISG-2012-01 NEI 12-06 13.1**	Full conformance with JLD-ISG-2012-01 and NEI 12-06 is expected with no deviations.
Provide a sequence of events and identify any time constraint required for success including the technical basis for the time constraint. **Ref: NEI 12-06 section 3.2.1.7 JLD-ISG-2012-01 section 2.1**	*Strategies that have a time constraint to be successful should be identified with a technical basis and a justification provided that the time can reasonably be met (for example, a walk through of deployment).* *Describe in detail in this section the technical basis for the time constraint identified on the sequence of events timeline Attachment 1A.* --- See Attachment 1A for the Sequence of Events Timeline. Discussion of key events, and any applicable technical basis, is provided below. The times to complete actions in the Events Timeline are based on operating judgment, conceptual designs, and current supporting analyses. The final timeline will be time validated once detailed designs are completed and procedures are developed. The results will be provided in a future six (6) month update. <u>Time Constraints and Technical Basis:</u> Action Item #3: Entering the applicable Emergency Operating Procedures

	(EOPs) and abnormal procedures for SBO is listed as time critical because there are time critical/sensitive actions required in the SBO procedures (discussed below) and it is important to enter the procedures and initiate the actions in a timely manner. Action Item #9: LaSalle has existing time critical actions to take control of the Automatic Depressurization System (ADS) Safety/Relief Valves (SRVs) from the Aux Building Electric Equipment Room (AEER) within 20 minutes to establish the less than or equal to 20 deg F/hr cooldown rate for the SBO event. Action Item #10: Completion of the initial DC load shedding, as specified by the current SBO procedure, within 30 min supports the analyzed coping capability of the batteries. 125 VDC and 250 VDC Battery coping times have been analyzed per engineering evaluation and are documented in LaSalle EC 391795 (Ref 1) with the following results: 125 VDC Systems Unit 1 125 VDC Div 1 Battery 1DC07E Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 2) and an extended load shed is completed prior to 4.5 hours into the event. 125 VDC Div 2 Battery 1DC14E Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 2) and an extended load shed is completed prior to 5.5 hours into the event. Unit 2 125 VDC Div 1 Battery 2DC07E Eight (8) hour coping time is demonstrated provided that the

	existing SBO load shed is completed per the current SBO procedure (Ref. 2) and an extended load shed is completed prior to 5.5 hours into the event. 125 VDC Div 2 Battery 2DC14E Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 2). An extended load shed is not required for this battery. 250 VDC Systems Unit 1 250 VDC Battery 1DC01E Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 2). An extended load shed is not required for this battery. Unit 2 250 VDC Battery 2DC01E Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 2). An extended load shed is not required for this battery. These battery profiles drive the actions to complete the initial DC load shedding and then to perform the extended DC load shedding (as required) once Extended Loss of AC Power (ELAP) has been declared. These actions collectively support an analyzed coping time of at least eight (8) hrs for each battery. The eight (8) hrs is conservative as a result of the model only being extended to eight (8) hrs to reflect the currently available vendor battery discharge curves. LaSalle has an existing time critical action for SBO to perform a DC load shed with completion times of 30 minutes and 180 minutes. These same SBO actions are reflected in the ELAP Event Timeline. An additional extended DC load shed is included in the Timeline actions to support the eight (8) hr coping times.

	Action Items #12 & #13: Opening all panel doors in the Main Control Room and AEER within 30 minutes is time sensitive because it supports the temperature transient calculations that were performed for SBO conditions and the application of NUMARC 87-00, Rev. 1 requirements. Action Item #14: Time period of one (1) hr is selected to ensure that ELAP entry conditions can be verified by control room staff and it is validated that emergency diesel generators (EDGs) are not available. One (1) hour is a reasonable assumption for operators to perform initial evaluation of the EDGs. Entry into ELAP provides guidance to operators to perform ELAP load shedding and FLEX equipment deployment actions. Action Item #17: Completion of the 250 VDC load shedding per the existing SBO procedure (Ref. 2) supports the DC coping time evaluations (see discussion above for Action Item #10). Action Item #18: Completion of the extended 125 VDC load shedding supports the DC coping analysis for ELAP (see discussion above for Action Item #10). Action Item #19: Manual control of the ADS SRVs requires adequate nitrogen supply to the ADS accumulators. Existing SBO nitrogen supply calculation L-003263, Rev. 2, "Volume Requirements for ADS Back-up Compressed Gas System (Bottle Banks) (Ref. 3), states that the 20 degree/hr cooldown rate would require 28 ADS SRV actuations in a four (4) hour period. It also calculates that both ADS nitrogen bottle banks can support 38 actuations. At a rate of ~7 actuations per hour, additional nitrogen supply will be required at ~5 hours. Action Item #21: Connection of the FLEX 480 VAC generator to supply power to the 125 VDC and 250 VDC battery chargers within six (6) hours supports the DC coping analysis (with

	margin). See discussion for Action Item #10. Action Item #22: The basic coping strategy being pursued at LaSalle is a cooldown of less than or equal to 20^{0}F/hr coupled with an early containment venting strategy and makeup to the suppression pool via an external source such that RCIC is maintained available for RPV level control. The following timeline events are based on the MAAP analysis (Ref. 4, Case 3.e): • The conceptual early containment venting trigger of 12 psig wetwell pressure is reached at ~5.4 hours. A wetwell pressure of ~8 psig is then regulated via the Hardened Containment Vent System (HCVS) to maintain the suppression pool temperature at ~234^{0}F for long term RCIC operation. • Suppression pool makeup via the external source (FLEX pump with UHS suction source) is initiated at ~6 hours based on suppression pool level decreasing as a result of the containment venting. • The HCTL curve is exceeded at ~6.7 hours. • The Pressure Suppression Pressure Limit/Curve is NOT exceeded under this strategy. • DW airspace temperature does NOT exceed the EOP limit of 340^{0}F (peaks at 261^{0}F under this strategy). Action Item #24: Per GOTHIC Analysis (Ref. 5), RCIC Room temperature reaches 169^{0}F (equipment acceptance limit per Ref. 8) at 13 hours. This drives the action to provide external air flow to the RCIC room. The time of 11 hours to initiate external air flow to the RCIC room is established to provide margin to the calculated value. Action Item #25: An evaluation of Spent Fuel Pool scenarios was performed and documented in LaSalle EC 392196 (Ref. 6). Spent Fuel Pool (SFP) makeup is not a time constraint with the initial condition of Mode 1 at 100% power, since the worst case fuel pool heat load conditions only exist during a refueling outage. Under non-outage conditions, the maximum SFP heat load is 27.38 MBtu/hr. Loss of SFP cooling with this heat load and an initial SFP temperature of 140 degrees F results in a time to boil of 12.1 hours, and 123 hours to the

	top of active fuel. Therefore, completing the equipment line-up for initiating SFP makeup at 12 hours into the event ensures adequate cooling of the spent fuel is maintained. The worst case SFP heat load during an outage is 56.03 MBtu/hr. Loss of SFP cooling with this heat load and an initial SFP temperature of 140 degrees F results in a time to boil of 5.86 hours, and 60.1 hours to the top of active fuel. With the entire core being located in the SFP, manpower resources normally allocated to aligning core cooling along with the Operations outage shift manpower can be allocated to aligning SFP makeup which ensures the system alignment can be established within eight (8) hours. Initiation at eight (8) hours into the event ensures adequate cooling of the spent fuel is maintained. Initial evaluations were used to determine the fuel pool timelines. Formal calculations will be performed to validate this information during development of the spent fuel pool cooling strategy detailed design, and will be provided in a future six (6) month update. BWROG FLEX Document: Issuance of BWROG document NEDC-33771P, "GEH Evaluation of FLEX Implementation Guidelines" on 1/31/13 (Ref. 7) did not allow sufficient time to perform the analysis of the deviations between Exelon's engineering analyses and the analyses contained in the BWROG document prior to commencing regulatory reviews of the Integrated Plan. This analysis is expected to be completed, documented on Attachment 1B, and provided to the NRC in the August 2013 six (6) month status update. References: 1. LaSalle Engineering Evaluation EC 391795, Rev. 000, "Battery Coping Times During ELAP with Extended Load Shedding." 2. LaSalle Abnormal Operating Procedure LOA-AP-101, "Unit 1 AC Power System Abnormal," Rev. 42 {Unit 2, LOA-AP-201, Rev. 36} 3. LaSalle Calculation L-003263, Rev. 02, "Volume Requirements for ADS Back-up Compressed Gas System (Bottle Banks)" 4. LS-MISC-017, Rev. 1, "MAAP Analysis to Support Initial FLEX Strategy," LaSalle Units 1 and 2 5. Sargent & Lundy Calculation 2012-11819, Rev. 0,

	"Transient Analysis of RCIC Pump Room for Extended Loss of A-C Power," 6. LaSalle Engineering Evaluation EC 392196, Rev. 0, "Spent Fuel Pool Uncovery Time for Outage and Online Scenarios," 7. GE Hitachi Nuclear Energy, NEDC-33771P, "GEH Evaluation of FLEX Implementation Guidelines," Rev. 1 8. LaSalle Calculation ATD-0351, "RCIC Pump Room Temperature Transient Following Station Blackout with Gland Seal Leakage," Rev. 3
Identify how strategies will be deployed in all modes. **Ref: NEI 12-06 section 13.1.6**	Deployment of FLEX is expected for all modes of operation. Transportation routes will be developed from the equipment storage area to the FLEX staging areas. An administrative program will be developed to ensure pathways remain clear or compensatory actions will be implemented to ensure all strategies can be deployed during all modes of operation. This administrative program will also ensure the strategies can be implemented in all modes by maintaining the portable FLEX equipment available to be deployed during all modes. Identification of storage areas and creation of the administrative program are open items. Closure of these items will be documented in a six (6) month update.

