Docket Nos. 50-329
and 50-330

APR 21 1978

Consumers Power Company
ATTN: Mr. S. H. Howell
Vice President
212 West Michigan Avenue
Jackson, Michigan 49201

THIS DOCUMENT CONTAINS
POOR QUALITY PAGES

Gentlemen:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION - PART THREE

My letter of February 24, 1978, forwarded the first of three scheduled parts of our requests for additional information for our FSAR review of Midland Plant Units 1 & 2. The third part of that request is enclosed.

We will need complete and adequate responses to Enclosure 1 by June 2, 1978. If you cannot meet this date, inform us within seven days after receipt of this letter so that we may revise our schedule accordingly.

We have encountered delays in our review of instrumentation and control systems and of the site security plan. We will advise you by separate correspondence of our revised schedule for these areas. We anticipate release of our initial requests for additional information regarding your Fire Protection Evaluation Report about mid-June, 1978.

Please contact us if you desire clarification or other discussions of the information requested.

Sincerely,

Original signed by:

Steven A. Varga, Chief
Light Water Reactors Branch No. 4
Division of Project Management

Enclosure:
As Stated

cc: See page 2

8006180614

OFFICE	LWR-4 DSH	LWR-4				
SURNAME	DHood/cz	SVarga				
DATE	4/21/78	4/21/78				

Consumers Power Company

ccs:
Michael I. Miller, Esq.
Isham, Lincoln & Beale
Suite 4200
One First National Plaza
Chicago, Illinois 60670

Judd L. Bacon, Esq.
Managing Attorney
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Mr. Paul A. Perry
Secretary
Consumers Power Company
212 W. Michigan Avenue
Jackson, Michigan 49201

Myron M. Cherry, Esq.
One IBM Plaza
Chicago, Illinois 60611

Honorable Curt Schneider
Attorney General
State of Kansas
Topeka, Kansas 66612

Irving Like, Esq.
Reilly, Like and Schneider
200 West Main Street
Babylon, New York 11702

James A. Kendell, Esq.
Currie and Kendall
135 North Saginaw Road
Midland, Michigan 48640

Louis W. Pribila, Esq.
Michigan Division Legal Department
47 Building
Dow Chemical USA
Midland, Michigan 48640

Lee Nute, Esq.
Michigan Division
The Dow Chemical Company
47 Building
Midland, Michigan 48640

ENCLOSURE 1

REQUEST FOR ADDITIONAL INFORMATION (Q1's)

PART 3 OF 3

MIDLAND PLANT UNITS 1 & 2

These requests for additional information are numbered such that the three digits to the left of the decimal identify the technical review branch and the numbers to the right of the decimal are the sequential request numbers. The number in parenthesis indicates the relevant section in the Safety Analysis Report. The initials RSP indicate the request represents a regulatory staff position.

Branch Technical Positions referenced in these requests can be found in "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," NUREG-75/087 dated September 1975.

010.0 Auxiliary Systems Branch

010.38 According to Figures 10.4-10 and 10.4-13 the inadvertent closure of AFW isolation valve IFV3875A or B (Unit 1) or 2FV3975A or B (Unit 2) to the unaffected steam generator following a main steam or feed-water line break inside containment would result in the loss of all AFW flow for the affected unit. Demonstrate how your design meets this single failure criterion or revise your design as necessary to assure AFW flow to the unaffected steam generator considering any single active failure.

040.0 Power Systems Branch

040.17 (3.10) Section 3.10.2.1 references IEEE Std 344-1971 and 1975 for equipment qualification. Identify the equipment that is qualified under the 1971 version and the equipment that is qualified under the 1975 version of IEEE-344.

040.18 (3.11) Your environmental qualification program for motor operated valve operators does not include 'aging'. We require aging be included in the qualification program. In addition provide your qualification program for safety related motors located inside and outside containment. Revise your FSAR to include this information.

040.19 (8.0) The following Regulatory Guides have been identified as being applicable for Midland Plant.

a. RG 1.63, Rev. 1
b. RG 1.118

We require that the recommendations included in these regulatory guides be satisfied in your design or provide a description and justification of the alternate criteria you intend to use.

040.20 (8.2) Your description of offsite power system is incomplete. Provide the following additional information:

1. A description of the number of right-of-way; number, type and height of towers per right-of-way; and the number of circuits per tower connecting the Midland Plant to the grid.

