AmerGen Energy Company, LLC
Oyster Creek
US Route 9 South
P.O. Box 388
Forked River, NJ 08731-0388

AmerGen SM
An Exelon/British Energy Company

10 CFR 50.90

September 19, 2001
2130-01-20107

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

Subject: Oyster Creek Generating Station
Facility License No. DPR-16
Docket No. 50-219
Technical Specification Change Request No. 287
Suppression Chamber to Drywell Vacuum Breakers

In accordance with 10 CFR 50.4(b)(1), Enclosure 1contains Technical Specification Change Request No. 287.

The purpose of this Technical Specification Change Request is to revise the number of allowed inoperable suppression chamber to drywell vacuum breakers from two (2) to five (5) as specified in Oyster Creek Technical Specification (TS) Section 3.5.A.5.b. This change decreases the required number of operable vacuum breakers for opening from twelve (12) to nine (9). Revised analysis demonstrates that only eight (8) vacuum breakers must open to ensure the internal containment negative pressure limit will not be exceeded. The additional vacuum breaker allows for a single failure of one vacuum breaker to open. Additionally, this change adds the 72 hour allowed outage time for a required operable suppression chamber to drywell vacuum breaker consistent with NRC Standard Technical Specifications NUREG-1433, Section 3.6.1.8, and revises the required actions for an inoperable position alarm circuit. A mark-up of TS page 3.5-4 showing the requested change is contained in Enclosure 2. Corresponding changes to the Bases of Specification 3.5 are also included in Enclosure 2. Replacement TS pages reflecting the requested change will be provided to the NRC prior to the issuance of the license amendment.

Using the standards in 10 CFR 50.92, AmerGen Energy Company, LLC (AmerGen) has concluded that these proposed changes do not constitute a significant hazards consideration, as described in the enclosed analysis performed in accordance with 10 CFR 50.91(a)(1). Pursuant to 10 CFR 50.91(b)(1), a copy of this Technical Specification Change Request is provided to the designated official of the State of New Jersey, Bureau of Nuclear Engineering, as well as the Chief Executive of the township in which the facility is located.

A001

This proposed change to the Technical Specifications has undergone a safety review in accordance with Section 6.5 of the Oyster Creek Technical Specifications. No new regulatory commitments are established by this submittal.

NRC approval of this change is requested by September 19, 2002. If any additional information is needed, please contact David J. Distel at (610) 765-5517.

Very truly yours,

Ron J. DeGregorio
Vice President – Oyster Creek

RJD/djd

Enclosures: (1) Oyster Creek Technical Specification Change Request No. 287 Safety Evaluation and No Significant Hazards Consideration
(2) Affected Oyster Creek Technical Specification Pages

c: H. J. Miller, Administrator, USNRC Region I
H. N. Pastis, USNRC Senior Project Manager, Oyster Creek
L. A. Dudes, USNRC Senior Resident Inspector, Oyster Creek
File No. 01059

United States of America
Nuclear Regulatory Commission

In the Matter of)

Docket No. 50-219

AmerGen Energy Company, LLC)

Certificate of Service

This is to certify that a copy of Technical Specification Change Request No. 287 for the Oyster Creek Generating Station Operating License, filed with the U.S. Nuclear Regulatory Commission on September 19, 2001, has this 19th day of September 2001 been served on the State of New Jersey Bureau of Nuclear Engineering, as well as the Chief Executive of the township in which the facility is located, by deposit in the United States mail, addressed as follows:

The Honorable Ronald Sterling
Mayor of Lacey Township
818 West Lacey Road
Forked River, NJ 08731

Mr. Kent Tosch, Director
Bureau of Nuclear Engineering
Department of Environmental Protection
CN 415
Trenton, NJ 08628

By: _____
Ron J. DeGregorio
Vice President – Oyster Creek

Oyster Creek Generating Station

Facility Operating License
No. DPR-16

Technical Specification Change
Request No. 287
Docket No. 50-219

Applicant submits by this Technical Specification Change Request No. 287 to the Oyster Creek Generating Station Operating License a change to Specification 3.5. All statements contained in this submittal have been reviewed, and all such statements made and matters set forth therein are true and correct to the best of my knowledge.

