Westinghouse Electric Corporation Energy Systems

Nuclear Services Division
Box 355
Pittsburgh Pennsylvania 15230-0355

March 4, 1996
CAW-96-936

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

Attention: Ms. Diane Jackson

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: Presentation Materials entitled, "RCS Flow Measurement Using Cold Leg Elbow Tap Flow Transmitters", (Proprietary)

Dear Ms. Jackson:

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-96-936 signed by the owner of the proprietary information, Westinghouse Electric Corporation. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.790 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying Affidavit by the 3 Loop Hot Leg Streaming, Westinghouse Owners Group Mini-Group.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-96- 936, and should be addressed to the undersigned.

Very truly yours,

N. J. Liparulo, Manager
Regulatory and Engineering Networks

Enclosures

cc: Kevin Bohrer/NRC (12H5)

CAW-96-936

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared Nicholas J. Liparulo, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Corporation ("Westinghouse") and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

Nicholas J. Liparulo, Manager
Regulatory and Engineering Networks

Sworn to and subscribed
before me this 6th day
of March, 1996

Notarial Seal
Denise K. Henderson, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires Oct. 28, 1996
Member, Pennsylvania Association of Notaries

Denise K Henderson
Notary Public

(1) I am Manager, Regulatory and Engineering Networks, in the Nuclear Services Division, of the Westinghouse Electric Corporation and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rulemaking proceedings, and am authorized to apply for its withholding on behalf of the Westinghouse Energy Systems Business Unit.

(2) I am making this Affidavit in conformance with the provisions of 10CFR Section 2.790 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by the Westinghouse Energy Systems Business Unit in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.790 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information which is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10CFR Section 2.790, it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in presentation materials entitled, "RCS Flow Measurement Using Cold Leg Elbow Tap Flow Transmitters", (Proprietary), on behalf of the Westinghouse Owners Group by the Westinghouse Electric Corporation, being transmitted by the Westinghouse Owners Group Letter and Application for Withholding Proprietary Information from Public Disclosure, Mr. Ramon Sabate, Chairman, 3 Loop Hot Leg Streaming Mini-group to the Document Control Desk,

Attention Diane Jackson. The proprietary information as submitted for use by the Westinghouse Owners Group is applicable to other licensee submittals.

This information is part of that which will enable Westinghouse to:

(a) Provide the NRC with the critical benchmark information needed to provide a methodology bias.

(b) Provide the NRC with the appropriate uncertainties associated with each methodology.

Further this information has substantial commercial value as follows:

(a) Westinghouse plans to use existing criticality analysis methodology benchmarking and uncertainties to perform criticality evaluations for customers to support NRC licensing requirements.

(b) Westinghouse can sell support and defense of technology to customers in the licensing process.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar analytical and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort,

having the requisite talent and experience, would have to be expended for the development of analytical techniques and data in support of this issue.

Further the deponent sayeth not.

Copyright Notice

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.790 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.

Proprietary Information Notice

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.790 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) contained within parentheses located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.790(b)(1).

WESTINGHOUSE OWNER'S GROUP

RCS FLOW MEASUREMENT USING COLD LEG ELBOW TAP FLOW TRANSMITTERS

FEBRUARY 13, 1996

AGENDA

INTRODUCTION

OUTLINE OF WESTINGHOUSE OWNER'S GROUP SUBGROUP PROGRAM

BASIC WESTINGHOUSE APPROACH

DISCUSSION OF LEAD PLANT

DISCUSSION OF SUBMITTAL, REVIEW, AND APPLICATION SCHEDULE

OUTLINE OF WESTINGHOUSE OWNER'S GROUP SUBGROUP PROGRAM

SUBGROUP CONSISTS OF 15 3-LOOP PLANTS

- FARLEY 1 AND 2
- V. C. SUMMER
- TURKEY POINT 3 AND 4
- VANDELLOS 2
- ASCO 1 AND 2
- ALMARAZ 1 AND 2
- RINGHALS 2, 3, AND 4
- MANSHAAN 1 AND 2

