



Pennsylvania Power & Light Company

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AUG 04 1982

Mr. T. T. Martin, Director
Division of Engineering and Technical Programs
U.S. Nuclear Regulatory Commission
Region I
631 Park Avenue
King of Prussia, PA 19406

SUSQUEHANNA STEAM ELECTRIC STATION
ACTION PLAN
ER 100450 FILE 841-4
PLA-1193

Docket Nos. 50-387
50-388

Dear Mr. Martin:

As discussed in the July 30, 1982 meeting, attached is Pennsylvania Power & Light Company's action plan for the investigation of small pipe program concerns.

If you have any questions, please call.

Very truly yours,

B. D. Kenyon
Vice President-Nuclear Operations

CTC/mks

Attachment

cc: G. Rhoads - USNRC

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SUSQUEHANNA STEAM ELECTRIC STATION
ACTION PLAN
INVESTIGATION OF CONCERNS
SMALL PIPE ADEQUACY

I. INTRODUCTION

As a result of normal work activities and inspections by Pennsylvania Power and Light Company, Bechtel (PP&L's major engineering and construction contractor) and the Nuclear Regulatory Commission personnel, a list of specific concerns about the adequacy of small piping at the Susquehanna Steam Electric Station has been generated.

Some of the aspects of these specific issues and the list of concerns, as a whole, raise a concern about whether the overall program for small piping is achieving its desired objective. Briefly stated, the small piping program is a set of procedures and controls arranged to ensure that an adequate set of design intentions are identified for small pipe and that these intentions are properly implemented to result in a quality installation in the field which matches the design intent. In order to achieve this objective, a coherent and correct program must be in place and it must be properly implemented.

The small piping program is only one of many parallel programs that have the same objective of properly implementing in the plant the specific intent of the designer. While the generalized steps of a design and construction program exist in all these parallel programs (see Figure I), the way each step is actually carried out in each program can vary. Should a step in the small piping program be determined to be flawed, similar steps in other programs may also suffer from the same deficiencies.



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II. PURPOSE

In order to fully understand the implications of the currently known concerns and to identify other potential weaknesses in the design and construction program which have significance to design adequacy or nuclear safety, PP&L will conduct an investigation. Specifically, the purpose is to confirm that the programs put in place to assure the design intent is properly implemented are achieving the desired objective. If weaknesses or deficiencies in performance are identified, their significance will be determined, corrective action for the specific impact on Susquehanna Steam Electric Station Unit 1 will be identified and implemented, and steps necessary to prevent recurrence of the problems elsewhere on the Susquehanna Steam Electric Station Project will be accomplished. These other areas include Unit 2 design and construction, and Unit 1 engineering and installation of plant changes.

A secondary purpose is to identify areas of possible improvement in program or technical areas that do not appear at this time as deficiencies in the program or implementation but are actions that, if implemented, would improve the likelihood of achieving the design intent.

III. SCOPE

The initial focus of this investigation is on the Unit 1 design and construction program. Subsequently, the implications to the design and installation of modifications to Unit 1 and to the design and construction programs of Unit 2 will be addressed.

The investigation scope can be defined on three levels:

1. Specific Issues: The concerns identified by PP&L and the NRC (see Attachment 1) will be assessed for their significance to the Unit 1 design adequacy, nuclear safety and small pipe program adequacy. These discrepancies and their implications will be evaluated and dispositioned.
2. Small Piping Program Assessment: This specific program will be examined, in detail, for programmatic adequacy; and its implementation on a representative sample system will be examined in detail. Program, procedure and technical aspects will be covered to determine if any weaknesses exist which may contribute to failure to establish a valid design intent or failure to carry out that intent in the plant construction.
3. Other Design/Construction Program Implications: Should program or technical issues arise from 1 and 2 above, they will be assessed for applicability to similar steps in other design/construction programs on Unit 1 (and subsequently Unit 2) to establish the need for changes to these programs to prevent recurrence of these problems.



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IV. SPECIFIC ISSUES

The initial specific issues being addressed are listed in Attachment 1. These issues are being investigated to ensure full understanding of them. Action is being taken to resolve these as well as determining their cause so that steps can be taken to prevent recurrence. Should these specific issues suggest broader concerns, they will be included in the scope of the program level assessments (Sections III.2 and III.3 above).

Response to the NRC on each of these issues will be provided in writing as required by NRC regulations and the provisions of this Action Plan and by means of meeting, if necessary, prior to August 25, 1982.



