



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

July 9, 1997

NOTE TO: PDIV-1 File  
FROM: *TWA* Tom Alexion  
SUBJECT: LICENSEE'S DRAFT RESPONSES TO NRC'S JUNE 13, 1997,  
REQUEST FOR ADDITIONAL INFORMATION ON GRADED QUALITY  
ASSURANCE, SOUTH TEXAS PROJECT, UNITS 1 AND 2  
(TAC NOS. M92450 AND M92451)

I received the subject faxes from the licensee. The purpose of this memo is to place this information in the public document room.

The licensee provided their formal response by letter dated June 26, 1997.

Docket Nos. 50-498 and 50-499

Attachment: Faxes from Licensee

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ST-HL-AE-5679  
File No.: G02.05  
10CFR50.54(a)

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

South Texas Project  
Unit 1 and Unit 2  
Docket No. STN 50-498 and STN 50-499  
Response to Request For Additional Information of June 13, 1997  
Regarding the South Texas Project's Graded Quality Assurance Program

- References: 1) Letter from M. A. McBurnett to the U. S. Nuclear Regulatory Commission dated May 21, 1997, "Revised Graded Quality Assurance Operations Quality Assurance Plan" (ST-HL-AE-5655)
- 2) Letter from W. T. Cottle to the U. S. Nuclear Regulatory Commission dated May 22, 1997, "Finalized Graded Quality Assurance Operations Quality Assurance Plan" (ST-HL-AE-5661)
- 3) Letter from L. E. Martin to the U. S. Nuclear Regulatory Commission dated June 10, 1997, "Change QA-032 to the Operations Quality Assurance Plan Revision 13," (ST-HL-AE-5668)
- 4) Letter from Thomas W. Alexion (NRC) to William T. Cottle, dated June 13, 1997, "Review of Revised Operations Quality Assurance Plan (OQAP), South Texas Project, Units 1 And 2 (STP) (TAC Nos. M92450 And M92451)"

On May 21, 1997, the South Texas Project provided a draft version of the Operations Quality Assurance Plan which implements the Graded Quality Assurance Program for the Nuclear Regulatory Commission review (Reference 1). This version included responses to the requests for additional information provided to the South Texas Project prior to May 21, 1997. Concurrent with the Nuclear Regulatory Commission review, the South Texas Project completed its internal review of the Operations Quality Assurance Plan and on May 22, 1997, the South Texas Project submitted the finalized version (Reference 2).



ST-HL-AE-5679  
File No.: G02.05  
Page 2

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Attachment 1 provides responses to the remaining questions which were not previously addressed. A copy of the last vendor audit report performed on our Probabilistic Safety Assessment vendor is provided in Attachment 2.

If there are any questions regarding this the Operations Quality Assurance Plan, please contact Mr. R. J. Rehkugler at (512) 972-7922. If you have any questions regarding the Graded Quality Assurance Probabilistic Safety Assessment, please contact Mr. C. R. Grantom at (512) 972-7372.

L. E. Martin  
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- Attachment: 1) Response To NRC Request for Additional Information of June 10,1997 on the Graded Quality Assurance Program
- 2) Graded Quality Assurance Process Flowchart
  - 3) Probabilistic Risk Importance Threshold For Input To Graded Quality Assurance Component Classifications
  - 4) Basis for Risk Importance Threshold
  - 5) Houston Lighting & Power Audit of PLG , Incorporated Vendor Audit No. 95-073 (VA)
  - 6) Additional PSA Information

Response To NRC Request for Additional Information of June 10, 1997 on the Graded  
Quality Assurance Program

Request for Additional Information #1

*"Definitions", p. 4 of 10 - The definition of "critical characteristic" needs to be revised to be consistent with the definition given in 10 CFR 21.3.*

Response 1

The OQAP definition of "critical characteristics" has been changed. See changes that were submitted under OQAP change 32 (ST-HL-AE-5668).

Request for Additional Information #2

*Chapter 1.0, §5.1.4.2, p. 3 of 4 - What are the full responsibilities of the Manager, Risk Management & Industrial Relations?*

Response 2

The responsibilities of the Manager, Risk Management and Industrial Relations, as they apply to the Graded Quality Assurance Program, have been included in OQAP change 32 (ST-HL-AE-5668). Other responsibilities are not included, as the South Texas Project does not address personnel responsibilities at this level in the OQAP.

Request for Additional Information #3

*Chapter 2.0, §3.1, p. 1 of 15 - "Station economics" should not be a factor in considering the safety needs for a nuclear power plant.*

Response 3

This has been deleted in OQAP change 32 (ST-HL-AE-5668).

Attachment 1  
ST-HL-AE-5679  
Page 4 of 13

Request for Additional Information #4

*Chapter 2.0, §2.2, p. 1 of 15 - Please provide explanatory words for including "(except design and fabrication of NRC certified radioactive waste shipping casks)."*

Response 4

The exception is currently in place and has been docketed and approved. This exception was taken in September, 1991 (refer to ST-HL-AE-3856) when HL&P clarified that the OQAP (with regard to 10CFR71, Subpart H), applies only to packaging and shipping of radioactive materials and not to design and fabrication of NRC certified radioactive waste shipping casks. HL&P is not imposing design and/or fabrication requirements on casks which have been certified by the NRC. This change (QA-001) was incorporated into the OQAP in December, 1991.

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*Chapter 2.0, §5.3.3, p. 4 of 15 - Add "Initial evaluations are performed by the Working Group." to the end of the paragraph.*

Request for Additional Information #6

*Chapter 2.0, §5.3.5, p. 4 of 15 - After "are" in the first sentence, add "developed by the Working Group and are."*

Request for Additional Information #7

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Response 5, 6, 7

These changes have been included as part of OQAP change 32 (ST-HL-AE-5668).

Request for Additional Information #8

*Chapter 2.0, Note, p. 5 of 15 - It appears that this note is redundant to §5.3.9 above.*

Response 8

This note has been removed in OQAP submitted May 22, 1997 (ST-HL-AE-5661).

Attachment 1  
ST-F. AE-5679  
Page 5 of 13

Request for Additional Information #9

Chapter 2.0, Table I, p. 14 of 15 - For the BASIC program exception to §12 of ANSI N45.2.13-1976, add "for audit of suppliers" after "necessary-"

Request for Additional Information #10

Chapter 13.0, p.4 of 4 - Add a new §5.8 as follows to provide an acceptable response to question #4 of NRC's 04/14/97 letter:

"5.8 for medium and low safety significant SSCs treated by the BASIC program controls, measures shall be established to conduct apparent cause determinations and to trend failures to assist in evaluating the need for more detailed root cause analyses (if excessive failures occur) and proper corrective action. Further, particular consideration will be given to assessing the potential implications of such failures generically to similar SSCs treated by the FULL program."

Response 9, 10

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Request for Additional Information #11

During the May 5-8, 1997, site visit NRC expressed concern that placing components with a risk achievement worth (RAW) greater than 10 but less than 100 in the Basic program may be inappropriate. NRC requested that HL&P identify this population of components in the QA program description, and describe how specific QA controls would be assigned to the components' critical attributes. NRC has not found a satisfactory resolution to this concern in the May 21, 1997, revised submittal. NRC requests that STP change the QA program description to:

- include a clear definition of the population of components in question. These components are currently categorized as medium safety-significant which provides no distinction from other medium safety-significant populations. NRC is willing to consider the acceptability of a definition of this population which does not include numerical guidelines in the OQAP, but the basic attributes of the population (e.g., high reliability yet a high impact on risk if problems develop) must be clearly described.
- provide a description of how QA controls will be assigned to the critical attributes of this population of components. As discussed, NRC does not find that simple application of Basic program controls is sufficient. Nor does NRC find that explicit consideration by the working group and expert panel of the assigned controls is sufficient. NRC is willing to consider the acceptability of assigning

Attachment 1  
ST-HL-AE-5679  
Page 6 of 13

*Full program controls to those critical component attributes which cause the component to belong to this population.*

*Another alternative is to simply assign these components to the high safety-significant category based on the sensitivity of plant risk on their performance and place them in the FULL program. Other alternatives may also be suggested.*

#### Response 11

The South Texas Project has changed the Graded Quality Assurance Program to require safety related components with a RAW between 10 and 100 to have FULL Quality Assurance controls applied to the critical attributes associated with that RAW. The OQAP chapter 2, sections 5.3.9 and 5.3.11 have been revised to reflect this change (OQAP change 32 (ST-HL-AE-5668)).

The Comprehensive Risk Management Procedure, OPGP02-ZA-0003 Addendum 2 has been revised. The flowchart is provided in Attachment 3 which identifies the Probabilistic Risk Importance thresholds used for Graded Quality Assurance component classifications.

The Graded Quality Assurance Working Group Procedure is currently being developed. It will include the following aspects:

- ✦ Components with a risk achievement worth greater than 100 or a Fussell-Vesely importance greater than 0.01 are to be placed in the Full QA Program.
- ✦ Components with a risk achievement worth greater than 10 but less than 100 are to have full QA controls specifically placed on those critical attributes which cause the components to have a high risk achievement worth.

A graphical representation of the Probabilistic Risk Importance thresholds for input to the Graded Quality Assurance component classifications is provided in Attachment 3.

#### Request for Additional Information #12

12. *Although not discussed during the May 5-8, 1997, site visit, discussion among the NRC on the acceptability of your proposed categorization scheme has raise the question of why a high Fussell-Vesely (FV) value should not also lead to a high-safety-significant categorization regardless of the RAW. Please provide your position with respect to this issue.*



Response 12

As noted in the response to item #11, the categorization process has been revised to reflect a threshold for the Fussell-Vesely component importance at 0.01. The basis for risk importance threshold is provided in Attachment 4.

Request for Additional Information #13

13. *Practices and activities to ensure quality of the South Texas PRA are an important element in justifying use of risk insights as part of the GQA program. It is the staff's understanding that current CDF and LERF values are approximately an order of magnitude lower than in the 1989 (CDF) and 1992 (LERF) baseline studies. Please provide details of processes to ensure that the PRA updates and modifications were correctly implemented. This should include:*

*a listing of the modifications made to the PPA, the reason for each change and a discussion of the impact on the plant's risk profile.*

Response 13

The staff is correct in its understanding that the current CDF/LERF values are approximately an order of magnitude lower than the referenced baseline studies. Continuous improvement of South Texas Project's PRA has always been an element of focus. Major PRA applications, such as the recent Diesel Generator Extended Allowed Outage Time (DG EAOT) request, have always contained updated PRA information. Listed below are the major PRA efforts at STP which required model updates along with the associated calculation for CDF and LERF (See also Figure 1 in Attachment 6).

	<b>Core Damage Frequency</b>	<b>Large Early Release Frequency</b>
PRA 1989	$1.7 \times 10^{-4}$ per operating year	Not Calculated
IPE 1992	$4.4 \times 10^{-5}$ per operating year	$9.9 \times 10^{-7}$ per operating year
Tech Spec 1993	$3.6 \times 10^{-5}$ per operating year	$1.3 \times 10^{-6}$ per operating year
DG EAOT 1995	$2.1 \times 10^{-5}$ per operating year	$5.6 \times 10^{-7}$ per operating year
STP_1996	$9.1 \times 10^{-6}$ per operating year	$1.4 \times 10^{-7}$ per operating year

Changes in core damage frequency from the original Probabilistic Safety Assessment (PSA) in 1989 (Reference 1) to the Individual Plant Examination (IPE) in 1992 (Reference 2) are described in IPE Section 1.4.

Changes to the plant models incorporated in the August 1993 submittal to the USNRC for STPEGS Risk-Based Evaluation of Technical Specifications are documented in Reference 3.

The DG Extended Allowed Outage Time (EAOT) study was prepared and submitted to the NRC in April 1995 (Reference 4). This model included enhanced modeling of loss of offsite power, including credit for the emergency transformer and updated offsite power recovery analysis, modeling enhancements based on the On-Line maintenance program at South Texas Project, and the results of the first plant specific data update. The current model was built from the model developed to support the DG EAOT.

No quantification has been made to measure the effect of any single change described below. System level changes were quantified as the system model changes were reviewed and accepted. The quantification of plant model changes were typically made with several changes at once.

Major changes in the current model from the DG EAOT model that affect the Level 1 and Level 2 results include:

- Attempted to obtain the maximum number of cutsets for all systems. Most system models now contain all possible cutsets. The highest cutset cutoff frequency in the current model is  $5 \times 10^{-12}$ . This increased the likelihood of system failure for the affected systems slightly.
- Increased detail in the modeling of planned maintenance of all modeled systems. Slight increase in unavailability for most systems.
- More detailed modeling of all normally operating systems to allow any initial configuration. No change in core damage frequency.
- Development of detailed system specific models for Class 1E 120V AC Vital Power and the Qualified Display Parameter System, Train D Class 1E 125V DC Power, Instrument Air, Solid State Protection System, and Component Cooling Water to the Centrifugal Charging Pumps. Slight increase in core damage frequency as more cutsets could be retained
- Changed the event tree modeling for support systems to represent all possible branches (i.e.  $2^n$  branches where n is the number of top events). This allows

more efficient use of logic rules for split fraction assignment. Minor corrections to logic rules were made. Depending upon the specific rule change, an increase or a decrease in core damage frequency resulted, the net effect on plant risk was a slight change.

- Refinement of the Class 1E AC Power model to reflect the bus stripping and breaker closing required after loss of offsite power. This removed these elements from the Emergency Diesel Generator (EDG) models. Slight increase in the likelihood of EDG failure as all system cutsets were obtained. Large increase in the likelihood of failure of the Class 1E AC Power system to reflect the breaker operations necessary to restore power to essential plant equipment.
- Development of split fractions for all systems that reflected all possible operating conditions and boundary conditions of the system. In other words, a three train standby system with one train required for success contains the following system level split fractions:
  - Three Trains Available
  - Trains A and B Available, Train C Failed by Input Conditions
  - Trains A and C Available, Train B Failed by Input Conditions
  - Trains B and C Available, Train A Failed by Input Conditions
  - Train A Available, Trains B and C Failed by Input Conditions
  - Train B Available, Trains A and C Failed by Input Conditions
  - Train C Available, Trains A and B Failed by Input Conditions
  - All Trains Failed by Input Conditions

In general these changes do not affect core damage frequency or system failure likelihood. These change allow all the basic events in a system to be explicitly included in importance measures.

- Modified the failure distribution for reactor trip breaker mechanical failure to reflect operating information from 1980 to 1993. Decreased the likelihood of ATWS by a factor of 10 with a corresponding change in core damage frequency.
- Ensured consistent modeling of common cause failures in all systems. This increased the likelihood of system failure slightly. No change in most systems.
- Modified the success criteria for the Essential Chilled Water system to include the requirement for cooling the Essential Core Cooling System pump rooms. Slight increase in core damage frequency for LOCA initiators.

- Modified the success criteria for Essential Chilled Water to reflect single train success for general transient events. Slight decrease in core damage frequency.
- Changed the success criteria for the Class 1E 125V DC trains to reflect new station blackout requirements. With a four hour coping time, only one load needs to shed as voltage decreases. No significant change to core damage frequency.
- Either charger in a DC train is capable of supplying all of the DC loads, previously Train A and C DC power required two chargers for success. Slight decrease in system failure frequency.
- Changed the initiating event models for Loss of DC Bus E1A11 or E1B11 to reflect event tree system model. Slight increase in core damage frequency.
- Modified all system specific initiating events to ensure consistent modeling. Changed filter and strainer exposure times to credit the alarms and operator actions specified Alarm Response Procedures. Incorporated the Abnormal Response Procedure for Loss of Ventilation, OPOP04-HE-0001, into the Loss of EAB HVAC and Loss of CR HVAC initiating events. Significant decrease in core damage contribution from these initiators.

The following changes affect the Level 2 models.

- Developed plant specific data on the frequency of opening the Supplemental Purge Valves. The previous data was generated in the mid-1980s based on conversions with operating personnel. The current data is based on plant experience. Reduced the likelihood of Large Early Release.
- Removed the RISKMAN linking event trees and added the necessary information to the Plant Damage State event trees. No significant effect on the Level 2 quantification results.
- Developed a system analysis package for the interfacing systems LOCA analysis. Increased the likelihood of Large Early Release slightly.
- Removed the "Large Pre-existing Leak" failure mode. This failure mode cannot exist if supplemental purge of the containment to reduce containment pressure to comply with Technical Specification requirements is required periodically, as is the case for the STP units. Slight decrease in the Large Early Release frequency.



In addition to the specific changes described above, slight errors in split fraction rule assignment and minor changes in systems models were incorporated. These changes had no noticeable impact on either core damage frequency or system failure frequency.

With respect to the quality processes performed for the risk model updates the following is a description of the processes used to ensure quality of the STP PRA.

Model revisions to the original PSA in 1989 up to the DG EAOT request were performed by the PRA contractor in conjunction with STP PSA analysts in accordance with the contractor's procedures and guidelines. These changes were reviewed by various groups within STP prior to acceptance and use. The DG EAOT request was issued as a stand alone document and reviewed internally by HL&P. Rather than formal QA procedures, these revisions were prepared and controlled using experienced analysts and peer review to ensure an adequate measure of model control.

The current STP PSA model, STP\_1996, was started in September 1995 and was intended from the beginning to be controlled in a manner similar to other processes controlled by quality assurance procedures. This model started from the model used in the analysis of the DG EAOT. The update process was performed to capture changes to the plant (i.e., procedure changes, equipment changes, drawing changes, etc.), correct errors identified during the update process, and to streamline the model to take advantage of the current computer code (RISKMAN®).

The update process was performed by HL&P personnel or by experienced contractor personnel assigned full time to the PRA group. The update was completed in March 1997 and is documented and controlled in a series of system, event tree, and special process notebooks maintained by the PRA group at HL&P. Each of these notebooks was assembled by a designated preparer, reviewed by a person in the PRA group that was not involved in the initial preparation, and accepted by the Risk and Reliability Group Administrator. An interim model was reviewed by the PRA consultant, PLG, who issued a letter report documenting the review. Issues identified by the PRA consultant were resolved and incorporated into the final PRA model. The model is currently undergoing detailed review by Operations and Engineering personnel at STP. The results of these reviews will be incorporated into the next revision to the PSA model.

The update process, although not initially covered by approved quality assurance procedures, was intended to satisfy relevant quality assurance requirements in place for similar processes. The update process correctly identified, modeled, verified, tracked, and implemented revisions to the current PSA.



References pertaining to the response for item #13:

1. South Texas Project Probabilistic Safety Assessment, PLG-0700, prepared for HL&P, April 1989.
2. Level 2 Probabilistic Safety Assessment and Individual Plant Examination, August 1992.
3. HL&P submittal to the U.S. Nuclear Regulatory Commission, "Risk Based Evaluation of Technical Specifications," ST-HS-HL-AE-4544, August 1993.
4. Evaluation of the Proposed Special Test Exception for Diesel Generator and Essential Cooling Water Maintenance, Prepared by HL&P April 1995.

Request for Additional Information #14

*During the May 5-8, 1997, site visit, you discussed an audit of your PRA contractors QA program. Please provide the results of the audit or assessment of the QA program of your PRA contractor.*

Response 14

Attachment 5 provides that latest Procurement Quality Audit Report 95-073 (VA) of PLG, Incorporated, performed at the PLG's Newport Beach facility in California, on September 11 through 14, 1995. It should be noted that STP owns, controls, and maintains all STP risk models. Contractor organizations are used for staff augmentation or to perform special projects and are not used to maintain or otherwise control the content of STP risk models.

Request for Additional Information #15

*In your response to RAI G-1 under cover letter dated October 30, 1996, you wrote that, "recently program procedures were developed to implement Appendix 8 features to establish configuration control of the PSA models." We note that we have received four procedures by letter dated May 22, 1997. The May 22, 1997, cover letter also stated that the "Configuration Control of the Probabilistic Safety Assessment Procedure" has been deleted. Please provide us with the procedures which will implement Appendix B features to establish configuration control-of the PRA models, or identify which of the four procedures is intended to provide that control.*

Response 15

The requirement for PSA configuration control is contained in the Probabilistic Safety Assessment Program procedure, OPGP04-ZA-0604, step 5.3 (See Attachment 6). The process used to describe the activities used to maintain configuration control of the PSA is contained in Risk Assessment Guideline 002, Review and Documentation of PSA Input Document Changes (See Attachment 6). The need to reference the PSA configuration control guidance document in the Probabilistic Safety Assessment Program procedure,

Attachment 1  
ST-HL-AE-5679  
Page 13 of 13

OPGP04-ZA-0604 has been determined to be necessary to ensure that changes to the PSA configuration control process are appropriately controlled. The Probabilistic Safety Assessment Program procedure, OPGP04-ZA-0604, step 5.3 will be revised to reference Risk Assessment Guideline 002 and, in step 5.5 to require that changes to that Risk Assessment Guideline be peer reviewed (See Attachment 6).

ST-HL-AE-5679  
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- include a clear definition of the population of components in question. These components are currently categorized as medium safety-significant which provides no distinction from other medium safety-significant populations. NRC is willing to consider the acceptability of a definition of this population which does not include numerical guidelines in the OQAP, but the basic attributes of the population (e.g., high reliability yet a high impact on risk if problems develop) must be clearly described.
- provide a description of how QA controls will be assigned to the critical attributes of this population of components. As discussed, NRC does not find that simple application of Basic program controls is sufficient. Nor does NRC find that explicit consideration by the working group and expert panel of the assigned controls is sufficient. NRC is willing to consider the acceptability of assigning Full program controls to those critical component attributes which cause the component to belong to this population.

*Another alternative is to simply assign these components to the high safety-significant category based on the sensitivity of plant risk on their performance and place them in the FULL program. Other alternatives may also be suggested.*

#### Response 11

The South Texas Project has changed the Graded Quality Assurance Program to include the safety related components with a RAW between 10 and 100 are to have FULL Quality Assurance applied to the critical attributes associated with that RAW. The OQAP chapter 2, sections 5.3.9 and 5.3.11 have been revised to reflect this change (OQAP change 32 (ST-HL-AE-5668))

The Comprehensive Risk Management Procedure, OPGP02-ZA-0003 Addendum 2 has been revised. The flowchart is provided in Attachment 3 which Probabilistic Risk Importance thresholds input for Graded Quality Assurance component classifications.

The Graded Quality Assurance Working Group Procedure is currently being developed. It will include the following aspects:

- ✦ Components with a risk achievement worth greater than 100 or a Fussell-Vesely importance greater than 0.01 are to be placed in the Full QA Program.
- ✦ Components with a risk achievement worth greater than 10 but less than 100 are to have full QA controls specifically placed on those critical attributes which cause the components to have a high risk achievement worth.

A graphical representation of the Probabilistic Risk Importance thresholds for input to the Graded Quality Assurance component classifications are provided in Attachment 3.

#### Request for Additional Information #12

12. *Although not discussed during the May 5-8, 1997, site visit, discussion among the NRC on the acceptability of your proposed categorization scheme has raise the question of why a high Fussell-Vesely (FV) value should not also lead to a high-safety-significant categorization regardless of the RAW. Please provide your position with respect to this issue.*

#### Response 12

The basis for risk importance threshold is provided in Attachment 4.

Request for Additional Information #13

13. Practices and activities to ensure quality of the South Texas PRA are an important element in justifying use of risk insights as part of the GQA program. It is the staff's understanding that current CDF and LERF values are approximately an order of magnitude lower than in the 1989 (CDF) and 1992 (LERF) baseline studies. Please provide details of processes to ensure that the PRA updates and modifications were correctly implemented. This should include:

a listing of the modifications made to the PPA, the reason for each change and a discussion of the impact on the plant's risk profile.

Response 13

**TO BE PROVIDED**

Request for Additional Information #14

During the May 5-8, 1997, site visit, you discussed an audit of your PRA contractor's QA program. Please provide the results of the audit or assessment of the QA program of your PRA contractor.

Response 14

Attachment 5 provides that latest Procurement Quality Audit Report 95-073 (VA) of PLG, Incorporated, performed at the PLG's Newport Beach facility in California, on September 11 through 14, 1995. **WE WILL SEND AN ADVANCE COPY OF THIS VIA FED EXP**

Request for Additional Information #15

In your response to RAI G-1 under cover letter dated October 30, 1996, you wrote that, "recently program procedures were developed to implement Appendix 8 features to establish configuration control of the PSA models." We note that we have received four procedures by letter dated May 22, 1997. The May 22, 1997, cover letter also stated that the "Configuration Control of the Probabilistic Safety Assessment Procedure" has been deleted. Please provide us with the procedures which will implement Appendix B features to establish configuration control of the PRA models, or identify which of the four procedures is intended to provide that control.

Response 15

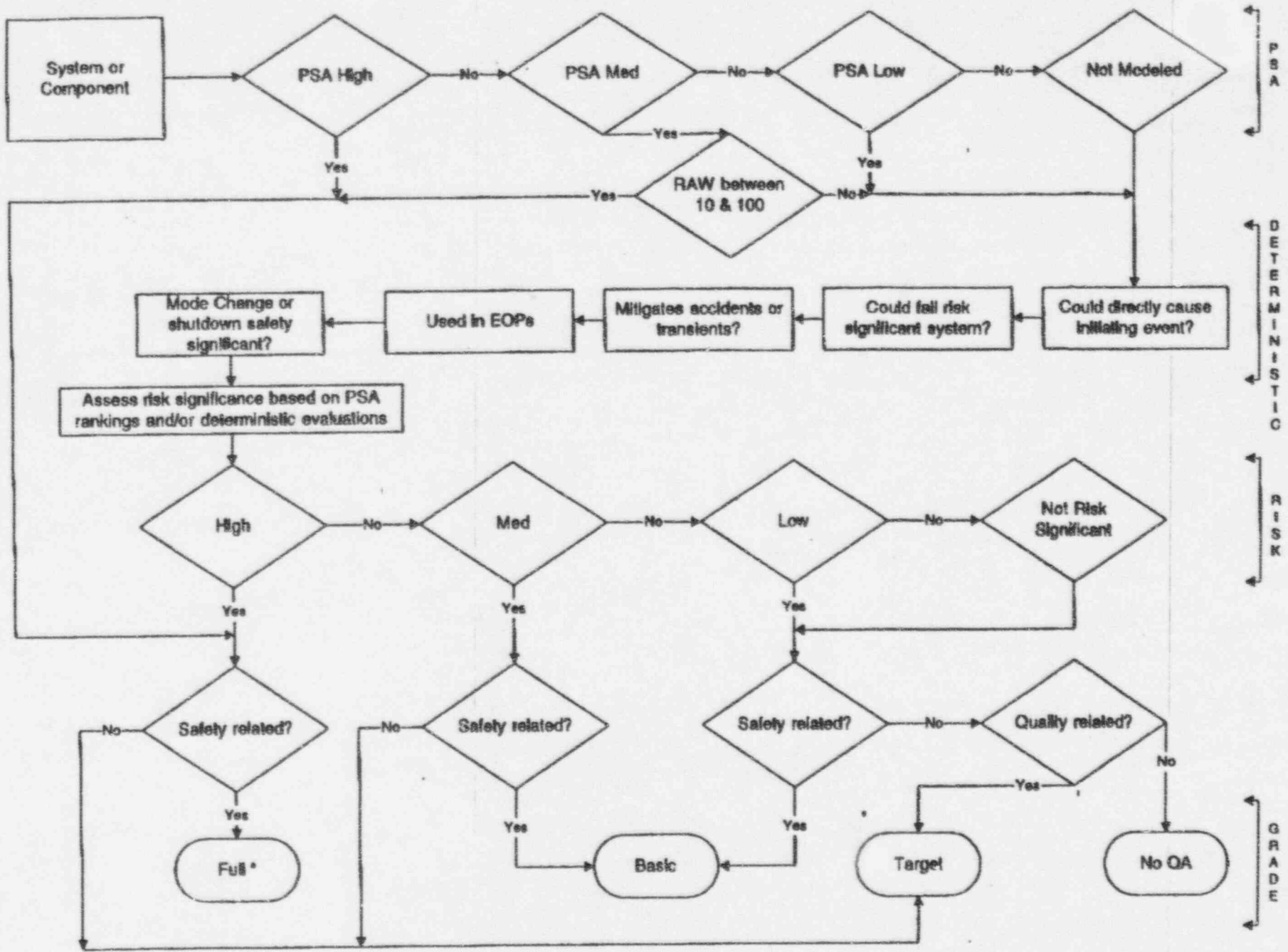
**TO BE PROVIDED**

ATTACHMENT 2

GRADED QUALITY ASSURANCE PROCESS FLOWCHART



### GQA PROCESS



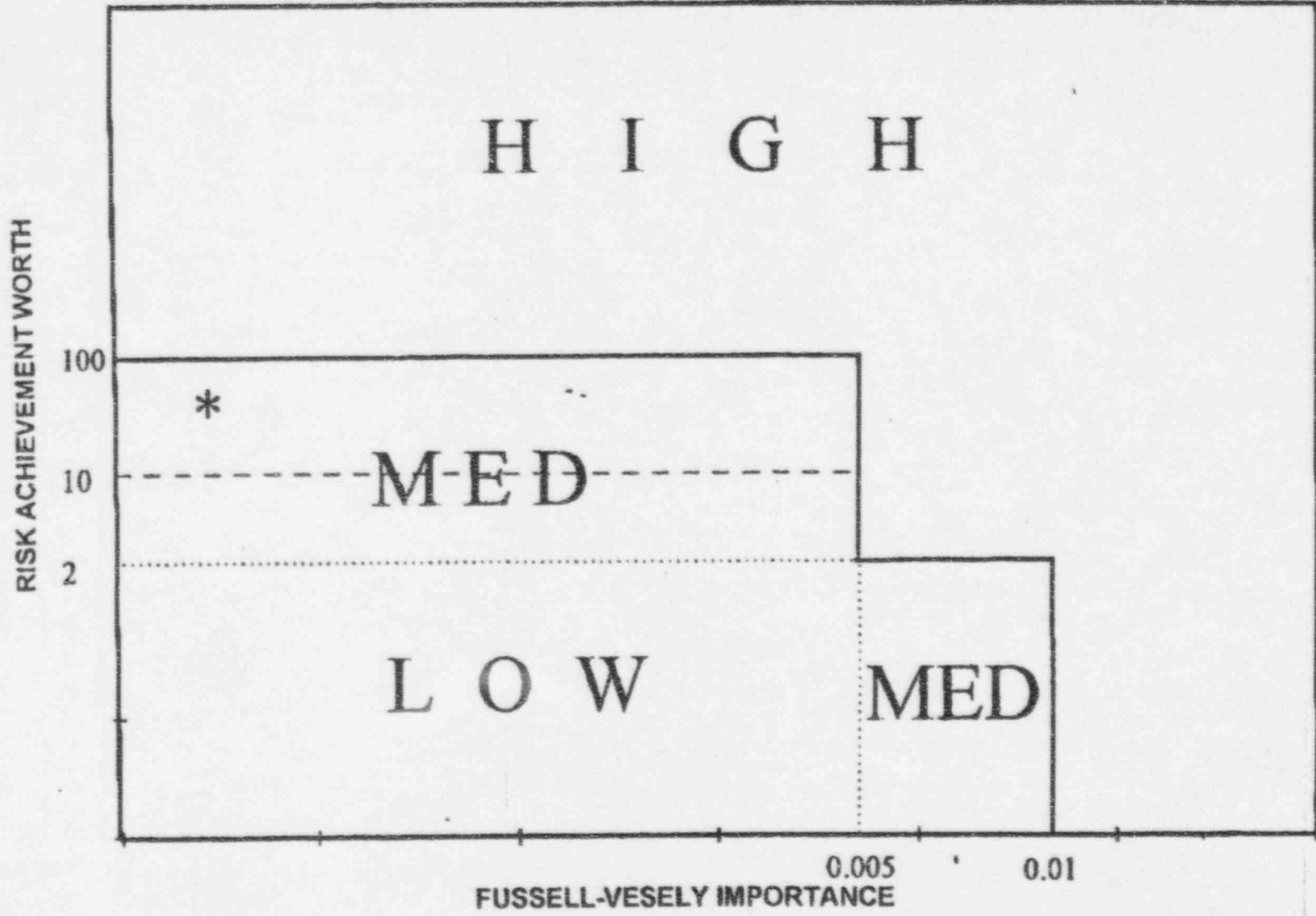
\* SR Components with a RAW between 10 and 100 are to have Full QA applied to the critical attributes associated with that RAW

ATTACHMENT 3

PROBABILISTIC RISK IMPORTANCE THRESHOLD FOR INPUT TO

GRADED QUALITY ASSURANCE COMPONENT CLASSIFICATIONS

# PROBABILISTIC RISK IMPORTANCE THRESHOLDS FOR INPUT TO GRADED QA COMPONENT CLASSIFICATIONS



\* Full Program is applied to critical attributes associated with the high Risk Achievement Worth

ATTACHMENT 4

BASIS FOR RISK IMPORTANCE THRESHOLD

**Basis for Risk Importance Thresholds:**

The following table provides a discussion of the Bases for establishing the risk thresholds applied in the Graded QA process.

RAW Threshold Value	Threshold Basis
>2.0	Components whose degradation and subsequent failure could lead to a doubling of the CDF should receive increased emphasis and are to be considered "more" important.
≥10.0	Components whose degradation and subsequent failure could lead to a CDF increase by an order of magnitude should receive increased emphasis and specific evaluations. Degradation and subsequent failure of these components could result in unacceptable system performance, and therefore, the evaluations are to be performed to ensure that degradation of critical attributes is identified and controlled.
≥100.0	Components whose degradation and subsequent failure could lead to an increase of two orders of magnitude should receive increased emphasis and are to be considered of high importance. Degradation of these components will result in unacceptable system performance, and possibly plant performance, therefore, full programmatic controls are maintained and monitored to ensure degradation does not occur.

**Basis for Fussell-Vesely Risk Importance Thresholds**

Fussell-Vesely Importance Threshold	Threshold Basis
0.005 (0.5%)	Components with greater than one half percent in the Fussell-Vesely risk importance measure should receive increased emphasis and are to be considered important since degradation in their failure rates could impact system level performance.
0.01 (1.0%)	Components with greater than one percent in the Fussell-Vesely risk importance measure should receive full programmatic controls and are to be considered highly important since degradation in their failure rates would impact system level performance and possibly plant level performance.



ATTACHMENT 5

HOUSTON LIGHTING & POWER AUDIT OF  
PLG. INCORPORATED IN NEWPORT BEACH, CA  
VENDOR AUDIT No. 95-073 (VA)

Sent by Fed. SR. 6/18/97

ATTACHMENT 5

HOUSTON LIGHTING & POWER AUDIT OF  
PLG, INCORPORATED IN NEWPORT BEACH, CA  
VENDOR AUDIT No. 95-073 (VA)

# The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

October 5, 1995

Mr. W. C. Gekler  
Quality Assurance Manager  
PLG, Incorporated  
4590 MacArthur Boulevard, Suite 400  
Newport Beach, CA 92660-2027

**Subject:** Houston Lighting & Power Audit of PLG,  
Incorporated in Newport Beach, CA  
Vendor Audit No. 95-073 (VA)

Dear Mr. Gekler:

Attached is Houston Lighting & Power (HL&P) Procurement Quality Audit Report 95-073 (VA) for the audit conducted at your facility in Newport Beach, CA September 11 through 14, 1995.

HL&P was the lead utility and was assisted by Pacific Gas and Electric Company (PG&E). The audit was performed under the auspices of the Nuclear Procurement Issues Committee (NUPIC). The purpose of the audit was to review and verify implementation of your Quality Assurance Program.

The attached report is for your information and use. The report describes the results as discussed during the audit, and the Post-Audit Conference in your Newport Beach facility.

As a result of this audit two (2) audit findings, with respect to external audits and training, were identified. The deficiencies are documented on two (2) Vendor Deficiency Reports (VDRs) which are attached to the report.

Please provide your response to the VDRs by November 6, 1995. Your response should include the date(s) that the corrective actions were or are to be completed. If the due date can not be met, provide a written request for an extension explaining the circumstances and the actions taken to date. This request must be received prior to the due date and must include a date by which you expect to provide the response. If, at the time of your response, required actions have been completed, documented evidence should be submitted to HL&P for verification of the stated action(s).

