PACIFIC GAS & ELECTRIC COMPANY

DIABLO CANYON NUCLEAR POWER PLANT

INDEPENDENT DESIGN VERIFICATION PROGRAM

INTERIM TECHNICAL REPORT

VERIFICATION OF THE MECHANICAL/NUCLEAR DESIGN OF THE CONTROL ROOM VENTILATION AND PRESSURIZATION SYSTEM

PERFORMED BY

STONE & WEBSTER ENGINEERING CORPORATION

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PROGRAM MANAGER'S PREFACE

DIABLO CANYON NUCLEAR POWER PLANT - UNIT I

INDEPENDENT DESIGN VERIFICATION PROGRAM

INTERIM TECHNICAL REPORT

VERIFICATION OF THE MECHANICAL/NUCLEAR DESIGN OF THE CONTROL ROOM VENTILATION AND PRESSURIZATION SYSTEM

This is the twentieth of a series of Interim Technical Reports prepared by the DCNPP-IDVP for the purpose of providing a conclusion of the program.

This report provides the analytical results, recommendations and conclusions of the IDVP with respect to the initial sample.

As IDVP Program Manager, Teledyne Engineering Services has approved this ITR including the conclusions and recommendations. The methodology followed by TES in performing this review and evaluation is described by Appendix B to this report.

ITR Reviewed and Approved
IDVP Program Manager
Teledyne Engineering Services

D. Stratouly
Assistant Project Manager

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1.0 INTRODUCTION

Stone & Webster Engineering Corporation (SWEC) has reviewed the design of the Control Room Ventilation and Pressurization System (CRVP) in accordance with the SWEC Scope of Work defined in Appendix D (DCNPP-1-IDVP-PP-002) of the IDVP Phase II, Program Management Plan issued by Teledyne Engineering Services (TES) as IDVP Program Manager. The review included control room cooling load; system air flow rates; applicable codes, standards and regulatory guides; system design temperatures and pressures; control room habitability; Technical Specification; system redundancy; and a field inspection. The scope of this review is amplified below.

This Interim Technical Report (ITR) does not address the review of fire protection, high energy line break or crack, or moderate energy line break effects on the CRVP system. These reviews are discussed in separate ITRs.

2.0 CRVP SYSTEM MECHANICAL/NUCLEAR DESIGN REVIEW

2.1 DEFINITION OF ITEMS REVIEWED

2.1.1 Control Room Cooling Load

Total system required cooling load was checked against the equipment capacity for all four modes of operation.

2.1.2 System Air Flow Rates

The required static pressures and flows were compared against the fans' actual capabilities for all four modes of operation. The system air flow requirements were checked against the actual system flow capability for all four modes of operation.

2.1.3 Codes, Standards, and Regulatory Guides

The codes, standards, and regulatory requirements applicable to the CRVP system design were reviewed.

2.1.4 System Design Temperatures and Pressures

System design temperatures and pressures specified were checked for all operating conditions. The system's compatibility with the specified design pressure and temperature was reviewed.

2.1.5 Control Room Habitability

The ability of the CRVP System to maintain control room habitability was reviewed based on the radiological and toxic environments identified in the DCNPP-1 licensing documents for the 4 modes of operation, adverse environmental occurrences and subsequent to postulated accidents.

2.1.6 Technical Specifications Review

The Technical Specifications requirements were reviewed to determine compatibility with the CRVP System design.

2.1.7 System Redundancy (Operability and Functionability)

A review of redundancy was performed to determine whether the CRVP system design satisfies the single failure criteria as defined in the DCNPP-1 licensing documents.

2.1.8 Field Inspection

A field inspection was performed to verify that the as-built conditions of the CRVP system are equivalent to the design documents and drawings used for IDVP review.

2.2 DESCRIPTION OF REVIEW

The review was initiated by reviewing the Design Chain to determine the service-related contractors and internal PG&E engineering groups involved in the mechanical design of the CRVP system. The results of this review identified EDS Nuclear Inc. and the PG&E Civil Group as the service-related

contractors and PG&E engineering group, respectively involved in the mechanical design of the CRVP system. The responsibilities and interfaces between the service-related contractor and PG&E were identified. Then the DCNPP-1 licensing documents pertaining to the CRVP system were reviewed and applicable licensing commitments were identified. The detailed review identified below was then conducted to determine whether the CRVP system licensing commitments (acceptance criteria) were met. The detailed reviews described below assumed single failures consistent with DCNPP-1 licensing commitments.