Provide a milestone schedule. This schedule should include:
• **Modifications timeline**
  o **Phase 1 Modifications**
  o **Phase 2 Modifications**
  o **Phase 3 Modifications**
• **Procedure guidance development complete**
  o **Strategies**
  o **Maintenance**
• **Storage plan (reasonable protection)**
• **Staffing analysis completion**
	See the Milestone Schedule provided in Attachment 2.
	
	Exelon Generation Company, LLC (Exelon) fully expects to meet the site implementation/compliance dates provided in Order EA-12-049 with no exceptions. Any changes or additions to the planned interim milestone dates will be provided in a future six (6) month update.

• **FLEX equipment acquisition timeline** • **Training completion for the strategies** • **Regional Response Centers operational** **Ref: NEI 12-06 section 13.1**	
Identify how the programmatic controls will be met. **Ref: NEI 12-06 section 11** **JLD-ISG-2012-01 section 6.0**	LaSalle will implement an administrative program for FLEX to establish responsibilities, and testing & maintenance requirements. A plant system designation will be assigned to FLEX equipment which requires configuration controls associated with systems. This will establish responsibilities, maintenance and testing requirements for all components associated with FLEX. Unique identification numbers will be assigned to all components added to the FLEX plant system. Equipment associated with these strategies will be procured as commercial equipment with design, storage, maintenance, testing, and configuration control as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11. Installed structures, systems and components pursuant to 10CFR50.63(a) will continue to meet the augmented quality guidelines of Regulatory Guide 1.155, Station Blackout. Standard industry PMs will be developed to establish maintenance and testing frequencies based on type of equipment and will be within EPRI guidelines. Testing procedures will be developed based on the industry PM templates and Exelon standards.
Describe training plan	Training materials for FLEX will be developed for all station staff involved in implementing FLEX strategies. For accredited training programs, the Systematic Approach to Training, SAT, will be used to determine training needs. For other station staff, a training overview will be developed per change management plan.
Describe Regional Response Center plan	LSCS has contractual agreements in place with the Strategic Alliance for FLEX Emergency Response (SAFER). The industry will establish two (2) Regional Response Centers (RRC) to support utilities during beyond design basis events. Each RRC will hold five (5) sets of equipment, four (4) of which will be able to be fully deployed when requested, the fifth set will have equipment in a maintenance cycle. Equipment will be moved from an

	RRC to a local Assembly Area, established by the SAFER team and the utility. Communications will be established between the affected nuclear site and the SAFER team and required equipment moved to the site as needed. First arriving equipment, as established during development of the nuclear site's playbook, will be delivered to the site within 24 hours from the initial request.
Notes: Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.	

Maintain Core Cooling

Determine Baseline coping capability with installed coping[1] modifications not including FLEX modifications, utilizing methods described in Table 3-1 of NEI 12-06:

- **RCIC/HPCI/IC**
- **Depressurize RPV for injection with portable injection source**
- **Sustained water source**

BWR Installed Equipment Phase 1:

Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain core cooling. Identify methods (RCIC/HPCI/IC)and strategy(ies) utilized to achieve this coping time.

RCIC System Summary

The Reactor Core Isolation Cooling (RCIC) system consists of a turbine, pump, piping, valves, accessories, and instrumentation designed to add water inventory to the reactor vessel thus assuring continuity of core cooling. Reactor vessel water is maintained or supplemented by the RCIC system during the following conditions:

a. Should the reactor vessel be isolated and yet maintained in the hot standby condition.
b. Should the reactor vessel by isolated and accompanied by a loss of normal coolant flow from the reactor feedwater system.
c. Should a complete plant shutdown under conditions of loss of normal feedwater system be started before the reactor is depressurized to a level where the reactor shutdown cooling mode of the RHR system can be placed into operation.

RCIC logic is powered from Division 1 and Division 2 125-Vdc. All valves are powered from 250-Vdc Bus 121/221Y, except the following: Inboard isolation valves E51-F063 and E51-F076 are powered from 480-Vac MCC Bus 136Y-2/236Y-2 and outboard isolation valve E51-F008 is powered from 480-Vac MCC, Bus 135X-1/235X-1.

When actuated, the RCIC system pumps water from either the condensate storage tank or the suppression pool to the reactor vessel. The RCIC system includes one turbine-driven pump, one barometric condenser with a d-c vacuum pump, one vacuum d-c condensate pump, automatic valves, control devices for this equipment, sensors, and logic circuitry.

The RCIC system is initiated automatically following a short time delay (not to exceed 3.0 seconds) after the receipt of a reactor vessel low water level signal and produces the design flow rate within 30 seconds. The controls then function to provide design makeup water flow to the reactor vessel until the amount of water delivered to the reactor vessel is adequate to restore vessel level, at which time the RCIC system automatically shuts down. The controls are arranged to allow remote-manual startup, operation, and shutdown.

[1] Coping modifications consist of modifications installed to increase initial coping time, i.e., generators to preserve vital instruments or increase operating time on battery powered equipment.

<u>Overpressure Protection – Safety/Relief Valve Summary</u>

The nuclear pressure-relief system has been designed:

a. to prevent overpressurization of the nuclear system that could lead to the failure of the reactor coolant pressure boundary;
b. to provide automatic depressurization for small breaks in the nuclear system occurring with malfunction of the high-pressure core spray (HPCS) system, so that low-pressure coolant injection (LPCI-mode of RHR) and low-pressure core spray (LPCS) systems can operate to protect the fuel barrier;
c. to permit verification of its operability; and
d. to withstand adverse combinations of loadings and forces resulting from operation during abnormal, accident, or special event conditions.

The nuclear pressure relief system safety/relief valves have been designed to meet the following power generation bases:

a. discharge to the containment suppression pool, and
b. correctly reclose following operation so that maximum operational continuity can be obtained.

The nuclear pressure relief system consists of safety/relief valves located on the main steamlines between the reactor vessel and the first isolation valve within the drywell. These valves protect against overpressure of the nuclear system. The safety/relief valves provide three main protection functions:

a. Overpressure relief operation - The valves open automatically to limit a pressure rise.
b. Overpressure safety operation - The valves function as safety valves and open (self-actuated operation if not already automatically opened for relief operation) to prevent nuclear system overpressurization.
c. Depressurization operation - The ADS valves open automatically as part of the emergency core cooling system (ECCS) for events involving small breaks in the nuclear system process barrier.

Each of the seven safety/relief valves that make up the Automatic Depressurization System (ADS) is provided with its own ADS accumulator and inlet check valve. These accumulators assure that the valves can be opened to perform their ADS function in the event of a failure of the non-safety related Drywell Pneumatic System. One control switch is available in the control room for each safety/relief valve associated with the ADS. These manual switches backup the automatic depressurization function by activating a separate solenoid control valve on the safety/relief valves. The switch is a two-position type OPEN-AUTO. The OPEN position is for manual safety/relief valve operation. Manual opening of the relief valves provides a controlled nuclear system cooldown under conditions where the normal heat sink is not available. ADS valves can be operated from the individual ADS logic relay panels.

Each ADS SRV has an ADS accumulator installed to provide a source of stored compressed gas for SRV operation. These accumulators are supplied by the Drywell Pneumatic System consisting of a safety-related portion and a non safety-related portion. The non safety-related portion is the normal pneumatic supply to the ADS accumulators. The safety-related portion, referred to as the ADS accumulator backup compressed gas system, maintains the ADS accumulators pressurized following a loss of the normal non safety-related pneumatic supply.

The ADS accumulator backup compressed gas system consists of two bottle banks that serve as the safety-related pneumatic supply for the seven ADS SRVs. One bottle bank supplies four of the seven ADS SRVs while the other serves the remaining three ADS SRVs. Each bottle bank consists of four bottles of compressed nitrogen and one reserve bottle at each bottle bank that can be utilized during bottle replacement. The reserve nitrogen bottle is valved in during the replacement of the four bottles installed at each bottle bank to allow for bottle change.

In addition, there is an emergency pressurization station in an accessible area of the auxiliary building at which each ADS gas line can be recharged indefinitely via nitrogen bottles brought to that point, in the event the reactor building becomes inaccessible.

In the SBO/ELAP event scenario, the ADS valves are controlled from the ADS logic relay panels in the Aux Electric Equipment Room (AEER) since the Main Control Room switches are associated with a solenoid that uses non-ADS nitrogen supply. The ADS valve control switches at the ADS logic relay panels are associated with solenoids that use the dedicated ADS nitrogen supply/accumulators.

Event Coping Strategy Using Installed Equipment:

Power Operation, Startup, and Hot Shutdown

At the initiation of the event the operators will enter the applicable EOPs and the abnormal operating procedure for SBO (Ref. 1). The ELAP procedures will be entered when there has been a Loss of Offsite Power, including all five (5) on-site Emergency Diesel Generators, with confirmation of no imminent return of any of these power sources to service.

The RCIC System will maintain RPV water inventory using the suppression pool as a suction source, while the ADS SRVs will be used for RPV pressure control.

Venting of the containment will be initiated such that peak Suppression Pool temperature remains below the maximum allowed for RCIC operation. BWROG RCIC System Operation in Prolonged Station Blackout – Feasibility Study (Reference 2) indicates that RCIC will remain functional as long as Suppression Pool temperature can be maintained less than approximately 230° F. Operation of RCIC above 230°F is currently being evaluated by General Electric and the

BWROG. (Ref. 3). The preliminary MAAP analysis (Ref. 4, Case 3.e) performed for strategy development indicated a maximum Suppression Pool temperature of 234° F. Additional work will be performed during detailed design development to ensure Suppression Pool temperature will support RCIC operation, in accordance with approved BWROG analysis, throughout the event.

The operators will commence a DC load shed to preserve DC power. Subsequently, the operators will reduce RPV pressure to 150-250 psig in order to maintain functionality of RCIC.