HOT LEG STREAMING TEST PROGRAM

PLANT DATA EVALUATION

POWER VS FLOW CORRELATION

USE OF ELBOW TAPS TO DETERMINE RCS FLOW

HOT LEG TEMPERATURE BIAS CORRECTION

OUTLINE OF WESTINGHOUSE OWNER'S GROUP SUBGROUP PROGRAM

HOT LEG STREAMING TEST

TWELVE THERMOCOUPLES ON EACH HOT LEG NUMBERED LIKE A CLOCK

THERMOCOUPLES MOUNTED JUST UPSTREAM OF RTD's

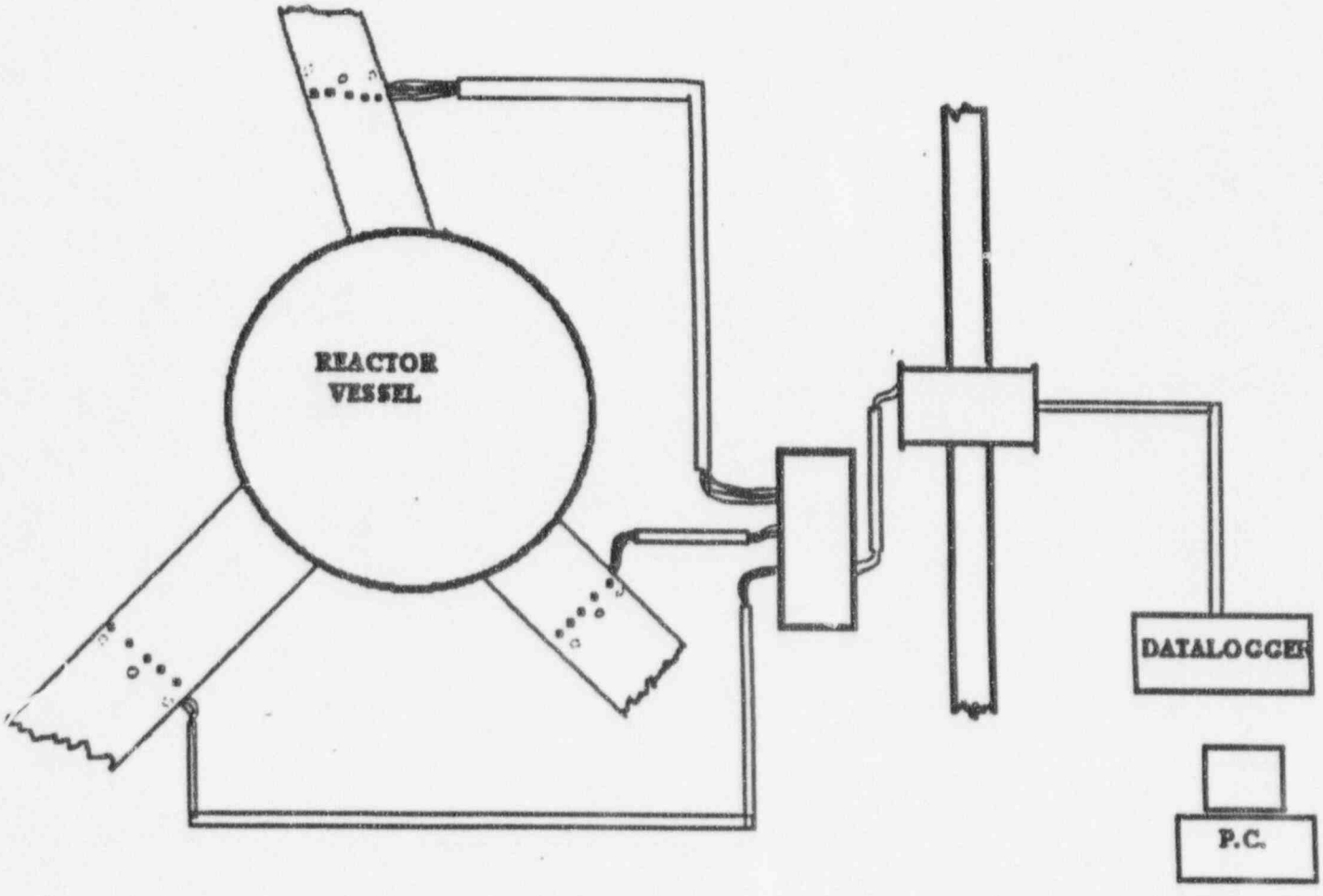
ONE THERMOCOUPLE MOUNTED NEAR EACH LOOP TO MEASURE AMBIENT TEMPERATURE

MEASUREMENTS TAKEN AT THE SAME TIME EVERY DAY

OUTLINE OF WESTINGHOUSE OWNER'S GROUP SUBGROUP PROGRAM

HOT LEG STREAMING TEST