2. Assurance that the physical separation of offsite circuits one and two (where they share a common corridor) is sufficient so that it will not jeopardize the independence of these circuits.

040.21 (8.2) Your grid reliability study results does not include any load flow chart or frequency and voltage deviation curves to demonstrate that your system is stable for (1) the loss of the unit generator, (2) the loss of the largest system load, and (3) the loss of the most limiting transmission line. Include this information in the FSAR. (SRP 8.2, Part III, item f).

040.22 (8.2, 8.3) Provide physical layout drawings of the circuits that connect the onsite distribution system to the preferred power supply and plant and layout drawings depicting the physical separation between redundant portions of the onsite distribution system, as requested in Sections 8.2 and 8.3 of the Standard Review Plan.

040.23 (7.0, 8.3) Identify all systems and components for which heat tracing is required and must be maintained during both normal operation, and shutdown cooling. Describe separation and redundancy of circuitry and power supplies for essential heat tracing service.

040.24 (7.0, 8.3) Provide the results of a review of your operating, maintenance and testing procedures to determine the extent of the usage of jumpers or other temporary forms of bypassing functions for testing or maintenance of safety related system. Identify and justify any cases where the use of the above methods cannot be avoided. Provide the criteria for any use of jumpers for testing.

040.25 (7.3,8.3) With respect to the application of single failure criterion to manually-controlled, electrically-operated valves, list all valves for which Branch Technical Position EICSB #18 may apply and provide a schematic diagram showing the design feature for meeting this position.

040.26 (6.3,8.3) (RSP) It is not clear from the description provided for the controls for isolation valves as to how the requirements to prevent overpressurization of the DHR system and the requirement of the DHR system to achieve cold shutdown will be accomplished in the design, in the event of a single electrical failure in the DHR suction line motor-operated valves. It is the staff's position that the design of the DHR isolation valves be made to conform to the requirements of GDC 34, both in the decay heat removal mode function and while preventing overpressurization of the DHR system.

Provide a design of the DHR isolation valves to meet the above stated staff requirements.

040.27 (8.3) Provide the following additional information with regard to containment electrical penetrations:

a. type of protection provided to assure that missiles inside the containment will not jeopardize the safety of the plant.

b. provisions for fire detection and protection at the penetration areas.

c. physical spacing with relation to any piping runs

040.28 (8.3) (RSP) Your design of penetration overload protection is unacceptable in its present form. We require that the following requirements of IEEE-279 should be satisfied with regard to the protection of the electrical penetrations:

a. The system shall, with precision and reliability automatically disconnect power to the penetration conductors when currents through the conductors exceed the preset limits.

b. All source and feeder breaker overload and short circuit protection systems are qualified for the service environment including seismic. The seismic qualification for non-Class 1E circuit breaker protection systems should as a minimum assure that the protection systems remain operable during an operating base earthquake.

c. The circuit breaker protection system trip set points must be compatible with the capability for test and calibration. Provisions for test under simulated fault conditions should be provided.

d. No single failure shall cause excessive currents in the penetration conductors which will degrade the penetration seals.

e. Signals for tripping source and feeder breakers shall be independent, physically separated and powered from separated sources.

Modify your design to include the above requirements.

040.29 (8.3) Recent operating experience has demonstrated that electrical equipment associated with Class 1E dc power systems may be incorrectly rated or qualified for the high voltages which may exist during battery charging operations. In this regard provide the design bases and criteria used to protect against overvoltage during the battery charging operation. In addition describe the type of charger overcurrent protection provided in your design.

040.30 (7.5,8.3) The transfer of manual control for safety related equipment shows that in some cases, the switches used to effect the transfer also remove the automatic actuation capability as well as transferring the manual control from the main control room to another location. Identify, all safety-related components (such as motors) for which the above applies and provide the bases and design criteria for this design. Also, state any design features (such as keylock switches or enclosures) which are provided to add assurance that these transfer or alternate control switches are in the corrent position during plant operations.

040.31 (8.3) Discuss the consequences resulting from the interruption of power to engineered safety features at any time during an accident sequence. Include in the discussion such subjects as load shedding, sequencing of loads on emergency diesel generators, effects on control logic, power to engineered safety features pumps etc. Show whether or not the engineered safety feature system recover automatically given this situation.