Cold Shutdown and Refueling

When in Cold Shutdown and Refueling, many variables exist which impact the ability to cool the core. In the event of an ELAP during these Modes, installed plant systems cannot be relied upon to cool the core; thus, transition to Phase 2 will begin immediately. All efforts will be made to expeditiously provide core cooling and minimize heat-up and repressurization. Exelon has a program in place (Ref. 5) to determine the time to boil for all conditions during shutdown periods. This time will be used to determine the time required to complete transition to Phase 2.
To accommodate the activities of vessel disassembly and refueling, water levels in the reactor vessel and the reactor cavity are often changed. The most limiting condition is the case in which the reactor head is removed and water level in the vessel is at or below the reactor vessel flange. If an ELAP/LUHS occurs during this condition then (depending on the time after shutdown) boiling in the core may occur quite rapidly. Deploying and implementing portable FLEX pumps to supply injection flow must commence immediately from the time of the event. This should be plausible because more personnel are on site during outages to provide the necessary resources. Strategies for makeup water include deployment of a FLEX pump to take suction from the UHS (CSCS room source or lake source) as described in the Phase 2 Core Cooling section.

Guidance will be provided to ensure that sufficient area is available for deployment and that haul paths remain accessible without interference from outage equipment during refueling outages.

Analysis will be performed during development of the detailed design to validate the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. The results of this analysis will be provided during a scheduled six (6) month update. This update will include any changes to the initial designs and/or strategies as submitted in the February 28, 2013 Integrated Plan.

References:

1. LaSalle Abnormal Operating Procedure LOA-AP-101, "Unit 1 AC Power System Abnormal," Rev. 42 {Unit 2, LOA-AP-201, Rev. 36}
2. GEH/BWROG Project Task Report, "RCIC System Operation in Prolonged Station Blackout – Feasibility Study," 0000-0143-0382-R1, March 2012
3. BWROG RCIC Pump and Turbine Durability Evaluation – Pinch Point Study, 0000-0155-1545-XX – currently in approval process
4. LS-MISC-017, Rev. 1, "MAAP Analysis to Support Initial FLEX Strategy," LaSalle Units 1 and 2
5. Exelon Nuclear Procedure OU-AA-103, "Shutdown Safety Management Program," Revision 12

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	*Confirm that procedure/guidance exists or will be developed to support implementation.* The existing EOPs (LGA-001) address RPV control via RCIC and SRVs. LaSalle abnormal operating procedure LOA-AP-101 addresses the required actions for response to a SBO, including the initial DC load shedding. LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	None
Key Reactor Parameters	*List instrumentation credited for this coping evaluation.* 1(2)C34-N004B, RPV Level (Control Room indicator is 1(2)C34-R606B) • Narrow Range, 0-60 inches 1(2)C34-N004C, RPV Level (Control Room indicator is 1(2)C34-R606C) • Narrow Range, 0-60 inches 1(2)E51-R602, RCIC Turbine Steam Inlet Pressure (Control Room) • 0-1500 psig 1(2)C61-R011, RPV Pressure (Remote Shutdown Panel) • 0-1500 psig 1(2)C61-R010, RPV Level (Remote Shutdown Panel) • Wide Range, -150 to +60 inches LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.

Notes:

Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

Maintain Core Cooling

BWR Portable Equipment Phase 2:

Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain core cooling. Identify methods (RCIC/HPCI/IC)and strategy(ies) utilized to achieve this coping time.

See Phase I discussion for RCIC System Summary.

See Phase I discussion for SRV summary.

Residual Heat Removal System Description:

The RHR system provides several functional configurations generally known as modes of operation. The different modes of RHR operation include:

- Shutdown Cooling and Reactor Vessel Head Spray Mode
    - 'B' RHR loop can be used for Fuel Pool Cooling
- Low-Pressure Coolant Injection Mode
- Containment Cooling Mode
    - Suppression Pool Cooling
    - Containment Spray

These different modes of operation provide multiple flow paths for injection into the RPV, containment, and the spent fuel pool.

Core Standby Cooling System – Equipment Cooling Water System Description:

The CSCS-ECWS for each unit consists of three independent piping subsystems corresponding to the three essential electrical power supply divisions for each unit. All pumps and strainers are located in the basements of the buildings within watertight cubicles to provide separation between divisions and flood protection. The outdoor CSCS-ECWS piping is buried to provide tornado and missile protection.

The CSCS-ECW subsystems take a suction from the service water tunnel located in the basement of the Lake Screen House. The service water tunnel is kept full by six (6) inlet lines which connect to the Circulating Water pump forebays. Prior to entering the service water tunnel inlet pipes, the water is strained by the Lake Screen House travelling screens to prevent large pieces of debris from entering the system and blocking flow or damaging equipment. The travelling screens are not seismically designed nor are they supplied with electrical power from the plant essential power buses. A 54-inch normally closed bypass line is installed to assure access to a continuous supply of CSCS water to the system in the unlikely event that all the travelling screens become blocked.

Maintain Core Cooling
BWR Portable Equipment Phase 2:
One of the pumps in the CSCS-ECW system is the 'B' Fuel Pool Cooling (FC) Emergency Makeup (EMU) Pump. This pump provides flow to the following locations: 1) Normally, pump discharge is configured to the "A" DG Strainer backwash line for testing purposes; 2) In an emergency, a spool piece is rotated to connect the pump discharge to the fuel pool make-up flooding hose station on the Refuel Floor; 3) Also in an emergency, alternate reactor and containment injection can be aligned through the 'B' RHR loop. In the strategy described below, the FLEX pump is pre-staged to essentially jumper around this 'B' FC EMU pump to use the safety-related water source available in the CSCS pump room (UHS water from Lake Screen House/Lake) and discharge to the path described in item #3 above (RPV and containment). For this Core Cooling function, the path to the suppression pool is used for makeup (RCIC suction source) and the path to the RPV would be used in the event that RCIC becomes unavailable. The Core Cooling strategy conceptual design contains features to expedite and simplify implementation, and may not be required in order to meet the event timeline for maintaining the safety function requirements of NEI 12-06. See attached Conceptual Sketches (Attachment 3). <u>Event Coping Strategy Using Portable Equipment:</u> RCIC will continue to maintain RPV inventory. SRVs will continue to be used to control RPV pressure. The primary strategy for providing RPV injection via FLEX equipment (should RCIC become unavailable) will be via 480 VAC pumps installed in a Unit 1 and Unit 2 CSCS pump room (conceptual design is using installation in the Div. 2 CSCS pump room). These pre-staged FLEX pumps will be connected to an UHS water source available in the CSCS pump rooms and the discharge will be connected to the discharge of the existing 'B' FC EMU pump. This flow path can provide injection to the RPV via the RHR system. This flow path can also provide makeup to the suppression pool to help maintain RCIC suction. These FLEX pumps will be powered via the existing 480 VAC distribution system that is powered by a portable 480 VAC FLEX generator. See attached Conceptual Sketches (Attachment 3). The alternate strategy for providing RPV injection via FLEX equipment is to pump water from the UHS (lake location) using a high volume, low pressure pumping system that conceptually consists of a hydraulic submersible pump to be placed in the UHS water source that provides adequate flow/NPSH to a portable diesel driven pump (PDDP). The PDDP provides water to each reactor building where it is attached to a new water piping system that is included in the hardened containment vent chase that goes up the outside wall on the east side of each reactor building. This new water piping system will have penetrations into the reactor buildings at the 761 ft elevation for

Maintain Core Cooling	
BWR Portable Equipment Phase 2:	
connection to the existing B.5.b RHR connections that provide a path for RPV injection. This RHR connection can also provide makeup to the suppression pool to help maintain RCIC suction. See attached Conceptual Sketches (Attachment 3). Analysis will be performed during development of the detailed design to validate the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. The results of this analysis will be provided during a scheduled six (6) month update. This update will include any changes to the initial designs and/or strategies as submitted in the February 28, 2013 Integrated Plan.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	*List modifications* • Pre-stage 480 VAC FLEX pumps in CSCS room • Install suction and discharge piping for pre-staged FLEX pumps to allow timely connection • Install electrical supply to pre-staged FLEX pumps to allow timely connection • For alternate FLEX strategy, install water piping in hardened vent pipe chase on east side of reactor buildings with external connection at ground elevations and internal connections at 761 feet elevation (for connection to existing B.5.b RHR connection point) and 843 feet elevation for injection to the spent fuel pools (as described in Spent Fuel Pool Cooling section of this Plan).
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* 1(2)C34-N004B, RPV Level (Control Room indicator is 1(2)C34-R606B) • Narrow Range, 0-60 inches 1(2)C34-N004C, RPV Level (Control Room indicator is 1(2)C34-R606C) • Narrow Range, 0-60 inches 1(2)E51-R602, RCIC Turbine Steam Inlet Pressure (Control Room) • 0-1500 psig 1(2)C61-R011, RPV Pressure (Remote Shutdown Panel)

Maintain Core Cooling	
BWR Portable Equipment Phase 2:	
	• 0-1500 psig 1(2)C61-R010, RPV Level (Remote Shutdown Panel) • Wide Range, -150 to +60 inches LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.
Storage / Protection of Equipment : **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
Flooding Note: if stored below current flood level, then ensure procedures exist to move equipment prior to exceeding flood level	Not applicable per NEI 12-06 as outlined within the first section of this integrated plan.
Severe Storms with High Winds	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
Snow, Ice, and Extreme Cold	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
High Temperatures	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11.