TEST EQUIPMENT CONFIGURATION



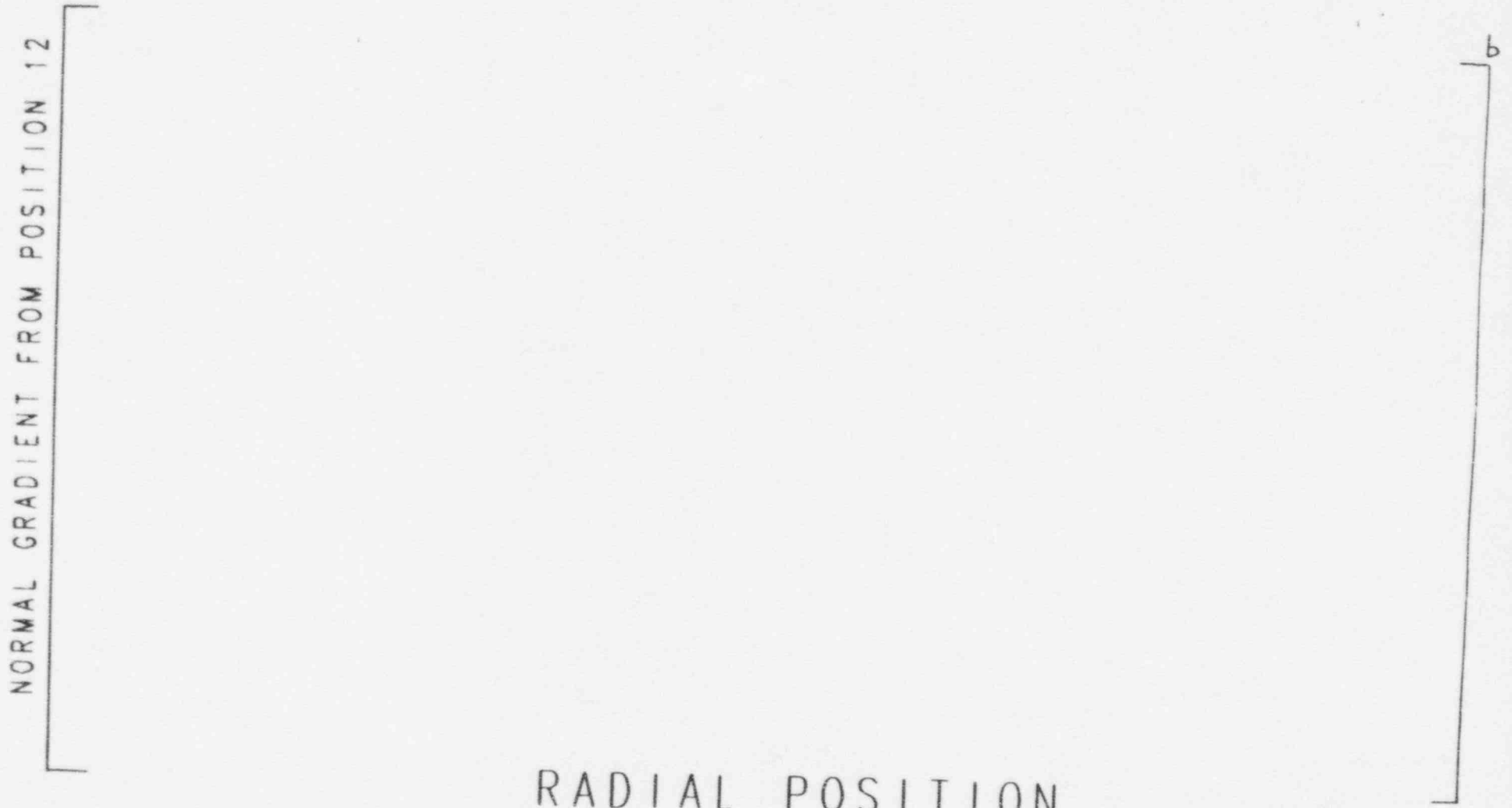
OUTLINE OF WESTINGHOUSE OWNER'S GROUP SUBGROUP PROGRAM

HOT LEG STREAMING TEST

SCHEMATIC OF THERMOCOUPLE SERIAL NUMBERS AND WIRING CHANNELS

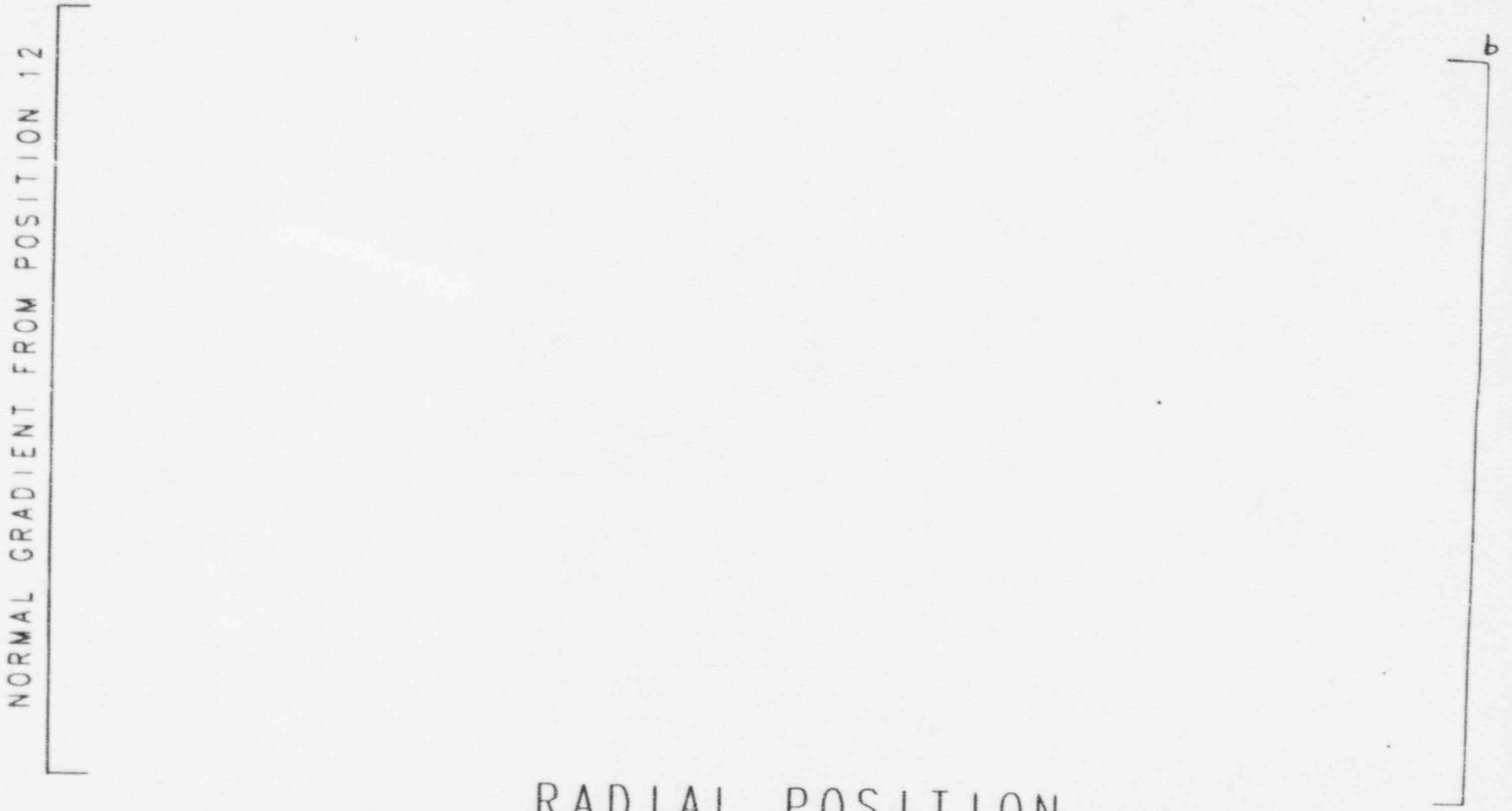
HOT LEG TEMPERATURE TEST AT VANDELLOS II

