ATTACHMENT (1)

REQUEST FOR EXTENSION OF THE COMPLETION DATE FOR CORRECTIVE ACTIONS RELATED TO GENERIC LETTER 2004-02

1.0 BACKGROUND

In Reference (1), the NRC staff summarized their bases for concluding that existing pressurized-water reactors (PWRs) could continue to operate through December 31, 2007, while implementing the required corrective actions for Nuclear Regulatory Commission (NRC) Generic Safety Issue 191 (GSI-191), "Assessment of Debris Accumulation on PWR Sump Performance." In Reference (2), Calvert Cliffs submitted a response to GL 2004-02. In that letter, Calvert Cliffs committed to completing the corrective actions required by GL 2004-02 by December 31, 2007 for Calvert Cliffs Unit 2 and requested an extension for Unit 1.

During the ensuing work to complete the GL 2004-02 corrective actions, it has become apparent that certain activities to resolve the containment sump issues cannot be completed within the current schedules, and, therefore, extensions to complete the corrective actions are necessary. Calvert Cliffs is performing a mechanistic analysis of the potential for adverse effects of post-accident debris blockage and of the potential for debris-laden fluids to affect the recirculation functions of the Emergency Core Cooling System (ECCS) and Containment Spray System following postulated design basis accidents for which the recirculation of these systems is required. However, certain activities have been identified for Calvert Cliffs that will not be completed by December 31, 2007; specifically, the downstream effects evaluations for components, including the reactor vessel and nuclear fuel, the chemical effects testing and evaluation, and the associated acceptance reviews. These items are discussed in greater detail in Section 3.0 below. Note that the results of the evaluations and testing may indicate the need for additional plant or procedure modifications to fully resolve open issues associated with GSI-191.

Therefore, Calvert Cliffs is requesting a schedule extension for Units 1 and 2 to complete the remaining technical evaluations and testing, as well as to determine whether any additional actions may be required based on the results of the technical evaluations and testing. The following information provides the basis for the extension request. Specifically, in the following discussion, Calvert Cliffs has addressed the "Criteria for Evaluating Delay of Hardware Changes," as described in Reference (4). This discussion supports Calvert Cliffs' request for an extension of the completion date to ensure that the necessary technical evaluations and testing have been completed to facilitate resolution of GSI-191 issues.

2.0 REASON FOR THE PROPOSED EXTENSION

Calvert Cliffs is requesting an extension until June 30, 2008 for the completion of the following activities: 1) downstream effects evaluations for components, including the reactor vessel and nuclear fuel, 2) chemical effects testing and evaluation, and 3) review of existing GSI-191 audit reports.

1. Downstream Effects

Calvert Cliffs used Revision 0 of WCAP-16406-P to evaluate downstream clogging and wear of ECCS components. However, WCAP-16406-P Revision 1 was issued in September 2007 and includes revised guidance for the performance of downstream effects evaluations for components, including the reactor vessel and nuclear fuel. Also, WCAP-16793-NP Revision 0, issued in May 2007, provides guidance on evaluation of blockage and chemical precipitant plateout in the reactor core and fuel and is currently undergoing NRC review. Consequently, revised downstream effects evaluations need to be performed in accordance with the most recent WCAP guidance. The revised downstream effects evaluations are scheduled to be completed for Calvert Cliffs by the end of April 2008.

In addition, the treatment of pump seals subject to cooling flow containing debris changed in Revision 1 of WCAP-16406. Now a pump seal failure must be assumed if the pump seals are subjected to debris laden water. Since the containment spray pumps at Calvert Cliffs use pump water to cool the mechanical seals, Calvert Cliffs has initiated an effort to demonstrate via testing that the pump seals are qualified for the mission time of the pump. We are working expeditiously with Wyle Labs to arrange this testing in the first quarter of 2008.

The HPSI pumps at Calvert Cliffs use cyclone separators. Although the cyclone separator vendor believes that the separators will successfully operate when handling fibrous debris, a test is planned to verify operation of the cyclone separators under these conditions. This testing is expected to be completed in the first quarter of 2008.