Maintain Core Cooling		
BWR Portable Equipment Phase 2:		
	Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.	
Deployment Conceptual Modification **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
For the primary strategy (for RPV injection if RCIC becomes unavailable), FLEX pumps will be pre-staged on each unit in one of the CSCS pump rooms. Pumps will take suction from the UHS source available in the CSCS pump rooms and will be connected to the discharge of the 'B' FC EMU pumps on each unit. The discharge is connected to the RHR system and can provide RPV injection.	Deployment to use the FLEX pumps for RPV injection will consist of connecting the suction and discharge piping as well as the electrical power supply for the 480 VAC motor (provided by FLEX portable generator through existing 480 VAC buses). Necessary modifications for deployment include: • Pre-stage 480 VAC FLEX pumps in CSCS room • Install suction and discharge piping for pre-staged FLEX pumps to allow timely connection • Install electrical supply to pre-staged FLEX pumps to allow timely connection	FLEX pump piping connections will be protected in the existing CSCS pump room structure in the lower elevation of the EDG building. Electrical connections for the FLEX 480 VAC generator are conceptually planned to be located in the corridor of the EDG buildings of each unit.
For the alternate strategy for RPV injection (should RCIC become unavailable), a submersible hydraulic pump	Modifications required for deployment of the alternate FLEX strategy include:	New water pipe, and connections, will be protected with the new hardened containment vent chase.

Maintain Core Cooling		
BWR Portable Equipment Phase 2:		
will be deployed at the UHS (lake location) to provide adequate flow/NPSH to a high capacity, low pressure portable diesel driven pump (PDDP) that provides flow to each unit. The PDDP will be connected to a water pipe installed in the hardened containment vent chase on the outside of each unit's east reactor building wall. Connection will be provided on each unit at the 761 feet elevation to connect to the existing B.5.b RHR locations. This RHR connection can be used to inject to the RPV.	• Installation of water pipe in hardened containment vent chase on each unit. • Installation of connections at the base of the water pipe in the chase and connections at the 761 feet elevation to connect to the existing B.5.b points on RHR.	

Notes:

Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated plan.

Maintain Core Cooling

BWR Portable Equipment Phase 3:

Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain core cooling. Identify methods (RCIC/HPCI/IC)and strategy(ies) utilized to achieve this coping time.

Phases 1 and 2 strategy will provide sufficient capability such that no additional Phase 3 strategies are required.

Phase 3 equipment for LaSalle includes backup portable pumps and generators. The portable pumps will be capable of providing the necessary flow and pressure as outlined in Phase 2 response for Core Cooling, Containment Cooling and Spent Fuel Pool Cooling. The portable generators will be capable of providing the necessary 480 volt power requirements as outlined in Phase 2 response for Safety Functions Support.

Details:

Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	No additional modification required.
Key Reactor Parameters	*List instrumentation credited or recovered for this coping evaluation.* LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.

Deployment Conceptual Modification
(Attachment 3 contains Conceptual Sketches)

Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
None.	None.	None.

Maintain Core Cooling
BWR Portable Equipment Phase 3:
Notes: Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

Maintain Containment
Determine Baseline coping capability with installed coping[2] modifications not including FLEX modifications, utilizing methods described in Table 3-1 of NEI 12-06: • **Containment Venting or Alternate Heat Removal** • **Hydrogen Igniters (Mark III containments only)**
BWR Installed Equipment Phase 1:
Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain containment. Identify methods (containment vent or alternative / Hydrogen Igniters)and strategy(ies) utilized to achieve this coping time. During Phase 1, containment integrity is maintained by the normal design features of the containment. In accordance with NEI 12-06 (Ref. 1), the containment is assumed to be isolated following the event. As the suppression pool heats up and the water begins to boil, the containment will begin to heat up and pressurize. In order to protect the containment for this scenario, an early containment venting strategy is implemented. In this case, the HCVS is used as implemented per EA-12-050, Reliable Hardened Containment Vents (Reference 2) with control from the main control room (MCR) or remote operating station. Commencing early containment venting (at a conceptual trigger of 12 psig wetwell pressure) will serve to limit the Containment pressure rise and Suppression Pool temperature rise, which will allow for long term operation of the RCIC System for core cooling. The suppression pool temperature is a limiting factor for implementation of the ELAP strategy. RCIC suction temperature will be allowed to go as high as ~230°F. By opening the HCVS at approximately the 5.4 hour point (corresponding to the conceptual trigger of 12 psig wetwell pressure), and maintaining the suppression pool airspace pressure at ~8 psig, the suppression pool temperature peaks at ~ 234°F (Reference 3). The containment design pressure is 45 psig (UFSAR Table 6.2-1). Containment pressure limits are not expected to be reached during the event as indicated by MAAP analysis (Reference 3), because the HCVS is opened prior to exceeding any containment pressure limits. Thus, containment integrity is not challenged and remains functional throughout the event. As indicated by MAAP analysis (Reference 3), the containment will require venting with the HCVS system at approximately 5.4 hours after event initiation (based on the conceptual venting trigger of 12 psig wetwell pressure). Phase 1 (i.e., the use of permanently installed plant equipment/features) of containment integrity is maintained throughout the duration of the event; no non-permanently installed equipment is required to maintain containment integrity. Therefore, there is no defined end time for the Phase 1 coping period for maintaining containment integrity. An alternative strategy for containment

[2] Coping modifications consist of modifications installed to increase initial coping time, i.e., generators to preserve vital instruments or increase operating time on battery powered equipment.

during Phase 1 is not provided, because containment integrity is maintained by the plant's design features.

Analysis will be performed during development of the detailed design to validate the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. The results of this analysis will be provided during a scheduled six (6) month update. This update will include any changes to the initial designs and/or strategies as submitted in the February 28, 2013 Integrated Plan.

References:

1. "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide", NEI 12-06, Revision 0, August 2012
2. NRC Order EA-12-050, "Issuance of Order to Modify Licenses With Regard to Reliable Hardened Containment Vents," March 12, 2012
3. LS-MISC-017, Rev. 1, "MAAP Analysis to Support Initial FLEX Strategy," LaSalle Units 1 and 2

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	• EA-12-050, Hardened Containment Vent Modification • Modification(s) needed to have suitable instrument(s) for Drywell Pressure and/or Suppression Chamber (Pool) Pressure indication • Modification needed to have suitable instrument for Suppression Pool level indication • Modification needed to expand the range for Suppression Pool water temperature
Key Containment Parameters	*List instrumentation credited for this coping evaluation.* Drywell temperature – 1(2)TI-CM045 (Remote Shutdown Panel) • 0-600 Deg F Drywell pressure – 1(2)C71-N004 (Local Rx Bldg 761 Elev.) • Narrow range, -20 to +60 inches water o Equates to ~-0.75 to +2.25 psig Suppression Pool water temperature – 1(2)TI-CM037 (Remote Shutdown Panel) • 0-225 Deg F Suppression Pool level – 1(2)CM02M (Local Rx Bldg 694 Elev) • Narrow range, approximately +/-1 ft of 699'11" Suppression Pool air temperature – 1(2)TI-CM040 (Remote Shutdown Panel) • 0-275 Deg F

	LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.
Notes: Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.	

Maintain Containment	
BWR Portable Equipment Phase 2:	
Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain containment. Identify methods (containment vent or alternative / Hydrogen Igniters)and strategy(ies) utilized to achieve this coping time. Containment venting via the use of the installed HCVS will continue in Phase 2. Inventory will be made up to the Suppression Pool with the FLEX Pump via the RHR System, which will maintain Suppression Pool level and also provide some cooling of the Suppression Pool. Analysis will be performed during development of the detailed design to validate the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. The results of this analysis will be provided during a scheduled six (6) month update. This update will include any changes to the initial designs and/or strategies as submitted in the February 28, 2013 Integrated Plan.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	Identified in Phase 1 discussion. Additionally, the modifications below provide the water source and flow paths for injection to the suppression pool: • Pre-stage 480 VAC FLEX pumps in CSCS room • Install suction and discharge piping for pre-staged FLEX pumps to allow timely connection • Install electrical supply to pre-staged FLEX pumps to allow timely connection • For alternate FLEX strategy, install water piping in hardened vent pipe chase on east side of reactor buildings with external connection at ground elevations and internal connections at 761 feet elevation (for connection to existing B.5.b RHR connection point) and 843 feet elevation for injection to the spent fuel pools (as described in Spent Fuel Pool Cooling section of this Plan).
Key Containment Parameters	*List instrumentation credited or recovered for this coping evaluation.* Drywell temperature – 1(2)TI-CM045 (Remote Shutdown Panel) • 0-600 Deg F

Maintain Containment	
BWR Portable Equipment Phase 2:	
	Drywell pressure – 1(2)C71-N004 (Local Rx Bldg 761 Elev.) • Narrow range, -20 to +60 inches water o Equates to ~-0.75 to +2.25 psig Suppression Pool water temperature – 1(2)TI-CM037 (Remote Shutdown Panel) • 0-225 Deg F Suppression Pool level – 1(2)CM02M (Local Rx Bldg 694 Elev) • Narrow range, approximately +/-1 ft of 699'11" Suppression Pool air temperature – 1(2)TI-CM040 (Remote Shutdown Panel) • 0-275 Deg F LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.
Storage / Protection of Equipment : **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
Flooding Note: if stored below current flood level, then ensure procedures exist to move equipment prior to exceeding flood level.	Not applicable per NEI 12-06 as outlined within the first section of this integrated plan.
Severe Storms with High Winds	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
Snow, Ice, and Extreme Cold	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment

Maintain Containment	
BWR Portable Equipment Phase 2:	
	2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
High Temperatures	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
Same as Core Cooling discussion. Connected to RHR and will be implemented via different valve lineups.	Same as Core Cooling discussion.	Same as Core Cooling discussion.

Notes:

Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

Maintain Containment	
BWR Portable Equipment Phase 3:	
Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain containment. Identify methods (containment vent or alternative / Hydrogen Igniters)and strategy(ies) utilized to achieve this coping time. Phases 1 and 2 strategy will provide sufficient capability such that no additional Phase 3 strategies are required. Phase 3 equipment for LaSalle includes backup portable pumps and generators. The portable pumps will be capable of providing the necessary flow and pressure as outlined in Phase 2 response for Core Cooling, Containment Cooling and Spent Fuel Pool Cooling. The portable generators will be capable of providing the necessary 480 volt power requirements as outlined in Phase 2 response for Safety Functions Support.	
Details:	
Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	No additional modification required.
Key Containment Parameters	*List instrumentation credited or recovered for this coping evaluation.* LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.

