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PARR,O.D. Light Water Reactors Branch 3

SUBJECT: Responds to 791010 ltr.Forwards comparison of pool dynamic loads program at facility w/acceptance criteria in NUREG-0487.

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NOV 2 1979

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SUSQUEHANNA STEAM ELECTRIC STATION
MARK II POOL DYNAMICS LOADS PROGRAM
ER 100450 FILE 172
PLA-417

Dear Mr. Parr:

Mr. S. A. Varga's letter of October 10, 1979 requested a definition of the pool dynamic loads program being relied on by each Mark II Owner. You will find attached a comparison of the pool dynamic loads program being used on the Susquehanna project with the NUREG 0487 acceptance criteria, Lead Plant Position and the Generic Long Term Program. This comparison supersedes the comparison provided in our letter of February 2, 1979. As with that earlier comparison, the final acceptance of the use of SRSS for combining dynamic loads is assumed. This is in accordance with the directions of the NRC staff at the October 19, 1978 meeting with the Mark II Owners.

With respect to the Susquehanna plant-unique programs, a review of the attached comparison will show three such areas:

1) Use of data from the plant-unique GKM-IIM tests for additional verification of the condensation oscillation pool boundary loads. These tests consist of a series of transient steam blowdowns simulating various loss-of-coolant accident conditions. The facility is constructed to be very closely prototypical of a single vent configuration in the Susquehanna containment. A more complete description of these tests is provided in the two reports submitted with our letter of October 25, 1979; "GKM-IIM Tests, Test Philosophy and Matrix" - adapted from KWU Working Report R 141/136/79 and "GKM-IIM Condensation Tests, Description of the Measurement Concept", KWU Working Report R 541/10/79.

The decision to proceed with these tests was made in January, 1979 based on our assessment that they would provide us test data earlier than the Mark II generic 4T tests, that the prototypical nature of the data would help expedite evaluation and licensing review and that, in addition to pool boundary pressure data, prototypical vent lateral load data could also be obtained.

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Testing at the facility began in early October and is scheduled to be completed by January, 1980. We expect to provide a test report in April, 1980 and an evaluation report in July, 1980.

2) Use of data from the GKM-IIM tests as additional verification of the Mark II generic vent lateral load definition provided in NEDE-24106-P. The above discussion on the GKM-IIM tests for condensation oscillation loads applies for this activity also.

3) As no Mark II generic program exists for calculation of submerged structures drag loads due to LOCA steam condensation processes all utilities are using plant-unique methods. For the Susquehanna and Limerick projects, Bechtel has developed a methodology which uses the information developed under Task A.16, "Improved Chugging Load Definition", for identification of a vent source load. A Greens function solution will then be used to provide the velocity and acceleration fields in the suppression pool. A similar Greens function solution will also be used to establish the velocity and acceleration fields in the suppression pool due to LOCA air bubble charging.

A report detailing the methodology is scheduled for submittal in April, 1980.

As noted in Mr. Varga's letter, design differences between the various Mark II Plants do exist. When these differences in design are combined with the various plant licensing schedules, it becomes difficult for all eight utilities to agree on a common program for closure of a technical question as broad as the Mark II pool dynamic loads program. You can be assured though that each utility is, in turn, sensitive to the resource constraints now placed on the NRC staff and will work towards the further development of generic programs for the ultimate closure of the Mark II program.