2. Chemical Effects Testing

In September 2006, Control Components, Inc. (CCI) performed head loss testing of a scaled portion of the Calvert Cliffs strainer using mechanistically determined fiber and particulate debris loads. This test was conducted in CCIs Large Loop Test Facility. The measured head loss at test temperature was 1.13 inches, which equates to 0.27 inches at the limiting NPSH-available temperature (212°F). This result indicated that there were several orders of magnitude of margin below the maximum allowable head loss value. Based on this favorable result Calvert Cliffs was confident that, when chemical precipitants were included in the debris mix, the measured head loss would still be below this maximum allowable value.

Due to other scheduled testing, CCI was not able to perform the head loss testing with chemical precipitants included until November 2007. This test was conducted in CCIs Multi-Function Loop test facility. The measured head loss during testing was an order of magnitude greater than the maximum allowable value. Completion of a successful head loss test with chemical precipitants included in the debris mix is required to confirm that the replacement strainers installed at Calvert Cliffs are adequate to maintain NPSH margin for the ECCS pumps during long-term core cooling and to confirm that no further physical modifications are required.

To complete the required head loss testing, the following actions need to be performed:

A. Understand differences in the CCI test facilities, and conclude whether one provides more realistic results than the other.

B. Review CCIs procedures on chemical precipitant generation, and placement into test loop to ensure it is in accordance with the applicable WCAP.

C. Revise debris load calculations to remove some of the conservatisms including:

   (1) Apply reduced ZOIs for Nukon, Transco Thermal Wrap and mineral wool insulations to reduce fiber load.

   (2) Apply a reduced ZOI for qualified coatings to reduce particulate load.

   (3) Conduct walkdowns during 2008 refueling outage to more accurately identify how much aluminum and marinite board could contribute to the chemical precipitant mix in the sump pool.

D. Using revised plant inputs, have ALION revise the chemical precipitant prediction.

E. Have CCI test the revised debris loads, and provide a head loss test report.

Once the 2008 refueling outage walkdown information on aluminum and marinite board is available (mid-March) a revised chemical precipitants evaluation can be performed by ALION. Once the chemical precipitants are known, CCI can perform the bench top testing in preparation for the head loss testing. This evolution previously took four weeks, but we are working with the vendor to improve this schedule. Once this is completed, the head loss testing can begin (early May). The head loss test report is expected to be delivered by early June, at which time the NPSH margin calculation can be finalized, and a response sent to the NRC. We are working with our vendors to secure testing windows that support completion of all actions by June 30, 2008.

3. Audit Items

Calvert Cliffs is aware that the NRC has conducted audits of several plants and has requested that utilities review these audits to ensure they have properly addressed any issues identified therein. Calvert Cliffs has identified some areas where additional work is required (low pressure safety injection pump turn-off at recirculation actuation signal, flashing across sump screen); however, with the amount of work required to address the Generic Letter we have been challenged to review all the audit reports with the degree of rigor that we believe is warranted. Additional time to ensure all audit items have been appropriately addressed is therefore also needed. These audit report reviews will be done in parallel with the testing and evaluations described above.

3.0 JUSTIFICATION FOR THE PROPOSED EXTENSION

The justification for continued operation that was previously provided (Reference 3) for Unit 1 is updated below. This new evaluation applies to Unit 2 currently and Unit 1 following the spring 2008 refueling outage. This justification assumes the installation of a new, larger strainer which has smaller openings in the strainer mesh and uses knowledge gained from recent strainer testing.

1. Low Head Loss for Fiber / Particulate Load

   The strainer installed in Unit 2, and which will be installed in Unit 1, was sized for debris loads as prescribed by the base methodology of Nuclear Energy Institute (NEI) 04-09 ("NEI Guidance Document for Evaluating ECCS Sump Performance"). In accordance with Section 3.4.3.3.1 of the NEI guidance document it was assumed that 60% of the generated fiber debris is small fines and that 100% of these small fines transport to the sump. This resulted in a large fiber load. In addition, Calvert Cliffs has a high unqualified coatings load (30,000 ft^2 of surface area, 30 ft^3 of volume). This entire coating load was assumed to transport to the sump screen. However, even with these conservatively determined debris loads, testing in September 2006 determined that the measured head loss across the filtration surface for the new sump strainer was 1.13 inches as compared to an allowable value of 7.5 inches. This test did not include chemical precipitants.