By: _____
Ron J. DeGregorio
Vice President – Oyster Creek

Sworn to and subscribed before me this 19th day of September 2001.

MARITA ZAREMBA
NOTARY PUBLIC OF NEW JERSEY
Commission Expires 5/31/2005

_____
Notary Public

ENCLOSURE 1

Oyster Creek Technical Specification Change Request No. 287

Safety Evaluation

And

No Significant Hazards Determination

I. Technical Specification Change Request No. 287

AmerGen Energy Company, LLC (AmerGen) requests that the following changed replacement pages be inserted into the existing Technical Specifications:

Revised Technical Specification Pages: 3.5-4, 3.5-10, and 3.5-12

Marked up pages showing the requested changes are provided in Enclosure 2.

II. Reason for Change

The existing Oyster Creek Technical Specification Section 3.5.A.5.b specifies that two (2) of the fourteen (14) suppression chamber to drywell vacuum breakers may be inoperable provided that the inoperable vacuum breakers are secured in the closed position. The proposed change revises the number of allowed inoperable suppression chamber to drywell vacuum breakers from two (2) to five (5). This change decreases the required number of operable vacuum breakers for opening from twelve (12) to nine (9). Revised analysis demonstrates that only eight (8) vacuum breakers must open to ensure the internal containment negative pressure limit will not be exceeded. The additional vacuum breaker allows for a single failure of one vacuum breaker to open.

The proposed change revises the existing Oyster Creek Technical Specification Section 3.5.A.5.b to add the 72 hour allowed outage time for a required operable suppression chamber to drywell vacuum breaker consistent with NRC Standard Technical Specifications NUREG-1433, Section 3.6.1.8.

The proposed change revises the required action statement of existing Oyster Creek Technical Specification Section 3.5.A.5.c for an inoperable vacuum breaker position alarm circuit. This change removes the 15-day limitation and allows a vacuum breaker to remain operable indefinitely provided the affected vacuum breaker and associated remaining position alarm circuit are verified to be operable immediately and monthly in accordance with existing Technical Specification 4.5.F.5.a. Additionally, a daily verification that the affected vacuum breaker is closed will be performed using the operable position alarm circuit. This additional testing provides an adequate alternate means of verifying operability of the remaining alarm circuit.

Technical Specification Section 3.5 Bases is also revised to describe the basis for the number of required operable suppression chamber to drywell vacuum breakers.

III. Safety Evaluation Justifying Change

The function of the suppression chamber to drywell vacuum breakers is to relieve vacuum in the drywell. The vacuum breakers allow gas and vapor flow from the suppression chamber to the drywell when the drywell is at a negative pressure with respect to the suppression chamber. Therefore, the suppression chamber to drywell vacuum breakers prevent an excessive negative differential pressure across the suppression chamber/drywell boundary. In addition, the water leg in the Mark I vent system downcomer is controlled by the drywell-to-suppression chamber differential pressure. The Oyster Creek drywell and connecting vent system tubes are designed for an external pressure of 2 psid at 205°F. The suppression chamber is designed for an external pressure of 1 psid at 150°F. The Bodega Bay (PG&E Company, Bodega Bay Atomic Park, Unit No. 1, Exhibit C, Preliminary Hazards Summary Report, Appendix I, Pressure Suppression Test Program, December 28, 1962) and Humboldt Bay (GEAP-3596,"Tests of Full Scale 1/48 Segment of the Humboldt Bay Pressure Suppression Containment," C.H. Robbins, November 17, 1960) tests form the major basis for the pressure suppression system design and the Bodega Bay tests established the Oyster Creek plant containment design. The existing Technical Specification requirement for twelve (12) required operable suppression chamber to drywell vacuum relief valves is based on the Bodega Bay pressure suppression tests and calculated minimum area for flow of non-condensible gases from the suppression chamber to the drywell.