LOOP 1

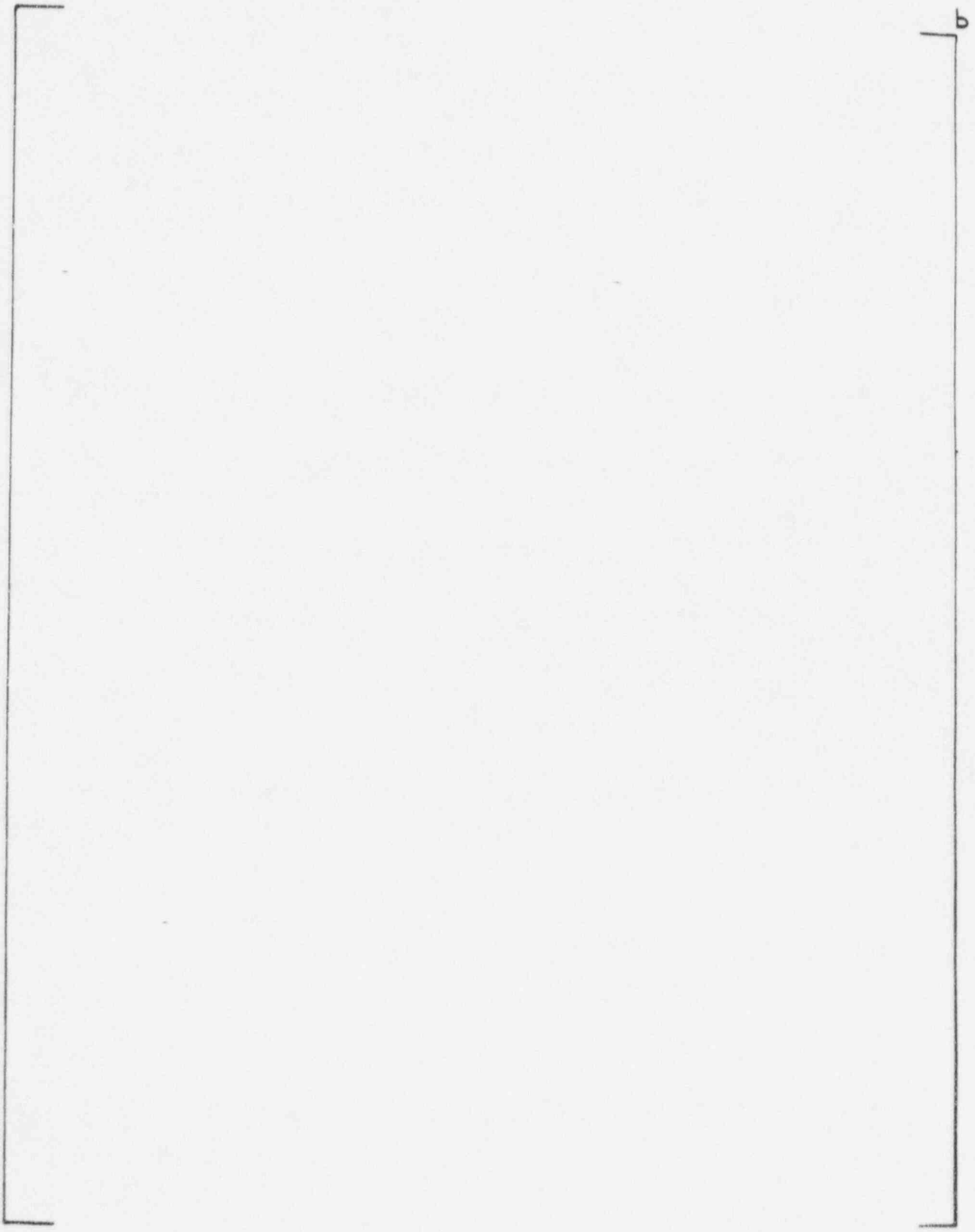


HOT LEG TEMPERATURE TEST AT VANDELLOS II

LOOP 3



BASIC WESTINGHOUSE APPROACH



BEST ESTIMATE HYDRAULICS ANALYSIS

BASIS:

[ ]b

COMPONENT ΔP MEASUREMENTS

PUMP HEAD, POWER, SPEED MEASUREMENTS

TESTS WITH 1 AND 2 PUMPS OPERATING

TEST DURING PLANT HEATUP

TESTS AFTER SEVERAL YEARS OPERATION

REACTOR VESSEL HYDRAULIC MODEL TESTS

REACTOR CORE ΔP MEASUREMENTS

COMPARISON TO EARLY CALORIMETRIC FLOWS

ELBOW TAP FLOW MEASUREMENTS

GOOD REPEATABILITY

CENTRIFUGAL METER, MOMENTUM FORCES,

NOT AFFECTED BY SURFACE ROUGHNESS (FOULING)