2. Conservative Chemical Precipitant Test Facility

   Testing with chemical precipitant was conducted in November 2007 and had to be conducted in a different laboratory than the debris load testing; one not believed to be as representative of the actual plant as the first test facility. The head loss from fiber and particulate alone was 15.5 inches (compared to the previously tested 1.13 inches), and when chemical precipitant was added the head loss went up to approximately 75 inches.

   The ratio of head loss for fiber and particulate, only, between the two test facilities is approximately 13.7. If the head loss with chemical precipitant is ratioed down to account for the effect of the test facility, the head loss with chemical precipitant included is 5.5 inches which is less than the allowable value of 7.5 inches.

3. Additional Margin Available from Sub-Cooled Margin

   The test head loss results mentioned above are at a test temperature of approximately 13-18°C. The head loss allowable limit of 7.5 inches assumes a fluid temperature of 100°C. If the test head loss results are translated into a head loss at 100°C the head loss goes from 1.13 inches to 0.264 inches. A similar reduction is applicable to all the head loss test results. Also note that the allowable head loss, at a temperature of 15°C, increases to over 25 feet (as compared to the previous 7.5 inches) when the effect of sub-cooled margin is included in the net positive suction head (NPSH)-available calculation. This calculation does not credit containment backpressure.

4. Containment Backpressure

The NPSH-available calculation does not credit containment backpressure. While a specific analysis for this purpose has not been performed, a review of existing analyses would indicate at least a 5 psi backpressure over 80 hours into the event. This 5 psi backpressure would allow approximately 12 additional feet of head loss margin. Beyond 80 hours the high pressure safety injection (HPSI) flow requirement is less than one-half the design HPSI flow, and operation with one containment spray pump would be acceptable. Since head loss is proportional to the square of the flow rate, with the strainer flow reduced by one-half, the head loss across the strainer would go down by one-fourth.

5. Design Debris Load Conservatisms

The new sump strainer is sized to accommodate the following particulate sources: qualified coating in the zone of influence (ZOI), latent debris, and unqualified coatings inside Containment. The unqualified coatings are assumed to be 30.0 ft^3; and are the largest source of particulate debris load on the strainer (approximately 70% of the total). Failed coating transport testing was conducted by Calvert Cliffs, and it demonstrated that at our low approach velocities (and even at eight times our approach velocity) the only coating transport to the strainer was dust-like particles. Per WCAP-16406 ("Evaluation of Downstream Sump Debris Effects in Support of GSI-191") dust-like particles are < 100 µM in size, and the quantity of failed unqualified coatings in this size range is only 1.56% of the total quantity of failed coatings. A review of the particulate load inputs to the head loss testing shows that if the non-transportability of these failed coatings is accounted for, the new strainer has been tested for a particulate load approximately 3 times higher than what might actually transport to it during a LOCA.

The quantity of insulation generated assumes a ZOI of 17 L/D. This ZOI is actually applicable to unjacketed insulation. Insulation jacketed by standard banding was not tested, and therefore it is conservatively assumed that the ZOI for insulation jacketed by standard banding is also 17 L/D. Testing done by others has shown marked reduction in the destruction ZOI for NUKON insulation with stainless steel jacketing. Thus, the insulation debris load is also very conservative.

From Section 5.1.3 of NUREG/CR-6808, fine debris such as individual fibers would remain suspended in the pool, and ultimately most of the fine debris would be transported to the sump screen. From Section 5.2.1, test data is given which shows that water velocities of 0.2 ft/sec are needed to move sunken individual shreds of insulation. For the new containment sump screens, having a surface area of 6000 ft^2, at a total sump flow of 5000 gpm (2 x Cont. Spray + 2 x HPSI + margin), the approach velocity would be 0.00186 ft/sec. This would indicate that only small, individual fines of suspended fibrous insulation would be transported to the sump screens. Furthermore, this velocity is less than the minimum screen retention velocity of 0.04 ft/sec listed in Table 5-1 of NUREG/CR-6808.

Additionally, per Figure 5-2 of NUREG/CR-6808, individual shreds of fiber insulation have a settling velocity of 1 mm/sec. Assuming a conservatively high sump level after the blowdown phase (62 inches) and a settling velocity of 1 mm/sec means that all the insulation would be settled to the floor within 26.25 minutes. The earliest a recirculation actuation signal could be received is 30 minutes. Therefore, there is time for the insulation to settle to the floor prior to the onset of containment sump recirculation. Once insulation and other debris has settled to the floor its transportability is greatly diminished.