Deployment Conceptual Design **(Attachment 3 contains Conceptual Sketches)**		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
None.	None.	None.

Maintain Containment
BWR Portable Equipment Phase 3:
Notes: Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

Maintain Spent Fuel Pool Cooling
Determine Baseline coping capability with installed coping[3] modifications not including FLEX modifications, utilizing methods described in Table 3-1 of NEI 12-06: • **Makeup with Portable Injection Source**
BWR Installed Equipment Phase 1:
Provide a general description of the coping strategies using installed equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup with portable injection source)and strategy(ies) utilized to achieve this coping time. There are no Phase 1 actions required at this time that need to be addressed. An evaluation of Spent Fuel Pool scenarios was performed and documented in LaSalle EC 392196 (Ref. 1). Spent Fuel Pool (SFP) makeup is not a time constraint with the initial condition of Mode 1 at 100% power, since the worst case fuel pool heat load conditions only exist during a refueling outage. Under non-outage conditions, the maximum SFP heat load is 27.38 MBtu/hr. Loss of SFP cooling with this heat load and an initial SFP temperature of 140 degrees F results in a time to boil of 12.1 hours, and 123 hours to the top of active fuel. Therefore, completing the equipment line-up for initiating SFP makeup at 12 hours into the event ensures adequate cooling of the spent fuel is maintained. The worst case SFP heat load during an outage is 56.03 MBtu/hr. Loss of SFP cooling with this heat load and an initial SFP temperature of 140 degrees F results in a time to boil of 5.86 hours, and 60.1 hours to the top of active fuel. With the entire core being located in the SFP, manpower resources normally allocated to aligning core cooling along with the Operations outage shift manpower can be allocated to aligning SFP makeup which ensures the system alignment can be established within eight (8) hours. Initiation at eight (8) hours into the event ensures adequate cooling of the spent fuel is maintained. Evaluation of the spent fuel pool area for steam and condensation has not yet been performed. The results of this evaluation and the vent path strategy, if needed, will be provided in a future six (6) month update. Analysis will be performed during development of the detailed design to validate the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. The results of this analysis will be provided during a scheduled six (6) month update. This update will include any changes to the initial designs and/or strategies as submitted in the February 28, 2013 Integrated Plan.

[3] Coping modifications consist of modifications installed to increase initial coping time, i.e., generators to preserve vital instruments or increase operating time on battery powered equipment.

References:

1. LaSalle Engineering Evaluation EC 392196, Rev. 0, "Spent Fuel Pool Uncovery Time for Outage and Online Scenarios,"

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	N/A
Identify any equipment modifications	Per EA 12-051 (SFP Level)
Key SFP Parameter	Per EA 12-051 (SFP Level) LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.

Notes:

Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

Maintain Spent Fuel Pool Cooling
BWR Portable Equipment Phase 2:
Provide a general description of the coping strategies using on-site portable equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup with portable injection source)and strategy(ies) utilized to achieve this coping time. The primary and alternate strategies for connection of the FLEX pumps for Core Cooling and Containment Cooling also provide connection to a dedicated hose station on the refuel floor that can be used for SFP filling and spray. The primary and alternate strategy connections also provide a path through 'B' RHR for SFP water addition without accessing the refuel floor. An additional spool piece will require installation to provide SFP fill via the RHR line. Evaluation of the spent fuel pool area for steam and condensation has not yet been performed. The results of this evaluation and the vent path strategy, if needed, will be provided in a future six (6) month update. Analysis will be performed during development of the detailed design to validate the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. The results of this analysis will be provided during a scheduled six (6) month update. This update will include any changes to the initial designs and/or strategies as submitted in the February 28, 2013 Integrated Plan. References: 1. LaSalle Engineering Evaluation EC 392196, Rev. 0, "Spent Fuel Pool Uncovery Time for Outage and Online Scenarios,"

Schedule:	
Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	Per EA 12-051 (SFP Level) Additionally, the modifications below provide the water source and flow paths for injection to the spent fuel pool: • Pre-stage 480 VAC FLEX pumps in CSCS room • Install suction and discharge piping for pre-staged FLEX pumps to allow timely connection • Install electrical supply to pre-staged FLEX pumps to allow timely connection • For alternate FLEX strategy, install water piping in hardened

Maintain Spent Fuel Pool Cooling	
BWR Portable Equipment Phase 2:	
	vent pipe chase on east side of reactor buildings with external connection at ground elevations and internal connections at 761 feet elevation (for connection to existing B.5.b RHR connection point) and 843 feet elevation for injection to the spent fuel pools (as described in Spent Fuel Pool Cooling section of this Plan).
Key SFP Parameter	Per EA 12-051 (SFP Level) LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.
Storage / Protection of Equipment : **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
Flooding Note: if stored below current flood level, then ensure procedures exist to move equipment prior to exceeding flood level.	Not applicable per NEI 12-06 as outlined within the first section of this integrated plan.
Severe Storms with High Winds	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
Snow, Ice, and Extreme Cold	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and

Maintain Spent Fuel Pool Cooling	
BWR Portable Equipment Phase 2:	
	programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
High Temperatures	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
FLEX pump and generator deployment same as previously described for Core Cooling and Containment Cooling. Connections are the same. Different flow path will be utilized to provide flow to the SFP either via the hose station flowpath or the RHR flowpath.	Same as previously described for Core Cooling and Containment Cooling. An additional spool piece will require installation to provide SFP fill via the RHR line.	Same as previously described. RHR spool piece that requires installation for SFP fill is in protected structure (reactor building).

Notes:

Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

Maintain Spent Fuel Pool Cooling
BWR Portable Equipment Phase 3:
Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain spent fuel pool cooling. Identify methods (makeup with portable injection source)and strategy(ies) utilized to achieve this coping time. Phases 1 and 2 strategy will provide sufficient capability such that no additional Phase 3 strategies are required. Phase 3 equipment for LaSalle includes backup portable pumps and generators. The portable pumps will be capable of providing the necessary flow and pressure as outlined in Phase 2 response for Core Cooling, Containment Cooling and Spent Fuel Pool Cooling. The portable generators will be capable of providing the necessary 480 volt power requirements as outlined in Phase 2 response for Safety Functions Support.

Schedule:	
Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	No additional modification required.
Key SFP Parameter	LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
None.	None.	None.

Maintain Spent Fuel Pool Cooling
BWR Portable Equipment Phase 3:
Notes: Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

Safety Functions Support
Determine Baseline coping capability with installed coping[4] modifications not including FLEX modifications.

BWR Installed Equipment Phase 1
Provide a general description of the coping strategies using installed equipment including station modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times.
<u>Electrical Support</u> The primary electrical power strategy is to connect a portable FLEX 480VAC generator to each unit to supply power to select 480 VAC buses (Division 1 and Division 2) so the 125 VDC Battery Chargers, 250VDC Battery Chargers, and 480 VAC FLEX pumps are powered up. See attached Conceptual Sketch (Attachment 3). The alternate electrical power strategy is to connect a portable FLEX 480 VAC generator to a portable power distribution panel on each unit and then directly power each load individually (i.e., each battery charger and FLEX pump). See attached Conceptual Sketch (Attachment 3). Safety Related 250VDC and 125VDC Bus voltage will be maintained by their associated batteries until the portable 480V generators are placed in service to re-energize the battery chargers. DC Load shedding will be accomplished in accordance with the existing SBO response procedure (Ref. 1) as well as an extended DC load shed procedure to be developed. 125 VDC and 250 VDC Battery coping times have been analyzed per EC 391795 (Ref 2) with the following results: 125 VDC Unit 1 125 VDC Div 1 Battery 1DC07E Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1) and an extended load shed is completed prior to 4.5 hours into the event. 125 VDC Div 2 Battery 1DC14E Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed

[4] Coping modifications consist of modifications installed to increase initial coping time, i.e., generators to preserve vital instruments or increase operating time on battery powered equipment.

per the current SBO procedure (Ref. 1) and an extended load shed is completed prior to 5.5 hours into the event.

Unit 2

125 VDC Div 1 Battery 2DC07E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1) and an extended load shed is completed prior to 5.5 hours into the event.

125 VDC Div 2 Battery 2DC14E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1). An extended load shed is not required for this battery.

250 VDC

Unit 1

250 VDC Battery 1DC01E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1). An extended load shed is not required for this battery.

Unit 2

250 VDC Battery 2DC01E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1). An extended load shed is not required for this battery.

These battery profiles drive the actions to complete the initial DC load shedding and then to perform the extended DC load shedding (as required) once ELAP has been declared. These actions collectively support an analyzed coping time of at least eight (8) hrs for each battery. The eight (8) hrs is conservative as a result of the model only being extended to eight (8) hrs to reflect the currently available vendor battery discharge curves.

<u>RCIC Room Habitability</u>

Per GOTHIC Analysis (Ref. 4), RCIC Room temperature reaches 169^{0}F (equipment acceptance limit per Ref. 3) at 13 hours. This drives the action to provide external air flow to the RCIC Room. The time of 11 hours to initiate external air flow to the RCIC Room is established to provide margin to the calculated value.

<u>Main Control Room Habitability</u>

Exelon Generation Company, LLC (Exelon) intends on maintaining the Operational command and control function within the Main Control Room. Habitability conditions will be evaluated and a strategy will be developed to maintain Main Control Room habitability. The strategy and associated support analyses will be submitted in a future six (6) month update.

AEER Habitability

Exelon Generation Company, LLC (Exelon) intends on maintaining the functions/actions that occur in the AEER for the SBO/ELAP scenario. Habitability conditions will be evaluated and a strategy will be developed to maintain AEER habitability. The strategy and associated support analyses will be submitted in a future six (6) month update.

