CONFORMANCE TO REGULATORY GUIDE 1.97
DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

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Published May 1985

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Prepared for the
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
Under DOE Contract No. DE-AC07-76ID01570
FIN No. A6483

ABSTRACT

This EG&G Idaho, Inc., report provides a review of the submittal for Regulatory Guide 1.97, Revision 3, for Unit 1 of the Davis-Besse Nuclear Power Station. Any exception to the guidelines of Regulatory Guide 1.97 are evaluated and those areas where sufficient basis for acceptability is not provided are identified.

FOREWORD

This report is supplied as part of the "Program for Evaluating Licensee/Applicant Conformance to RG 1.97," being conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of Systems Integration, by EG&G Idaho, Inc., NRC Licensing Support Section.

The U.S. Nuclear Regulatory Commission funded the work under authorization B&R 20-19-10-11-3.

Docket No. 50-346
TAC No. 51084

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1. INTRODUCTION

On December 17, 1982, Generic Letter No. 82-33 (Reference 1) was issued by D. G. Eisenhut, Director of the Division of Licensing, Nuclear Reactor Regulation, to all licensees of operating reactors, applicants for operating licenses, and holders of construction permits. This letter included additional clarification regarding Regulatory Guide 1.97, Revision 2 (Reference 2), relating to the requirements for emergency response capability. These requirements have been published as Supplement No. 1 to NUREG-0737, "TMI Action Plan Requirements" (Reference 3).

The Toledo Edison Company, the licensee for the Davis-Besse Nuclear Power Station, provided a response to Section 6.2 of the generic letter on June 28, 1984 (Reference 4). This response provides a comparison of the licensee's instrumentation to the recommendations of Revision 3 of Regulatory Guide 1.97 (Reference 5).

This report provides an evaluation of that material.

2. REVIEW REQUIREMENTS

Section 6.2 of NUREG-0737, Supplement 1, sets forth the documentation to be submitted in a report to the NRC describing how the licensee complies with Regulatory Guide 1.97 as applied to emergency response facilities. The submittal should include documentation that provides the following information for each variable shown in the applicable table of Regulatory Guide 1.97:

1. Instrument range
2. Environmental qualification
3. Seismic qualification
4. Quality assurance
5. Redundance and sensor location
6. Power supply
7. Location of display
8. Schedule of installation or upgrade.

Furthermore, the submittal should identify deviations from the regulatory guide and provide supporting justification or alternatives.

Subsequent to the issuance of the generic letter, the NRC held regional meetings in February and March 1983, to answer licensee and applicant questions and concerns regarding the NRC policy on this subject. At these meetings, it was noted that the NRC review would only address exceptions taken to Regulatory Guide 1.97. Furthermore, where licensees or applicants explicitly state that instrument systems conform to the regulatory guide, it was noted that no further staff review would be necessary. Therefore, this report only addresses exceptions to

Regulatory Guide 1.97. The following evaluation is an audit of the licensee's submittal based on the review policy described in the NRC regional meetings.

3. EVALUATION

The licensee provided a response to Item 6.2 of the NRC generic letter 82-33 on June 28, 1984. The response describes the licensee's position on post-accident monitoring instrumentation. This evaluation is based on that material.

3.1 Adherence to Regulatory Guide 1.97

The licensee has provided a review of their post-accident monitoring instrumentation that compares the instrumentation characteristics against the recommendations of Regulatory Guide 1.97, Revision 3. The licensee has provided a listing of the regulatory guide variables, wherein are listed compliance, deviations, and references to justification for any deviations. Therefore, it is concluded that the licensee has provided an explicit commitment on conformance to Regulatory Guide 1.97, except for those deviations that were justified by the licensee as noted in Section 3.3.

3.2 Type A Variables

Regulatory Guide 1.97 does not specifically identify Type A variables, i.e., those variables that provide information required for operator controlled safety actions. The licensee classifies the following instrumentation as Type A.

