

HOUSTON LIGHTING & POWER COMPANY  
NUCLEAR ENGINEERING & CONSTRUCTION  
PROCEDURES MANUAL

**SUMMARY OF REVISIONS**

PROC NO	SUBJECT				
EAD-3	Design Process Reviews and Independent Technical Assessments				
REVISION NUMBER	REVISION DESCRIPTION				Training Required
					yes      no
0	Original issuance				✓ <i>[Signature]</i>
1	Adds category for indeterminate findings to independent technical assessment checklist				<i>[Signature]</i>
2	Changes procedure for incorporating checklists per Attachments 7.1 and 7.2; changes procedure for reviewing calculations generated by outside organizations				<i>[Signature]</i>
3	Changes "design process technical audit" to "design process review"				<i>[Signature]</i>
4	Changes procedure for preparing checklists; requires publication of post-review/assessment meeting minutes				<i>[Signature]</i>
REVISION AUTHORIZATION					
REVISION NUMBER	0	1	2	3	4
ISSUE DATE	12-1-82	1-5-83	5-27-83	6-15-83	2-1-84
EFFECTIVE DATE	12-15-82	1-7-83	6-1-83	6-20-83	2-1-84
PREPARED BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>
APPROVED BY					
APPROVED BY	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>

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## 1.0 Purpose

This procedure establishes the methods used for reviews of the design process, assessment of design, and documentation of results.

## 2.0 Scope

This procedure covers activities of the Engineering Assurance Department with respect to in-house review or assessment of a design. This procedure does not cover third-party design assessments.

## 3.0 References

- 3.1 Engineering Assurance Department Procedure EAD-4, Reporting of Design Process Review/Technical Assessment Results
- 3.2 Engineering Assurance Department Procedure EAD-7, Reporting and Disposition of Action Items

## 4.0 Definitions

None

## 5.0 Responsibilities

- 5.1 Vice President, Nuclear Engineering & Construction  
Reviews and approves the design process review or design assessment before findings are sent to the affected organization(s)
- 5.2 Manager, Engineering Assurance Department  
Identifies the topics to be reviewed or assessed, reviews and approves the plan of design process reviews or design assessments, appoints team leader, and presents results of the review or assessment to the affected organization(s)
- 5.3 Engineering Assurance Department staff  
Prepares the document list required for review, completes the design verification checklist and criteria for design review, and also documents the results of the assessment or design process review

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## 6.0 Procedure

- 6.1 The Manager, Engineering Assurance Department, identifies the topics to be reviewed and/or assessed and also determines the responsible Engineering Assurance Department engineering personnel to provide necessary technical review of the topic selected.
- 6.2 For design process reviews the following procedure shall be followed:
  - 6.2.1 Each discipline engineer shall prepare a checklist pertinent to the subject being reviewed; Attachment 7.2 is an example of such a checklist. The completed checklist shall be filed in the Engineering Assurance Department file as well as in the South Texas Project Records Management System (STP RMS) but need not be part of the design process review report. R4
  - 6.2.2 Each discipline engineer shall prepare a complete list of documents to be reviewed.
  - 6.2.3 The Manager, Engineering Assurance Department, or his designee shall hold a pre-review meeting with the affected organization(s), identifying the scope of the design process review and outlining major subject areas to be reviewed.
  - 6.2.4 The responsible engineer shall document the results of the design process review, complete the checklists, including any additional items deemed necessary for a particular design process review, and prepare the design process review report per Engineering Assurance Department Procedure EAD-4, Reporting of Design Process Review/ Technical Assessment Results. R4
  - 6.2.5 The Manager, Engineering Assurance Department, or his designee shall discuss the results of the design process review with the affected organization in a post-review meeting, the minutes of which will be published after the meeting. R4
  - 6.2.6 The Engineering Assurance Department shall forward the design process review findings to the Vice President, Nuclear Engineering & Construction, for review and approval.
  - 6.2.7 After the design process review findings have been reviewed by the Vice President, Nuclear Engineering & Construction, the Engineering Assurance Department shall notify the affected organization of the findings.

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6.2.8 The responsible engineer for the design process review shall verify that appropriate corrective action for review findings has been taken per Engineering Assurance Department Procedure EAD-7, Reporting and Disposition of Action Items.