040.32 (8.3) Provide a discussion of your criteria for the underground cable installation for Class 1E systems. In addition, discuss how the Class 1E underground cable system design conforms to the following:

a. Quality standards, as required by the Commission's General Design Criterion (GDC 1).

b. Seismic Category I classification, as required by GDC 2.

c. Minimization of the probability and effects of fires, as required by GDC 3.

d. Compatability with the environmental conditions associated with all modes of operation and appropriate protection against events and conditions outside the nuclear unit, as required by GDC 4.

e. Sufficient Independence and redundancy to satisfy the onsite power system requirements dictated by GDC 17.

f. Prevention of a common failure mode of the redundant cable systems for any design basis event including rain and floods, as required by IEEE Std 308 Section 5.2.1.

g. Preclusion of the utilization of directly buried conduits under roadways.

Include the above information in your FSAR.

40.33 9.5.2) The information regarding the onsite communications system (Section 9.5.2) does not adequately cover the system capabilities during transients and accidents. Provide the following information:

(a) Identify all working stations in the standard plant design where it may be necessary for plant personnel to communicate with the control room or the emergency shutdown panel during and/or following transients and/or accidents (including fires) in order to mitigate the consequences of the event and to attain a safe cold plant shutdown.

(b) Indicate the maximum sound levels that could exist at each of the above identified working stations for all transients and accident conditions.

(c) Indicate the types of communication systems that will be available at each of the above identified working stations.

(d) Indicate the maximum background noise level that could exist at each working station and yet reliably expect effective communication with the control room using:

1. the page party communications system, and
2. any other additional communication system provided that working station.

(e) Describe the performance requirements and tests that the above inplant working stations communication systems will be required to pass in order to be assured that effective communication with the control room or emergency shutdown panel is possible under all conditions.

(f) Discuss the protective measures taken to assure a functionally operable onsite communication system. The discussion should include the considerations given to component failures, loss of power, and the severing of a communication line or trunk as a result of an accident or fire.

040.34 (9.5.3) Identify the vital areas and hazardous areas where emergency lighting is needed for safe shutdown of the reactor and the evacuation of personnel in the event of an accident (including fire). Tabulate the lighting systems provided in your design to accommodate those areas so identified.

040.35 (9.5.4) Section 9.5.4, Emergency Diesel Fuel Oil Storage and Transfer System (EDFSTS), does not reference ANSI Standard N195, "Fuel Oil Systems for Standby Diesel Generators". Indicate if you intend to comply with this Standard in your design of the Emergency Diesel Fuel Oil Storage and Transfer System; otherwise provide justification for non-compliance. (SRP 9.5.4, Part II, Item 6).

040.36 (9.5.4) Figure 9.5-31, Emergency Diesel Engine Fuel Oil Piping Schematic, shows that the filter and strainer on the engine have differential pressure switches to sense a high pressure drop. In section 9.5.4 indicate if these will be monitored and if there will be alarms locally and in the control room. The duplex strainer for the auxiliary module does not show a differential pressure switch. Indicate the means for monitoring this strainer for cleanliness. (SRP 9.5.4, Part III, Item 1).

040.37 (9.5.4) Figures 9.5-25 and 9.5-31 do not show and section 9.5.4.5 does not discuss any instrumentation for measuring temperature and flow rate for the emergency diesel engine fuel oil system. Provide information showing the means for monitoring temperature and flow rate and any alarms provided. Also provide information on the means for monitoring the pressure level. (SRP 9.5.4, Part III, Item 1).

040.38 (9.5.4) Discuss the means for detecting or preventing growth of algae in the diesel fuel storage tank. If it were detected, describe the methods to be provided for cleaning the affected storage tank. (SRP 9.5.4, Part III, Item 4).

040.39 (9.5.4) Discuss what precautions will be taken in the design of the fuel oil system in locating the fuel oil day tank and connecting fuel oil piping with regard to possible exposure to ignition sources such as open flames and hot surfaces. (SRP 9.5.4, Part III, Item 6).

040.40 (9.5.4) (9.5.5) (9.5.6) (9.5.7) (9.5.8) Identify all high and moderate energy lines and systems that will be installed in the diesel generator room. Discuss the measures that will be taken in the design of the diesel generator facility to protect the safety related systems, piping and components from the effects of high and moderate energy line failure to assure availablity of the diesel generators when needed. (SRP 9.5.4, Part III, Item 8 SRP 9.5.5, Part III, item 4, SRP 9.5.6, Part III, item 5; SRP 9.5.7, Part III, item 3; SRP 9.5.8, Part III, item 6c).