2.2.1 Control Room Cooling Load

An independent calculation (Calc. No. 14296-P-10) was performed to determine the total required cooling capacity of the CRVP system's air conditioning equipment for the four modes of operation described in FSAR Section 9.4.1. This was done by identifying the as-built equipment in the control room during a site visit. Actual vendor data, nameplate data, and conservative equipment efficiencies were used to determine the amount of heat rejected into the control room. Outside design air conditions identified in FSAR Section 9.4 and equipment rejected heat were used to determine the maximum cooling load the air conditioning equipment would have to accommodate under the four modes of operation.

These maximum cooling loads were compared to the capacity of the air conditioning equipment based on vendor data. The resulting control room temperatures were independently calculated (Calc. No. 14296-P-11), using vendor data for the cooling coil, and compared to the design temperature committed to in the FSAR Section 9.4.1. The calculated heat absorbed in the cooling coil under these conditions was compared to the capacity of heat rejection by the compressor and condenser as stated in the vendor documents to determine whether adequate cooling capacity was installed.

2.2.2 System Air Flow Rates

The control room Certified Air Balance Test Report (Certificate No. 112068 of August 25, 1982) performed by PG&E was reviewed, and the recorded values were compared to design air flow rates as shown in the PG&E Flow Diagram (Drawing

No. 511157, Rev. 6) and duct drawings. Fans static pressures and motor brake horsepowers recorded in the Certified Air Balance Test Report were compared against the nameplate ratings to determine whether they can accommodate additional system resistances due to dirty filters. Air flow rates taken from the Certified Air Balance Test Report were used to calculate independently the resulting control room temperatures (Calc. No. 14296-P-11) in Section 2.2.1, above. This calculation was used to determine whether adequate air is supplied to the control room to maintain air temperatures at the design values identified in the FSAR Section 9.4.1. The air distribution from the Certified Balance Test Report was compared against the design flows on the Flow Diagram (PG&E Drawing No. 511157, Rev. 6). This was done to determine whether the system can be balanced as designed and whether the actual intake and recirculation air flow rates match those values used in the PG&E control room habitability analyses.

In addition, the results of PG&E start-up test procedure (No. 23.1, Rev. 2 of June 11, 1979, and its Addendum No. 2 of December 29, 1981) were reviewed to check the CRVP system's ability to pressurize the control room under Mode 4 operation as stated in the FSAR Section 9.4.1.

2.2.3 Codes, Standards, and Regulatory Guides

PG&E purchase order specifications for the CRVP System equipment were reviewed to determine whether the applicable codes, standards, and regulatory guides identified in the FSAR Table 9.4-6 were specified.

2.2.4 System Design Temperatures and Pressures

Duct and equipment design temperatures and pressures as specified in PG&E specifications were reviewed to ensure their compatibility with the actual pressures developed by the fans. Similarly, the design temperature and pressure of the refrigerant piping and equipment as specified in the PG&E purchase order specifications were compared against those values expected to occur during operation.

2.2.5 Control Room Habitability

The radiation dose calculation (EDS Nuclear Inc. Calc. No. 006) and chlorine concentration calculation (FSAR Section 9.4.1) were reviewed to determine whether the values of air flow rates, control room volume, filter efficiencies, damper closing time, detector response time, and infiltration rate were input into the calculations correctly. These calculations were also reviewed to determine whether the effects of single failure were considered in the calculations.

The HEPA/charcoal filter unit design was reviewed. Filter efficiencies and air flow capacities specified in the PG&E specifications were checked for conformance to the licensing commitments (FSAR Table 15.5-30) during Mode 4 operation. In evaluating the filter efficiencies used in the control room habitability analyses, an independent calculation (Calc. No. 14296-P-12) was performed to check the ability of the duct heaters upstream of the filter unit to remove the moisture from the outside air and to maintain its relative humidity at levels identified in Regulatory Guide 1.52.

The chlorine detector and radiation monitor purchase order specifications were reviewed to determine whether the sensitivities and response times specified to the vendors agreed with the design values identified in the FSAR Section 9.4.1.

2.2.6 Technical Specifications Review

The Technical Specifications (Section 3/4.7.5) were reviewed to determine whether they meet the requirements for in-place testing delineated in Regulatory Guide 1.52 and FSAR Section 16.5.9. This review was also performed to determine whether the Technical Specification (Section 3/4.7.5) requirements are compatible with the CRVP system design.

