SOUTHERN CALIFORNIA EDISON, SAN ONOFRE
NUCLEAR GENERATING STATION 2 (SONGS 2)

DOCKETS 50-361

CEN 266(S)-NP
Revision 01-NP

SONGS-2 CPC AND CEAC
DATA BASE LISTING

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ABSTRACT

This document provides the data base constants for the Core Protection Calculator System consistent with the functional design described in the CPC Functional Design Specification (Reference 1), the CEAC Functional Design Specification (Reference 2), the certified CPC FORTRAN Simulation Code, the CPC/CEAC software Modification for SONGS Units 2 and 3 (Reference 3) and the CPC/CEAC Software Modification for System 80 (Reference 4). The data base constants are contained in data files in Section 3.1. These files use nomenclature and vector location numbers consistent with the CPC FORTRAN Simulation Code. Section 3.2 contains a cross-reference table which correlates the CPC FORTRAN Simulation Code nomenclature to the CPC and CEAC Functional Design Specification nomenclature. In addition to the data base constants, initialization criteria are contained in Section 3.3.

The constants contained in this document are applicable to the Revision 03 to the SONGS-2 CPC/CEAC System Software. This revision is applicable to SONGS-2 Cycle 2.

TABLE OF CONTENTS

1.0   INTRODUCTION

1.1   PURPOSE

The purpose of this document is:

(1) To specify the CPC and CEAC data base constants applicable
     to the SONGS-2 Rev. 03 software described by References 1, the
     CPC Functional Design Specification, Reference 2, the CEA
     Calculator Functional Design Specification, Reference 3 and 4
     the CPC/CEAC software Modification for, SONGS 2 and 3 and
     System 80.

(2) To serve as the design interface document between C-E
     engineering groups responsible for the specification and
     implementation respectively, of the CPC/CEAC design.

1.2   SCOPE

The CPC/CEAC system, as functionally described in References 1, 2
and as modified by References 3 and 4, is implemented in assembly
language and also exists as a FORTRAN simulation. This document
provides:

(1) Data base values for the protection system algorithm constants
     denoted by References 1, 2, 3 and 4, for use in the assembly
     language implementation and

(2) Selected data base values for those protection system
     algorithm and simulation associated constants required by
     the FORTRAN Simulation Code, and

(3) Initialization criteria required by the system implementation
     group and specified in References 1, Section 3.6.

1.3   APPLICABILITY

The data base constants specified by this document are applicable to:

(1) the CPC and CEAC protection systems described in References 1, 2, 3 and 4.

(2) the SONGS-2 CPC FORTRAN Simulation Code.

1.4   REFERENCES

1.4.1   Functional Design Specification For a Core Protection Calculator, CEN-147(S)-NP, January, 1981.

1.4.2   Functional Design Specification for a Control Element Assembly Calculator, CEN-148(S)-NP, January, 1981.

1.4.3   CPC/CEAC Software Modifications for San Onofre Nuclear Generation Station Units No. 2 and 3, CEN-281 (s)-NP, Revision 01, November 1984.

1.4.4   Dockets STN-50-470F, Enclosure 1-NP to LD-82-039, CPC/CEAC Software Modifications for System 80, March, 1982.

2.0 SUMMARY

This document contains a compilation of CPC and CEAC constants.
These constants are applicable to SONGS-2 operation. The sources of
these constants and their bases are included in the References
section. These References reside in the CPC design file.

3.0 DATA BASE CONSTANTS

The data base constants contained within this section define a
FORTRAN data file [   ]. In
some cases, data arrays in the data file exceed the dimensions
specified by References 1, 2, 3 and 4. This is done to allow for
possible expansion of some data constants at a future date.

Section 3.2 contains a cross-reference list. This list is
provided to assure consistency between the system functional
design nomenclature and the FORTRAN Simulation Code nomenclature.
The left hand column contains FORTRAN constant names as found in
the data file in Section 3.1. The middle column contains the
vector location associated with the FORTRAN file. The right hand
column contains the corresponding constant name as found in the
functional design specifications, References 1, 2 and as modified by
References 3 and 4.