040.41 (9.5.4) Assume an unlikely event has occurred requiring operation of a diesel generator for a prolonged period that would require replenishment of fuel oil without interrupting operation of the diesel generator. What provision will be made in the design of the fuel oil storage fill system to minimize the creation of turbulence of the sediment in the bottom of the storage tank. Stirring of this sediment during addition of new fuel has the potential of causing the overall quality of the fuel to become unacceptable and could potentially lead to the degradation or failure of the diesel generator.

040.42 (9.5.4) Discuss the provisions made to assure the quality of the stored fuel oil meets the minimum requirements at all times. (SRP 9.5.4, Part III, Item 4).

040.43 (9.5.4) Provide information that shows that fuel oil day tank associated with each diesel generator is located at an elevation to assure slight positive pressure at the engine pumps. (SRP 9.5.4, Part III, Item 5c).

040.44 (9.5.4) In section 9.5.4.2 it is mentioned that the four fuel storage tanks (35,000 gal. each) are not located in a Seismic Category I structure but are buried underground. Indicate how they are designed to withstand a seismic event. (SRP 9.5.4, Part III, Item 2).

040.45 (9.5.4) Discuss the nearness and the means available for supplying additional fuel oil in a timely manner when needed.

040.46 (9.5.5) Section 9.5.5.2 states that diesel generator coolant water system includes a turbocharger air cooler, lube oil cooler and a jacket water cooler and figure 9.5-26 shows some of the temperatures and flow rates for these components. Provide information on the individual component heat removal rates (BTU/hr), flow (lbs/hr) and temperature differential for both the tube and shell sides and the total heat removal rate required. (SRP 9.5.5, Part III, Item 1).

040.47 (9.5.5) Section 9.5.5.2 indicates that diesel jacket water cooler is supplied on the shell side by the service water system. Section 9.2.1 indicates that the service water pump pit normally receives water supply from the cooling towers and that an engineered safety features actuation signal (ESFAS) will automatically shift to the water supply from the cooling pond. Provide the results of an analysis which takes into account the time lag when switching the supply of jacket cooling water to the diesel generator from the normally used water from the cooling towers to the source of water from the cooling pond. The concern is that there may be a reduced amount of water supplied during this period that may cause engine overheating. Discuss the affects of the above to the performance of the diesel engine.

040.48 (9.5.5) The diesel engine generator sets should be capable of operation at less than full load for extended periods without degradation of performance or reliability. Provide a discussion of your diesel engine operation parameters, including minimum load requirements, and relate this to anticipated minimum loads under accident recovery conditions and during accident standby operation when offsite power is available. (SRP 9.5.5, Part III, Item 7).

040.49 (9.5.5) You state in section 9.5.5.2 that the diesel generator cooling water system includes a surge tank (standpipe) with makeup water from the demineralized water system. The surge tank will provide a reserve to compensate for system changes in volume and any minor leaks during operation. The surge tank will also maintain the required NPSH on the system circulating pump. The surge tank makeup water supply comes from the non-safety grade demineralized water system. Demonstrate that the surge tank size will be adequate to maintain the required NPSH and makeup water for seven days continuous operation of the diesel generator at maximum rated load, or provide a seismic Category 1, quality group C makeup water supply the surge tank.

040.50 (9.5.5) Provide information on the emergency diesel engine cooling water system water chemistry and indicate how this compares with the manufacturers recommendations. (SRP 9.5.5, Part III, Item 1c).

040.51 (9.5.6) Provide a discussion of the measures taken in the design of the standby diesel generator air starting system to preclude the fouling of the starting air valve or filter with contaminants such as oil carry over and rust. (SRP 9.5.6, Part III, Item 1).

040.52 (9.5.6) Provide symbols on Figure 9.5-27, Emergency Diesel Generator Starting System, to designate the seismic design boundaries of the different portions of the system.

040.53 (9.5.7) For the diesel engine lubrication system in section 9.5.7 provide the following information: 1) define the temperature differentials, flow rate, and heat removal rate of the interface cooling system external to the engine and verify that these are in accordance with recommendations of the engine manufacturer; 2) discuss the measures that will be taken to maintain the required quality of the oil, including the inspection and replacement when oil quality is degraded; 3) describe the protective features (such as blowout panels) provided to prevent unacceptable crankcase explosion and to mitigate the consequences of such an event; and 4) describe the capability for detection and control of system leakage. (SRP 9.5.7, Part II, Items 8a, 8b, 8c, Part III, Item 1).