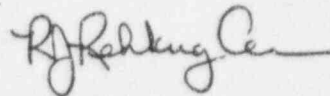
Project Manager on Behalf of the Participants in the South Texas Project

AD95-073.VA2

As stated in the NUPIC Audit Program Description, provided to you with the audit scope, NUPIC members will receive a copy of this report and the completed checklist. This audit report is not intended in any way to be an approval/disapproval of PLG, Incorporated. It is each utility's responsibility to evaluate this report and determine if the information provided is acceptable for their planned application or use.

Your cooperation during the audit was greatly appreciated. If you have any questions concerning the audit, please contact Mr. J. E. Adkins at (512) 972-8516.

Sincerely,



R. J. Rehkgler  
Director, Quality

*OKA*  
JEA/kmw  
Attachment

c: L. E. Martin  
R. D. Martin  
A. M. Richards  
D. I. Towler  
A. J. Granger  
M. E. Smith  
N. O. Laughlin N5010  
NUPIC Membership  
Audit File 95-073 (VA)  
Vendor History File

**HOUSTON LIGHTING & POWER  
STPEGS PROCUREMENT QUALITY  
AUDIT REPORT 95-073 (VA)**

**AUDIT NUMBER:** 95-073 (VA)

**AUDIT DATES:** September 11 through 14, 1995

**ORGANIZATION/ACTIVITY:**

PLG, Incorporated in Newport Beach, CA/Risk analysis and software development

**PURPOSE/SCOPE:**

To verify the adequacy and effective implementation of the PLG Quality Assurance Program for the supply of plant risk model development and analysis associated with this activity.

**SUMMARY:**

The Houston Lighting & Power (HL&P) audit of PLG was performed September 11 through 14, 1995 in Newport Beach, CA. The audit assessed the adequacy and effective implementation of the PLG Quality Assurance Program.

PLG's Quality Assurance Plan, PLG-0223 Revision 23, and applicable procedures provide adequate measures for meeting the requirements applicable to Plant Risk Model Development and Analysis. The audit team evaluated applicable portions of PLG's quality assurance program with emphasis on control of software development and changes. This evaluation included a review of documentation, personnel interviews, and a technical review of the verification and validation processes as they related to revisions and changes to the Riskman software program..

The implementation of the QA program was determined to be satisfactory with the exception of procurement (auditing of suppliers) and program compliance (indoctrination and training of personnel). The audit team determined that these deficient conditions had no impact on the quality of services provided. This determination was based on the work being performed by EQE (PLG's vendor) was still in process and audit of the activities is scheduled. Also, the personnel that had not completed or passed indoctrination and training were not associated with nuclear safety related work to-date.

**DEFICIENCIES:**

1. PLG did not perform the required external audit of EQE International.
2. Six (6) PLG personnel have not completed and/or passed indoctrination and training within the required time frame.

**CONCERNS:**

None



HOUSTON LIGHTING & POWER  
STPEGS PROCUREMENT QUALITY  
AUDIT REPORT 95-073 (VA)

RECOMMENDATIONS:

None

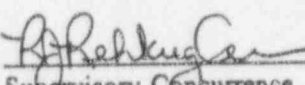
AUDIT TEAM: J. E. Adkins - Team Leader (HL&P)  
J. R. Harris - Team Member (PG&E)  
A. M. Richards - Technical Specialist (HL&P)

PERSONNEL CONTACTED: 1 = Pre-Audit Conference  
2 = During the Audit  
3 = Post-Audit Conference

J. B. Garrick, P. E.	1		
E. M. Ward	1	2	3
W. R. Fuller			3
W. C. Gekler	1	2	3
W. L. Albertson	1	2	
S. R. Melvin	1	2	3
B. Shimizu	1	2	3
S. McKinney		2	
W. T. Loh		2	
D. Bidwell	1	2	

ATTACHMENT: 1 - Audit Report 95-073 (VA) Details

  
Lead Auditor 10-5-95  
Date

  
Supervisory Concurrence 10/05/95  
Date

**HOUSTON LIGHTING & POWER  
STPEGS PROCUREMENT QUALITY  
AUDIT REPORT 95-073 (VA)**

The elements associated with material control/handling, storage and shipping, fabrication/assembly/special processes, test/inspection, and calibration are not applicable to activities performed by PLG, Incorporated.

#### **ORDER ENTRY**

Order entry activities are performed in accordance with the QA Plan. The Contract Administrator initiates a Job Master Detail which is assigned an internal PLG Job/Task Number for tracking purposes, and a Project QA Startup Checklist is prepared for the base contract and any subsequent change orders. Customer quality requirements are transcribed into the Project QA Startup Checklist, which, is reviewed and approved by appropriate personnel. Any concerns related to the contract/order are promptly communicated back to the customer and resolved. No unique order entry requirements were identified. Order entry activities were determined to be adequate and effectively implemented.

#### **DESIGN REQUIREMENTS**

PLG, Incorporated does not perform design activities. Parameters relative to design are provided to PLG by the customer and incorporated into the associated work package documents. It should be noted that any efforts performed by PLG associated with design are related to risk analysis, software development, maintenance and application, which are discussed further in the Software Quality Assurance section of this report.

#### **SOFTWARE QUALITY ASSURANCE**

PLG has controls in place for the development, maintenance, and application of software programs. These controls assure that customer requirements are adequately incorporated into the work packages. Controls are established for production code development, verification, validation, certification, and revision. Requirements for various reviewers ensure that they are independent of the software developer. Revisions to production code are processed to the same standards as the original development, ensuring that changes to software are adequately and effectively documented, evaluated, approved, verified and validated. Production code software is logically labeled, and each version is stored in a master software library, which provides the ability to reconstruct the configuration of the software for any date during which the software was qualified for use. PLG's program provides adequate assurance that software design and controls are fully documented and supported by a sound technical background. The controls for software and risk analysis are adequate and are being effectively implemented.

#### **PROCUREMENT**

The controls of procurement activities for safety related engineering services and computer software are adequately documented in the PLG QA Plan and associated procedures. Interviews with personnel indicated that no nuclear safety related engineering services or computer software for nuclear safety related application had been procured since the last NUPIC audit. Implementation of these controls was verified by review of purchase orders and changes associated with work tasks for

**ATTACHMENT 1**  
**AUDIT REPORT 95-073 (VA) DETAILS**

**PROCUREMENT (Con't)**

two foreign utilities which were processed in accordance with the QA Plan. These purchase orders were for engineering services and included appropriate quality/technical requirements and method of acceptance as required by the QA program. However, the PLG QA program requires an audit of subcontractors' work to normally be performed within 30 days of work start. This review determined that work on one of these orders had been in process more than 60 days without the required audit being performed.

Vendor Deficiency Report 95-019 was issued.

**DOCUMENT CONTROL/ADEQUACY**

Document control measures are well implemented and provide personnel at their work locations with the latest required documents for their activities. Manuals, procedures, and revisions are approved by the appropriate personnel and contain adequate criteria. The QA Plan and implementing procedures are distributed to personnel identified on the controlled distribution list. The activities associated with document control were determined to be adequate and effectively implemented.

**PROGRAM COMPLIANCE**

The PLG Quality Assurance Program is described in the Quality Assurance Plan, PLG-0223 Revision 23, dated 06-06-95, and is supplemented by implementing procedures. The QA Plan and the implementing procedures establish adequate controls for activities affecting quality.

The QA Manager reports directly to a Corporate Officer to assure independence from operational activities. He has sufficient authority to identify quality problems, recommend solutions, and verify corrective implementation. Communications with PLG management are maintained through audit reports and semi-annual management assessment meetings. These assessments are performed in meetings attended by PLG Corporate Officers and managers. Topics discussed cover audit reports, CARs, training, project status, and other items germane to the overall effectiveness of the QA program. The QA program is regularly assessed through audits of PLG projects and QA activities associated with the production of software and engineering analysis.

Deficiencies identified during internal audits are documented and tracked on Corrective Action Reports (CARs). Corrective actions for CARs are verified by QA and reviewed by the responsible Project Manager, the QA Manager, and a Corporate Officer prior to closure. CARs reviewed during the audit contained sufficient detail to identify the deficiency, the cause, and the corrective actions taken. The status of CARs is maintained in the QA Audit Record which is reviewed by the QA Manager on a quarterly basis. CARs are also reviewed by PLG during the annual audit of the CAR program.

PLG has provided guidance in the form of a procedure for determining when a 10CFR Part 21 condition exists and the reporting responsibilities for notification to the client and the Nuclear Regulatory Commission (NRC). This procedure is appropriately posted in the PLG lunch room.

Internal audits are performed on a planned and periodic basis. Presently, PLG has one certified Lead Auditor and one Auditor-In-Training. These auditors are independent of the areas being audited. PLG routinely performs audits of open projects and generic QA activities. These audits verify that applicable implementing procedures are being followed.

**ATTACHMENT 1  
AUDIT REPORT 95-073 (VA) DETAILS**

**PROGRAM COMPLIANCE (Con't)**

The QA program provides for qualifying suppliers through an external audit process. However, no external audits were performed since 1993. This condition resulted in one deficiency where PLG did not perform a required external audit.

Vendor Deficiency Report 95-019 was issued.

Training of personnel is established however, not in all cases adequately implemented. Two employees had not completed training within the required 30 days, and four employees had not achieved the minimum passing score.

Vendor Deficiency Report 95-020 was issued.

Records are credible, legible, and did not show signs of alteration. Records are appropriately filed, identified, and retrievable. Records are stored under controlled conditions that provide adequate environmental protection. Upon completion of a project, inactive files may be sent to a remote storage facility and if necessary, can be retrieved within one business day. The most significant quality record (a final report or software revision) is provided to the customer.

With exception of the noted deficiencies relating to external audits and training, program compliance activities are adequate and are being effectively implemented.

**TECHNICAL SPECIALIST SUMMARY**

Review of various documents and activities during the audit assured that PLG is implementing the necessary controls to provide work products that conform to the applicable requirements. PLG possesses a competent and technically experienced staff for the development and implementation of software programs related to plant risk assessment. Overall, the program for controlling software and plant risk analysis is adequate and is being effectively implemented.

**PREVIOUS AUDIT FINDINGS**

A review of the corrective action implementation for four (4) findings identified in the previous NUPIC audit conducted by Pacific Gas and Electric, was performed during this audit.

AFR93-086:

Internal Audit 9052-QAR-69 reviewed a representative sample of PLG CARs. Semi-annual management assessments on 12/23/94 and 08/16/95 reviewed the status of open CARs and actions were assigned. Corrective actions for CARs are verified by QA and reviewed by the responsible Project Manager, QA Manager, and a Corporate Officer prior to closure. The audit team recommends that PG&E consider closing this finding.

AFR93-087:

The audit team verified that PLG's corrective action for this finding continues to be satisfactorily implemented. No further action is required.

**ATTACHMENT 1  
AUDIT REPORT 95-073 (VA) DETAILS**

**PREVIOUS AUDIT FINDINGS (Con't)**

AFR93-088:

The audit team verified that PLG is initiating a Project QA Startup Checklist in compliance with their response to this finding. The audit team recommends that PG&E consider closing this finding.

AFR93-089:

The audit team verified that PLG is identifying on the Project QA Startup Checklist the QA requirements to be imposed. Additionally, Procedure 106, Contract QA Requirements Form identifies the QA requirements for contractor services and method of acceptance for the orders placed with EQE International. However, PLG has not audited EQE as required by the PLG QA Plan. This deficient condition was documented on HL&P Vendor Deficiency Report (VDR) 95-019. Processes are in place which provide for dedication of commercial services/software to be used in safety related application. However, interviews with PLG personnel determined that no instances have occurred which required the use of this process. The audit team recommends PG&E consider closing this finding.

**STATUS OF NRC INSPECTIONS**

NUREG 0040 was reviewed and included as part of this audit. No current concerns involving PLG were identified for review.

Based on input to the audit provided by Baltimore Gas & Electric, the audit team reviewed documentation associated with NRC Information Notice 92-21 dated 03/24/92. Based on correspondence from Houston Lighting & Power dated 06/04/92 and correspondence from Commonwealth Edison dated 07/07/92, PLG no longer considers this IN an open issue.



HOUSTON LIGHTING & POWER COMPANY  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
VENDOR DEFICIENCY REPORT  
VDR NO. 95-020

Page 1 of 2

1. Revision No.: 0 Issue Date: 10/05/95 Due Date: 11/06/95

2. Severity Level: 1.        2. X 3.        Problem Report Required: No

3. Hold on Shipment Required: No Hold on Shipment Release: N/A  
Signature/Date

4. Vendor: Vendor Contact: Discovered During:  
PLG, Incorporated W. C. Gekler Audit 95-073 (VA)

5. Requirement(s):

Procedure 103, Revision 4, dated 09/15/92, Section 2 states in part: "training shall include indoctrination in the PLG QA Plan and procedures for personnel within 1 month of date of hire." Section 3 states in part: "objective evidence of each person's training shall be provided in the form of a completed, signed, and graded quiz. A grade of 70% shall be considered passing."

6. Deficiency(s):

Contrary to the above requirements, two PLG employees at the Bethesda, MD facility had not completed training within the required time frame (e.g. S. T. Celi-hired 07/29/95; T. J. Celi-hired 07/25/95). Four other Bethesda employees had received training but had not achieved a passing score on the indoctrination training quiz within the 30 day period (e.g. J. Lautz, M. Pettipaw, M. J. Pine, and F. Warner).

7. Recommended Action(s):

Remedial - Assure that training is completed in accordance with the requirements of Procedure 103.

Corrective - Provide appropriate corrective action to address the root cause and preclude recurrence.

8. Initiated By: J.E. Adkins  
Date: 10-5-95

Approved By: R. R. King  
Date: 10/5/95

HOUSTON LIGHTING & POWER COMPANY  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
VENDOR DEFICIENCY REPORT  
VDR NO. 95-020

Page 2 of 2

9. Response: Sat.  Unsatisfactory  
Unsatisfactory  Evaluator: J.E. Adkins Approved: H. H. Russell  
Date: 1-10-96 Date: 1-10-96

10. Verification: Sat.  Unsatisfactory  
Unsatisfactory  Evaluator: J.E. Adkins Approved: H. H. Russell  
Date: 1-10-96 Date: 1-10-96

11. Verification/Closure Details/Remarks:

RESPONSE AND CORRECTIVE ACTION SATISFACTORY. SEE PLG  
CORRESPONDENCE DATED 12/12/95. J.E. Adkins  
1-10-96

12. Closed By: H. H. Russell Date: 1-10-96

# The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

February 22 , 1996

Mr. W. C. Gekler  
Quality Assurance Manager  
PLG, Incorporated  
4590 MacArthur Boulevard, Suite 400  
Newport Beach, CA 92660-2027

**Subject:** Houston Lighting & Power Audit of PLG,  
Incorporated in Newport Beach, CA  
Vendor Audit No. 95-073 (VA)

**Re:** PLG correspondence dated February 7, 1996

Dear Mr. Gekler:

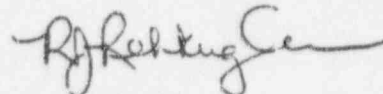
Your correspondence provided revised procedures as a result of corrective action for Vendor Deficiency Report (VDR) 95-019. The revision to Procedures 101 and 106 were evaluated for use by Houston Lighting & Power (HL&P) and were determined to appropriately address the cited conditions.

The deficiencies having been satisfactorily addressed, no further action is required. VDR 95-019 and the audit are considered closed.

A copy of this correspondence and associated documentation will be distributed to NUPIC members for their evaluation and use. It is the responsibility of each member to determine appropriate action in accordance with their Quality Assurance Program.

If you have any questions concerning this correspondence, please contact Mr. J. E. Adkins at (512) 972-8516.

Sincerely,



R. J. Rehkugler  
Director, Quality

*JEA*  
JEA/kmw  
Attachments

c: L. E. Martin  
R. D. Martin  
A. M. Richards  
N. O. Laughlin  
D. I. Towler

A. J. Granger  
M. E. Smith  
NUPIC Membership  
Audit File 95-073 (VA)  
Vendor History File

Project Manager on Behalf of the Participants in the South Texas Project

HOUSTON LIGHTING & POWER COMPANY  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
VENDOR DEFICIENCY REPORT  
VDR NO. 95-019

Page 1 of 2

1. Revision No.: 0 Issue Date: 10/05/95 Due Date: 11/06/95

2. Severity Level: 1.        2. X 3.        Problem Report Required: No

3. Hold on Shipment Required: No Hold on Shipment Release: N/A  
Signature/Date

4. Vendor: PLG, Incorporated Vendor Contact: W. C. Gekler Discovered During: Audit 95-073 (VA)

5. Requirement(s):

Procedure 106, Revision 13, Section 6 states in part: "Normally, an onsite audit shall be started within 30 days after the start of work."

6. Deficiency(s):

Contrary to this requirement, work on Purchase Order NB-1667, issued to EQE International, has been in process approximately 2 - 3 months without an audit having been performed.

7. Recommended Action(s):

Remedial - Perform audit as required by Procedure 106.

Corrective - Provide appropriate corrective action to address the root cause and preclude recurrence.

8. Initiated By: *J.E. Adkins* Approved By: *L. H. Kugler*  
Date: 10-5-95 Date: 10/5/95

9. Response: Sat. *v* Evaluator: *J.E. Adkins* Approved: *L. H. Kugler*  
Unsat.        Date: 1-10-96 Date: 1-10-96

HOUSTON LIGHTING & POWER COMPANY  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
VENDOR DEFICIENCY REPORT  
VDR NO. 95-019

Page 2 of 2

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10. Verification: Sat.       Evaluator: J.E. Adams      Approved: [Signature]  
                  Unsat.       Date: 2-21-96      Date: 2-21-96

---

11. Verification/Closure Details/Remarks:

RESPONSE ACCEPTABLE PENDING REVISION AND SUBMITTAL OF PROCEDURES. SEE PLG CORRESPONDENCE DATED 12/12/95 AND 1/3/96.

J.E. Adams  
1/10/96

VERIFICATION SATISFACTORY. SEE PLG CORRESPONDENCE DATED 2/7/96 AND ASSOCIATED PROCEDURE REVISIONS.

J.E. Adams  
2/21/96

---

12. Closed By: [Signature]      Date: 2-21-96

---





ENGINEERS  
APPLIED SCIENTISTS  
MANAGEMENT CONSULTANTS

(A Member of  
The Failure Group, Inc.)

PLG, Inc.  
4590 MacArthur Boulevard, Suite 400  
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Tel. 714-833-2020 • Fax 714-833-2085

PLG, Inc., Bethesda, MD, Office  
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PLG, Inc., Tokyo, Japan, Office  
Tel. +81-3-3432-8833 • Fax +81-3-3437-1005

February 7, 1996

Mr. R. J. Rehkugler  
Director, Quality  
Houston Lighting & Power Company  
South Texas Project Electric Generating Station  
P. O. Box 289  
Wadsworth, TX 77483

Dear Mr. Rehkugler:

VENDOR AUDIT NO. 95-073 (VA)

This is in response to your letter dated January 10, 1996, relating to the open VDR 95-019. As requested in your letter, enclosed are revisions to the following procedures:

— **Procedure 101, Revision 13**

Requirements for the preparation of a Project QA Startup Checklist have been removed from this procedure and transferred to the following procedure.

— **Procedure 106, Revision 14**

Requirements for the preparation of a Project QA Startup Checklist (PQASC) have been added to this procedure and include the added responsibilities of Contract Administrator, who will prepare the PQASC, and of the Project Manager, who will implement the requirements in the PQASC. A sample of the updated PQASC has been added.

Mr. R. J. Rehkugler  
Houston Lighting & Power Company

February 7, 1996  
Page 2

A copy of these procedures along with other revised procedures will be submitted shortly to Mr. Bobby J. Tedder for formal review and acceptance, as required by your contract requirements.

If you have any further questions, please let us know.

Very truly yours,

*W. C. Gekler*  
Willard C. Gekler  
Quality Assurance Manager

Enclosures

PROCEDURE 101 REVISION RECORD			
Revision Number	Revision Date	Description (Including Affected Page Numbers)	Approved (Initials)
3	6/14/83	Procedure reformatted and consolidated.	EBC
4	2/7/85	Revised to clarify forms and procedures for handling forms.	WCG
5	3/6/87	Revised to agree with current logging practice including computer-based system. Added Figures 101-1 and 101-2 and deleted Forms 101-1 and 101-2. Affected pages: ii, iii, 101-1, 101-2, 101-3, 101-4, and 101-5.	WCG
6	2/10/88	Clarified description of controlled documents in Sections 2.1 and 2.2. Affected pages: ii, 101-1, 101-2, and 101-3.	WCG
7	1/12/89	Revised to incorporate provision for duplicate record storage in Sections 3.2 and 4 and clarification of project document deliverables in Sections 2 and 2.2. Affected pages: ii, 101-1, 101-2, and 101-3.	WCG
8	9/15/92	Incorporated document control and file close out of deliverables. Updated Figures 101-1 and 101-2. Affected pages: ii and 101-2 through 101-5.	WCG
9	5/26/93	Incorporated paragraphs on corporate documents, TRR/DRRs, and new logs. Affected pages: ii, iii, 101-1, 101-2, 101-3, 101-5, and 101-6.	WCG
10	3/15/94	Incorporated use of Project Startup Checklist (Form PLG-F54). Added Section 3.2. Updated Figures 101-1 and 101-2. Affected pages: ii, iii, and 101-1 through 101-6.	WCG
10a	12/1/94	Incorporated use of Project QA Startup Checklist in lieu of Project Startup Checklist (PLG-F54). Affected pages: ii, 101-1 through 101-3 and 101-7 through 101-9.	WCG
11	2/28/95	Replaced Project QA Startup Checklist with an executed one page display. Affected pages: ii and 101-7.	WCG
12	5/31/95	Deleted reference to DRRs for software and related documents. Affected pages: ii, iii, 101-1, 101-3, and 101-4.	

PROCEDURE 101 REVISION RECORD			
Revision Number	Revision Date	Description (Including Affected Page Numbers)	Approved (Initials)
▶ 13	▶ 2/7/96	▶ Responsibility of QA Manager to prepare Project QA Startup Checklists as described in this procedure has been transferred to Contract Administrator as described in Procedure 106. Sample Project Startup Checklist transferred to Procedure 106. Affected pages: iii, iv, 101-1, 101-5, and 101-6.	▶ WCG

**PROCEDURE 101**

**CONTENTS**

▶ **1 RESPONSIBILITIES** ..... **101-1**

**2 HANDLING CONTROLLED DOCUMENTS** ..... **101-1**

    2.1 Project Control Documents ..... 101-2

    2.2 Deliverables ..... 101-2

    2.3 Corporate Documents ..... 101-2

**3 FILING AND DISTRIBUTION** ..... **101-2**

    3.1 Project Documents ..... 101-2

    3.2 QA Records ..... 101-3

▶ **3.3 Miscellaneous Documents** ..... **101-4**

**4 FILE CLOSE-OUT** ..... **101-4**



## PROCEDURE 101

### DOCUMENT CONTROL SYSTEM

This procedure defines the requirements for distribution, filing, and disposition of documents necessary to control and document quality of projects performed in accordance with the PLG Corporate Quality Assurance (QA) Plan and Procedures.

#### ▶ 1. RESPONSIBILITIES

The Project Manager shall establish a document control system to ensure that objective evidence of compliance with the Quality Assurance Plan and QA Procedures 101, 104, 105, and 107 is maintained in an auditable form for the duration of the project.

- ▶ The Quality Assurance (QA) Manager shall assure that the document control system
  - ▶ complies with the QA Plan and Procedures by first conducting a project QA startup audit.
  - ▶ For the startup audit, the QA Manager shall randomly select a project or projects from
  - ▶ those projects for which Project QA Startup Checklists have been issued within the last
  - ▶ 2-month period.
- 
- ▶ The Contract Administrator shall complete the Project QA Startup checklist all in
  - ▶ accordance with the requirements of Procedure 106.

The Document Clerk shall operate the document control system and maintain logs of QA records and documents received and issued by the project.

#### 2. HANDLING CONTROLLED DOCUMENTS

Controlled documents are project control documents and deliverables prepared exclusively for a project and corporate documents that are used to control and provide objective evidence of quality. Project control documents include the Project Plan and Procedures, the Project QA Plan and Procedures, if required, and drawings and documents that define project technical criteria including any applicable codes and standards. Project deliverables may include reports, presentations, computer software including analyst codes and user manuals, and other documents and materials identified in a deliverables list included in the contract.

- ▶ Corporate documents include the Corporate QA Plan and Procedures, Project QA Startup
- ▶ Checklists, Supplier Contract QA Requirements forms, QA training records, and QA auditor qualification records.

## **2.1 PROJECT CONTROL DOCUMENTS**

For each project, the Project and Quality Assurance Managers shall establish distribution lists for dissemination of Project Control Documents and shall provide the Document Clerk with the basis for the project document filing system. The Document Clerk shall issue numbered copies of the Project Plan and Procedures, if applicable, to the individuals on the list of controlled document holders designated by the Project Manager.

## **2.2 DELIVERABLES**

The PLG Project Manager shall establish a list of deliverables and a distribution list of holders of those deliverables, and shall identify those deliverables requiring review and approval in accordance with Procedures 104 and 107. The Document Clerk shall distribute deliverables and their revisions to the individuals on the list.

## **2.3 CORPORATE DOCUMENTS**

The Corporate Manager responsible for each corporate document used to control and assure quality shall establish distribution lists for dissemination of these documents and shall provide the Document Clerk with the basis for the filing system. The Document Clerk shall issue numbered copies of the corporate documents where applicable.

## **3. FILING AND DISTRIBUTION**

### **3.1 PROJECT DOCUMENTS**

For each project, the Document Clerk shall establish a filing system. Projects include client projects as well as in-house projects; e.g., Job No. 9052. Except for the final publications of a deliverable, each document received by the Document Clerk or issued by the Project Manager shall be assigned a PLG document log number, as follows:

- PLG Job/Task Number XXXX.XX
- Type of Document

- Chronological Sequence Number

The types of documents include:

PQASC	Project QA Startup Checklists
DOC	Incoming Documents, Including Correspondence and Transmittal Letters
PLG	Outgoing Documents, Including Correspondence, Transmittal Letters, and Faxes; however, fax working papers need not be logged in.
DWG	Drawings, Sketches
TRR/DRR	Technical Review Reports/Document Review Records
QAR/CAR	QA Audit Reports/Corrective Action Reports
Deliverables	Final Publications

Upon receipt, the Document Clerk shall log documents according to the type of document. This log is maintained on a computer-based system, examples of which are shown in Figures 101-1 and 101-2. The final publications of the deliverables are assigned chronologically sequenced numbers (e.g., PLG-0223) by the Document Clerk.

For TRR/DRR and QAR/CAR, when the log numbers are assigned, a preliminary copy of these documents is provided to the Document Clerk for filing purposes until a final copy is received by the Document Clerk. At this time, the Document Clerk shall replace the preliminary copy with the final copy and will log in all remaining pertinent data.

### 3.2 QA RECORDS

Completed QA records used as objective evidence of compliance with project QA requirements shall be forwarded to the Document Clerk by the individuals responsible for completing the records. These records include, but are not limited to, TRRs, DRRs, QARs, CARs, and deliverables. The Document Clerk shall place completed originals in the project files.

Complete QA records shall be stored in the project files while the project is active. If required by the client's contract, duplicate copies of completed QA records shall be stored in a separate, approved storage facility while the project is active. The frequency for updating duplicate copy storage will be determined jointly by the client and PLG during contract negotiation. Duplicate QA records are not required if an approved fireproof storage file is used for storing the original, completed QA records. Code certification files

are QA records and shall be stored in an approved fireproof file, or duplicate copies shall be stored in an approved separate storage facility. Separate code certification files are not required for each project.

### **3.3 MISCELLANEOUS DOCUMENTS**

The Document Clerk shall distribute miscellaneous documents according to standard distribution lists, or as directed by the Project Manager. Miscellaneous documents include trip reports, monthly status reports, meeting minutes, and internal correspondence.

### **4. FILE CLOSE-OUT**

The Project Manager shall notify the Document Clerk when the project is complete and the deliverables have been accepted by the client. The Document Clerk shall place the document logs and project documents in an inactive file. The inactive file will be transferred to an approved storage location. Storage may be terminated 1 year after completion of the project unless the contract requires longer storage at a designated location. Alternatively, the client may request storage of the inactive file at its own facilities.

INCOMING DOCUMENTS REPORT

Date Printed: 1/ 8/96

Client: TENNESSEE VALLEY AUTHORITY  
 Title: BFN SITE SUPPORT

Project/Job No.: 1621  
 Distribution: JKL/DHJ/WTL/AAD

PLG Document No.	Description	Date	Date Received	Sent By	Sent To	Copies To	Remarks	Checked Out By
		Last Modified						
TVA-1621-DOC-01	ORIGINAL AND THREE COPIES OF THE THIRD SUPPLEMENT TO PERSONAL SERVICES CONTRACT TV-91121V	Sep/ 5/95	Sep/ 5/95	MJRAY	EMWARD	EMW/FOR ACTION/FILE		
TVA-1621-DOC-02	ON-LINE MAINTENANCE MATRIX	9/ 5/95 Oct/ 9/95	Oct/ 9/95	HAND CARRIED	DHJOHNSO	DRJ/WTL/JKL/JCL		
TVA-1621-DOC-03	BROWNS FERRY UNIT 2 & 3 DIFFERENCES TRAINING	Sep/ 1/95 10/ 9/95	Oct/ 9/95	HAND CARRIED	DHJOHNSO	DRJ/WTL/JKL/JCL		
TVA-1621-DOC-04	BFN TRANSMITTAL OF ON-LINE MAINTENANCE MATRIX	Oct/ 2/95 10/ 9/95	Oct/ 9/95	HAND CARRIED	DHJOHNSO	DRJ/WTL/JKL/JCL		
TVA-1621-DOC-05	ISSUES TO BE RESOLVED/CONSIDERED FOR THE UNIT 2 AND UNIT 3 MODELS WITH DHJOHNSON'S NOTES	Oct/ 1/95 10/ 9/95	Oct/ 9/95	HAND CARRIED	DHJOHNSO	DRJ/WTL/JKL/JCL		
TVA-1621-DOC-06	BFN MODEL CHANGES	Oct/ 9/95 10/ 9/95	Oct/ 9/95	HAND CARRIED	DHJOHNSO	DRJ/WTL/JKL/JCL		
TVA-1621-DOC-07	CONTRACT NO. TV-91121V TVA TASK NO. 0013-396559 REV. 00	Sep/29/95 10/10/95	Oct/10/95	RLKEENER	EMWARD	EMW/FOR ACTION/FILE		
TVA-1621-DOC-08	ON-LINE MAINTENANCE MATRIX DRAFT	Oct/11/95 10/11/95	Oct/11/95	RLJONES	DHJOHNSO	DRJ/FILE		
TVA-1621-DOC-09	ISSUES TO BE RESOLVED FOR THE UNIT 2 AND 3 MODELS	Oct/13/95 10/13/95	Oct/13/95	HJONES	DHJOHNSO	DAB/VSH/JKL/JCL		
TVA-1621-DOC-10	CONTRACT NO. TV-91121V TVA TASK NO. 0013-396559 REVISION 00	Sep/25/95 10/16/95	Oct/16/95	RLKEENER/T	EMWARD	EMW/CONTRACT FILE/FILE	FULLY EXECUTED	
TVA-1621-DOC-11	PROBLEM EVALUATION REPORT (PER) LOSS OF HVAC	Oct/20/95 10/20/95	Oct/20/95	RLJONES	DHJOHNSO	DRJ/WTL/JKL/JCL		
TVA-1621-DOC-12	SECTION 1, MODEL DESCRIPTION, REV 0, MARCH 1994	Nov/ 2/95 11/ 2/95	Nov/ 2/95	RLJONES/ V	JKLIMING		MELINDA	

Figure 101-1. Incoming Document Log



OUTGOING DOCUMENT LOG

Date Printed: 1/ 8/96

Client: TENNESSEE VALLEY AUTHORITY  
 Title: BFN MODEL EXTENSIONS

Project/Job No.: 1624  
 Distribution: JKL\*/DHJ/WTL/AA

PLG Document No.	Description	Date	Sent By	Sent To	Copies To	Remarks
TVA-1624-PLG-01	EXTENSION TO THE BFN PRA DELIVERABLE 1A LETTER REPORT FOR SUBTASKS 1 AND 2	9/15/95	JWREAD	HLJONES	JWR/DHJ/WTL/DJ	
TVA-1624-PLG-02	EXTENSION TO THE BFN PRA DELIVERABLE 1B LETTER REPORT FOR SUBTASKS 3 AND 4	9/27/95	JWREAD	HLJONES	JWR/WTL/FILE	
TVA-1624-PLG-03	UNIT 2 PRA WITH UNIT 3 RETURNED TO SERVICES: OPEN QUESTIONS	11/17/95	DHJOHNSON	HLJONES	DHJ/SSR/AA/DJKL	
TVA-1624-PLG-04	RESULTS OF BATTERY BOARD IMPORTANCE CALCULATIONS AND REPRESENTATION OF ATWS IN THE PRA MODEL	11/30/95	DHJOHNSON	HLJONES	DHJ/SSR/AA/DJKL	
TVA-1624-PLG-05	RESULTS OF BATTERY BOARD IMPORTANCE CALCULATIONS	12/7/95	DHJOHNSON	HLJONES	DHJ/SSR/WTL/AA	
TVA-1624-PLG-06	RESULTS OF BATTERY BOARD IMPORTANCE CALCULATIONS	12/11/95	DHJOHNSON	HLJONES	DHJ/WTL/AA/DJKL	
TVA-1624-PLG-07	DRAFT RESULTS FOR UNIT 2 PRA (WITH UNIT 3 RETURNED TO SERVICE)	12/21/95	DHJOHNSON	HLJONES	DHJ/WTL/FILE	
TVA-1624-PLG-08	UPDATED MATRIX	1/3/96	DHJOHNSON	HLJONES		(*#JENNIFER)
TVA-1624-PLG-09	PRELIMINARY IDENTIFICATION OF TIP EQUIPMENT AND OPERATOR ACTION	1/5/96	DHJOHNSON	HLJONES		(*#BRENDA)

Figure 101-2. Outgoing Document Log



4590 MacArthur Boulevard, Suite 400  
Newport Beach, CA 92660-2027  
Fax 714-833-2085 • Verification 714-833-2020

ENGINEERS • APPLIED SCIENTISTS •  
MANAGEMENT CONSULTANTS

### FAX COVER PAGE

PLEASE DELIVER TO OR NOTIFY: Mr. James E. Adkins

COMPANY/ORGANIZATION: Houston Lighting & Power Company QA

FAX NO.: 512-972-7935 VERIFICATION NO.: \_\_\_\_\_

TOTAL NUMBER OF PAGES INCLUDING COVER PAGE: 3

FROM: Mr. Willard C. Gekler ACCOUNT NO.: 9052

DATE: February 21, 1996 TIME: \_\_\_\_\_

MESSAGE:

Attached are the full sheets for PQASC 1591-1 shown on Page 6-10. Call me if you have any questions.