Very truly yours,

N. W. Curtis
Vice President - Engineering & Construction

Attachment

REVIEW OF SUSQUEHANNA SES UNITS 1 & 2 POOL DYNAMIC LOADINGS FOR LOCA AND SRV EVENTS - COMPARISON WITH NUREG 0487, LEAD PLANT PROGRAM AND GENERIC LONG TERM PROGRAM

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
I. LOCA RELATED HYDRODYNAMIC LOADS				
A. Submerged Boundary Loads During Vent Clearing. 33 psi overpressure added to local hydrostatic below vent exit (walls and basemat) - linear attenuation to pool surface.	March 20, 1979 letter. 24 psi statically applied to surfaces below vent exit (attenuate to 0 psi at pool surface) for period of vent clearing. Zimmer and LaSalle meet NUREG 0487.	24 psi overpressure statically applied with hydrostatic pressure to surfaces below vent exit (attenuate to 0 psi at pool surface) for period of vent clearing per March 20, 1979 letter from GE.	Following lead plant/long term position.	
B. Pool Swell Loads.				
1. Pool Swell Analytical Model (PSAM)				
a. Air bubble pressure - use PSAM described in NEDE-21544-P.	(a) Accept NUREG 0487	(a) Accept NUREG 0487	(a) Accept NUREG 0487	
b. Pool swell elevation - use PSAM described in NEDE-24544-P with apolytropic exponent of 1.2 for wetwell air compression.	(b) Accept NUREG 0487 (Shoreham February 16, 1979 letter reemphasizes response to Question 020.68)	(b) Use PSAM with polytropic exponent of 1.2 to a maximum swell height which is the greater of 1.5 vent submergence or the elevation corresponding to the drywell floor uplift Δ p used for design assessment per response to Question 020.68 and February 16, 1979 letter from Shoreham.	(b) Following long term position.	

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
c. Pool swell velocity - use PSAM described in NEDE-24544-P multiplied by a factor of 1.1.	(c) Accept NUREG 0487 with velocity vs elevation obtained from PSAM.	(c) Accept NUREG 0487 with velocity vs elevation obtained from PSAM.	(c) Following lead plant/ long term position.	
d. Pool swell acceleration - use PSAM described in NEDE-24544-P.	(d) Accept NUREG 0487	(d) Accept NUREG 0487	(d) Accept NUREG 0487	
e. Wetwell air compression - use PSAM described in NEDE-24544-P.	(e) Accept NUREG 0487	(e) Accept NUREG 0487	(e) Accept NUREG 0487	
f. Drywell pressure history - unique based on NEDM-10320.	(f) Accept NUREG 0487	(f) Accept NUREG 0487	(f) Accept NUREG 0487	
2. Loads on Submerged Boundaries. Maximum bubble pressure predicted by PSAM is to be added uniformly to local hydrostatic below vent exit (walls and basemat) and linear attenuation to pool surface. Apply to walls up to maximum pool swell elevation.	Accept NUREG 0487	Accept NUREG 0487	Accept NUREG 0487	
3. Impact Loads				
a. Small structures - (For horizontal pipes, I-beams, and other similar structures having one dimension $\leq$ 20 in.). The loading function shall have the versed sine shape: $p(t) = 0.5\, p_{max}(1-\cos 2\pi \frac{t}{\tau})$	(a) Accept NUREG 0487	(a) Accept NUREG 0487	(a) Accept NUREG 0487	

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
b. Large structures - not applicable, no large structures are impacted by pool swell.	(b) Not applicable (no large structures)	(b) Not applicable (no large structures)	(b) Not applicable (no large structures)	
c. Grating - The static drag load, P_{ss}, is to be calculated by forming the product of ΔP from Figure 4-40 of NEDO-21060, Rev. 2, and the total area of the grating. To account for the dynamic nature of the initial loading, the static drag load is increased by a multiplier given by: $\frac{P_{SE}}{D} = 1 + \sqrt{1 + (0.0064Wf)^2}$	(c) Accept NUREG 0487 with velocity vs elevation obtained from PSAM.	(c) Accept NUREG 0487 with velocity vs elevation obtained from PSAM.	(c) Following lead plant/ long term position.	
4. Wetwell Air Compression				
a. Wall loads - directly apply the PSAM calculated pressure due to wetwell compression.	(a) Accept NUREG 0487	(a) Accept NUREG 0487	(a) Accept NUREG 0487	
b. Diaphragm upward load - calculate Δ PUP using the correlation: $\Delta PUP = 8.2 - 44F$, for $0 \lesssim F \lesssim 0.13$; $\Delta PUP = 2.5$ psi, for $F > 0.13$; where: $F = \frac{AB \quad AP \quad VS}{VD \quad (AV)^2}$	(b) Accept NUREG 0487	(b) Accept NUREG 0487	(b) Accept NUREG 0487	