040.54 (9.5.7) The P&ID (figure 9.5-28) for the diesel generator lube oil system does not show means for monitoring and alarming for high and low oil level anywhere in the system including the engine lube oil system reservoir. Provide in the discussion and on the P&ID the means for indicating and alarming for high and low oil level. (SRP 9.5.7, Part III, Item 1e).

040.55 (9.5.7) Discuss the design precuations that will be taken to prevent entry of deliterious materials in the engine lubrication oil system due to operator error during recharging of lubricating oil or normal operation. (SRP 9.5.7, Part III, Item 1c).

040.56 (9.5.8) Figure 1.2-27 shows the diesel generator building plan and elevation and illustrates the arrangement of the combustion intake and exhaust system. However, it does not clearly show the details of the labyrinth arrangement for admission of intake air. Indicate if the labyrinth arrangement for intake air is dependent upon actuation of flow control devices (louvers, dampers) (SRP 9.5.8, Part III, Item 4).

040.57 (9.5.8) Figure 1.2-27 shows the arrangement of the diesel engine exhaust vent pipes above the diesel generator roof. This portion of the exhaust vent system is not shown protected from tornado missiles. Justify your design or provide missile protection.

040.58 (9.5.8) Indicate which system components in the diesel generator air intake and exhaust system that are exposed to atmospheric conditions (ice, freezing rain or snow) and discuss how these components are protected from possible clogging during any operating condition (SRP 9.5.8, Part III, item 5).

040.59 (9.5.8) Describe the sensors and alarms provided in the design of the diesel engine combustion air intake and exhaust system to warn the operator when design parameters are exceeded. (SRP 9.5.8, Part III, item 1 & 4).

040.60 (9.5.8) Discuss the possible effects on diesel generator operation (such as reduced power capability, difficulty in starting) during an event in which there is an ingress of gases (mentioned in section 2.2 and listed in Table 6.4-3) into the diesel generator intake. Use the 100% release column in table 6.4.3 and justify that there will be satisfactory diesel generator operation.

040.61 (10.2) Expand your discussion of the turbine speed control and overspeed protection system. Provide additional explanation of the turbine and generator electrical load following capability for the turbine speed control system with the aid of system schematics (including turbine control and extraction steam valves to the heaters). Tabulate the individual speed control protection devices (normal, emergency and backup), the design speed (or range of speed) at which each device begins operation to perform its protective function (in terms of percent of normal turbine operating speed).

In order to evaluate the adequacy of the control and overspeed protection system provide schematics and include identifying numbers to valves and mechanisms (mechnical and electrical) on the schemaics. Describe in detail, with references to the identifying numbers, the sequence of events in a turbine trip including response times, and show that the turbine stabilizes. Provide the results of a failure mode and effects analysis for each of the overspeed protection systems. Show that a single steam valve failure or failure of any high or moderate energy line cannot disable the turbine overspeed trip from functioning. (SRP 102, Part III, items 1-4).

040.62 (10.2) In section 10.2.3.5, Inservice Inspection, you state that the main steam stop and control, reheat stop, and intercept valves are exercised as required by closing each valve and observing the valve position indicator that it moves smoothly to a fully closed position. Also indicate the frequency in time that this observation is made. (SRP 10.2 , Part II, Item 5b).

040.63 (10.2) Describe with the aid of drawings, the bulk hydrogen storage facility including its location and distribution system. Include the protective measures considered in the design to prevent fires and explosions during operations such as filling and purging the generator, as well as during normal operations.

040.64 (10.2) In section 10.2.2.2 it is stated that "The stop valves are tied together after the seats with an equalizer pipe". Explain the purpose for the "equalizer pipe".

040.65 (10.3) Figures 10.3-1 and 10.3-2 show the main steam supply system for units 1 and 2 and figure 10.1-1 and 10.1-2 show the process flow diagram for the steam and power conversion systems for units 1 and 2. It appears from these diagrams that the steam from the steam generator "a" and steam generator "b" is not manifolded before entering the high pressure turbine. However, there appears to be an interconnection around the normally open intertie valves 059 and 060. Provide a discussion to explain the means of manifolding the steam from steam generator "a" and steam generator "b".