2.2.7 System Redundancy (Operability and Functionability)

A review was performed to determine whether the CRVP system redundancy meets single failure criteria consistent with FSAR Section 9.4.1 commitments. This review was performed assuming a design basis accident concurrent with a single failure.

Single failures considered were failure of a vital bus and failure of an individual component, such as filtration train, fan, damper, air conditioning equipment, or instrumentation. The CRVP system flow diagram and duct drawings identified in Section 2.2.2 were used as the basis of the review. The emergency electrical power supply to system components was reviewed for two cases: (1) Unit 1 and Unit 2 both operational; (2) Unit 1 only operational. In addition, a review was performed of the CRVP system's operability and functionability. The PG&E start-up test procedure (No. 23.1, Rev. 2 of June 11, 1979, and its Addendum No. 2 of December 29, 1981) was reviewed to determine whether the system is capable of operation in each of the four modes identified in FSAR Section 9.4.1. The start-up test procedure was also reviewed to determine whether the system initiates Mode 3 or Mode 4 operation automatically upon each of the signals identified in FSAR Section 9.4.1.

2.2.8 Field Inspection

A field inspection of the CRVP system was performed to compare the as-built conditions to the PG&E Flow Diagram (No. 511157, Rev. 6) and duct drawings used in the IDVP review. A walk-down of the system was performed. Parameters such as number and sequence of fans, dampers, and air conditioning equipment, duct layout, location of radiation and chlorine monitors, etc, were checked during the walk-down and any significant variations from the drawings were noted.

2.3 SUMMARY OF REVIEW RESULTS

2.3.1 Control Room Cooling Load

The total cooling load calculated by SWEC (Calc. No. 14296-P-10) for Modes 1, 2, 3, and 4 operations is approximately 5 percent higher than the value shown in FSAR Table 9.4-7. This value is considered to be within the expected calculational accuracy. Using the air flow rate from the Certified Air Balance Test Report, the resulting control room temperature was calculated. From this, the heat absorbed in the cooling coil was also calculated. This calculated cooling load is within the nameplate cooling capacity of the compressor and condenser.

2.3.2 System Air Flow Rates

The values recorded in the PG&E control room Certified Air Balance Test Report (Certification No. 112068) for supply air, return air, makeup air, and pressurization air under all four modes of operation are within 10 percent of the design air flow rates indicated on the PG&E Flow Diagram (No. 511157, Rev. 6) and duct drawings. A variation of ±10 percent in the air flow rates of the CRVP system would not affect the system's ability to maintain the control room temperature below the limits delineated in FSAR Section 9.4.1.

The fan brake horsepowers recorded in the Certified Air Balance Test Report were reviewed. For the supply fans, booster fans, and pressurization fans, the recorded brake horsepowers indicate that the nameplate motor ratings are adequate to accommodate system design air flows.

The resulting control room temperature was calculated based on the cooling load calculated in Section 2.3.1 above and the supply air flow recorded in the Certified Air Balance Test Report. This calculated temperature is well below the maximum allowable control room temperature based on instrument limitations identified in FSAR Section 9.4.1.

The air distribution as recorded in the Certified Air Balance Test Report matches the design values on the PG&E Flow Diagram and duct drawings. Also, the actual intake and recirculation air flow rates recorded in the Certified Air Balance Test Report match the air flow rates used in the PG&E control room habitability analyses.

The results of PG&E start-up test procedure No. 23.1 were reviewed. The control room pressure recorded under Mode 4 operation was above the 1/8 in. W.G. positive pressure required in FSAR Section 9.4.1.

2.3.3 Codes, Standards, and Regulatory Guides

The review of the PG&E purchase order specifications for the CRVP system equipment showed that the applicable codes, standards, and regulatory guides identified in the FSAR Section 9.4.1 have been specified.

2.3.4 System Design Temperatures and Pressures

Review of the PG&E purchase order specifications indicates that the duct and equipment design pressures match those recommended in the 1972 Equipment Volume of the ASHRAE Handbook for the maximum static pressures developed by the fans. The actual fan static pressures as recorded in the Certified Air Balance Test Report (Certificate No. 112068) are within the specified design pressures. In addition, the materials specified are adequate for the range of temperatures the system is expected to experience.