# PROJECT QA STARTUP CHECKLIST

Log No. 1591 -PQASC- 1 Rev. A

1. Job No. 1591 Project: Systems Conversion
2. Prepared By: Wyatt Albertson Date: June 9, 1995
- Revised By: Ben Shimizu Date: October 17, 1995
3. Client: Baltimore Gas & Electric (BG&E)
- Purchase Order No. 11605G Date Executed: February 14, 1995

## Quality Assurance Requirements:

- ▶ Yes Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants in accordance with 10CFR50, Appendix B.
- ▶ All work will be done in accordance with the PLG Quality Assurance Program (PLG-0223). (re: #PLG-P792)
- ▶ No Requirements for Reporting of Defects and Noncompliance in accordance with 10CFR21.
- ▶ Non-Safety Related technical support services to be performed for a fault-tree system analysis for six (6) Calvert Cliffs Nuclear Power Plant systems. (re: #RE-94-355 and Supplement to #PLG-P792)

## Scope of Work:

Contractor shall provide necessary supervision and qualified personnel to perform Non-Safety technical support services for the Plant site to include, but not limited to:

- a. Perform fault-tree system analyses for six (6) Calvert Cliffs Nuclear Power Plant systems: 4 KV, 13 KV, Main Steam, 125VDC, 480VDC and 120VAC.
- b. Work shall be performed in accordance with BGE's System Analysis Technical Specification #RE-94-355 (re: attachment to #1591-PQASC-1, Rev. 0) and in accordance with Contractor's Proposal #PLG-P792, dated January 30, 1995 and Supplement, dated January 31, 1995 and all attachments thereto (attached).

Contractor shall be responsible for providing work related Measuring and Test Equipment, Tools and Equipment, and consumable/expendable items as is customary and necessary to perform required services. Any such items that are available and

generally furnished by BGE shall be coordinated between Contractor and BGE's Technical Representative.

Detail work requirements, documents and reports shall be coordinated between Contractor and BGE's Technical Representative.

- 4. Subcontracting: None X Yes \_\_\_\_\_
- ▶ 5. Independent Technical Review and Document Review Records (enter in the blank spaces below, yes, no, or N/A):
  - ▶ Yes PLG work products shall receive Independent Technical Review in accordance with PLG Procedure 104.
  - ▶ N/A Subcontractor work products shall receive Independent Technical Review in accordance with PLG Procedure 104.
  - ▶ Yes Any deliverable software shall be certified in accordance with PLG QA Program. Analyst Code shall be evaluated by Independent Technical Review and the review shall be documented on the TRR Checklist (reverse side of Form 104-1).
  - ▶ Yes Any work products, including software and analyst codes, provided to the client without full application of PLG QA Program shall contain a statement identifying those elements of the QA Program not applied to the work product, with the use of Document Review Records, DRR Form 107-1, or in the transmittal letter, for example: "This work product is being transmitted to the client without Independent Technical Review in accordance with PLG QA Procedure 104."
  - ▶ N/A Subcontractor's work products and software shall receive independent technical review and certification, as appropriate, in accordance with Subcontractor QA Program.

QA Lead Auditor: Benjamin J. [Signature] Date: 10/23/95

Software Development Manager: [Signature] Date: 10/26/95

QA Manager: W. C. [Signature] Date: 10/24/95

Project Manager: Thomas J. [Signature] Date: 10/27/95

Contract Administrator: E. M. [Signature] Date: 10/26/95

PROCEDURE 106 REVISION RECORD			
Revision Number	Revision Date	Description (Including Affected Page Numbers)	Approved (Initials)
3	6/14/83	Title changed from Processing Procurement Documents. Procedure rewritten to be more concise.	EBC
4	2/7/85	Revised to clarify application of quality assurance requirement in procurement of services.	WCG
5	12/30/86	Revised to facilitate handling of Form 106-1, which also has been revised.	WCG
6	10/23/87	Revised Section 3.1 and Form 106-1. Affected pages: ii, iii, 106-2, and 106-4.	WCG
7	4/28/88	Incorporated requirements for computer software development and purchased software. Affected pages: ii, iii, 106-1 through 106-3.	WCG
8	1/12/89	Incorporated use of Qualified Suppliers List to support Procedure 105, Revision 10. Affected pages: ii, 106-1 through 106-3.	WCG
9	6/12/90	Incorporated methods of documenting approval of new contractor's qualifications. Affected pages: ii, iii, 106-2 through 106-4.	WCG
10	9/15/92	Deleted the use of Qualified Suppliers List. Incorporated auditing requirement of subcontractors proposing to use a QA program other than the PLG QA program. Revised Form 106-1. Affected pages: ii, iii, and 106-1 through 106-4.	WCG
11	5/26/93	Revised Form 106-1. Affected pages: ii and 106-4.	WCG
12	3/15/94	Revised Section 2.1 and added footnote on commercial-grade item. Revised Section 2.2 and added Section 6 on external audit. Completely revised Form 106-1. Affected pages: ii, iii, and 106-1 through 106-5.	WCG
13	5/31/95	Added review of applicable Project QA Startup Checklists under Section 1. Deleted checkbox for PLG Software QA Procedures (PLG-0859) from Form 106-1. Affected pages: ii, iii, 106-1, 106-3, 106-4, and 106-6.	WCG



PROCEDURE 106 REVISION RECORD			
Revision Number	Revision Date	Description (Including Affected Page Numbers)	Approved (Initials)
▶ 14	2/7/95	▶ Changed responsibility of preparation of Project QA Startup Checklists from Quality Assurance to Contract personnel. Separated requirements of 10CFR21 from those of 10CFR50, Appendix B. Deleted requirements of 10CFR50.55(e). Affected pages: iii, 106-1, and 106-3 through 106-11.	WCG

**PROCEDURE 106****CONTENTS**

▶		
▶		
▶		
▶	<b>1 RESPONSIBILITIES</b>	<b>106-1</b>
▶	<b>2 PROJECT STARTUPS</b>	<b>106-2</b>
▶	<b>3 PROCUREMENT DOCUMENTS</b>	<b>106-5</b>
▶	3.1 Quality Assurance Documents	106-5
▶	3.2 Methods for Acceptance	106-5
▶	<b>4 REVIEWS AND APPROVALS OF PROCUREMENT OF ENGINEERING AND COMPUTER SOFTWARE DEVELOPMENT SERVICES</b>	<b>106-6</b>
▶	4.1 Prior to Award of Procurement	106-6
▶	4.2 Award of Procurement	106-6
▶	4.3 After Award of Procurement	106-7
▶	<b>5 REQUIREMENTS FOR PURCHASED COMPUTER SOFTWARE</b>	<b>106-7</b>
▶	<b>6 INTERNAL AUDIT</b>	<b>106-7</b>
▶	<b>7 EXTERNAL AUDIT</b>	<b>106-7</b>
▶	7.1 Subcontractor QA Program	106-8
▶	7.2 PLG QA Program	106-8

**PROCEDURE 106**  
**PROJECT STARTUPS**  
**PROCUREMENT OF ENGINEERING AND COMPUTER SOFTWARE**  
**DEVELOPMENT SERVICES,**  
**AND PURCHASED COMPUTER SOFTWARE**

- ▶ This procedure defines the methods by which Project QA Startup Checklists\* are prepared
- ▶ at project startups, and maintained current with subsequent changes to the contracts and
- ▶ purchase orders.
  
- ▶ Additionally, this procedure defines the quality assurance requirements for processing and
- ▶ review of procurement documents for the purchase of engineering and computer
- ▶ development services, and computer software, concurrent or subsequent to the effort in
- ▶ preparing the Project QA Startup Checklists. It also defines the measures used to assure
- ▶ that the performance of the purchased services and software comply with quality
- ▶ assurance requirements specified in the procurement documents.
  
- ▶ **1. RESPONSIBILITIES**
  
- ▶ The Contract Administrator is responsible for the initiation and maintenance of Project QA
- ▶ Startup Checklists\* for projects requiring PLG QA Program, based on contracts, purchase
- ▶ orders, change orders, and work authorizations, whichever are applicable. The Contract
- ▶ Administrator shall specify the standard terms and conditions for PLG contract QA
- ▶ requirements in procurement documents for all engineering and software development
- ▶ services, and purchased computer software.
  
- ▶ The Project Manager shall (1) review and approve the applicable Project QA Startup
- ▶ Checklist for client's contract quality requirements, and (2) if the terms of the client
- ▶ contract quality requirements are not in agreement with the directions received from the
- ▶ client's project manager, then request waiver of the contract requirements from the client.
- ▶ The Project Manager shall also review the subcontractor's quality requirements and the
- ▶ scope of work and acceptance criteria for subcontracted engineering and computer
- ▶ software development services and purchased computer software.
  
- ▶ The Quality Assurance Manager shall review and approve the applicable Project QA Startup
- ▶ Checklist\* for client's and subcontractor's quality requirements and, if necessary, specify
  


---

- ▶ \*See Sample Project QA Startup Checklist at the end of this procedure.

- ▶ changes in the standard PLG contract QA requirements for the subcontracted services and purchased software. If required, the QA Manager shall arrange for a timely audit of the subcontractor in accordance with the QA audit procedure.

▶ **2. PROJECT STARTUPS**

- ▶ The Contract Administrator shall initiate the Project QA Startup Checklist at the project
- ▶ startup whenever (1) a contract, requiring PLG QA Program, has been signed with PLG's
- ▶ Client, and (2) under the same contract, purchase order(s) will be issued to PLG's
- ▶ subcontractor(s). Whenever there is a change in the contract or purchase order, the
- ▶ Contract Administrator shall review the current Project QA Startup Checklist, and, if
- ▶ necessary, make a revision thereof. Unless items shown are not required by the contract,
- ▶ the Project QA Startup Checklist shall include, at a minimum, the following items:\*

- ▶ 1. Log No.: \_\_\_\_\_ (Job No.) -PQASC- \_\_\_\_\_ (Serial No.) , Rev. \_\_\_\_\_ (Rev. No.) \*\*
- ▶ 2. Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_
- ▶ Revised By: \_\_\_\_\_ Date: \_\_\_\_\_ (This is not required on Rev. 0.)
- ▶
- ▶ 3. Client: \_\_\_\_\_ (Client Name) \_\_\_\_\_
- ▶ Contract/Purchase Order No. \_\_\_\_\_ Date Issued (or Executed): \_\_\_\_\_
- ▶
- ▶ 4. Quality Assurance Requirements: (Clarify whether the scope includes requirement of
- ▶ 10CFR21 or 10CFR50, Appendix B, or both.)
- ▶ Scope of Work: (Provide a brief description of work to be performed.)
- ▶
- ▶ 5. a. Change Order (List only if issued)
- ▶ Change Order No. \_\_\_\_\_ Date Issued (or Executed): \_\_\_\_\_
- ▶ Quality Assurance Requirements: (List only if modified from the original contract or
- ▶ previous change orders.)
- ▶ Scope of Work: (Provide a brief description of work to be performed.)

- 
- ▶ \*Wordings of items shown are to appear as such in the Project QA Startup Checklists.
  - ▶ Those shown in parentheses are (1) alternate entries, (2) descriptions of items, or (3) for information only. Those shown in parentheses (2) and (3) will not appear as such on the checklists.

- ▶ \*\*The Serial Number for the original issue is "1," followed by "2," "3," etc. The Revision
- ▶ Number for the original issue is "0," followed by "A," "B," "C," etc. When there is no
- ▶ continuity in the scope of work of subsequent change orders, use a new Serial Number
- ▶ instead of a new Revision Number.

- ▶ b. Contract Work Authorization: (Or equivalent, if issued.)
- ▶ Contract Work Authorization No. \_\_\_\_\_ Date Issued (or Executed): \_\_\_\_\_
- ▶ Quality Assurance Requirements: (List only if modified from the original change order or previous work authorizations.)
- ▶ Scope of Work: (Provide a brief description of work to be performed.)

- ▶ 6. Subcontracting: None \_\_\_ Yes \_\_\_ (Only if "Yes," list the following items.)
- ▶ Subcontractor Names:

- ▶ a. \_\_\_\_\_ (Subcontractor Name) Purchase Order No. NB-\_\_\_\_\_
- ▶ Order Date: \_\_\_\_\_
- ▶ b. \_\_\_\_\_ (If required, list additional name) Purchase Order No. NB-\_\_\_\_\_
- ▶ Order Date: \_\_\_\_\_

- ▶ Subcontractor Quality Grade for Acceptance of Work: (Enter a, b, etc., only once.)

- ▶ \_\_\_ PLG QA Program, PLG-0233
- ▶ \_\_\_ PLG QA Program, PLG-0233, excluding 10CFR21 requirements.
- ▶ \_\_\_ Subcontractor QA Program in accordance with 10CFR50, Appendix B, after acceptance by PLG.
- ▶ \_\_\_ Subcontractor reporting requirements in accordance with 10CFR21, after acceptance by PLG.
- ▶ \_\_\_ Commercial grade items as defined in 10CFR21.
- ▶ \_\_\_ Industry standards and practices specified in PLG purchase order.
- ▶ \_\_\_ Other: Specify: \_\_\_\_\_

- ▶ Subcontractor Work to be Performed:

- ▶ a. \_\_\_\_\_ (Subcontractor Name)
- ▶ (Provide brief description of the work in the purchase order.)
- ▶ Change Order (No.) Order Date: \_\_\_\_\_ (List only if issued.)
- ▶ (Provide a brief description of work to be performed.)
- ▶ b. \_\_\_\_\_ (Subcontractor Name)
- ▶ (Provide a brief description of work in the purchase order.)
- ▶ Change Order (No.) Order Date: \_\_\_\_\_ (List only if issued.)
- ▶ (Provide a brief description of work to be performed.)



▶ 7. Independent Technical Review and Document Review Records: (Enter in the blank spaces below: Yes, No, or N/A.)

- ▶ \_\_\_\_\_ PLG work products shall receive Independent Technical Review in accordance with PLG Procedure 104.
- ▶ \* \_\_\_\_\_ Subcontractor work product shall received Independent Technical Review in accordance with PLG Procedure 104.
- ▶ \_\_\_\_\_ Any deliverable software shall be certified in accordance with PLG QA Program. Analyst Code shall be evaluated by Independent Technical Review and the review shall be documented on the TRR Checklist including the reverse side of Form 104-1.
- ▶ \_\_\_\_\_ Any work products, including software and analyst codes, provided to the client without full application of PLG QA Program shall contain a statement identifying those elements of the QA Program not applied to the work product, with the use of Document Review Records, DRR Form 107-1, or in the transmittal letter, for example: "This work product is being transmitted to the client without Independent Technical Review in accordance with PLG QA Procedure 104."
- ▶ \* \_\_\_\_\_ Subcontractor's work products and software shall receive independent technical review and certification, as appropriate, in accordance with Subcontractor QA Program.

▶ Software Development Manager: \_\_\_\_\_ Date: \_\_\_\_\_

▶ Quality Assurance Manager: \_\_\_\_\_ Date: \_\_\_\_\_

▶ Project Manager: \_\_\_\_\_ Date: \_\_\_\_\_

▶ Contract Administrator: \_\_\_\_\_ Date: \_\_\_\_\_

▶ Original: Document Clerk

▶ cc: Corporate Officer	Project Manager	Software Development Manager
▶ SVP, Fin. and Admin.	Task Leaders:	QA Lead Auditor
▶ VP Nuclear	_____	Preparer
▶ QA Manager	_____	Project File(s)
▶ Computer Applications	_____	

▶ 3. PROCUREMENT DOCUMENTS

▶ \_\_\_\_\_

▶ \*If more than one subcontractor, identify to which subcontractors these items apply.

### ▶ 3.1 QUALITY ASSURANCE REQUIREMENTS

- ▶ Procurement documents are written agreements for contracted engineering and software development services and purchased software.

As required, these procurement documents shall specify the scope of quality assurance requirements for the following:

- Acceptance criteria of the contracted services.
- Right of access to the subcontractor facilities and records.
- ▶ • Compliance with (1) PLG QA Program, or (2) the subcontractor's QA program; all in accordance with 10CFR50, Appendix B.
- ▶ • Compliance with the reporting of defects and noncompliance in accordance with 10CFR21.
- ▶ • Industry standards and practices.
- Commercial-grade item.\*
- Error reporting requirements for purchased computer software.

### ▶ 3.2 METHODS FOR ACCEPTANCE

PLG may accept services by any or all of the following methods:

- Source selection based on onsite evaluation.
- Source evaluation and selection based on past performance.
- Technical verification of the data produced in accordance with Procedure 104.
- Surveillance and/or audit of the contracted services.

- 
- ▶ \*A commercial-grade item means an item that is not subject to design or specification requirements that are unique to facilities or activities licensed pursuant to 10CFR50.
  - ▶ Dedication of a commercial-grade item occurs after vendor's work product has been accepted by PLG in accordance with Procedure 104.

- Review of objective evidence for conformance to PLG QA Program or subcontractor QA Program.
- ▶ 4. REVIEWS AND APPROVALS OF PROCUREMENT OF ENGINEERING AND COMPUTER SOFTWARE DEVELOPMENT SERVICES

▶ 4.1 **PRIOR TO AWARD OF PROCUREMENT**

Upon receipt, the Contract Administrator and the Project and Quality Assurance Managers shall review the proposals.

- The Contract Administrator shall prepare the Contract QA Requirements Form (Form 106-1), and (1) if there are no changes from the original purchase order, initial it and
- ▶ make required distribution (see exceptions below for new subcontractor), or (2) if it is the original purchase order or there are changes from the original purchase order, initial and forward it with proposed contract QA requirements to the Project Manager. The Project Manager shall review the proposed contract QA requirements and, if acceptable, sign the right signature column of Form 106-1, and forward it to the Quality Assurance Manager. The Quality Assurance Manager shall review the proposed contract QA requirements and, if acceptable, sign the Form 106-1.

Finally, if it is a new subcontractor, the Project and Quality Assurance Managers shall signify its acceptance by signing the reverse side of Form 106-1, regardless of whether the standard PLG contract QA requirements are changed.

▶ 4.2 **AWARD OF PROCUREMENT**

- When the subcontractor is found to be acceptable, the Contract Administrator shall prepare
- ▶ the purchase order, incorporating the requirements in the completed Form 106-1. The
  - ▶ Quality Assurance Manager shall co-sign the purchase order.\*

---

▶ \*See Sample Purchase Order at the end of this procedure.

▶ **4.3 AFTER AWARD OF PROCUREMENT**

Once the contract is awarded, revisions to the original purchase order shall be processed in the same manner as the original, with the exception of proposal review and acceptance of the subcontractor, unless the proposed revisions warrant the same degree of review and approach as the original purchase order.

▶ **5. REQUIREMENTS FOR PURCHASED COMPUTER SOFTWARE**

- ▶ On receipt by the Contract Administrator of a request by the Computer Services Coordinator for purchase of off-the-shelf computer software, the following steps are required:

- Ascertain that "error reporting" is automatically included in the supplier's software warranty.

or

- Incorporate PLG standard terms and conditions for "error reporting" in the purchase order.

▶ **6. INTERNAL AUDIT**

- ▶ Review of the standard terms and conditions in the PLG's client contracts and PLG procurement documents issued to subcontractors will be made, and audit of the completed Project QA Startup Checklists and the general use of Contract QA Requirements (Form 106-1) will be performed in conjunction with the project audits specified in Procedure 102.

▶ **7. EXTERNAL AUDIT**

Auditing of subcontractor's activities depends on the scope of the subcontractor's work and the type of QA program utilized; namely, the subcontractor's QA Program or the PLG QA Program. Normally, an onsite audit shall be started within 30 days after the start of work. A program evaluation shall precede the audit if the subcontractor QA program is utilized and has not been evaluated previously.

If the subcontractor work products consist totally of commercial-grade items, no audit is required.

▶ **7.1 SUBCONTRACTOR QA PROGRAM**

Most of the programs are established to comply with 10CFR50, Appendix B, only.

- ▶ Reporting requirements of 10CFR21 may be a separate part of the subcontractor's program. This type of program requires evaluation of several QA documents beforehand, after which an audit of the implementation of the programs is conducted onsite.

▶ **7.2 PLG QA PROGRAM**

The PLG QA Program is established in accordance with 10CFR50, Appendix B, including the reporting requirements of 10CFR21, and the program has been utilized by the subcontractors according to the contract agreements.

This type of program requires only an onsite audit of the implementation of the program.



**CONTRACT QA REQUIREMENTS**

Contractor \_\_\_\_\_ P.O. NB- \_\_\_\_\_ Revision No. \_\_\_\_\_

Client \_\_\_\_\_ Job No: \_\_\_\_\_

*Contract Administrator shall complete items in boxed area by checking appropriate blocks.*

**QA REQUIREMENT FOR CONTRACTOR SERVICES**

Work to be performed under this purchase order shall be in compliance with:

- PLG QA Program, PLG-0223.
- ▶  PLG QA Program, PLG-0223, excluding 10CFR21 requirements.
- Subcontractor's QA Program(s) in accordance with 10CFR50, Appendix B, and after acceptance by PLG.
- ▶  Subcontractor's reporting requirements in accordance with 10CFR21, after acceptance by PLG.
- Industry standards and practices specified herein.
- ▶  Commercial-grade items as defined in 10CFR21.
- ▶  "Error reporting" requirements for purchased computer software.
- Other (specify) \_\_\_\_\_

This is  is not  a revision in QA requirements from the original purchase order.

**METHOD FOR ACCEPTANCE OF CONTRACTED SERVICES**

- The first audit shall be conducted by PLG within 30 days after the start of work.
- Upon delivery of the completed work or any completed portion thereof, PLG shall review all items delivered and shall notify Contractor in writing within 30 days after delivery whether or not the delivered items are acceptable. Failure to provide Contractor with such written notification, setting forth any reason why one or more of the delivered items is not acceptable, shall constitute PLG's acceptance of such a completed item. Contractor shall make all changes reasonably necessary to correct the unacceptable items, and the foregoing acceptance procedure shall apply to any corrected and redelivered item.
- Other (specify) \_\_\_\_\_

This is  is not  a revision in method of acceptance from the original purchase order.

**RIGHT OF ACCESS**

- \_\_\_\_\_ and/or PLG shall have the right of access to the facilities and records of \_\_\_\_\_ for the purpose of ensuring the quality assurance requirements applicable to the type of work described in the Scope of Work have been met.
- Other (specify). \_\_\_\_\_

This is  is not  a revision in right of access from the original purchase order.

Contract Administrator Initials \_\_\_\_\_ Date \_\_\_\_\_

If there are no changes from the original purchase order, make distribution as shown below.

**APPROVAL OF CONTRACT QA REQUIREMENTS**

orig: Contract Administrator

cc: QA Manager

Lead Auditor

Project Manager

Document Clerk

\_\_\_\_\_  
Project Manager Date

\_\_\_\_\_  
Quality Assurance Manager Date

FORM 106-1

Go to reverse side for new contract only.

**CONTRACTOR QUALIFICATIONS**  
(complete for new contract only)

*Contract Administrator shall complete items in boxed area by checking appropriate blocks.*

**ACCEPTANCE OF CONTRACTOR QUALIFICATIONS** (complete for new contract only)

- By prior similar work performance under Purchase Order NB-\_\_\_\_\_ Dated \_\_\_\_\_
- By submitted qualifications; e.g., Contractor QA Program and sample internal audits.
- By evaluation of Contractor QA Program and onsite audit.
- Others (Specify) \_\_\_\_\_

Contract Administrator Initials \_\_\_\_\_ Date \_\_\_\_\_

**APPROVAL OF CONTRACTOR QUALIFICATIONS**

\_\_\_\_\_  
Project Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
QA Manager

\_\_\_\_\_  
Date

SAMPLE PROJECT QA STARTUP CHECKLIST\*

**PROJECT QA STARTUP CHECKLIST**

Log No. 1591 -PQASC- 1 Rev. A

- 1. Job No. 1591 Project: Systems Conversion
- 2. Prepared By: Wyatt Albertson Date: June 9, 1995
- Revised By: Ben Shimizu Date: October 17, 1995
- 3. Client: Baltimore Gas & Electric (BG&E)
- Purchase Order No. 11605G Date Executed: February 14, 1995

- 4. Subcontracting: No
- 5. Independent Technical spaces below, yes, no:
  - Yes PLG work performed with PLG Program.
  - N/A Subcontractor in accordance with PLG Program.
  - Yes Any deliverables provided without full identifying the work with the use of transmittal letter to client without Procedure 104.
  - N/A Subcontractor review and approval Program.

**Quality Assurance Requirements:**

Yes Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants in accordance with 10CFR50, Appendix B.

All work will be done in accordance with the PLG Quality Assurance Program (PLG-0223). (re: #PLG-P792)

No Requirements for Reporting of Defects and Noncompliance in accordance with 10CFR21.

Non-Safety Related technical support services to be performed for a fault-tree system analysis for six (6) Calvert Cliffs Nuclear Power Plant systems. (re: #RE-94-355 and Supplement to #PLG-P792)

**Scope of Work:**

Contractor shall provide necessary supervision and qualified personnel to perform Non-Safety technical support services for the Plant site to include, but not limited to:

- a. Perform fault-tree system analyses for six (6) Calvert Cliffs Nuclear Power Plant systems: 4 KV, 13 KV, Main Steam, 125VDC, 480VDC and 120VAC.
- b. Work shall be performed in accordance with BGE's System Analysis Technical Specification #RE-94-355 (re: attachment to #1591-PQASC-1, Rev. 0) and in accordance with Contractor's Proposal #PLG-P792, dated January 30, 1995 and Supplement, dated January 31, 1995 and all attachments thereto (attached).

Contractor shall be responsible for providing work related Measuring and Test Equipment, Tools and Equipment, and consumable/expendable items as is customary and necessary to perform required services. Any such items that are available and

**Software Development Man**

QA Manager: W.C. Schen Date: 10/24/95

Project Manager: Thomas J. Mikschl Date: 10/27/95

Contract Administrator: E.M. Ward Date: 10/26/95

\* Numbering of Items shown may not necessarily agree with those items specified in Section 2 because of the difference in the scope of work and in subcontracting.

SAMPLE PURCHASE ORDER

**PLG, Inc.  
PURCHASE ORDER**

ORDER DATE	ORDER NUMBER
------------	--------------

SHIP TO: PLG, Inc.  
4590 MacArthur Boulevard, Suite 400  
Newport Beach, CA 92660-2027

SHOW OUR ORDER NUMBER on all packages, correspondence, invoices, and shipping papers.

ISSUED TO:

REFERENCE:

QUALITY ASSURANCE REQUIRED:  Yes  No

If yes, the basis for acceptance is: <input type="checkbox"/> Audit has been performed and results are current and favorable. <input type="checkbox"/> Audit is scheduled to be performed within 30 days of start of work.
--

ATTACHED CONDITIONS		TERMS	
SHIP DATE	DELIVER ON	VIA	
REQUISITIONER	ANY CONTACT SHOULD BE WITH BUYER	CONFIRMED WITH	DATE

No change shall be made to the price, terms and conditions, specified requirements, or schedules of this Purchase Order without express authorization of the responsible buyer. Additional costs resulting from work done or material supplied without such authorization may be denied.

Accepted By \_\_\_\_\_

Date \_\_\_\_\_

CONTRACTPROFORMA.DOC.01/23/96

PLG, Inc.

By \_\_\_\_\_  
Quality Assurance

By \_\_\_\_\_  
Elizabeth M. Ward  
Senior Vice President  
Finance and Administration

# The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

January 10, 1996

Mr. W. C. Gekler  
Quality Assurance Manager  
PLG, Incorporated  
4590 MacArthur Boulevard, Suite 400  
Newport Beach, CA 92660-2027

**Subject:** Houston Lighting & Power Audit of PLG,  
Incorporated in Newport Beach, CA  
Vendor Audit No. 95-073 (VA)

**Re:** PLG correspondence dated December 12, 1995  
and January 3, 1996

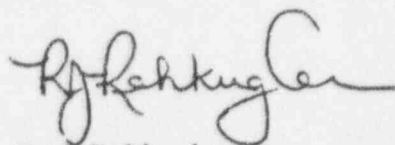
Dear Mr. Gekler:

Your correspondence provided corrective actions for Vendor Deficiency Reports (VDRs) 95-019 and 95-020. The corrective actions were evaluated for use by Houston Lighting & Power (HL&P) and were determined to appropriately address the cited conditions.

VDR 95-020 is considered closed. The audit and VDR 95-019 will remain open pending revision and submittal of the procedures identified in the referenced correspondence.

If you have any questions concerning this correspondence, please contact Mr. J. E. Adkins at (512) 972-8516.

Sincerely,



R. J. Rehkugler  
Director, Quality

*JEA*  
JEA/kmw

c: L. E. Martin  
R. D. Martin  
A. M. Richards  
N. O. Laughlin  
D. I. Towler

A. J. Granger  
M. E. Smith  
NUPIC Membership  
Audit File 95-073 (VA)  
Vendor History File

Project Manager on Behalf of the Participants in the South Texas Project



HOUSTON LIGHTING & POWER COMPANY  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
VENDOR DEFICIENCY REPORT  
VDR NO. 95-019

Page 1 of 2

1. Revision No.: 0 Issue Date: 10/05/95 Due Date: 11/06/95

2. Severity Level: 1.      2. X 3.      Problem Report Required: No

3. Hold on Shipment Required: No Hold on Shipment Release: N/A  
Signature/Date

4. Vendor: PLG, Incorporated Vendor Contact: W. C. Gekler Discovered During: Audit 95-073 (VA)

5. Requirement(s):

Procedure 106, Revision 13, Section 6 states in part: "Normally, an onsite audit shall be started within 30 days after the start of work."

6. Deficiency(s):

Contrary to this requirement, work on Purchase Order NB-1667, issued to EQE International, has been in process approximately 2 - 3 months without an audit having been performed.

7. Recommended Action(s):

Remedial - Perform audit as required by Procedure 106.

Corrective - Provide appropriate corrective action to address the root cause and preclude recurrence.

8. Initiated By: QJE Admin Approved By: R. R. King  
Date: 10-5-95 Date: 10/5/95

9. Response: Sat. ✓ Evaluator: QJE Admin Approved: [Signature]  
Unsatisfactory:      Date: 1-10-96 Date: 1-10-96

HOUSTON LIGHTING & POWER COMPANY  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
VENDOR DEFICIENCY REPORT  
VDR NO. 95-019

---

10. Verification: Sat. \_\_\_\_\_ Evaluator: \_\_\_\_\_ Approved: \_\_\_\_\_  
Unsatisfactory: \_\_\_\_\_ Date: \_\_\_\_\_ Date: \_\_\_\_\_

---

11. Verification/Closure Details/Remarks:

RESPONSE ACCEPTABLE PENDING REVISION AND SUBMITTAL  
OF PROCEDURES. SEE PLG CORRESPONDENCE DATED 12/12/95 AND  
1/3/96.

*J. E. Adkins*  
1/10/96

---

12. Closed By: \_\_\_\_\_ Date: \_\_\_\_\_

---

**HOUSTON LIGHTING & POWER COMPANY  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
VENDOR DEFICIENCY REPORT  
VDR NO. 95-020**

Page 1 of 2

1. Revision No.: 0 Issue Date: 10/05/95 Due Date: 11/06/95

2. Severity Level: 1.        2. X 3.        Problem Report Required: No

3. Hold on Shipment Required: No Hold on Shipment Release: N/A  
Signature/Date

4. Vendor: PLG, Incorporated Vendor Contact: W. C. Gekler Discovered During: Audit 95-073 (VA)

5. Requirement(s):

Procedure 103, Revision 4, dated 09/15/92, Section 2 states in part: "training shall include indoctrination in the PLG QA Plan and procedures for personnel within 1 month of date of hire." Section 3 states in part: "objective evidence of each person's training shall be provided in the form of a completed, signed, and graded quiz. A grade of 70% shall be considered passing."

6. Deficiency(s):

Contrary to the above requirements, two PLG employees at the Bethesda, MD facility had not completed training within the required time frame (e.g. S. T. Celi-hired 07/29/95; T. J. Celi-hired 07/25/95). Four other Bethesda employees had received training but had not achieved a passing score on the indoctrination training quiz within the 30 day period (e.g. J. Lautz, M. Pettipaw, M. J. Pine, and F. Warner).

7. Recommended Action(s):

Remedial - Assure that training is completed in accordance with the requirements of Procedure 103.

Corrective - Provide appropriate corrective action to address the root cause and preclude recurrence.

8. Initiated By: J.E. Adkins Approved By: [Signature]  
Date: 10-5-95 Date: 10/5/95

HOUSTON LIGHTING & POWER COMPANY  
SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION  
VENDOR DEFICIENCY REPORT  
VDR NO. 95-020

Page 2 of 2

9. Response: Sat.  Unsat.  Evaluator: J.E. Adkins Date: 1-10-96 Approved: [Signature] Date: 1-10-96

10. Verification: Sat.  Unsat.  Evaluator: J.E. Adkins Date: 1-10-96 Approved: [Signature] Date: 1-10-96

11. Verification/Closure Details/Remarks:

RESPONSE AND CORRECTIVE ACTION SATISFACTORY. SEE PLG  
CORRESPONDENCE DATED 12/12/95. J.E. Adkins  
1-10-96

12. Closed By: [Signature] Date: 1-10-96



ENGINEERS  
APPLIED SCIENTISTS  
MANAGEMENT CONSULTANTS

(A Member of  
The Failure Group, Inc.)

## CONFIRMATION OF FAX

PLG, Inc.  
4590 MacArthur Boulevard, Suite 400  
Newport Beach, CA 92660-2027  
Tel. 714-833-2020 • Fax 714-833-2085

PLG, Inc., Bethesda, MD, Office  
Tel. 301-907-9100 • Fax 301-907-0050

PLG, Inc., Albuquerque, NM, Office  
Tel. 505-881-1424 • Fax 505-880-0727

PLG, Inc., Tokyo, Japan, Office  
Tel. +81-3-3432-8833 • Fax +81-3-3437-1005

January 3, 1996

Mr. James E. Adkins  
South Texas Electric Generating Station  
Houston Lighting & Power Company  
P.O. Box 289  
Wadsworth, TX 77483

Dear Jim:

### COPY OF REVISED PURCHASE ORDER

Enclosed is a copy of the revised purchase order issued to EQE International. This revised order uses the purchase order format now established for purchases of quality related materials and services. As you pointed out, we had established the new format during the NUPIC audit and it was reviewed by the NUPIC audit team at that time.

We will be sending you an updated version of Procedure 106 incorporating the Project Quality Assurance Startup Checklist requirement by the end of January when completion of that and other procedure upgrades has been approved.

Thank you again for your help and we wish you a good year in 1996.

Very truly yours,

Willard C. Gekler  
QA Manager

Enclosure



**PLG, Inc.**  
**PURCHASE ORDER**

ORDER DATE 11/14/95	ORDER NUMBER NB-1705
------------------------	-------------------------

Change Order 2

SHIP TO: PLG, Inc.  
 4590 MacArthur Boulevard, Suite 400  
 Newport Beach, CA 92660-2027

SHOW OUR ORDER NUMBER on all packages, correspondence, invoices, and shipping papers.

ISSUED TO: EQE International  
 Attention: Mr. George W. Reitter  
 44 Montgomery Street, Suite 3200  
 San Francisco, CA 94104

REFERENCE: ~~\*\*\*\*\*~~ NOK 1594

QUALITY ASSURANCE REQUIRED:  Yes  No

If yes, the basis for acceptance is:	
<input checked="" type="checkbox"/>	Audit has been performed and results are current and favorable.
<input type="checkbox"/>	Audit is scheduled to be performed within 30 days of start of work.

ATTACHED CONDITIONS Terms and Conditions for Services		TERMS	
SHIP DATE	DELIVER ON	VIA	
REQUISITIONER Harold F. Perla	ANY CONTACT SHOULD BE WITH BUYER Elizabeth M. Ward	CONFIRMED WITH	DATE

In accordance with the terms and conditions of Purchase Order No. NB-1705, this Change Order No. <sup>1</sup>/<sub>2</sub> is issued to revise the following section:

**QUALITY ASSURANCE**

The work to be performed under this Purchase Order shall be in compliance with EQE's QA program that has been approved by PLG.

EQE will store all project QA records, such as their project calculations, for 3 years and will make them available to PLG upon request. This storage will be done at EQE's expense and will not be passed on to PLG.

**ALL OTHER TERMS AND CONDITIONS OF PURCHASE ORDER NO. NB-1705 REMAIN UNCHANGED AND IN FULL FORCE AND EFFECT.**

No change shall be made to the price, terms and conditions, specified requirements, or schedules of this Purchase Order without express authorization of the responsible buyer. Additional costs resulting from work done or material supplied without such authorization may be denied.

Accepted By \_\_\_\_\_

Date 11-16-95

PLG, Inc.