6. Operator Training & Actions

The above discussion points out that because of the low suction velocity to the sump, and the long available debris settling time prior to recirculation mode, the sump strainer at Calvert Cliffs is not susceptible to rapid accumulation of debris. If debris were to somehow accumulate on the screen to the point that pump cavitation resulted, this process would only occur very gradually. As part of the defense-in-depth strategy, procedural guidance exists which identifies actions to be taken to mitigate this condition.

Pump cavitation would be detected by the Operators who have procedural guidance to monitor the pumps for evidence of pump cavitation. The training the Operators received in response to Bulletin 2003-01 instructed them to consider reducing the total sump flow when pump cavitation was detected. This would be achieved by first throttling HPSI flow, and then if necessary turning off the containment spray pumps and relying on the containment air coolers for atmosphere control. Only one HPSI pump at throttled flow is needed to provide adequate cooling for the core.

7. Mitigative Measures

a. Physical Modifications

Unit 2 - Calvert Cliffs Unit 2 completed the installation of an approximately 6000 ft^2 surface area replacement strainer system (which includes some margin for chemical effects), and replaced or banded calcium silicate insulation that could contribute to a limiting debris bed in Containment during the spring 2007 refueling outage.

Unit 1 – The same strainer system modification is planned for Unit 1 during the spring 2008 refueling outage. No calcium silicate insulation has been identified in the ZOI in the Unit 1 Containment.

b. Containment Cleanliness

Calvert Cliffs has a procedure in place to ensure containment cleanliness as documented in the response to NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors" (Reference 5). A detailed containment inspection is performed prior to closing Containment following a plant outage that requires a containment entry, or following a containment entry at power. The procedure specifically directs the inspection for, and removal of, loose debris (e.g., rags, trash, clothing, etc.) in the Containment that could be transported to the containment recirculation sump or that could block containment drainage paths. Additionally, the procedure directs the removal of temporary material that is used in Containment and the restraint of any temporary material that is to be left in Containment. Containment sump inspections are required by Technical Specifications.

c. Information Notice 2005-26

On September 16, 2005, the NRC issued Information Notice (IN) 2005-26, "Results of Chemical Effects Head Loss Tests in a Simulated PWR Sump Pool Environment."

IN 2005-26 applies to plants with installed calcium silicate insulation and trisodium phosphate as a buffering agent inside Containment. Calvert Cliffs Unit 2 has calcium silicate insulation on some small bore piping which was susceptible to damage from a limiting break. In Reference

(6), Calvert Cliffs updated the results of a review of compensatory measures in light of IN 2005-26. During the Unit 2 spring 2007 refueling outage, calcium silicate insulation was removed or banded in ZOI to prevent it from being a contributing debris source for a limiting break.

d. Large Break LOCA Evaluation

With the installation of the new sump strainer and other associated changes and evaluations, there has been a significant reduction in the vulnerability to debris blockage and component wear in the recirculation system when mitigating a LOCA. For the remaining outstanding issues of downstream and chemical effects, the vulnerability is significant for large break LOCAs only. For small and intermediate break LOCAs, it is expected that there will be a significant reduction in debris generation, at least one order of magnitude. With this type of reduction in the fibrous and particulate sources, a functional strainer will be assured for small and intermediate break LOCAs. This is further assured since the strainer design is sized for a conservative estimate of the fibrous (ZOI=17 L/D) and particulate (all unqualified coatings fail) debris loading.

With conservatisms removed, and the lower fiber/particulate load associated with a medium and small-break LOCA considered, there is reasonable assurance that significant areas of the strainer filtration surface will remain essentially clean. This conclusion is augmented by the fact that our low strainer approach velocity (0.00186 ft/sec) precludes the transport of much of the debris assumed to transport to the strainer. By having a clean strainer flow area, chemical precipitates will not have a debris bed to imbed in, and therefore will not block these portions of the strainer either.

