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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)

APPROVED: Warren M. Kinsey / PLANT MANAGER — 5-30-90 DATE APPROVED — 05-30-90 DATE EFFECTIVE

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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 0PGP04-ZA-0604 (Ref. 4.1). In order to efficiently perform the periodic updates described in 0PGP04-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.

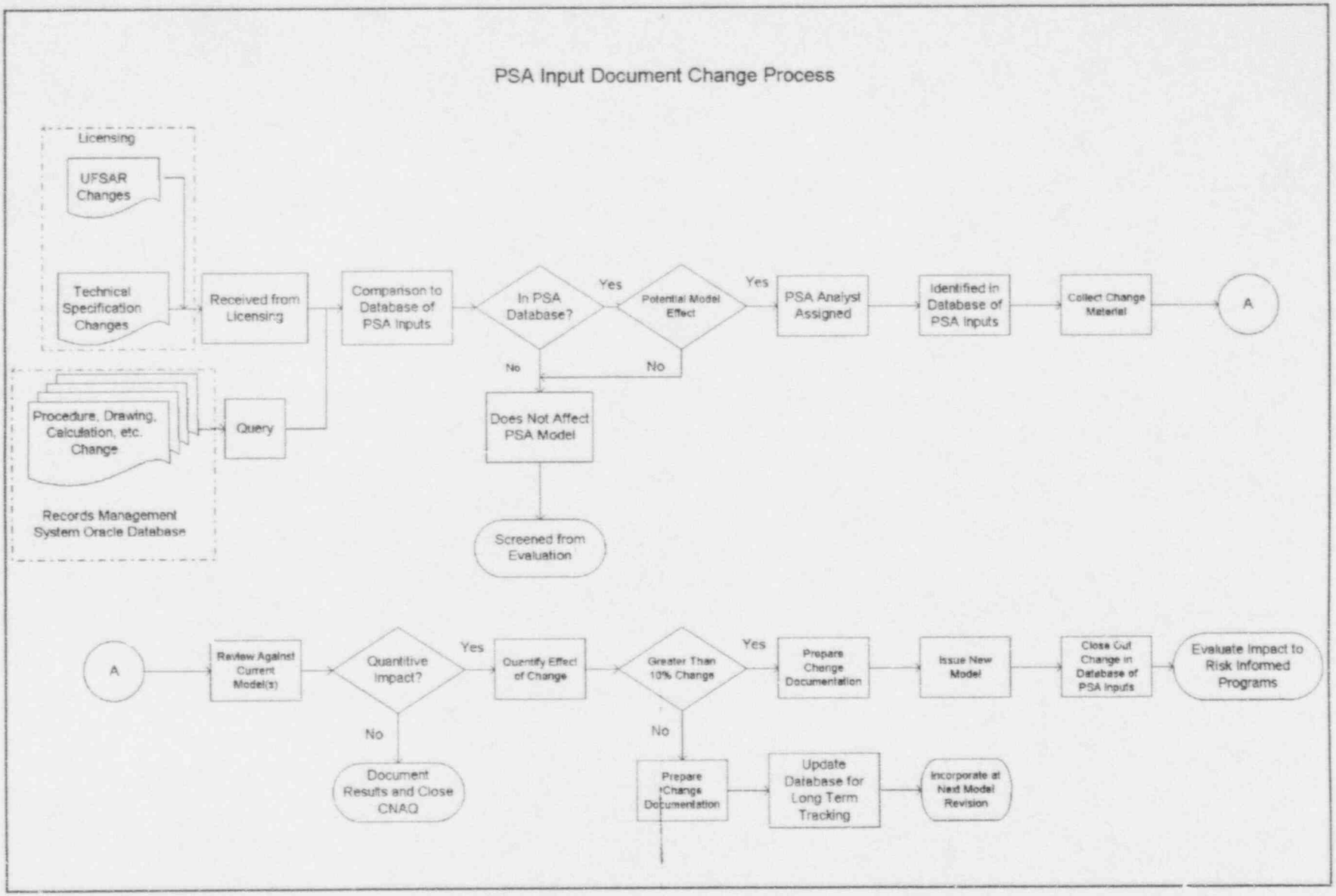
3.9 A time limit cannot be established for incorporation of major changes to the Reference PSA model. Staff and plant commitments may result in major changes being identified and deferred until the next major scheduled model update.

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, 0PGP04-ZA-0604, Rev. 0.


PSA Input Document Change Process
Licensing
UFSAR Changes
Technical Specification Changes
Received from Licensing
Comparison to Database of PSA Inputs
In PSA Database?
Yes
Potential Model Effect
Yes
PSA Analyst Assigned
Identified in Database of PSA Inputs
Collect Change Material
A
No
No
Procedure, Drawing, Calculation, etc. Change
Records Management System Oracle Database
Query
Does Not Affect PSA Model
Screened from Evaluation
A
Review Against Current Model(s)
Quantitive Impact?
Yes
Quantify Effect of Change
Greater Than 10% Change
Yes
Prepare Change Documentation
Issue New Model
Close Out Change in Database of PSA Inputs
Evaluate Impact to Risk Informed Programs
No
No
Document Results and Close CNAQ
Prepare Change Documentation
Update Database for Long Term Tracking
Incorporate at Next Model Revision

ATTACHMENT 6

HOUSTON LIGHTING & POWER AUDIT OF

PLG , INCORPORATED IN NEWPORT BEACH, CA

VENDOR AUDIT No. 95-073 (VA)

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MANAGEMENT CONSULTANTS

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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,

W. C. Gekler

Willard C. Gekler
Manager, Quality Assurance

5.3 Reference PSA Model Updates:

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

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 0PGP07-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 0PGP03-ZE-0002, "Calculations".