By \_\_\_\_\_

Quality Assurance

By \_\_\_\_\_

Elizabeth M. Ward  
 Senior Vice President

Finance and Administration



ENGINEERS  
APPLIED SCIENTISTS  
MANAGEMENT CONSULTANTS

(A Member of  
The Failure Group, Inc.)

RECEIVED

DEC 18 1995

R. J. REHKUGLER

PLG, Inc.  
4590 MacArthur Boulevard, Suite 400  
Newport Beach, CA 92660-2027  
Tel. 714-833-2020 • Fax 714-833-2085

PLG, Inc., Bethesda, MD, Office  
Tel. 301-907-9100 • Fax 301-907-0050

PLG, Inc., Albuquerque, NM, Office  
Tel. 505-881-1424 • Fax 505-880-0727

PLG, Inc., Tokyo, Japan, Office  
Tel. +81-3-3432-8833 • Fax +81-3-3437-1005

December 12, 1995

ST-RL-HL-0588

PFN:D43

Mr. R. J. Rehkugler  
Director, Quality  
Houston Lighting & Power Company  
South Texas Project Electric Generating Station  
P. O. Box 289  
Wadsworth, TX 77483

Dear Mr. Rehkugler:

VENDOR AUDIT NO. 95-073 (VA)

This is in response to your letter dated October 5, 1995, a copy of which was received by Fax on November 14, 1995.

Current status of our corrective actions recommended in your Vendor Deficiency Reports (VDRs) are as follows:

1. VDR No. 95-019: External Audit of EQE International

Remedial Actions:

EQE Engineering Consultants, a division of EQE International, who is the direct PLG subcontractor was audited on September 21 and 26, 1995. A copy of PLG Audit Report No. 1594-3, with a completion date of October 12, 1995, is enclosed. A copy of our audit findings and observations, transmitted to EQE by our letter dated October 12, 1995, is also enclosed. There are two (2) audit findings and six (6) observations.

This completes our remedial actions on this item.

Subsequently, based on the audit findings, one of our commitments was to issue a change order, and we have issued the change order on November 14, 1995, to their subcontract to allow EQE to implement their own QA Program. As a result, by our

letter dated November 16, 1995, a copy of which is enclosed, we have postponed their audit finding reports response date to within 30 days of their receipt of our change order.

Corrective Actions to Address Root Cause and Preclude Recurrence:

On July 21, 1995, we implemented PLG Procedure 101, which includes requirements for Project QA Startup Checklists (PQASCs) to be prepared and completed by Quality Assurance within 1 month from the project startup. The PQASC includes a clause for auditing new subcontractors, when required by PLG QA Program (PLG-0223).

Furthermore, our Contract Administrator (CA) will assume, in the very near future, the responsibility of initiation and maintenance of PQASCs. The CA will prepare a PQASC whenever (1) a client contract, requiring implementation PLG QA Program, has been signed by PLG, and (2) whenever a new purchase order or change order has been issued to PLG's subcontractor(s) under the same contract. This will reduce lead time considerably for QA auditor planning for internal and subcontractor audits.

Requirements for PQASCs will be transferred into the revised Procedure 106, which is scheduled to be submitted for your acceptance in early January 1996.

2. VDR No. 95-020: Personnel Indoctrination and Training

Remedial Actions:

Of the six (6) personnel not indoctrinated and trained in accordance with PLG-0223 at the time of your audit in September 1995, five (5) new full-time employees have completed indoctrination and training, and received passing score as shown in the enclosed QA Training Record, dated December 5, 1995.

This completes our remedial actions on this item.

The remaining one (1) new associate is not an employee and currently works part-time in projects covered by the PLG Meteorological Projects, Policies, and Procedures Manual (MPPPM). This person assists in maintaining computers used for reducing meteorological data, assisting in meteorological records management, and transferring meteorological software to clients. Because of his limited background, we do not foresee him engaging in projects covered under PLG-0223, and thus he has not received QA training and his name has been removed from the QA Training Record.

Mr. R. J. Rehkugler  
Houston Lighting & Power Company

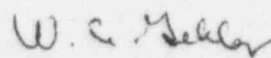
December 12, 1995  
Page 3

Corrective Actions to Address Root Cause and Preclude Recurrence:

The first session of QA retraining seminars was conducted for the Newport Beach personnel on November 20, 1995, with several important topics, one of which was regarding interpretation of our training procedure. When handing out indoctrination package to new full-time employees, it was emphasized to the human resource personnel that all professional and key administrative and clerical employees will receive a QA training package as well, and will be trained in PLG-0223 within 30 days of their employment. Associates engaged in projects requiring PLG-0223 will be trained similarly; however, associates and part-time employees, all of whose work will be directed and reviewed by trained personnel, may not require QA training.

If you have any further questions, please let us know.

Very truly yours,



Willard C. Gekler  
Quality Assurance Manager

Enclosures



ENGINEERS  
APPLIED SCIENTISTS  
MANAGEMENT CONSULTANTS

(A Member of  
The Failure Group, Inc.)

PLG, Inc.  
4590 MacArthur Boulevard, Suite 400  
Newport Beach, CA 92660-2027  
Tel. 714-833-2020 • Fax 714-833-2085

PLG, Inc., Bethesda, MD, Office  
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Tel. 505-881-1424 • Fax 505-880-0727

PLG, Inc., Tokyo, Japan, Office  
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September 14, 1995

Mr. Thomas Roche  
EQE International Inc.  
Lakeshore Towers  
18101 Von Karman Avenue, Suite 400  
Irvine, CA 92715

Dear Tom:

#### QUALITY ASSURANCE AUDIT

We greatly appreciate your cooperation in arranging to allow PLG to perform an audit of work being performed for PLG under our purchase orders NB-1667 and NB-1705. As you are aware, this work is being performed under our quality assurance (QA) program, PLG-0223.

As agreed in our telephone conversation on September 13, 1995, Mr. Ben Shimizu, PLG's Lead Auditor and I will meet with you at 1:00 p.m. on September 21, 1995, at your office to conduct the audit. Our audit will address all portions of the PLG QA program applicable to the work that you are performing for us. Basically, that will require a review of the project files for both purchase orders.

Please call if you have any questions regarding our planned audit.

Very truly yours,

Willard C. Gekler  
Manager, Quality Assurance





ENGINEERS  
APPLIED SCIENTISTS  
MANAGEMENT CONSULTANTS

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The Failure Group, Inc.)

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October 12, 1995  
EDF-1540-PLG-38  
NOK-1594-PLG-50

BJGarrick  
HFPerla  
TUMarston  
EMWard  
WLABertson  
RKDeremer  
WCGekler  
BShimizu  
Client Files

Mr. Thomas R. Roche, P.E.  
Technical Manager  
EQE Engineering Consultants  
Lakeshore Tower  
18101 Von Karman Avenue, Suite 400  
Irvine, CA 92715-1032

Dear Mr. Roche:

AUDIT FINDING REPORTS AND OBSERVATIONS

We greatly appreciate your cooperation in allowing PLG to perform an audit of work being performed by EQE for PLG on September 21 and 26, 1995.

The audit was conducted according to the PLG Subcontractor Quality Assurance Audit Plan delivered to you during the initial interview at your office. Enclosed are two (2) Audit Finding Reports (AFRs). We have listed our suggested corrective actions for the AFRs. Please respond by completing items 8 through 11 for each AFR and return the AFR originals within 30 days to the undersigned.

Please comply with the "Scheduled Corrective Actions Completion Date" so that we may verify the corrective action as soon as practicable.

Also summarized immediately following this letter are our observations with recommendations for improvements in the EQE QA Program, or required actions that have to be completed under the current purchase orders. Items not listed have all been acceptable and no further actions are required.

Very truly yours,

*W. C. Gekler*

Willard C. Gekler  
Quality Assurance Manager

BShimizu/bkf  
E154038.WCG

Enclosures

OBSERVATIONS AND FINDINGS  
RESULTING FROM  
AUDIT OF WORK PERFORMED UNDER

Purchase Order: <u>NB-1667</u>	Revision: <u>0</u>	Date: <u>1/11/95</u>
Purchase Order: <u>NB-1705</u>	Revision: <u>0</u>	Date: <u>3/23/95</u>
	Revision: <u>1</u>	Date: <u>8/24/95</u>

It is understood that any corrective actions taken by EQE Engineering Consultants, based on findings of the audit conducted by PLG, Inc., are within the requirements of the above Purchase Orders.

Observation made during the audit are not corrective actions requested of EQE at this time; however, they are listed either as recommendations for improvements in the EQE QA Program, or required actions that have to be taken prior to the completion of the Purchase Orders.

The requirements in the PLG Purchase Orders and in the EQE QA Program formed the basis of the PLG observations and findings. During the PLG audit, EQE was requested to produce a sampling of objective evidences that are intended to be in compliance with each of these requirements. Note that comments and questions, shown as such in parentheses ( ) or [ ], are not a part of these requirements.

OBSERVATION NO. 1

REQUIREMENT:

4.3 Calculations

The calculations shall be prepared by qualified personnel under supervision of the project engineer. They shall be checked for accuracy, adequacy, and compliance to the requirements of the applicable parts of project criteria by qualified personnel who did not originate the work.

DESCRIPTION OF OBSERVATION:

Calc. No. 52340.02-C-002, Rev. No. 0, 49 pages total.  
Project: EDF Containment Overpressure. Calc. Title: Containment Shell Membrane Capabilities. Sht No. 2, dated 6/2/95.  
Awaiting checking per TP-10Q, Revision 2, 2/14/95, Page 16 of 18, Checking Guidelines.

OBSERVATION NO. 2

REQUIREMENT:

4.7 Interface Control

All technical or contractual correspondences to the client shall be signed by the project manager. or designee.

DESCRIPTION OF OBSERVATION:

Under the new Revision No. 2 to Purchase Order NB-1705, the EQE Project Manager will establish, implement, and maintain Interface Control in accordance with AP-200Q, using Master File Index, similar to that for PLG/EDF Overpressure, No. 52340, X:WRF\52340MF.

OBSERVATION NO. 3

REQUIREMENT:

7.2 Records Turnover

Project quality records generated by EQE during the course of a project may be turned over to the client during or at the completion of the

project work. Such records shall be reviewed for legibility and completeness prior to the turnover to the client. EQE shall not retain records for client without specific agreement, and therefore, does not classify quality-related records as "Lifetime" or "Nonpermanent."

**DESCRIPTION OF OBSERVATION:**

PLG Project Manager shall either (1) accept the original EQE calculations for storage, or (2) specify for EQE storage in the new Revision 2 to Purchase Order NB-1705 under Quality Assurance requirements.

**OBSERVATION NO. 4**

**REQUIREMENT:**

7.3 Document Storage

Copies of quality-related records generated by EQE shall be forwarded to the client or stored in separate locations when specified by client quality assurance requirements.

**DESCRIPTION OF OBSERVATION:**

See Observation No. 3 above. When specified for EQE storage by the client's QA requirements, they are stored as follows:

1 set in storage at San Francisco.

1 set in storage locally at NER.

**OBSERVATION NO. 5**

**REQUIREMENT:**

9.4 10CFR21 Reportability

The president is responsible for notifying the NRC of defects or noncompliance as defined and required by 10CFR21. (Posting requirements?)

**DESCRIPTION OF OBSERVATION:**

10CFR21.6, Posting Requirements, is not totally complied with; (1) 10CFR Part 21, dated 1/1/93 [posted but outdated], (2) Section 206 [posted and acceptable], and (3) Notice 15000-35/AP-110Q [posted and acceptable]. Since the Purchase Orders are for projects under foreign clients, the finding is classified as "observation."

**OBSERVATION NO. 6**

**REQUIREMENT:**

11.2 Schedules

A schedule of audits shall be maintained by the QA manager.

**DESCRIPTION OF OBSERVATION:**

Internal audits are performed every 6 months or at job closeout, whichever is sooner. Under the new Revision No. 2 to Purchase Order NB-1705, closeout audit will be scheduled and performed by EQE under EQE QA Program.

1. AUDIT FINDING REPORT NO. 1 2. AUDIT REPORT NO. 1594-3

3. REQUIREMENT: PLG Purchase Order No. NB-1705, Revision 0, Date 3/23/95, under QUALITY ASSURANCE, it is stated, "The work to be performed under this Purchase Order shall be in compliance with PLG QA Program, PLG-0223, in accordance with 10CFR50, Appendix B, including reporting requirements of 10CFR and 10CFR50.55(e)."

4. DESCRIPTION OF FINDING: For documentation, QA forms referenced in PLG-0223 have been substituted by equivalent EQE forms as referenced in EQE QA Manual, Revision 2, dated 11/15/91.

5. SUGGESTED CORRECTIVE ACTION: PLG will issue revision to the PLG Purchase Order NB-1705, Quality Assurance, stating as follows: "The work to be performed under this Purchase Order shall be in compliance with EQE QA Manual, Revision 2, November 15, 1991, in accordance with 10CFR50, Appendix B."

EQE shall establish, implement, and maintain the QA Program under this Purchase Order retroactive to the original date of March 23, 1995, all in accordance with EQE QA Manual, Revision 2, dated 11/15/91.

6. Bill J.R. 10/11/95 7. W.C. Gschler 10/12/95  
INITIATED BY DATE QA MANAGER DATE

TO BE COMPLETED BY SUBCONTRACTOR

8. PROBABLE CAUSE:

9. CORRECTIVE ACTIONS:

10. SCHEDULED CORRECTIVE ACTIONS COMPLETION DATE: \_\_\_\_\_

11. \_\_\_\_\_ TITLE DATE  
APPROVED BY

TO BE COMPLETED BY PLG

12. RESPONSE EVALUATED AND ACCEPTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

13. CORRECTIVE ACTIONS VERIFIED:

14. \_\_\_\_\_ DATE 15. \_\_\_\_\_ DATE  
VERIFIED BY QA MANAGER

1. AUDIT FINDING REPORT NO. 2 2. AUDIT REPORT NO. 1594-3

3. REQUIREMENT: Section 11.1 Project Audits  
The QA manager shall be responsible for selection and assignment of qualified personnel to perform internal audits. An audit team shall consist of a lead auditor, and may have qualified members from the engineering staff who are not directly working on the project.  
[(1) Use words, instead, such as "who are not directly involved in the work being audited," and (2) how is "Lead Auditor" qualified?]

4. DESCRIPTION OF FINDING: Douglas Freeland, Record of Lead Auditor Qualification, Dated 9/23/94.  
(1) No entries for "Examination," "Passed," and "Date."  
(2) No signature/date for "Auditor Qualification Certified By" and "Date Certified."  
(3) However, the form is signed/dated 9/23/94 in space allocated for "Annual Evaluation."

5. SUGGESTED CORRECTIVE ACTION:  
Make proper entries for the missing data and responsible person to certify lead auditor qualification and make annual evaluation for Douglas Freeland.

6. [Signature] 10/10/95 7. W.C. Guber 10/12/95  
INITIATED BY DATE QA MANAGER DATE

TO BE COMPLETED BY SUBCONTRACTOR

8. PROBABLE CAUSE:

9. CORRECTIVE ACTIONS:

10. SCHEDULED CORRECTIVE ACTIONS COMPLETION DATE: \_\_\_\_\_

11. APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

TO BE COMPLETED BY PLG

12. RESPONSE EVALUATED AND ACCEPTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

13. CORRECTIVE ACTIONS VERIFIED:

14. \_\_\_\_\_ 15. \_\_\_\_\_  
VERIFIED BY DATE QA MANAGER DATE



**PLG SUBCONTRACTOR  
QUALITY ASSURANCE AUDIT PLAN**

Subcontractor:	<u>EQE Engineering Consultants</u>	Audit Report No.:	<u>1594-3</u>
Address:	<u>18101 Von Karman Ave. #400</u>	Audit Dates:	<u>9/21 and 26/95</u>
	<u>Irvine, CA 92715-1032</u>		
QA Contact:	<u>Thomas R. Roche</u>		
Telephone No. for QA Contact:	<u>(714)833-3303</u>		
Plan Prepared By:	<u>Ben Shimizu</u>	Date:	<u>9/19/95</u>
Approved By:	<u>W. C. Seiler</u>	Date:	<u>9/19/95</u>

**AUDIT FOR WORK PERFORMED UNDER .**

Purchase Order: NB- 1705      Revision: 1      Date: 8/24/95

It is understood that any corrective actions taken by the subcontractor, based on findings of the audit conducted by PLG, Inc., are within the requirements of the above Purchase Order.

Observations made during the audit are not corrective actions requested of the subcontractor; however, they are listed either as recommendations for improvements in the subcontractor's Quality Assurance Program, or required actions that have to be taken prior the completion of the Purchase Order.

The following provisions in the subcontractor's Quality Assurance Program will form the basis of the PLG audit. During the PLG audit, the subcontractor is required to produce a sampling of objective evidences that are intended to be in compliance with each of these provisions. Note that comments and questions, shown as such in parentheses ( ) or [ ], are not a part of the Quality Assurance Program.



2. Quality Assurance Program

2.2 Program Control

The QA Program shall be periodically reviewed by the QA manager. The QA manager shall report on the adequacy and effectiveness of the EQE QA Program to the president. As a minimum, such report shall be performed on an annual basis. Revision to the QA Program shall be initiated by the QA manager and approved by the president. (Does the president review such reports and/or order changes to the QA Program?)

Acceptable: Irvine Regional Office Audit; Audit Report No. 94-46, dated

12/20/94 (attachment A). Finding No. 01: Provide clarification of

responsibilities of EC Division Director vs those of President. Corrective

Action: EQE Memo dated 6/20/95 (attachment B), states that the position

of President has been replaced by that of EC Division Director.

The revision level and date of revision shall be indicated on the updated page and appropriate entry made on the Table of Revisions.

Acceptable: QA Manual, Revision 2, 11/15/91, total pages 39. Table of

Revision, Revision 2, 11/15/91, page 3.

2.4 Indoctrination

Formal training shall be documented by the individual who leads the indoctrination and training session, or a designee. The record shall include names of personnel trained and a description of the material covered. (Provide most recent training records including dates.)

Acceptable: Training Sessions Records, 12312-01/Training(1/92),

(attachment C). Name/Date: David Nakaki, 5/23/93; Hassan Hadidi-Tarnjed,

5/25/93; Gregory Hardy, 5/25/93; and Don Wesley, 5/26/93. Material covered:

AP-10Q, Rev. 1.

### 3. Organization

- 3.1 The EQE organization is illustrated in Figure 3-1, and a typical project organization, including the relationship between technical and quality activities, is shown in Figure 3-2. (Provide names of current personnel. No mention of contracting personnel. Who handles contracting matters?)

Acceptable: EQE Organization Chart, June 20, 1995 (attachment B)

President - Douglas Fraizier

Chief Financial Officer - George Reitter (handles contracts)

EQE Engineering Consultants Division Director - Gregory Hardy

Division QA Manager - Steven Harris

Regional, technical, or administrative managers may be delegated quality assurance responsibilities by the president on a project-specific basis. (Provide names of current personnel on PLG projects.)

Acceptable: Overlay, dated 9/26/95, on QA Manual, Page 14, (attachments B & D).

Los Angeles Regional Manager - Robert Campbell

Project Manager - Don Wesley

Project Auditor - Thomas Roche

Project Engineers - Dave Nakaki and Hassan Hadidi-Tamjed

Project Administrator - Jennifer Freiholtz

### 4. Design Control

#### 4.3 Calculations

The calculations shall be prepared by qualified personnel under supervision of the project engineer. They shall be checked for accuracy, adequacy, and compliance to the requirements of the applicable parts of project criteria by qualified personnel who did not originate the work.

Observation: Calc. No. 52340.02-C-002, Rev. No. 0, 49 pages total.

Project: EDF Containment Overpressure. Calc. Title: Containment Shell

Membrane Capabilities. Sht No. 2, dated 6/2/95. Awaiting checking per

TP-10Q, Revision 2, 2/14/95, Page 16 of 18, Checking Guidelines,

(attachment E).

4.4 Computer Programs

All active EQE computer programs are identified by a program name, revision number, level number, and revision release date.

N/A: No computer programs are required on the current Purchase Order.

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Sampling of other computer codes are provided on Log for Irvine Controlled  
Verified Computer Codes, 2HD298nb/14036-3.1 (attachment F).

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Modification to any EQE programs are performed by qualified personnel and are validated after each major modification.

(see 4.4 Computer Program above)

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4.5 Design Review

Design reviews are performed by qualified personnel, other than those who performed the original work, to provide an overview of the project results, and to verify the reasonableness of results and conclusions.

N/A: Only calculations are performed under this Purchase Order. (see 4.3

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Calculations)

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4.7 Interface Control

All technical or contractual correspondences to the client shall be signed by the project manager or designee. Work may be performed by consultants under the EQE QA Program. All work performed by consultants for the project is reviewed and audited along with calculations and drawings prepared by EQE engineers.

Observations: Under the new Revision No. 2 to this Purchase Order, the

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Project Manager will establish, implement, and maintain Interface Control in

---

accordance with AP-200Q, using Master File Index, similar to that for PLG/EDF

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Overpressure, No. 52340, X:WRF\52340MF (attachment G). (PLG Job No. 1540)

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Consultants are not used under this Purchase Order.

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4.8 Engineering Drawings

Each drawing shall receive an independent check by a qualified engineer.

N/A: No engineering drawings are prepared for under this Purchase Order.

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4.9 Reports

The project manager shall establish project report requirements and shall assign qualified personnel to prepare reports in accordance with established EQE quality procedures. The project manager shall assign qualified personnel to review reports for technical content and shall be responsible for approving the report.

N/A: No project reports have been prepared to date under this Purchase Order.

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5. Procurement Control

5.1 The purchase order shall be reviewed by the QA manager and the project manager to ensure that applicable technical criteria, design bases, and quality assurance requirements of EQE's clients are passed to the subcontractors.

N/A: No subcontractors are required on this Purchase Order.

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6. Instructions, Procedures, and Drawings

These EQE quality procedures and instructions are prepared by appropriate technical staff and are approved by the responsible technical or QA manager. Descriptions of these documents and their control are contained in other sections of this manual.

Acceptable: Sampling of approved procedures shown are as follows:

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Calculation Procedure, TP-10Q

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Reporting of Defects and Noncompliance, AP-110Q

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Interface Control, AP-200Q

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7. Document Control

7.2 Records Turnover

Project quality records generated by EQE during the course of a project may be turned over to the client during or at the completion of the project work. Such records shall be reviewed for legibility and completeness prior to the turnover to the client. EQE shall not retain records for client without specific agreement, and therefore, does not classify quality-related records as "Lifetime" or "Nonpermanent."

Observation: PLG Project Manager shall either (1) accept the original EQE  
calculations for storage, or (2) specify for EQE storage in the new Revision 3 to  
this Purchase Order under Quality Assurance requirements.

7.3 Document Storage

Copies of quality-related records generated by EQE shall be forwarded to the client or stored in separate locations when specified by client quality assurance requirements.

Observation: See item 7.2 above. When specified for EQE storage by the  
client's QA requirements, they are stored as follows:

1 set in storage at San Francisco.

1 set in storage locally at NBR.

9. Control of Nonconformances/Corrective Action

9.2 Responsibilities

Any employee of EQE who discovers a nonconformance to technical or quality requirements in a document controlled by this program shall identify the nonconformance and notify the QA manager who shall make final determination of whether or not a nonconformance exists.

Acceptable: No nonconformance reported under this Purchase Order. Sampling  
shown was for NCR No. 94-01, dated 9/13/94, on Project No. 52244.02 in Irvine  
Office. Finding was "QA requirements for the project unknown." Resolved,  
closed out and accepted on 6/23/95 (attachment H).



9.4 10CFR21 Reportability

The president is responsible for notifying the NRC of defects or noncompliance as defined and required by 10CFR21. (Posting requirements?)

Observation: 10CFR21.6, Posting Requirements, is not totally complied with;

(1) 10CFR Part 21, dated 1/1/93 [posted but outdated], (2) Section 206 [posted], and (3) Notice 15000-35/AP-110Q [posted].

Since this Purchase Order is for a project under a foreign client, the finding is classified as "observation."

The methods for conducting a preliminary safety evaluation, documenting the occurrence of defects or noncompliances, and notifying the client and the NRC are specified in EQE quality procedures.

Acceptable: EQE notification procedure is AP-110Q. To date no reporting has been initiated.

10. Quality Assurance Records

10.4 Storage

Records shall be filed in cabinets, with controlled access as directed by the QA manager. (How is access physically controlled?)

Acceptable: Building entry during office hours is controlled by the receptionist.

After hours, it is controlled by card-key entry. For monitoring entry into QA files by QA Administrator, see next item.

Each file location shall have provisions for sign-out of records by authorized personnel, showing who removed record, and when they were returned. (Does "authorized personnel" mean the person who authorizes the removal of records by unauthorized personnel, or any person who is preauthorized to remove the records?)

Acceptable: Access to all EQE Project files is permitted to all EQE project personnel. All non-EQE project personnel may gain access to EQE project files only through authorization of the Project Administrator or designee. Form "File Access," is displayed on the face of each file drawer (attachment I).



## 11. Audits

## 11.1 Project Audits

The QA manager shall be responsible for selection and assignment of qualified personnel to perform internal audits. An audit team shall consist of a lead auditor, and may have qualified members from the engineering staff who are not directly working on the project. [( 1) Use words, instead, such as "who are not directly involved in the work being audited, (2) how is "Lead Auditor" qualified, and (3) provide sampling of QA audit reports.]

Acceptable: Thomas R. Roche, Lead Auditor qualification is extended for one year, memo from QA Manager dated 2/13/95 (attachment J).

Finding: Douglas Freeland, Record of Lead Auditor Qualification, dated 9/23/94. (attachment K).

(1) No entries for "Examination," "Passed," and "Date."

(2) No signature/date for "Auditor Qualification Certified By" and "Date Certified."

(3) However, the form is signed/dated 9/23/94 in space for "Annual Evaluation."

Acceptable: No QA audit required to date under this Purchase Order. See item 11.2 below. Internal audits are performed every 6 months or at job closeout, whichever is sooner. Sampling of audit report observed is as follows:

QA Audit Report (Project); Audit No. 95-02; No. of Pages, 12.

Project: Robinson USI A-46 and IPEEE; Client, Carolina Power & Light Co.

Project No. 52212; Audit Date 6/19/95; Lead Auditor, Doug Freeland;

Corrective Action Required, No; Reportable under 10CFR21, No; Sign-off,

Lead Auditor 6/20/95, Project Manager 6/20/95, and QA Manager 6/23/95.

## 11.2 Schedules

A schedule of audits shall be maintained by the QA manager. (Provide sampling of recent audit schedule.)

Acceptable: Audit Schedule, July 1995, issued by Steven Harris, QA Manager.

Internal audits are performed every 6 months or at job closeout, whichever is sooner.

Observation: Under the new Revision No. 2 to this Purchase Order, closeout audit will be scheduled and performed by EQE.

11.3 Subcontractor Audits

Subcontractor audits EQE shall be performed on a selective basis or as requested by the client to ensure compliance to the quality assurance requirements designated in the subcontractor procurement documents.

N/A: No EQE subcontractors are required on the current Purchase Order.

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Lead Auditor:	<u><i>Ben Schriber</i></u>	Date:	<u>10/10/95</u>
QA Manager:	<u><i>W. C. Schriber</i></u>	Date:	<u>10/12/95</u>
Project Manager:	<u><i>W. C. Schriber</i></u>	Date:	<u>10/23/95</u>

Orig: Document Clerk

cc: Corporate Officer  
Sr VP Finance & Adm.  
VP Nuclear  
QA Manager

Project Manager  
Contract Administrator  
Lead Auditor

TJMikschl  
WAlbertson  
KRDeremer

### ATTENDANCE LIST

INITIAL INTERVIEW

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_ Affiliation \_\_\_\_\_

EXIT INTERVIEW

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Name \_\_\_\_\_ Title \_\_\_\_\_ Affiliation \_\_\_\_\_

ATTENDANCE LIST

INITIAL INTERVIEW

Date: 9/21/95

Time: 1 PM.

<u>Name</u>	<u>Title</u>	<u>Affiliation</u>
W. C. Seher	QA Manager	PLG Inc.
BEN SHIMIZU	LEAD AUDITOR	PLG
Tom Roche	Regional QA	EGE
Brandy Stott	Quality Assurance Admin.	EGE.

EXIT INTERVIEW

Date: \_\_\_\_\_

Time: \_\_\_\_\_

<u>Name</u>	<u>Title</u>	<u>Affiliation</u>
-------------	--------------	--------------------

## ATTENDANCE LIST

## INITIAL INTERVIEW

Date:

9/26/95

Time:

9 AM.

Name	Title	Affiliation
DAVID NAKAKI	PRINCIPAL ENGINEER	EQE
Tom Roche	QA coordinator	EQE
Brandy Stout	QA admin.	EQE
Jennifer Freyholtz	QA Admin	EQE
W.C. Behler	QA Mgr	PLG
Ben Shimizu	QA Lead Auditor	PLG

## EXIT INTERVIEW

Date:

9/26/95

Time:

10:30 AM

Name	Title	Affiliation
Greg Hardy	Senior Vice President	EQE
Tom Roche	EQE Coach	EQE
Brandy Stout	QA admin.	EQE
Steve P. Harris	QA M	EQE (Telecom)
Jennifer Freyholtz	QA Admin	EQE
W.C. Behler	QA Mgr	PLG
Ben Shimizu	QA Lead Auditor	PLG



ENGINEERS  
APPLIED SCIENTISTS  
MANAGEMENT CONSULTANTS

(A Member of  
The Failure Group, Inc.)

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November 16, 1995  
EDF-1540-PLG-40  
NOK-1594-PLG-61

BJGarrick  
HFPerla  
TUMarston  
EMWard  
RYDeremer  
WCGekler  
SBhimizu  
WLAAlbertson  
Client Files

Mr. Thomas R. Roche, P.E.  
Technical Manager  
EQE International  
Lakeshore Tower  
13101 Von Karman Avenue, Suite 400  
Irvine, CA 92715-1032

Reference: PLG letter dated October 12, 1995, Audit Finding Reports and Observations

Dear Tom:

#### EXTENSION OF AUDIT FINDING REPORTS RESPONSE DATE

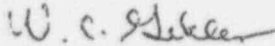
Change Order No. 2 to the PLG Purchase Order No. NB-1705 has been issued to Mr. George W. Reitter in your San Francisco Office on November 14, 1995. We hereby extend the subject response date within 30 days of your receipt of our change order.

Please respond by completing items 8 through 11 in the enclosed two (2) Audit Finding Reports also referred to in the above-referenced letter.

Please comply with the "Scheduled Corrective Actions Completion Date" so that we may verify your corrective actions as soon as practicable.

Very truly yours,

BShimizu/bkf  
E154040.WCG

  
Willard C. Gekler  
Quality Assurance Manager

Enclosures



1. AUDIT FINDING REPORT NO. 1                      2. AUDIT REPORT NO. 1594-3

3. REQUIREMENT: PLG Purchase Order No. NB-1705, Revision 0, Date 3/23/95, under QUALITY ASSURANCE, it is stated, "The work to be performed under this Purchase Order shall be in compliance with PLG QA Program, PLG-0223, in accordance with 10CFR50, Appendix B, including reporting requirements of 10CFR and 10CFR50.55(e)."

4. DESCRIPTION OF FINDING: For documentation, QA forms referenced in PLG-0223 have been substituted by equivalent EQE forms as referenced in EQE QA Manual, Revision 2, dated 11/15/91.

5. SUGGESTED CORRECTIVE ACTION: PLG will issue revision to the PLG Purchase Order NB-1705, Quality Assurance, stating as follows:  
"The work to be performed under this Purchase Order shall be in compliance with EQE QA Manual, Revision 2, November 15, 1991, in accordance with 10CFR50, Appendix B."

EQE shall establish, implement, and maintain the QA Program under this Purchase Order retroactive to the original date of March 23, 1995, all in accordance with EQE QA Manual, Revision 2, dated 11/15/91.

6. Brian J. [Signature]                      12/14/95                      7. [Signature]                      10/12/95  
INITIATED BY                      DATE                      QA MANAGER                      DATE

TO BE COMPLETED BY SUBCONTRACTOR

8. PROBABLE CAUSE: \_\_\_\_\_

9. CORRECTIVE ACTIONS: \_\_\_\_\_

10. SCHEDULED CORRECTIVE ACTIONS COMPLETION DATE: \_\_\_\_\_

11. \_\_\_\_\_  
APPROVED BY                      TITLE                      DATE

TO BE COMPLETED BY PLG

12. RESPONSE EVALUATED AND ACCEPTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

13. CORRECTIVE ACTIONS VERIFIED: \_\_\_\_\_

14. \_\_\_\_\_                      \_\_\_\_\_                      15. \_\_\_\_\_                      \_\_\_\_\_  
VERIFIED BY                      DATE                      QA MANAGER                      DATE

1. AUDIT FINDING REPORT NO. 2 2. AUDIT REPORT NO. 1594-3

3. REQUIREMENT: Section 11.1 Project Audits  
The QA manager shall be responsible for selection and assignment of qualified personnel to perform internal audits. An audit team shall consist of a lead auditor, and may have qualified members from the engineering staff who are not directly working on the project.  
[(1) Use words, instead, such as "who are not directly involved in the work being audited," and (2) how is "Lead Auditor" qualified?]

4. DESCRIPTION OF FINDING: Douglas Freeland, Record of Lead Auditor Qualification, Dated 9/23/94.  
(1) No entries for "Examination," "Passed," and "Date."  
(2) No signature/date for "Auditor Qualification Certified By" and "Date Certified."  
(3) However, the form is signed/dated 9/23/94 in space allocated for "Annual Evaluation."

5. SUGGESTED CORRECTIVE ACTION:  
Make proper entries for the missing data and responsible person to certify lead auditor qualification and make annual evaluation for Douglas Freeland.