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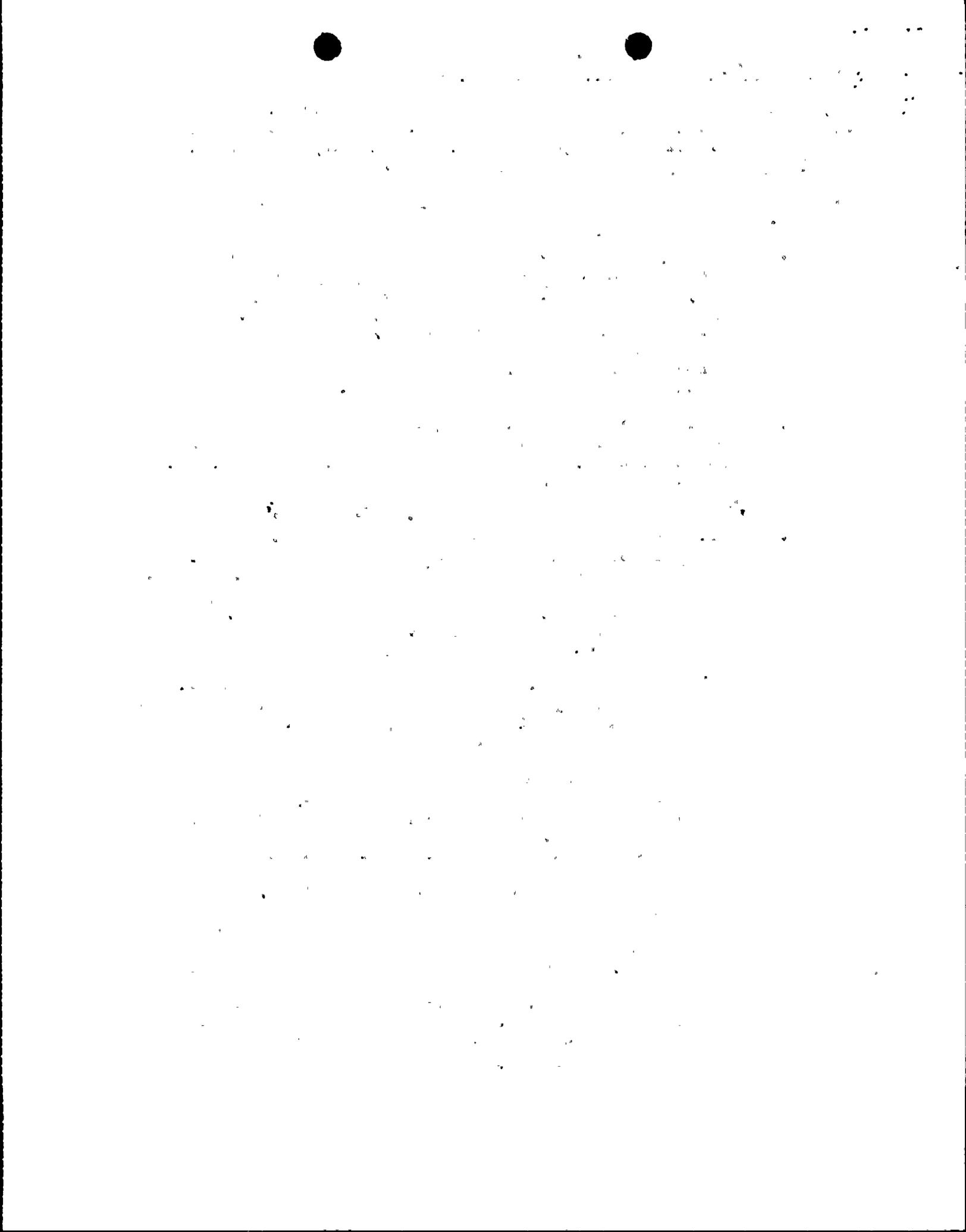
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V. SMALL PIPING PROGRAM ASSESSMENT

Figure II is a flow chart of all of the activities included within this Action Plan in response to these items of concern. The central section of Figure II defines the major steps of the Small Piping Program Assessment.