[ ]b

CONTRACTION FROM STEAM GENERATOR INTO PIPING

ELIMINATES IMPACT OF UPSTREAM VELOCITY GRADIENTS

REFERENCE: ASME FLUID METERS

DISCUSSION OF LEAD PLANT

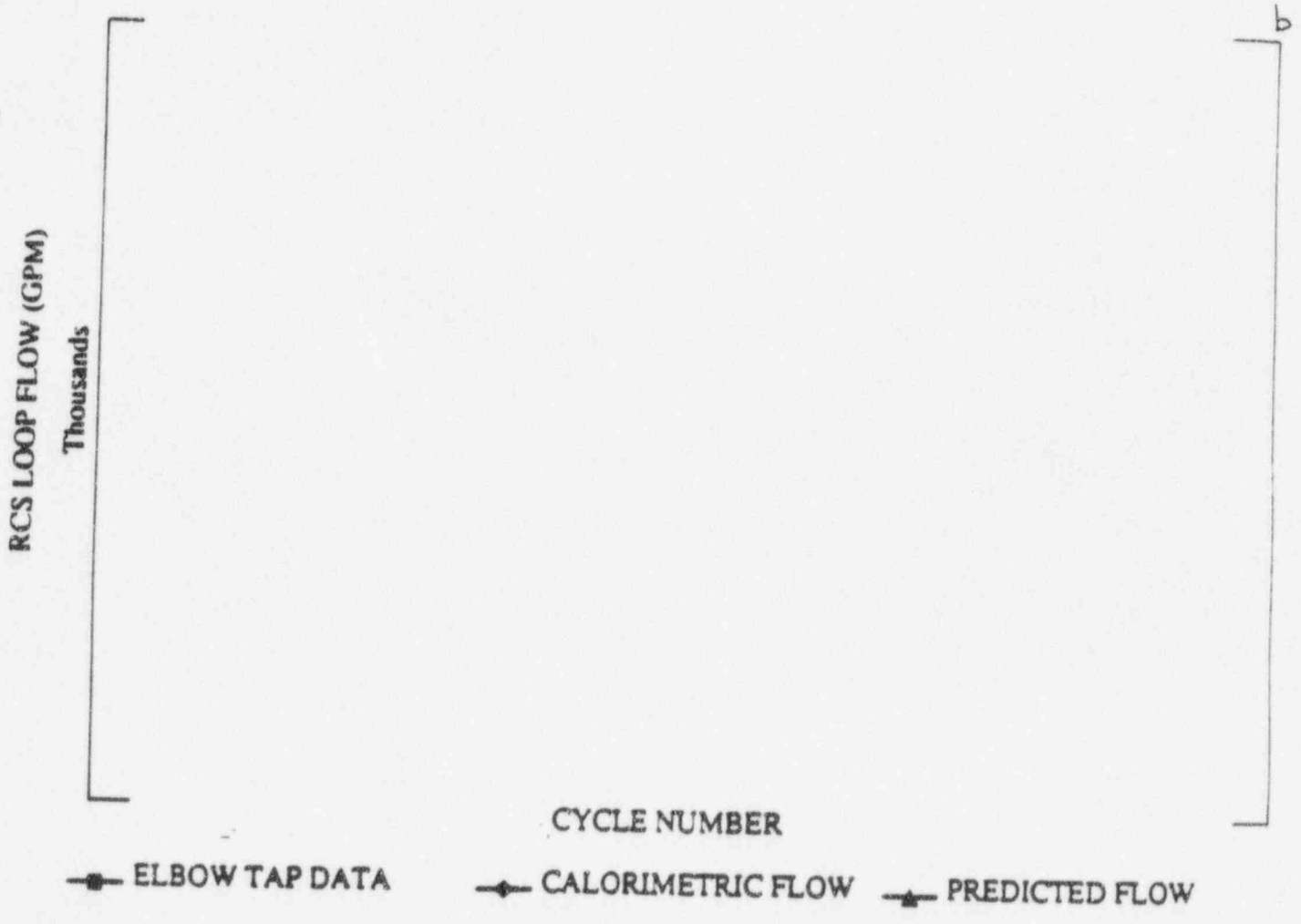
FARLEY UNITS 1 AND 2 LEAD PLANT FOR MEASURING RCS FLOW USING ELBOW TAPS