1. Reactor coolant system (RCS) hot leg water temperature

2. RCS pressure

3. Containment pressure

4. Containment hydrogen concentration

5. Residual heat removal system flow

6. Flow in high pressure injection system

7. Flow in low pressure injection system

8. Refueling water storage tank level

9. Pressurizer level

10. Steam generator pressure.

11. Control room normal ventilation isolation status.

The above instrumentation meets Category 1 recommendations consistant with the requirements for Type A variables.

3.3 Exceptions to Regulatory Guide 1.97

The licensee identified exceptions to and deviations from Regulatory Guide 1.97. These are discussed in the following paragraphs.

3.3.1 Reactor Coolant System (RCS) Soluble Boron Concentration

Regulatory Guide 1.97 recommends on-line instrumentation with a range of 0 to 6000 ppm to verify boron injection and reactivity control in a post-accident situation. The licensee has not provided this on-line instrumentation, but can obtain the information by utilizing the post-accident sampling system and on-site laboratory analysis.

The licensee takes exception to Regulatory Guide 1.97 with respect to post-accident sampling capability. This exception goes beyond the scope of this review and is being addressed by the NRC as part of their review of NUREG-0737, Item II.B.3.

3.3.2 RCS Cold Leg Water Temperature

Regulatory Guide 1.97 recommends Category 1 instrumentation with a range of 50 to 700°F for this variable. The licensee has supplied Category 3 instrumentation with a range of 50 to 650°F. There is a deviation in both range and category.

The licensee states that the cold leg temperature will be less than 650°F for any design basis event. As the instrumentation will remain on scale for any anticipated event, we find the range of this instrumentation acceptable.

The licensee's justification for Category 3 instrumentation follows.

1. The cold leg temperature is not required to establish or verify natural circulation. If the RCS hot leg temperature and the core exit temperature when compared to the RCS pressure establishes that a subcooled condition exists and at least one steam generator has established auxiliary feedwater flow as indicated by steam generator level, then natural circulation will be assured. It is due to this reasoning that the licensee has identified RCS hot leg temperature, RCS pressure, and steam generator pressure as Type A variables.

2. The licensee states that they do not have to monitor cold leg temperature in order to prevent thermal shock to the reactor vessel due to excessive HPI flow (throttling), because the reactor vessel does not have high copper content or axial welds.

As the licensee has supplied Category 1 instrumentation for the variables RCS hot leg temperature, core exit temperature, steam generator level, and auxiliary feedwater flow, and because the licensee indicates that the thermal shock is not a consideration, we find this justification for Category 3 RCS cold leg water temperature instrumentation acceptable.

3.3.3 RCS Hot Leg Water Temperature

Regulatory Guide 1.97 recommends instrumentation with a range of 0 to 700°F for this variable. The licensee has supplied instrumentation with a range of 120 to 920°F. The licensee states that at temperatures less than 280°F, the decay heat removal system is used instead of the steam generators to cool the RCS. This system has additional temperature instrumentation to monitor the RCS in this temperature range. Category 1 core exit thermocouples also provide information below 120°F.

We concur with the licensee that the range of 120 to 920°F is satisfactory for this variable.

3.3.4 RCS Pressure

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 0 to 3000 psig. The licensee has provided instrumentation with a range from 0 to 2500 psig. They state that no new operator action would be taken or performed with an extended range from 2500 to 3000 psig; that all operator actions occur within the provided 0 to 2500 psig range.

Regulatory Guide 1.97 states that it is essential that the range be sufficient to keep the instruments on scale. The licensee has not shown that this is the situation for all design basis accident scenarios. Therefore, we cannot concur with this deviation. The licensee should either show that the supplied range encompasses all anticipated RCS pressures or provide the recommended range.

3.3.5 Radiation Level in Circulating Primary Coolant

The licensee indicates that radiation level measurements to indicate fuel cladding failure are provided by the following instruments:

1. Letdown line radiation monitors

2. Post-accident sampling system.

The post-accident sampling system is available with the reactor isolated.

Based on the alternate instrumentation provided by the licensee, we conclude that the instrumentation supplied for this variable is adequate, and therefore, acceptable.