A review of the PG&E Specification No. 8771 for the refrigerant piping system and valves indicates that the pressures and temperatures developed in the refrigerant piping, valves, and fittings by the compressor and condenser agree with the values listed on vendor drawings for the compressor and condenser, and are within the recommended range as specified in the vendors' catalogs. The expected range of actual pressures and temperatures within the system is within the specified design values.

2.3.5 Control Room Habitability

A review of the radiation dose calculation performed by EDS Nuclear Inc. (Calc. No. 006) indicates that the values of air flow rates, control room volume, infiltration rate, and filter efficiencies input into the calculation agree with those identified in FSAR Section 9.4.1.

Also, the value of outside pressurization air input into the calculation indicates that the effects of single failure have been taken into account. The calculation also takes the effects of single failure into account by assuming that the outside pressurization air flows through one of the filter units.

A review of the chlorine concentration calculations (FSAR Section 9.4.1) shows that the values of air flow rates, infiltration rates, and control room volume input into the calculation match those values identified in the FSAR. However, the value of damper closing time used in the calculations was not the

same as the value identified in FSAR Section 9.4.1. Calculation No. 14296-P-13 showed that the chlorine detector response time could also vary from that value used by PG&E under single failure. Therefore, an independent calculation (Calc. No. 14296-P-13) of chlorine concentration was performed using both the value of damper closing time recorded in the start-up test procedure No. 23.1 done by PG&E and the calculated value for chlorine detector response time. This calculated value of chlorine concentration is well below the limits of Regulatory Guide 1.52.

The air flow capacity of the HEPA/Charcoal filter unit specified in the PG&E purchase order specifications is equivalent to that value recorded in the Certified Air Balance Test Report and thus meets the IDVP acceptance criteria. Also, the filter efficiencies specified agree with those used in the control room habitability analyses. In evaluating the filter efficiency for methyliodide, a calculation (Calc. No. 14296-P-12) was performed to find the relative humidity of the air entering the filter unit. This calculated value is within the limits of Regulatory Guide 1.52 necessary to allow the efficiency used in the control room habitability analyses.

The PG&E purchase order specifications for chlorine and radiation monitors were also reviewed. The review showed that the specified monitors' sensitivities and response times agree with the values identified in FSAR Section 9.4.1. The duct drawings for the pressurization air intakes were reviewed and the as-built conditions at the normal air intakes were reviewed during a site visit. These reviews showed that the chlorine and radiation monitors have been located as indicated in the FSAR Figure No. 9.4-1.

2.3.6 Technical Specifications Review

The requirements for in-place testing of the CRVP system stated in the Technical Specifications (Section No. 3/4.7.5) match those requirements of Regulatory Guide 1.52 and FSAR Section 16.5.9. In addition, the limiting conditions for plant operation stated in the Technical Specifications allow the CRVP system to perform its design function, assuming single failure and the adequacy of equipment electrical power supplies. The adequacy of electrical power supplies is discussed in Section 2.3.7.

2.3.7 System Redundancy (Operability and Functionability)

A review of the PG&E Flow Diagram (No. 511157, Rev. 6) and duct drawings for the CRVP system shows that the design of the CRVP system does include redundant equipment. However, a review of the emergency electric power supplies shows that adequate electrical power redundancy is not supplied to the CRVP system to meet the single failure criteria identified in FSAR Section 9.4.1. The concern exists that portions of the CRVP system required to maintain the Unit 1 control room habitability are shared between Units 1 and 2 and, as such, are provided safety-related power from the Unit 2 diesel generators and electrical system. If the Unit 2 safety-related electrical system is not available, such as prior to the licensing of Unit 2 or during major electrical outages, the CRVP system does not meet the single failure criteria. Typical examples are given below:

1. With only Unit 1 power available, there is no power available for the radiation and chlorine monitors located in the pressurization system south remote air intake.

2. Failure of "H" Bus would result in no power available for the Unit 1 air conditioning equipment, which provides conditioned air to remove heat generated from the vital electrical equipment located in the safeguards room.

3. Failure of "H" or "F" Bus would result in no power available for the normal air intake and exhaust motor-operated dampers which are required to close and isolate the control room envelope from the outside contaminated air during a LOCA and to permit control room pressurization.