FARLEY PLANTS ARE TYPICAL OF MOST PLANTS THAT HAVE IMPLEMENTED LLLPs IN THE CORE DESIGN

GOOD CORRELATION BETWEEN ELBOW TAP DATA AND BEST ESTIMATE HYDRAULIC ANALYSIS

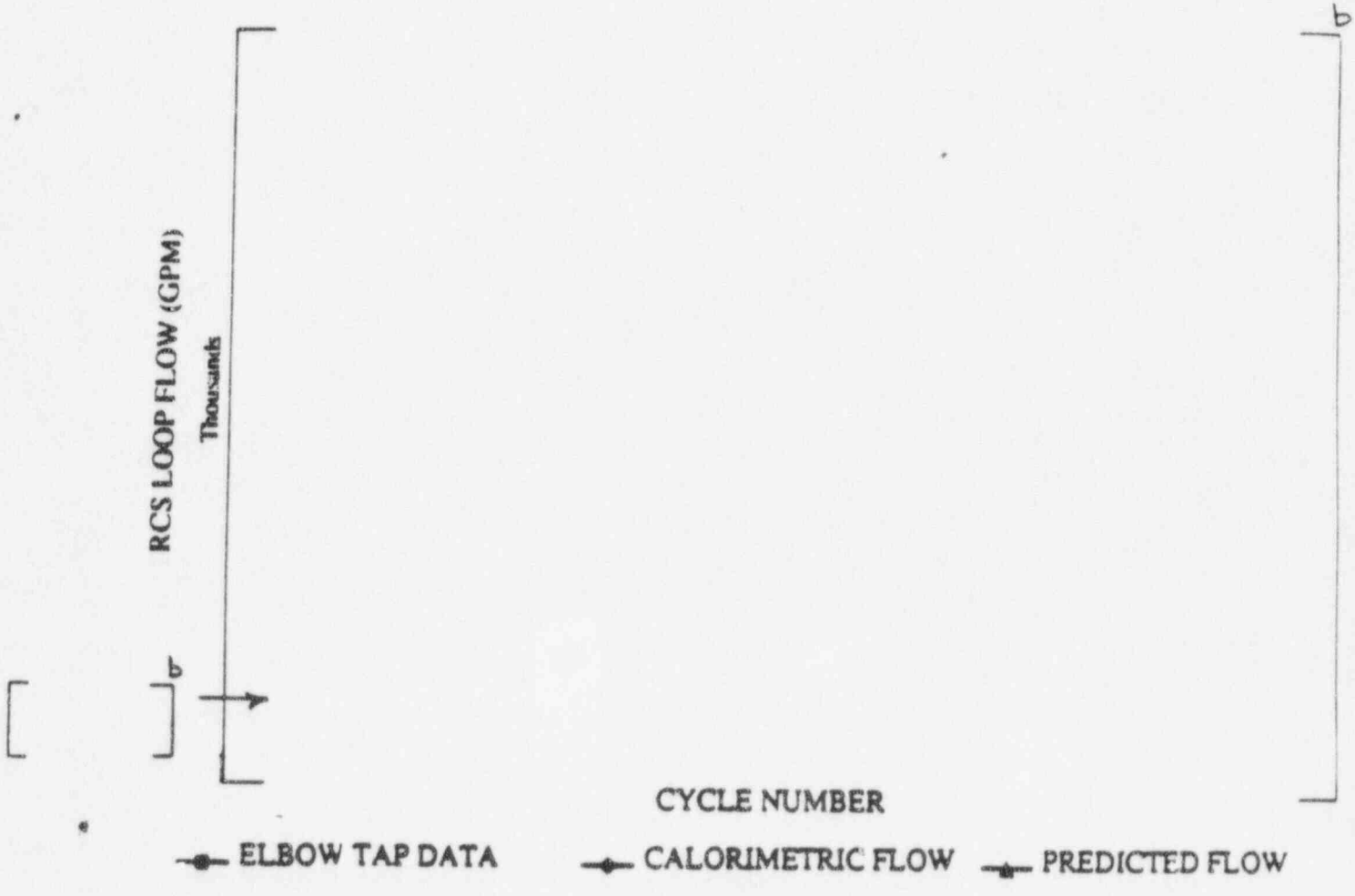
DISCUSSION OF LEAD PLANT

FARLEY UNIT 1 RCS PERFORMANCE HISTORY



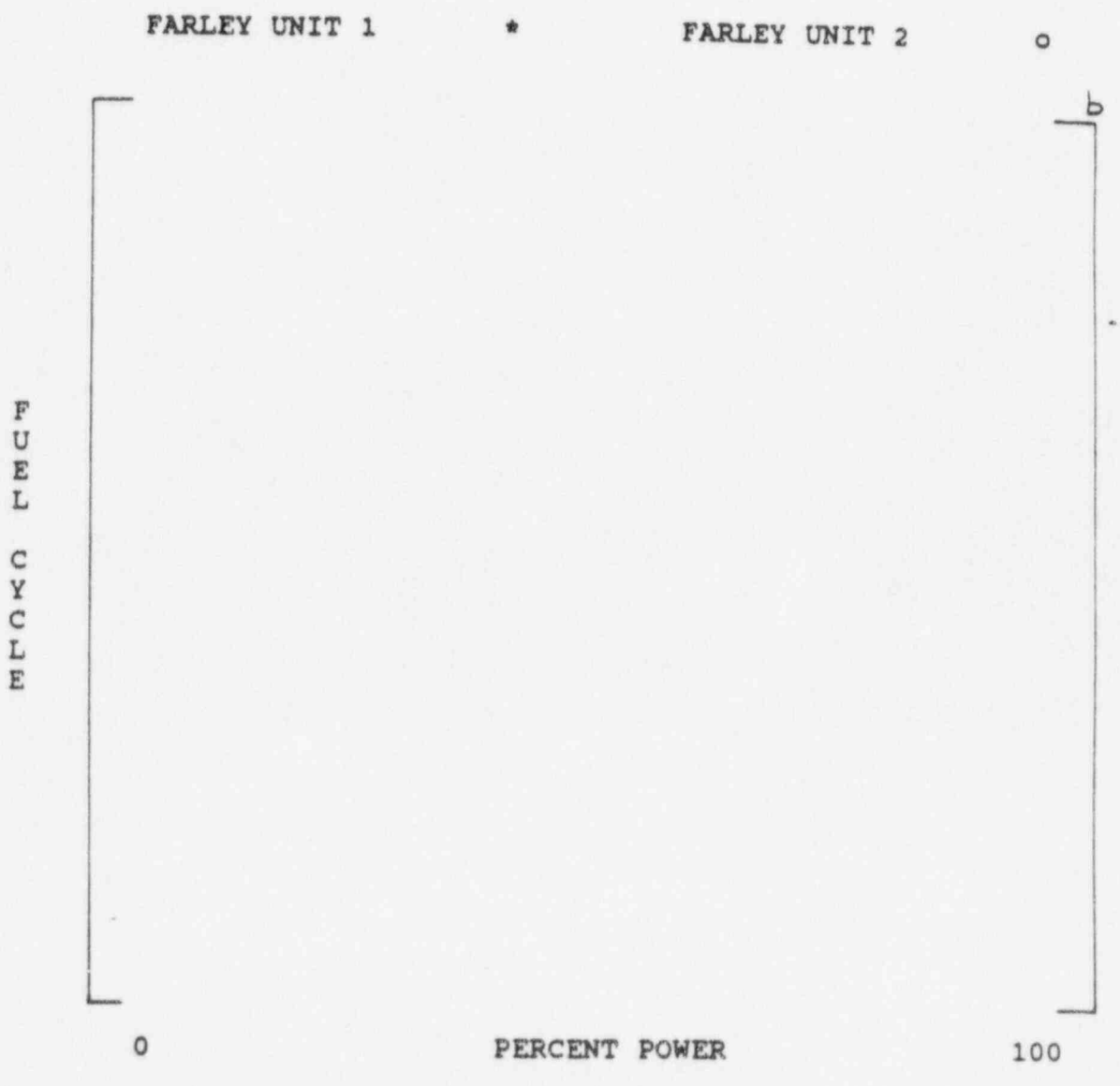