3.3.6 Analysis of Primary Coolant

The licensee states that this variable is not necessary at the Davis-Besse Nuclear Power Station.

The licensee takes exception to Regulatory Guide 1.97 with respect to post-accident sampling capability. This exception goes beyond the scope of this review and is being addressed by the NRC as part of their review of NUREG-0737, Item II.B.3.

3.3.7 Containment Effluent Radioactivity--Noble Gases from Identified Release Points
Effluent Radioactivity--Noble Gases (from Buldings or Areas Where Penetrations and Hatches Are Located)
Radiation Exposure Rate (Inside Buildings or Areas Where Access is Required)

The information on these variables is missing from the licensee's submittal. The licensee should provide the information required by Section 6.2 of NUREG-0737, Supplement No. 1 for these variables, identify any deviations from Regulatory Guide 1.97 and justify any deviations.

3.3.8 Residual Heat Removal (RHR) Heat Exchanger Outlet Temperature

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee has provided instrumentation that, except for

environmental qualification, is Category 2. The licensee states that Category 3 instrumentation is acceptable since an accident signal causes maximum cooling to take place, i.e., the heat exchanger bypass valve is automatically shut, diverting full flow through the heat exchangers.

Environmental qualification has been clarified by the Environmental Qualification Rule, 10 CFR 50.49. We conclude that Regulatory Guide 1.97 has been superseded by a regulatory requirement. Any exception to this rule is beyond the scope of this review and should be addressed in accordance with 10 CFR 50.49.

3.3.9 Accumulator Tank Level and Pressure

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable with a range of 10 to 90 percent volume and 0 to 750 psig. The licensee has identified deviations in this instrumentation: a range of 0 to 14 ft level and Category 3 pressure instrumentation with a range of 0 to 700 psig.

The licensee has not provided justification for the deviation in level range nor stated the extent of the deviation. The licensee should identify and justify this deviation in range.

Table 6.11 of the Final Safety Analysis Report (FSAR, Reference 6) indicates that the accumulator pressure is manually controlled at 600 ± 15 psig. Further, there are relief valves that relieve pressure in excess of 700 psig, the tank design pressure. Therefore, we find the range of the pressure instrumentation acceptable.

The accumulators are passive, and the licensee indicates that there are no manual actions taken as a result of the pressure indication. All operator actions are done based on pressurizer level. Thus, the licensee concludes that Category 3 instruments are adequate for backup instrumentation.

We find that the 0 to 700 psig, Category 3 instrumentation is satisfactory for the pressure portion of this variable.

3.3.10 Boric Acid Charging Flow

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee has Category 3 instrumentation. The licensee states that this variable is not part of a safety-related system. It is the boration pathway for normal operation. For post-accident situations the borated water storage tank provides boration via the high and the low pressure coolant injection.

Based on the information provided by the licensee, we find the deviation from Category 2 to Category 3 for this variable acceptable.

3.3.11 Pressurizer Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the top to the bottom of the pressurizer vessel. The licensee states that this range is not met. The licensee does state that the range covers any design basis transients, and that the level indication will remain on scale.

Based on the licensee's statement, we find that the range is adequate. However, the licensee should state the range per the requirements of Section 6.2 of NUREG-0737, Supplement No. 1..

3.3.12 Pressurizer Heater Status

Regulatory Guide 1.97 recommends instrumentation to monitor the current drawn by the pressurizer heaters. The licensee's instrumentation consists of on/off indication of the redundant emergency pressurizer heaters. The licensee indicates that the control of these heater banks is either on or off, and therefore the instrumentation is appropriate.

Section II.E.3.1 of NUREG-0737 requires a number of the pressurizer heaters to have the capability of being powered by the emergency power sources. Instrumentation is to be provided to prevent overloading a diesel

generator. Also, technical specifications are to be changed accordingly. The Babcock and Wilcox Standard Technical Specifications, Section 4.4.3.2, require that the emergency pressurizer heater current by measured quarterly. These emergency power supplied heaters should have the current instrumentation recommended by Regulatory Guide 1.97.