040.66 (10.3) Referring to figure 10.1-1, explain the operational consequences (turbine and process requirements) if one of the normally open unit 1 intertie valves (valves number 059 and 060 from figure 10.3-1) is inadvertently closed.

040.67 (10.3) Referring to figure 10.1-1, explain the purpose of the dashed line between the stop valve and the control valve. It does not appear that this line is also shown in figure 10.3-1.

040.68 (10.4.1) Provide a discussion to explain the large difference shown in Table 10.4-1 for Unit 1 between the exhaust steam flow to the condenser, 2,035,259 lb/hr and total condensate outflow 7,312,293 lb/hr. These figures do not appear to be consistent with those in table 10.1-1 even when taking into account the additional steam flows to the hp and lp evaporators and the flow to the reheaters and steam jet air ejectors. Provide a flow balance diagram to the condenser similar to the diagram (figure 1) provided in PSAR amendment no. 11, dated 5/1/70.

040.69 (10.4.1) In section 10.4.1.4 you have discussed tests but not inspection. Provide information on inspections as per regulatory guide 1.70.

040.70 (10.4.1) Discuss the effect of main condenser degradation (leakage, vacuum, loss) on reactor operation. (SRP 10.4.1, Part III, Item 1).

040.71 (10.4.1) Discuss the possible mechanisms for hydrogen production in the secondary side water and provide the expected production rate of hydrogen in SCFM. Discuss the effectiveness of the means to prevent hydrogen buildup. (SRP 10.4.1, Part III, Item 7).

040.72 (10.4.1) Discuss the measures taken to prevent corrosion/erosion of condenser tubes and components. (SRP 10.4.1, Part III, Item 1).

040.73 (10.4.1) Indicate what design provisions have been made to preclude failures of condenser tubes or components from turbine by-pass blowdown. (SRP 10.4.1, Part III, Item 3).

040.74 (10.4.4) Assure that a high energy line failure of the turbine by-pass system (TBS) will not have an adverse effect or preclude operation of any safety-related turbine overspeed protection components or systems located close to the TBS. (SRP 10.4.4; Part III, Item 4).

040.75 (10.4.4) Provide the results of a failure mode and effects analysis to determine the effect of malfunctions of the turbine by-pass system on the operation of the reactor and main turbine generator unit. (SRP 10.4.4, Part III, Item 4).

040.76 (10.4.10) In your response to question 040.11, with 3 items relating to the feedwater required, the following additional information is requested: For Item 1, indicate where the originating source is for the demineralized makeup water supplied by Dow. For Item 3, indicate what the effect of a sudden cut off of the 40% tertiary feedwater supplied by Dow would have on the reactor system. Also discuss the effects of a sudden cut off of the total steam load by Dow on the reactor system.

110.0 MECHANICAL ENGINEERING BRANCH

110.30
(3.9.3)
(RSP)

Your response to Q110.19 is not completely acceptable. We request that you clarify your response to more specifically address the consideration of asymmetric load effects on reactor coolant system components and supports which could result from postulated reactor coolant pipe breaks within cavities located inside containment. Appendix 110-1 describes the information that is required.

APPENDIX 110-1

In your assessment of potential damage to the reactor vessel, steam generator, pressurizer, and other NSSS component supports from the effects of postulated pipe breaks inside containment, consideration should be given to breaks both inside and outside of the reactor pressure vessel cavity. This assessment should be made for all postulated breaks in high energy piping systems including but not limited to the following locations:

a. Reactor vessel hot and cold leg nozzle to piping terminal ends;

b. Reactor coolant pump suction and discharge nozzles to piping terminal ends;

c. Steam generator inlet and outlet nozzle to piping terminal ends.

(Note also that: Postulated steam line breaks may control the design of certain steam generator supports and, therefore, must also be considered in support design.)

In addition, provide the following information relating to the component supports:

1. The method of analysis for the blowdown loads indicating the direction of the thrust load, dynamic amplification factor, if one is being used and the nature of the load time history;

2. A description of the supports (lower and upper if applicable) including the dimensions;

3. Number, orientation and capacity of snubbers;

4. The location and break area of the postulated pipe break in the reactor vessel, steam generator, or other component cavity which controls design, and the resulting asymmetric loads;

5. Load combinations that include the asymmetric loads and the method of combining loads. The peak loads for the SSE and dynamic system loads associated with any postulated pipe break (including asymmetric load effects) shall be combined by absolute sum unless justification is provided for any alternative method of combination.