6. Bruce D. [Signature] 10/10/95 7. W.C. [Signature] 10/12/95  
INITIATED BY DATE QA MANAGER DATE

TO BE COMPLETED BY SUBCONTRACTOR

8. PROBABLE CAUSE:

9. CORRECTIVE ACTIONS:

10. SCHEDULED CORRECTIVE ACTIONS COMPLETION DATE: \_\_\_\_\_

11. APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

TO BE COMPLETED BY PLG

12. RESPONSE EVALUATED AND ACCEPTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

13. CORRECTIVE ACTIONS VERIFIED:

14. \_\_\_\_\_ 15. \_\_\_\_\_  
VERIFIED BY DATE QA MANAGER DATE

PLG-0223, QUALITY ASSURANCE PROGRAM  
QA TRAINING RECORD

Page 1 of 2

Updated: 12-05-95

Name	QA Training Completed	Completed Score	1991 QA Retraining Completed	1992-94 QA Retraining Completed	1995-96 QA Retraining Completed	DCPRA Project QA Training Completed
W.L. Albertson	07-05-95	81	(N/R)(2)	11-22-91	11-20-95	(N/R)
M.S. Arjonilla	10-15-91	88	07-23-91	11-22-91		(N/R)
M.J. Abrams(B)	01-23-87	72	08-14-91	01-28-92		N/R)
R. Berger(PG&E)	(N/R)(2)		(N/R)(2)	(N/R)(2)		08-15-85
V.M. Bier(Ac)	10-22-85	91	04-04-91	02-02-92		07-29-86
*S.T. Celi(B)	10-03-95	80	(N/R)(2)	(N/R)(2)		(N/R)
*T.J. Celi(B)	10-10-95	96	(N/R)(2)	(N/R)(2)		(N/R)
D.L. Dato-On	02-09-95	86	(N/R)(2)	(N/R)(2)		(N/R)
R.K. Deremer(E)	10-22-85	100	08-14-91	12-20-91		(N/R)
A.A. Dykes	11-12-86	97	06-06-91	11-22-91		(N/R)
R.A. Dykes	09-28-90	83	09-05-91	01-20-92		(N/R)
M.A. Emerson(Albuq)	01-04-89	93	05-09-91	01-26-92		11-21-91
S.P. Fogarty	04-04-95	76	(N/R)(2)	(N/R)(2)	11-20-95	(N/R)
W.R. Fuller	10-22-85	96	04-04-91	12-20-91	11-20-95	(N/R)
J.F. Gabor(GK&Ac)	04-07-92	94	(N/R)(2)	07-10-92		(N/R)
B.J. Garrick	10-28-85	100	09-09-91	12-20-91	11-20-95	12-08-86
F. Gee(PG&E)	06-20-86	100	(N/R)(2)	(N/R)(2)		07-02-86
W.C. Gekler	10-29-85	99	04-04-91	(N/R)(1)	(N/R)(1)	01-30-86
T.D. Godkin(B)	08-22-95	79	(N/R)(2)	(N/R)(2)		(N/R)
D.H. Johnson	10-22-85	95	05-09-91	11-22-91	11-20-95	06-12-86

Quarterly Distribution:

*W.C. Gekler*      12/12/95  
-----  
QA Manager      Date

Legends:

- (\*) - New Person
- (Ac) - Associate
- (B) - Bethesda Office
- (E) - Encinitas Office
- (N/R) - Not required
- (N/R)(1) - Not required (Instructor)
- (N/R)(2) - Not required (Client, or prior to employment)

Orig: Document Clerk  
cc: Corporate Officer  
QA Manager  
EMWard  
SRMedhekar

TUMarston  
WRFuller  
WTloh  
KWoodard

DHJohnson  
MAEmerson  
DJWakefield  
TGBoyle

BShimizu

## QA TRAINING RECORD

Page 2 of 2

Name	QA Training Completed	Completed Score	QA Retraining Completed	QA Retraining Completed	QA Retraining Completed	DCPRA Project Completed
S. Kaplan(Ac)	10-22-85	92	04-04-91	12-20-91		01-07-87
M. Kenton(GK&Ac)	04-07-92	88	(N/R)(2)	10-19-92		(N/R)
J.P. Kindinger	01-12-87	94	05-09-91	11-22-91	11-20-95	01-09-87
W.M. Lardner	12-02-93	73	(N/R)(2)	10-11-94	11-20-95	(N/R)
*J. Leutz(B)	09-19-95	79	(N/R)(2)	(N/R)(2)		(N/R)
J. Lewis(B)	03-03-83	86	06-06-91	01-28-92		(N/R)
J.K. Liming	01-05-95	90	(N/R)(2)	(N/R)(2)	11-20-95	(N/R)
J.C. Lin	10-22-85	96	04-04-91	11-22-91	11-20-95	04-30-86
W.T. Loh	10-22-85	85	04-04-91	11-22-91	11-20-95	05-23-86
T.U. Marston	09-08-95	82	(N/R)(2)	(N/R)(2)		(N/R)
S.I. McKinney	02-22-90	78	06-06-91	11-22-91		02-24-89
S.R. Medhekar	09-28-90	80	04-04-91	12-20-91	11-20-95	12-05-91
S.R. Melvin	04-07-92	85	(N/R)(2)	09-03-92	11-20-95	(N/R)
T.J. Mikschl(E)	10-22-85	89	11-07-91	12-20-91	11-20-95	08-12-85
J.H. Moody(Ac)	03-07-91	92	04-04-91	02-05-92		(N/R)
M.B. Murray(GK&Ac)	04-07-92	78	(N/R)(2)	07-10-92		(N/R)
K.M. Nassan(Albuq)	04-24-92	82	(N/R)(2)	08-01-92		(N/R)
D.E. Naff(PG&E)	02-24-87	92	(N/R)(2)	(N/R)(2)		02-24-87
K.W. Naylor	10-22-85	78	04-04-91	11-22-91	11-20-95	(N/R)
K.R. Paxton(Ac)	06-09-94	73	(N/R)(2)	(N/R)(2)		(N/R)
H.F. Perla	10-22-85	96	04-04-91	11-22-91		08-15-85
*M. Pettipaw(B)	10-03-95	87	(N/R)(2)	(N/R)(2)		(N/R)
*M.J. Pine(B)	10-03-95	88	(N/R)(2)	(N/R)(2)		(N/R)
S.B. Rao	10-22-85	82	04-04-91	11-22-91		10-12-85
S.S. Rodgers	03-07-91	77	09-09-91	02-11-92		(N/R)
C.M. Roy	11-23-94	88	(N/R)(2)	(N/R)(2)		(N/R)
A. Sharon(GK&Ac)	04-07-92	70	(N/R)(2)	10-20-92		(N/R)
B. Shimizu(Ac)	10-15-86	100	(N/R)(1)	11-22-91	11-20-95	10-15-86
J.W. Stetkar	01-07-86	100	07-23-91	11-22-91		01-07-87
G.J. Stevenson(Ac)	05-08-87	88	04-04-91	01-13-92		(N/R)
M.K. Sun(ROCAEC)	05-03-89	89	(N/R)(2)	(N/R)(2)		(N/R)
R. Thierry(PG&E)	06-20-86	97	(N/R)(2)	(N/R)(2)		06-20-86
W.A. Thomas(GK&Ac)	04-07-92	91	(N/R)(2)	10-16-92		(N/R)
G.A. Tinsley	10-22-85	98	05-09-91	11-22-91	11-20-95	12-23-85
D. Vanover(GK&Ac)	04-07-92	90	(N/R)(2)	10-16-92		(N/R)
D.J. Wakefield(E)	10-22-85	97	04-04-91	12-20-91		08-12-85
E.M. Ward	10-28-85	92	08-14-91	11-22-91	11-20-95	(N/R)
L.L. Warren	03-04-94	79	(N/R)(2)	10-21-94	11-20-95	(N/R)
K. Woodard(B)	10-22-85	81	04-04-91	01-28-92		(N/R)
L. Xing	07-19-93	83	(N/R)(2)	11-26-94	11-20-95	(N/R)

NUCLEAR PROCUREMENT ISSUES COMMITTEE  
AUDIT CHECKLIST  
SUMMARY SHEET

Revision 6

Page 1 of 37

SUPPLIER INFORMATION					AUDIT SCOPE
SUPPLIER: P.L.G., Incorporated					ANSI N45.2 ( )
ADDRESS: 4590 MacArthur Blvd., Suite 400					ANSI N45.2.2 ( )
CITY, STATE AND ZIP CODE: Newport Beach, CA 92660-2027					ANSI N45.2.6 ( )
TELEPHONE NO.: (714) 863-3504		FAX NO. (714) 833-2085			ANSI N45.2.9 ( )
PRODUCT/SERVICE: Plant Risk Model Development and Analysis Services					ANSI N45.2.11 ( )
					ANSI N45.2.12 ( X )
CODE STAMP AND AUTHORIZATIONS: None					ANSI N45.2.13 ( X )
					ANSI N45.2.23 ( )
SUPPLIER CONTACTS					ANSI N101.4 ( )
SENIOR COMPANY OFFICER: DR. John B. Garrick, P. E.		TITLE: President & CEO		PHONE: (714) 863-3500	10CFR50 App. B ( X )
SENIOR QA OFFICER: Willard C. Gekler		TITLE: QA Manager		PHONE: (714) 863-3504	NUREG 0040 (No)
					IEEE 323 ( )
AUDIT INFORMATION					IEEE 344 ( )
LEAD UTILITY: Houston Lighting & Power					IEEE 383 ( )
AUDIT ID NO: 95-073 (VA)		AUDIT DATES: 09/11-14/95			ASME NCA 3800 ( )
					ASME NCA 4000 ( )
AUDIT TEAM INFORMATION					ASME SECT XI ( )
AUDIT TEAM	UTILITY	NAME	TITLE	TELEPHONE NO	ANSI/ASME NQA-1 ( X )
TEAM LEADER	HLP	J. E. Adkins	Staff Procurement Specialist	(512) 972-8516	SNT-TC-1A ( )
TEAM MEMBER	PGE	J. R. Harris	Procurement Auditor	(805) 545-4299	
TEAM MEMBER					OTHER:
TEAM MEMBER					
TECHNICAL SPECIALIST (SPECIFY DISCIPLINE)	HLP Risk & Reliability	A. M. Richards	Senior Engineer	(512) 972-7666	

Audit Team Leader J.E. Adkins Date 10-2-95

NUPIC Representative J.E. Adkins Date 10-2-95



RUPIC  
AUDIT CHECKLIST  
SUMMARY SHEET

SUPPLIER: PLG, Incorporated

AUDIT NO: 95-073 (VA)

Vendor QA Manual Quality Assurance Plan (PLG-0223)

Revision 23

Date 06/06/95

AUDIT SECTION	SECTION DESCRIPTION	C	E	QA PROGRAM REFERENCE	IMPLEMENTATION STATUS	COMMENTS/FINDING
I	ORDER ENTRY	/	/	QA Plan 2.2.2 & 2.2.4	S	
II	DESIGN	/	/	QA Plan 3.1	S	
III	SOFTWARE QUALITY ASSURANCE	/	/	See Sup'l SQA Ckt	S	
IV	PROCUREMENT	/	/	QA Plan 3.2 & 3.5	U	See VDR 95-019
V	MATERIAL CONTROL/HANDLING, STORAGE & SHIPPING	/	/	Not Applicable	Not Applicable	
VI	FABRICATION/ASSEMBLY/SPECIAL PROCESSES	/	/	Not Applicable	Not Applicable	
VII	TEST/INSPECTION	/	/	Not Applicable	Not Applicable	
VIII	CALIBRATION	/	/	Not Applicable	Not Applicable	
IX	DOCUMENT CONTROL/ADEQUACY	/	/	QA Plan 3.3 & 3.4	S	
X-A	ORGANIZATION/PROGRAM	/	/	QA Plan 2.1 & 2.2	S	
X-B	NONCONFORMING ITEMS/PART 21	/	/	QA Plan 4.	S	Nonconforming Items N/A to PLG, Inc.
X-C	INTERNAL AUDIT	/	/	QA Plan 7.	S	
X-D	EXTERNAL AUDIT	/	/	QA Plan 3.5 & 7	U	See VDR 95-019
X-E	CORRECTIVE ACTION	/	/	QA Plan 5.	S	
X-F	TRAINING/CERTIFICATION	/	/	QA Plan 3.6 & 7	U	See VDR 95-020
X-G	RECORDS	/	/	QA Plan 6.	S	

IMPLEMENTATION KEY

S = SATISFACTORY

U = UNSATISFACTORY

N/A = NOT APPLICABLE

C = Recommended Calibration Supplier Checklist  
E = Recommended Engineering Services Checklist



## SECTION I - ORDER ENTRY

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
1.1 Record the procedures/instructions and/or drawings used to verify implementation in this area. (Document O.E. on Figure 10)		
<p>1.2 Verify that Utility Purchase Order (PO) technical and quality requirements are correctly interpreted and translated on supplier's control documents (i.e. travelers, shop work orders, work tracking document including item description and part numbers). (Document O.E. on Figure 1)</p> <p>NOTE: Required testing to be verified in Section VII</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 4S-1 Vendor Program Ref: <u>QA Plan, Sections 2.2.2 &amp; 2.2.4</u></p>	<p>Order entry activities are performed by the Contract Administrator as required by Section 2, of the PLG QA Plan. The Contract Administrator initiates a "Job Master Detail" which identifies contract information including a Yes/No block to indicate if QA requirements are applicable. This document is also assigned an internal PLG Job/Task Number for tracking purposes. Additionally, a Project QA Startup Checklist is generated in accordance with PLG Procedure 101, Document Control System, Revision 12, dated 05/31/95. The Project QA Startup Checklist is prepared for the base contract and subsequent change orders. Customer quality requirements are transcribed into the Project QA Startup Checklist which is approved by the QA Manager, Software Development Manager, Project Manager, and the Contract Administrator. One instance was noted where PLG had not transcribed the requirement to supply a certificate of conformance. The certification was issued during the audit. As this was an isolated case, the audit team determined that no further action was required. Order entry was determined to be adequate and satisfactorily implemented.</p>	S
<p>1.3 Assure that the utility purchase order requirements which will not/cannot be met by supplier are promptly communicated back to the utility.</p> <p>This includes notification to utility of design deviations.</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Sec. III NQA-1 Supplement 4S-1, 7S-1 Vendor Program Ref: <u>QA Plan, Sections 2.2.2 &amp; 2.2.4</u></p>	<p>Any concerns related to the contract/order are promptly communicated back to the the customer. Verified by review of Fax PLG to PGE dated 09-07-94, requesting clarification of Change Order 6, to Contract 278-0013-90, and requesting a copy of PGE Procedure NRS CF2.HR1, which was invoked by this change. Also reviewed Fax PLG to Gosgen dated 04/25/94, regarding methodology/approach for performing analysis. This amendment number 5, was against (KKG) Gosgen Switzerland original contract (no number) dated 10-20-90. No other examples were readily available for review during the audit. This area was determined to be adequate and effectively implemented.</p>	S
<p>TEAM MEMBER: J. E. Adkins</p> <p style="text-align: right;">DATE: 09/11/95</p>		

(FIGURE 1)

CONTROL OF TECHNICAL/QUALITY REQUIREMENTS			
UTILITY P.O./TECH/QA REQUIREMENTS IMPOSED *1.2	UTILITY ITEM DESCRIPTION AND PART NUMBER *1.2	TRANSLATED TO SUPPLIER DOCUMENTS *1.2	CUSTOMER REQUIREMENTS TRANSLATED *1.2 YES/NO
YAE P. O. 16548, dated 05/22/95. No QA Requirements imposed. No indication as to whether the order was SR or NSR.	Service-Tailor Riskmen to YAE Specification Version 1.0, Revision 1, dated 04/11/95.	Job Master Detail, Job #1609 dated 05/22/95. Project QA Startup Checklist, Job #1609, dated 08/30/95.	Yes
SNC P. O. SN950008, dated 01/11/95, Safety Related, Invoked standard QA requirements per SNC Master Agreement SNP-0069, dated 07/01/94.	Service-Fire Analysis for Plant Hatch, Unit 2.	Job Master Detail, Job #1604 dated 05/22/95. Project QA Startup Checklist, Job #1604, dated 07/20/95.	Yes
HL&P P. O. ST-400258, Sup. #47, dated 03/29/95, Safety Related, standard QA requirements.	Service-Emergency Transformer Analysis for integration into PRA.	Job Master Detail, Job #1593, dated 02/22/95. Project QA Startup Checklist, Job #1593, dated 05/17/95.	Yes
(KKG) Goggen Switzerland Original Contract (no number) dated 10/20/90, Contract Amendment #5, dated 04/27/95, invoked PLG QA Plan PLG-0223.	Service-Update Goggen PSA Models to Riskmen 6.0.	Job Master Detail, Job #1590, dated 04/06/95. Project QA Startup Checklist, Job #1598, dated 07/05/95.	Yes
SNC P. O. 70168990000, dated 01/05/94, With change 2, dated 02/02/95, Safety Related, 10CFR21, standard QA requirements, PLG QA Plan PLG-0223.	Service-IPEEE Fire Analysis for Plant Vogtle.	Job Master Detail, Job #1523, dated 01/20/94. Project QA Startup Checklist, Job #1523, dated 02/24/95.	Yes
PGE P. O. 278-0013-90, Change Order #5, dated 09/04/93, SR, 10CFR21, 10CFR50, No Subcontracting. Change Order #6, dated 10/05/94, extended term of service and invoked PG&E's NRS Procedure NRS CF2.NR1 revision 0, Computer Programs.	Service-(1), Risk analysis and Riskman updates as requested. (2), PRA and IPEEE-Non-Safety.	Job Master Detail, Job #1525, dated 01/01/94. Project QA Startup Checklist dated 09/12/95, Job #1525.	Yes

\* Refers to applicable question.

TEAM MEMBER: J. E. Adkins

DATE: 09/14/95

## SECTION II - DESIGN

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
2.1 Record the procedures/instructions and/or drawings used to verify implementation in this area. (Document O.E. on Figure 10)		
<p>2.2 Verify that measures to control the translation of design requirements into design documents are implemented.</p> <p>a) Review engineering/production documents for inclusion of applicable technical and quality requirements.</p> <p>b) Verify inclusion of contractually identified design bases, (regulatory requirements, Code Requirements, codes, standards, EQ/Seismic Report Numbers, Analyses etc.) in design/quality documents.</p> <p>c) For suppliers with design responsibility/authority, verify that the design is supported by engineering/test data (i.e., calculations, performance test, etc.).</p> <p>NOTE: Evidence reviewed to be used in Sections III &amp; VI. (Document O.E. on Figure 2)</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Section 3.1</u></p>	<p>PLG does not perform design activities per se, nor do they produce design documents. Therefore, this question is not applicable when applied strictly to design attributes of systems, structures, and components. When applied to software design, however, these checklist items are applicable and for the most part are addressed in the Supplemental Checklist for Software Development Section III. A brief comment about each subsection of this checklist item when applied to software design is given below.</p> <p>a) No new production codes have been developed at PLG since the last MUPIC audit. The PLG job listed in Figure 2 and Problem Reports listed in Figure 4 of the supplemental section III checklist were reviewed for proper incorporation of design requirements. PLG adequately included applicable technical and quality requirements when processing work packages and/or PRs to production codes for (RISKMAN).</p> <p>b) Work packages reviewed adequately included contractually identified requirements. Design specifications for production code development and revisions thereto are provided for in Procedure 105. For code revisions (PRs), design specifications were adequately incorporated by PLG.</p> <p>c) PLG's software QA program provides adequate assurance that software design is fully documented and supported by a sound technical background. These attributes, as they relate to activities performed by PLG are adequate and are being effectively implemented.</p>	S
<p>2.3 Verify that measures are established and implemented for the selection and review for suitability of application, of materials, parts, equipment and processes that are essential to the safety related function of the product.</p> <p>If the supplier's safety-related components have parts classified as non-safety related, the following items should be considered:</p> <p>a. Is the process controlled?</p> <p>b. Is a functional evaluation approach used?</p> <p>c. Has the evaluation included analysis of failure modes to assure the parts failure would not prevent the component from performing its safety related function?</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>Not Applicable</u></p>	<p>Not Applicable to PLG, Incorporated. Scope of work is for services and does not include hardware.</p>	N/A
<p>TEAM MEMBER: <u>A. M. Richards, J. E. Adkins</u></p> <p>DATE: <u>09/13/95</u></p>		

## SECTION II - DESIGN

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>2.4 Verify that measures are established and implemented for the identification and control of design interfaces.</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Section 3.1</u></p>	<p>The PLG QA Plan establishes adequate measures for the identification and control of design interfaces. Since PLG is a small company, design interfaces are limited to memos, letters, phone calls, etc. between specified technical contacts and/or the client.</p>	S
<p>2.5 Verify that measures are established and implemented for the verification of design adequacy.</p> <p>a) Assure the verification method used is identified (design review, alternate calculations or test) and that the verification is performed by individuals or groups other than those who performed the original design, but who may be from the same organization.</p> <p>b) When the verification method used is qualification test, verify that a prototype unit is tested under the most adverse design conditions. (Document O.E. on Figure 2)</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Section 3.1</u></p>	<p>a) All verifications performed are by independent technical reviews which are documented on a Technical Review Report (TRR). Verified by review of the work package identified on Figure 2. See Section III Supplemental Checklist Item 4 and Figure 4 for assessment of software verification.</p> <p>b) This attribute is not applicable to PLG activities. PLG does not produce hardware and/or perform qualification testing.</p>	S
TEAM MEMBER: A. M. Richards/J. E. Adkins		DATE: 09/13/95



## SECTION II - DESIGN

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>2.6 Verify that measures are established and implemented to control design changes including changes for spare/replacement parts. (Document O.E. on Figure 2)</p> <p>a) Review revised design documents, (e.g. calculations, drawings, stress reports), to verify that design changes are made using design control measures equal to those of the original design.</p> <p>b) Ensure that design changes have been adequately evaluated to assure that the impact of the change is carefully considered (i.e. performance, interchangeability and qualification).</p> <p>c) Review design changes to verify that they were reviewed and approved by the same organization as originally reviewed and approved, or by other knowledgeable, qualified and designated organization.</p> <p>d) Verify that utility approval of design changes is obtained if required by the utility procurement document. (Document O.E. on Figure 2)</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Section 3.1</u></p>	<p>a, b, c) See Section III Supplemental Checklist Item 8 for assessment of PLG's measures for revision to production codes.</p> <p>d) Not applicable. Procurement documents reviewed did not require approval by the customer.</p>	S
<p>2.7 For equipment qualified by prior testing, verify that when material substitutions or modifications (including changes for spare parts) are made the following are considered:</p> <p>1) Prior qualification tests are reviewed to determine the effect on the item qualification.</p> <p>2) Evaluations to indicate whether or not new qualification tests are required.</p> <p>3) Justifications for not having to perform new qualification tests are documented. (Document O.E. on Figure 2)</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>Not Applicable</u></p>	<p>Not Applicable to PLG, Incorporated. Scope of work is for services and does not include equipment, material, or spare replacement parts.</p>	N/A
<p>TEAM MEMBER: A. M. Richards/J. E. Adkins</p>		<p>DATE: 09/13/95</p>



## SECTION II - DESIGN

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>2.8 Verify and assess the suppliers controls for dedication of manufactured/purchased Commercial Grade Items (CGI) such that critical characteristics are determined. Determine adequacy of identified critical characteristics. (Control of Procurement accomplished in Section IV). (Inspection/testing for acceptance/dedication reviewed in Section VII). (Document D.E. on Figure 3)</p> <p>NOTE: This question applies to CGI's dedicated by the supplier for utility procurement as basic components (this does not address items sold by suppliers as CGI which require utility dedication).</p> <p>Appendix B/ANSI W45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 7S-1 Vendor Program Ref: <u>Not Applicable</u></p>	<p>Not applicable to PLG, Incorporated. See Checklist Item 2.7.</p>	<p>N/A</p>
<p>TEAM MEMBER: A. M. Richards/J. E. Adkins</p>		<p>DATE: 09/13/95</p>

SECTION II - DESIGN  
(FIGURE 2)

DESIGN DOCUMENT	BASES	SUPPORTED BY ENG/TEST DATA	METHOD OF DESIGN VERIFICATION	DESIGN CHANGE CONTROL AND REV/DATE	UTILITY APPROVAL DOCUMENTATION
*2.2 PLG Job #1523, IPEEE-SMC Vogtle	*2.2 SMC P. O. 70168990000-IPEEE Fire Analysis for Plant Vogtle, Project QA Startup Checklist Job #1523	*2.2 TRR-1523-TRR-03	*2.5 Hand Calculations	*2.6 2.7 N/A In-process	*2.6 N/A-Not Required

\* Refers to applicable question.

MUPIC  
AUDIT CHECKLIST

SECTION II - DESIGN  
(FIGURE 3)

COMMERCIAL GRADE ITEMS		
ITEM DESCRIPTION (P/N, S/N/Model No., etc.) *2.8	CRITICAL CHARACTERISTICS *2.8	METHOD(S) OF DEDICATION *2.8
Not applicable to PLG, Incorporated. See Checklist Item 2.7.		
* Refers to applicable question.		

SECTION 4  
 SUPPLEMENTAL  
 CHECKLIST  
 FOR  
 SOFTWARE DEVELOPMENT

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS												
<p>1. Record Procedures, Instructions &amp; Drawings used to verify implementation in this area.</p> <p>(Document O.E. on Figure 10).</p>														
<p>2. Verify that measures are established and implemented to assure that the software QA program consists of a systematic life cycle process including phases such as development of a plan for software QA, requirements, design, testing of the code, operation and maintenance.</p> <p>NOTE: The life cycle phases should proceed in a traceable, planned, and orderly manner. The number of phases and relative emphasis placed on each phase will depend on the nature and complexity of the software.</p> <p>Appendix B/ANSI N45.2 Ref: (3/4)                  ASME Section III                  NQA-1 Supplement 3S-1                  Vendor Program Ref: <u>QA Plan, Sections 2.2.6, 2.2.7, 2.2.8, &amp; 3.1</u></p>	<p>Procedure 105, "Production Code Quality Assurance" establishes the quality assurance responsibilities and certification requirements for production codes used by PLG. Responsibilities are delineated for the following positions:</p> <table border="0" data-bbox="1208 702 1896 842"> <tr> <td>Project Manager</td> <td>Production Code User</td> </tr> <tr> <td>Software Development Manager</td> <td>Computer Operations Manager</td> </tr> <tr> <td>Production Code Specifier</td> <td>Software Librarian</td> </tr> <tr> <td>Production Code Programmer</td> <td>Quality Assurance Manager</td> </tr> <tr> <td>Production Code Verifier</td> <td>Software QA Coordinator</td> </tr> <tr> <td>Code Verification Reviewer</td> <td></td> </tr> </table> <p>Programs are established for production code development, verification, certification, and revision. Project deliverables are also discussed, while delivery procedures are outlined in Procedure 107, "Documents and Software Review, Approval, and Transmittal." PLG satisfactorily fulfills the requirements of a software QA program consisting of a systematic life cycle process.</p> <p>(Continued)</p>	Project Manager	Production Code User	Software Development Manager	Computer Operations Manager	Production Code Specifier	Software Librarian	Production Code Programmer	Quality Assurance Manager	Production Code Verifier	Software QA Coordinator	Code Verification Reviewer		<p>S</p>
Project Manager	Production Code User													
Software Development Manager	Computer Operations Manager													
Production Code Specifier	Software Librarian													
Production Code Programmer	Quality Assurance Manager													
Production Code Verifier	Software QA Coordinator													
Code Verification Reviewer														
<p>3. Verify that measures are established and implemented to assure that the software QA program provides for the review and approval by appropriate personnel, at defined steps in the software development life cycle. Assure that the reviewer(s) are independent of those who developed the software.</p> <p>Appendix B/ANSI N45.2 Ref: (3/4)                  ASME Section III                  NQA-1 Supplement 3S-1                  Vendor Program Ref: <u>QA Plan, Sections 2.2.6, 2.2.7, 2.2.8, &amp; 3.1</u></p>	<p>Procedure 105 outlines the review and approval process throughout the software development life cycle for production codes. Requirements for various reviewers ensure that they are independent of the software developers. Therefore, PLG's software QA program provides sufficient review and approval by independent reviewers of production codes.</p> <p>Review of analyst programs is discussed in Procedure 104 which states that "[o]rdinarily, independent reviewers shall be persons other than those directly performing the work being reviewed."                  See Figure 4 for documents reviewed.</p>	<p>S</p>												
<p>TEAM MEMBER: A. M. Richards/J.E. Adkins</p> <p style="text-align: right;">DATE: 09/13/95</p>														

SECTION III  
SUPPLEMENTAL  
CHECKLIST  
FOR  
SOFTWARE DEVELOPMENT  
CONTINUATION PAGE

Section III Item 2 (Continued)

Analyst codes are discussed in Section 3.1 of the QA Plan. Independent technical review of analyst programs are performed per Procedure 104, "Independent Technical Reviews." Since analyst program are usually relatively simple macros or programs, a formal detailed life cycle phase is not delineated. Typically, an analyst code is developed based on a programmer's needs, and before it is used in safety-related work, an independent technical review is performed. See Figure 4 for documents reviewed.



SECTIG. I  
SUPPLEMENTAL  
CHECKLIST  
FOR  
SOFTWARE DEVELOPMENT

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>4. Verify that measures are established and implemented to assure that software verification is performed at defined steps in the development life cycle. A verification plan should be written and approved prior to implementation. The verification shall ensure the products of a given cycle phase fulfill the requirements of the previous phase or phases. Assure the verification activities are performed by individuals other than those who designed the software and that the results are documented.</p> <p>(Document O.E. on Figure 1)</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Sections 2.2.6, 2.2.7, 2.2.8, &amp; 3.1</u></p>	<p>The concepts of verification and validation are so closely related that in many instances they can be discussed together. According to PLG Procedure 105, a Production Code Verifier is assigned by the Project Manager and Software Development Manager. Per procedure, this verifier cannot be the Production Code Programmer. The Verifier:</p> <ol style="list-style-type: none"> <li>1) develops a test plan (both for new production codes and revisions to production codes);</li> <li>2) checks that the code meets the specification requirements;</li> <li>3) reviews the User Manual for completeness and accuracy;</li> <li>4) designs and runs sample problems;</li> <li>5) checks the Programmer's sample problems;</li> <li>6) documents hand calculations;</li> <li>7) document the verification process; and</li> <li>8) prepares a Verification Package.</li> </ol> <p>The Software Development Manager and Software QA Coordinator review the verification and the Software Librarian reproduces the code and enters it into the master software library. (Continued)</p>	S
<p>5. Verify that measures are established and implemented to assure that software validation is performed to ensure that the software satisfies the requirements. A validation plan should be written and approved prior to implementation. Assure the results of the validation activities are evaluated by individuals other than those who designed the software and that the results are documented.</p> <p>(Document O.E. on Figure 1)</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Sections 2.2.6, 2.2.7, 2.2.8, &amp; 3.1</u></p>	<p>See checklist item 4 above and continuation page.</p>	S
<p>6. Verify that measures are established and implemented to assure that configuration baselining is defined at the completion of each major phase of the development life cycle. Assure approved changes created subsequent to a baseline are added to the baseline. Verify the baseline defines the most recent approved software configuration.</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Sections 2.2.6, 2.2.7, 2.2.8, &amp; 3.1</u></p>	<p>Configuration baselining is controlled by the Project Manager. He makes the decisions concerning which problem reports will be included in the next revision to the code. He also determines whether an update is major (e.g., 5.x to 6.0) or minor (e.g., 5.x to 5.x+1). Although this process is not formally proceduralized, PLG is such a small organization that there would be no confusion concerning which problem reports or changes are encompassed in production code updates. Also, the Software Librarian maintains a database showing the status of all problem reports. Upon completion of a new version of a production code, the database is updated to show which Problem Reports were closed or completed in that version. PLG adequately and effectively implements baseline configuration requirements. See Figure 4 for documents reviewed.</p>	S

SECTION III  
SUPPLEMENTAL  
CHECKLIST  
FOR  
SOFTWARE DEVELOPMENT

CONTINUATION PAGE

Section III Item 4 (Continued)

A Verification/Validation plan for production codes is not written and approved prior to implementation. However, the Verification/Validation plan is reviewed for satisfactory completion by an independent reviewer prior to certification of the Production Code/Revision.

Verification and validation of analyst programs is discussed in Procedure 104. The independent review which is performed is sufficient for the certification of analyst programs.

PLG adequately meets the requirement of Verification and Validation through their verification and certification processes. See Figure 4 for documents reviewed.

SECTION I  
SUPPLEMENTAL  
CHECKLIST  
FOR  
SOFTWARE DEVELOPMENT

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>7. Verify that measures are established and implemented to assure that the software and documentation baselines are uniquely labeled to identify changes to the configuration by revision (e.g., version #). Labeling shall provide the ability to reconstruct the configuration of the software for any date during which the software was qualified for use.</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Sections 2.2.7 &amp; 3.1</u></p>	<p>As stated in Checklist Item 6, production code software is logically labeled, and each version or revision is stored in a master software library on Bernoulli Disk. Therefore, labeling requirements are adequate and being effectively implemented by PLG. Verified by visual observation of Bernoulli disk through version 6.01, dated 07/18/95 which are maintained in the Software Library.</p>	S
<p>8. Verify that measures are established and implemented to assure that the changes to software are formally documented, evaluated and approved by the organization responsible for the original software development. Verify the changes are controlled commensurate with those applied to the original software development. Assure the change is appropriately reflected in software documentation and traceability is maintained.</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Section 3.1</u></p>	<p>Procedure 105 states in Section 2.4 that "[m]ajor code revisions shall be prepared in accordance with the production code specification ... using the normal code verification and certification procedure described in Sections 2.1 through 2.3." Sections 2.1 through 2.3 of Procedure 105 cover Code Development, Code Verification and Verification Review, and Production Code Certification. Therefore, by processing changes to Production Codes to the same standards as the original development, PLG ensures that changes to software are adequately and effectively documented, evaluated, approved, verified and validated. Verified by review of the PRs identified in Figure 4.</p>	S
<p>9. Verify that measures are established and implemented to assure that software verification and validation activities are performed as necessary for the change. These measures shall assure the change does not impact the software's intended function.</p> <p>Note: Hardware (platform dependence) is an integral part of the verification and validation process and should be considered when components must be changed.</p> <p>Appendix B/ANSI N45.2 Ref: (3/4) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Section 3.1</u></p>	<p>As stated in item 8 above, Procedure 105 states in Section 2.4 that "[m]ajor code revisions shall be prepared in accordance with the production code specification ... using the normal code verification and certification procedure described in Sections 2.1 through 2.3." Sections 2.1 through 2.3 of Procedure 105 cover Code Development, Code Verification and Verification Review, and Production Code Certification. Therefore, by processing changes to Production Codes to the same standards as the original development, PLG ensures that changes to software are adequately and effectively documented, evaluated, approved, verified and validated. Verified by review of the PRs identified in Figure 4.</p> <p>Note: PLG, Incorporated does not produce hardware.</p>	S
TEAM MEMBER: A. M. Richards/J. E. Adkins		DATE: 09/13/95

SECTION III  
SUPPLEMENTAL  
CHECKLIST  
FOR  
SOFTWARE DEVELOPMENT

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>10. Verify that measures are established and implemented to assure that the software errors and failures from <u>both</u> internal and external sources are identified, documented, evaluated, and assessed for impact on past and present applications. Verify this problem reporting system assures methods of notification are identified and problems are promptly reported to affected organizations, including users.</p> <p>Note: Error notifications may be provided as part of a maintenance agreement.</p> <p>(Document D.E. on Figure 1)</p> <p>Appendix B/ANSI N45.2 Ref: (15/16,16/17) ASME Section III NQA-1 Basic Requirement 15,16 Vendor Program Ref: <u>QA Plan, Sections 3.1 &amp; 5.1</u></p>	<p>The Problem Report (Form 105-2a) is used by PLG to document and evaluate identified problems with RISKMAN. Although the end user (e.g., utilities) may fill out a Problem Report and forward it to PLG, a more likely scenario is that the end user contacts PLG by telephone or fax and describes the identified problem. Then, PLG would initiate the Problem Report and process it to completion. If an identified problem is deemed serious enough by the Project Manager, then, as a minimum, members of the RISKMAN Technology Group (RTG) would be notified of the problem and either a solution or a work-around would be provided. Generally, several non safety-related Problem Reports are completed, and at a time specified by the Project Manager, the corrected code is distributed to the affected users as a new revision to the code.</p> <p>There are currently no completed Problem Reports which have been processed to the latest revision of Procedure 105. However, the most recent Problem Reports which were completed and issued as RISKMAN Version 6.01 were reviewed and found to have been processed in a manner which adequately meets the requirements of this item. It should also be noted that since most, if not all, Problem Reports generated against production codes require a revision to the code, then the resolution of the Problems is processed as changes to the code. As stated in the assessment of Items 8 &amp; 9 in this checklist, PLG adequately processes and reviews changes to software. See Figure 4 for PRs reviewed.</p>	S
<p>11. Verify that the released software program is utilized as intended by the originating software design organization.</p> <p>Appendix B/ANSI N45.2 Ref: (3,4/16,17) ASME Section III NQA-1 Supplement 3S-1 Vendor Program Ref: <u>QA Plan, Section 3.1</u></p>	<p>In the development, revision, and testing/verification of Production Computer Codes, several commercial computer software products are used. Software products used in the development of RISKMAN include: QEMM (memory manager), DOS (operating system), AREV (database engine), and Easyflow (graphical fault tree interface). Although PLG has not verified these products separately, by verifying the individual modules of RISKMAN which contain or use these products, PLG has indirectly verified the performance of these commercial software products.</p> <p>It is the determination of the audit team that software used by PLG, is utilized as intended by the software designer.</p>	S
<p>TEAM MEMBER: A. N. Richards/J. E. Adkins</p> <p style="text-align: right;">DATE: 09/13/95</p>		