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
AB = break area AP = net pool area AV = total vent area VS = initial wetwell air space volume VD = drywell volume				
5. Asymmetric Load. Apply the maximum air bubble pressure calculated from PSAM and a minimum air bubble pressure (zero increase) in a worst case distribution to the wetwell wall.	Use twice the 10% of maximum bubble pressure statically applied to 1/2 of the submerged boundary (with hydrostatic pressure) proposed in March 16, 1979 letter from GE.	Use twice the 10% of maximum bubble pressure statically applied to 1/2 of the submerged boundary (with hydrostatic pressure) proposed in March 16, 1979 letter from GE.	Following lead plant/long term position.	
C. Steam Condensation and Chugging Loads. 1. Downcomer Lateral Loads				
a. Single vent loads: - A static equivalent load of 8.8 KIPs shall be used provided: (i) the downcomer is 24 inches in diameter (ii) the downcomer dominant natural frequency is ≤ 7 Hz, submerged (iii) the downcomer is unbraced or braced at or above approx. 8 ft. from the exit.	(a) Accept NUREG 0487 for static analysis.	(a) Use single vent dynamic lateral load developed under Task A-13 (NEDE-24106-P).	(a) Following long term program. Load definition per NEDE-24106-P and confirmation through Task A.13 and plant unique GKM-IIM test data on lateral bracing loads.	(a) GKM-IIM test report scheduled for submittal in April, 1980 and evaluation report scheduled for July, 1980.

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
- A static equivalent load of 8.8 KIPs multiplied by the ratio of the natural frequency and 7 Hz for dominant natural frequencies between 7 and 14 Hz. Other restrictions in (i) and (iii) apply.				
- If the natural frequency of the downcomer is > 14 Hz or if bracing is closer than 8 ft. above the exit, a plant specific dynamic structural calculation shall be performed using a dynamic load defined by:				

$$P(t) = P_0 \sin \frac{\pi t}{\tau};\ 0 < t < \tau$$

$$= 0;\ \text{for } t < 0 \text{ and } t > \tau$$

where: $2\ \text{msec} < \tau < 10\ \text{msec}$, and the impulse $I = 2 P_0 (\tau/\pi)$ is 200 lbf-sec. Restriction (i) also applies.

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
b. Multiple vent loads - Use the load specified in Figure 4-10b of NEDE-21061-P, Rev. 2, multiplied by a factor of 1.26 for downcomers with natural frequencies greater than 7 Hz. For natural frequencies greater than 7 Hz, apply an additional multiplier equal to the ratio of its frequency and 7 Hz.	(b) Accept NUREG 0487	(b) Use multi-vent dynamic lateral load developed under Task A-13.	(b) Following long term program.	
2. Submerged Boundary Loads				
a. High Steam Flux Loads				
Sinusoidal pressure fluctuation added to local hydrostatic. Amplitude uniform below vent exit, linear attenuation to pool surface. 4.4 psi peak-to-peak amplitude. 2-7 Hz frequencies. NEDE-21061-P, Rev. 2	(a) Accept NUREG 0487	(a) NRC criteria used as interium spec. pending completion of Task A.17, "Steam Condensation Oscillation Test". Additional frequency ranges also being evaluated.	(a) Accept NUREG 0487 except 3.5 psi peak-to-peak amplitude used. Confirmation of design loads to be based on plant unique GKM-IIM tests.	(a&b) GKM-IIM test report scheduled for submittal in April, 1980 and evaluation report scheduled for July, 1980.