The number of suppression chamber to drywell vacuum breakers required to function for relieving suppression chamber pressure and to prevent excessive water height in the vent downcomers has been reanalyzed for the following three bounding design basis events in accordance with General Electric NEDE-24802, "Mark I Containment Program - Mark I Wetwell-to-Drywell Vacuum Breaker Functional Requirements, Task 9.4.3," April 1980. This same methodology has been implemented for most BWR Mark I containment plants over the last 20 years and has been previously reviewed and approved by NRC. It is noted that Peach Bottom Units 2 and 3 Amendment Nos. 210 and 214, respectively, issued by NRC on August 30, 1995, utilized this methodology to reduce the number of required operable suppression chamber to drywell vacuum breakers. The bounding design basis events are summarized below:

- Inadvertent Drywell Spray Activation During Normal Operation
- Drywell Spray Activation During a Design Basis LOCA
- Core Spray Flow into the Drywell During a Design Basis LOCA Following Vessel Reflood

The General Electric NEDE-24802 methodology utilizes a mass and energy balance to determine vacuum breaker flow area. Sensitivity analyses show that key input parameters have been conservatively determined as described below. The acceptance criterion for these analyzed events is to maintain the maximum calculated suppression chamber to drywell differential pressure below 2.0 psid. An additional criterion was conservatively imposed to limit the maximum water height in the vent downcomers to less than 6.75 ft to prevent suppression chamber water from being drawn into the vent header.

Case 1 – Inadvertent Drywell Spray Activation During Normal Operation

This case analyzes the inadvertent manual actuation of one loop of drywell spray during normal operation. The initial suppression chamber water temperature is assumed to be 95°F which is the maximum allowed by the Oyster Creek Technical Specification 3.5.A.1(c)(1). Sensitivity studies performed as part of the analysis show that higher initial suppression chamber water temperatures increase the potential water height in the downcomer. The spray temperature is assumed to be 45°F. Sensitivity studies performed as part of the analysis show that lower temperature sprays increase the cooldown effect and therefore the potential suppression chamber to drywell differential pressure and potential water height in the downcomer for this event. The initial drywell temperature is assumed to be 150°F, which is the design maximum normal operating temperature. Since the code assumes a drywell atmosphere of 100% humidity, the drywell conditions following spray when the drywell air space becomes saturated are calculated in accordance with NEDE-24802 methodology. Therefore, the code input initial drywell temperature and pressure conditions were determined to be 115°F and 15.6 psia, respectively. The maximum calculated differential pressure for this event is 0.52 psid, and the maximum calculated water level in the downcomer is 5.47 ft, which are well below the acceptance criteria.

Case 2 – Drywell Spray Activation During a Design Basis LOCA

This case analyzed actuation of both a single loop and two loops of drywell spray. This case assumed that all non-condensables are released into the suppression chamber air space early in the event. In addition to the Case 1 assumptions, it is also assumed that the suppression chamber water temperature following blowdown is at least 105°F and that the suppression chamber air space is at the same temperature. Following blowdown, the drywell pressure will be greater than the suppression chamber airspace pressure by the amount of the downcomer

submergence. Initial suppression chamber pressure is calculated to be 35.69 psia. Initial drywell temperature and pressure is calculated to be 263.27°F and 37.44 psia, respectively. The maximum calculated differential pressure for this event is 0.96 psid, and the maximum calculated water level in the downcomer is 6.36 ft, which remain below the acceptance criteria.

Case 3 – Core Spray Flow into the Drywell During a Design Basis LOCA Following Vessel Reflood

The initial conditions for this case are identical to Case 2. For this case, drywell sprays are not actuated, but a spray effect is assumed when the reactor pressure vessel is reflooded with emergency core cooling injection until the injection flows out of the break. Two loops of injection are assumed. The temperature out the break is assumed at 212°F liquid water. The calculated maximum differential pressure for this event is 0.53 psid, and the maximum calculated water level in the downcomer is 5.53 ft, which are well below the acceptance criteria.