SECTION II  
SUPPLEMENTAL  
CHECKLIST  
FOR  
SOFTWARE DEVELOPMENT

SUPPLIER: PLG, IncorperateAUDIT NO: 95-073 (VA) PAGE 17 OF 37

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>12. Verify that measures are established and implemented to assure that software procured as safety-related or commercial grade is capable of performing its intended function.</p> <p>(Document O.E. on Figure 1)</p> <p>a) When software is procured as safety related, verify adequate controls are in place (i.e. acceptable supplier qualification, procurement practices and receipt inspection) to ensure that the supplier is providing software that meets the specified technical and quality requirements. The purchaser's audit of the software supplier shall ensure that verification and validation is controlled, documented, and adequate when considering the intended function of the software.</p> <p>b) For software procured as a commercial grade item, assure that dedication activities such as verification and validation are performed and documented to ensure the software functions as intended.</p> <p>Appendix B/ANSI M45.2 Ref: (7/8) ASME Section III Vendor Program Ref: <u>QA Plan, Sections 3.2 &amp; 3.5</u></p>	<p>a) Per Computer Operations, no outside safety-related software packages have been procured by PLG since the last NUPIC audit (12/93). However, portions of the RISKMAN code have been contracted out. In such cases, the code is verified and tested under the PLG Software QA Program, thus meeting all applicable requirements. [Per RISKMAN 6.0 Problem Report No. 880 -- all applicable forms were PLG forms (Problem Report, Analyst Report, Maintenance Log, and Verification)].</p> <p>b) Procedure 106, "Procurement of Engineering Services and Computer Software," Section 4, discusses requirements for purchased computer software. The requirements are to "[e]scertain that 'error reporting' is automatically included in the supplier's software warranty ... or [i]ncorporate PLG standard terms and conditions for 'error reporting' in the purchase order." Further clarification from Computer Operations, indicates that professional experience with the commercial titles is a factor in determining the handling of "error reporting" (i.e., whether formal PLG "error handling" is necessary). The verification and validation of commercial software products is discussed in the assessment of Checklist Item 11.</p> <p>PLG adequately assures that software purchased either as safety-related or commercial is capable of performing its intended function.</p>	S
<p>13. Verify documents such as: user manuals, theory manuals, verification manuals, programmers manuals are appropriately controlled, available to users of the software, and updated when impacted by software revisions.</p> <p>Appendix B/ANSI M45.2 Ref: (5,6/6,7) ASME Section III NQA-1 Supplement 6S-1 Vendor Program Ref: <u>QA Plan, Sections 2.2.8, &amp; 3.4</u></p>	<p>RISKMAN User Manuals are controlled and available to RISKMAN users. One of the responsibilities of the Production Code Programmer per Procedure 105, Section 1.4 is that he "[p]repare a production code user manual ... or, ... other guidelines acceptable to the client or appropriate for the code format and use. The accuracy and usefulness of the manual or guideline is verified concurrently with code verification.</p> <p>See checklist item 10.A.4</p>	S
<p>14. Describe the policies/practices that the supplier has instituted to control software viruses and prevent viruses from entering the supplier's system and, possibly, infecting customers. The process should be capable of being updated to assure new viruses will be detected.</p>	<p>PLG Administrative Procedures AP-33 and AP-34 discuss Virus Procedures and Virus Procedures for Software. These procedures ensure that PLG owned and operated computers (including laptops) are rebooted at least once a week, and virus software (controlled in the AUTOEXEC.BAT) is allowed to scan the boot sector and root directory of the local hard drives. Also, any diskette sent outside of PLG is scanned for viruses and verified clean by labeling and initialing the diskette. PLG Computer Operations Staff members are required to install virus information updates within 1 month of receipt on all machines. Also, writable volumes on a network server are scanned for viruses at least bimonthly.</p>	
<p>TEAM MEMBER: A. M. Richards/J. E. Adkins</p> <p>DATE: 09/13/95</p>		



SECTION III  
SUPPLEMENTAL  
CHECKLIST  
FOR  
SOFTWARE DEVELOPMENT

SUPPLIER: PLG, IncorporatedAUDIT NO: 95-073 (VA) PAGE 18 OF 37

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY
<p>15. Describe the suppliers controls over:</p> <ul style="list-style-type: none"> <li>• The mass duplication of codes, including labeling, revision control, media and checksums.</li> </ul> <p>(Are duplicated copies <u>exact</u> duplicates of production copy originals?)</p> <ul style="list-style-type: none"> <li>• Retirement of the software code; Does retirement of software codes include such items as information about storage location, labeling, media stability, restricted access.</li> </ul>	<p>Mass duplication of codes is performed from a master source copy on Bernoulli Disk to 3.5" floppy diskettes. Ordinary PC workstations are used to copy to the floppies either straight from the Bernoulli or via a subdirectory on a hard drive. For single distributions of a code, the floppy copies are tested on a PC. For mass distributions, spot checks are made on the floppy diskettes. As stated in the assessment of Checklist Item 14 above, each floppy diskette that leaves PLG is virus checked and labeled and initialed to indicate that it is clean. Duplicate copies of production copy originals are exact copies.</p> <p>Currently, there have been no retired production codes at PLG.</p>
<p>TEAM MEMBER: A. M. Richards/J. E. Adkins</p>	<p>DATE: 09/13/95</p>

(FIGURE 4 SUPPLEMENTAL)

SOFTWARE PROGRAM (NAME, NO., REV./DATE)	PROGRAM END USE (E.G. DESIGN, PROD, CAL, ACCEPTANCE)	VERIFICATION	VALIDATION	ERROR NOTIFICATION DOCUMENT
RISKMAN - Revision 6.01, dated 07/18/95. Problem Report #903 Problem Report #910 Problem Report #911 Problem Report #913 Problem Report #914 Problem Report #919	Risk Analysis	4,9 Hand Calculations Hand calculations Hand Calculations Hand Calculations Hand Calculations Hand Calculations	5,9 Hand Calculations and Test Run Hand Calculations and Test Run Hand Calculations and Test Run Hand Calculations and Test Run Hand Calculations and Test Run Hand Calculations and Test Run	10 Problem Report #903 Problem Report #910 Problem Report #911 Problem Report #913 Problem Report #914 Problem Report #919
* Refers to applicable question.				
TEAM MEMBER: A. M. Richards/J. E. Adkins DATE: 09/13/95				

## SECTION IV - PROCUREMENT

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
4.1 Record the procedures/instructions and/or drawings used to verify implementation in this area. (Document O.E. on Figure 10)		
<p>4.2 Verify that measures are established and implemented to assure that applicable requirements are included in documents for procurement of items including spare and replacement parts and services.</p> <p>Verify that Vendor's procurement documents, including changes, include provisions for the following, as applicable:</p> <ol style="list-style-type: none"> <li>Statement of the scope of work.</li> <li>Technical requirements by reference to specific drawings, codes, specifications.</li> <li>Requirement for a documented quality assurance program, implemented, and meeting applicable code/regulatory requirements.</li> <li>Requirement for right of access to plant facilities and records for source inspection/audit.</li> <li>Identification of documentation required.</li> <li>Requirement for reporting and approving disposition of nonconformances.</li> <li>Requirements for records availability, retention and disposition.</li> <li>Requirements for extending applicable requirements to lower tier suppliers.</li> <li>Applicability of 10CFR21. (Document O.E. on Figure 5)</li> </ol> <p>Appendix B/ANSI N45.2 Ref: (4/5) ASME Section III NQA-1 Supplement 4S-1 Vendor Program Ref: <u>QA Plan, Section 3.2</u></p>	<p>Measures for control of procurement are addressed in Procedure 106, Procurement of Engineering Services and Computer Software, Revision 13, dated 05/31/95. These measures contain provisions for invoking the applicable requirements of items a. through i. PLG, Incorporated does not procure spare/replacement parts. No nuclear safety related orders were available for review during the audit. Interviews with PLG personnel indicated that no nuclear safety related engineering services or computer software for nuclear safety related application had been procured since the last NUPIC Audit. Two (2) purchase orders (identified on Figure 5) associated with work task for foreign utilities which are processed in a similar manner, were reviewed to verify satisfactory implementation of this activity. This review determined that PLG is adequately and effectively implementing the applicable requirements of Procedure 106 as it relates to the content of procurement documents.</p>	S
<p>4.3 Verify implementation of the system used to control and release procurement documents, including changes.</p> <p>Appendix B/ANSI N45.2 Ref: (6-7) ASME Section III NQA-1 Supplement 4S-1 Vendor Program Ref: <u>QA Plan, Section 3.2</u></p>	<p>Procurement documents, including changes thereto are controlled and released in accordance with the requirements identified in Procedure 106, Procurement of Engineering Services and Computer Software, Revision 13, dated 05/13/95. No nuclear safety related orders were available for review during the audit. Interviews with PLG personnel indicated that no nuclear safety related engineering services or computer software for nuclear safety related application had been procured since the last NUPIC Audit. Two (2) purchase orders (identified on Figure 5) associated with work task for foreign utilities which are processed in a similar manner, were reviewed to verify satisfactory implementation of this activity. This review determined that PLG was adequately and effectively implementing the applicable requirements of Procedure 106 as it relates to the control and release of procurement documents or changes thereto.</p>	S
<p>TEAM MEMBERS: <u>J. E. Adkins</u></p>		<p>DATE: <u>09/12/95</u></p>

## SECTION IV - PROCUREMENT

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>4.4 Verify that measures are established and implemented for the evaluation, selection and assessment of suppliers (including distributors and calibration, NDE, testing labs, heat treatment services suppliers) consistent with the importance, complexity and quality of the product or service.</p> <p>a. Verify evaluations are performed 1) prior to award of contract, 2) at the specified frequency, and 3) ensure only approved suppliers are used.</p> <p>b. Verify that the scope of approval of the sub-supplier is commensurate with the requirements of the procurement documents. (Document O.E. on Figure 5)</p> <p>Appendix B/ANSI N45.2 Ref: (7/8) ASME Section III NQA-1 Supplement 7S-1 Vendor Program Ref: <u>QA Plan, Section 3.5</u></p>	<p>Procedure 106, Procurement of Engineering Services and Computer Software, Revision 13, dated 05/31/95 contains measures for meeting these requirements. No nuclear safety related orders were available for review during the audit. Interviews with PLG personnel indicated that no nuclear safety related engineering services or computer software for nuclear safety related application had been procured since the last NUPIC Audit. Two (2) purchase orders (identified on Figure 5) associated with work task for foreign utilities which are processed in a similar manner, were reviewed to verify implementation of this activity. However, this review determined that an audit of EGE International had not been conducted for PLG P.O. NB-1667, Job #1540, which has been in-process 2 - 3 months or longer. The PLG QA Program requires an audit of subcontractors work to be performed within thirty days of work start.</p>	<p>U VDR 95-019</p>
<p>4.5 Verify that measures are established and implemented to assure that purchased material, equipment and services conform to the procurement documents (i.e., receipt inspection) (Document O.E. on Figure 5)</p> <p>NOTE: Record M&amp;TE observed or in use and inspection personnel on figure 5.</p> <p>Appendix B/ANSI N45.2 Ref: (7/8) ASME Section III NQA-1 Supplement 7S-1 Vendor Program Ref: <u>QA Plan, Section 3.5</u></p>	<p>Measures are established in Procedure 106, which provides for acceptance by any or all of the following methods: Source selection based on onsite evaluation; Source evaluation and selection based on past performance; Technical verification of the data produced in accordance with PLG Procedures; Surveillance and/or audit of the contracted services; Review of objective evidence for conformance to PLG or subcontractor QA Program, as applicable. No nuclear safety related orders were available for review during the audit. Two (2) purchase orders (identified on Figure 5) associated with work task for foreign utilities which are processed in a similar manner, were reviewed to verify implementation of this activity. Both orders reviewed had the method of acceptance adequately identified in accordance with the above procedure. However, it should be noted that no deliverables have been provided as of the date of this audit.</p>	<p>S</p>
<p>4.6 Verify where acceptance of material from an ASME certificate holder is based on certification from Subsuppliers, that the Supplier validates the certification via surveillance, audit and/or independent tests.</p> <p>Appendix B/ANSI N45.2 Ref: (7/8) IE Notice 86-21 including supplements NQA-1 Supplement 7S-1 Vendor Program Ref: <u>Not Applicable</u></p>	<p>Not applicable to PLG, Incorporated. Scope of work is for services and does not include the procurement or supply of ASME material.</p>	<p>N/A</p>
<p>TEAM MEMBER: J. E. Adkins</p> <p>DATE: 09/13/95</p>		

MRPIC  
AUDIT CHECKLIST

SECTION IV - PROCUREMENT  
(FIGURE 5)

P.O. & DATE	SUPPLIER & LOCATION	ITEM DESCRIPTION (P/N, S/N, / MODEL NO.)	METHOD & DATE OF SUPPLIER EVALUATION	SCOPE OF SUPPLIER APPROVAL & LIMITATIONS	ACCEPTANCE DOCUMENT	NOTE USED	INSPECTOR
*4.2 NP-1667, dated 01/13/95, w/change order #1, dated 06/08/95, for Job #1540.	*4.2 (X.D) EDE International, San Francisco, CA (Corporate), work to be performed by office in Newport Beach, CA	*4.2 N/A - Service, Structural Evaluation for EDF (France)	*4.4 Past Perf., Work to be in accordance with PLG QA Plan, audit scheduled 09/21/95.	*4.4 Work to be in accordance with PLG QA Plan, audit scheduled for 09/21/95.	*4.5 Document review, and audit - task still in process.	*4.5 N/A	*4.5 N/A
NB-1705, dated 03/23/95, w/change order #1, dated 08/24/95, for Job #1594.	Same as above	N/A - Service, develop seismic fragilities for HOK BEZNAU (Switzerland)	Same as above.	Same as above.	Same as above.	N/A	N/A

\* Refers to applicable question.



## SECTION IX - DOCUMENT CONTROL/ADEQUACY

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>9.1 Verify that measures are established and implemented to control the issuance of documents (i.e., procedures, instructions, drawings, work orders, etc.) including changes. These measures shall assure that documents are: (Document O.E. on Figure 10)</p> <ul style="list-style-type: none"> <li>a) Reviewed for adequacy</li> <li>b) Approved by appropriate personnel</li> <li>c) Approved for release by authorized personnel</li> <li>d) Distributed to applicable work station, and include definitive quantitative/qualitative acceptance criteria as applicable</li> </ul> <p>Evidence to be obtained from Sections I-VIII &amp; X shall be identified within this section.</p> <p>NOTE: Objective evidence is recorded by each auditor on Figure 10. The responsible team member completes the assessment/summary for question 9.1 based on input from auditors and/or as documented on Figure 10.</p> <p>Appendix B/ANSI N45.2 Ref: (5, 6/6, 7) ASME Section III NQA-1 Supplement 6S-1 Vendor Program Ref: <u>QA Plan, Sections 3.3 &amp; 3.4</u></p>	<p>In addition to the QA Plan, measures are established and implemented through Procedure 101, Document Control System, Revision 12, dated 05/31/95. These measures ensure that items a) through d), as applicable to PLG activities are complied with. Documents identified throughout the checklist in addition to those listed in Figure 10, were readily available and verified to be the correct revision. In addition, the audit team verified by review of acknowledgements that the Encinitas, CA satellite office had received the current revision of the QA Plan and Procedures. The activities associated with Document Control were determined to be adequate and being effectively implemented.</p>	S
TEAM MEMBER: J. E. Adkins, J. R. Harris, A. M. Richards		DATE: 09/13/95

SECTION IX - PROCEDURE DATA SHEET  
(FIGURE 10)

PROCEDURE/INSTR/DRWG/TITLE	REV/DATE	CORRECT REVISION (YES/NO)	CHECKLIST SECTION
Procedure 101, Document Control System	Revision 12, dated 05/31/95	Yes	I, IX, 10.G.1-.3
Project QA Startup Checklist #1609	Revision 0, dated 08/30/95	Yes	I
Project QA Startup Checklist #1604	Revision 0, dated 07/20/95	Yes	I
Project QA Startup Checklist #1593	Revision 0, dated 05/17/95	Yes	I
Project QA Startup Checklist #1598	Revision 0, dated 07/05/95	Yes	I
Project QA Startup Checklist #1523	Revision 0, dated 02/24/95	Yes	I
Project QA Startup Checklist #1525	Revision 1, dated 04/25/90	Yes	I
Procedure 106, Procurement of Engineering Services and Computer Software	Revision 13, dated 05/31/95	Yes	IV, 10.D
Project QA Startup Checklist #1594	Revision 1, dated 09/13/95	Yes	IV
Project QA Startup Checklist #1540	Revision 0, dated 02/15/95	Yes	IV
Procedure 105, Production Code Quality Assurance	Revision 15, dated 05/31/95	Yes	II, III-Sup'l, 10.A.4
Procedure 104, Independent Technical Review	Revision 14, dated 05/31/95	Yes	II, III-Sup'l
Procedure 107, Documents and Software Review, Approval, and Transmittal	Revision 14, dated 05/31/95	Yes	II, III-Sup'l, 10.A.4
AP-33, Virus Procedures	Dated 09/13/95	Yes	III-Sup'l
AP-34, Virus Procedures for Software	Dated 09/13/95	Yes	III-Sup'l
Procedure 102, Audit of and Corrective Actions for Quality Assurance	Revision 13, dated 05/31/95	Yes	10.C, 10.E, 10.F.2
Procedure 103, Personnel QA Training	Revision 4, dated 09/15/92	Yes	10.F.1
Procedure 108, Compliance with 10CFR21 and 50.55(e)	Revision 9, dated 05/31/95	Yes	10.B.3, 10.C
Quality Assurance Plan PLG-0223	Revision 23, with changes through 06/06/95	Yes	10.A.1-.3, 10.c
		*=DOCUMENT NOT VERIFIED	

## SECTION X - PROGRAM COMPLIANCE

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
10.1 Record the procedures/instructions and/or drawings used to verify implementation in this area. (Document O.E. on Figure 10)		
<p>10.A.1 Verify that the individual/organization responsible for defining the overall effectiveness of the QA Program:</p> <ul style="list-style-type: none"> <li>a) is designated; (i.e., authority, organizational structure and responsibility is documented);</li> <li>b) has established a policy and authority statement;</li> <li>c) is independent of production pressures;</li> <li>d) has direct access to appropriate management levels;</li> <li>e) reports regularly on the effectiveness of the Program.</li> </ul> <p>Appendix B/ANSI N45.2 Ref: (1-3) ASME Section III NQA-1 Supplement 1S-1 Vendor Program Ref: <u>QA Plan, Section 2.1 &amp; 2.2</u></p>	<p>PLG identifies the make-up and responsibilities of their QA organization in the QA Plan, Sections 2.1 and 2.2, as follows:</p> <ul style="list-style-type: none"> <li>a&amp;b) The QA Manager is responsible to the Corporate Officer for maintenance and implementation of the QA Plan and Procedures.</li> <li>c) The Corporate Officer shall assure that the QA and Project Managers have the authority and independence needed to identify and resolve QA problems.</li> <li>d) The QA Manager shall report directly to the Corporate Officer (Vice President).</li> <li>e) PLG Management will perform an annual assessment of the PLG QA Program, for which they are responsible, to assure its effective implementation. The meeting will be attended, as a minimum, by the Responsible Corporate Officer and Corporate Officers or Managers in charge of Administration, Contracts, Project Management, and QA. In practice, the PLG QA Program is primarily implemented by the QA Manager, one Lead Auditor, an Auditor-in-training, and the Project Managers.</li> </ul> <p style="text-align: center;">Continued</p>	S
<p>10.A.2 Assess whether personnel performing verification activities have the authority, independence and organizational freedom to:</p> <ul style="list-style-type: none"> <li>a) Identify quality problems;</li> <li>b) Initiate, recommend or provide solutions to problems;</li> <li>c) Verify implementation of solutions;</li> <li>d) Control further processing of nonconformances until proper disposition has occurred.</li> </ul> <p>Appendix B/ANSI N45.2 Ref: (1-3) ASME Section III NQA-1 Supplement 1S-1 Vendor Program Ref: <u>QA Plan, Sections 2.2</u></p>	<p>PLG's QA Plan, Section 2.2 assures that personnel performing verification activities have independence. The PLG Lead Auditor reports directly to the QA Manager. The Lead Auditor has the authority to identify quality problems through the Corrective Action Report (CAR) system. Quality problems identified on CARs are required to have a recommended corrective action proposed and the corrective action completion verified prior to closure. Processing of nonconforming conditions is controlled through the CAR system which assures timely completion of the proposed corrective actions - 30 days is the target for completion. PLG's program for this item is adequate and being effectively implemented.</p>	S
<p>TEAM MEMBER: J. R. Harris</p> <p style="text-align: right;">DATE: 09/12/95</p>		

MUPIC  
AUDIT CHECKLIST

CONTINUATION PAGE

10...1 (Continued)

These individuals revise and approve manual and procedure changes, provide independent verifications of PLG's quality-related activities and track corrective actions to completion. All of these activities are summarized in semi-annual management meetings to assess the overall effectiveness of the PLG QA Program. PLG's program for this item was adequate and being effectively implemented.

TEAM MEMBER: J. R. Harris

DATE: 09/12/95

## SECTION X - PROGRAM COMPLIANCE

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>10.A.3 Verify that the suppliers management regularly reviews, assesses and evaluates the application, status and effectiveness of the Quality Assurance Program consistent with importance to safety, reliability and performance for the items and services to which it applies.</p> <p>Appendix B/ANSI N45.2 Ref: (2/2) ASME Section III NQA-1 Basic Req 2 Vendor Program Ref: <u>QA Plan, Section 2.1</u></p>	<p>PLG's QA Plan, Section 2.1 states that PLG Management will perform an assessment of the QA Program on an annual basis. PLG exceeds this requirement by performing semi-annual assessments. Reports dated 12/22/94 and 08/16/95 were reviewed during this audit. These assessments had been completed in Management Assessment Meetings which were attended by PLG Management. Topics discussed included: the QA Manual, internal audits, CARs, training, software verifications, and NUPIC audit finding response status. Additionally, project and internal audits are reviewed by the responsible Project Manager. See checklist item 11.C for more details. PLG's program for this item is adequate and being effectively implemented.</p>	S
<p>10.A.4 Describe the method that is used to control revisions to Vendor Technical/Maintenance Manuals, Service Advice Letters, Instruction Manual Updates and the method for transmitting those changes to their customers.</p> <p>Vendor Program Ref: <u>QA Plan, Section 3</u></p>	<p>PLG's implementing Procedures 105, Section 4, and 107, Section 4.2.4, state that Computer Operations personnel shall provide validation documentation and installation instructions for every reproduction of PLG certified and non-certified source codes. PLG maintains a log identifying when letters were transmitted to customers. Reviewed transmittal logs for notifications to customers for Riskman revisions 6.0 and 6.01, sent on 02/14/95 and 07/18/95, respectively. All U.S. nuclear utilities on PLG's Riskman Technology Group list had been notified except one utility. Per PLG, this customer has chosen to continue using Riskman 5.2 at this time. PLG's program for this item was determined to be adequately implemented.</p>	
<p>10.A.5 Verify that measures are established and implemented for control of items returned from utility for repair/rework. (Document O.E. on Figure 11)</p> <p>Appendix B/ANSI N45.2 Reg. (15/16) ASME Sec. III NQA-1 Supplement 15S.1 Vendor Program Ref: <u>Not applicable</u></p>	<p>Not applicable to PLG, Incorporated. PLG scope of work does not include repair/rework of items.</p>	N/A
<p>TEAM MEMBER: J. R. Harris</p> <p>DATE: 09/12/95</p>		



## SECTION X - PROGRAM COMPLIANCE

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>10.B.1 Verify that measures are established and implemented to:</p> <ul style="list-style-type: none"> <li>a) Identify nonconforming items;</li> <li>b) ensure that responsibility and authority for review/disposition is identified;</li> <li>c) controls further processing, delivery and installation of items until disposition is completed.</li> <li>d) notification to utility of nonconforming conditions when required by utility p.o. (Document O.E. on Figure 11)</li> </ul> <p>Appendix B/ANSI W45.2 Ref: (15/16) ASME Section III NQA-1 Supplement 15S-1 Vendor Program Ref: <u>Not applicable</u></p>	<p>Not applicable to PLG. PLG is a service organization and nonconforming items are not within the scope of their activities.</p>	<p>N/A</p>
<p>10.B.2 Verify that the nonconforming items are reviewed and dispositioned such that:</p> <ul style="list-style-type: none"> <li>a) The disposition is identified and adequate</li> <li>b) Documented justification is provided verifying the acceptability of the nonconforming items which are dispositioned repair or use-as-is</li> <li>c) The as built records shall reflect the accepted deviation</li> <li>d) Procedures or instructions for repair and rework are provided</li> <li>e) Repaired &amp; reworked items are reinspected</li> <li>f) Closeout is adequate (Document O.E. on Figure 11)</li> </ul> <p>Appendix B/ANSI W45.2 Ref: (15/16) ASME Section III NQA-1 Supplement 15S-1 (para 4.1) Vendor Program Ref: <u>Not applicable</u></p>	<p>Not applicable to PLG. See checklist item 10.B.1 above.</p>	<p>N/A</p>
<p>TEAM MEMBER: <u>J. R. Harris</u></p>		<p>DATE: <u>09/12/95</u></p>

## SECTION X - PROGRAM COMPLIANCE

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>10.B.3 10CFR21</p> <p>a) Are appropriate documents posted?</p> <p>b) Is there a mechanism to determine if a Part 21 condition exists?</p> <p>c) Is there a mechanism to provide for notification to the NRC or affected utilities?</p> <p>Regulatory Reference: 10CFR21.6 Vendor Program Ref: <u>QA Plan, Section 4</u></p>	<p>a) PLG's Procedure 108 addresses 10CFR21, 10CFR50, and Section 206. This procedure is posted in the PLG lunch room. However, the copy posted was revision 8 when revision 9 had been issued on 05/31/95. This situation was immediately rectified by PLG with no further action deemed necessary.</p> <p>b) Sections 4 and 5 of Procedure 108 identify the reporting requirements and the responsible PLG officer. Section 4 also provides guidance in making the determination if a Part 21 condition exist.</p> <p>c) Section 6 of Procedure 108 states that the PLG officer shall advise the client within 5 days of notice of a potential defect or deficiency. Notification shall be made to the NRC within 2 days with a written follow-up notification within 30 days.</p> <p>PLG has not had any 10CFR21 reportable incidents for the period since the 1993 NUPIC audit. PLG's program is adequate for this checklist item.</p>	
<p>10.C Verify that measures are established and implemented to ensure a comprehensive system of planned and periodic <u>internal</u> audits. Verify that the participants have no direct responsibility in the areas audited. Verify that checklists were used with objective evidence documented, that audit results were documented and reviewed by management having responsibility in the area audited and that follow-up action is taken where needed. (Document O.E. on Figure 12)</p> <p>Appendix B/ANSI N45.2 Ref: (18/19) ASME Section III NQA-1 Supplement 18S-1 Vendor Program Ref: <u>QA Plan, Section 7</u></p>	<p>PLG has established measures to ensure that a comprehensive system of planned and periodic internal audits are performed in their QA Plan, Section 7 and Procedure 102. See Figure 12 for PLG audits reviewed during this portion of the audit. All audits reviewed had been performed by QA auditors that were independent of the activities being audited. Audits of the QA group were performed by auditors appointed from outside the QA organization. Generic checklist are established in Procedure 102 and define the attributes to be evaluated for each type of internal audit. All internal audits reviewed contained completed checklist with sufficient objective evidence documented. Typically, copies of logs, start-up checklist, training records, etc., which had been covered by the audit were attached to the audit report.</p> <p style="text-align: center;">Continued</p>	S
<p>10.D Verify that measures are established and implemented to ensure a comprehensive system of planned and periodic <u>external</u> audits. Verify that checklists were used with objective evidence documented and that follow-up action is taken where needed. See Figure 5 for suppliers. (Document O.E. on Figure 12)</p> <p>Appendix B/ANSI N45.2 Ref: (18/19) ASME Section III NQA-1 Supplement 18S-1 Vendor Program Ref: <u>QA Plan, Sections 3,5 &amp; 7</u></p>	<p>PLG's Procedure 106 is written to address internal and external audits associated with subsupplier qualifications. However, per PLG's QA Manager, PLG has not performed any external audits for the period since the 1993 NUPIC audit. A deficiency was identified in this area and is described in checklist item 4.4.</p>	U VDR 95-019
TEAM MEMBER: J. R. Harris		DATE: 09/13/95

CONTINUATION PAGE

10.C (Continued)

Audit reports had been reviewed by responsible management in the area being audited. The audit reports were signed by the lead Auditor, the Project Manager, and the QA Manager. PLG had noted items which required follow-up in CARs. Examples of audits requiring follow-up included:

9052-QAR-68 which issued CAR 9052-CAR-32. This CAR was closed 02/10/95.

9052-QAR-71 which issued CAR 9052-CAR-33. This CAR was closed 08/10/95.

Also see checklist item 10.A.3 which describes the semi-annual management assessment process utilized by PLG. This process provides a timely effectiveness evaluation of PLG's QA Program.

Audit schedules are tracked on a quarterly QA Audit Record. This document identifies the project internal audits that have been performed and/or scheduled. The report also notes the assigned auditor, the audit dates, the date the checklist was approved, and the status of any associated CARs. PLG's program for this item is adequate and being effectively implemented.

TEAM MEMBER: J. R. Harris

DATE: 09/12/95

## SECTION X - PROGRAM COMPLIANCE

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>10.E Verify that measures are established and implemented to assure that conditions adverse to quality are promptly identified and corrected. These measures shall include as a minimum: (Document O.E. on Figure 11)</p> <p>a) Identification and description of the condition adverse to quality;</p> <p>b) Determination of the cause and actions taken to prevent recurrence for significant conditions adverse to quality.</p> <p>c) Review and approval by responsible authority on the adequacy of the corrective action;</p> <p>d) Follow-up action for closeout to verify that the corrective action has taken place or is scheduled.</p> <p>Appendix B/ANSI N45.2 Ref: (16/17) ASME Section III NQA-1 Basic Requirement 16 Vendor Program Ref: <u>QA Plan, Section 5</u></p>	<p>PLG has established measures for the prompt identification and correction of problems in Procedure 102. Conditions adverse to quality including audit deficiencies are required to be identified on a Corrective Action Report (CAR). Corrective actions developed in response to CARs are required to be implemented within 30 days and require QA verification prior to closure.</p> <p>a) CARs are required to provide a description of the condition adverse to quality.</p> <p>b) CARs list the cause for the deficiency.</p> <p>c) CARs are reviewed and signed off by the person who completed the corrective actions, the QA Lead Auditor, the Project Manager, the QA Manager, and a Corporate Officer.</p> <p>d) QA verifies corrective actions are complete before the CAR is closed. PLG's program for this item is adequate and being effectively implemented.</p>	S
<p>10.F.1 Verify that measures are established and implemented for indoctrination and training of personnel who perform activities affecting quality.</p> <p>NOTE: Evidence to be obtained from Sections II and IV through VIII</p> <p>Appendix B/ANSI N45.2 Ref: (2/2) ASME Section III NQA-1 Supplement 2S-4 Vendor Program Ref: <u>QA Plan, Section 3.6</u></p>	<p>PLG's Procedure 103 states that new employees shall be trained in the PLG QA Plan and procedures within 1 month of date of hire. Contrary to this requirement two PLG employees at the Bethesda, MD facility had not completed training as required. Four other Bethesda employees had received training but had not achieved a passing score on the indoctrination quiz within the thirty day period. (Note: this information was taken from PLG's QA Training Record dated 09/08/95.)</p>	U VDR 95-020
<p>10.F.2 Verify that inspection/test personnel, auditors, NDE, Welding and similar specialists (i.e., ASME Code work design personnel to ASME/ANSI N626.3) are qualified and have certifications, as applicable, on file in accordance with industry and/or supplier program requirements. (Document O.E. on Figures 13, 14)</p> <p>NOTE: Evidence to be obtained from Sections II, IV, VI, VII and X</p> <p>Appendix B/ANSI N45.2 Ref: (2, 9, 10, 11, 18/2, 10, 11, 12, 19) NQA-1 Supplement 2S-1, 2S-2, 2S-3 ASME Section III Vendor Program Ref: <u>QA Plan, Sections 3.6 &amp; 7</u></p>	<p>PLG Procedure 102, Section 3 states that the QA Manager shall assign personnel who are not involved in the project being audited and who are qualified to the intent of ANSI N45.2.23 (1978) and ANSI/ASME NQA-1-1989. The audit personnel shall report to the QA Manager for purposes of the audit. At the present time, PLG only has one certified Lead Auditor and one active Auditor-In-Training. See Figure 13 for specifics. PLG does not perform any testing or special processes and therefore does not have any other certified work classifications. PLG's program for this item is adequate and being effectively implemented.</p>	S
<p>TEAM MEMBER: J. R. Harris</p> <p>DATE: 09/13/95</p>		



## SECTION X - PROGRAM COMPLIANCE

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>10.G.1 Verify that measures are established and implemented to assure that records not transferred to the utility are maintained in facilities that provide storage, retention requirements and protection against environmental effects, damage and loss including, as a minimum:</p> <ul style="list-style-type: none"> <li>a) Inspection and test records;</li> <li>b) Audit reports;</li> <li>c) Quality related procedures/instructions/drawings;</li> <li>d) Qualifications and certifications;</li> <li>e) Material Analysis records;</li> <li>f) Certifications of Compliance/Conformance;</li> <li>g) Laboratory/Engineering/Manufacturing Operating Logs.</li> <li>h) Calibration Records</li> <li>i) Nonconformance Documents</li> </ul> <p>Appendix B/ANSI N45.2 Ref: (17/18) ASME Section III NQA-1 Supplement 17S-1 Vendor Program Ref: <u>QA Plan, Section 6</u></p>	<p>PLG's controls for QA records are established in Procedure 101. This procedure provides guidance for indexing, filing, storage, retention, distribution, and maintenance and distribution of project records and deliverables. Other QA records such as TRRs, DRRs, CARs, OARs and deliverables are also specified to be stored in project files. Records not submitted to the customer are shipped to offsite storage after they become inactive. PLG's storage may be terminated after one year or the client may request the records for storage at the clients facility. All records reviewed during the audit were stored in metal file cabinets for protection.</p> <p>PLG maintains files for record types b, c, d, and i from the list associated with this checklist item. The other record types are not applicable to PLG.</p> <p>Records reviewed during this phase of the audit included the items identified in Figures 11, 12, 13, and Project Files for project 1590 and 1593 (HL&amp;P) and 1280 and 1523 for Southern Nuclear (Hatch and Vogtle respectively). PLG's program for this item is adequate and being effectively implemented.</p>	S

TEAM MEMBER: J. R. Harris

DATE: 09/13/95



## SECTION X - PROGRAM COMPLIANCE

METHOD OF VERIFICATION	ASSESSMENT/SUMMARY	RESULTS
<p>10.G.2 Verify that records are legible, identifiable, and retrievable.</p> <p>For minor changes, verify that those which do not require the same review and approval and the persons who can authorize such a decision are clearly delineated.</p> <p>Appendix B/ANSI N45.2 Ref: (17/18) ASME Section III NQA-1 Supplement 17S-1, 6S-1 Vendor Program Ref: <u>QA Plan, Section 6</u></p>	<p>Records reviewed during the audit were found to be legible, identifiable, and retrievable.</p> <p>PLG does not have a program to control minor changes to documents but records did not appear to have been inappropriately altered. PLG's control of records appears to be adequate and effectively controlled.</p>	S
<p>10.G.3 Verify that vendor record packages are consistent with contract/P.O. requirements and adequately document the "as-built" of the item or component.</p> <p>NOTE: These records should include material certification and test data for traceability and quality verification; reports of inspections, examinations, and test results for conformance verification; drawings, specifications, procedures, and instructions for use in control of configuration; and records of nonconformances and their resolution.</p> <p>Appendix B/ANSI N45.2 Ref: (17/18) ASME Section III Vendor Program Ref: <u>QA Plan, Section 6</u></p>	<p>See checklist item 10.G.1 for the record types and records reviewed during this phase of the audit. The significant records associated with PLG's activities are delivered to the client as a final report which the customer reviews for acceptance. Software products are verified and validated by PLG and checked by the customer.</p> <p>PLG's program for this item is adequate and being effectively implemented.</p>	S
<p>10.G.4 Verify that measures are established and implemented to assure Certificates of Compliance/Conformance are only issued by authorized supplier personnel.</p> <p>Appendix B/ANSI N45.2 Ref: (6/7) NQA-1/Supp 7S-1 ASME Section III Vendor Program Ref: <u>QA Plan, Section 6</u></p>	<p>PLG does not routinely provide certificates of calibration/conformance for the services they provide. However, it was noted that one utility (HL&amp;P) had requested a certificate of conformance, which had not been provided and no exception was taken by PLG to the contract requirements. PLG issued the requested certification to HL&amp;P during the audit and indicated they would continue to do so when requested in the procurement document. See checklist item 1.2 for specifics. The audit team determined that no further action was necessary.</p>	S
<p>TEAM MEMBER: J. R. Harris</p> <p>DATE: 09/13/95</p>		

## SECTION X - PROGRAM COMPLIANCE

(FIGURE 11 WCR/CAR)

ITEM ID/DESCRIPTION	NCR/ CAR NUMBER	DATE INITIATED	DISCREPANT CONDITION	DISPOSITION	REINSPECTION/ VERIFICATION	FOR USE-AS-IS-OR REPAIR-CUSTOMER NOTIFIED?	CLOSURE DATE
*10.B, 10.E 10.A.5	*10.B, 10.E 10.A.5	*10.B & 10.E 10.A.5	*10.B, 10.E 10.A.5	*10.B, 10.E 10.A.5	*10.B.2 10.E	*10.B 10.A.5	*10.B, 10.E 10.A.5
Transmittals	1518-CAR-1	10/17/94	Transmittals not logged	Logged items and revised applicable procedure.	12/01/94	N/A	12/09/94
Technical Review Reports	1418-CAR-4	07/07/94	Missing documents	Copies were located and applicable procedure was revised.	09/06/94	N/A	09/12/94
Technical Review Reports	1280-CAR-1	09/03/93	Incomplete or missing documents	Documents were located and/or completed.	04/14/94	N/A	04/14/94
Documentation of Riskman 6.0 and 6.01	9052-CAR-34	08/11/95	Lack of complete documentation	Open	Scheduled for 10/05/95	N/A	Open
Configuration control of in-house PC stations	9052-CAR-35	08/11/95	Lack of documentation	Open	Scheduled for 09/30/95	N/A	Open
Training Records	9052-CAR-32	09/22/94	Training classes had not been completed within frequency	Completed training	02/09/95	N/A	02/10/95
SQA Training Records	9052-CAR-33	05/23/95	Unable to locate training records	Located records and revised applicable procedures.	07/21/95	N/A	08/10/95
* Refers to applicable question.							
TEAM MEMBER: J. R. Harris							
DATE: 09/13/95							

SECTION X - PROGRAM COMPLIANCE  
(FIGURE 12 AUDITS/SURVEILLANCES)

REPORT ID #	PERFORMANCE DATE	SCOPE	INTERNAL EXTERNAL/ (I/E)	ITEMS CONSIDERED AND SUPPLIER PROCESSES EVALUATED (SPECIFY)	AUDITING ORGANIZATION TEAM MEMBERS	NUMBER OF DEFICIENCIES (OPEN/CLOSED)	CORRECTIVE ACTION VERIFICATION METHOD & DATE
*10.C, 10.D	*10.C, 10.D	*10.C, 10.D	*10.C, 10.D	*10.C, 10.D	*10.C, 10.D	*10.C, 10.D	*10.C, 10.D
1590-QAR-2	08/22/95	Project Review-Diesel Generator AOT Review	I	Procedure 101 Implementation	B. Shimizu	None	N/A
1593-QAR-3	08/22/95	Project Review-Revise Base Model for Electric Power Recovery Update	I	Procedure 101 Implementation	B. Shimizu	None	N/A
9052-QAR-68	09/22/94	Personnel Indoctrination	I	Procedure 103 Implementation	B. Shimizu	One-Closed	Document Review 02/10/95
9052-QAR-71	05/23/95	Computer Operations	I	Procedure 105 Implementation	B. Shimizu	One-Closed	Document Review 08/10/95
9052-QAR-70	12/07/94	Document Control	I	Procedure 107 Implementation	B. Shimizu	None	N/A
9052-QAR-72	01/24/95	10CFR21 Posting	I	Procedure 108 Implementation	B. Shimizu	None	N/A
9052-QAR-69	05/19/94	Quality Assurance Sys.	I	Procedure 102 Implementation	B. Shimizu and T. Fenstermacher	None	N/A
		The above audits were noted on the PLG 1995 QA Audits Record (reviewed 09/07/95) by the PLG QA Manager.					