Another concern is that portions of the Class 1 CRVP system are shared by Unit 1 and Unit 2, and as such, equipment is provided electrical power from both the Units 1 and 2 safety-related electrical system. The FSAR, page 8.3-4 states that for a postulated LOCA in one unit and a shutdown in the other unit, each unit can withstand an assumed failure of a vital bus. It is a basic assumption that a design earthquake occurs simultaneously with a LOCA. The design earthquake produces the loss of offsite power.

Therefore, it must be assumed that three vital buses (one in the LOCA unit and two in the shutdown unit) do not have power available. Evaluation of the various combinations of vital bus failures for a postulated LOCA in either Unit 1 or Unit 2 indicates conditions under which the CRVP system does not meet its design bases as stated in licensing commitments. Typical examples are provided below:

1. LOCA in Unit 2

   Combinations of Vital Bus Failures: F2 H1 H2
   F1 F2 H2
   F2 G2 H1

   No power available to any of the above combinations of vital buses would prevent the automatic closure of the outside air normal intake and exhaust motor-operated dampers. These dampers are required to close in Mode 4 operation to permit control room pressurization to 1/8 in. W.G. and reduce radioactivity inleakage. Also, no power to vital bus combinations F2, H1, H2 and F2, G2, H1 would result in loss of power to the air conditioning units which provide cooling to the safeguards room which contains the vital electrical equipment required for safe shutdown.

2. LOCA in Unit 2

   Combinations of Vital Bus Failures: F1 G1 H2
   F1 H1 H2
   F1 F2 H1

   No power available to any of the above vital bus combinations would prevent the automatic closure of the outside air normal intake and exhaust motor-operated dampers. These dampers are required to close in Mode 4 operation to permit control room pressurization to 1/8 in. W.G. and reduce radioactivity inleakage. Also, no power to vital bus combinations F1, G1, H2 and F1, H1, H2 would result in loss of power to the air conditioning units which provide cooling to the safeguards room, which contains the vital electrical equipment required for safe shutdown.

The preoperational test procedure No. 23.1 performed by PG&E on the CRVP system was reviewed. The test procedure indicated that the system did switch to, and operate in, each of the four modes of operation identified in the FSAR upon manual initiation. Also, the report indicated that the system did automatically initiate Mode 3 or Mode 4 operation upon simulating each of the initiation signals identified in the FSAR.

2.3.8 Field Inspection

A complete walk-down of the CRVP system was performed. The walk-down showed that the configuration of the CRVP system is equivalent to the PG&E Flow Diagram (No. 511157, Rev. 6) and duct drawings.

2.4 EVALUATION OF REVIEW RESULTS

2.4.1 Control Room Cooling Load

The cooling capacity of the CRVP system air conditioning equipment identified in the FSAR is adequate for the calculated maximum cooling load and thus meets the IDVP acceptance criteria.

2.4.2 System Air Flow Rates

The air flow rates recorded for the control room in the Certified Air Balance Test Report agree with those values identified in the PG&E Flow Diagram and duct drawings and thus meet the IDVP acceptance criteria.

The calculated control room temperature is well below the upper limit based on instrument limitations identified in the FSAR and thus meets the IDVP acceptance criteria.

2.4.3 Codes, Standards, and Regulatory Guides

The codes, standards, and regulatory guides specified in the PG&E specifications match those listed in the FSAR and thus meet the IDVP acceptance criteria.

2.4.4 System Design Temperatures and Pressures

The specified materials of construction for the CRVP system are adequate for the static pressures recorded for the control room in the Certified Air Balance Test Report and the temperatures identified in the FSAR. The expected operational pressures and temperatures are within the specified design values; therefore, the IDVP acceptance criteria are met.

2.4.5 Control Room Habitability

The parameters reviewed for the control room habitability analyses agree with those identified in the FSAR and thus meet the IDVP acceptance criteria.

2.4.6 Technical Specifications Review

The review of the Technical Specifications showed that the CRVP system design as described in the FSAR is compatible with the requirements of the specifications within the limits of the IDVP acceptance criteria.

2.4.7 System Redundancy (Operability and Functionability)

The mechanical equipment redundancy and the system operability and functionability meet the acceptance criteria of the IDVP. However, the emergency electrical power redundancy does not meet the IDVP acceptance criteria for single failure. The major deficiencies in the emergency electrical power redundancy arise because some safety-related Unit 1 equipment is powered from Unit 2 power supplies and, conversely, some safety-related Unit 2 equipment is powered from Unit 1 power supplies.