Battery Room Ventilation

It is expected that the rise in temperature in the Safety Related Battery Rooms due to the loss of ventilation will not adversely affect the functionality of the batteries. However, hydrogen generation upon re-energizing the battery chargers will be addressed in Phase 2.

Spent Fuel Pool Area Ventilation

Evaluation of the spent fuel pool area for steam and condensation has not yet been performed. The results of this evaluation and the vent path strategy, if needed, will be provided in a future six (6) month update.

Analysis will be performed during development of the detailed design to validate the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. The results of this analysis will be provided during a scheduled six (6) month update. This update will include any changes to the initial designs and/or strategies as submitted in the February 28, 2013 Integrated Plan.

References:

1. LaSalle Abnormal Operating Procedure LOA-AP-101, "Unit 1 AC Power System Abnormal," Rev. 42 {Unit 2, LOA-AP-201, Rev. 36}
2. LaSalle Engineering Evaluation EC 391795, Rev. 000, "Battery Coping Times During ELAP with Extended Load Shedding."
3. LaSalle Calculation ATD-0351, "RCIC Pump Room Temperature Transient Following Station Blackout with Gland Seal Leakage," Rev. 3
4. Sargent & Lundy Calculation 2012-11819, Rev. 0, "Transient Analysis of RCIC Pump Room for Extended Loss of A-C Power,"

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.

Identify modifications	Modifications described under the Core Cooling, Containment Cooling and SFP Cooling sections.
Key Parameters	Described under Core Cooling, Containment Cooling and SFP Cooling sections. LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.
Notes: Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.	

Safety Functions Support
BWR Portable Equipment Phase 2

Provide a general description of the coping strategies using on-site portable equipment including station modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times.

Electrical Support

The primary electrical power strategy is to connect a portable FLEX 480VAC generator to each unit to supply power to select 480 VAC buses (Division 1 and Division 2) so the 125 VDC Battery Chargers, 250VDC Battery Chargers, and 480 VAC FLEX pumps are powered up. See attached conceptual sketch (Attachment 3).

The alternate electrical power strategy is to connect a portable FLEX 480 VAC generator to a portable power distribution panel on each unit and then directly power each load individually (i.e., each battery charger and FLEX pump). See attached conceptual sketch (Attachment 3).

Safety Related 250VDC and 125VDC Bus voltage will be maintained by their associated batteries until the portable 480V generators are placed in service to re-energize the battery chargers.

DC Load shedding will be accomplished in accordance with the existing SBO response procedure (Ref. 1) as well as an extended DC load shed procedure to be developed.

125 VDC and 250 VDC Battery coping times have been analyzed per EC 391795 (Ref 2) with the following results:

125 VDC

Unit 1

125 VDC Div 1 Battery 1DC07E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1) and an extended load shed is completed prior to 4.5 hours into the event.

125 VDC Div 2 Battery 1DC14E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1) and an extended load shed is completed prior to 5.5 hours into the event.

Safety Functions Support

BWR Portable Equipment Phase 2

Unit 2

125 VDC Div 1 Battery 2DC07E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1) and an extended load shed is completed prior to 5.5 hours into the event.

125 VDC Div 2 Battery 2DC14E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1). An extended load shed is not required for this battery.

<u>250 VDC</u>

Unit 1

250 VDC Battery 1DC01E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1). An extended load shed is not required for this battery.

Unit 2

250 VDC Battery 2DC01E

Eight (8) hour coping time is demonstrated provided that the existing SBO load shed is completed per the current SBO procedure (Ref. 1). An extended load shed is not required for this battery.

These battery profiles drive the actions to complete the initial DC load shedding and then to perform the extended DC load shedding (as required) once ELAP has been declared. These actions collectively support an analyzed coping time of at least eight (8) hrs for each battery. The eight (8) hrs is conservative as a result of the model only being extended to eight (8) hrs to reflect the currently available vendor battery discharge curves.

<u>RCIC Room Habitability</u>

Per GOTHIC Analysis (Ref. 4), RCIC Room temperature reaches 169^{0}F (equipment acceptance limit per Ref. 3) at 13 hours. This drives the action to provide external air flow to the RCIC Room. The time of 11 hours to initiate external air flow to the RCIC Room is established to provide margin to the calculated value.

Safety Functions Support
BWR Portable Equipment Phase 2
Main Control Room Habitability Exelon Generation Company, LLC (Exelon) intends on maintaining the Operational command and control function within the Main Control Room. Habitability conditions will be evaluated and a strategy will be developed to maintain Main Control Room habitability. The strategy and associated support analyses will be submitted in a future six (6) month update. AEER Habitability Exelon Generation Company, LLC (Exelon) intends on maintaining the functions/actions that occur in the AEER for the SBO/ELAP scenario. Habitability conditions will be evaluated and a strategy will be developed to maintain AEER habitability. The strategy and associated support analyses will be submitted in a future six (6) month update. Battery Room Ventilation It is expected that the rise in temperature in the Safety Related Battery Rooms due to the loss of ventilation will not adversely affect the functionality of the batteries. To address hydrogen generation upon re-energizing the battery chargers, the battery room doors will be propped open to prevent a buildup of hydrogen in the battery rooms. Spent Fuel Pool Area Ventilation Evaluation of the spent fuel pool area for steam and condensation has not yet been performed. The results of this evaluation and the vent path strategy, if needed, will be provided in a future six (6) month update. Fuel Oil Supply to Portable Equipment Fuel oil to portable FLEX Pumps and Generators will be supplied by the quantity of fuel in the tanks located on the skids of the portable equipment. This initial fuel will then be supplemented by fuel tanks contained on the back of the FLEX Truck. When required, fuel can then be pumped from the Emergency Diesel Generator Day Tanks. Analysis will be performed during development of the detailed design to validate the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. The results of this analysis will be provided during a scheduled six (6) month update. This update will include any changes to the initial designs and/or strategies as submitted in the February 28, 2013 Integrated Plan.

<table>
<tr><th colspan="2">Safety Functions Support</th></tr>
<tr><th colspan="2">BWR Portable Equipment Phase 2</th></tr>
<tr><td colspan="2">References:

1. LaSalle Abnormal Operating Procedure LOA-AP-101, "Unit 1 AC Power System Abnormal," Rev. 42 {Unit 2, LOA-AP-201, Rev. 36}
2. LaSalle Engineering Evaluation EC 391795, Rev. 000, "Battery Coping Times During ELAP with Extended Load Shedding."
3. LaSalle Calculation ATD-0351, "RCIC Pump Room Temperature Transient Following Station Blackout with Gland Seal Leakage," Rev. 3
4. Sargent & Lundy Calculation 2012-11819, Rev. 0, "Transient Analysis of RCIC Pump Room for Extended Loss of A-C Power,"</td></tr>
<tr><td colspan="2">Details:</td></tr>
<tr><td>Provide a brief description of Procedures / Strategies / Guidelines</td><td>LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.</td></tr>
<tr><td>Identify modifications</td><td>1. The primary electrical power strategy is to connect a portable FLEX 480VAC generator to each unit to supply power to select 480 VAC buses (Division 1 and Division 2) so the 125 VDC Battery Chargers, 250VDC Battery Chargers, and 480 VAC FLEX pumps are powered up. See attached conceptual sketch (Attachment 3). This modification will involve providing connections to the selected buses as well as connections to the portable 480VAC generator.
2. The alternate electrical power strategy is to connect a portable FLEX 480 VAC generator to a portable power distribution panel on each unit and then directly power each load individually (i.e., each battery charger and FLEX pump). See attached conceptual sketch (Attachment 3). This modification will involve providing connections directly to the supported loads from the mobile distribution panel as well as a connection from the portable 480VAC generator to the mobile distribution panel.</td></tr>
<tr><td>Key Parameters</td><td>LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.</td></tr>
<tr><td colspan="2"></td></tr>
</table>

Safety Functions Support	
BWR Portable Equipment Phase 2	
Storage / Protection of Equipment : **Describe storage / protection plan or schedule to determine storage requirements**	
Seismic	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
Flooding Note: if stored below current flood level, then ensure procedures exist to move equipment prior to exceeding flood level.	Not applicable per NEI 12-06 as outlined within the first section of this integrated plan.
Severe Storms with High Winds	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
Snow, Ice, and Extreme Cold	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.
High Temperatures	Structures to provide protection of FLEX equipment will be constructed to meet the requirements of NEI 12-06 Section 11. Schedule to construct permanent building is contained in Attachment 2, and will satisfy the site compliance date. Temporary locations will be used until building construction completion. Procedures and programs will be developed to address storage structure requirements, haul path requirements, and FLEX equipment requirements relative to the external hazards applicable to LaSalle.

Safety Functions Support		
BWR Portable Equipment Phase 2		
Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
For the primary strategy, the 480VAC generator will be moved from the storage location to outside the EDG building (each unit). Conceptually, it is envisioned that the connection to the 480VAC generator will occur in the hallway of the EDG building at ground elevation. Permanently installed cabling/conduit would be run from that location to the selected 480VAC buses. For the alternate strategy, the 480VAC generator will be moved from the storage location to outside the EDG building (each unit). Cabling would be run to the mobile distribution panel that is pre-staged in a protected structure (EDG or Aux Bldg). Cabling would then be run from the mobile distribution panel to the selected loads.	For the primary strategy, modifications will be required to the selected 480VAC buses to provide a pre-wired connection capability for the FLEX 480VAC generator power supply. This modification would also involve running cable/conduit to the EDG building (both units) hallway on the ground elevation for the 480VAC generator connection point. For the alternate strategy, modification to the supported loads would be required to accommodate a direct connection from the mobile distribution panel.	For both the primary and alternate strategies, all connection points will be inside protected structures (either the EDG or Aux Buildings).
Notes: Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS		

Safety Functions Support
BWR Portable Equipment Phase 2
during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

Safety Functions Support
BWR Portable Equipment Phase 3
Provide a general description of the coping strategies using phase 3 equipment including modifications that are proposed to maintain and/or support safety functions. Identify methods and strategy(ies) utilized to achieve coping times. Phases 1 and 2 strategy will provide sufficient capability such that no additional Phase 3 strategies are required. Phase 3 equipment for LaSalle includes backup portable pumps and generators. The portable pumps will be capable of providing the necessary flow and pressure as outlined in Phase 2 response for Core Cooling, Containment Cooling and Spent Fuel Pool Cooling. The portable generators will be capable of providing the necessary 480 volt power requirements as outlined in Phase 2 response for Safety Functions Support.