\* Refers to applicable question.

TEAM MEMBER: J. R. Harris

DATE: 09/12/95

## SECTION X - PROGRAM COMPLIANCE

(FIGURE 13 AUDIT/INSPECTION/NDE PERSONNEL)

NAME/STAMP *10.F.2	QUALIFICATION/CERTIFICATION CERT TYPE AND LEVEL *10.F.2	EYE EXAM DATES *10.F.2
Ben Shimizu - Lead Auditor (presently the only qualified Lead Auditor at PLG)	N45.2.23 Lead Auditor. Original Qualification at PLG was 11/11/86. Annual Evaluations have been performed on approximately 12 months intervals. The last two evaluations were on 07/07/94 and 07/05/95.	Not Required
T. E. Fenstermacher - Lead Auditor at the time he performed assessment of QA in 9052-QAR-69.	N45.2.23 Lead Auditor. Original qualification at PLG was 07/06/87. Annual evaluations completed through 07/07/94.	Not Required
W. L. Albertson - Auditor-in-training.	Completed PLG training & auditors examination On 07/20/95. Presently working on required audits to become a Lead Auditor.	Not Required

\* Refers to applicable question.

SECTION X - PROGRAM COMPLIANCE  
(FIGURE 14 WELDER/WELD OPERATOR)

NAME/STAMP *10.F.2	CERT TYPE (PROCESS & POSITIONS) *10.F.2	CODE QUALIFIED TO *10.F.2	WPS PROCEDURES AND REV/DATE *10.F.2	MAINTENANCE OF QUALIFICATION *10.F.2
Not applicable. PLG does not perform welding.				
* Refers to applicable question.				
TEAM MEMBER: J. R. Harris DATE: 09/11/95				



SUPPLIER QUALITY PROGRAM  
 AUDIT CHECKLIST  
 ANSI N45.2.12 AND ANSI N45.2.23 SUPPLEMENT  
 (Regulatory Guides 1.44, R79 and 1.148, R60)

AUDIT ITEM NO.	QUALITY ELEMENT & SUPPLIER QUALITY PROGRAM REFERENCES	QUALITY REQUIREMENTS AND AUDIT GUIDELINES	RESULTS S,X,N/A	SUMMARY OF INVESTIGATION
		<p>Instructions:</p> <p>A. Complete attributes X.10.C, X.10.D of the NUPIC Audit Checklist.</p> <p>B. Complete the following items:</p> <p><u>AUDIT IMPLEMENTATION</u>            (Document O.E. on Figure 1)</p>		
1.0	Preparation	<p>Verify an individual audit plan describing the audit to be performed is developed and documented by the auditing organization. This plan shall identify the audit scope, the requirements, the activities to be audited, organizations to be notified, the applicable documents, the schedule, and written procedures or checklists.</p>	S	<p>Audit plans are an integral part of the audit report and notes the audit subject, persons to be notified, auditor, and date of notification. This plan is approved by the QA Manager and is attached to the checklist for the audit.</p>
1.1	<u>Ref. Procedure 102</u> <u>QA Plan 7</u>			
1.2	<p>Reporting</p> <p><u>Ref. Procedure 102</u>  <u>QA Plan 7</u></p>	<p>Verify that an audit report, which is signed by the audit team leader, provides for the following:</p> <ol style="list-style-type: none"> <li>(1) Description of the audit scope.</li> <li>(2) Identification of the auditors.</li> <li>(3) Persons contacted during audit activities.</li> <li>(4) A summary of audit results, including an evaluation statement regarding the effectiveness of the quality assurance program elements which were audited.</li> </ol>	S	<p>Reviewed audits noted in Figure 12 and verified that items 1 through 4 had been addressed. No statements are made that the attributes were satisfactory, but deficient areas are noted for followup and CARs are written.</p>
				<p>Auditor Signature <u>J. R. Harris</u> Date <u>09/13/95</u></p>

\* S = SATISFACTORY X = UNSATISFACTORY N/A = NOT APPLICABLE

SUPPLIER QUALITY PROGRAM  
 AUDIT CHECKLIST  
 ANSI N45.2.12 AND ANSI N45.2.23 SUPPLEMENT  
 (Regulatory Guides 1.44, R79 and 1.146, R80)

AUDIT ITEM NO.	QUALITY ELEMENT & SUPPLIER QUALITY PROGRAM REFERENCES	QUALITY REQUIREMENTS AND AUDIT GUIDELINES	RESULTS S,X,N/A	SUMMARY OF INVESTIGATION
1.2	Reporting (Cont.)	<p>(5) Description of each quality assurance program deficiency in sufficient detail to assure that corrective action can be effectively implemented by the audited organization.</p> <p>(6) Recommendations for correcting program deficiencies or improving the quality assurance program as appropriate.</p>	S	Findings are identified in CARs for followup of corrective actions.
2.0	Lead Auditor Qualifications	<u>PERSONNEL</u> (Document O.E. on Figure 1)		
2.1	Ref. <u>Procedure 102</u> <u>QA Plan 7</u>	Verify that the prospective Lead Auditor has verifiable evidence that a minimum of ten (10) credits under the scoring system established in Section 2.3.1 of ANSI N45.2.23.	S	B. Shimizu and T. Fenstermacher had 10 credits on N45.2.23 certification records. See Figure 13.
2.2		Verify that the Lead Auditor's capability to communicate effectively, both written and oral, is attested to in writing by the Lead Auditor's employer.	S	Both Lead Auditors had also been documented as having adequate communication skills; had completed a minimum of five audits within 3 years prior to qualification. Both Lead Auditors had been certified after passing the PLG audit exam.
2.3		Verify the Lead Auditor has participated in a minimum of five (5) quality assurance audits within a period of time not to exceed three (3) years prior to the date of qualification, one audit of which shall be a nuclear quality assurance audit within the year prior to his qualification.	S	
2.4		Verify the Lead Auditor has passed an examination which evaluates his knowledge and understanding of ANSI N45.2, ANSI N45.2.12, general structure of quality assurance programs, and audit planning and performance techniques. The test may be oral, written, practical, or any combination of the three types.	S	Auditor Signature <u>J. R. Harris</u> Date <u>09/13/95</u>

SUPPLIER QUALITY PROGRAM  
 AUDIT CHECKLIST  
 ANSI N45.2.12 AND ANSI N45.2.23 SUPPLEMENT  
 (Regulatory Guides 1.44, R79 and 1.146, R80)

AUDIT ITEM NO.	QUALITY ELEMENT & SUPPLIER QUALITY PROGRAM REFERENCES	QUALITY REQUIREMENTS AND AUDIT GUIDELINES	RESULTS S,X,N/A	SUMMARY OF INVESTIGATION
2.5	Lead Auditor Qualifications (Cont.)	Verify copies of the objective evidence regarding the type(s) and content of the examination(s) are retained by the employer.	S	Exams for Shimizu and Fenstermacher are attached to their certifications.
2.6		Verify that documented management assessments are performed annually to evaluate the proficiency of Lead Auditors. Management may extend the qualification, require retraining, or require requalification.	S	Annual evaluations had been completed on the Lead Auditors as noted in Figure 13.
2.7		<p>Verify each Lead Auditor is certified by his employer as being qualified to lead audits. This certification shall, as a minimum, document the following:</p> <ul style="list-style-type: none"> <li>(1) Employer's name.</li> <li>(2) Lead Auditor's name.</li> <li>(3) Date of certification or recertification.</li> <li>(4) Basis for qualification (i.e., education, experience, communication skills, training, examination, etc.)</li> <li>(5) Signature of employers' designated representative who is responsible for such certification.</li> </ul>	S	<p>Verified Lead Auditor certifications for Shimizu and Fenstermacher had addressed Items 1 - 5 as follows:</p> <ul style="list-style-type: none"> <li>1) Pickard, Lowe, and Garrick, Inc.</li> <li>2) Ben Shimizu T. E. Fenstermacher</li> <li>3) 11/11/86; 07/06/87, respectively.</li> <li>4) 17 credits; 11 credits - combination of education and experience.</li> <li>5) Both certifications signed by W. C. Gekler, QA Manager and B. J. Garrick, President.</li> </ul> <p>Auditor Signature <u>J. R. Harris</u> Date <u>09/13/95</u></p>

\* S = SATISFACTORY X = UNSATISFACTORY N/A = NOT APPLICABLE

SUPPLIER QUALITY PROGRAM  
 AUDIT CHECKLIST

ANSI N45.2.12 AND ANSI N45.2.23 SUPPLEMENT  
 (Regulatory Guides 1.144, R79 and 1.146, R80)

FIGURE 1

AUDIT REPORT ID NUMBER *1.0	AUDIT PLAN NUMBER *1.1	AUDIT REPORT *1.2	LEAD AUDITORS *2.0	LEAD AUDITOR INITIAL QUAL/CERT *2.1, 2.2, 2.7	LEAD AUDITOR PARTICIPATION *2.3	LEAD AUDITOR EXAMINATION *2.4, 2.5	MANAGEMENT EVALUATION *2.6
1590-QAR-2	Yes	Yes	B. Shimizu	Yes	Yes	Yes	Yes
1593-QAR-3	Yes	Yes	B. Shimizu	Yes	Yes	Yes	Yes
9052-QAR-68	Yes	Yes	B. Shimizu	Yes	Yes	Yes	Yes
9052-QAR-71	Yes	Yes	B. Shimizu	Yes	Yes	Yes	Yes
9052-QAR-70	Yes	Yes	B. Shimizu	Yes	Yes	Yes	Yes
9052-QAR-72	Yes	Yes	B. Shimizu	Yes	Yes	Yes	Yes
9052-QAR-69	Yes	Yes	B. Shimizu & T. Fenstermacher	Yes	Yes	Yes	Yes

\* Refers to applicable question.

AUDITOR SIGNATURE J. R. Harris DATE 09/12/95



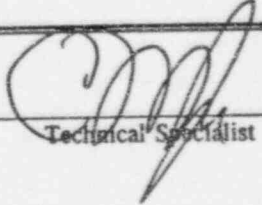
Revision:   
Date: 01-24-95

Supplier: PLG, Incorporated   
Audit No: 95-073 (VA)   
Page: 1 of 5


# PBSA WORKSHEET

Items Description: Computer Software   
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
1. Determine if a separate software quality function has been established. If not, determine if the established programs are written such that software quality requirements are adequately addressed. If not, verify plans are being developed to address software concerns. Review the appropriateness of the organization which legitimizes the Software Quality Program.	10 CFR 50, Appendix B, Section I NQA-1, Section 1 ANSI N45.2.11 - 1974, 5.1.1	Implementing Procedures	S	III
2. Verify that verification results are reviewed, approved, documented; exceptions are adequately documented and reviewed by the original design group.	10 CFR 50, Appendix B, Section III N45.2.11 - 1974 NQA-1 3s-1	Implementing Procedures	S	II, III
3. Review the change control process employed by the Software Quality Program and verify that changes made to specifications and source code receive the same reviews, justification, approvals, and documentation required of the original design.	10 CFR 50 Appendix B, Section III N45.2.11 - 1974 NQA-1 3s-1	Implementing Procedures	S	II, III

  
Technical Specialist

10/2/95  
Date

  
Audit Team Leader

10-2-95  
Date



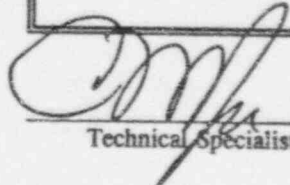
Revision 9  
Date: 01-24-95

Supplier: PLG, Incorporated  
Audit No: 95-073 (VA)  
Page: 2 of 5

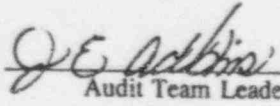
# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
4. Verify procedures or instructions have been prepared to control and document the development of software systems in the following areas , as applicable:  a. Software QA Plan b. Requirements Specification c. Design Specification d. Verification/Validation Plans e. User Documentation f. Standards Manual g. Product Release Procedures h. Installation Manual i. Training Manual j. Operations Manual k. Project file	N45.2.11 - 1974, Section 4.5. 10 CFR 50, Appendix B, Section V NQA-1-1989, Section 5 NQA-2a, Part 2.7	Implementing Procedures	S	III

  
\_\_\_\_\_  
Technical Specialist

10/2/95  
Date

  
\_\_\_\_\_  
Audit Team Leader

10-2-95  
Date

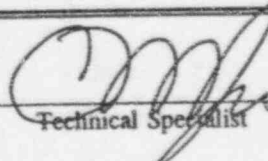
Revision 9  
Date: 01-24-95

Supplier: PLG, Inc ted  
Audit No: 95-073 (V<sub>rs</sub>)  
Page: 3 of 5

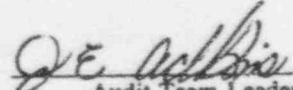
# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
5. Verify measures are established to assure purchased software products or services conform to procurement documents.	10 CFR 50, Appendix B, Section VII NQA-1-1989, Section 7 NQA-2a-1990, Part 2.7, Sections 10.1, 3	Implementing Procedures	S	IV
6. Verify that there exists documented evidence that purchased software conforms to procurement documents.	10 CFR 50, Appendix B, Section VII	Implementing Procedures	Not Verified	III, IV
7. Verify that the monitoring of software contractors includes making sure the contractor has defined software quality program and that it is being properly implemented.	NUREG 4640, Sections 11.1, 2	Implementing Procedures  Measures are in place to control items 6 & 7. However, PLG has not procured any software from software contractors for safety related application since the last NUPIC audit. Therefore, implementation could not be verified.	Not Verified	III, IV

  
Technical Specialist

10/2/95  
Date


  
Audit Team Leader

10-2-95  
Date


# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<p>8. Verify that processes are established to manage and control changes to software, associated hardware, and documentation including:</p> <ul style="list-style-type: none"> <li>a. documentation of problems.</li> <li>b. notification of problems to affected individuals/ organizations</li> <li>c. evaluation of problems for potential impact on work already performed.</li> <li>d. correction of problems.</li> <li>e. retest of software or changes</li> </ul>	<p>NQA-2a 1990, Part 2.7</p>	<p>Implementing Procedures</p>	<p>S</p>	<p>II, III</p>

  
\_\_\_\_\_  
Technical Specialist

10/2/95  
Date

  
\_\_\_\_\_  
Audit Team Leader

10-2-95  
Date

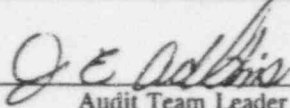
# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
9. Verify that problems found during Verification and Validation activities are resolved (i.e., V&V is taken as a serious activity).	NQA-2a-1990, Part 2.7	Implementing Procedures	S	III

  
\_\_\_\_\_  
Technical Specialist

10/2/95  
Date

  
\_\_\_\_\_  
Audit Team Leader

10-2-95  
Date

# The Light company

Houston Lighting & Power

South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

July 31 , 1995

Mr. William C. Gekler  
Quality Assurance Manager  
PLG, Incorporated  
4590 McCarthur Blvd, Suite 400  
Newport Beach, CA 92660-2027

**Subject:** Houston Lighting & Power Audit of PLG, Inc.  
Newport Beach, CA - Audit Number 95-073 (VA)

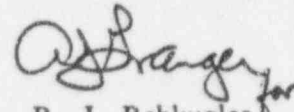
Dear Mr. Gekler:

This is to confirm the arrangements made with you for Houston Lighting & Power Company (HL&P) to conduct an audit at your facility in Newport Beach, CA the week of September 11-14, 1995. The audit will be performed as a joint utility audit under the auspices of the Nuclear Procurement Issues Committee (NUPIC) Joint Audit Program. Attached for your information is the audit scope and a copy of the NUPIC Audit Program Description.

Participating in the audit will be Mr. C. D. Wright, Audit Team Leader (HL&P), Mr. R. A. Carvelle, Audit Team Member (Pacific Gas & Electric Company), Ms. M. G. Toole, Audit Team Member (HL&P) and Mr. C. R. Grantom, Technical Specialist (HL&P). Please plan for a brief entrance meeting to begin at 9:00 am on Monday, September 11, 1995 to discuss audit details, objectives and schedule.

You may reach Mr. Wright at (512) 972-7247 should there be any questions concerning this audit.

Sincerely,

  
R. J. Rehugler  
Director, Quality

*CDW*  
CDW/kmw  
Attachment

c: T. H. Cloninger N5009  
L. E. Martin N5005  
R. D. Martin N5014  
R. J. Tennant N4003  
G. C. Sandlin N3001  
N. O. Laughlin N5010  
C. R. Grantom N4011  
NUPIC Membership

Mr. Bob Carvelle  
Quality Assurance Department  
Pacific Gas & Electric Company  
P. O. Box 770000  
San Francisco, CA 94177

Audit File 95-073 (VA)  
Vendor History File

Project Manager on Behalf of the Participants in the South Texas Project



AUDIT SCOPE

AUDIT NUMBER 95-073 (VA)

ORGANIZATION:

PLG, Incorporated  
4590 McCarthur Blvd., Suite 400  
Newport Beach, CA 92660-2027

PURPOSE/SCOPE:

Evaluate the adequacy and verify effective implementation of the PLG, Inc. Quality Assurance Program for compliance with 10CFR50, Appendix B, as it relates to a supplier of Engineering Services (Plant Risk Model Development).

APPLICABLE DOCUMENTS:

PLG, Incorporated Quality Assurance Manual, Revision 21, with changes through December 12, 1994.

REFERENCE DOCUMENTS:

NUPIC Checklist Revision, 6, dated March 26, 1995

NUPIC Supplemental Checklist for Software Development, Revision 0

Chet Wright 7-26-95 [Signature] 7/26/95  
Prepared By Date Approved By Date

# The Light company

Houston Lighting & Power

South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

July 6, 1995

To: NUPIC Membership

**Subject:** Houston Lighting & Power (HL&P) Audit of PLG, Inc.  
Newport Beach, CA - Audit Number 95-073 (VA)

Dear Member:

HL&P is scheduled to lead the Nuclear Procurement Issues Committee (NUPIC) audit of PLG, Incorporated supported by Pacific Gas & Electric Company. The audit is scheduled for September 11-14, 1995.

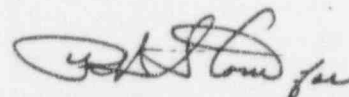
This letter is to serve as ninety (90) day notification to all NUPIC Members. Please submit supplier history/concerns, critical characteristics and procurement documents (with suppliers location referenced), by August 7, 1995.

Please submit your response, to the audit team leader:

Mr. C. D. Wright  
Houston Lighting & Power  
P. O. Box 289 Mail Code N4006  
Wadsworth, TX 77483

Should you have a question concerning the audit, please contact C. D. Wright at (512) 972-7247.

Sincerely,



J. E. Adkins  
NUPIC Representative

CDW/kmw  
Attachment

AD95-073.VA

Project Manager on Behalf of the Participants in the South Texas Project

Revision :  
Date: 01-24-95

Supplier: PLG Inc.  
Audit No: \_\_\_\_\_  
Page: 1 of 5

# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<p><u>CHECKLIST SECTION I: ORGANIZATION</u></p> <p>1. Determine if a separate software quality function has been established. If not, determine if the established programs are written such that software quality requirements are adequately addressed. If not, verify plans are being developed to address software concerns. Review the appropriateness of the organization which legitimizes the Software Quality Program.</p>	<p>10 CFR 50, Appendix B, Section I NQA-1, Section 1 ANSI N45.2.11 - 1974, 5.1.1</p>			
<p><u>CHECKLIST SECTION II: DESIGN CONTROL</u></p> <p>2. Verify that verification results are reviewed, approved, documented; exceptions are adequately documented and reviewed by the original design group.</p>	<p>10 CFR 50, Appendix B, Section III N45.2.11 - 1974 NQA-1 3s-1</p>			
<p>3. Review the change control process employed by the Software Quality Program and verify that changes made to specifications and source code receive the same reviews, justification, approvals, and documentation required of the original design.</p>	<p>10 CFR 50 Appendix B, Section III N45.2.11 - 1974 NQA-i 3s-1</p>			

S.S. Takar  
Technical Specialist

7.10.95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date

Revision 9  
Date: 01-24-95

Supplier: PLG Ir  
Audit No: \_\_\_\_\_  
Page: 2 of 5

# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<p><u>CHECKLIST SECTION III:</u> <u>INSTRUCTIONS, PROCEDURE, AND DRAWINGS</u></p> <p>I. Verify procedures or instructions have been prepared to control and document the development of software systems in the following areas , as applicable:</p> <ul style="list-style-type: none"><li>a. Software QA Plan</li><li>b. Requirements Specification</li><li>c. Design Specification</li><li>d. Verification/Validation Plans</li><li>e. User Documentation</li><li>f. Standards Manual</li><li>g. Product Release Procedures</li><li>h. Installation Manual</li><li>i. Training Manual</li><li>j. Operations Manual</li><li>k. Project file</li></ul>	<p>N45.2.11 - 1974, Section 4.5. 10 CFR 50, Appendix B, Section V NQA-1-1989, Section 5 NQA-2a, Part 2.7</p>			

S.S. Taber  
Technical Specialist

7.10.95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date

Revision 9  
Date: 01-24-95

Supplier: PLG Ir  
Audit No: \_\_\_\_\_  
Page: 3 of 5

# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<u>CHECKLIST SECTION IV; CONTROL OF PURCHASED ITEMS</u>				
1. Verify measures are established to assure purchased software products or services conform to procurement documents.	10 CFR 50, Appendix B, Section VII NQA-1-1989, Section 7 NQA-2a-1990, Part 2.7, Sections 10.1, 3			
2. Verify that there exists documented evidence that purchased software conforms to procurement documents.	10 CFR 50, Appendix B, Section VII			
3. Verify that the monitoring of software contractors includes making sure the contractor has defined software quality program and that it is being properly implemented.	NUREG 4640, Sections 11.1, 2			

S.S. Einar  
Technical Specialist

7-10-95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date



# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<p><u>CHECKLIST SECTION V: CONFIGURATION MANAGEMENT IDENTIFICATION, CONTROL, AND STATUS</u></p> <p>1. Verify that processes are established to manage and control changes to software, associated hardware, and documentation including:</p> <ul style="list-style-type: none"> <li>a. documentation of problems.</li> <li>b. notification of problems to affected individuals/ organizations</li> <li>c. evaluation of problems for potential impact on work already performed.</li> <li>d. correction of problems.</li> <li>e. retest of software are changes</li> </ul>	<p>NQA-2a 1990, Part 2.7</p>			

S.S. Tolan      7-10-95  
Technical Specialist      Date

\_\_\_\_\_  
Audit Team Leader      Date

# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<p><u>CHECKLIST SECTION VI: VERIFICATION AND VALIDATION (INSPECTION, TEST, AND CONTROL)</u></p> <p>1. Verify that problems found during Verification and Validation activities are resolved (i.e., V&amp;V is taken as a serious activity).</p>	<p>NQA-2a-1990, Part 2.7</p>			

S.S. Eshen  
Technical Specialist

7-10-95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date

# The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

July 31, 1995

Mr. William C. Gekler  
Quality Assurance Manager  
PLG, Incorporated  
4590 McCarthur Blvd, Suite 400  
Newport Beach, CA 92660-2027

**Subject:** Houston Lighting & Power Audit of PLG, Inc.  
Newport Beach, CA - Audit Number 95-073 (VA)

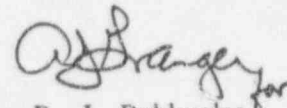
Dear Mr. Gekler:

This is to confirm the arrangements made with you for Houston Lighting & Power Company (HL&P) to conduct an audit at your facility in Newport Beach, CA the week of September 11-14, 1995. The audit will be performed as a joint utility audit under the auspices of the Nuclear Procurement Issues Committee (NUPIC) Joint Audit Program. Attached for your information is the audit scope and a copy of the NUPIC Audit Program Description.

Participating in the audit will be Mr. C. D. Wright, Audit Team Leader (HL&P), Mr. R. A. Carvelle, Audit Team Member (Pacific Gas & Electric Company), Ms. M. G. Toole, Audit Team Member (HL&P) and Mr. C. R. Grantom, Technical Specialist (HL&P). Please plan for a brief entrance meeting to begin at 9:00 am on Monday, September 11, 1995 to discuss audit details, objectives and schedule.

You may reach Mr. Wright at (512) 972-7247 should there be any questions concerning this audit.

Sincerely,

  
R. J. Rehkugler  
Director, Quality

*CDW*  
CDW/kmw  
Attachment

c: T. H. Cloninger N5009  
L. E. Martin N5005  
R. D. Martin N5014  
R. J. Tennant N4003  
G. C. Sandlin N3001  
N. O. Laughlin N5010  
C. R. Grantom N4011  
NUPIC Membership

Mr. Bob Carvelle  
Quality Assurance Department  
Pacific Gas & Electric Company  
P. O. Box 770000  
San Francisco, CA 94177

Audit File 95-073 (VA)  
Vendor History File

Project Manager on Behalf of the Participants in the South Texas Project

NUPIC COMPLIANCE COMMITTEE PROCEDURE  
ATTACHMENT 1

Audit Lead Review Checklist		
Supplier: <b>PLG, INCORPORATED</b>	Audit Date: <b>9/11-14/95</b>	Lead: <b>HLP</b>
Attribute	Set Unset	
	S	U
1. Use of current, approved Checklist.	✓	
2. Adequate Lead Auditor certifications and Technical Specialist qualifications.	✓	
3. NUPIC Representative-approved Audit Plan which references the NUPIC Checklist.	✓	
4. Notification to members for input 90 days in advance of the audit to include completed preliminary PDSA Worksheet and notification to suppliers and members 30 days in advance which includes the Audit Plan, the schedule and the Joint Audit Program Description. *		✓
5. Report identifies the supplier scope of supply and applicability of program for safety related and commercial grade item procurement. <b>PLG DOES NOT PROCURE CGIs</b>	✓	
6. Report addresses unique order entry requirements for safety related procurements.	✓	
7. Report provides an assessment of QA Program effectiveness including nonconformance significance.	✓	
8. Report includes an assessment of corrective action from the previous NUPIC audit.	✓	
9. Report addresses status of activities in response to NRC information.	✓	
10. Report includes contacts at entrance, exit and during the audit.	✓	
11. Report includes summary of Technical Specialist evaluation.	✓	
12. Issuance of the report within 30 days.	✓	
13. Corrective action response requested for findings within 30 days.	✓	
14. Package includes Audit Report, the Checklist, 2 Summary Sheets, completed PDSA Worksheets, findings, personal certification/qualification, and transmittal letter to supplier.	✓	
15. Results column of Checklist marked Set, Unset or Not Applicable.	✓	
16. All areas of Checklist including Vendor Program Reference, Assessment Summary and Data Sheets completed or marked Not Applicable with adequate explanation.	✓	
17. Corrections/revisions to the Checklist initialed and dated.	✓	
18. Supplemental pages properly identified and paginated.	✓	
19. Summary Sheet signed by Audit Team Leader and NUPIC Representative or designee.	✓	
20. Legibility and reproducibility of audit package.	✓	
21. Copy of Audit/Survey Feedback Questionnaire left with supplier.	✓	
22. NUPIC supplier database updated.	✓	
23. Completed Audit Frequency Assessment Form sent to Information Services Working Group Chairperson.	✓	
24. Audit Status: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">Open</span> Closed		
Lead Review: <b>90 DAY NOTIFICATION MISSED DUE TO SCHEDULING AROUND HLP REFUELING OUTAGE.</b>		
Reviewed by NUPIC Representative:		Date: <b>10-5-95</b>

**AUDIT SCOPE**

**AUDIT NUMBER 95-073 (VA)**

**ORGANIZATION:**

PLG, Incorporated  
4590 McCarthur Blvd., Suite 400  
Newport Beach, CA 92660-2027

**PURPOSE/SCOPE:**

Evaluate the adequacy and verify effective implementation of the PLG, Inc. Quality Assurance Program for compliance with 10CFR50, Appendix B, as it relates to a supplier of Engineering Services (Plant Risk Model Development).

**APPLICABLE DOCUMENTS:**

PLG, Incorporated Quality Assurance Manual, Revision 21, with changes through December 12, 1994.

**REFERENCE DOCUMENTS:**

NUPIC Checklist Revision, 6, dated March 26, 1995

NUPIC Supplemental Checklist for Software Development, Revision 0

<u>Chet Wright</u>	<u>7-26-95</u>	<u>[Signature]</u>	<u>7/26/95</u>
Prepared By	Date	Approved By	Date



# The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

July 6, 1995

To: NUPIC Membership

Subject: Houston Lighting & Power (HL&P) Audit of PLG, Inc.  
Newport Beach, CA - Audit Number 95-073 (VA)

Dear Member:

HL&P is scheduled to lead the Nuclear Procurement Issues Committee (NUPIC) audit of PLG, Incorporated supported by Pacific Gas & Electric Company. The audit is scheduled for September 11-14, 1995.

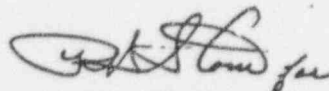
This letter is to serve as ninety (90) day notification to all NUPIC Members. Please submit supplier history/concerns, critical characteristics and procurement documents (with suppliers location referenced), by August 7, 1995.

Please submit your response, to the audit team leader:

Mr. C. D. Wright  
Houston Lighting & Power  
P. O. Box 289 Mail Code N4006  
Wadsworth, TX 77483

Should you have a question concerning the audit, please contact C. D. Wright at (512) 972-7247.