6.3 For independent technical assessments, the following procedure shall be followed:

- 6.3.1 Each discipline engineer shall prepare an assessment checklist pertinent to the subject being reviewed; Attachment 7.1 is an example of such a checklist. R4
- 6.3.2 The responsible engineer shall prepare a complete list of documents required for design assessment and shall inform the project of the schedule for receiving the documents.
- 6.3.3 The Manager, Engineering Assurance Department, shall hold a pre-assessment meeting with the affected organization(s), identifying the scope of the assessment and outlining the major subject areas to be assessed.
- 6.3.4 The responsible engineer shall document the results of the assessment, complete the checklists, and prepare an assessment report per Engineering Assurance Department Procedure EAD-4, Reporting of Design Process Review/Technical Assessment Results. The completed checklist and questionnaire shall be filed in the Engineering Assurance Department files as well as in STP RMS but need not be a part of the report. R4
- 6.3.5 If a calculation is generated by an outside organization and the Engineering Assurance Department responsible engineer only reviews the calculation for independent technical assessment purposes, the responsible engineer may incorporate a summary statement for deficiencies in the calculations, if any, and other pertinent observations.
- 6.3.6 The Manager, Engineering Assurance Department, or his designee shall discuss the results of the assessment with the affected organization in a post-assessment meeting, the minutes of which will be published after the meeting. R4
- 6.3.7 The Engineering Assurance Department shall forward the assessment findings to the Vice President, Nuclear Engineering & Construction, for review and approval.

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6.3.8 After the assessment findings have been reviewed by the Vice President, Nuclear Engineering & Construction, the Engineering Assurance Department shall notify the affected organization of the findings.

6.3.9 The responsible engineer for the assessment shall verify that the findings have been resolved per Engineering Assurance Department Procedure EAD-7, Reporting and Disposition of Action Items.

## 7.0 Attachments

7.1 Independent technical assessment checklist

7.2 Design process review/independent technical assessment verification checklist



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### Attachment 7.1

#### Sample Independent Technical Assessment Checklist

1. Basic functions of each structure, system, and component
2. Performance requirements such as capacity, rating, and system output
3. Codes, standards, and regulatory requirements, including the applicable issue and/or addenda
4. Design conditions such as pressure and temperature
5. Loads such as seismic, wind, thermal, and dynamic
6. Environmental conditions anticipated during storage, construction, and operation
7. Interface requirements, including functional and physical interfaces involving structures, systems, and components
8. Material requirements, including such items as compatibility, electrical insulation properties, and protective coating
9. Mechanical requirements such as vibration, stress, shock, and reaction forces
10. Structural requirements, including items such as foundation and supports
11. Hydraulic requirements such as pump net positive suction heads and allowable pressure drop
12. Chemistry requirements such as provisions for sampling and limitations on water chemistry
13. Electrical requirements such as source of power and voltage
14. Layout and arrangement requirements
15. Operational requirements under various conditions such as plant start-up, normal operation, and emergency operation

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16. Instrumentation and control requirements, including controls and alarms required for operation, testing, and maintenance
17. Redundancy, diversity, and separation requirements of structure, systems, and components
18. Failure effects requirements of structures, systems, and components, including a definition of events they must be designed to withstand
19. Test requirements, including in-plant tests and the conditions under which they will be performed
20. Accessibility requirements and requirements for maintenance, repair, and inservice inspection, including the conditions under which these activities will be performed
21. Fire protection or resistance requirements
22. Safety requirements such as grounding

Note: Findings shall be designated according to the following categories:

- A - acceptable
- C - concern, any item that needs further evaluation due to a lack of information or that requires additional evaluation before a final conclusion can be reached
- D - not acceptable
- NA - not applicable
- I - indeterminate, no information available

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## Attachment 7.2

### Sample Design Process Review/Independent Technical Assessment Verification Checklist

1. Were the inputs correctly selected and incorporated into the design?
2. Are assumptions used in initial design reverified in detailed design?
3. Are the applicable codes, standards, and regulatory requirements, including issue and addenda, properly identified, and are requirements met?
4. Have the design interface requirements been satisfied?
5. Was an appropriate design method used?
6. Is the output reasonable compared to inputs?
7. Are the specified parts, equipment, and processes suitable for the required application, and have all conditions been considered?
8. Are the specified materials/components compatible with each other and the design environmental conditions to which they will be exposed?
9. Have adequate maintenance features and requirements been specified?
10. Are accessibility and other design provisions adequate for construction and performance of needed maintenance and repair?
11. Has the design properly considered radiation exposure to the public?
12. Are the acceptance criteria incorporated into the design documents sufficient to allow verification that design requirements have been satisfactorily accomplished?
13. Are adequate handling, storage, cleaning, and shipping requirements specified?
14. Are adequate identification requirements specified?