Details:	
Provide a brief description of Procedures / Strategies / Guidelines	LaSalle will use the industry developed guidance from the Owners Groups, EPRI and NEI Task team to develop site specific procedures or guidelines to address the criteria in NEI 12-06. These procedures and/or guidelines will support the existing symptom based command and control strategies in the current EOPs.
Identify modifications	No additional modification required.
Key Parameters	LaSalle's evaluation of the FLEX strategy may identify additional parameters that are needed in order to support key actions identified in the plant procedures/guidance or to indicate imminent or actual core damage (NEI 12-06 Rev. 0 Section 3.2.1.10) and any differences will be communicated in a future six (6) month update following identification.

Deployment Conceptual Design (Attachment 3 contains Conceptual Sketches)		
Strategy	**Modifications**	**Protection of connections**
Identify Strategy including how the equipment will be deployed to the point of use.	*Identify modifications*	*Identify how the connection is protected*
None.	None.	None.

Safety Functions Support
BWR Portable Equipment Phase 3
Notes: Exelon Generation Company, LLC (Exelon) has not finalized the engineering designs for compliance with NRC Order EA-12-049. Detailed designs based on the current conceptual designs will be developed to determine the final plan and associated mitigating strategies. Analysis will be performed to validate that the plant modifications, selected equipment, and identified mitigating strategy can satisfy the safety function requirements of NEI 12-06. Once these designs and mitigating strategies have been fully developed, Exelon will update the integrated plan for LSCS during a scheduled six (6) month update. This update will include any changes to the initial designs as submitted in the February 28, 2013 Integrated Plan.

BWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
Three (3) large self prime pumps (Support Alternate Strategy)	X	X	X			To be determined as part of detailed design process.	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11.
Three (3) 480 VAC Generators (Support Primary Strategy)	X	X	X	X	X	To be determined as part of detailed design process.	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11.
Two (2) 480 VAC Pumps (Support Primary Strategy)	X	X	X			To be determined as part of detailed design process.	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06

BWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
							section 11.
Three (3) Submersible Hydraulic Pumps (Support Alternate Strategy)	X	X	X			To provide suction to portable large self prime pumps from UHS. Actual number and size of submersible hydraulic pumps to be determined as part of detailed design process.	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11.
Ford F750 Truck w/snow plow and diesel fuel tanks					X	Tow vehicle, portable equipment refueling vehicle, and debris removal vehicle	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11.
Three (3) Tandem Axle Hose Trailers (Support Alternate Strategy)	X	X	X			Capable of hauling hoses, fittings, tools and spray monitors	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01

BWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
							section 6 and NEI 12-06 section 11.
Six (6) 5.5 kW portable diesel generators (Support powering fans for RCIC room cooling)					X	Diesel, 5.5 kW	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11.
Ten (10) portable fans with ducting (Support RCIC room cooling)					X	115 VAC, 5,000 SCFM	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11.
Two (2) Oscillating Spray Fire Monitors			X			250 gpm	Equipment maintenance and testing will be performed in accordance with the industry

BWR Portable Equipment Phase 2							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Maintenance*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		Maintenance / PM requirements
(Support SFP Spray)							templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11.
Miscellaneous fire hose and fittings (Support Alternate Strategy and SFP Spray)	X	X	X			Various	Equipment maintenance and testing will be performed in accordance with the industry templates, as outlined in JLD-ISG-2012-01 section 6 and NEI 12-06 section 11.

BWR Portable Equipment Phase 3							
Note: The RRC equipment has not been procured at the time of this submittal. Once the SAFER committee determines the equipment specifications for bid, updates will be made as necessary to this table. The Phase 3 portable equipment table will be updated once all of the equipment has been procured and placed in inventory.							
Use and (potential / flexibility) diverse uses						*Performance Criteria*	*Notes*
List portable equipment	Core	Containment	SFP	Instrumentation	Accessibility		
Medium Voltage Diesel Generator	**X**	**X**	**X**	**X**	**X**	2 MW output at 4160 Vac, three phase	• Generator must be common commercially available. • Must run on diesel fuel.
Low Voltage Diesel Generator	**X**	**X**	**X**	**X**	**X**	500 kW output at 480 Vac, three phase	• Generator must be common commercially available. • Must run on diesel fuel.
Low Pressure Pump	**X**	**X**	**X**			300 psi shutoff head, 2500 gpm max flow	
Low Pressure Pump	**X**		**X**			500 psi shutoff head, 500 gpm max flow	
Low Pressure Pump					**X**	110 psi shutoff head, 400 gpm max flow submersible	

Low Pressure Pump	**X**	**X**				150 psi shutoff head, 5000 gpm max flow	
Air Compressor		**X**				120 psi minimum pressure, 2000 scfm	

Phase 3 Response Equipment/Commodities	
Item	**Notes**
Radiation Protection Equipment • Survey instruments • Dosimetry • Off-site monitoring/sampling	The RRC will not stock this type of equipment but this equipment will be requested from site-to-site and utility-to-utility on an as required basis.
Commodities • Food • Potable water	The RRC will not stock these commodities but they will be requested from site-to-site and utility-to-utility on an as required basis.
Fuel Requirements	300 – 500 gallon bladders that can be delivered by air.
Heavy Equipment • Transportation equipment • Debris clearing equipment	• TBD during site specific playbook development • Redundant Phase 2 equipment to be located at RRC

Attachment 1A
Sequence of Events Timeline

Action item	Elapsed Time	Action	Time Constraint Y/N [5]	Remarks / Applicability
	0	Event Starts	NA	Plant @100% power
1	0	Reactor Scram and SBO.		
2	~2 min	RCIC starts on lo-lo RPV water level and injects at 600 gpm	N	Automatic equipment function
3	0-5 mins	Operating crew enters applicable EOPs and abnormal procedures for SBO.	Y (time critical activities in LOA-AP-101)	LOA-AP-101, Att. K to direct initial SBO response (Ref. 1)
4	5 mins	DC load shedding initiated	N	LOA-AP-101, Att. K, Step 2. Initiation of load shedding is not time critical – completion of load shedding is time critical.
5	5 mins	Attempt to start emergency diesel generators (3 for Unit 1, 2 for Unit 2)	N	LOA-AP-101, Att. K, Step 3.
6	5 mins	Equipment Operator dispatched to Aux Electric Equipment Room (AEER) to: • Control the ADS SRVs to support cooldown within 20 mins • Open all panel doors in AEER within 30 mins • Monitor and report critical parameters at Remote Shutdown Panel & 1H13-P629/1H13-P631 panels	N	LOA-AP-101, Att. K, Step 4. Dispatch of EO is not time critical – completion of the tasks is time sensitive and discussed below.
7	5 mins	Reactor Operator control RPV level with RCIC	N	LOA-AP-101, Att. K, Step 5 For events in which

[5] Instructions: Provide justification if No or NA is selected in the remarks column
If yes, include technical basis discussion as requires by NEI 12-06 section 3.2.1.7

				CST is not available, suction path swapped to suppression pool.
8	15 mins	Defeat RCIC Low Steam Line Pressure Isolation (RO Control Room portion)	N	Not time critical since not depressurizing RPV at this time. LGA-RI-101, E.2 (Ref. 2)
9	20 mins	Control of ADS SRVs to support cooldown established and an RPV depressurization at less than or equal to 20 deg F per hour is commenced.	Y	LOP-AP-101, Att. K, Step 6. Time sensitive portions are establishing control within 20 mins and depressurizing/cooling down slow enough.
10	30 mins	Partial Initial DC load shedding completed	Y	LOA-AP-101, Att. K, Step 2, 30 min loads
11	30 mins	Defeat RCIC Low Pressure Isolation Logic (EO AEER portion)	N	Not time critical since not depressurizing RPV at this time. LGA-RI-101, Att. A
12	30 mins	All panel doors in AEER opened.	Y	Time sensitive for AEER temperature evaluation.
13	30 mins	All panel doors in Main Control Room opened	Y	LOA-AP-101, Att. K, Step 11. Time sensitive for Control Room temperature evaluation.
14	~60 mins	Control Room crew has assessed SBO and plant conditions and declares an Extended Loss of AC Power (ELAP) event.	Y	Time is reasonable approximation based on operating crew assessment of plant conditions.
15	~60 mins	Equipment Operators dispatched to begin setup/connection of FLEX equipment (480VAC generators to power battery chargers and FLEX pump).	N	DC coping analysis (Ref. 3) shows the 125VDC and 250VDC batteries have a minimum of 8 hours coping capability with initial and deep load shedding completed (as applicable to particular battery).