3.3.13 Quench Tank Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the top to the bottom of the tank. The range supplied by the licensee indicates the straight cylindrical shell height, excluding the hemispherical ends of the tank.

The portion of the quench tank level that is not indicated is in the upper and lower hemispherical head regions, where the volume to level ratio is not linear. This an acceptable deviation from Regulatory Guide 1.97.

3.3.14 Quench Tank Temperature

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 50 to 750°F. The installed instrumentation has a range of 0 to 400°F.

The licensee states that the quench tank rupture disc relieves any pressure in excess of 100 psig. The saturated steam at this pressure will not exceed 338°F.

We find the licensee's justification for this deviation acceptable.

3.3.15 Steam Generator Level

Regulatory Guide 1.97 recommends Category 1 instrumentation with a range from tube sheet to separators. This is for U-tube steam generators. The Davis-Besse steam generators are of once-through design, and as such the heat exchange area would be described as tube sheet to tube sheet. The licensee has Category 3 instrumentation that measures from tube sheet to

tube sheet (0 to 600 in.) and Category 1 instrumentation that reads 0 to 250 in. (It appears that the zero for these two sets of instrumentation is not the same.)

The licensee justifies this deviation based on the auxiliary feedwater control, which is used to mitigate the effects of a small break LOCA, using the narrow range instruments (the level is maintained between 33 and 96 in.). The Category 3 wide range channels are considered backup instruments by the licensee. The licensee notes, however, that a study regarding possible additional steam generator instrumentation is in progress. This is in conjunction with the steam feedwater rupture control system trips.

The licensee has not shown that the narrow range instruments will remain on scale for every analyzed transient or accident. Therefore the narrow range is not acceptable. The licensee has not shown that the Category 3 wide range instruments will remain operational for every analyzed transient or accident. We conclude that the instrumentation provided is not acceptable for this variable. The licensee should provide the modifications necessary to provide wide range Category 1 steam generator level instrumentation.

3.3.16 Steam Generator Pressure

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 0 to 20 percent above the lowest safety valve setting. The lowest safety valve setting is 1050 psig; therefore, the range should be from 0 to 1260 psig. The instrumentation for this variable has a range of 0 to 1200 psig, 9 percent above the highest safety valve setting.

The licensee states that the pressure indication will remain on scale, including the most severe design basis accident. Based on this statement, and the maximum range being 100 psi above the highest safety valve setting, we find that the range of 0 to 1200 psig is acceptable.

3.3.17 Safety/Relief Valve Positions or Main Steam Flow

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee states that the position of the atmospheric vent valves (AVV) and the main steam safety valves (MSSV) is not monitored and that monitoring is not required to mitigate the consequences of a design basis accident. AVV position is indicated in the control room via indicating lights on the safety features actuation system panel and the hand/auto stations indicators for the AVV's which are used to reduce and maintain the steam generator pressure below the MSSV setpoints. In addition, the licensee states that the sound emitted from the valves provides an audible indication to the operators when either the MSSV's or AVV's lift.

The licensee has not verified Category 2 instrumentation for the AVV's, the MSSV's nor the alternate main steam flow. We conclude the licensee has not provided acceptable instrumentation for this variable. The licensee should provide the recommended instrumentation.

3.3.18 Condensate Storage Tank Water Level

Regulatory Guide 1.97 recommends Category 1 instrumentation for this variable. The licensee has Category 3 instrumentation. The nuclear safety related feedwater supply is from the service water (SW) system. This is the assured water supply. The switchover from the condensate storage tank (CST) to SW is automatic. The licensee states that this has been reviewed and approved by the NRC (see letter dated February 21, 1984, TED No. 1455, comment GS-4). The licensee states that the CST serves no nuclear safety related function other than being the preferred water source. Therefore, the licensee concludes that Category 3 instrumentation is appropriate for this variable.