Changes to Risk Assessment Guidelines shall be peer reviewed.

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.

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 0PGP03-ZE-0002, "Calculations"

3.6 0PGP07-ZA-0014, "Software Quality Assurance Program"

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

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Probabilistic Safety Assessment Program			
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

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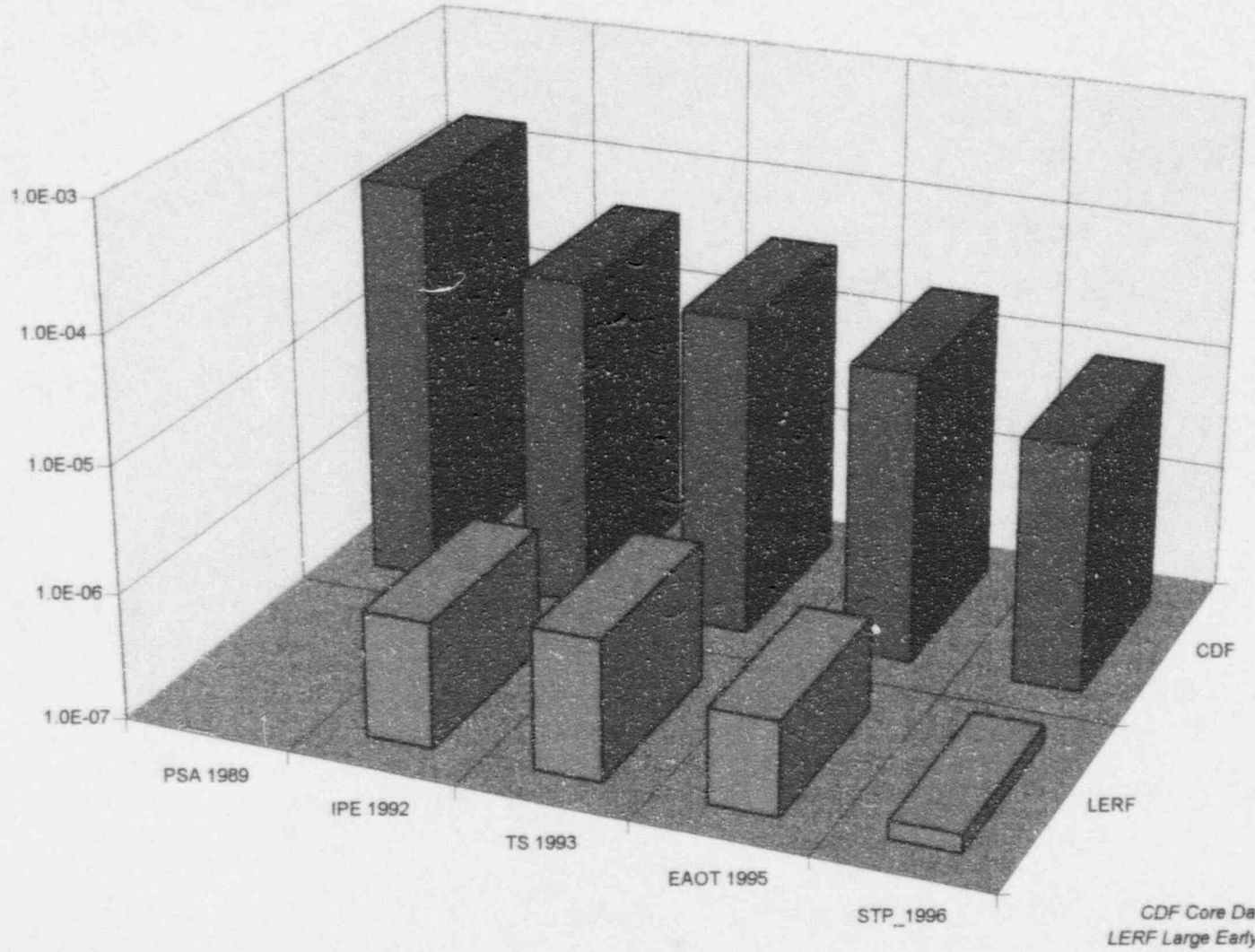
Evolution of STP's PSA



CDF Core Damage Frequency
LERF Large Early Release Frequency

Figure 1
Attachment 5

ATTACHMENT 5

ADDITIONAL PSA INFORMATION

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 4

BASIS FOR RISK IMPORTANCE THRESHOLD