The assessment of the Small Piping Program will proceed as follows:

1. Identify the various small pipe QA program documents applicable to Unit 1 and common piping and hanger design, installation and test including Project Engineering and Field Engineering procedures, design guidance specifications/drawings, installation specifications and Quality Control Instructions. Define these documents in a hierarchy of requirements for the total small pipe QA program.
2. Define a representative sample of small piping and hangers to be used as the basis of a comprehensive investigation to determine if the existing small pipe program as implemented by Bechtel did produce piping systems which fully meet the design intent.
3. Define the elements of this investigation. Examples of the types of issues that will be addressed in this assessment of the small piping program on Unit 1 are:
 - o Was the design intent adequately defined, verified and communicated to the various design organizations participating in the design process?
 - o Did the program provide sufficient definition of the means by which inspections/tests would confirm that the installed systems/components did in fact meet the design intent?
 - o Did the program include effective checks and balances to assure that interfacing organizations communicated sufficiently to result in design, installation, inspection and test of systems and components which met the design intent?
 - o Does the final hardware, as installed, confirm that the design and construction processes and subsequent prescribed inspections and tests were sufficient to achieve an installed system/component that meets the design intent?
 - o Do the specific deficiencies noted by all investigators have broader generic implications to the elements of the small piping program and other similar programs?



4. Assemble a team of PP&L people qualified in the technical and QA Program areas of small pipe design, installation, test and inspection. Have them develop check lists to be used to structure the investigation. These check lists are to be predicated on the information developed in Steps 1, 2 and 3 above.
5. Document the results of the assessment including all QA programmatic deficiencies (both procedural deficiencies and failure to implement) and all technical deficiencies. The Investigation Manager will ensure that those which may be significant to Unit 1 operation and safety are reported immediately to the Superintendent-SSES.

The Investigation Manager will also present each deficiency to a Review Committee composed of experienced PP&L personnel and a senior Bechtel engineer. This presentation will include relevant background information developed by the team that identified and reported the condition.

The Review Committee will be required to render and document a determination whether the deficiency has generic technical/QA program implications for small piping systems or for other similar design and construction programs.

The deficiencies identified by the Investigation Team and the Review Committee's assessment of the generic implications of those deficiencies will be assembled for presentation to the NRC in a meeting to be held early in the week of August 16, 1982. This interim report is intended to provide a status to the NRC.



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.VI. OTHER DESIGN/CONSTRUCTION PROGRAM IMPLICATIONS

Results of the evaluation which have significance for programs other than the Small Piping Program (see Figure II, right-hand section) will be evaluated. The additional evaluations will look at comparable steps in other design and construction programs to determine impact and corrective action. The results of these assessments will also be reported to the NRC. We anticipate presenting the results of our assessments by August 25, 1982. All results of our investigations will be reported to Bechtel Power Corporation for their action with respect to other nuclear station projects.



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.VII. SUMMARY AND CONCLUSION

In response to internal and NRC concerns, PP&L has embarked on aggressive and thorough examination of the programs for the design, installation and inspection activities covering the small piping and hangers to confirm the adequacy of this program or to identify deficiencies to be corrected. The action plan also includes assessment for broader or generic implications of any deficiencies to other design and construction activities at SSES. This assessment is timed to provide NRC with our conclusion by August 25, 1982.



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ATTACHMENT 1

The following is a listing of the Technical Issues and Program Issues resulting from an NRC site inspection of SSES Unit 1.

A. Technical Issues:

- 3 1. Demonstrate that the stress analysis considers the effects of grouted pipe penetrations and show acceptability of the as-built configuration.
- 1 2. Demonstrate that stress intensification factors used for small bore piping for weldolets and sockolets have been properly considered.
- 2 3. Demonstrate acceptability of loadings of equipment nozzles for small pipe analyses.
- 4 4. Address the design of a clamp used as a small bore pipe anchor (Detail 600) which does not provide adequate resistance to axial and torsional slippage. Issue includes the following:
 - 5 a. Bolt Length
 - 6 b. Bolt Material
 - c. Bolt Torque Values
 - 7 d. Weld Distortions
 - 18 { e. Clamp Contact
 - f. Pipe Wall Stress
 - g. Load Capacity
- 20 5. Demonstrate that differential building movements were considered in the analysis of the piping which contains the following supports:

SP-HCB-108-1, H2039 & H2041
SP-HCB-133, H8, H10 & H11
SP-HCB-126, H2021 & H2024
- 21 6. Demonstrate the adequacy of support SP-HCC-136-H2003 which appears to lack rigidity in the non-loaded plane.
- 8 7. Demonstrate acceptability of support SP-GBC-101-14, H210 which has clamp ears trimmed.