We find this to be a good faith attempt, as defined in NUREG-0737, Supplement No. 1, Section 3.7 (Reference 3), to meet NRC requirements and is, therefore, acceptable.

3.3.19 Containment Spray Flow

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee indicates that the flow is determined by the status lights for the pumps and the status lights for the valve position. These are Category 1. The flow meters are considered by the licensee to be backup Category 3 indication.

The status lights are not acceptable for determining flow. The licensee should identify any specific deviations from the Category 2 recommendations for the flow meters, and either provide justification for the deviation or upgrade the instrumentation to Category 2.

3.3.20 Containment Atmosphere Temperature

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable with a range from 40 to 400°F. The licensee has supplied Category 3 instrumentation with a range of 0 to 300°F. Their justification for this deviation is that the primary variable required to show accident mitigation and containment integrity is reactor building pressure which is a Category 1 variable. They consider the atmosphere temperature a Category 3 variable.

The containment atmosphere temperature directly indicates the accomplishment of a safety function (containment cooling), and is, therefore, a key variable. As such, Category 2 requirements should be met by the licensee.

The licensee indicates that the maximum containment temperature will be less than 285°F. Therefore, the range of 0 to 300°F is acceptable.

3.3.21 Containment Sump Water Temperature

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable with a range of 50 to 250°F. The licensee does not have direct instrumentation for this variable. Their justification is that monitoring the sump temperature is not needed to assure that net positive suction head

(NPSH) exists for the decay heat pumps or the containment spray pumps. They state that containment sump water temperature is not required to mitigate the consequences of any design basis accidents. Additionally, the sump water temperature can be measured by use of the decay heat removal heat exchanger (cooler) inlet temperature when recirculating the sump contents.

We find this alternative acceptable for this variable; however, the licensee should verify that this instrumentation meets Category 2 recommendations.

3.3.22 Makeup Flow-In

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable with a range of 0 to 110 percent of design flow. The licensee indicates that their instrumentation does not comply with this range, though the actual range is not identified. An on-going review is to establish a new range. The licensee should commit to meet or exceed the range recommended by the regulatory guide.

The licensee indicates that this instrumentation deviates from the Category 2 requirements in that it is not environmentally qualified. Environmental qualification has been clarified by the Environmental Qualification Rule, 10 CFR 50.49. We conclude that Regulatory Guide 1.97 has been superseded by a regulatory requirement. Any exception to this rule is beyond the scope of this review and should be addressed in accordance with 10 CFR 50.49.

3.3.23 Letdown Flow-Out

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee, has provided instrumentation that, except for environmental qualification, is Category 2. The licensee states that this variable is not required in the mitigation of an accident, and that the letdown system is isolated by accidents requiring containment isolation.

Environmental qualification has been clarified by the Environmental Qualification Rule, 10 CFR 50.49. We conclude that Regulatory Guide 1.97 has been superseded by a regulatory requirement. Any exception to this rule is beyond the scope of this review and should be addressed in accordance with 10 CFR 50.49.

3.3.24 Volume Control Tank Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the top to the bottom of the tank. The licensee does not consider this as post-accident instrumentation; however, the range supplied by the licensee indicates the straight cylindrical shell height, excluding the hemispherical ends of the tank. Also the licensee indicates that this tank is not required in an accident situation, as system isolation occurs.

Based on the licensee's justification for not requiring this instrumentation in a post-accident situation, we find this deviation in range acceptable.

3.3.25 Component Cooling Water (CCW) Temperature to Engineered Safety Features (ESF) System

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable. The licensee is supplying Category 3 instrumentation. Two of the three component cooling water heat exchangers outlet temperatures are monitored in the control room.

During a design basis accident, upon actuation of the Safety Features Actuation System (SFAS) Incident Level 2, the service water inlet valves to the CCW heat exchangers are opened providing maximum cooling water to the heat exchanger. The licensee states that no actions are required based upon this temperature and the valve position are indicated in the control room and the valves open automatically by safety grade control systems. For these reasons, the licensee considers this instrumentation as Category 3 backup instrumentation.