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
b. Medium Steam Flux Loads				
Sinusoidal pressure fluctuation added to local hydrostatic. Amplitude unfiorm below vent exit, linear attenuation to pool surface. 7.5 psi peak-to-peak amplitude. 2-7 Hz frequencies. NEDE-21061-P, Rev. 2.	(b) Accept NUREG 0487	(b) NRC criteria used as interium spec. pending completion of Task A.17 "Steam Condensation Oscillation Test". Additional frequency ranges also being evaluated.	(b) Accept NUREG 0487 except 10.0 psi peak-to-peak amplitude used. Confirmation of design loads to be based on plant unique GKM-IIM tests.	
c. Chugging				
- Uniform loading condition - Maximum amplitude uniform below vent exit, linear attenuation to pool surface. +4.8 psi max overpressure, -4.0 psi max underpressure 20-30 Hz frequency. (Pending resolution of FSI concerns) NEDE-21061-P, Rev. 2.	(c) Accept NUREG 0487	(c) NRC criteria used as interium spec. pending completion of Task A.16 "Improved Chugging Load Definition".	(c) Accept NUREG 0487 (lead plant position).	Resolution of FSI concerns through Task A.16.
- Asymmetric loading condition - Maximum amplitude unform below vent exit - linear attenuation to pool surface. +20 psi max				

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
overpressure, -14 psi max underpressure, 20-30 Hz frequency, peripheral variation of amplitude follows observed statistical distribution with maximum and minimum diametrically opposed. NEDE-21061-P, Rev. 2.				
II. SRV-RELATED HYDRODYNAMIC LOADS				
A. Pool Temperature Limits. All Mark II facilities shall use quencher type devices. The suppression pool local temperature shall not exceed 200°F for all plant transients involving SRV operations. Measurements from temperature sensors located on the containment wall in the sector containing the discharge device at the same elevation as the device can be used as local indication.	Accept NUREG 0487	Document will be prepared using additional PP&L test data to support no (local) temperature limit for quenchers.	Following long term program.	Schedule calls for submittal of report in January, 1980.
B. Air Clearing Loads.				
a. Methodology for bubble load prediction T-quencher - use ramshead methodology described in Sec. 3.2 of NEDO-21061-P, Rev. 2.	(a) Accept NUREG 0487	(a) T-quencher load presented in Susquehanna DAR, Sec. 4.1.3.	(a) Following long term program.	

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
X-quencher - use Sec. 3.3 of NEDO-21061-P, Rev. 2.		X-quencher load definition being developed by Burns & Roe based largely on Caorso test data.		
b. SRV Discharge Load Cases. The following load cases shall be considered for design evaluation of containment structures and equipment inside the containment: 1. Single valve, first and subsequent actuation. 2. ADS valve actuation. 3. Two adjacent valve first actuation. 4. All valves discharged sequentially by setpoint. 5. All valves discharged simultaneously by assuming all bubbles are oscillating in phase.	(b) Load case 5 is not realistic and should not be included for evaluation. Multiple valve cases will be addressed in plant DAR's.	(b) T-quencher load case 4 is not included for evaluation. It is bounded by Susquehanna DAR Sections 4.1.3.1 and 4.1.3.2.	(b) Following long term program.	
c. Bubble Frequency. T-quencher - a range of bubble frequency of 4-12 Hz is the minimum range that shall be evaluated. The range shall be increased if required to include the frequency predicted by the ramshead methodology together with ± 50% margin.	(c) Plant unique closure reports define method used to define bubble frequency.	(c) T-quencher bubble frequency is presented in Susquehanna DAR, Section 4.1.3.	(c) Following long term program.	