AmerGen Calculation No. C-1302-243-E170-087, "Wetwell-to-Drywell Vacuum Breaker Sizing," performed using General Electric NEDE-24802, April 1980, demonstrates that the number of suppression chamber to drywell vacuum breakers can be reduced to eight (8) and still maintain adequate vacuum relief capability. The analysis acceptance criteria for Oyster Creek includes a maximum suppression chamber to drywell pressure differential of less than 2.0 psid and a maximum water column height in the downcomer less than the 6.75 ft as previously discussed. The limit for the water height is conservatively based on maintaining the height below the ring header height of the downcomer to ensure that no water will rise to a level that may flood the ring header. The above analysis has demonstrated that eight (8) suppression chamber to drywell vacuum breakers are required to open to ensure that the internal containment negative pressure limit and the maximum water level limit in the downcomer will not be exceeded. The proposed Technical Specification requirement includes an additional required operable vacuum breaker, nine (9) total. This allows for a single failure of one vacuum breaker to open. This single failure capability is beyond the existing licensing basis requirement and provides an additional conservatism in the licensing basis. Therefore, the proposed revision to the number of required operable suppression chamber to drywell vacuum breakers does not adversely affect nuclear safety or safe plant operations.

The proposed change to add the 72 hour allowed outage time to restore a required operable vacuum breaker to operable status is consistent with NRC Standard Technical Specifications, NUREG-1433. During the allowed outage time of 72 hours, the plant is still capable of ensuring the internal containment negative pressure limit is met, assuming

no additional single failures. The specified action statement if the required number of operable vacuum breakers is not satisfied remains unchanged. Therefore, this proposed change does not adversely affect nuclear safety or safe plant operations.

The existing Oyster Creek Technical Specification Section 3.5.A.5.c allows one position alarm circuit for each operable vacuum breaker to be inoperable for up to 15 days. Each suppression chamber to drywell vacuum breaker is equipped with two redundant position alarm circuits which include indicating lights in remote local panels in the reactor building, and an alarm in the control room to indicate when the vacuum breaker disks are open more than 0.10 inch at any point along the surface of the disk. The suppression chamber to drywell vacuum breakers are relied upon to remain closed during the initial blowdown phase of a postulated LOCA to preclude any steam bypass of the suppression chamber, and to open in the event of negative pressure between the suppression chamber and the drywell. The position alarm circuits do not serve any function other than indication. The existing Technical Specification requires that after a 15-day period with one alarm circuit inoperable, an operable vacuum breaker must be made inoperable by tying closed the operable vacuum breaker or placing the plant in the cold shutdown condition in accordance with Technical Specification Section 3.5.A.5.d. This current requirement is overly restrictive considering the existence of a redundant circuit and unnecessarily results in an operable vacuum breaker becoming inoperable. The proposed change is to allow a vacuum breaker to remain operable indefinitely provided the affected vacuum breaker and associated remaining position alarm circuit are verified to be operable immediately and monthly in accordance with existing Technical Specification 4.5.F.5.a. Additionally, a daily verification that the affected vacuum breaker is closed will be performed using the operable position alarm circuit. This proposed change is appropriate considering the external vacuum breaker design at Oyster Creek, which provides physical accessibility to the vacuum breakers.

This monthly surveillance verifies functionality of the remaining alarm circuit. This additional surveillance provides adequate assurance of vacuum breaker and alarm circuit operability. If the remaining alarm circuit or the vacuum breaker become inoperable based on the monthly operability test then the affected vacuum breaker is tied closed and declared inoperable. The existing Technical Specification Section 3.5.A.5.c requirement for daily verification of vacuum breaker closure will be performed by verification of the closed indicating light on the operable position indicating circuit of the affected vacuum breaker. The redundant alarm circuit provides reasonable assurance of vacuum breaker position without subjecting operators to unnecessary personnel dose exposure and personnel safety risk. Accordingly, the existing Technical Specification requirement for daily physical verification is being deleted. Therefore, this proposed change does not adversely affect nuclear safety or safe plant operations.

IV. No Significant Hazards Determination

AmerGen has determined that this Technical Specification Change Request poses no significant hazards considerations as defined by 10 CFR 50.92.

1. Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed change reduces the number of vacuum breakers required to be operable from twelve to nine, allows continued operation for 72 hours with one required vacuum breaker inoperable, and allows a vacuum breaker to remain operable with one position alarm circuit inoperable. The proposed change does not increase the probability of an accident. The number of vacuum breakers required to be operable is not assumed to be an accident initiator of any analyzed event. Reducing the number of required vacuum breakers from twelve to nine is consistent with the analysis that shows eight vacuum breakers are sufficient to maintain containment differential pressures and downcomer water column height below acceptable limits. The 72 hour allowed outage time for a required operable vacuum breaker is considered acceptable due to the low probability of an event in which the remaining vacuum breaker capability would not be adequate assuming a single failure to open (NRC Standard Technical Specifications, NUREG-1433). The change does not allow continuous operation with only eight vacuum breakers operable. Therefore, the consequences of an accident are not increased. This change does not alter assumptions relative to the mitigation of an accident or transient event. The position alarm circuits only provide indication of valve position prior to an event and do not perform any accident mitigation functions. Additional surveillance of an operable vacuum breaker with an inoperable position alarm circuit will provide adequate assurance of vacuum breaker status and operability of the remaining redundant position alarm circuit.

   Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated.

   The proposed change reduces the number of vacuum breakers required to be operable from twelve to nine, allows continued operation for 72 hours with one

required vacuum breaker inoperable, and allows a vacuum breaker to remain operable with one position alarm circuit inoperable. This change will not physically alter the plant since no new or different type of equipment will be installed. The change in analytical methods used to establish the proposed Technical Specification limits for normal plant operation preserves the current safety analysis assumptions and acceptance criteria. The proposed 72 hour allowed outage time for a required operable vacuum breaker is consistent with NRC Standard Technical Specifications, NUREG-1433, and is considered acceptable due to the low probability of an event in which the remaining vacuum breaker capability would not be adequate assuming a single failure to open. Additional surveillance of an operable vacuum breaker with an inoperable position alarm circuit will provide adequate assurance of vacuum breaker status and operability of the remaining redundant position alarm circuit.

Therefore, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in a margin of safety.

This proposed change reduces the number of vacuum breakers required to be operable from twelve to nine, allows continued operation for 72 hours with one required vacuum breaker inoperable, and allows a vacuum breaker to remain operable with one position alarm circuit inoperable. Reducing the number of required vacuum breakers from twelve to nine is consistent with the analysis that shows eight vacuum breakers are sufficient to maintain containment differential pressures and downcomer water column height below acceptable limits. Therefore, the margin of safety is not affected. The safety analysis assumptions and acceptance criteria are maintained. In addition, with one required vacuum breaker inoperable for 72 hours, the margin of safety is not significantly reduced considering the remaining vacuum breakers are still available and sufficient to mitigate an event, and the low probability of an accident occurring during this time period requiring vacuum breaker operation. Additional surveillance of an operable vacuum breaker with an inoperable position alarm circuit will provide adequate assurance of vacuum breaker status and operability of the remaining redundant position alarm circuit.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

V. Information Supporting an Environmental Assessment

10 CFR 51.22 (c)(9) provides criteria for and identification of licensing and regulatory actions eligible for categorical exclusion from performing an environmental assessment. A proposed amendment to an operating license for a facility requires no environmental assessment if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant hazards consideration, (2) result in a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (3) result in a significant increase in individual or cumulative occupational radiation exposure.

AmerGen has reviewed this license amendment and has determined that it meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22 (c)(9). Pursuant to 10 CFR 51.22 (c), no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of the proposed license amendment. The basis for this determination is as follows:

1. The proposed license amendment does not involve a significant hazards consideration as described in Item IV of this evaluation.