We find the justification for the existing instrumentation for this variable acceptable.

3.3.26 Component Cooling Water Flow to ESF System

Regulatory Guide 1.97 recommends Category 2 flow instrumentation to monitor the operation of the component cooling water system. The licensee does not have instrumentation for this variable, citing a study that determined that this variable is not required to mitigate the consequences of a design basis accident. There is alternate instrumentation consisting of pump motor status (on/off) and system valve position.

We do not concur with the licensee. The alternate instrumentation will not determine proper system operation should there be flow blockage or a pipe rupture. The licensee should supply the recommended instrumentation.

3.3.27 High Level Radioactive Liquid Tank Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the top to the bottom of the tank. The range supplied by the licensee indicates the straight cylindrical shell height, excluding the hemispherical ends.

The portion of the high level radioactive liquid tank level that is not indicated is in the upper and lower hemispherical head regions, where the volume to level ratio is not linear. This is an acceptable deviation from Regulatory Guide 1.97.

3.3.28 Radioactive Gas Holdup Tank Pressure

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of 0 to 150 percent of design pressure. The tank design pressure is 150 psig and pressure above this is automatically relieved. The instrumentation range is 0 to 200 psig. Thus the range deviates from the recommended range.

There is a safety relief valve on this tank, set to relieve any pressure above 150 psig. An alarm is set at 140 psig. As the tank pressure will not exceed 150 psig, we find the 0 to 200 psig range acceptable.

3.3.29 Emergency Ventilation Damper Position

Regulatory Guide 1.97 recommends monitoring the open-closed status of these dampers. The licensee states that all emergency ventilation system (EVS) dampers have the recommended indication except for the fan inlet dampers which do not have indication in the control room but are interlocked to open when the auxiliary building normal ventilation dampers are closed. Differential pressure across the filter banks is provided in the control room. Overall EVS system performance can be determined from the annulus to mechanical penetration Category 1 differential pressure indicators, located in the control room.

We find the licensee's alternate instrumentation for this variable acceptable.

3.3.30 Noble Gas Vent from Steam Generator Safety Relief Valves or Atmospheric Dump Valves

Regulatory Guide 1.97 recommends this Category 2 instrumentation for the variable. The recommended parameters to be monitored for this variable are noble gas, duration of release in seconds and mass of steam per unit time.

In regard to this variable, the licensee states that the position indication of the atmospheric vent valves (AVV) and the main steam safety valves (MSSV) is not monitored and that monitoring is not required to mitigate the consequences of a design basis accident. AVV position is indicated in the control room via indicating lights. In addition, the licensee states that the sound emitted from the valves provides an audible indication to the operators when either the MSSV's or AVV's lift. Dose

estimate procedures are used to quantify noble gas/radioiodine releases from the AVV's, MSSV's and auxiliary feedwater steam turbine exhaust utilizing the currently installed main steamline radiation monitors or the steam jet air ejector radiation monitor.

We find this arrangement unacceptable for this variable. First, the licensee should identify the range of the main steamline monitors, verify that the range is adequate and that the instrumentation is Category 2. Second, the licensee should indicate how the duration of the release and the mass of steam per unit time is determined. Third, the licensee should show that the results derived from this method are within an acceptable tolerance from the actual release.

3.3.31 Estimation of Atmospheric Stability

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of -9 to +18°F or an analogous range for alternative stability analysis. The licensee has supplied instrumentation with a range of -4 to +8°F. The licensee justifies this, indicating that the range is based on the Pasquill Stability Class specified in Regulatory Guide 1.23.

Table 1 of Regulatory Guide 1.23 provides seven atmospheric stability classifications based on the difference in temperature per 100 meters elevation change. These classifications range from extremely unstable to extremely stable. Any temperature difference greater than +4°C or less than -2°C does nothing to the stability classification. The licensee's instrumentation includes this range. Therefore, we find that this instrumentation is acceptable to determine the atmospheric stability.