It is noted that the CPC FORTRAN Simulation Code requires additional
constants to simulate certain hardware and executive system
features. Corresponding constants are not required by the CPC
and CEAC functional design specifications. This is reflected in
the data base listing. The only constants which are relevant to
the protection system algorithms, as described by References 1, 2, 3
and 4, are the constants which have a symbolic name in the right
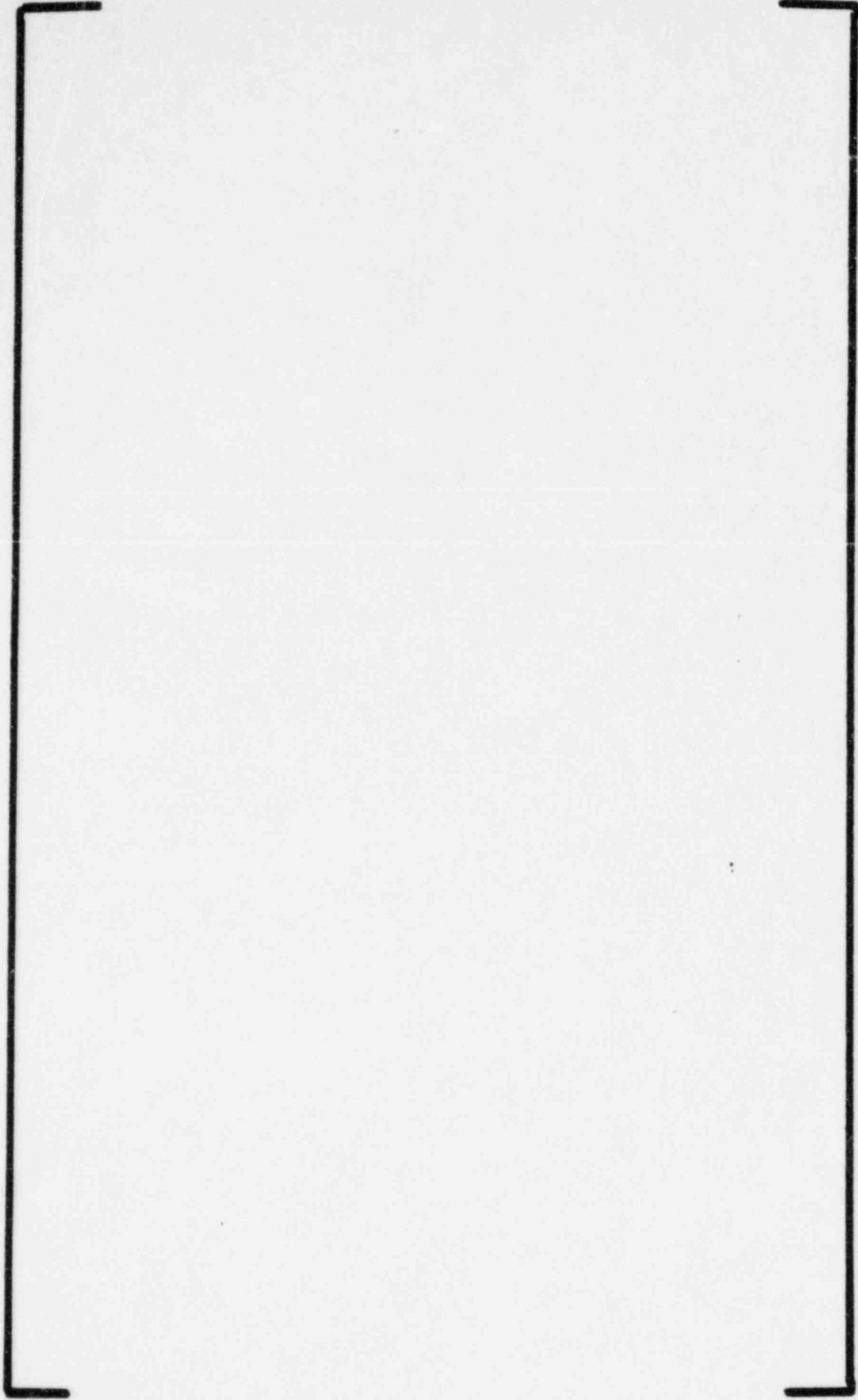hand column of Section 3.2.