Sincerely,



J. E. Adkins  
NUPIC Representative

CDW/kmw  
Attachment

AD95-073.VA

Project Manager on Behalf of the Participants in the South Texas Project

Revision 9  
Date: 01-24-95

Supplier: PLG Inc.  
Audit No: \_\_\_\_\_  
Page: 1 of 5

# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<u>CHECKLIST SECTION I: ORGANIZATION</u>				
1. Determine if a separate software quality function has been established. If not, determine if the established programs are written such that software quality requirements are adequately addressed. If not, verify plans are being developed to address software concerns. Review the appropriateness of the organization which legitimizes the Software Quality Program.	10 CFR 50, Appendix B, Section I NQA-1, Section 1 ANSI N45.2.11 - 1974, 5.1.1			
<u>CHECKLIST SECTION II: DESIGN CONTROL</u>				
2. Verify that verification results are reviewed, approved, documented; exceptions are adequately documented and reviewed by the original design group.	10 CFR 50, Appendix B, Section III N45.2.11 - 1974 NQA-1 3s-1			
3. Review the change control process employed by the Software Quality Program and verify that changes made to specifications and source code receive the same reviews, justification, approvals, and documentation required of the original design.	10 CFR 50 Appendix B, Section III N45.2.11 - 1974 NQA-1 3s-1			

S.S. Taber  
Technical Specialist

7.10.95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date

# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<p><u>CHECKLIST SECTION III:</u> <u>INSTRUCTIONS, PROCEDURE, AND DRAWINGS</u></p> <p>I. Verify procedures or instructions have been prepared to control and document the development of software systems in the following areas, as applicable:</p> <ul style="list-style-type: none"> <li>a. Software QA Plan</li> <li>b. Requirements Specification</li> <li>c. Design Specification</li> <li>d. Verification/Validation Plans</li> <li>e. User Documentation</li> <li>f. Standards Manual</li> <li>g. Product Release Procedures</li> <li>h. Installation Manual</li> <li>i. Training Manual</li> <li>j. Operations Manual</li> <li>k. Project file</li> </ul>	<p>N45.2.11 - 1974, Section 4.5. 10 CFR 50, Appendix B, Section V NQA-1-1989, Section 5 NQA-2a, Part 2.7</p>			

S.S. Tahan  
Technical Specialist

7.10.95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date

# PBSA WORKSHEET

Items Description: Computer Software  
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1. Verify measures are established to assure purchased software products or services conform to procurement documents.	10 CFR 50, Appendix B, Section VII NQA-1-1989, Section 7 NQA-2a-1990, Part 2.7, Sections 10.1, 3			
2. Verify that there exists documented evidence that purchased software conforms to procurement documents.	10 CFR 50, Appendix B, Section VII			
3. Verify that the monitoring of software contractors includes making sure the contractor has defined software quality program and that it is being properly implemented.	NUREG 4640, Sections 11.1, 2			

S.S. Fisher  
Technical Specialist

7.10.95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date

# PBSA WORKSHEET

Items Description: Computer Software  
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1) Technical Characteristics (Essential For Form, Fit or Function) and/or items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<p><u>CHECKLIST SECTION V: CONFIGURATION MANAGEMENT (IDENTIFICATION, CONTROL, AND STATUS)</u></p> <p>1. Verify that processes are established to manage and control changes to software, associated hardware, and documentation including:</p> <ul style="list-style-type: none"> <li>a. documentation of problems.</li> <li>b. notification of problems to affected individuals/ organizations</li> <li>c. evaluation of problems for potential impact on work already performed.</li> <li>d. correction of problems.</li> <li>e. retest of software are changes</li> </ul>	<p>NQA-2a 1990, Part 2.7</p>			

S.S. Telma  
Technical Specialist

7.10.95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date



# PBSA WORKSHEET

Items Description: Computer Software  
(Part #, Process, Service) Risk Model Analysis

1) Technical Characteristics (Essential For Form, Fit or Function) and/or Items of interest	2) Acceptance Criteria	3) Supplier 's Method of Control	Results	References (Checklist Section)
<p><u>CHECKLIST SECTION VI: VERIFICATION AND VALIDATION (INSPECTION, TEST, AND CONTROL)</u></p> <p>1. Verify that problems found during Verification and Validation activities are resolved (i.e., V&amp;V is taken as a serious activity).</p>	<p>NQA-2a-1990, Part 2.7</p>			

S.S. Fisher  
Technical Specialist

7-10-95  
Date

\_\_\_\_\_  
Audit Team Leader

\_\_\_\_\_  
Date

ATTACHMENT 6

ADDITIONAL PSA INFORMATION

### Evolution of STP's PSA

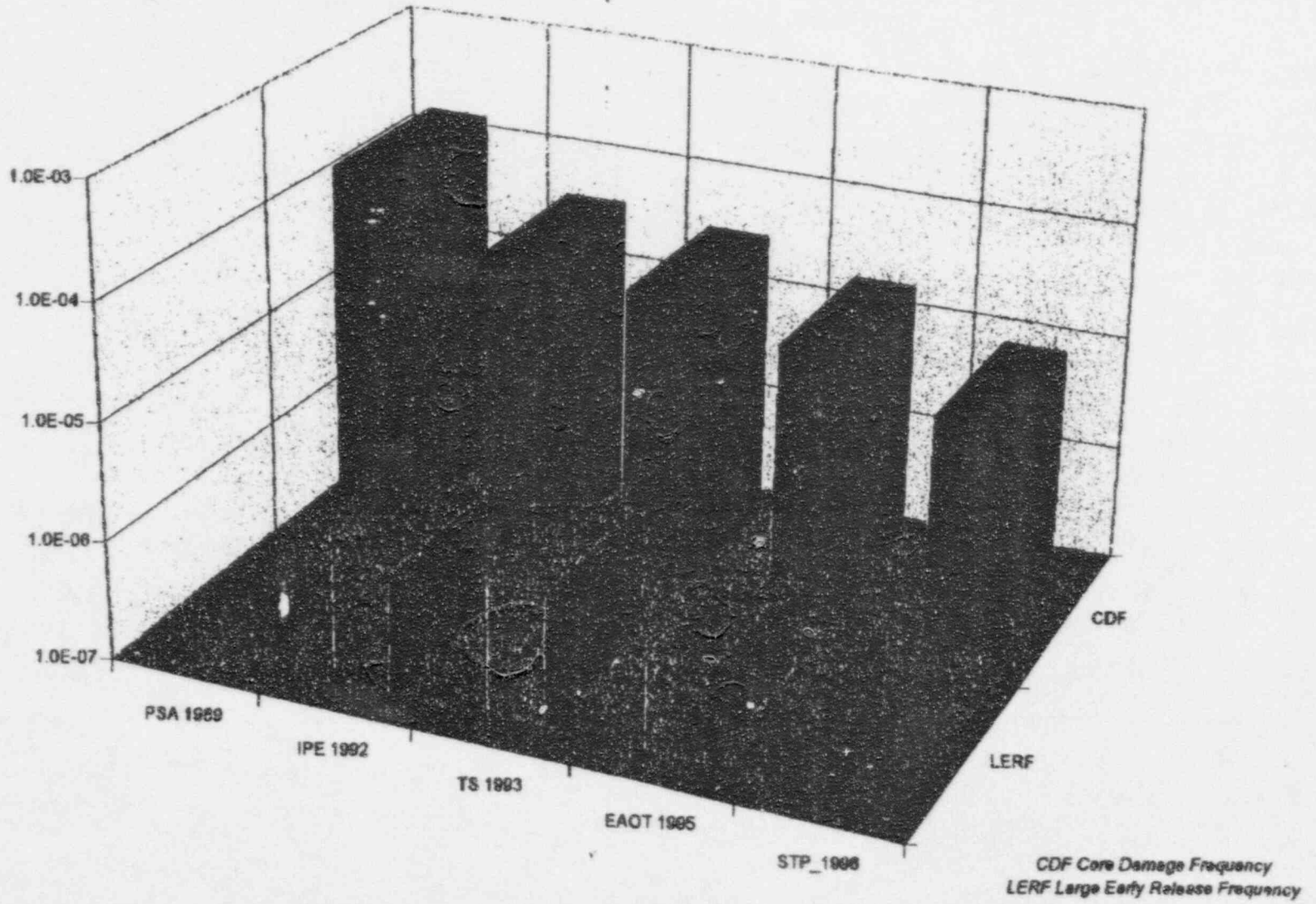


Figure 1  
Attachment 6

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

D0527

<small>M:\WP\APPROVED\PGP04-ZA-0604.D0M</small> Effective Date: 07/15/96 Print Time / Date: 7:53 AM 06/19/97		<h2>OPGP04-ZA-0604</h2>		<b>Rev. 0</b> <b>General</b>		Page 1 of 4	
<b>Probabilistic Safety Assessment Program</b>							
Quality		Non Safety-Related		Usage: Available		Effective Date: 07/15/96	
B. D. Webb		A. M. Richards		N/A		Nuclear Fuel & Analysis	
PREPARER		TECHNICAL		USER		COGNIZANT ORGANIZATION	

Table of Contents

	<u>Page</u>
1.0 Purpose and Scope .....	2
2.0 Definitions .....	2
3.0 References .....	2
4.0 Responsibilities .....	3
5.0 Requirements .....	3
5.1 Reference PSA Models .....	3
5.2 Documentation .....	3
5.3 Reference PSA Model Updates .....	4
5.4 Computer Programs and Methodology .....	4
5.5 Procedures and Quality Assurance .....	4

OPGP04-ZA-0604

Rev. 0

Page 2 of 4

## Probabilistic Safety Assessment Program

## 1.0 Purpose and Scope

This procedure specifies the maintenance of the STP Probabilistic Safety Assessment (PSA) and associated administrative controls. This procedure satisfies the commitment for a "living" PSA stated in References 3.2, 3.3 and 3.4.

## 2.0 Definitions

2.1 Probabilistic Safety Assessment (PSA) - A method of determining the theoretical risk and consequences of nuclear accidents.

2.1.1 Level 1 PSA - The determination of the frequency of accidents causing severe core damage.

2.1.2 Level 2 PSA - The determination of the magnitude and frequency of radioactive releases resulting from nuclear accidents.

2.1.3 Level 3 PSA - The determination of the health effects on the public due to releases from nuclear accidents.

2.2 Reference PSA Model - An identifiable set of PSA inputs which represents the nominal plant configuration and operating condition.

## 3.0 References

3.1 Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Probabilistic Safety Assessment - External Events, Docket Nos. 50-498 and 50-499, L. E. Kokajko to W. T. Cottle, Aug. 31, 1993.

3.2 Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment Nos. 59 and 47 to Facility Operating License Nos. NPF-76 and NPF-80, S. C. Black to W. T. Cottle, dated Feb. 17, 1994.

3.3 Individual Plant Examination (IPE) - Internal Events, South Texas Project, Units 1 and 2, August 28, 1992 supplemented by letter dated Nov. 17, 1994.

3.4 NRC Staff Evaluation of South Texas Project Individual Plant Examination (IPE), (Internal Events Only), T. Alexion to W. T. Cottle, Aug. 9, 1995.

3.5 OPGP03-ZE-0002, "Calculations"

3.6 OPGP07-ZA-0014, "Software Quality Assurance Program"

3.7 Risk Assessment Guideline 002, Review and Documentation of PSA Input Document Changes



OPGP04-ZA-0604

Rev. 0

Page 3 of 4

## Probabilistic Safety Assessment Program

## 4.0 Responsibilities

- 4.1 The Risk and Reliability Analysis (RRA) Supervisor is responsible for maintaining the Level 1 and Level 2 PSA for STP and will designate a Responsible Analyst for each Reference PSA model.
- 4.2 The Responsible Analyst for each Reference PSA Model is responsible for model updates, documentation, record keeping, and configuration control of the assigned model.

## 5.0 Requirements

5.1 Reference PSA Models

Reference PSA models that apply to the normal plant configuration are maintained. These reference models are periodically updated to keep them current with plant changes, operating data, and advances in PSA methodology.

The PSA consists of at least two models, based on plant operating mode:

- An at-power PSA applicable to modes 1 and 2.
- A shutdown PSA (or PSSA) covering modes 3 through core off-load (Level 1 only).

There may be more Reference PSA Models that apply to parts of the plant or special plant configurations.

5.2 Documentation:

For each Reference PSA Model, documentation is maintained that includes all sources of input data, modeling techniques, and assumptions used in the analysis. Input data includes physical description of the plant, component dependencies, success criteria, methods of operation, and equipment operating history.

Documentation is organized into a formal report which includes at least the following volumes:

- Data collection and analysis
- Initiating Events
- Event Trees
- System models
- Basic Event - TAG/TPNS Cross Reference
- External Events
- Spatial Interactions
- Human Factors
- Containment Analysis
- Summary of Results

These documents will be retained by Records Management.

OPGP04-ZA-0604

rev. 0

Page 4 of 4

## Probabilistic Safety Assessment Program

5.3 - Reference PSA Model Updates:

The Reference PSA Models is updated at least every Unit 1 refueling cycle incorporating applicable plant modifications, procedure changes and data collected since the previous update. All relevant documentation is updated when the reference model is updated, and the new version is not used until the model is approved and the documentation is complete. Revisions can be made more frequently at the discretion of the RRA Supervisor. A file of proposed model changes will be maintained between major model updates. All PRA calculations and sensitivity analyses will be performed using the latest version of the Reference PSA Model that exists at the start of the work.

5.4 Computer Programs and Methodology:

The STP PSA model is based on the RISKMAN Computer Program from PLG, Inc. This program integrates data analysis, systems analysis and event tree quantification. Containment response and radiation releases are computed using the EPRI MAAP program.

5.5 Procedures and Quality Assurance:

Computer codes are maintained in accordance with OPGP07-ZA-0014, "Software Quality Assurance Program." RISKMAN and MAAP are level 2 programs under this procedure.

The PSA updates and documentation are independently reviewed and approved by the RRA Supervisor. Calculations based on the PSA are performed in accordance with OPGP03-ZE-0002, "Calculations".

Changes to Risk Assessment Guidelines shall be peer reviewed.

in accordance  
with Risk  
Assessment  
Guideline 002  
(Ref. 3.7).

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HOUSTON LIGHTING AND POWER COMPANY  
SOUTH TEXAS PROJECT  
ELECTRIC GENERATING STATION  
PLANT PROCEDURES MANUAL



STATION PROCEDURE

SAFETY-RELATED (Q)

Calculations

OPGP03-ZE-0002  
Rev. 3 (General)  
Page 1 of 9

APPROVED:

Warren H. Kinney  
PLANT MANAGER

5-30-90  
DATE APPROVED

05-30-90  
DATE EFFECTIVE

<u>Table of Contents</u>	<u>Page</u>
1.0 Purpose and Scope	2
2.0 Definitions	2
3.0 Responsibilities	2
4.0 Procedure	3
5.0 References	5
6.0 Support Documents	5
6.1 Addendum 1, Calculation Number Format	6
6.2 Addendum 2, Typical Calculation Page Format	7
6.3 Calculation Cover Sheet (-1)	8
6.4 Calculation Checklist (-2)	9

1.0 Purpose and Scope

- 1.1 The purpose of this procedure is to devise the methods used for preparing, checking, approving, controlling, revising and retaining calculations generated by the Nuclear Plant Operations Department (NPOD).
- 1.2 This procedure does not apply to calculations which are performed as part of another procedure.
- 1.3 This procedure is applicable to all NPOD departments. Each Department Manager may determine whether or not calculations within their scope of responsibility should be controlled in accordance with this procedure. This determination is based upon the importance to safety of the item under consideration. The requirements of this procedure do not apply to calculations performed prior to the effective date of this procedure.
- 1.4 This procedure shall not be used to perform design calculations as controlled by IP-3.09Q "Engineering Organization Program for the Preparation and Verification of Design Calculations". The scope of this IP includes calculations which form the basis of final drawings, final specifications or other final documents for design activities involving reactor physics; stress, thermal hydraulics, and accident analysis; materials compatibility; and accessibility for maintenance, inservice inspection, and repair.

2.0 Definitions

- 2.1 SAFETY RELATED CALCULATIONS (SR) - Calculations used to establish the technical basis for judgments on the safety implications of activities associated with plant operation, that are required to be documented, and do not change the design or licensing basis as described in the Final Safety Analysis Report.
- 2.2 COGNIZANT ORGANIZATION - The organization which produced, performed, or is presently responsible for maintaining the calculation.
- 2.3 ORIGINATOR - The individual(s) that performed the calculation.
- 2.4 VERIFIER - An individual(s) competent in the field of the calculation and shall be other than those who performed the calculation.

3.0 Responsibilities

- 3.1 ORIGINATOR - The originator is responsible for preparing or revising the calculation in accordance with Steps 4.1 and 4.3.

- 3.2 VERIFIER - The verifier is responsible for confirming the accuracy, correctness, applicability of the method and completeness of the calculation in accordance with Step 4.2.
- 3.3 SUPERVISOR - The individual responsible for assigning competent verifier(s) and reviewing and approving the calculation in accordance with Step 4.4.
- 3.4 PROJECT DOCUMENT CONTROL (PDC) - The organization responsible for maintaining a log to assign identification and revision numbers to calculations and ensure proper retention of calculations generated by WPOD.
- 3.5 RECORD MANAGEMENT SYSTEM (RMS) - The organization responsible for maintaining records for retrieval.

#### 4.0 Procedure

##### 4.1 The Originator shall:

4.1.1 Prepare a purpose and scope statement which states the following:

- a. the objective of the calculation.
- b. the extent to which the calculation is applicable including any limitations
- c. the specified requirements that must be completed before the calculation is considered complete.

4.1.2 Prepare the calculation referring to Addendum 2 and the Calculation Checklist (-2) as guidelines.

4.1.3 Complete Section I of the Calculation Cover Sheet (-1).

4.1.4 Determine the retention duration for the calculation and record it on the bottom of the Calculation Cover Sheet (-1). If the calculation is used to support a safety-related activity, the retention duration shall be for the life of the plant.

4.1.5 Obtain a calculation number and revision number from PDC. All initial calculations shall be entered as Revision 0. The calculation number shall be in accordance with Addendum 1. Enter the calculation number and revision number on the top of the Calculation Cover Sheet (-1).



Calculations

OPGPO3-ZE-0002

Rev. 3

Page 4 of 9

4.1.6 Each revision of a calculation shall be retrievable. The new calculation shall have the same calculation number as the revised calculation and a new revision number. The list of revisions for the new calculation shall be upgraded to reflect the new revision number and reason for the revision on the Calculation Cover Sheet (-1).

4.1.7 Submit the calculation to a Verifier as identified by the Originator's Supervisor.

4.2 The Verifier shall:

4.2.1 Review, confirm, or substantiate the calculation result by one or more methods to provide assurance that the result meets the specified inputs. The method of verification shall be identified and documented on the Calculation Cover Sheet (-1) and additional pages if necessary. Alternate calculations may be used to verify the accuracy of the calculation. The results of verifications shall be documented. Documentation shall be attached to the original calculation and shall be auditable against the verification method(s) identified.

4.2.2 If the verification does not confirm the calculation's original result, the calculation/discrepancy/question shall be resolved with the originator(s).

4.2.3 Complete the Calculation Checklist (-2) and Section II of the Calculation Cover Sheet (-1).

4.2.4 Return the calculation to the originator.

4.3 The Originator shall:

4.3.1 Re-examine the calculation package to verify inclusion of the following:

- o Calculation Cover Sheet (-1),
- o Calculation Checklist (-2),
- o all required calculation sheets, and
- o all required alternate calculation sheets.

4.3.2 Number the pages of the calculation package.

4.3.3 Submit the calculation to the Supervisor for review and approval.

Calculations

OPGP03-ZE-0002

Rev. 3

Page 5 of 9

4.4 The Supervisor shall:

4.4.1 Verify accurate completion of the Calculation Cover Sheet (-1) and Calculation Checklist (-2).

4.4.2 Determine whether other interfacing or reference calculations are affected and take appropriate action to revise them.

a) Interfacing or reference calculations which provide input to the subject calculation shall be revised and approved prior to approval of the subject calculation.

b) Other interfacing or reference calculations shall be tracked through revision and approval and reference the affected calculation.

4.4.3 Determine if other Divisions and/or Departments should review the calculation prior to approval. Document these additional reviews by completion of Section III of the Calculation Cover Sheet (-1).

4.4.4 Review and approve the calculation by completing Section IV of the Calculation Cover Sheet (-1).

4.4.5 Route the approved calculation to PDC for processing. PDC will issue working copies and transmit film to Site Records Center (SRC).

4.5 PDC shall file the calculation appropriately and take appropriate action to identify previous revisions on file as superceded.

5.0 References

5.1 IP-3.26Q Rev. 0 "Preparation and Verification of Safety Related Calculations"

6.0 Support Documents

6.1 Addendum 1, Calculation Number Format

6.2 Addendum 2, Typical Calculation Page Format

6.3 Calculation Cover Sheet (-1)

6.4 Calculation Checklist (-2)

Calculations

OPGPO3-ZE-0002

Rev. 3

Page 6 of 9

ADDENDUM 1

CALCULATION NUMBER FORMAT

(Page 1 of 1)

Calculations shall be numbered using the following alphanumeric series:

YY - AA - NNN

\_\_\_\_ Denotes a sequential number which shall not be sequential from year to year. This number may be more or less than three digits at the discretion of PDC.

\_\_\_\_ Denotes the alpha system designator which identifies the system to which the calculation applies. Refer to Addenda 6 and 7 of OPGPO3-ZA-0039 for a list of system and non-system designators.

\_\_\_\_ Denotes the year the number was issued.

ADDENDUM 2

TYPICAL CALCULATION PAGE FORMAT

1.0 Each calculation page shall have a header similar to the following:

Calculation No. \_\_\_\_\_ Rev. No. \_\_\_\_\_  
 Page \_\_\_\_\_ of \_\_\_\_\_  
 Subject: \_\_\_\_\_

---

2.0 Identify revisions to calculations by placing revision bars in the right hand margin next to the contents which were revised (i.e. any additions, deletions, or changes to the original calculation). When extensive changes to the calculation are made, place the word (General) in parentheses next to the calculation revision number on the Calculation Cover Sheet (-1) to indicate that this revision represents an extensive revision to the calculation.

3.0 The calculation shall be prepared in a legible and reproducible form.

4.0 The calculation shall contain a description of the methodology used to perform the calculation. This description shall be presented such that the Verifier can understand and reconstruct the method used to perform the calculation. Previously developed methods and solutions used as guidelines shall be identified as design input.

5.0 Assumptions, references and base input data shall be stated when they are introduced into the calculation. Their justification and source shall be included such that they may be understood by the Verifier.

6.0 Computer Calculations

6.1 Computer codes may be used for SR Calculations. The computer codes shall be used for the purposes for which they were approved and verified by the CO. The calculation shall contain sufficient information for the Verifier to duplicate the results using inputs and assumptions provided in the SR Calculation. The User Manual for the computer code shall be referenced. A copy of the computer output (either hard copy or microfiche) should be attached to the calculation. If the computer output is not attached, proper cross-referencing shall be included to indicate its storage location. If the calculation utilizes results of computer output attached to an issued calculation, then that issued calculation shall be referenced on the computer output.

6.2 Hard copy (i.e., paper) output shall have page accountability. Each page of the output shall contain the calculation number, the time and date the job was run.

6.3 Each sheet of microfiched output shall contain the calculation number, the time and date the job was run, a unique job name or job number combination identifier and page accountability.

CALCULATION COVER SHEET

OPGPO3-ZE-0002-1

(Page 1 of 1)

Calculation No. \_\_\_\_\_ Rev. No. \_\_\_\_\_

Cognizant Organization \_\_\_\_\_ Page 1 of \_\_\_\_\_

I Subject: \_\_\_\_\_  
 \_\_\_\_\_

Applicable to Unit(s): \_\_\_\_\_

Purpose and Scope \_\_\_\_\_  
 \_\_\_\_\_

Document(s) which are supported by this calculation: \_\_\_\_\_  
 \_\_\_\_\_

Document ID	Title

Originator Signature \_\_\_\_\_ Date \_\_\_\_\_

---

II Calculation Verification method \_\_\_\_\_  
 \_\_\_\_\_

Verifier Signature \_\_\_\_\_ Date \_\_\_\_\_

---

III Additional reviews performed by	Representing (Dept/Div)

---

IV Supervisor Signature \_\_\_\_\_ Date \_\_\_\_\_

This calculation, when approved, shall be retained for \_\_\_\_\_



CALCULATION CHECKLIST

OPGP03-ZE-0002-2

(Page 1 of 1)

Calculation No. \_\_\_\_\_ Rev. No. \_\_\_\_\_

Cognizant Organization \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_

DIRECTIONS: If the statement is true, initial the block provided for each statement. If the statement is false, leave the initial block blank until the conflict is resolved with the originator. If the statement is not applicable mark the block appropriately.

INITIALS		
ORIG.	VER.	
_____	_____	1. The Calculation Cover Sheet (-1) is completed other than the Supervisor's signature.
_____	_____	2. The statements defining the calculation purpose, methodology, and objectives are clear and concise.
_____	_____	3. Applicable codes, standards, and references are listed in the calculation. Any exceptions to applicable codes or standards are identified and appropriate.
_____	_____	4. Assumption statements are appropriate and clearly stated.
_____	_____	5. If established criteria is used to support the calculation, the use is appropriate and incorporated correctly.
_____	_____	6. The calculation is orderly and complete with enough sketches or drawings so that the work can be understood.
_____	_____	7. The calculation format is in accordance with the procedure.
_____	_____	8. The calculation numerical accuracy is consistent with the desired result and is reasonable.
_____	_____	9. The calculation inputs and their sources are identified.
_____	_____	10. Computerized calculation processes are defined in enough detail so as to be able to be re-performed consistently.
_____	_____	11. The revision does not adversely affect the current approved calculation.
_____	_____	12. The revision block at the top right-hand margin of each calculation sheet is filled in correctly.
_____	_____	13. A revision bar is in the right-handed margin of each calculation sheet to indicate a revision to the text/numerical calculation as necessary.

5

**South Texas Project  
Electric Generating Station  
Risk & Reliability Analysis**

**Risk Assessment Guideline  
Number 002  
Review and Documentation of PSA Input  
Document Changes**

	Signature/Print	Date
Prepared By	<i>David C. Sillwell</i> / D. C. Sillwell	4/29/97
Reviewed By	<i>H.C. Moldenbauer</i> / H.C. Moldenbauer	5/1/97
Approved By	<i>J.C.R. Granton</i> / J.C.R. Granton	5/1/97

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
TABLE OF CONTENTS .....	ii
1.0 PURPOSE OF GUIDELINE .....	1
2.0 BACKGROUND .....	1
3.0 STEPS .....	2
4.0 REFERENCES .....	5

## 1.0 PURPOSE OF GUIDELINE

This guideline identifies the process used to review and disposition changes to the Reference PSA model documentation. Documentation, for the purposes of this procedure, includes the information identified as reference material in the PSA system and event tree notebooks.

## 2.0 BACKGROUND

The STP PSA is intended to be a "living" assessment of the risk of operation of STP. Periodic updates to the PSA are performed in accordance with the Probabilistic Safety Assessment Program identified in OPGP04-ZA-0604 (Ref. 4.1). In order to efficiently perform the periodic updates described in OPGP04-ZA-0604, changes to the reference documents that support the PSA must be reviewed, and where necessary, incorporated into the reference documents. The reference documents are included in the Database of PSA Inputs maintained by the Risk and Reliability Analysis Group (RRA).

To ensure an efficient process, reference document changes are reviewed on a continual basis. Based on these reviews, recommended actions are identified which include:

- Screening from further review
- Screening for qualitative impact
- Screening for quantitative impact; and
- Incorporating into a working system notebook.

This Risk Analysis Guideline is used to guide the process for review and disposition of changes to the reference documentation identified in the various notebooks that support the Reference PSA Model. The steps are illustrated in the flowchart presented in Figure 1.

As part of this process, members of the RRA Group are assigned responsibility for selected notebooks that form the basis of the Reference PSA Model. It is expected that all changes affecting a particular model will be reviewed and dispositioned by the same assigned individual between major model updates. This reinforces individual ownership of selected parts of the risk model and should enable a shorter update process.

The members of the RRA Group are encouraged to maintain an up-to-date "working" copy of their assigned notebooks. These working documents should include all minor

changes (e.g. editorial and insignificant model changes) currently outstanding against their assigned notebook.

This guideline covers changes to documents already identified as affecting the PSA models. New documents that affect the PSA models are identified during the periodic PSA update process (every eighteen months).

### 3.0 STEPS

3.1 The Technical Support staff receives a periodic update to the status of documentation contained in the Database of PSA Inputs. These changes are usually identified on a monthly basis to ensure a uniform and continuing process. Approval to extend this time is obtained verbally from the RRA Administrator and is documented by E-Mail to the Technical Support Staff.

3.2 The following changes are received:

- a. Changes to licensing basis documents, e.g., UFSAR, Technical Specifications, are received directly from the Nuclear Licensing Group.
- b. Changes to procedures, drawings, calculations, etc. are identified by performing a "query" on the plant Oracle database using the Database of PSA Inputs to define the query.

3.3 Based on a comparison of the changed documents, an initial screening is performed by the Technical Support staff. Those documents not identified in the Database of PSA Inputs are screened from further evaluation.

The initial documentation received from Nuclear Licensing and the Oracle database query are retained for eighteen months (model update frequency) by the RRA section for historical purposes only.

3.4 Those documents that are not screened from evaluation are assigned to the RRA PSA analyst responsible for the affected documentation by the Technical Support staff screener. This should be accomplished within 5 working days from receipt of a new set of documents. Notification of the RRA Administrator is necessary if the time will exceed 5 working days.



- 3.5 When assigned to the responsible PSA analyst, the Database of PSA Inputs is modified to indicate the status of the change. This database is used to track the current status of potential and proposed changes to the PSA models resulting from changes in reference information.
- 3.6 The PSA analyst will collect the change documentation and start the review process. The review process consists of comparing the changed document to the information contained in the PSA.
- 3.7 For those documents that are updates to PSA references, but do not affect the modeling or quantification of the Reference PSA Model or models developed from this model:
- a. A change to the reference number is made in a "working" copy of the affected document. The working copy is maintained by the responsible PSA analyst.
  - b. When the reference change is complete in the working copy of the affected document, the Database of PSA Inputs modified to indicate that the affected document is updated and closed.
- 3.8 For those documents that affect the modeling or quantification of the Reference PSA Model or models developed from that model:
- a. A preliminary assessment is made by the responsible analyst to determine the possible magnitude of the change. This assessment can range from complete model requantification to the performance of sensitivity calculations to no action because the effect of the change is expected to be negligible. A change package containing the assessment is filed in the "Pending PSA Changes" notebook, for incorporation into the Reference PSA model during the next major update.
  - b. If the expected change identified above is less than 10% of the current Reference PSA Model Core Damage Frequency (CDF), the responsible PSA analyst prepares a change documentation package that briefly describes the change and the effect of the change on the Reference PSA Model.

The ten percent of CDF limit is based on engineering judgement. Changes greater than this limit indicate a need for detailed evaluation of the plant risk models with a concurrent commitment of significant staff resources for incorporation. Changes less than this limit will not have a

significant impact on the Reference PSA Model and the risk models supported by the Reference PSA Model and therefore do not indicate a need to commit significant resources for incorporation. This limit may be adjusted at the discretion of the RRA Administrator.

The responsible PSA analyst updates the Database of PSA Inputs to indicate the change will be incorporated in the next revision to the Reference PSA Model. The change package is filed in the "Pending PSA Changes" notebook, for incorporation into the Reference PSA model during the next major update.

The Pending PSA Changes notebook is maintained by the RRA Group to identify minor changes in the models that support the Reference PSA Model. Minor changes include typographical errors discovered in the text and changes to the models that result in a less than 10% change in the Reference PSA CDF.

It is expected that most minor changes will be dispositioned within 30 days of the initial identification described in Step 3.4.

- c. If the expected change is greater than 10% of the current Reference PSA Model CDF, the change has a measurable effect on the Reference PSA Model and should be incorporated as soon as possible to ensure the Reference PSA Model remains a "Living" document.
- d. The assigned PSA analyst prepares a change package that identifies the change, the expected magnitude of the change, and the suggested steps for incorporation of the change into the model.
- e. The RRA Administrator will assign a completion date for a proposed change where the expected change in CDF exceeds 10% of the CDF calculated in the Reference PSA Model.

Incorporation of the change will require approval of all of the affected documentation and re-issue of a modified Reference PSA Model.

- f. Upon incorporation of the change into the modified Reference PSA Model, the new model is issued as the Reference PSA Model.
- g. The Database of PSA Inputs is modified to indicate the close out of the change documentation and issuance of the new Reference PSA Model.

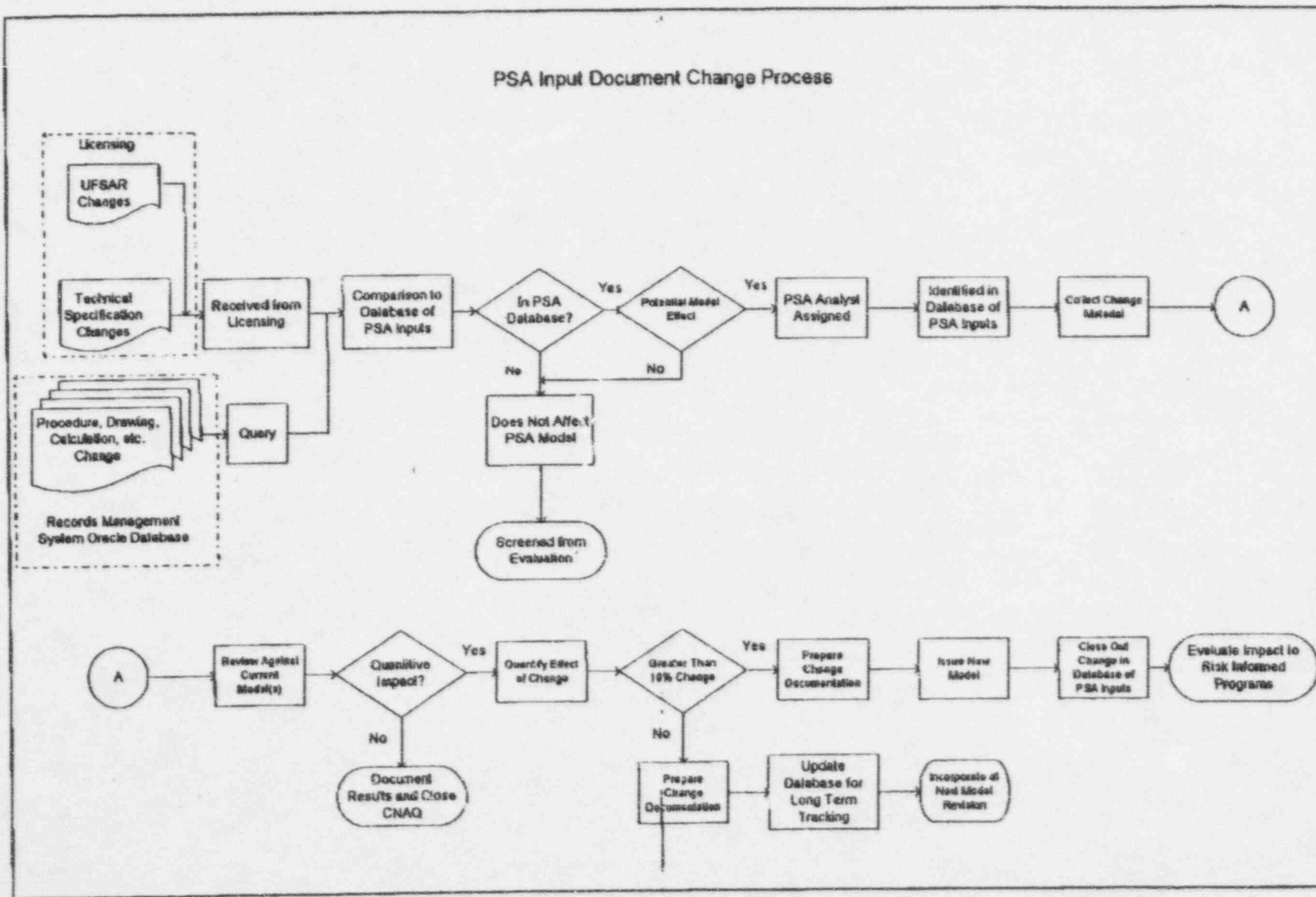
- 3.9 A time limit cannot be established for incorporation of major changes to the Reference PSA model. Staff and plant commitments may result in major changes being identified and deferred until the next major scheduled model update.
- 3.10 A review of identified changes to the Reference PSA Model which have not yet been incorporated to assess the cumulative impact of the changes will be performed periodically. This review will be documented in the Pending PSA Changes notebook.

This review will assist in the maintenance of the PSA as a "living" document by ensuring that the cumulative effect of changes to the PSA are within the 10% of CDF bounds described above.

#### 4.0 REFERENCES

- 4.1 Probabilistic Safety Assessment Program, OPGP04-ZA-0604, Rev. 0.

PSA Input Document Change Process



**COVER SHEET FOR CORRESPONDENCE**  
**USE THIS COVER SHEET TO PROTECT ORIGINALS OF**  
**MULTI-PAGE CORRESPONDENCE**



~~NOTE~~  
MEMORANDUM TO: PD IV-1 File  
FROM: Tom Alexion  
SUBJECT: LICENSEE'S DRAFT RESPONSES TO NRC'S JUNE 13, 1997, REQUEST FOR ADDITIONAL INFORMATION ON GRADED QUALITY ASSURANCE, SOUTH TEXAS PROJECT, UNITS 1 AND 2 (TAC NOS. M92450 AND M92451)

~~45942~~  
3243

G: STP 92450. NOT  
7/1/97

I received the subject faxes from the licensee. The purpose of this memo is to place this information in the public document room.

The licensee provided their formal response by letter dated June 26, 1997.

Docket Nos. 50-498 and 50-499

Attachment: Faxes from Licensee

DISTRIBUTION

Docket File  
PUBLIC (PDR)

~~JCH/ord~~  
~~T Alexion~~