2. The proposed license amendment will not result in a significant change in the types or increase in the amounts of any effluents that may be released offsite. The proposed amendment ensures that the internal containment negative pressure limit will not be exceeded. The changes do not modify the reactor coolant pressure boundary, containment integrity, nor make any physical changes to the facility design, material, or construction standards

3. The proposed license amendment will not result in a significant increase in individual or cumulative occupational radiation exposure. The consequences of any design basis accident are not affected by this change. The proposed changes do not affect the integrity of the reactor coolant pressure boundary or any fission product barrier. Occupational exposures are expected to be reduced by the proposed changes.

VI. Conclusion

The proposed change has been reviewed in accordance with Section 6.5 of the Oyster Creek Technical Specifications, and it has been concluded that this change requires NRC approval. As discussed above, using the standards in 10 CFR 50.92, AmerGen has determined that there are no significant hazards involved with the proposed change.

AmerGen requests that the amendment authorizing this change be effective immediately upon issuance and implemented within 30 days of issuance.

ENCLOSURE 2

Oyster Creek Technical Specification Change Request No. 287

Affected Technical Specification Pages

5. Pressure Suppression Chamber - Drywell Vacuum Breakers

a. When primary containment is required, all suppression chamber - drywell vacuum breakers shall be OPERABLE except during testing and as stated in Specification 3.5.A.5.b and c, below. Suppression chamber - drywell vacuum breakers shall be considered OPERABLE if:

(1) The valve is demonstrated to open from closed to fully open with the applied force at all valve positions not exceeding that equivalent to 0.5 psi acting on the suppression chamber face of the valve disk.

(2) The valve disk will close by gravity to within not greater than 0.10 inch of any point on the seal surface of the disk when released after being opened by remote or manual means.

(3) The position alarm system will annunciate in the control room if the valve is open more than 0.10 inch at any point along the seal surface of the disk.

b. ~~Two~~ Five of the fourteen suppression chamber - drywell vacuum breakers may be inoperable provided that they are secured in the closed position. With one of the nine required suppression chamber - drywell vacuum breakers inoperable, restore one vacuum breaker to OPERABLE status within 72 hours.

c. One position alarm circuit for each OPERABLE vacuum breaker may be inoperable~~, for up to 15 days~~ provided that each OPERABLE suppression chamber - drywell vacuum breaker with one defective alarm circuit~~, is physically~~ verified to be ~~closed~~ OPERABLE immediately, and ~~daily during this period~~ monthly in accordance with 4.5.F.5.a. Additionally, a daily verification using the OPERABLE position alarm circuit that the affected vacuum breaker is closed shall be performed.

and associated remaining position alarm circuit are

d. If Specifications 3.5.A.5 (a), (b) or (c) can not be met, the reactor shall be PLACED IN the COLD SHUTDOWN CONDITION within 24 hours.

6. After completion of the startup test program and demonstration of plant electrical output, the primary containment atmosphere shall be reduced to less than 4.0% O_2 with nitrogen gas within 24 hours after the reactor mode selector switch is placed in the RUN MODE. Primary containment deinerting may commence 24 hours prior to a scheduled shutdown.

7. Deleted.

The capacity of the 14 suppression chamber to drywell vacuum relief valves is sized to limit the external pressure of the drywell during post-accident drywell cooling operations to the design limit of 2 psi. They are sized on the basis of the Bodega Bay pressure suppression tests[9X10]. ~~In Amendment 15 of the Oyster Creek FDSAR, Section II, the area of 2920 sq. in. is stated as the minimum area for flow of non-condensible gases from the suppression chamber to the drywell. To achieve this requirement, at least 12 of the 14 vacuum breaker valves (18" diameter) must be OPERABLE.~~

Each suppression chamber drywell vacuum breaker is fitted with a redundant pair of limit switches to provide fail safe signals to panel mounted indicators in the reactor building and alarms in the control room when the disks are open more than 0.1" at any point along the seal surface of the disk. These switches are capable of transmitting the disk closed-to-open signal with 0.01" movement of the switch plunger. Continued reactor operation with failed components is justified because of the redundancy of components and circuits and, most importantly, the accessibility of the valve lever arm and position reference external to the valve. The fail-safe feature of the alarm circuits assures operator attention if a line fault occurs.