SONGS PLANT SCE UNIT 1 INITIAL CORE
CPC/CEAC CONSTANTS (OCTOBER 5,1984)

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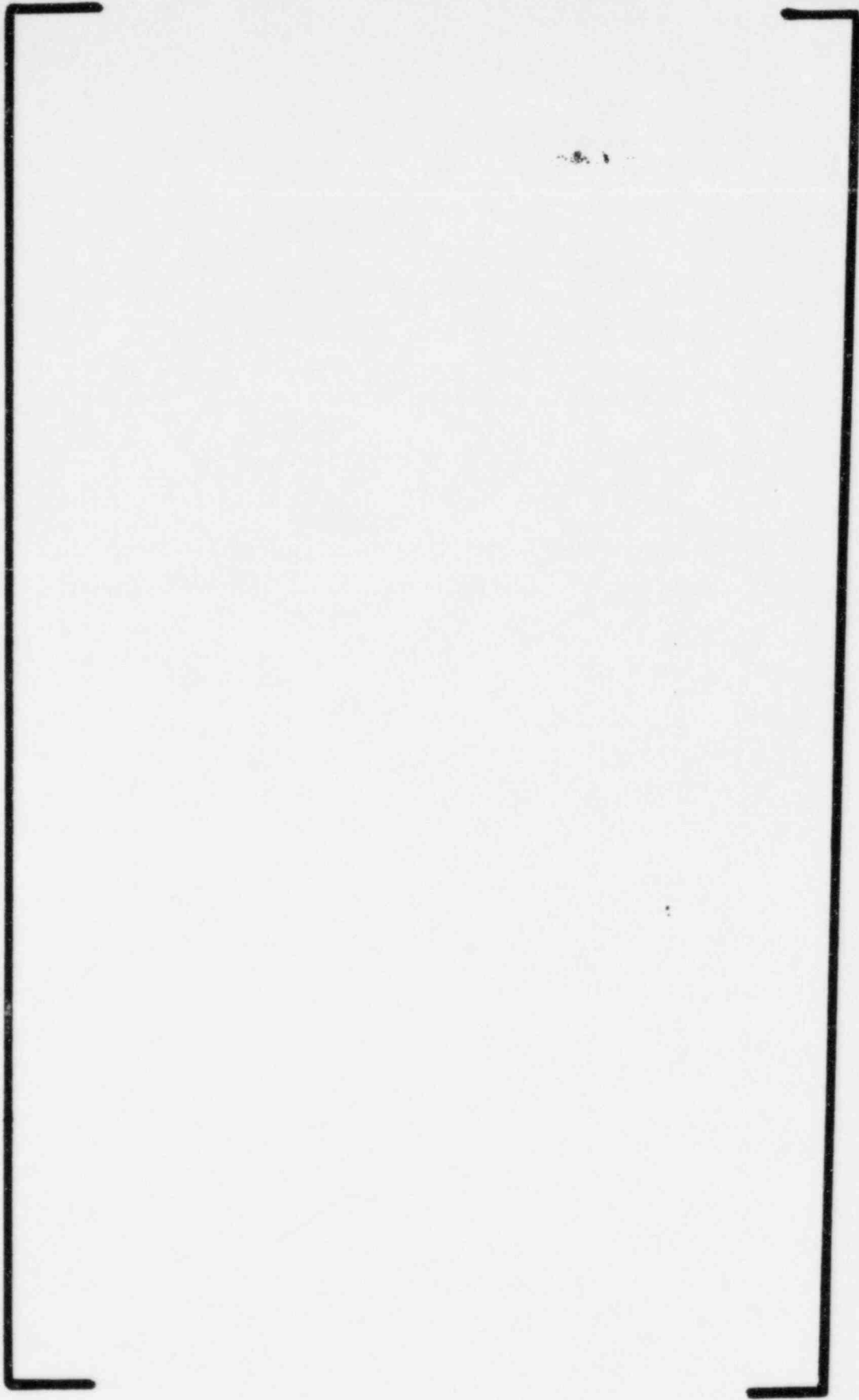3.2   CROSS REFERENCE TABLE
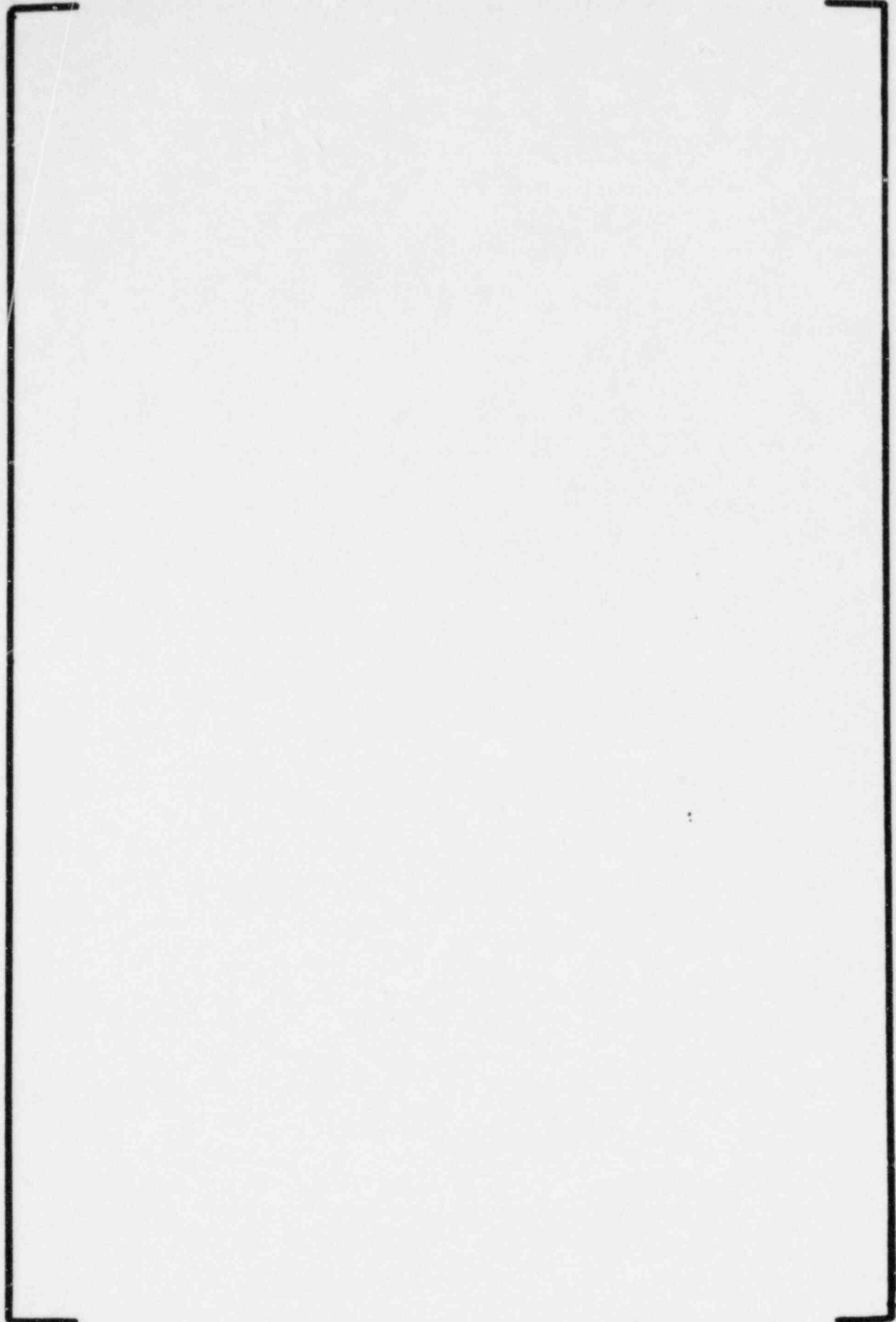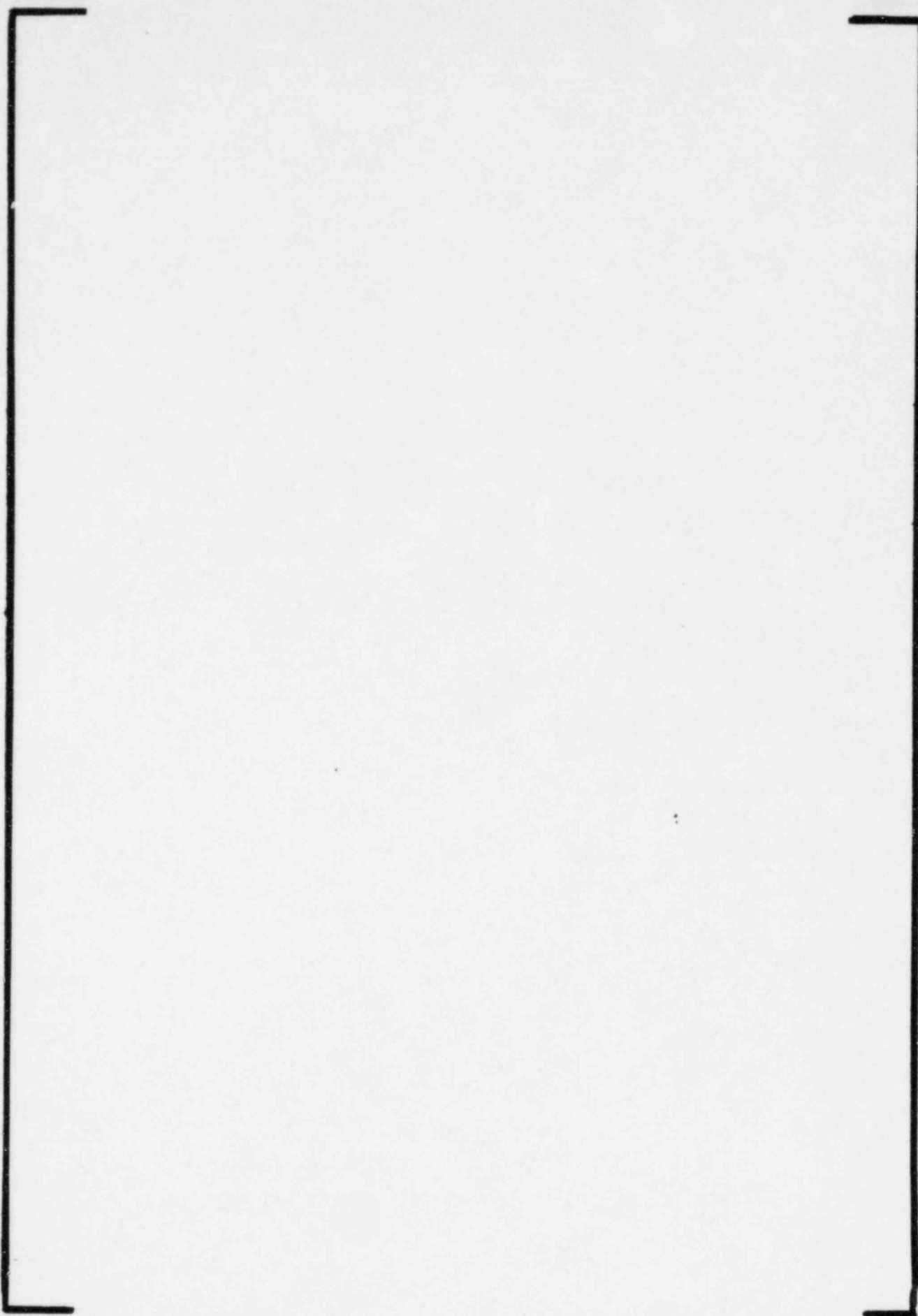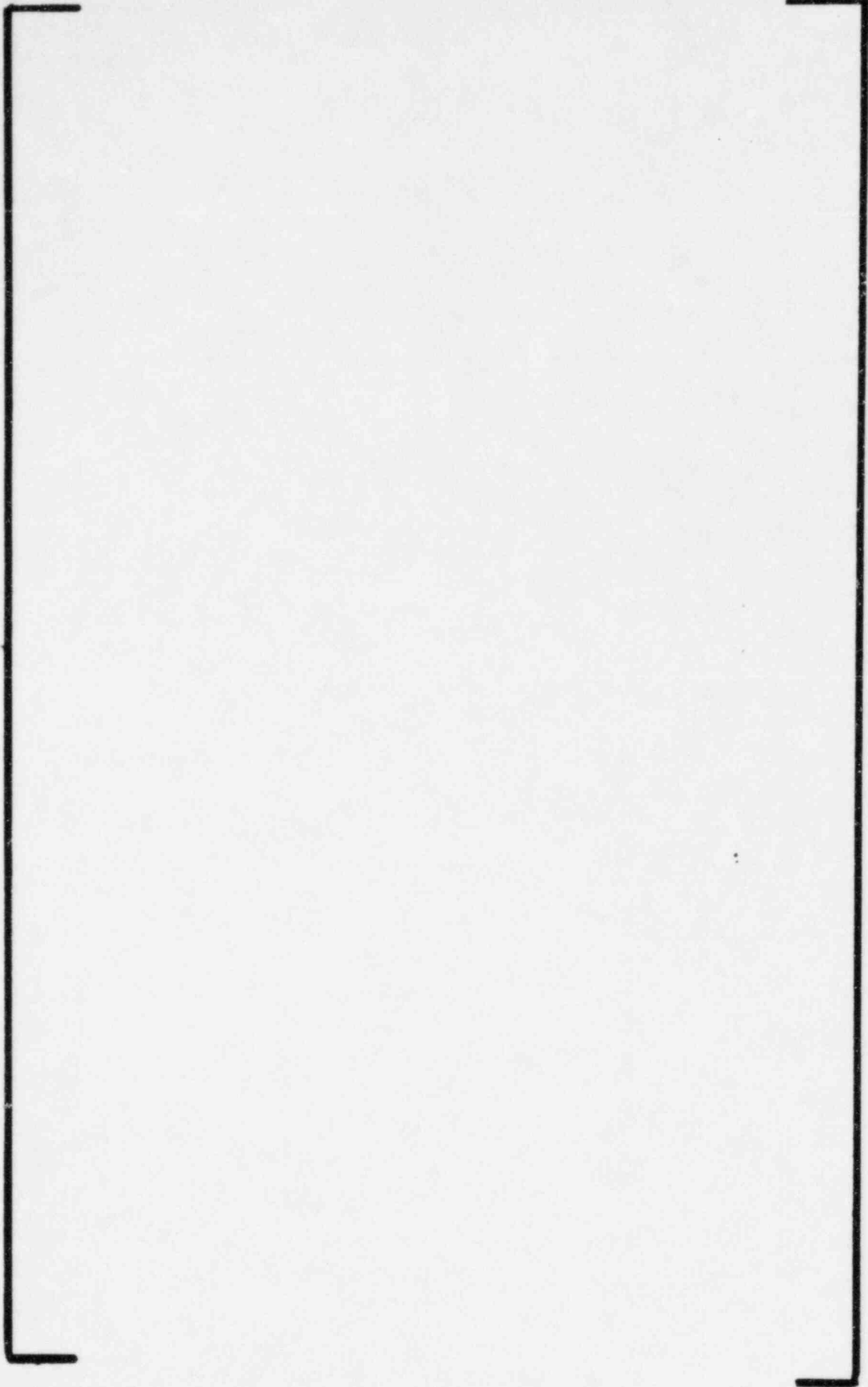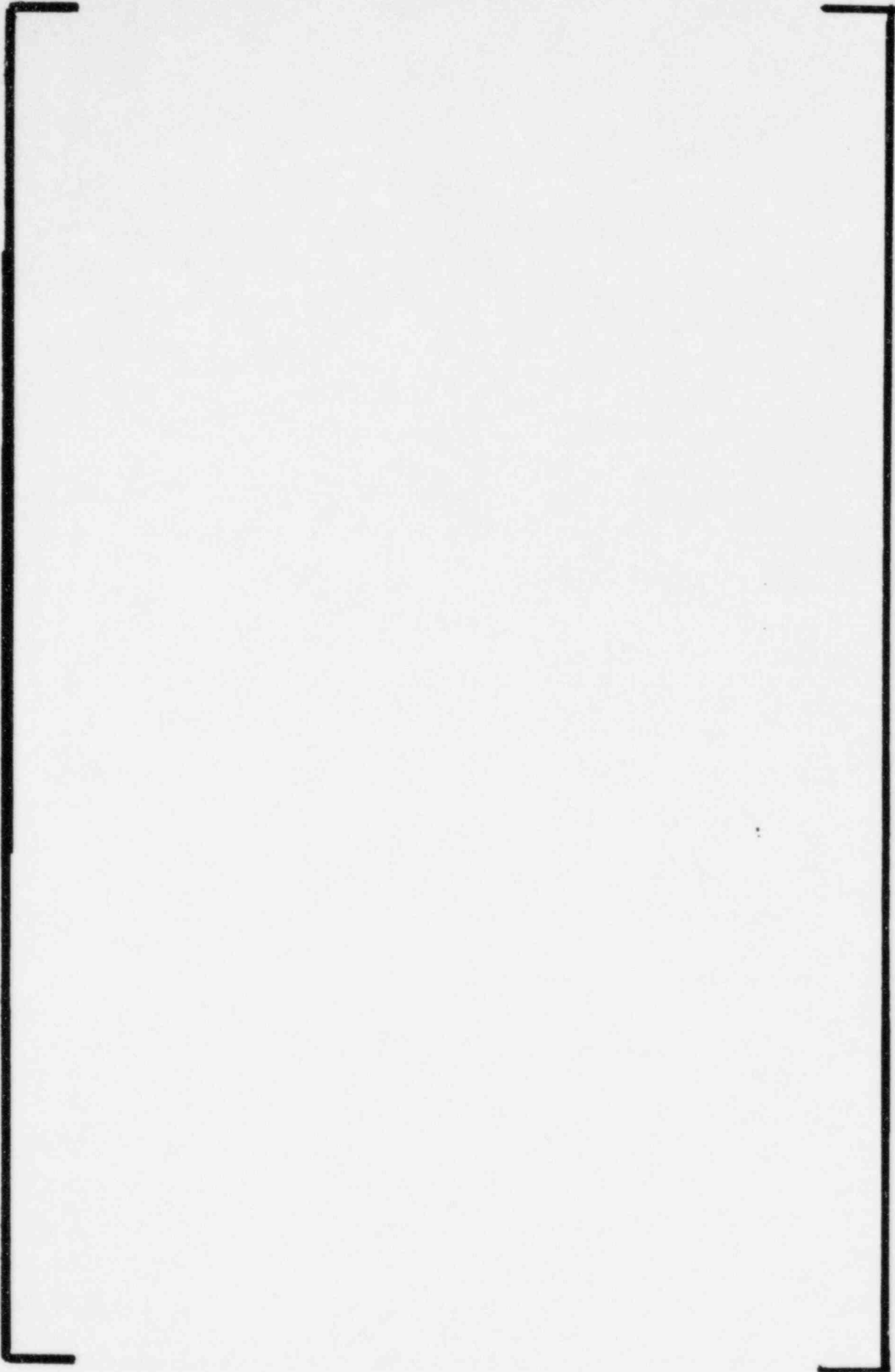
3.3   INITIALIZATION CRITERIA

Section 3.6 of Reference 1 defines initialization and initialization criteria. The values for the initialization constants are:

$$\begin{bmatrix} & \\ & \\ & \end{bmatrix}$$

During initialization, the variables to which the above constants apply always approach steady-state from the conservative direction.

3.4   ADDITIONAL COMMENTS

3.4.1   Determination of Constants

The constants contained in Section 3.1 have been prepared in
accordance with Quality Assurance of Design Procedures with the
exception of:

(1) Part-Loop Pump Dependent Constants

Constant   Vector Location

3.4.2 Conversion Factors

Certain constants are required for execution of the CPC FORTRAN Simulation Code. These constants are not required for input to the CPC Software Design implementation process, but are quality assured within the scope of this document.

Constant	Vector Location

3.4.3 Multiply - Defined Constants

Several constants are specified in more than one data base location. These constants either use the same variable name and memory location, or have different variable names and memory locations due to individual program usage. These constants are listed below, so that if one of these constants is changed, all locations using this constants will be corrected.

CONSTANT	VECTOR LOCATION	PROGRAM	COMMENT

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