16	~180 mins	Initiate Extended DC load shedding to prolong 125 VDC battery life to ~8 hrs	N	DC coping analysis (Ref. 3) shows that extended DC load shedding needs to be completed within 4.5 hrs for U1 Div. 1, 5.5 hrs for U1 Div. 2, 5.5 hrs for U2 Div. 1 and deep load shedding is not required for U2 Div. 2. Initiation of extended (deep) load shedding is shown in the timeline to allow ~1.5 hrs to complete.
17	180 mins	Initial DC load shedding completed	Y	LOA-AP-101, Att. K, Step 2, 180 minute loads
18	4.5 hrs	Complete Extended DC load shedding for applicable 125VDC batteries.	Y	Timing of completion of extended DC load shedding is important to extending coping time to 8 hrs as described earlier in timeline.
19	5 hrs	Provide additional nitrogen supply for ADS SRVs	Y	Per LOA-IN-101 (Ref. 4) & LOP-IN-05 (Ref. 5). Time sensitive per calculation L-003263 (Ref. 6).
20	~5.4 hrs	Initiate early containment venting strategy at a wetwell pressure of ~12 psig. Open hardened containment vent with path from the wetwell.	N	MAAP analysis (Ref. 7) indicates that the conceptual early containment venting strategy trigger of 12 psig in the wetwell will occur at ~5.4 hrs with this strategy.
21	6 hrs	480VAC generators connected to supply battery chargers for 125VDC (Div. 1 and 2) and 250VDC buses	Y	Restore AC power to battery chargers prior to loss of each battery at the analyzed value of ~8 hrs.
22	6 hrs	FLEX pumps connected (electrical and water suction/discharge path) and alignment for	Y	MAAP analysis (Ref. 7) is showing

		suppression pool makeup established. Suppression pool makeup begins.		suppression pool makeup at 6.2 hrs based on the suppression pool level reduction from implementation of the early containment venting strategy at ~5.4 hrs. This MAAP analysis also shows a required makeup flowrate of ~95 gpm for the first 4 hrs after the vent is opened.
23	~6.7 hrs	Heat Capacity Temperature Limit (HCTL) curve exceeded, RPV depressurization to ~200 psig required. RPV pressure now maintained 150-250 psig range to support RCIC operation.	N	MAAP analysis (Ref. 7) indicates that the HCTL curve will be exceeded at ~6.7 hrs based on this strategy. RPV depressurization stops at ~200 psig (pressure band of 150-250 psig used) in RPV to preserve RCIC operation. Modified depressurization approach supported by BWROG changes to EPGs.
24	~11 hrs	Provide external air flow to RCIC room	Y	GOTHIC analysis (Ref. 8) shows that external air flow needs to be provided within 13 hrs to prevent room temps from exceeding 169 deg F which is the maximum allowable value from the current SBO analysis (Ref. 9).
25	12 hrs	Begin SFP injection based on FLEX "normal" scenario that begins with both units on-line at 100% power.	Y	EC 392196 (Ref. 10) indicates that SFP boiling begins at ~12 hrs with TAF being reached at ~123 hrs. Beginning SFP inject

				by ~12 hrs provides margin to degraded radiological conditions and TAF.
26	24 -72 hrs	Continue to maintain critical functions of core cooling (via RCIC), containment (via hardened vent opening and FLEX pump injection to suppression pool) and SFP cooling (FLEX pump injection to SFP). Utilize initial RRC equipment in spare capacity.	N	Not time critical/sensitive since Phase 2 actions result in indefinite coping times for all safety functions.
		References: 1. LaSalle Abnormal Operating Procedure LOA-AP-101, "Unit 1 AC Power System Abnormal," Rev. 42 {Unit 2, LOA-AP-201, Rev. 36} 2. LaSalle LGA Support Procedure LGA-RI-101, "Unit 1 Alternate Vessel Injection Using RCIC Including Defeat of RCIC Isolations," Rev. 005 (Unit 2, LGA-RI-201, Rev. 003} 3. LaSalle Engineering Evaluation EC 391795, Rev. 000, "Battery Coping Times During ELAP with Extended Load Shedding." 4. LaSalle Abnormal Operating Procedure LOA-IN-101, "Loss Of Drywell Pneumatic Air Supply," Rev. 007 {Unit 2, LOA-IN-201, Rev. 007} 5. LaSalle Normal Operating Procedure LOP-IN-05, "Replacing Nitrogen Bottles on Instrument Nitrogen System Supporting Op Eval OE06-00," Rev. 023 6. LaSalle Calculation L-003263, Rev. 02, "Volume Requirements for ADS Back-up Compressed Gas System (Bottle Banks)" 7. LS-MISC-017, Rev. 1, "MAAP Analysis to Support Initial FLEX Strategy," LaSalle Units 1 and 2 8. Sargent & Lundy Calculation 2012-11819, Rev. 0, "Transient Analysis of RCIC Pump Room for Extended Loss of A-C Power," 9. LaSalle Calculation ATD-0351, "RCIC Pump Room Temperature Transient Following Station Blackout with Gland Seal Leakage," Rev. 3		

		10. LaSalle Engineering Evaluation EC 392196, Rev. 0, “Spent Fuel Pool Uncovery Time for Outage and Online Scenarios,”		

Attachment 2
Milestone Schedule

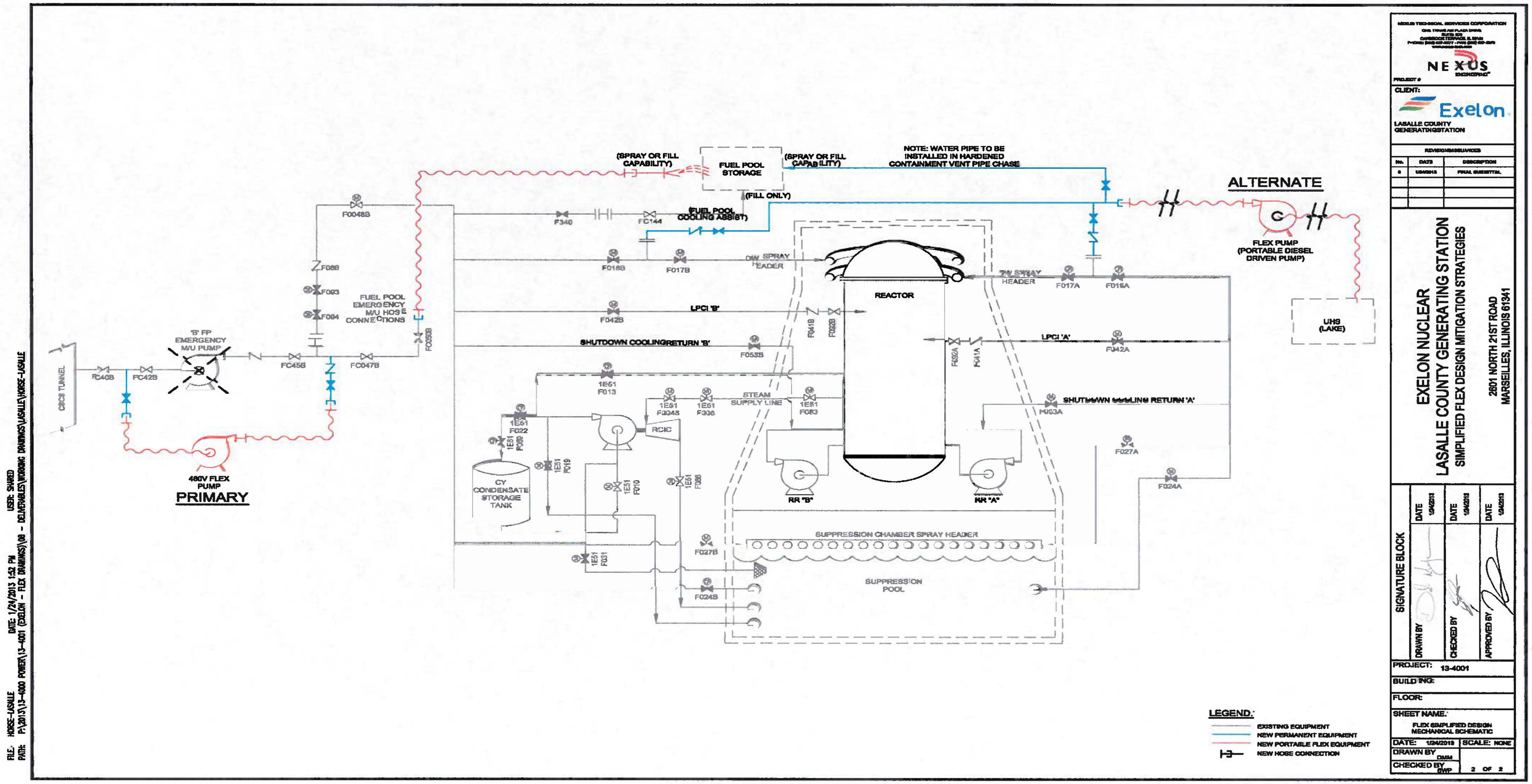
Site: LaSalle

Original Target Completion Date		Activity	Status {Include date changes in this column}
		Submit 60 Day Status Report	Complete
		Submit Overall Integrated Implementation Plan	Complete
		Contract with RRC	Complete
Recurring action, Aug and Feb		Submit six (6) month updates	Ongoing
Unit 1	**Unit 2**	Modification Development	
Jan 2015	Jan 2014	• Phase 1 modifications	Note 1
Jan 2015	Jan 2014	• Phase 2 modifications	Note 1
Jan 2015	Jan 2014	• Phase 3 modifications	Note 1
Unit 1	**Unit 2**	Modification Implementation	
Mar 2016	Feb 2015	• Phase 1 modifications	Note 1
Mar 2016	Feb 2015	• Phase 2 modifications	Note 1
Mar 2016	Feb 2015	• Phase 3 modifications	Note 1
		Procedure development	
Feb 2015		• Strategy procedures	Note 1
Feb 2015		• Maintenance procedures	Note 1
Oct 2014		Staffing analysis	Note 1
Feb 2015		Storage Plan and construction	Note 1
Feb 2015		FLEX equipment acquisition	Note 1
Feb 2015		Training completion	Note 1
Dec 2014		Regional Response Center Operational	(will be a standard date from RRC)
Mar 2016		Unit 1 Implementation date	Note 1
Feb 2015		Unit 2 Implementation date	Note 1

Note(s):

1. Exelon will update the status of ongoing and future milestones in the Integrated Plan for LSCS during a scheduled six (6) month update. This update will include any changes to the milestone schedule as submitted in the February 28, 2013 Integrated Plan.

Attachment 3
Conceptual Sketches



Attachment 3 Cont'd
Conceptual Sketches