B. Program Issues:

- 15 1. The installation and inspection of the small bore pipe clamp anchor (Detail 600) was done in accordance with a superseded drawing.
- 16 2. The as-built verification program performed by Bechtel engineers and QC did not disclose the installation and inspection problems of Detail 600.

3. The follow-up inspection of the Detail 600 supports by
17 PL QC did not identify all the unacceptable supports.
4. Bechtel QC did not verify the proper installation of
19 shop fabricated components of the Detail 600 supports.



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GENERALIZED STEPS OF A DESIGN AND IMPLEMENTATION PROCESS

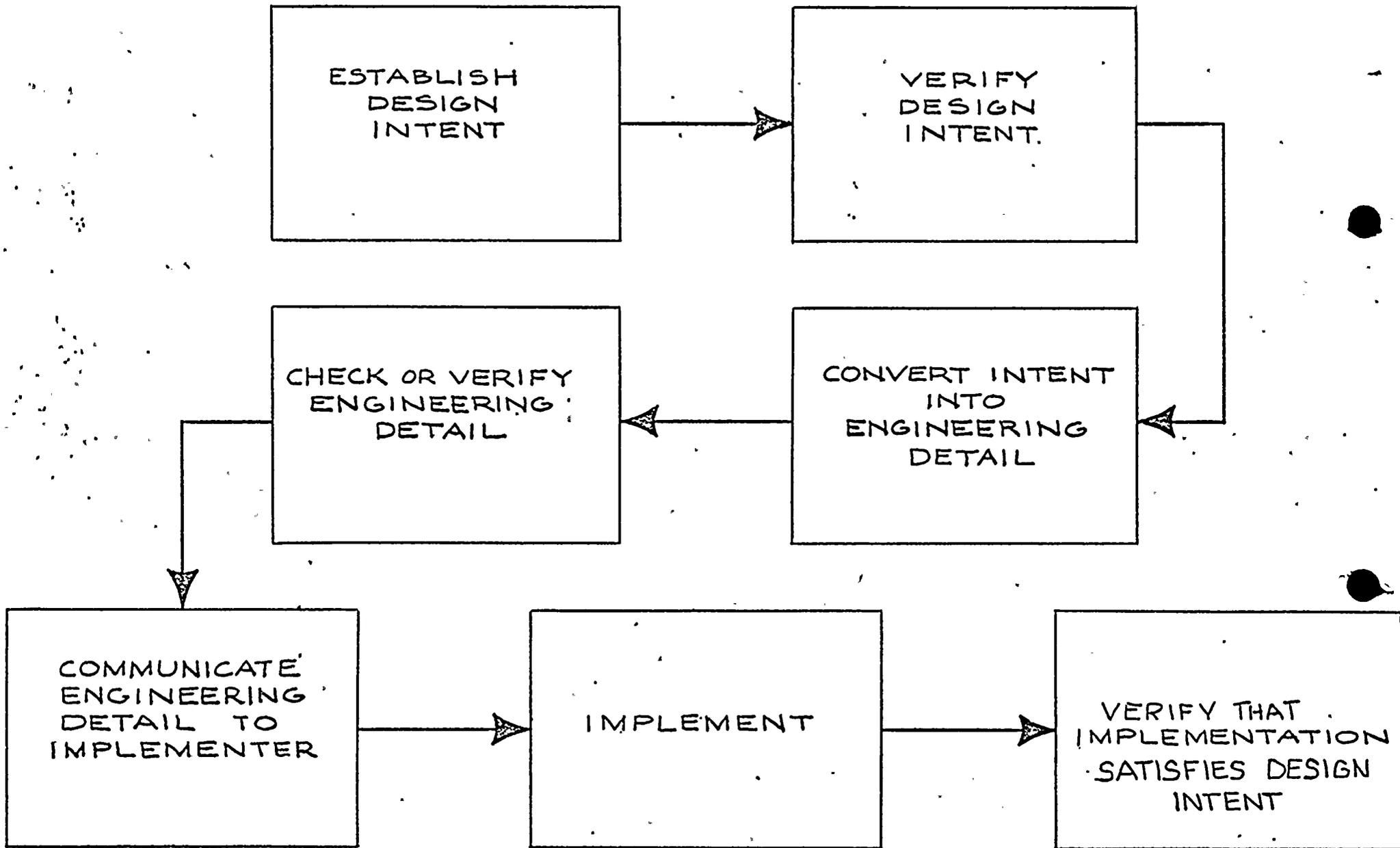


FIGURE I