With an order of magnitude or more reduction in the debris, the effect of LOCA-generated debris on downstream components will also be significantly reduced. Existing reviews on downstream effects would indicate that at this reduced debris load there will be no component wear or clogging except for the seals on the containment spray pumps which are cooled with containment spray water. However, testing referenced in WCAP-16406-P documents that with a conservative debris load in the pump water, a typical pump's mechanical seals can operate at least 40 hours without failure. Containment and Reactor Coolant System cooling for medium and large LOCAs require either two Containment Air Coolers (CACs) or a Containment Spray Header (with a functioning Shutdown Cooling Heat Exchanger). Therefore, there is reasonable assurance that the ECCS components will be able to provide the required decay heat removal / long-term core cooling function.

e. PRA Risk Evaluation

The quantitative risk evaluation addresses potential vulnerability for large break LOCAs only since small and medium break LOCAs are dispostioned in Section 3.0.7.1.d above. The frequency of this initiating event is low (1.3E-6/yr per NUREG/CR-6928). The increase in core damage frequency (CDF) and large early release frequency (LERF) is determined from the initiating event frequency for a large break LOCA. Integrating the initiating event frequency over the period of the proposed six month extension determines the core damage probability (CDP) and the large early release probability (LERP). As noted above, the initiating event frequency for a large break LOCA is equal to 1.3E-6/yr. Therefore, for a six month extension to complete GL 2004-02 corrective actions, the CDP is calculated as follows:

CDP = (1.3E-6/yr)*(0.50 years) CDP = 6.5E-7

The LERP is negligible based on the Level 2 Probabilistic Risk Assessment (PRA) model.

No credit is taken for recovery actions, which Calvert Cliffs would normally use, to ensure continued supply from the sumps. The base CDF and base LERF values for Calvert Cliffs Units 1 and 2 are shown below along with the CDP and LERF values that were calculated for the proposed six month extension.

Unit	Base CDF	CDP for an 6 month extension	Base LERF	LERF for an 6 month extension
CCNPP 1	7.3E-5/yr	6.5E-7	5.7E-6/yr	<1E-07*
CCNPP 2	7.8E-5/yr	6.5E-7	7.1E-6/yr	<1E-07*

* If sump clogging or downstream and chemical effects cause a failure of ECCS, then core damage will occur relatively late in the event. Further, the Reactor Coolant System pressure will be low and minimize the probabilities of thermally induced steam generator tube ruptures and core ejection. Thus the ratio of CDF to LERF will be much great then a factor of ten.

Regulatory Guide 1.174 states that, when calculated changes in risk are < 1E-6/yr, a permanent change is "very small" if the total plant CDF is less than 1E-4/yr. For LERF, a "very small" change is a calculated risk < 1E-7/yr if the total LERF is less than 1E-5/yr. This Regulatory Guide sets criteria for permanent plant changes with associated risk increases. In this case, it may be conservatively used to evaluate the risk impact of the six month extension to complete the GL 2004-02 corrective actions. The assumption that the sump is 100% unavailable is additionally conservative. Therefore, based on Regulatory Guide 1.174, the risk associated with proposed six month extension to complete the GL 2004-02 corrective actions for Calvert Cliffs Units 1 and 2 is not considered to be significant.

f. Safety Features and Margins in Current Configuration/Design Basis

In addition to the measures described above, there are design features that would facilitate mitigation of this issue. Calvert Cliffs has NRC approval to invoke the Leak-Before-Break methodology to eliminate the dynamic effects (pipe whip and jet impingement) of postulated reactor coolant piping ruptures from the design basis of the plant. This approval was based on a plant specific evaluation (CEN-367-A) of the inherent toughness of the cold leg and hot leg piping at Calvert Cliffs which concluded that the probability of a pipe failure before noticeable leakage could be detected and the plant brought into a safe-shutdown condition was negligibly small. While leak-before-break is not being used to establish the design basis load on the sump strainer, it does provide a basis for safe continued operation until the completion of the GL 2004-02 corrective actions.

4.0 COMPLIANCE WITH SECY-06-0078 CRITERIA

SECY-06-0078 (Reference 4) specifies two criteria for short duration GL 2004-02 extensions, limited to several months and a third criterion for extensions beyond several months. These three criteria and the associated responses for Calvert Cliffs are provided below.