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
X-quencher - a range of bubble frequency of 4-12 Hz shall be evaluated.		X-quencher bubble frequency being developed by Burns & Roe based largely on Caorso test data.	N/A.	
C. Quencher Arm and Tie Down Loads.				
1. Quencher Arm Loads. Vertical and lateral arm loads are to be developed on the basis of bounding assumptions for air/water discharge from the quencher and conservative combinations of maximum/minimum bubble pressures acting on the quencher per NEDE-21061-P, Rev. 2.	Accept NUREG 0487	X-quencher - Accept NUREG 0487 T-quencher arm loads are presented in Susquehanna DAR, Section 4.1.2.5.	N/A. Following long term program.	
2. Quencher Tie-down Loads. The vertical and lateral arm load transmitted to the basemat via the tie-down plus vertical transient wave and thrust loads calculated from a standard momentum balance are to be calculated based on conservative clearing assumptions per NEDE-21061-P, Rev. 2.	Accept NUREG 0487	X-quencher - Accept NUREG 0487 T-quencher tie-down loads are presented in Susquehanna DAR Section 4.1.2.5.	N/A. Following long term program.	

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
III. LOCA/SRV SUBMERGED STRUCTURE LOADS				
A. LOCA/SRV Jet Loads.				
1. LOCA Downcomer Jet Load Calculate based on methods described in NEDE-21730 and the following constraints and modifications: (a) Standard drag at the time the jet first encounters the structure must be multiplied by the factor: $1 + \frac{6 V_a}{C_D A_X R_i}$ where: V_a = acceleration volume as defined in NEDE-21730 C_D = drag coefficient as defined in NEDE-21730 A_X = projected area as defined in NEDE-21730 R_i = vent exit radius	Will address criteria by proposing corrected equations in 1.a and 1.b.	Ring vortex model including potential function for induced flow being finalized. More appropriate acceleration drag consideration to be identified.	Following lead plant position.	Have modified earlier position to follow Lead Plants. Evaluation of quencher for higher jet loads in process.

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS

(b) Forces in the vicinity of the jet front shall be computed on the basis of Formula 2-12 and 2-13 of NEDE-21730. The local velocity, U_ω, and acceleration, $\dot{U}_\omega$, are to be conservatively calculated by the methods of NEDE-21471 from the potential function:

$$\phi = \frac{-3}{8\pi} \cdot U_j \cdot V_W \frac{\cos \theta}{r^2}$$

where:

r & θ = spherical coordinates from jet front

U_j = jet velocity from NEDE-21730

V_W = initial volume of water in the vent

(c) After the last fluid particle has reached the jet front a spherical vortex continues propagating. The drag on structures in its vicinity can be bounded by using the flow field from the formula for ϕ above with U_j as the jet front velocity from NEDE-21730 at time $t = t_f$.

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
2. SRV Quencher Jet Loads				
This load may be neglected for those structures located outside a zone of influence which is a sphere circumscribed around the quencher arms. If there are holes in the end caps, the radius of the sphere should be increased by 10 hole diameters. (Confirmation during long term program required).	The P5.5 pressure transducer data from the T-quencher test program presented in Section 8.0 of the Susquehanna DAR shows no water jet effect thus no loads are specified beyond a 5 ft. cylindrical zone of influence.	The P5.5 pressure transducer data from the T-quencher test program presented in Section 8.0 of the Susquehanna DAR shows no water jet effect thus no loads are specified beyond a 5 ft. cylindrical zone of influence.	Following lead plant/long term program.	
		X-quencher - Accept NUREG 0487.	N/A.	
B. LOCA/SRV Air Bubble Drag Loads				
1. LOCA Air Bubble Loads				
Calculate based on the analytical model of the bubble charging process and drag calculations of NEDE-21471 until the bubbles coalesce. After bubble contact, the pool swell analytical model, together with the drag computation procedure NEDE-21471 shall be used. Use of this methodology shall be subject to the following constraints and modifications:				