3.3.32 Accident Sampling (Primary Coolant, Containment Air and Sump)

The licensee's post-accident sampling system provides sampling and analysis as recommended by the regulatory guide, except that

1. The emergency core cooling system pump room sump is not sampled

2. It does not have containment air oxygen content analysis

3. Containment air hydrogen and gamma spectrum analysis are done by on-line monitors in preference to grab samples.

The licensee takes exception to Regulatory Guide 1.97 with respect to post-accident sampling capability. This exception goes beyond the scope of this review and is being addressed by the NRC as part of their review of NUREG-0737, Item II.B.3.

4. CONCLUSIONS

Based on our review, we find that the licensee either conforms to or is justified in deviating from Regulatory Guide 1.97, with the following exceptions:

1. RCS pressure--the licensee should either show that the present range is adequate or provide the recommended range (Section 3.3.4).

2. Containment effluent radioactivity--the licensee should provide the information required by Section 6.2 of NUREG-0737, Supplement No. 1, identify any deviations from Regulatory Guide 1.97 and justify any deviations (Section 3.3.7).

3. Effluent radioactivity--the licensee should provide the information required by Section 6.2 of NUREG-0737, Supplement No. 1, identify any deviations from Regulatory Guide 1.97 and justify any deviations (Section 3.3.7).

4. Radiation exposure rate--the licensee should provide the information required by Section 6.2 of NUREG-0737, Supplement No. 1, identify any deviations from Regulatory Guide 1.97 and justify any deviations (Section 3.3.7).

5. RHR heat exchanger outlet termperature--environmental qualificaton should be addressed in accordance with 10 CFR 50.49 (Section 3.3.8).

6. Accumulator tank level--the licensee should define and justify the deviation from the recommended range (Section 3.3.9).

7. Pressurizer level--the licensee should identify the range (Section 3.3.11).

8. Pressurizer heater status--the licensee should provide the instrumentation recommended by Regulatory Guide 1.97 (Section 3.3.12).

9. Steam generator level--the licensee should provide wide range Category 1 instrumentation for this variable (Section 3.3.14).

10. Safety/relief valve positions or main steam flow--the licensee should supply the recommended instrumentation (Section 3.3.17).

11. Containment spray flow--the licensee should identify the specific deviation from Category 2 instrumentation and either justify or correct the deviation (Section 3.3.19).

12. Containment atmosphere temperature--the licensee should upgrade this instrumentation to Category 2 (Section 3.3.20).

13. Containment sump water temperature--the licensee needs to verify that the alternate instrumentation is Category 2 (Section 3.3.21).

14. Makeup flow-in--the licensee should apply the recommended range (Section 3.3.22).

15. Letdown flow-out--environmental qualfication should be addressed in accordance with 10 CFR 50.49 (Section 3.3.23).

16. Component cooling water flow to ESF system--the licensee should supply the recommended instrumentation (Section 3.3.26).

17. Noble gas from steam generator safety relief valves or atmospheric dump valves--the licensee should provide additional justification for this deviation (Section 3.3.30).

5. REFERENCES

1. NRC letter, D. G. Eisenhut to All Licensees of Operating Reactors, Applicants for Operating Licenses, and Holders of Construction Permits, "Supplement No. 1 to NUREG-0737--Requirements for Emergency Response Capability (Generic Letter No. 82-33)," December 17, 1982.

2. Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident, Regulatory Guide 1.97, Revision 2, U.S. Nuclear Regulatory Commission (NRC), Office of Standards Development, December 1980.

3. Clarification of TMI Action Plan Requirements, Requirements for Emergency Response Capability, NUREG-0737, Supplement No. 1, NRC, Office of Nuclear Reactor Regulation, January 1983.

4. Toledo Edison Company letter, R. P. Crouse to Director of Nuclear Reactor Regulation, NRC, June 28, 1984, Serial No. 1059.

5. Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident, Regulatory Guide 1.97, Revision 3, NRC, Office of Nuclear Regulatory Research, May 1983.

6. Final Safety Analysis Report, Davis-Besse Nuclear Power Station, Unit No. 1, Toledo Edison Company.

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