DISCUSSION OF LEAD PLANT

FARLEY UNIT 2 RCS PERFORMANCE HISTORY



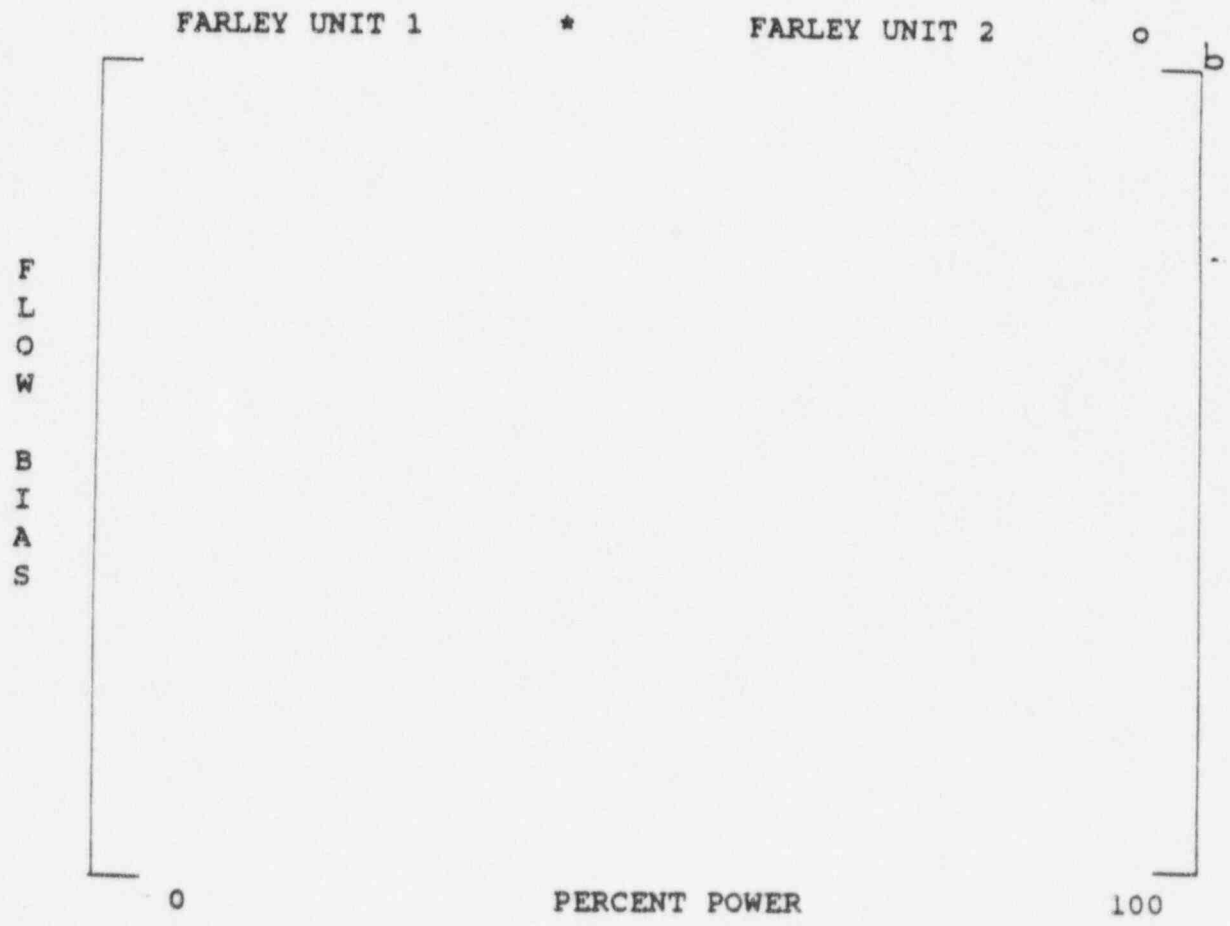
DISCUSSION OF LEAD PLANT

FARLEY POWER DIFFERENCE VS CYCLE



DISCUSSION OF LEAD PLANT

FARLEY POWER-FLOW CORRELATION



2nd ROW - OUTER ROW POWER DIFFERENCE