The CRVP system was the only shared system reviewed under the IDVP. The requirement for additional verification is dependent upon the resolution of the above concerns. If the power supplies are such that the FSAR single failure criteria cannot be met, then additional verification of power supplies for other shared systems should be performed.

2.4.8 Field Inspection

The as-built configuration of the CRVP system is equivalent to the configuration identified in the FSAR and design documents and thus meets the acceptance criteria of the IDVP.

2.5 EOI Reports Issued

Two reports were issued for the verification of mechanical/nuclear design of the CRVP system. The status of these reports is summarized in Appendix A.

EOI 8012 was issued because of the concern for lack of redundancy to provide adequate cooling and pressurization for the control room prior to operation and/or licensing of Unit 2. This file is presently an Error Class A.

EOI 8016 was issued because of the concern for lack of redundancy to provide adequate cooling and pressurization for the control room with both Units 1 and 2 available. This file is presently an Error Class A.

2.6 CONCLUSION

The following is a summary as to whether additional verification or additional sampling of the items reviewed is required.

2.6.1 Control Room Cooling Load

No additional verification or additional sampling is needed.

2.6.2 System Air Flow Rates

No additional verification or additional sampling is needed.

2.6.3 Codes, Standards, and Regulatory Guides

No additional verification or additional sampling is needed.

2.6.4 System Design Temperatures and Pressures

No additional verification or additional sampling is needed.

2.6.5 Control Room Habitability

No additional verification or additional sampling is needed.

2.6.6 Technical Specifications Review

No additional verification or additional sampling is needed.

2.6.7 System Redundancy (Operability and Functionability)

Since there is evidence of a generic concern in the design of shared systems, additional verification, as discussed in Section 2.4.7, of the emergency electrical power supplies of shared systems may be required.

2.6.8 Field Inspection

No additional verification or additional sampling is needed.

APPENDIX A

EOI FILES

DCNPP IDVP STATUS REPORT

	REV.	LATEST REV.			ACTION	
FILE NO.	DATE	REV.	DATE	BY	STATUS	ORG	SUBJECT
8012	820924	0	820924	SWEC	OIR	SWEC	CLASS 1 PORTIONS OF CRVP SYSTEM
8012	820924	1	821001	SWEC	PPRR/OIP	TES	CLASS 1 PORTIONS OF CRVP SYSTEM
8012	820924	2	821022	TES	OIR	SWEC	CLASS 1 PORTIONS OF CRVP SYSTEM
8012	820924	3	821103	SWEC	PER/A	TES	CLASS 1 PORTIONS OF CRVP SYSTEM
8012	820924	4	821116	TES	ER/A	PG&E	CLASS 1 PORTIONS OF CRVP SYSTEM
8016	820927	0	820927	SWEC	OIR	SWEC	CL.1 PORTIONS OF CRVP SYS. NOT MEETING DES. BASIS
8016	820927	1	821001	SWEC	PPRR/OIP	TES	CL.1 PORTIONS OF CRVP SYS. NOT MEETING DES. BASIS
8016	820927	2	821022	TES	OIR	SWEC	CL.1 PORTIONS OF CRVP SYS. NOT MEETING DES. BASIS
8016	820927	3	821103	SWEC	PER/A	TES	CL.1 PORTIONS OF CRVP SYS. NOT MEETING DES. BASIS
8016	820927	4	821116	TES	ER/A	PG&E	CL.1 PORTIONS OF CRVP SYS. NOT MEETING DES. BASIS

APPENDIX B

PROGRAM MANAGER'S ASSESSMENT

APPENDIX B

PROGRAM MANAGEMENT ASSESSMENT

Independent design verification of the tasks performed by SWEC to verify the Mechanical/Nuclear Design of the CRVP System was done in accordance with Phase II Program Management Plan, IDVP dated June 18, 1982 and the Engineering Procedure EP-1-014.

The task of verification involved several visits to the SWEC offices and detailed discussion and review with SWEC personnel of the work performed by SWEC including the methodology and calculations used in this evaluation.

The files issued by SWEC as Program Resolution Reports or Potential Error Reports were reviewed thoroughly and specific recommendations were made to the IDVP Program Manager delineating appropriate resolution.

As a result of the verification of the initial sampling selected by SWEC and the assessment of the impact of SWEC findings, TES, as Program Manager, is of the opinion that because of the concern on system redundancy, the need for additional verification shall be decided after analyzing PG&E response to the EOI Files issued on this task.