4.1 SECY-06-0078 Criterion No. 1

The licensee has a plant-specific technical/experimental plan with milestones and schedule to address outstanding technical issues with enough margin to account for uncertainties.

Response

Calvert Cliffs has completed debris generation analyses, debris transport analyses, debris blockage and wear analyses for downstream components (using WCAP-16406-P Revision 0), strainer head loss and vortex testing for expected debris (excluding chemical precipitants), and replacement strainer design for both Calvert Cliffs units. Installation of the replacement strainer has occurred for Calvert Cliffs Unit 2 and will be completed for Calvert Cliffs Unit 1 during the spring 2008 refueling outage.

Technical issues concerning downstream effects and the impact of chemical precipitates on strainer head loss will not be complete for Calvert Cliffs Units 1 and 2 by December 31, 2007. Actions to complete these issues are described (along with their schedule) in Section 2.0.

4.2 SECY-06-0078 Criterion No. 2

The licensee identifies mitigative measures to be in place prior to December 31, 2007, and adequately describes how these mitigative measures will minimize the risk of degraded ECCS [emergency core cooling system] functions during the extension period.

Response

Mitigative measures have already been implemented to minimize the risk of degraded ECCS and containment spray functions during the requested extension period as described in Section 3.07.

4.3 SECY-06-0078 Criterion 3

For proposed extensions beyond several months, a licensee's request will more likely be accepted if the proposed mitigative measures include temporary physical improvements to the ECCS sump or materials inside containment to better ensure a high level of ECCS performance.

Response

Calvert Cliffs has implemented the following physical improvements to the containment sump to better ensure a high level of ECCS performance:

- Strainer Installation

  Unit 2 – Calvert Cliffs completed the installation of the Unit 2 replacement strainer system during the spring 2007 refueling outage. The new strainer system represents a significant improvement over the previous design. The total surface area of the new strainer is approximately 6000 ft. This replaced the previous screen, which had a surface area of approximately 115 ft^2.

  Unit 1 – The same modification is planned for Unit 1 during the spring 2008 refueling outage.

- Calcium Silicate Insulation Mitigation

  Calvert Cliffs Unit 2 banded or removed calcium silicate insulation from susceptible areas inside Containment. There is no longer any credible high-energy line break that can impact the remaining calcium silicate insulation in Containment. The remaining calcium silicate insulation is located outside of the LOCA ZOIs. Further, metal jacketing protecting the remaining calcium silicate insulation prevents significant damage due to containment spray. Finally, the remaining calcium silicate insulation would not become submerged.

5.0 CONCLUSION

An extension of the Unit 1 and 2 completion dates from December 31, 2007 (February 25, 2008 for Unit 1) to June 30, 2008 for corrective actions and modifications required by GL 2004-02 is acceptable because:

- The core damage and large early release probabilities associated with the six month extension are very conservatively evaluated as 6.5E-7 and negligible, respectively. This risk impact is the same at both Unit 1 and 2 and is characterized as "very small" per NRC Regulatory Guide 1.174.
- Calvert Cliffs has completed considerable work to further promote a high level of ECCS pump performance including replacement strainer installation (Unit 2), and calcium silicate insulation mitigation.
- Calvert Cliffs has implemented mitigative measures to minimize the risk of degraded ECCS functions during the extension period.
- Calvert Cliffs has a plant-specific plan with milestones and schedule to address the outstanding technical issues with sufficient conservatism to address uncertainties.

6.0 REFERENCES

1. Generic Letter 2004-02, dated September 13, 2004, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors
2. Letter from G. Vanderheyden (CCNPP) to Document Control Desk (NRC), dated March 3, 2005, Response to NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors"
3. Letter from J. A. Spina (CCNPP) to Document Control Desk (NRC), dated September 20, 2006, Update of Response to Generic Letter 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors (TAC Nos. MC4672 and MC4673)
4. SECY 06-0078, dated March 31, 2006, Status of Resolution of GSI-191, "Assessment of [Effect of] Debris Accumulation on PWR Sump Performance"
5. Letter from K. J. Nietmann (CCNPP) to Document Control Desk (NRC), dated August 8, 2003, Response to NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors"
6. Letter from J. A. Spina (CCNPP) to Document Control Desk (NRC), dated May 2, 2007, Revision to Generic Letter 2004-02 Response