Conservative estimates of the hydrogen produced, consistent with the core cooling system provided, show that the hydrogen air mixture resulting from a loss-of-coolant accident is considerably below the flammability limit and hence it cannot burn, and inerting would not be needed. However, inerting of the primary containment was included in the proposed design and operation. The 5% oxygen limit is the oxygen concentration limit stated by the American Gas Association for hydrogen-oxygen mixtures below which combustion will not occur.[4] The 4% oxygen limit was established by analysis of the Generation and Mitigation of Combustible Gas Mixtures in Inerted BWR Mark I Containments.[12]

To preclude the possibility of starting up the reactor and operating a long period of time with a significant leak in the primary system, leak checks must be made when the system is at or near rated temperature and pressure. It has been shown[9X10] that an acceptable margin with respect to flammability exists without containment inerting. Inerting the primary containment provides additional margin to that already considered acceptable. Therefore, permitting access to the drywell for the purpose of leak checking would not reduce the margin of safety below that considered adequate and is judged prudent in terms of the added plant safety offered by the opportunity for leak inspection. The 24-hour time to provide inerting is judged to be a reasonable time to perform the operation and establish the required O_2 limit.

A calculation[15] was performed in accordance with NEDE-24802[16] to determine the required number of vacuum breakers by using a mass and energy balance to determine vacuum breaker flow area. The results of the calculation indicate that 8 vacuum breakers are required to provide vacuum relief capability. An additional vacuum breaker is included for single failure criteria, bringing the total required to 9.

Two separate filter trains are provided, each having 100% capacity[6]. If one filter train becomes inoperable, there is no immediate threat to secondary containment and reactor operation may continue while repairs are being made. Since the test interval for this system is one month (Specification 4.5), the time out-of-service allowance of 7 days is based on considerations presented in the Bases in Specification 3.2 for a one-out-of-two system.

Two automatic secondary containment isolation valves are installed in each reactor building ventilation system supply and exhaust duct penetration. Both isolation valves for each supply duct penetration are located inside the secondary containment boundary, and the two exhaust duct penetration isolation valves are located outside of the secondary containment boundary. Removal of an inboard supply or exhaust valve (closest to the boundary) is permitted only when secondary containment is not required. The outboard isolation supply or exhaust valve can be removed when secondary containment is required as long as the inboard valve is secured in the closed position.

References:

(1) FDSAR, Volume I, Section V-1
(2) FDSAR, Volume I, Section V-1.4.1
(3) FDSAR, Volume I, Section V-1.7
(4) Licensing Application, Amendment 11, Question III-25
(5) FDSAR, Volume I, Section V-2
(6) FDSAR, Volume I, Section V-2.4
(7) Licensing Application, Amendment 42
(8) Licensing Application, Amendment 32, Question 3
(9) Robbins, C. H., "Tests on a Full Scale 1/48 Segment of the Humboldt Bay Pressure Suppression Containment, "GEAP-3596, November 17, 1960.
(10) Bodega Bay Preliminary Hazards Summary Report, Appendix I, Docket 50-205, December 28, 1962.
(11) Report H. R. Erickson, Bergen-Paterson To K. R. Goller, NRC, October 7, 1974. Subject: Hydraulic Shock Sway Arrestors.
(12) General Electric NEDO-22155 "Generation and Mitigation of Combustible Gas Mixtures in Inerted BWR Mark I Containment" June 1982.
(13) Oyster Creek Nuclear Generating Station, Mark I Containment Long-Term Program, Plant Unique Analysis Report, Suppression Chamber and Vent System, MPR-733; August, 1982.
(14) Oyster Creek Nuclear Generating Station, Mark I Containment Long-Term Program, Plant Unique Analysis Report, Torus Attached Piping, MPR-734; August, 1982.
(15) AmerGen Calculation C-1302-243-E170-087, "Wetwell-to-Drywell Vacuum Breaker Sizing."
(16) General Electric NEDE-24802, "Mark I Containment Program Mark I Wetwell-to-Drywell Vacuum Breaker Functional Requirements, Task 9.4.3," April 1980.