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
a. A conservative estimate of bubble asymmetry shall be added by increasing accelerations and velocities computed in step 12 of Section 2.2 of NEDE-21730 by 10%. If the alternate steps 5A, 12A and 13A are used the acceleration drag shall be directly increased by 10% while the standard drag shall be increased by 20%.	(a) Accept NUREG 0487 adjustments to drag.	(a) Accept NUREG 0487 adjustments to drag.	(a) NEDE-21471 methodology used to determine bubble formation with exception that time dependent drywell pressure history will be used to define bubble pressure. Bubble to be used as source and a Green's function solution will be used to establish the velocity and acceleration fields.	Report scheduled for submittal in April, 1980.
b. Modified coefficients C_D' from accelerating flows as presented in Keulegan & Carpenter and Sarpkaya references shall be used with transverse forces included, or an upper bound of a factor of three times the standard drag coefficients shall be used for structures with no sharp corners or with streamwise dimensions at least twice the width.	(b) Identify more appropriate acceleration drag coefficient treatment than factor of 3.	(b) Identify more appropriate acceleration drag coefficient treatment than factor of 3.	(b) Following lead plant/long term program.	

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
c. The equivalent uniform flow velocity and acceleration for any structure or structural segment shall be taken as the maximum values "seen" by that structure not the value at the geometric center.	(c) Demonstrate that acceleration at center of structure is technically correct. Demonstrate that error resulting in velocity at center vs maximum velocity is small and bounded by conservatism in velocity applied. Thus simplified DFFR approach is acceptable.	(c) Demonstrate that acceleration at center of structure is technically correct. Demonstrate that error resulting in velocity at center vs maximum velocity is small and bounded by conservatism in velocity applied. Thus simplified DFFR approach is acceptable.	(c) Following lead plant/long term program.	
d. For structures that are closer together than three characteristic dimensions of the larger one, either a detailed analysis of the interference effects must be performed or a conservative multiplication of acceleration and drag forces by a factor of four must be performed.	(d) Demonstrate that factor of 4 is not technically correct for standard drag. Refer to question response to 020.70. Interference effect on acceleration drag will be analyzed on a plant unique basis.	(d) Demonstrate that factor of 4 is not technically correct for standard drag. Refer to question response to 020.70. Interference effect on acceleration drag will be analyzed on a plant unique basis.	(d) Following lead plant/long term program.	
e. If significant blockage from downcomer bracing exists relative to the net pool area, the standard drag coefficients shall be modified by conventional methods (Pankhurst & Holder reference).	(e) Demonstrate that factor of 4 is not technically correct for standard drag. Refer to question response to 020.70. Interference effect on acceleration drag will be analyzed on a plant unique basis.	(e) Demonstrate that factor of 4 is not technically correct for standard drag. Refer to question response to 020.70. Interference effect on acceleration drag will be analyzed on a plant unique basis.	(e) Following lead plant/long term program.	

NRC ACCEPTANCE CRITERIA (NUREG 0487 10/78)	LEAD PLANT POSITION (JULY 23, 1979)	GENERIC LONG TERM PROGRAM POSITION	SUSQUEHANNA POSITION	REMARKS
f. Formula 2-23 of NEDE-21730 shall be modified by replacing M_H by $P_{FB}V_A$ where V_A is obtained from Tables 2-1 and 2-2.	(f) Accept NUREG 0487	(f) Accept NUREG 0487	(f) Accept NUREG 0487	
2. a. SRV ramshead air bubble loads	Accept NUREG 0487	Accept NUREG 0487	N/A.	
b. SRV quencher air bubble loads. T-quencher - loads may be computed on the basis of the above ramshead methodology using 25% of the calculated ramshead bubble pressure and assuming the bubble to be located at the center of the quencher device having a bubble radius equal to the quencher radius.	T-quencher bubble location and size are plant unique. Amplitude and frequency are based on PP&L program, methodology from NEDE-21471-P is used to apply load to structures.	T-quencher submerged struc-load methodology is presented in Susquehanna DAR, Section 4.1.3.	Following long term program.	
X-quencher - loads may be computed on the basis of the above ramshead methodology using bubble pressures calculated by the methods of NEDE-21061-P, Rev. 2, for the X-quencher.		X-quencher methodology being developed by Burns & Roe.	N/A.	